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LMFBR SAFETY

4. Review of Current Issues and Bibliography of Literature 1974 - 1975

J. R. Buchanan - G. W. Keilholtz

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Nuclear Safety Information Center

LMFBR SAFETY

4. REVIEW OF CURRENT ISSUES AND BIBLIOGRAPHY OF LITERATURE (1974—1975)

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FOREWORD

The Nuclear Safety Information Center (NSIC), which was established in March 1963 at Oak Ridge National Laboratory, is principally supported by the U.S. Nuclear Regulatory Commission's Office of Nuclear Regulatory Research. Support is also provided by the Division of Reactor Development and Demonstration of the U.S. Energy Research and Development Administration. NSIC is a focal point for the collection, storage, evaluation, and dissemination of safety information to aid those concerned with the analysis, design, and operation of nuclear facilities. A system of key words is used to index the information cataloged by the Center. The title, author, installation, abstract, and key words for each document reviewed are recorded at the central computing facility in Oak Ridge. The references are cataloged according to the following categories:

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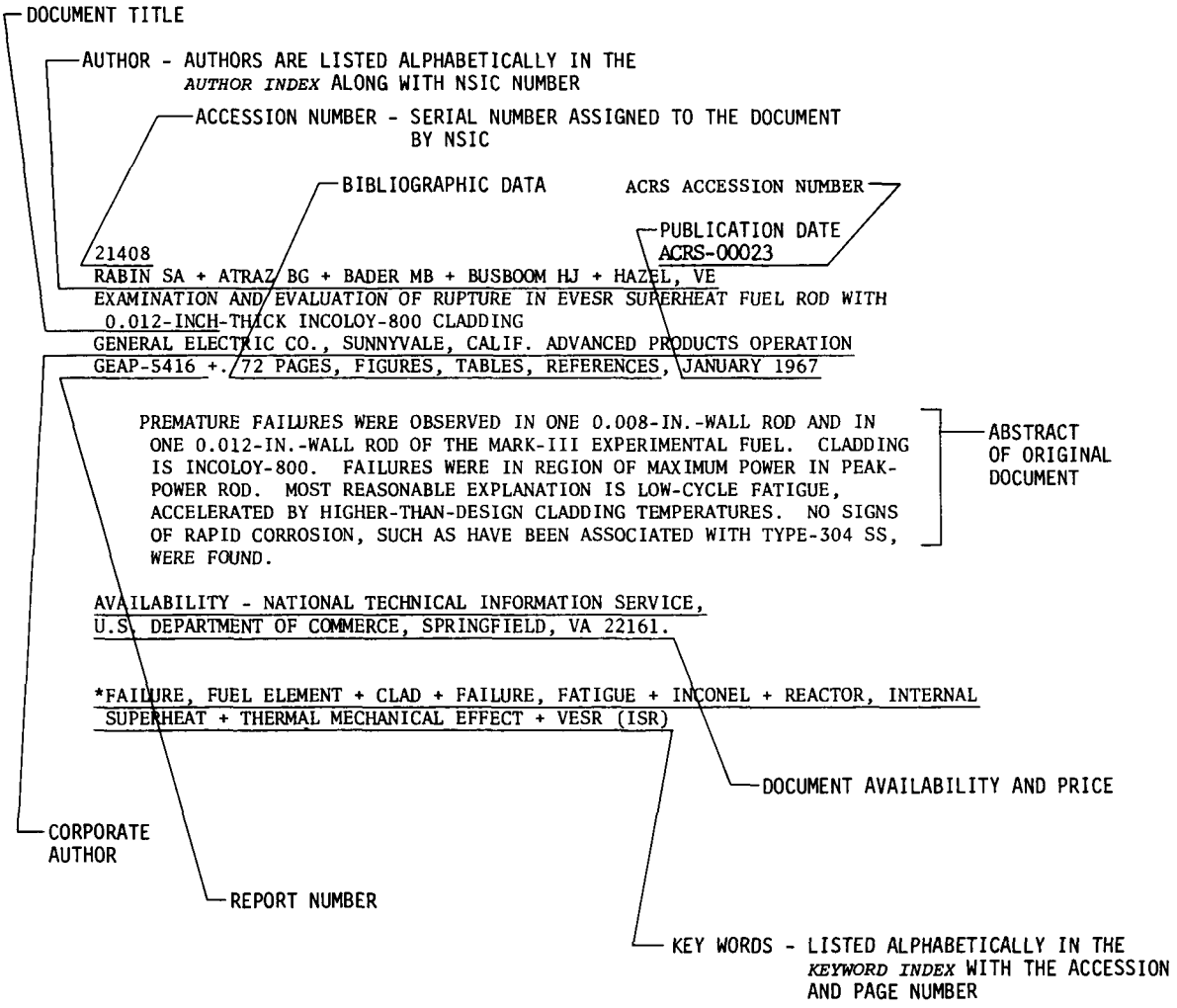
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PARTS AND METHOD OF INDEXING ABSTRACTS



LMFBR SAFETY

4. REVIEW OF CURRENT ISSUES AND BIBLIOGRAPHY OF LITERATURE (1974–1975)

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ABSTRACT

This report discusses the current status of liquid-metal fast breeder reactor (LMFBR) development and one of the principal safety issues, a hypothetical core-disruptive accident (HCDA). Bibliographic information on worldwide LMFBRs relative to the development of the breeder reactor as a safe source of nuclear power is presented for the period 1974 through 1975. The bibliography consists of approximately 1554 abstracts covering early research and development and operating experiences leading up to the present design practices that are necessary for the licensing of breeder reactors. Key-word, author, and permuted-title indexes are included for completeness.

INTRODUCTION

This bibliography of abstracts of literature relating to the liquid-metal fast breeder reactor (LMFBR) from the computer file of the Nuclear Safety Information Center (NSIC) provides valuable background information for those engaged in research, design, analysis, and licensing of breeder reactors. This is the second volume of a series on LMFBR safety and covers the literature for 1974 and 1975. This introduction to the bibliography includes a brief discussion of the current status of breeder development and one of the principal safety issues — the hypothetical core-disruptive accident (HCDA).

As attested to by the Energy Research and Development Administration (ERDA) and others, the development of the breeder reactor is essential to the assurance of adequate long-range supplies of nuclear fuel.[1,2] The LMFBR is the favored fast breeder reactor system in the United States, Great Britain, West Germany, the USSR, Japan, Italy, and France. Current-generation LMFBRs use mixed oxide (plutonium-uranium) fuel cooled by

liquid sodium. Coolant temperatures range from 400°C (750°F) at the inlet to 540°C (1000°F) at the mixed core outlet while the system is kept at a low pressure of 2 to 10 atm.[3] The feasibility of developing commercially attractive LMFBRs in the United States is founded on the extensive body of both light-water reactor (LWR) experience and sodium reactor technology.[4-9] The latter includes several years of experience each with the Sodium Reactor Experiment, and the Hallam, Sefor, and Fermi reactors; 10 years of operating experience with the Experimental Breeder Reactor (EBR-II), plus experience with its predecessor EBR-I;[10] the fuels and manufacturing technology developed for the Fast-Flux Test Facility (FFTF);[11] and the component designs for the Clinch River Breeder Reactor Plant (CRBRP);[12,13] as well as the utilization of data and experience gained from the LMFBR development programs in Europe.[14-23] Selected plant characteristics are given in Table 1 for the world's LMFBRs.[13]

As for any nuclear reactor, the safety of the fast reactor depends upon ensuring the continuity of heat removal from the hot radioactive core. At the same time provisions must be made for shutting down the reactor (i.e., terminating the nuclear fission process) when required, so that heat production after shutdown is by decay heat only. Thus, a major task is to ensure that the reactor can be shut down, or scrammed, when required. All shutdown system designs of the present generation incorporate two independent neutron-absorber systems. Less than half the capacity of either system is usually sufficient to scram the reactor. Swelling and creep phenomena in materials due to radiation-induced void formation are receiving considerable attention. Special attention is paid to the removal of decay heat, generally through diverse heat-removal systems. Other areas of concern relate to the energetics and mechanical consequences of a core-disruptive accident. Major research and development programs are under way to provide further understanding of these safety phenomena, and commercial development of the breeder in the U.S. depends upon successful completion of this effort. The decision[24] as to commercialization is to be made by 1986.

The Comptroller General of the United States in a report[25] to Congress found that "there are, . . ., environmental and safety uncertainties

Table 1. Characteristics of various LMFBR plants

Reactor	Nation	Criticality[a]	Power [MW(t)]	Fuel	Fuel loading (kg_m)	Heat transport system[b,c]
EBR-1	U.S.	1951	1.2	U	64	1 loop
BR-5	USSR	1958	5→10	PuO_2 (UC)	49.6	2 loop
DFR	U.K.	1959	60	UO_2	200	24 loop
EBR-II	U.S.	1963	62.5	U	363	Pool
Enrico Fermi	U.S.	1963	300	U	2000	3 loop
Rapsodie	France	1966	20→40	Pu-UO_2	300	2 loop
SEFOR	U.S.	1969	20	Pu-UO_2	1920	1 loop + ACS
BOR-60	USSR	1970	60	UO_2	176	2 loop
FARET[d]	U.S.	1972	50	Pu-UO_2	260	1 loop + ACS
BN-350	USSR	1972	1000	Pu-UO_2	2050	6 loop
Phenix	France	1973	560	Pu-UO_2	3500	Pool
PFR	U.K.	1974	600	Pu-UO_2	6000	Pool
FFTF	U.S.	1978	400	Pu-UO_2	3000	3 loop
JOYO	Japan	1977	100	Pu-UO_2	903	2 loop + ACS
BN-600	USSR	1979	1470	Pu-UO_2	3900	Pool
SNR-300	West Germany	1981	736	Pu-UO_2	5000	3 loop + ACS
PEC	Italy	1980	∿125	Pu-UO_2	?	2 loop semipool
MONJU	Japan	1983	540	Pu-UO_2	7900	3 loop
Super Phenix	France	1982	2900	Pu-UO_2	?	Pool
CRBRP	U.S.	1983	975	Pu-UO_2	7561	3 loop

[a] The dates given are the latest published dates and in some instances may be optimistic.

[b] ACS = Auxiliary Cooling System.

[c] The loop system uses pipes to connect the reactor vessel, coolant pump, and heat exchanger; whereas the pool concept immerses the core, heat exchanger, and coolant pump in a single pool of sodium. The former has a smaller vessel, a smaller inventory of sodium, and greater ease in isolating components for maintenance. The pool-type system has a greater heat capacity because of the larger sodium inventory, and since there are no external pipes in this system, there is less concern about leakage.

[d] The FARET project was canceled in 1965.

regarding the LMFBR that remain to be resolved. These include hypothetical core disruptive accidents which may lead to . . . recriticality. . . . Only the recriticality issue is unique to the LMFBR and other fast reactors. The other issues are common to nuclear fission power in general, but their resolution is critical because the LMFBR would exacerbate the problems."

The LMFBR has one very important safety advantage over the LWR;[26] that is, there is no need for high-pressure components within the reactor containment. With no natural pressure source, the concern then becomes a question of whether there are any combinations of malfunctions that could lead to a power excursion of sufficiently high ramp rate to generate excessive pressure. Other advantages accrue from the good heat-transfer characteristics of the sodium and its chemical reactivity, which make it efficient in retaining many fission products. On the other hand, the rapid oxidation, or burning, of sodium is important to safety assessments as is the reactivity associated with incidents that lead to voiding of sodium.

Design Philosophy

The approach to safety in the design of LMFBRs is similar to the "defense-in-depth" philosophy used in LWR design[27] (see Table 2). The philosophy, founded on the supposition that the probability of accidents decreases rapidly with their severity, defines three levels of safety:[13]

1. Care in design, construction, and operation.
2. Standby engineered safety features such as redundant decay-heat-removal systems, emergency power systems, and two independent shutdown systems that are designed to control the consequences of equipment failures, operator error, and anticipated transients.
3. Other features, such as dynamic loading conditions for specific components, the reactor vessel, or containment structure, designed to control the consequences of events such as a major core-disruptive accident that have been judged to be of low probability.

The first level of safety emphasizes accident prevention through intrinsic design features such as quality assurance, redundancy, testability, inspectability, and fail-safe characteristics.

Table 2. Multilevel safety design of an LMFBR plant

Level	Objective	Operating category	Typical events within operating capacity	Typical safety design features
1	Provision of a plant of simple, reliable, and functional design free of defects, with inherent safe performance, fabricated and operated to the highest proven standards	Normal operation	Events that will normally occur: Full-power operation Startup and shutdown Random fuel-pin failure Refueling	Fuel assembly design to prevent flow blockage Fuel of proven performance through life Core restraint to provide negative power coefficient Adequate Doppler coefficient Low-pressure coolant system with wide margin to boiling Maximum use of proven technology and hands-on maintenance Radioactive-waste-treatment system
2	Provision of protection systems to provide adequate response of system in the event of all identified transients	Anticipated faults	Events that, based on experience, are expected to occur at least once in the life of the plant: Loss of off-site power Loss of power to one pump Operator error Spurious scrams	Multiple reactor coolant loops Decay-heat-removal redundancy Battery power supplies for vital services Guard vessels for leak protection Inert atmospheres in sodium cells
		Unlikely faults	Events which are not expected to occur individually but which might occur once during the life of the plant, based on the total list of such events: Pump seizure Failure of dump system Steam-generator leak	Two independent shutdown systems Sodium-water reaction protection system
3	Provision of extra capability to cope with extremely unlikely events that are never expected to occur and additional design requirements to provide prudent margin for unforeseen events	Extremely unlikely faults	Events that are never expected to occur: Maximum flood, or earthquake, or tornado Large sodium fire Large sodium-water reaction	Site selection Flood barriers Containment isolation Low-leakage containment
		Hypothetical events	Design margins to provide for unforeseen events	Capability to accept extra thermal loads in the core support structure Capability to accept dynamic loads in vessel and primary system components Geometric requirements around the vessel Control-room radiological protection

The second level of safety is implemented in the plant-protection systems, reliability programs, heat-removal-system protection, redundant power supplies, etc. An extensive reliability program is currently under way for the CRBRP to help set the design basis for the plant protection system.[28] The reliability criterion used is that stated in the regulatory guidance provided for the analogous accident in LWRs, "Anticipated Transient Without Scram" (ATWS),[29] as follows: "The safety objective is that the likelihood of all accidents with significant consequences not included in the design basis envelope should not be greater than one in one million per year, i.e., should not occur with a failure rate greater than 10^{-6} per year. For the particular potential failure path of ATWS, the staff believes that a failure rate of the order of one-tenth of the overall safety objective is an appropriate objective."

The third level of safety supplements the first two by providing plant response to low-probability faults. Analysis of the HCDA illustrates the present state of technology in treating the third level of safety and shows that the provision of design margin involves an evaluation of the entire reactor plant. The core-disruptive accident is the most controversial area of LMFBR reactor safety evaluation. The prime conceivable mechanistic initiator of a core-disruptive accident is the combination of an accident, such as complete loss of coolant flow, with a total inability to scram, or shut down, the reactor (i.e., a disabling failure in the second level of safety). For this reason, a major effort is being put forth in the LMFBR development program to demonstrate that the reliability of scram as well as system structural integrity and post-shutdown core cooling is so high as to preclude choice of the HCDA as a design basis.

Hypothetical Core-Disruptive Accident

A number of views support the inclusion of low-probability HCDAs in the design basis of the reactor containment. In 1975 members of the NRC Regulatory Staff[30] stated: "It is our opinion that the occurrence of low probability core disruptive accidents, leading to loss-of-coolable geometry, cannot be completely precluded, and the state of technology is such that precise quantification of the accident consequences cannot be made

at this time. It is therefore important that, from the viewpoint of the health and safety of the public, the consequences of core disruptive accidents must be safely accommodated in a fast breeder reactor through appropriate features incorporated into the containment design."

Relative to the CRBRP design, the report[25] of the U.S. Comptroller General stated: "A major LMFBR design safety issue is whether an HCDA should be included as a Design Basis Accident in LMFBRs. On the basis of the current state of technology and experience, NRC safety experts told us that such an accident, although unlikely, was within the realm of possibility and should be provided for in the design of the first LMFBR demonstration plant on the Clinch River in Tennessee until a better understanding of the HCDA phenomenon is achieved."

However, in the May 1976 letter to the CRBRP, the NRC stated that "it is our current position that the probability of core melt and disruptive accidents can and must be reduced to a sufficiently low level to justify their exclusion from the design basis accident spectrum. We will therefore not consider CDAs as design basis accidents. . . . Nevertheless, . . . prudence dictates that additional measures be taken to limit consequences and reduce residual risk from potential CRBR accidents having a lower probability than design basis accidents to insure that the public health and safety is adequately protected."[31] NRC will require that the function specifications for protecting the containment integrity provide for "a core mechanical work energy release of 1200 MW-sec based on fuel vapor as the working fluid and expansion to 1 atmosphere."[31]

Earlier (1974) Nicholson[26] (of Ohio State University and formerly with Argonne National Laboratory) expressed the following view: "Over the past few years there has been an increasing body of opinion developing that the studies of hypothetical meltdown and disassembly accidents contribute nothing to the design of safe reactors and detract from the objective of licensing the fast breeder. . . . Hypothetical accident studies are not only useful but in fact an essential ingredient in both the design process and licensing. In particular, one design criterion must be the containment of all effects resulting from a hypothetical disassembly accident. . . . [Nicholson] . . . believes this statement to be true for any fast breeder that is built within at least the next fifteen

years and perhaps longer. There is no way to avoid this design requirement in the foreseeable future. It is well within the capacity of the industry to design for containment, but not without the expenditure of considerable effort. It is essential that all designers accept this challenge and proceed to accommodate the necessary perturbations in the design process."

Nicholson suggested an energy release on the order of 1000 MWsec (∿500 lb TNT) be used as a target value for the design basis of containments for a demonstration-size plant until probabilities of failure below the 10^{-6} to 10^{-7} range can be demonstrated.[26] As the design and detailed accident analysis progresses, the energy release value can be adjusted toward the end goal of an optimum design parameter. The design also depends on the degree of fuel-coolant interaction and the choice of working fluid, since the mechanical work potential depends dramatically on whether the fluid is fuel vapor or sodium vapor. The damage potential is much lower if fuel vapor is the only working fluid.

The French[32] have taken the HCDA "into account for the dimensioning of the primary and secondary containment in a conservative way, even quite arbitrarily and regardless of the initial causes." For Super Phenix, they have assumed as a working hypothesis "a coherent gravity compaction of the core leading to a $60/sec ramp rate." A design criterion provides that "the safety vessel, its upper closure structures, and structures around them must safely contain the consequences of whole core accidents." Containment response to the HCDA has been analyzed by calculations and explosive tests. For the Preliminary Safety Analysis Report, a mechanical energy release of at least 800 MWsec was assessed.[33]

Smidt,[15] of West Germany, found "that the safety design basis of present fast reactors compare favorably with that of LWRs." However, for future larger plants, he called for "a better definition especially with respect to the whole core accident" and suggested that "this might even become a matter of general feasibility for large commercial LMFBRs." Hübel,[14] of West Germany, reported that the SNR-300 will have a "provision of a two-stage defense line against HCDAs. The reactor vessel as a primary containment boundary has to be designed against a minimum mechanical

energy of 150 MWsec, while 370 MWsec are required for the integral containment system."

In the United Kingdom, Farmer[21] suggests that among the "range of possible or hypothetical accidents it is not unusual to see a description of a power excursion caused by a reactivity change of $100 per second. This implies the possible addition of a few dollars over a few tens of milliseconds which would seem to . . . [be] . . . a possibility which could never be entirely ruled out." Farmer suggests that the margin for effectiveness of the containment is not adequate if his current accident model is extrapolated to a 1200-MW(e) reactor. However, he hopes "to show that the model is excessively pessimistic on several counts" and "that the modest rearrangement of the core necessary to cancel the reactivity change can be brought about by moderate pressures exerted at lower temperatures by fission products contained in the fuel, or indeed by any other mechanism or materials added for that specific purpose." It is believed that "these effects would reduce the damaging work capability of the accident by at least an order of magnitude, would lead to low central pressures and only partial core melting." It would then be possible "to show a capability of engineering containment."

In 1975 an optimistic view was expressed[34] by ERDA: "Future LMFBRs can be expected to differ from early U.S. designs. Perhaps the most significant current change results from the conviction that we have essentially exhausted the search for sequences that could result in energetic HCDAs. Other than conceivable cladding motion or sodium void reactivity effects, we feel there remains no credible potential for damaging energetics from an LMFBR HCDA. It is likely that these exceptions could, if necessary, be controlled by design. Current design requirements for containment of energetics other than that implied by credible cladding or sodium voiding effects, then, represent no more than margin to cover for the fact that confirmatory experiments have not yet been completed."

Fauske, in a 1976 review[35] on the role of the HCDA in design and licensing, concluded that ". . . (1) the probabilities of initiators leading to core meltdown should and can be made sufficiently low (objective, $<10^{-6}$ per reactor-year) to reduce them to Class 9 accidents,

(2) best-estimate analysis including design considerations should and can demonstrate the unlikelihood (objective, $<10^{-2}$) of a postulated core meltdown leading to substantial energetics that would challenge the energy absorption capability provided by the primary-system design, i.e., the absence of energetic hydrodynamic disassembly and/or energetic fuel-coolant interactions, (3) the principal basis for the primary-system design should be set by functional requirements where any weak links in the resulting design should be upgraded to give an overall consistent system with an optimum energy adsorption capability (essentially current practice) and not by arbitrary HCDA energetics, and (4) on the basis of best-estimate analysis including design considerations, the objective should and can be to demonstrate long-term containment capability of the fuel debris following a postulated core-meltdown accident."

ERDA has made conceptual plans for a Safety Research Experimental Facility (SAREF) to investigate the energetics of an HCDA under more prototypic conditions. The facility would perform tests to determine the potential for recriticality and associated energy releases.[25] ERDA is also considering the possibility of building a test reactor in a remote site to carry out tests involving core-disruptive accidents that would include recriticality.[36]

Instructions for Using the Bibliography

The abstracts in this bibliography were selected from the NSIC computer file using REACTOR, LMFBR and REACTOR, LMCR as key words. The document descriptions added to the file prior to 1970 are found in Vol. 1 (ORNL/NUREG/NSIC-125); those for 1970 to 1972 are in Vol. 2 (ORNL/NUREG/NSIC-129); those for 1972 to 1974 are in Vol. 3 (ORNL/NUREG/NSIC-131); and this volume covers 1974 to 1975. Abstracts added after 1975 will be issued in follow-up volumes covering periods of approximately one year.

The abstracts in this volume are sorted into the NSIC category scheme and listed essentially in chronological order, with the assigned accession numbers in numerical order. The bibliography is followed by key-word, author, and permuted-title indexes.

A brief explanation of the scope of each category* in which the abstracts are presented follows:

1. General Safety Considerations — Deals with all safety aspects of radiation policy, safeguards, standards, codes, cost, financial liability, and insurance. Also covers the comparative risk to public health and safety from nuclear and nonnuclear hazards.

2. Siting of Nuclear Facilities — Considers factors used in evaluating sites, for example, facility design, proposed operation, population density, use characteristics of the environs, physical characteristics of the site, and earthquake considerations.

3. Transportation and Handling of Radioactive Materials — Pertains to shipping containers, shipping regulations, criticality safety, transportation accidents, design of tiedowns, shipping condition (impact, fire, vibration, etc.), heat-transfer capability, etc.

5. Heat Transfer and Thermal Transients — Considers all facets of the analysis of postulated accidents. Includes burnout heat flux, heat transfer, reliability analysis, thermal-mechanical effects, in-reactor experiments, coolant-activity buildup, and experiments such as in LOFT.

6. Reactor Transients, Kinetics, and Stability — Includes the studies, analytical and experimental, such as those conducted in TREAT and SPERT, in which the transient behavior of reactors and criticality accidents are examined. Deals, for example, with reactivity effects due to voids and temperature, Doppler coefficient, etc.

7. Fission Product Release, Transport, and Removal — Pertains to the release of fission products from various materials and their movement within a nuclear-facility containment system. Transport of fission products involves the physical and chemical characterization of the released radionuclides and also includes mechanisms such as deposition, adsorption, filtration, fallout, plateout, etc.

8. Sources of Energy Release Under Accident Conditions — Considers nuclear, Wigner, and gamma energies, energy release by chemical reactions,

*Categories 4, 14, 15, and 19 through 21 are inactive; therefore they are not included.

metal-water reactions, and all other types of energy that might be released as a result of a nuclear accident.

9. Nuclear Instrumentation, Control, and Safety Systems — Includes the design of control and safety systems for various nuclear processes, as well as the required instrumentation and hardware. The problems involved are the performance required of safety systems; the specification of instrumentation; the concepts of coincidence, redundance, failure modes, and reliability; adequacy of shutdown margins; design features of mechanical devices; and related subjects.

10. Electrical Power Systems — Deals with routine and emergency means of supplying electrical power to nuclear facilities of any kind. Includes all phases of the generation and distribution of electrical power to and within a nuclear power plant. Considers the reliability of the power system and the effects of system disturbances on safety and operation of the reactor.

11. Containment of Nuclear Facilities — Encompasses all aspects of pressure containment for all types of nuclear facilities. Includes fuel cladding, piping, pressure vessels, containment, and reactor buildings. Major concerns are design considerations, penetrations, structural integrity, leak testing, quality assurance, and radiation damage.

12. Plant Safety Features — Reactor — Covers all engineered safety features of reactors except containment. Includes systems for reducing temperature and pressure, air cleaning, disposal of liquid waste, and emergency core cooling. Other topics include maintenance, decontamination, fuel-element protective devices, etc.

13. Plant Safety Features — Nonreactor — Deals with facilities associated with the external fuel cycle and with the use of radioactive material created by nuclear fission. Major divisions are mining, ore conversion, enrichment, fuel-element fabrication, hot cells, fuel processing, fuel conversion, waste disposal, and radioisotopes.

16. Meteorological Considerations — Considers not only diffusion and deposition of radioactive material near the surface of the earth in connection with reactor operations, but also the atmospheric transport and fallout in the troposphere and stratosphere as a result of nuclear-weapons tests.

17. Operational Safety and Experience — Covers the safety aspects of routine reactor operation and of incidents or unusual operating occurrences, large and small. Includes power, research, and test reactors, also fuel-processing plants.

18. Safety-Analysis and Design Reports — Deals largely with safety-analysis and design reports for reactors not yet operational. The reports are generated by facility designers and by the NRC Regulatory Staff.

References on mathematical models and codes usually appear in Category 5 or 18; however, some may be expected to occur in any of the categories depending on the subject matter of the model or code.

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1. *Report of the Cornell Workshops on the Major Issues of a National Energy Research and Development Program*, Cornell University, Ithaca, N.Y. (December 1973).

2. *Report of the Liquid Metal Fast Breeder Reactor Program Review Group*, ERDA-1 (January 1975).

3. J. Graham, *Fast Reactor Safety*, Academic, New York, 1971.

4. D. Okrent, *Proceedings of the Conference on Safety, Fuels, and Core Design in Large Fast Power Reactors, Oct. 11–14, 1965*, ANL-7120.

5. D. Okrent, *Proceedings of the International Conference on Sodium Technology and Large Fast Reactor Design, Nov. 7–9, 1968*, ANL-7520, Parts I and II.

6. *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1975*, CONF-740401-P1, -P2, -P3.

7. M. H. Fontana, "1974 ANL Topical Meeting on Fast Reactor Safety," *Nucl. Safety* 16(2), 141 (March–April 1975).

8. *Liquid Metal Fast Breeder Reactor Program Plan*, Vol. 10, *Safety*, WASH-1110, 2d Ed. (December 1972).

9. D. Okrent, "Design and Safety in Large Fast Power Reactors," *At. Energy Rev.* 7, 135 (1969).

10. L. J. Koch, "EBR Plus 10: Is the U.S. Formula Right for Effective LMFBR Development?" *Nucl. News* 17(10), 55 (August 1974).

11. D. E. Simpson, "FFTF Design for Safety," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974,* CONF-740401-P2.

12. *Clinch River Breeder Reactor Plant, Preliminary Safety Analysis Report*, Docket 50-537 (April 1975).

13. J. Graham, "Nuclear Safety Design of the Clinch River Breeder Reactor Plant," *Nucl. Safety* 16(5), 564 (September–October 1975).

14. H. J. Hübel, "The Safety Related Criteria and Design Features for SNR," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974,* CONF-740401-P1, pp. 3–28.

15. D. Smidt, "Selection of Safety Design Basis of Fast Reactors in the Federal Republic of Germany," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P3, pp. 1635–1646.

16. *Proceedings of International Conference on Engineering of Fast Reactors for Safe and Reliable Operation, Karlsruhe, October 1972,* Gesellshaft fur Kernforschung MBH, Karlsruhe, 1973.

17. F. Justin et al., "Safety Criteria for the Super-Phenix Reactor," *Trans. Amer. Nucl. Soc.* 20, 464 (1975).

18. C. Girard, "French Program on LMFBR Safety," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P1.

19. H. J. Teague, "Fast Reactor Safety Research Needs, What, Why, How, and When," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P1, pp. 343–360.

20. G. Kessler, "Fast Reactor Safety Research Needs Within the DeBeNeLux-Project SNR," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P1, pp. 361–378.

21. F. R. Farmer, "Contribution to Panel Discussion on Selection of Safety Design Bases for Fast Power Reactors," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P3, pp. 1679–1682.

22. "USSR Details Design Criteria, Economics of Fast Breeder Reactors Now in Service," *Energy Digest* 3, 440–443 (Sept. 30, 1973).

23. E. Gilby, "Breeder Reactors — Design for Safety," *New Scientist* 57, 418–421 (Feb. 22, 1973).

24. "Commercialization Decision by 1986 — Seamans," *Nucl. News* 19(2), 31 (February 1976).

25. "The Liquid Metal Fast Breeder Reactor: Promises and Uncertainties," Issue Paper to the Congress by the Comptroller General of the United States, OPS-76-1, pp. 63–77 (July 31, 1975).

26. R. B. Nicholson, "The Role of Hypothetical Accident Analysis in Fast Breeder Design and Licensing," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P3, pp. 1660–1668.

27. *The Safety of Nuclear Power Reactors (Light-Water-Cooled) and Related Facilities*, WASH-1250 (July 1973).

28. *CRBR Project, Reliability Program Plan*, Docket 50-537 (Jan. 9, 1976).

29. *Technical Report on Anticipated Transients Without Scram for Water-Cooled Power Reactors*, WASH-1270 (September 1973).

30. T. P. Speis et al., "Studies of Core Disruptive Accidents and Licensing Aspects of Fast Breeder Reactors," *Trans. Amer. Nucl. Soc.* 20, 547 (1975).

31. R. P. Denise, U.S. Nuclear Regulatory Commission, letter to L. W. Claffey, CRBRP Office, May 6, 1976.

32. J. F. Petit, "Safety Design Basis for Power LMFBR in France," *Proceedings of the Fast Reactor Safety Meeting, Beverly Hills, Calif., Apr. 2–4, 1974*, CONF-740401-P3, pp. 1683–1693.

33. J. F. Petit, "Creys-Malville Plant (Super Phenix) Main Inherent and Design Safety Characteristics," *Trans. Amer. Nucl. Soc.* 22, 479 (1975).

34. W. H. Hannum, J. D. Griffith, and A. C. Millunzi, "Reactors — Safe at Any Speed," *Trans. Amer. Nucl. Soc.* 22, 483 (1975).

35. H. K. Fauske, "The Role of Core-Disruptive Accidents in Design and Licensing of LMFBRs," *Nucl. Safety* 17(5), 550–567 (September–October 1976).

36. J. D. Allen et al., *Conceptual Design for a Fast Reactor Safety Test Facility, Preliminary Report*, LA-6031-MS (October 1975).

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CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-093611 ALSO IN CATEGORY 16 DATED 1974
DEVELOPMENT FACILITIES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 72-145(REV.1) +. 265 PAGES, FIGURES, NOVEMBER 1974

THIS DOCUMENT PROVIDES A DESCRIPTION OF THE VARIOUS DEVELOPMENT FACILITIES AVAILABLE AT HEDL FOR USE IN THE FFTF/LMFBR PROGRAM. THE FACILITIES DESCRIBED ENCOMPASS: THE FAST FLUX TEST FACILITY (FFTF) REACTOR PLANT AS A TEST BED; THE HIGH TEMPERATURE SODIUM FACILITY (HTSF), A NONRADIOACTIVE LARGE COMPONENT TEST FACILITY; GENERAL SODIUM FACILITIES; HYDRAULICS LABORATORY; FUEL FABRICATION FACILITIES, FUEL EXAMINATION FACILITIES, CHEMICAL AND MICROSTRUCTURAL ANALYSIS LABORATORIES, AND SUPPORT LABORATORY CAPABILITIES. FACILITIES UTILIZATION IS BASED ON PRIORITIES OF THE VARIOUS PROGRAMS WITH THE FFTF HAVING THE HIGHEST PRIORITY. THE FACILITIES ARE CAPABLE OF MODIFICATION TO SUIT THE SPECIFIC TEST REQUIREMENTS. SUFFICIENT DETAIL IS PROVIDED IN THIS REPORT TO PERMIT ASSESSMENT OF USE FOR PARTICIPANTS IN THE LMFBR PROGRAM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR DESCRIPTION + THERMAL MECHANICAL EFFECT + FFTF (TR) + TEST, COMPONENT + IRRADIATION TESTING + SYSTEM DESCRIPTION + COMPONENT DESCRIPTION

1-093641 ALSO IN CATEGORIES 17 AND 18 DATED 1975
PROCEEDINGS OF THE SCIENTIFIC-TECHNICAL CONFERENCE 'ATOMIC POWER, FUEL CYCLES, RADIATION STUDY OF MATERIALS', HELD IN ULYANOVSK, 5-10 OCTOBER 1970 (VOL.1)
CONF-701074-P1 +. 725 PAGES, JANUARY 1975 (TRANSLATED FROM RUSSIAN)

CONTAINS ARTICLES DISCUSSING NUCLEAR ENERGY DEVELOPMENT IN THE VARIOUS SOVIET BLOC NATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + REACTOR, BWR + COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + REACTOR, PWR + ACCIDENT, HYPOTHETICAL + CZECHOSLOVAKIA + GERMANY + HUNGARY + USSR + BULGARIA + OPERATING EXPERIENCE + GROWTH/DEVELOPMENT + INDUSTRY, NUCLEAR + REACTOR STARTUP

1-098943 DATED 1973
INTERNATIONAL WORKING GROUP ON FAST REACTORS SIXTH ANNUAL MEETING, VIENNA, AUSTRIA, 9-11 MAY 1973. SUMMARY REPORT, PART II
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
TID-26349 +. 187 PAGES, AUGUST 1973

CONTAINS THE MINUTES OF THE MEETING, TEN PAPERS WHICH REVIEW THE NATIONAL PROGRAMMES IN THE FIELD OF LMFBR'S, AND OTHER PRESENTATIONS AT THE MEETING, AND THE DISCUSSIONS ON THE REVIEW OF NATIONAL PROGRAMMES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FRANCE + IAEA + UNITED KINGDOM + GERMANY + ITALY + JAPAN + USSR + UNITED STATES + R AND D PROGRAM

1-099336 DATED 1974
ANDERS WA
THE NEXT 20 YEARS FOR NUCLEAR POWER - THE GOVERNMENT'S EVOLVING ROLE
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
AEC PRESS RELEASE T-599 +. 4 PAGES, NOVEMBER 5, 1974

DISCUSSES FIRST THE GOVERNMENT-INDUSTRY RELATIONSHIP IN NUCLEAR POWER DEVELOPMENT, AND SECOND, THE ROLE OF REGULATION IN ACHIEVING OVERALL SAFETY AND ENVIRONMENTAL GOALS. THE DIRECTIONS IN WHICH THESE TWO AREAS EVOLVE WILL HAVE A LARGE IMPACT ON THE SHAPE OF NUCLEAR POWER ENTERPRISES OVER THE NEXT 20 YEARS. BOTH AREAS WILL LIKELY UNDERGO FUNDAMENTAL CHANGES AS A RESULT OF THE RECENT LEGISLATIVE REORGANIZATION OF THE FEDERAL ENERGY DEVELOPMENT AND REGULATORY RESPONSIBILITIES. IT SEEMS CONTRADICTORY THAT WHILE THE LWR CONCEPT IS GENERALLY EXPECTED TO CARRY THE BULK OF THE NATION'S NUCLEAR GENERATING CAPACITY FOR THE NEXT 20 YEARS AND MORE, THE AEC HAS NO LWR TECHNOLOGY BRANCH IN RRD. THE DESIRE IS THAT ERDA WILL RESPOND FAVORABLY TO A RECOMMENDATION FOR AN EXPANDED GOVERNMENT ROLE IN THE MID-SPECTRUM OF NUCLEAR R&D.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

REGULATION, AEC + REACTOR, LWR + GROWTH/DEVELOPMENT + INDUSTRY, NUCLEAR + SPOKESMAN, AEC

1-100111 DATED 1970
NUCLEAR REACTOR SAFETY RESEARCH, REPORT TO CONGRESS FOR 1969
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
MM-1246, PP. 265-83 +. 19 PAGES, FROM 'FUNDAMENTAL NUCLEAR ENERGY RESEARCH', JANUARY 1970

SUMMARIZES THE YEAR'S ACTIVITIES IN SAFETY RESEARCH ON (1) WATER REACTOR LOSS OF COOLANT STUDIES, CLADDING BEHAVIOR, AND PRESSURE GENERATION; (2) FAST REACTOR TREAT EXPERIMENTS, LIQUID URANIUM DIOXIDE HEAT, AND SODIUM-AIR REACTION; AND (3) REACTOR SITING AND ENVIRONMENT STUDIES.

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-100111 *CONTINUED*
AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CHEMICAL REACTION + GEOLOGY + ACCIDENT, LOSS OF COOLANT + SEISMOLOGY + SITING, REACTOR + TREAT (PRR) + AIR + REACTOR, LWR + URANIUM DIOXIDE + METEOROLOGY + EXPERIMENT + R AND D PROGRAM + THERMAL POLLUTION

1-101234 DATED 1975
REPORT OF THE LIQUID METAL FAST BREEDER REACTOR PROGRAM REVIEW GROUP
U.S. ERDA
ERDA-1 +. 114 PAGES, TABLES, FIGURES, JANUARY 1975

THE REVIEW CONFIRMS THE NEED TO PROCEED EXPEDITIOUSLY TO DEVELOP THE LMFBR AT THIS TIME TO ASSURE THE CONTINUED AVAILABILITY OF THE NUCLEAR POWER OPTION TO MEET THE NATION'S FUTURE ENERGY NEEDS. IN VIEW OF THE FACTORS CONCERNING URANIUM RESOURCES THE OBJECTIVE OF ACHIEVING COMMERCIAL BREEDER AVAILABILITY BY THE EARLY 1990'S THE PRUDENT ONE, THOUGH THERE IS SOME RISK THAT THIS TIMING MAY BE LATE IN RELATION TO NEED. TO ACCOMPLISH THIS OBJECTIVE REQUIRES AN AGGRESSIVE EFFORT.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

ENERGY SOURCE + ECONOMIC STUDY + FORECAST + GROWTH/DEVELOPMENT + N-POWER FORECAST + FUEL CYCLE

1-102042 DATED 1973
GENERAL CRITERIA FOR THE NEW SAFETY RULES FOR SODIUM PLANTS
AEC-TR-7589 +. 9 PAGES, 1973 (TRANSLATED FROM ITALIAN)

CONTAINS A LIST OF 37 SAFETY CRITERIA FOR SODIUM HANDLING PLANTS THAT COVER THE TOPICS OF GENERAL PHILOSOPHY, ORGANIZATION, PLANT DESIGN, BUILDING DESIGN, PLANT CONTAINMENT, PERSONNEL, FIRE FIGHTING, AND MISCELLANEOUS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT + DESIGN CRITERIA + IAEA + UNITED KINGDOM + ITALY + SAFETY PRINCIPLES AND PHILOSOPHY + FIRE PROTECTION

1-102227 DATED 1974
PUBLIC ISSUES OF NUCLEAR POWER
UNIVERSITY OF MINNESOTA, MINNEAPOLIS
740 PAGES, PROCEEDINGS OF A COURSE HELD AT THE UNIV. OF MINNESOTA, SEPT. 23-DEC. 4, 1974

THE PARTICIPATION OF OUR NATION'S FOREMOST CRITICS WAS SOUGHT AND, TO A SIGNIFICANT EXTENT, THESE CRITICS ARE REPRESENTED IN THE SESSIONS. FOR THOSE NOT REPRESENTED, THEIR RECENT TALKS AND PUBLICATIONS ARE INCLUDED IN THE REFERENCE LISTINGS. PROPONENTS AND SPECIALISTS IN NUCLEAR POWER WERE SELECTED FROM INDUSTRY AND FEDERAL GOVERNMENT. THESE PROCEEDINGS INCLUDE THE MATERIAL SUBMITTED BY THE SPEAKERS FOR THEIR TALKS OR THE TRANSCRIPTION OF THE PRESENTATION.

AVAILABILITY - ADDRESSING & MAILING, PUBLICATIONS-PUBLIC ISSUES, 2818 COMO AVE. S.E., MINNEAPOLIS, MINN. 55414 ($14.20/COPY, UNIV. OF MINNESOTA)

PLUTONIUM + RADIATION IN PERSPECTIVE + WASTE MANAGEMENT + REACTOR, LWR + RADIATION, PUBLIC EDUCATION + INDUSTRY, NUCLEAR + BENEFIT VS RISK + N-POWER, SAFETY OF + OPPONENT + PROPONENT + SOCIO/PHILOSOPHICAL CONSIDERATION + POWER PLANT, NUCLEAR + FUEL CYCLE

1-103019 DATED 1975
VENDRYES G
PHENIX: ON THE PATH TO ITS OBJECTIVES
7 PAGES, 2 TABLES, 8 REFERENCES, NUCLEAR NEWS, 18(5), PP. 82-88 (APRIL 1975)

THE YEAR 1974 WAS ONE OF OUTSTANDING SIGNIFICANCE FOR THE FRENCH LIQUID-METAL FAST BREEDER REACTOR PROGRAM. IT WAS MARKED BY COMPLETION OF TESTS, POWER RISE ,AND THE FIRST FEW MONTHS OF OPERATION OF THE PHENIX DEMONSTRATION POWER PLANT. THIS ACHIEVEMENT TAKES PLACE SEVEN YEARS AFTER THE STARTUP OF RAPSODIE, THE EXPERIMENTAL REACTOR THAT WAS AND CONTINUES TO BE AN INVALUABLE WORKING TOOL. THE EXPERIENCE AND CONFIDENCE GAINED WITH RAPSODIE MADE IT POSSIBLE TO PREPARE THE NEXT STEP, AIMED AT THE CONSTRUCTION AND OPERATION OF A DEMONSTRATION PLANT WITH A SIGNIFICANT POWER OUTPUT: PHENIX-250 MWE.

FRANCE + OPERATING EXPERIENCE + RAPSODIE (LMCR) + COST, CAPITAL + CONSTRUCTION SCHEDULE + PHENIX (LMFBR)

1-103362 DATED 1975
NOVICK S
A TROUBLESOME BREW
4 PAGES, ENVIRONMENT, 17(4), PP. 8-11 (JUNE 1975)

STRONG CRITICISM OF LMFBR PROJECT. FEELS THAT WE DO NOT KNOW WHETHER LMFBRS ARE SAFE ENOUGH TO BUILD AND THAT THE RESEARCH INVOLVED IS TO BUILD AND OPERATE A LARGE NUMBER WITH THE U.S. BEING THE LABORATORY. FEELS TAHT RISKS ARE GREATER THAN THAT GIVEN IN AEC (ERDA) PROPOSED FINAL ENVIRONMENTAL STATEMENT.

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-103362 *CONTINUED*
CONTAINMENT + EXPLOSION + *BENEFIT VS RISK + N-POWER, SAFETY OF + *OPPONENT + ACCIDENT, CORE DISRUPTIVE

1-103363 DATED 1975
COCHRAN TB + SPETH JG + TAMPLING AR
A POOR BUY
NATIONAL RESOURCES DEFENSE COUNCIL, WASHINGTON, D.C.
9 PAGES, 2 TABLES, ENVIRONMENT, 17(4), PP. 12-20 (JUNE 1975)

DISCUSSES THE LMFBR PROJECT AS TO HAZARDS, ECONOMICS, TIME TABLE, AND ALTERNATIVES. CALLS FOR A DELAY IN THE LMFBR PROGRAM FOR ONE DECADE. FEELS THAT THE PROGRAM IS PREMATURE AND THAT THERE IS NO PENALTY IN SUCH DELAY. SUGGESTS RECASTING THE LMFBR EFFORT AS A LOW-PRIORITY PROGRAM CENTERED ON THE FAST FLUX TEXT FACILITY AND CANCELLING CURRENT PLANS FOR GOING AHEAD WITH THE CLINCH RIVER DEMONSTRATION PLANT. FUNDS WOULD BE FREED FOR THE ACCELERATED DEVELOPMENT OF SOLAR, GEOTHERMAL, FOSSIL FUEL, FUSION, AND CONSERVATION TECHNOLOGIES.

ECONOMICS + ENERGY SOURCE + *COST, CAPITAL + N-POWER, SAFETY OF + *OPPONENT + CONSTRUCTION SCHEDULE + COST BENEFIT

1-103436 ALSO IN CATEGORIES 13 AND 18 DATED 1975
COCHRAN TE
THE LIQUID METAL FAST BREEDER REACTOR - AN ENVIRONMENTAL AND ECONOMIC CRITIQUE
271 PAGES, PUBL. BY RESOURCES FOR THE FUTURE INC., 1974 (BOOK)

COCHRAN TAKES A CRITICAL LOOK AT THE ECONOMIC AND ENVIRONMENTAL ARGUMENTS WHICH HAVE BEEN MADE IN FAVOR OF AN EARLY INTRODUCTION OF THE LMFBR AS CENTRAL COMPONENT OF THE UNITED STATES ELECTRICAL ENERGY SYSTEM. IN GENERAL HE FEELS THAT THE ECONOMIC ARGUMENTS PUT FORTH ARE OPEN TO ANY SERIOUS QUESTIONS. HE ALSO SUGGESTS THAT THE LMFBR APPEARS TO HAVE NO ENVIRONMENTAL ADVANTAGE OVER THE PRESENTLY OPERATING LIGHT WATER REACTORS AND ESPECIALLY NOT OVER THE HIGH TEMPERATURE GAS REACTOR.

AVAILABILITY - THE JOHNS HOPSKINS UNIVERSITY PRESS, BALTIMORE, MARYLAND 21218

ECONOMICS + PLUTONIUM + ENVIRONMENT + *SAFEGUARDS, NUCLEAR MATERIAL + COST, CAPITAL + *N-POWER, SAFETY OF + OPPONENT + FUEL CYCLE

1-103437 DATED 1974
KENWARD M
FLIGHT OF THE PHENIX
2 PAGES, NEW SCIENTIST, 64(992), PP. 425-426 (NOV. 7, 1974)

WHILE BRITAIN'S FAST REACTOR PROGRAM HAS BEEN TROUBLED BY MINOR DIFFICULTIES THAT ADD UP TO A TWO-YEAR DELAY, FRANCE HAS COMPLETED A SIMILAR PROGRAM ON TIME. THE 250 MWE PHENIX REACTOR WENT CRITICAL AT THE END OF AUGUST 1973. CONSTRUCTION STARTED IN APRIL 1968, AND WAS COMPLETED IN 1972. AFTER A LITTLE OVER A MONTH OF CRITICALITY PHENIX PRODUCED ITS FIRST 'NUCLEAR' STEAM. AND BY THE END OF JANAURY 1974, CEA AND EDF STARTED POWER TESTS. THE FINAL START UP MILESTONE WAS PASSED ON 12 MARCH WHEN PHENIX REACHED ITS DESIGN OUTPUT OF 251 MWE.

FRANCE + CRITICALITY EXPERIMENT + *PHENIX (LMFBR) + *REACTOR STARTUP

1-103919 ALSO IN CATEGORY 18 DATED 1975
CLINCH RIVER BREEDER REACTOR PROJECT: 1974 TECHNICAL PROGRESS REPORT
WESTINGHOUSE ELECTRIC CORPORATION
227 PAGES, 28 TABLES, 1975

PRESENTS A REVIEW OF THE CRBR PROJECT. TOPICS REVIEWED INCLUDE PROJECT MANAGEMENT, REACTOR SYSTEMS, PLANT SYSTEMS, CONTROL AND PROTECTION SYSTEMS, INSTRUMENTATION AND ELECTRICAL SYSTEMS, BUILDING ARRANGEMENT, AND SAFETY AND LICENSING.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CONTROL SYSTEM + *REACTOR DESCRIPTION + SYSTEM DESCRIPTION + REVIEW + COMPONENT DESCRIPTION + *CLINCH RIVER (LMFBR) + LICENSING PROCESS + INSTRUMENTS, MISC.

1-103921 ALSO IN CATEGORY 18 DATED 1975
THE LIQUID METAL FAST BREEDER REACTOR PROGRAM - PAST, PRESENT, AND FUTURE
U.S. GENERAL ACCOUNTING OFFICE
70 PAGES, APROL 28, 1975

PRESENTS A REVIEW OF THE LMFBR PROGRAM INCLUDING: ORIGIN AND EVOLUTION; ELEMENTS AND FACILITIES; MANAGEMENT OF THE PROGRAM; FUNDING FOR ENERGY RESEARCH AND DEVELOPMENT; AND FOREIGN LMFBR PROGRAMS.

AVAILABILITY - U.S. GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.

ECONOMICS + FRANCE + *REVIEW + *AGENCY, AEC

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-103994 ALSO IN CATEGORY 18 DATED 1975
CUNNINGHAM DC + GALDE DD
LIQUID METAL FAST BREEDER REACTOR
U.S. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
TID-3333-S2 +. 263 PAGES, JUNE 1975

THIS BIBLIOGRAPHY CITES 1,966 PUBLICATIONS CONTAINING INFORMATION ON LIQUID METAL FAST BREEDER REACTORS. THE CITATIONS WERE TAKEN FROM NUCLEAR SCIENCE ABSTRACTS (NSA) VOLUMES 28 (JULY 1973) THROUGH 30 (DECEMBER 1974). EACH CITATION LISTS THE ORIGINAL NSA ABSTRACT NUMBER AS WELL AS A BIBLIOGRAPHY CITATION NUMBER. A PERSONAL AUTHOR INDEX, A REPORT NUMBER AVAILABILITY INDEX, AND A SUBJECT INDEX ARE PROVIDED IN WHICH CITATIONS ARE IDENTIFIED BY MEANS OF THE BIBLIOGRAPHY CITATION NUMBERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY

1-104424 ALSO IN CATEGORIES 13 AND 18 DATED 1973
ZEIGLER RK
QUALITY ASSURANCE PLAN FOR MIXED OXIDE FUEL FOR LMFBR
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-UR-73-740 + CONF-730911-1 +. 7 PAGES, FROM WESTERN REGIONAL CONFERENCE OF AMERICAN SOCIETY FOR QUALITY CONTROL, PORTLAND, OREGON, SEPT. 27, 1973

AN EVALUATION OF THE ADEQUACY OF THE METHODS OF ANALYSIS IS PRESENTED FOR CHEMICAL SPECIFICATIONS OF LMFBR/FFTF MIXED URANIUM-PLUTONIUM OXIDE FUEL. THIS EVALUATION IS BASED ON STATISTICAL ANALYSES OF THE RESULTS OBTAINED BY SEVEN LABORATORIES ON A DISTRIBUTED BATCH OF FFTF FUEL PELLETS AND DISTRIBUTED SPECIAL BLENDS OF CERTAIN IMPURITIES AND A HIGH PURITY URANIUM-PLUTONIUM OXIDE MATRIX. BASED UPON THE RESULTS OF THIS EVALUATION A QUALITY ASSURANCE PROGRAM WILL BE DISCUSSED WHICH WILL ENSURE THE CONTINUING EXISTENCE OF QUALITY DATA FOR THE CHEMICAL CHARACTERIZATION OF LMFBR/FFTF MIXED OXIDE FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM + URANIUM + FUEL, PELLET TYPE + ANALYTICAL TECHNIQUE + *QUALITY ASSURANCE + MIXED OXIDE

1-104663 DATED 1975
FONTANA MH
1974 ANS TOPICAL MEETING ON FAST REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
9 PAGES, 1 TAB., 8 REFS., NUCLEAR SAFETY, 16(2), PP. 141-49 (MARCH-APRIL 1975)

THIS ARTICLE IS A BRIEF REVIEW OF THE AMERICAN NUCLEAR SOCIETY TOPICAL MEETING ON FAST REACTOR SAFETY, HELD AT BEVERLY HILLS, CALIF., APR. 2-4, 1974, SPONSORED BY THE TECHNICAL GROUP ON REACTOR SAFETY AND THE LOS ANGELES SECTION OF THE AMERICAN NUCLEAR SOCIETY. PRESENTATIONS AND DISCUSSIONS ON SAFETY PHILOSOPHY, RESEARCH NEEDS, AND SAFETY PHENOMENOLOGY INDICATE STEADY PROGRESS TOWARD UNDERSTANDING THE TECHNICAL BASES OF FAST REACTOR SAFETY, ALTHOUGH DIFFERENCES OF OPINION APPEAR TO EXIST WITH RESPECT TO PHILOSOPHY OF APPLICATION TO REACTOR DESIGNS.

FRANCE + UNITED KINGDOM + FFTF (TR) + *SAFETY PRINCIPLES AND PHILOSOPHY + REVIEW + UNITED STATES + SAFETY PROGRAM + *ACCIDENT, CORE DISRUPTIVE

1-104679 DATED 1975
THE CASE FOR THE LIQUID METAL FAST BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORPORATION
18 PAGES, 1975

THE LMFBR HAS BEEN MALIGNED AS TOO EXPENSIVE, UNSAFE, UNNECESSARY AND ENVIRONMENTALLY OBJECTIONABLE. IN ADDITION TO PRESENTING GENERAL BACKGROUND ON THE LMFBR, THIS PAPER ADDRESSES SOME OF THE CRITICISMS. CONTENTIONS PRESENTED ARE AS FOLLOWS: NUCLEAR FISSION IS A HIGHLY STABLE, ENTIRELY PREDICTABLE PROCESS, BOTH THE TECHNOLOGY AND THE EXPERIENCE TO OVERCOME THE POTENTIAL HAZARDS THAT PLUTONIUM PRESENTS ARE IN HAND, AND THE LMFBR WILL HAVE LESS EFFECT ON THE ENVIRONMENT THAN MOST FORMS OF ELECTRIC ENERGY PRODUCTION USED TODAY.

AVAILABILITY - DR. J. B. YASINSKY, MARKETING MANAGER, WESTINGHOUSE ELECTRIC CORP., ADVANCED REACTORS DIVISION, P.O. BOX 158, MADISON, PENN. 15663

ECONOMICS + PLUTONIUM + REACTOR TRANSIENT + TRANSPORTATION AND HANDLING + *SAFEGUARDS, NUCLEAR MATERIAL + *N-POWER, SAFETY OF

1-105485 DATED 1974
BARON S
LMFBR: THE ONLY ANSWER
BURNS & ROE INC., NEW JERSEY
9 PPS, 8 FIGS, MECHANICAL ENGINEERING, 96(12), PP. 12-20 (DEC. 1974)

THE AUTHOR COMPARES THE SOURCES OF ENERGY AVAILABLE TO US AND PRESENTS DATA TO PROVE THAT THE LMFBR IS THE BEST OPTION TO SUPPLY FUTURE ENERGY NEEDS. HE SAYS ALL OTHER OPTIONS OFFER ONLY

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-105485 *CONTINUED*
POOR OR UNCERTAIN ALTERNATIVES. FOR COMPARISON, HE LOOKS AT ENERGY RESOURCES, EFFICIENCY OF CONVERSION, ENVIRONMENTAL DEGREGATION, ECONOMIC FACTORS, AND THE EVOLUTION FROM RESEARCH TO POWER PRODUCTION. HE SAYS THAT COAL, URANIUM (LMFBR), FUSION, AND SOLAR POWER ARE THE ONLY POSSIBILITIES WORTH COMPARISON. HE FINDS ALL SOURCES FAIL IN ONE OR MORE WAYS EXCEPT THE BREEDER.

*ENERGY SOURCE + URANIUM + ECONOMIC STUDY + R AND D PROGRAM + FORECAST + *FUEL, FOSSIL + *COMPARISON + GROWTH/DEVELOPMENT + ENVIRONMENTAL QUALITY

1-105682 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.15 - CONTROL OF DELTA FERRITE IN WELDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q120.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REQUIREMENTS FOR DELTA FERRITE CONTENT ARE GIVEN IN THE ASME CODE, SECTION III, ASME CODE CASE 1592-1, RDT STANDARDS M1-1T AND M1-2T, AND THE REACTOR VESSEL SPECIFICATION. IN ALL CASES, THE DETERMINATION OF DELTA FERRITE CONTENT WILL BE MADE FROM CHEMICAL ANALYSES OF WELDING MATERIALS AS APPLIED TO THE SHAEFFLER DIAGRAM IN THE ASME CODE. THERE IS NO REQUIREMENT THAT DELTA FERRITE DETERMINATIONS BE MADE FROM PRODUCTION WELDS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CODES AND STANDARDS + WELDS + CHEMICAL ANALYSIS + MATERIAL + PROPERTY, PHYSICAL + RESPONSE TO NRC QUESTION + METALLURGY + CLINCH RIVER (LMFBR)

1-105689 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.8 - RDT STANDARD TO BE USED
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q222.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE PLANT PROTECTION SYSTEM, THE C AND E SERIES OF RDT STANDARDS LISTED IN TABLE 7.1-4 WILL BE USED TO FORM THE BASIS FOR PREPARATION OF EQUIPMENT SPECIFICATIONS. IN ORDER TO ENSURE THEIR CORRECT USE IN THE PROCUREMENT OF EQUIPMENT, SPECIFIC SECTIONS OR PARAGRAPHS WILL BE INCLUDED IN THE SPECIFICATIONS, AS APPROPRIATE. FOR OTHER SAFETY RELATED INSTRUMENTATION AND CONTROLS, THE C AND E SERIES OF RDT STANDARDS LISTED IN THIS TABLE WILL BE USED AS REQUIRED TO SUPPLEMENT EXISTING COMMERCIAL AND NUCLEAR CODES ALREADY IN EXISTENCE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CODES AND STANDARDS + FABRICATION + *REACTOR PROTECTION SYSTEM + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

1-105690 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.10 - COMPLIANCE OF THE PPS AND ESF WITH STANDARDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 5 PAGES, PP. Q222.10-1 THRU Q222.10-5 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES HOW THE REQUIREMENTS OF GDCS AND IEEE STANDARD 279-1971 ARE MET ON AN INDIVIDUAL AND SECTION BY SECTION BASIS. ALSO, SHOWS COMPLIANCE WITH THE RECOMMENDATIONS OF APPLICABLE IEEE STANDARDS, REGULATORY GUIDES AND BRANCH POSITIONS AS GIVEN IN APPENDIX 7A OF THE STANDARD REVIEW PLAN.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CODES AND STANDARDS + DESIGN CRITERIA + REACTOR PROTECTION SYSTEM + RESPONSE TO NRC QUESTION + SINGLE FAILURE CRITERION + ENGINEERED SAFETY FEATURE + CLINCH RIVER (LMFBR)

1-105980 ALSO IN CATEGORIES 9 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-22 +. 179 PAGES. AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, AUG. 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING COMPONENTS NOT COVERED BY ASME CODE, CONTROL RODS, SOURCE RANGE FLUX MONITORING SYSTEM, SODIUM DUMP SYSTEM, SODIUM FIRE PROTECTION SYSTEM, AND CUMULATIVE MECHANICAL DAMAGE FUNCTION. INCLUDES RESPONSES TO NRC QUESTIONS CONERNING THE ABOVE MENTIONED SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*NRC QUESTION + CODES AND STANDARDS + CONTAINMENT DESIGN + DESIGN CRITERIA + STORAGE CONTAINER + EQUIPMENT + *REPORT, PSAR + INSTRUMENT, STARTUP RANGE + FIRE PROTECTION + *CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

1-106002 ALSO IN CATEGORY 18 DATED 1975

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-106002 *CONTINUED*
RESPONSE TO QUESTION 222.36 - CONFORMANCE TO IEEE STANDARD 352-1975
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 2 PAGES. PP. Q222.36-1 THRU Q222.36-2 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE CRBRP RELIABILITY PROGRAM IS STRUCTURED ALONG THE GUIDELINES PROVIDED IN IEEE 352-75 AND CONFORMS TO THE INTENT OF THAT STANDARD. THE STATED OBJECTIVE OF IEEE-352-75 IS TO PRESENT THE GENERAL PRINCIPLES THAT MAY BE USED TO EVALUATE THE QUALITATIVE AND QUANTITATIVE RELIABILITY AND AVAILABILITY OF SAFETY RELATED NUCLEAR POWER PLANT SYSTEMS. THUS. WHILE GENERAL PRINCIPLES MAY BE FOLLOWED. UTILIZATION OR NON-UTILIZATION OF SPECIFIC METHODS DESCRIBED IN THE STANDARD DOES NOT INDICATE A DEGREE OF CONFORMANCE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*CODES AND STANDARDS + DESIGN CRITERIA + *ELECTRIC POWER + RELIABILITY. SYSTEM + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

1-106003 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.37 - QUALIFICATION PROCEDURES IN IEEE STANDARD 323-1974
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q222.37-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

TYPE TESTING. OPERATING EXPERIENCE. ANALYSIS OR COMBINATIONS THEREOF WILL BE USED TO DOCUMENT THAT CLASS IE EQUIPMENT WILL MEET OR EXCEED ITS PERFORMANCE REQUIREMENTS THROUGHOUT THE EQUIPMENT'S QUALIFIED LIFE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CODES AND STANDARDS + *TESTING + RELIABILITY. COMPONENT + RESPONSE TO NRC QUESTION + *EQUIPMENT + CLINCH RIVER (LMFBR)

1-106159 ALSO IN CATEGORY 11 DATED 1974
THIRD QUARTERLY REPORT. 1974 FAST BREEDER PROJECT
KERNFORSCHUNGSZENTRUM. PROJEKT SCHNELLER BRUTER. KARLSRUHE. F.R. GERMANY
EURFNR-1229 + KFK-1274/3 + EUR-5199 +. 150 PPS. FIGS. DEC. 1974

FUEL SWELLING IS THOUGHT TO BE THE CAUSE OF HIGH PLASTIC STRAINS MEASURED DURING IN-PILE EXPERIMENTS. CORROSION ON THE INSIDE OF THE TUBE WALL INCREASES WITH INCREASING BURNUP. RESULTS ON SWELLING BEHAVIOR OF ALSTENITIC STEELS AFTER VARIOUS KINDS OF PRELIMINARY TREATMENT INDICATE A CONSIDERABLE REDUCTION OF SWELLING IN THE COLD-WORKED CONDITION AND A PARTICULARLY ADVANTAGEOUS BEHAVIOR OF 1.4970 TYPE STEEL. NEW EVALUATIONS OF CROSS-SECTIONS OF U-238 AND PU-239 FOR KEDAK-3 NUCLEAR DATA FILE HAVE RESULTED IN A NUMBER OF CHANGES RELATIVE TO THE VALUES USED SO FAR. THE MECHANICAL EFFECTS OF A FUEL-SODIUM INTERACTION ARE STUDIED BY THEORETICAL CALCULATIONS AND BY EXPLOSION TESTS ON REACTOR CORE MODELS. IN THE EXPLOSION TEST PEAK PRESSURES UP TO 100 ATM. WERE ACCOMMODATED BY FUEL WITHOUT ANY MAJOR PLASTIC STRAINS.

AVAILABILITY - INIS SECTION. INTERNATIONAL ATOMIC ENERGY AGENCY. P.O. BOX 590. A-1011 VIENNA. AUSTRIA

EXPLOSION + CLADDING + TESTING + STEEL. STAINLESS + CORROSION + GERMANY + IRRADIATION TESTING + STRESS STRAIN DATA + CROSS SECTION + FUEL ROD + SWELLING

1-106505 ALSO IN CATEGORY 18 DATED 1975
DELVES PH
SODIUM RIG ENGINEERING: SAFETY PHILOSOPHY AND CODE OF PRACTICE
UKAEA REACTOR GROUP. RISLEY. UK
NP-20.417 +. 11 PPS. MARCH 1975

THE BROAD PRINCIPLES OF GOOD SODIUM ENGINEERING ARE STATED AGAINST THE BACKGROUND OF EXPERIENCES TO DATE. AND INCORPORATES THE COMMENTS AND VIEWS OF MANY FROM PARTICIPATING NATIONS. TOPICS SPECIFICALLY ADDRESSED INCLUDE ORGANIZATION. PLANT DESIGN. RIG CONTAINMENT. PERSONNEL. AND FIRE PROTECTION.

AVAILABILITY - HER MAJESTY'S STATIONERY OFFICE. P.O. BOX 569. LONDON. S.E.1. ENGLAND

GUIDE + *SAFETY PRINCIPLES AND PHILOSOPHY + R AND D PROGRAM + FIRE PROTECTION

1-106784 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F2 - PROJECT COST CATEGORIES
PROJECT MANAGEMENT CORP.. ILL.
DOCKET 50537-9 +. 1 PG. P. A1-271 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE ENVIRONMENTAL REPORT WILL BE ADJUSTED TO REFLECT THE CURRENT PROJECT COST ESTIMATE IN AMENDMENT 11.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-106784 *CONTINUED*
ECONOMICS + RESPONSE TO NRC QUESTION + COST ANALYSIS + CLINCH RIVER (LMFBR)

1-106791 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F3 - LABOR SUPPLY AND DEMAND
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-272 THRU A1-273 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IT IS NOT APPROPRIATE TO CUMULATE THE DEMAND NUMBERS BECAUSE THE PEAK DEMAND FOR CARPENTERS AND ELECTRICIANS OCCURS AROUND THE THIRD YEAR OF CONSTRUCTION WHILE ELECTICIANS AND STEAMFITTERS PEAK AROUND THE FOURTH YEAR. THE ORIGINAL TABLE WAS PREPARED WHEN THE ESTIMATED PEAK EMPLOYMENT WAS 1,200 AND IT WAS THE ONLY EMPLOYMENT FIGURE AVAILABLE. THE SUMMING OF THE DATA WAS BASED ON PEAK NUMBERS FOR THOSE CRAFTS AT TVA'S PROPOSED HARTSVILLE NUCLEAR PLANTS PROJECT. THESE FOUR CRAFTS WERE EVALUATED BECAUSE OF THE NUMBER REQUIRED AND THE HIGH SKILL LEVEL INVOLVED FOR NUCLEAR PLANT WORK. THUS, THEY WOULD BE THE CRAFTS MOST LIKELY TO TAX THE LOCAL LABOR MARKET.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

IMPACT PROPERTY + RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

1-106792 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F5 - MAXIMUM NUMBER OF CONSTRUCTION WORKERS FROM OUTSIDE KNOXVILLE AREA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-275 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A SERIES OF SURVEYS OF CONSTRUCTION WORKERS AT MAJOR TVA PROJECTS PROVIDED THE BASIS FOR THE ESTIMATE OF WORKERS ORIGINATING OUTSIDE THE KNOXVILLE LABOR AREA. THESE SURVEYS HAVE COVERED A FOSSIL-FUEL GENERATING PLANT AND THREE NUCLEAR PLANTS. PEAK EMPLOYMENT HAS RANGED FROM 2,200 TO 3,200 WITH SURVEYS CONDUCTED AT OTHER EMPLOYMENT LEVELS AS WELL. THE GEOGRAPHIC SETTING OF THE SITES HAS VARIED FROM THE EDGE OF A METROPOLITAN AREA TO A VERY ISOLATED SITE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

1-106793 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F7 - SUMMARY OF ECONOMIC COMPARISON OF LMFBR DEMONSTRATION PLANT ALTERNATIVES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 2 TABS, PP. A1-277 THRU A1-280 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A SUMMARY OF THE ECONOMIC COMPARISON OF LMFBR DEMONSTRATION PLANT ALTERNATIVES. THE COMPARISON DID NOT INCLUDE INTEREST DURING CONSTRUCTION AND WAS MADE IN TOTAL CURRENT DOLLARS. A CASH FLOW ANALYSIS WAS NOT PERFORMED EXCEPT FOR THE OPERATING COST ITEMS DURING THE DEMONSTRATION PERIOD. AN ESCALATION ALLOWANCE OF 30 PERCENT WAS USED TO ESTIMATE THE TOTAL PROJECT COST.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMIC STUDY + RESPONSE TO NRC QUESTION + COST ANALYSIS + ELECTRIC POWER, ALTERNATE + POWER PLANT, FOSSIL FUEL + COMPARISON + POWER PLANT, NUCLEAR + CLINCH RIVER (LMFBR)

1-106794 ALSO IN CATEGORIES 10 AND 18 DATED 1975
RESPONSE TO QUESTION F9 - VALUE OF ELECTRICITY PRODUCED
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-282 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A TOTAL GENERATION DURING THE DEMONSTRATION PERIOD OF APPROXIMATELY 9.5 BILLION KWH, BASED ON AN ASSUMED PLANT AVAILABILITY OF 55 PERCENT DURING THE DEMONSTRATION PERIOD, WHEN VALUED AT 4.9 MILLS/KWH, TOTALS NEARLY $47 MILLION OR AN AVERAGE OF $9.4 MILLION PER YEAR FOR A 5-YEAR PERIOD.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMICS + ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + COST BENEFIT + CLINCH RIVER (LMFBR)

1-106795 ALSO IN CATEGORIES 10 AND 18 DATED 1975
RESPONSE TO QUESTION F10 - VALUE OF ELECTRICITY PRODUCED ON TVA SYSTEM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-283 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AVERAGE COST OF ELECTRICITY PRODUCED ON THE TVA SYSTEM BY TVA GENERATING PLANTS IN FISCAL YEAR 1974 (JULY 1, 1973, THROUGH JUNE 30, 1974) WAS 4.929 MILLS/KWH INCLUDING DEPRECIATION.

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-106795 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + TVA + CLINCH RIVER (LMFBR)

1-106796 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F11 - PAYROLL EFFECTS AND BENEFITS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-284 THRU A1-285 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ESTIMATED NET INCREASE IN RETAIL SALES AND SALES TAX RESULTING FROM DIRECT AND INDIRECT PAYROLLS ARE SHOWN. IT IS ESTIMATED THAT 45 PERCENT OF PAYROLLS WILL BE SPENT ON RETAIL PURCHASES. FURTHER ALLOWANCE IS MADE FOR GASOLINE SALES, WHICH ARE NOT SUBJECT TO RETAIL SALES TAX; IT IS ESTIMATED THAT FIVE PERCENT OF RETAIL SALES WILL BE FOR GASOLINE. WE DO NOT CONSIDER THE USE OF IRS ALLOWABLE PROPORTIONS TO BE ADEQUATE BECAUSE THEY DO NOT NECESSARILY REFLECT TOTAL AGGREGATE SALES OR SALES TAX. CERTAIN MAJOR CATEGORIES OF RETAIL PURCHASES ARE ALLOWABLE IN ADDITION TO THE TABLE VALUE, INCLUDING AUTOMOBILES, BOATS, MOBILE HOMES AND BUILDING MATERIALS UNDER CERTAIN CONDITIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMIC STUDY + RESPONSE TO NRC QUESTION + COST BENEFIT + CLINCH RIVER (LMFBR)

1-106797 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION F12 - PLANT EMPLOYMENT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-286 THRU A1-287 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES DATA ON THE 'NORMAL' EMPLOYMENT TRENDS AND PROJECTIONS FOR THE STUDY AREA AND FOR PLANT CONSTRUCTION EMPLOYMENT OVER THESE NORMAL LEVELS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

1-106805 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1 - ER SCHEDULES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-312 THRU A1-313 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A SCHEDULE FOR THE ISSUANCE OF THE FINAL ENVIRONMENTAL STATEMENT ON THE LMFBR PROGRAM AND THE FINAL ERDA DETERMINATIONS RELATING THERETO. IDENTIFIES MAJOR DIFFERENCES BETWEEN THE DRAFT AND PROPOSED FINAL STATEMENTS OF THE CRBRP ER AND AMENDS THESE SECTIONS TO REFLECT THE LATEST EVALUATIONS IN THE PROPOSED FINAL STATEMENT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + PUBLIC HEARING + CLINCH RIVER (LMFBR) + LICENSING PROCESS

1-106808 ALSO IN CATEGORIES 17 AND 18 DATED 1975
RESPONSE TO QUESTION 7 - LMFBR PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-324 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES THE RELATIONSHIP OF THE CRBRP TO SUBSEQUENT PHASES OF THE LMFBR PROGRAM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + R AND D PROGRAM + COMPARISON + CLINCH RIVER (LMFBR)

1-107660 ALSO IN CATEGORY 18 DATED 1975
ADVANCED NUCLEAR REACTORS - AN INTRODUCTION
U.S. ERDA, WASHINGTON
ERDA-46 +. 25 PPS. FIGS. SEPT. 1975

PRESENTS AN INTRODUCTION TO FISSION AND NUCLEAR REACTORS AND DISCUSSES URANIUM RESOURCES, BREEDING, AND PLUTONIUM PRODUCTION. THE BREEDER DEVELOPMENT PROGRAM IS DESCRIBED AND BENEFITS OF THE BREEDER ARE LISTED. BRIEF PARAGRAPHS ARE GIVEN WHICH DISCUSS THE LMFBR DEVELOPMENT PROGRAM ISSUES INCLUDING ENVIRONMENTAL IMPACT, SAFETY, WASTE MANAGEMENT, PLUTONIUM TOXICITY, AND SAFEGUARDS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-10768C *CONTINUED*
PLUTONIUM + URANIUM + WASTE MANAGEMENT + *REVIEW + *TOXICITY + RESOURCE, NATURAL

1-107741 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001/64 - USE OF REGULATORY GUIDE 1.87
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
5 PGS, PF. Q001.64-1 THRU Q001.64-5 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL FIVE CODE CASES SHOULD BE INVOKED, WHERE APPLICABLE, FOR COMPONENTS IN HIGH-TEMPERATURE GAS-COOLED REACTORS, GAS-COOLED FAST BREEDER REACTORS, AND LIQUID METAL FAST BREEDER REACTORS. THE SUBJECT CODE CASES ARE IMPOSED BY THE EQUIPMENT SPECIFICATIONS, EXCEPT THE CODE CASE REVISION DISTRIBUTED AT TIME OF CONTRACT PLACEMENT, OR LATER, WILL BE USED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *HIGH TEMPERATURE + RESPONSE TO NRC QUESTION + *COMPONENTS + CLINCH RIVER (LMFBR) + NRC REGULATORY GUIDE

1-107743 ALSO IN CATEGORIES 11 AND 18 DATED 1975
RESPONSE TO QUESTION 001.84 - COMPLIANCE WITH APPENDIX H, 10CFR50
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.84-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

APPENDIX H IS DIRECTED SPECIFICALLY TOWARD REACTOR VESSELS FABRICATED FROM FERRITIC STEELS. AS THE CRBR VESSEL IS TO BE MADE FROM AN AUSTENITIC STAINLESS STEEL, CERTAIN SECTIONS OF APPENDIX H (IN PARTICULAR, THOSE RELATED TO FRACTURE TOUGHNESS TESTING) ARE NOT CONSIDERED APPLICABLE. ALTHOUGH BOTH TYPES OF MATERIAL SUFFER A LOSS OF IMPACT RESISTANCE AS A CONSEQUENCE OF NEUTRON IRRADIATION, THAT UNDERGONE BY THE FERRITIC STEELS IS ACCOMPANIED BY A SIGNIFICANT UPWARD CHANGE IN THE DUCTILE-TO-BRITTLE TRANSITION TEMPERATURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BRITTLE FRACTURE + CODES AND STANDARDS + THERMAL MECHANICAL EFFECT + *MATERIAL + NEUTRON + RESPONSE TO NRC QUESTION + DAMAGE + FRACTURE TOUGHNESS + *RADIATION EFFECT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

1-107744 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.86 - SUPPLEMENTAL REQUIREMENTS TO RDT STANDARDS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.86-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

EACH RDT STANDARD IS FORMATTED TO CONTAIN A TABLE OF CONTENTS AND A SCOPE OF APPLICATIONS. THE SCOPE GENERALLY PROVIDES A DESCRIPTION OF THE SUPPLEMENTAL REQUIREMENTS TO EXISTING CODES. NONE OF THE STANDARDS DESIGNATED E OR M ARE UNIQUE IN THAT EACH IS BASED UPON AN EXISTING STANDARD SUCH AS THE ASME CODE. THE UNIQUENESS OF STANDARDS DESIGNATED F IS SPECIFIED IN THE SCOPE AND APPLICABLE DOCUMENTS SECTION, IF ANY, OF EACH STANDARD. AN INDEX OF RDT STANDARDS IS ISSUED ON A QUARTERLY BASIS BY OAK RIDGE NATIONAL LABORATORY FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CODES AND STANDARDS + *DESIGN CRITERIA + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

1-107849 ALSO IN CATEGORY 18 DATED 1975
GRAHAM J
NUCLEAR SAFETY DESIGN OF THE CLINCH RIVER BREEDER REACTOR PLANT
WESTINGHOUSE ELECTRIC CORPORATION
17 PPS, 5 TABS, 10 FIGS, 9 REFS, NUCLEAR SAFETY, 16(5), PP. 561-80 (SEPT.-OCT. 1975)

REVIEWS THE DESIGN PHILOSOPHY AND SAFETY FEATURES OF THE 975-MW(T) CLINCH RIVER BREEDER REACTOR, A SODIUM-COOLED DEMONSTRATION REACTOR TO BE BUILT NEAR OAK RIDGE, TENN. THE OVERALL SAFETY OF THE PLANT IS BASED ON THREE LEVELS OF PROTECTION: (1) RELIABLE OPERATION THROUGH INTRINSIC FEATURES OF THE DESIGN, (2) PROTECTION PROVIDED AGAINST ANTICIPATED FAULTS AND UNLIKELY EVENTS, AND (3) PROVISION FOR EXTREMELY UNLIKELY EVENTS. THE PRINCIPAL FEATURES OF EACH OF THESE THREE SAFETY DESIGN LEVELS ARE DISCUSSED. IN addition, WORK IS CONTINUING ON A PARALLEL DESIGN APPROACH THAT TREATS A CORE-DISRUPTIVE ACCIDENT AS A DESIGN BASIS.

DESIGN CRITERIA + FUEL HANDLING + *REACTOR DESCRIPTION + SAFETY PRINCIPLES AND PHILOSOPHY + SYSTEM DESCRIPTION + *CLINCH RIVER (LMFBR)

1-108133 DATED 1975
BETHE HA

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-108133 *CONTINUED*
TESTIMONY TO THE SUBCOMMITTEE TO REVIEW THE NATIONAL BREEDER REACTOR PROGRAM OF THE JOINT COMMITTEE ON ATOMIC ENERGY - JUNE 24, 1975
CORNELL UNIVERSITY
18 PPS, FROM HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, JUNE 24, 1975

PRESENTS THE STATEMENT OF DR. HANS BETHE FOLLOWED BY THE JCAE QUESTIONS AND ANSWERS OF BETHE. TOPICS DISCUSSED INCLUDE NEED FOR THE BREEDER, ADVANTAGES OF THE BREEDER, OBJECTIONS TO THE BREEDER, HAZARD OF DIVERSION OF PLUTONIUM, AND NUCLEAR ACCIDENTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

ACCIDENT + PLUTONIUM + REVIEW + *SAFEGUARDS, NUCLEAR MATERIAL + JCAE

1-108777 ALSO IN CATEGORY 9 DATED 1974
JACOBI SKW + SCHNEIDER RO + WEBER GG
RELIABILITY AND AVAILABILITY OF A SAFETY SHUTDOWN SYSTEM
KERNFORSCHUNGSZENTRUM KARLSRUHE, GERMANY
11 PPS, TABS, FIGS, PROCEEDINGS OF THE ANNUAL RELIABILITY & MAINTAINABILITY SYMPOSIUM, 7(2), SESSION 4C, PP. 186-96 (JAN. 29, 1974)

THIS PAPER IS AN EVALUATION OF RELIABILITY AND AVAILABILITY FOR THE SAFETY SHUTDOWN SYSTEM OF A FAST BREEDER REACTOR. A *MULTI-INPUT-SAFETY-SHUTDOWN-SYSTEM* IS STUDIED FOR MONITORING EACH SUBASSEMBLY SEPARATELY TO MEET SPECIFIC SAFETY REQUIREMENTS FOR THE SODIUM COOLED FAST BREEDER. IN PART 1, A DESCRIPTION OF THE SYSTEM IS GIVEN. SOME PROPERTIES AND CONDITIONS LEADING TO SHUT DOWN ARE DISCUSSED. THIS IS BY NO MEANS INTENDED AS A COMPLETE LIST OF POSSIBLE EVENTS BUT SHOULD INDICATE THE NEED FOR SEPARATE SAFETY MONITORING OF EACH SUBASSEMBLY. IN PART 2, A NUMBER OF CONCEPTS USEFUL FOR A FAULT TREE EVALUATION ARE INTRODUCED. UNAVAILABILITY AND THE EXPECTED NUMBER OF FAILURES FOR THIS MODEL ARE EVALUATED.

RELIABILITY ANALYSIS + *REACTOR PROTECTION SYSTEM + DESIGN STUDY + *RELIABILITY, SYSTEM + SHUTDOWN SYSTEM, SECONDARY

1-109094 ALSO IN CATEGORY 18 DATED 1975
GRAHAM J
LMFBR DESIGN BASIS ACCIDENTS AND THEIR ACCOMMODATION
WESTINGHOUSE ELECTRIC CORPORATION
8 PPS, PRESENTED AT THE ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUCSON, ARIZONA, OCT. 5-8, 1975

IN THE PAST A CORE DISRUPTION WAS USED TO SET REQUIREMENTS FOR CONTAINMENT BARRIERS OF SMALL LMFBRS. IT NOW SEEMS THAT THE USE OF SUCH A DESIGN BASIS ACCIDENT HAS CREATED A MISPLACED EMPHASIS. GREATER SAFETY IS TO BE PROVIDED BY THE PROVISION OF RELIABILITY ASSURANCE, THAT SUCH AN ACCIDENT IS OF SUCH LOW PROBABILITY THAT IT IS INAPPROPRIATE AS A DESIGN BASIS ACCIDENT, AND GREATER EMPHASIS SHOULD BE PLACED ON THE BASIC PROTECTION AGAINST ACCIDENTS RATHER THAN ON THE MITIGATION OF PRESUMED CONSEQUENCES.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILLINOIS 60521

*DESIGN CRITERIA + REACTOR TRANSIENT + RELIABILITY ANALYSIS + ACCIDENT, PROBABILITY OF + QUALITY ASSURANCE + ACCIDENT, DESIGN BASIS + ACCIDENT, CORE DISRUPTIVE

1-109105 ALSO IN CATEGORY 7 DATED 1975
SAGAN LA
PLUTONIUM - SOME POLITICAL AND SOCIAL CONSIDERATIONS
PALO ALTO MEDICAL CLINIC
5 PPS, PRESENTED AT THE ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUSCON, ARIZON, OCT. 5-8, 1975

WE IN THE NUCLEAR COMMUNITY HAVE A SPECIFIC AND CRUCIAL ROLE TO PLAY IN CREATING THE POLITICAL AND LEGAL MACHINERY NECESSARY TO THE SAFE AND PEACEFUL USE OF NUCLEAR ENERGY. MY PLEA IS THAT YOU NOT DISSIPATE YOUR ENERGIES IN PAROCHIAL AND TECHNICAL DEBATES WHICH ONLY CONFUSE AND FRIGHTEN THE PUBLIC, BUT WILL DEDICATE YOURSELVES TO THOSE LARGER ISSUES WHERE YOUR KNOWLEDGE AND WISDOM CAN LEAD THE PUBLIC TO THE TRULY SAFE USE OF NUCLEAR ENERGY. THERE WILL BE SOME WHO WILL URGE YOU TO AVOID ANY DISCUSSION OF SAFEGUARDS OR DIVERSION OF NUCLEAR MATERIALS LEST THAT LEAD TO REACTION AGAINST ALL USES OF NUCLEAR ENERGY. THAT RISK EXISTS, BUT IF YOU BELIEVE, AS I DO, THAT THE PUBLIC CAN MAKE MATURE JUDGEMENTS, THEN THAT RISK IS VERY SMALL.

AVAILABILITY - L.A. SAGAN, M.D., PALO ALTO MEDICAL CLINIC, PALO ALTO, CALIF.

CHEMICAL TOXICITY + PLUTONIUM + HAZARD, RELATIVE + MILITARY CONSIDERATION + FUEL MANAGEMENT + SAFEGUARDS, NUCLEAR MATERIAL + TOXICITY + SOCIO/PHILOSOPHICAL CONSIDERATION + FUEL CYCLE

1-109159 DATED 1975
BEHNKE WE
AN ELECTRIC UTILITY VIEW OF THE LIQUID METAL FAST BREEDER REACTOR
COMMONWEALTH EDISON COMPANY, ILLINOIS
4 PPS, PP. 56-59, FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, NEWARK, DELAWARE, AUG. 18-22, 1975

DEVELOPMENT OF THE BREEDER IS CRITICAL TO ACHIEVING LONG-TERM NUCLEAR POWER POTENTIAL, AND THE

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GENERAL SAFETY CONSIDERATIONS

1-109159 *CONTINUED*
CRBRP IS THE LOGICAL NEXT STEP. GOVERNMENT AND UTILITY LEADERS AGREE THAT LMFBR DEVELOPMENT SHOULD BE THE TOP ENERGY R&D PRIORITY. IT WILL ADVANCE UTILIZATION OF ENERGY AVAILABLE IN URANIUM FUEL FROM 1 OR 2 PERCENT TO PERHAPS 60 PERCENT WHICH WOULD STRETCH U.S. URANIUM RESERVES FROM DECADES TO CENTURIES. UTILITIES BELIEVE IT IS EXTREMELY IMPORTANT TO PROCEED WITH CONSTRUCTION AND DEMONSTRATION-OPERATION OF THE CLINCH RIVER BREEDER REACTOR PLANT, BECAUSE IT IS CRUCIAL TO DESIGN OF NEAR-COMMERCIAL PLANTS. THE BRITISH, FRENCH, AND RUSSIANS ARE ALL PURSING BREEDER CONSTRUCTION ON A SCHEDULE 5 OR 6 YEARS AHEAD OF OURS. EVEN NOW IT WILL BE HARD TO DEVELOP AND INTRODUCE BREEDERS ON A SCHEDULE WHICH WILL AVOID SERIOUS NUCLEAR FUEL SUPPLY PROBLEMS IN THE 1990'S, WHEN LOW-COST URANIUM SUPPLIES WILL BE NEARLY GONE. ALTERNATIVE SOURCES OF ENERGY OFFER FAINT HOPE.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

ECONOMICS + REVIEW + FORECAST + *INDUSTRY, UTILITY + POWER PLANT, NUCLEAR + CLINCH RIVER (LMFBR)

1-109163 DATED 1975
RICHARDS RB + HORST KM + GIBSON AS
THE COMMERCIALIZATION OF THE BREEDER
GENERAL ELECTRIC COMPANY
8 PPS, PP. 62-69, FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, NEWARK, DELAWARE, AUG. 18-22, 1975

PLACES IN PERSPECTIVE: (1) ECONOMIC AND ENVIRONMENTAL INCENTIVES FOR THE BREEDER, (2) TIME URGENCY FOR INTRODUCTION OF THE BREEDER AS A COMMERCIAL ENERGY SOURCE, AND (3) DEVELOPMENT STEPS LEADING TO COMMERCIALIZATION. THE EVIDENCE SUPPORTS THE THESIS: (1) THAT THERE WILL BE SIGNIFICANT BENEFIT TO THE NATION - BOTH ECONOMICALLY AND ENVIRONMENTALLY - TO DEVELOP THE BREEDER AS A MAJOR ENERGY SOURCE, (2) THAT TO REAP THIS BENEFIT, BREEDER POWER PLANTS SHOULD BE DEPLOYED IN SIGNIFICANT NUMBERS BY THE TURN OF THE CENTURY, (3) THAT THE BREEDER CAN BE COMMERCIALLY AVAILABLE IN THE EARLY '90'S IF THE PROGRAM IS ACCELERATED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*ECONOMICS + DESIGN STUDY + ENVIRONMENTAL QUALITY + *INDUSTRY, UTILITY + POWER PLANT, NUCLEAR

1-109164 ALSO IN CATEGORIES 11 AND 18 DATED 1975
IACOBELLIS SF
DEVELOPMENT AND TESTING REQUIREMENTS FOR MAJOR LMFBR COMPONENTS
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
8 PPS, PP. 70-77, FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, NEWARK, DELAWARE, AUG. 18-22, 1975

THE MOST SIGNIFICANT DEVELOPMENT REQUIRED TO MOVE FROM CRBRP COMMERCIAL PLANTS IS A SCALEUP IN THE SIZE OF HEAT TRANSFER COMPONENTS. TO ACHIEVE THIS SCALEUP WITH ADEQUATE ASSURANCE OF SUCCESSFUL RELIABLE PERFORMANCE, SIGNIFICANT TESTING OF THESE COMPONENTS WILL BE REQUIRED. THIS PAPER WILL FOCUS ON THAT ASPECT OF THE LMFBR PROGRAM. IN THE CURRENT LMFBR PROGRAM NO INTERMEDIATE-SIZED PLANTS ARE PLANNED. INSTEAD, THE CURRENT PROGRAM PLACES A MUCH GREATER EMPHASIS ON NEED FOR A COMPREHENSIVE COMPONENT TESTING PROGRAM. THIS PAPER WILL REVIEW DEVELOPMENT STATUS OF MAJOR LMFBR COMPONENTS, EXPLORE TECHNICAL UNCERTAINTIES, AND DISCUSS BOTH THE CURRENT MAJOR COMPONENT TESTING CAPABILITIES AND PLANNED FUTURE EXPANSIONS OF THESE FACILITIES.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

RELIABILITY ANALYSIS + *TEST, COMPONENT + *COMPONENTS + STEAM GENERATOR + *COMPONENT DESCRIPTION + PUMPS + PIPES AND PIPE FITTINGS + HEAT EXCHANGERS

1-109824 DATED 1975
SEFOR REACTOR AND SITE DONATED TO UNIVERSITY OF ARKANSAS
1 PG., NUCLEAR NEWS, 18(15), PG. 72 (DEC. 1975)

SEFOR, THE EXPERIMENTAL NUCLEAR REACTOR BUILT TO DEMONSTRATE THE SAFETY AND FEASIBILITY OF THE LIQUID METAL FAST BREEDER REACTOR, WAS OFFICIALLY DONATED TO THE UNIVERSITY OF ARKANSAS. THE 620 ACRE SITE AND REACTOR WERE GIVEN TO THE UNIVERSITY FOR THE PURPOSE OF SCIENTIFIC AND EDUCATIONAL RESEARCH PROGRAMS. C. O. COGBURN, PROFESSOR OF MECHANICAL ENGINEERING AT THE UNIVERSITY, SAID THE SITE WILL BE USED PRIMARILY FOR ZOOLOGICAL, BOTANICAL, AND AGRICULTURAL STUDIES. PLANS FOR THE REACTOR ARE TENATIVE. SINCE THE PRIMARY LOOP WAS OPENED TO THE ATMOSPHERE, AND CONSIDERABLE FUNDS WOULD BE NEEDED FOR GETTING THE REACTOR BACK INTO OPERATION, IT IS DOUBTFUL IF THE REACTOR WILL BE USED.

SEFOR (RE) + COLLEGES AND UNIVERSITIES

1-109840 DATED 1975
LMFBR: ITS NEED AND TIMING. DISCUSSION OF THE NEED TO CONTINUE TIMELY LMFBR DEVELOPMENT, INCLUDING COMMENTS ON "BYPASSING THE BREEDER" BY NRDC
U.S. ERDA, WASHINGTON

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GENERAL SAFETY CONSIDERATIONS

1-109840 *CONTINUED*
ERDA-38 +. 140 PPS. FIGS. MAY 20, 1975

IN MARCH 1975 THE NATURAL RESOURCES DEFENSE COUNCIL ISSUED A REPORT 'BYPASSING THE BREEDER - A REPORT ON MISPLACED FEDERAL ENERGY PRIORITIES'. ERDA STAFF RESPONDS TO THAT REPORT ATTEMPTING TO CLARIFY DIFFERENCES OF OPINION. THE ERDA PAPER EXPLAINS WHY THEY THINK BREEDERS ARE ECONOMIC AND WHY THEY ARE NEEDED AS SOON AS POSSIBLE. ERDA PRESENTS FACTS ON THE PRESENT ELECTRIC POWER SITUATION EXPLAINING HOW NUCLEAR GENERATION REDUCES THE COST OF POWER, AND ESPECIALLY HOW THE BREEDER CAN REDUCE FUTURE ELECTRICAL COSTS. AN UPDATED COST BENEFIT IS PRESENTED ON THE LMFBR PROGRAM. CONCLUDING REMARKS STATE - THE LMFBR IS SAFE AND ECONOMICAL AND THAT CONTINUED DEVELOPMENT IS NECESSARY IF IT IS TO BECOME AVAILABLE ON A TIMELY BASIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + *R AND D PROGRAM + *INDUSTRY, UTILITY + *COST BENEFIT

1-109938 ALSO IN CATEGORY 18 DATED 1974
ANGERER G + EISEMANN E + FISCHER EA
CRITICAL DISCUSSION OF SOME IMPORTANT TOPICS IN FAST BREEDER SAFETY ANALYSIS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 17 PPS, PP. 1223-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE THEORETICAL SAFETY ANALYSIS OF LMFBRS PRESENTLY CONCENTRATES ON A MECHANISTIC DESCRIPTION OF ACCIDENT SEQUENCES WHICH COINCIDE WITH A COMPLETE FAILURE OF THE REACTOR SAFETY SYSTEM. THESE UNPROTECTED ACCIDENTS MAY LEAD TO A DISASSEMBLY OF THE CORE. DISCUSSES THE UNCERTAINTIES IN THIS ANALYSIS, WHICH ARE DUE TO NEUTRONIC AND NON-NEUTRONIC METHODS AND DATA, AND THE IMPACT OF THESE UNCERTAINTIES ON IMPORTANT SAFETY CHARACTERISTICS OF THE REACTOR HAS BEEN INVESTIGATED IN VARIOUS SENSITIVITY STUDIES. BY THIS PROCEDURE, THE MOST RELEVANT UNCERTAINTIES ARE IDENTIFIED. IT IS FOUND THAT PRESENTLY ESSENTIAL EXPERIMENTAL VERIFICATIONS ON CERTAIN HYPOTHESIZED PHENOMENA IN THE AREAS OF PIN FAILURE, FUEL COOLANT INTERACTION, FUEL MOVEMENT, AND FUEL SLUMPING ARE LACKING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *ACCIDENT, HYPOTHETICAL + THEORETICAL INVESTIGATION + *SAFETY ANALYSIS + ACCIDENT, CORE DISRUPTIVE

1-109939 ALSO IN CATEGORY 18 DATED 1974
JACKSON JF + STEVENSON MG + SEVY RH
TRENDS IN LMFBR HYPOTHETICAL-ACCIDENT ANALYSIS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 23 PPS, PP. 1241-64, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE CURRENT PHILOSOPHY IN THE U.S. EMBRACES THREE LEVELS OF SAFETY CONSIDERATION IN FAST REACTOR DESIGN. THE FIRST LEVEL EMPHASIZES PROPER DESIGN AND CONSTRUCTION IN ORDER TO PRODUCE AN INHERENTLY SAFE AND RELIABLE REACTOR. THE SECOND LEVEL PROVIDES PROTECTION SYSTEMS TO ENSURE THAT ANY OFF-NORMAL CONDITIONS CAN BE SAFELY ARRESTED OR ACCOMMODATED. THE THIRD LEVEL CONSIDERS SPECIAL FEATURES THAT PROVIDE AN ADDITIONAL MARGIN OF PUBLIC PROTECTION IN CASE EXTREMELY UNLIKELY OR UNFORSEEN CIRCUMSTANCES SHOULD ARISE. HCDAS ARE USUALLY CONSIDERED AS PART OF THIS THIRD-LEVEL EVALUATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, HYPOTHETICAL + *ACCIDENT, CORE DISRUPTIVE

1-109940 ALSO IN CATEGORIES 6 AND 18 DATED 1974
BOUDREAU JE + JACKSON JF
RECRITICALITY CONSIDERATIONS IN LMFBR ACCIDENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 24 PPS, PP. 1265-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

RECENT STUDIES SUGGEST THAT FUEL WHICH IS DISPERSED UPWARD BY A MILD PROMPT CRITICAL BURST MAY REENTER THE CORE REGION CAUSING A SECONDARY EXCURSION. IN THIS PAPER, SEVERAL MODES OF FUEL REENTRY RECRITICALITY ARE EXAMINED, AND PHENOMENA WHICH STRONGLY AFFECT REACTIVITY RAMP RATE ESTIMATES ARE EVALUATED. A BROAD RANGE OF RAMP RATES RESULTS FROM THESE STUDIES. THE RESULTS ALSO INDICATE THAT A NUMBER OF EFFECTS EXPECTED TO BE PRESENT IN REALISTIC SITUATIONS CAN STRONGLY MITIGATE THE REACTIVITY INSERTION RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + *ACCIDENT, HYPOTHETICAL

1-109953 ALSO IN CATEGORIES 9 AND 18 DATED 1974
CAVE L
A COMPARATIVE STUDY OF THE SAFETY OF LIQUID METAL-COOLED AND GAS-COOLED FAST REACTORS
POLLUTION PREVENTION (CONSULTANTS) INC.

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GENERAL SAFETY CONSIDERATIONS

1-109953 *CONTINUED*
CONF-740401-P3 +. 28 PPS. PP. 1452-80. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE PRINCIPAL FEATURES OF THE METHOD USED IN THIS PAPER ARE AS FOLLOWS: (1) A QUANTITATIVE STANDARD OF SAFETY IS DEFINED WHICH IS COMMON TO BOTH SYSTEMS. (2) THE POSSIBILITY OF ATTAINING THIS STANDARD OF SAFETY IN EACH SYSTEM WITH FEASIBLE DESIGN FEATURES. LARGELY IRRESPECTIVE OF COST. (3) THE EFFECT OF SUBSTANTIAL CHANGES IN THE BASIC ASSUMPTIONS. INCLUDING THE STANDARD OF SAFETY REQUIRED ON DESIGN FEASIBILITY. (4) THE EFFECT ON SAFETY OF THE GENERATING COSTS AND DOUBLING TIMES PREDICTED FOR THE TWO SYSTEMS. TAKING INTO ACCOUNT FACTORS WHICH MAY LEAD TO DIFFERENCES IN AVAILABILITY. THE EFFECTS ON SAFETY OF THE DIFFERENCES BETWEEN THE MAIN VARIANTS OF EACH SYSTEM (I.E.. 'POOL' AND 'LOOP' TYPE LMFBR; UPWARD AND DOWNWARD CORE FLOW GCFR) ARE EXAMINED BRIEFLY BUT THESE ARE FOUND TO BE UNIMPORTANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR. GCR + *COMPARISON. REACTOR CHARACTERISTICS + PROBABILITY

1-109954 ALSO IN CATEGORY 9 DATED 1974
CRAVERO M + LUCENET G
EVALUATION OF THE PROBABILITY OF AN AIRCRAFT CRASH ON A NUCLEAR POWER PLANT
ELECTRICITE DE FRANCE
CONF-740401-P3 +. 11 PPS. PP. 1481-92. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE LIQUID METAL FAST BREEDER REACTOR SUPER-PHENIX. (ELECTRICAL POWER 1200 MW) WHICH WILL BE BUILT AT CREYS-MALVILLE IN THE RHONE VALLEY MUST FOLLOW THE GUIDELINES GIVEN IN FRANCE FOR THE SAFETY OF THIS REACTOR. ONE OF THESE GUIDELINES IS TO EVALUATE THE RISKS IN RELATION WITH AIR TRAFFIC. CONSEQUENTLY. A STUDY OF THIS PROBLEM WAS BEGUN TO ESTIMATE THE PROBABILITY OF AN AIRCRAFT CRASH ON THE POWER PLANT SUPER-PHENIX. PARTICULARLY ON THE REACTOR BUILDING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

FRANCE + *ACCIDENT. HYPOTHETICAL + *AIRCRAFT + SAFETY EVALUATION + PROBABILITY

1-109956 ALSO IN CATEGORIES 11 AND 18 DATED 1974
BROWN NW + STITT RK + WILSON RJ
AN ESTIMATE OF LMFBR STEAM GENERATOR SYSTEM RELIABILITY AND AVAILABILITY
GENERAL ELECTRIC CO.. SUNNYVALE. CALIF.
CONF-740401-P3 +. 16 PPS. PP. 1508-24. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

A PROBABILISTIC EVALUATION OF A REFERENCE STEAM GENERATOR SYSTEM IS DISCUSSED. THE STUDY WAS CONDUCTED IN SUPPORT OF THE AEC LMFBR STEAM GENERATOR SYSTEMS DEVELOPMENT PROGRAM. THE OBJECTIVE OF THE STUDY WAS TO HELP IN IDENTIFYING THE RELATIVE IMPORTANCE OF CRITICAL DEVELOPMENT AREAS. THE STUDY ESTIMATES THE PROBABILITY OF STRUCTURAL DAMAGE TO THE SECONDARY SODIUM SYSTEM BOUNDARY AND THE AVAILABILITY OF A SINGLE LOOP OF A THREE LOOP REFERENCE PLANT. CRITICAL DEVELOPMENT NEEDS AND THEIR RELATIVE IMPORTANCE TO RELIABILITY AND AVAILABILITY GOALS ARE IDENTIFIED BASED ON THE PROBABILISTIC EVALUATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*RELIABILITY. COMPONENT + *STEAM GENERATOR + PROBABILITY + EQUIPMENT DEVELOPMENT

1-109964 ALSO IN CATEGORY 18 DATED 1974
SMIDT D
SELECTION OF SAFETY DESIGN BASIS OF FAST REACTORS IN THE FEDERAL REPUBLIC OF GERMANY
KERNFORSCHUNGSZENTRUM KARLSRUHE. F.R. GERMANY
CONF-740401-P3 +. 11 PPS. PP. 1635-46. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE SAFETY DESIGN BASIS OF FAST REACTORS TO A VERY GREAT EXTENT IS DETERMINED BY DESIGN BASIS ACCIDENTS. DBA'S ARE DESCRIBED FOR THE SNR-300 AND COMPARED TO THOSE FOR LWR'S. FOR FUTURE LARGE FAST REACTORS TOO CONSERVATIVE ASSUMPTIONS WITH RESPECT TO THE WHOLE CORE ACCIDENT MAY LEAD TO SERIOUS FEASIBILITY PROBLEMS. THREE DIFFERENT STRATEGIES FOR THE SOLUTION ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

GERMANY + SAFETY ANALYSIS + *COMPARISON. REACTOR CHARACTERISTICS + *ACCIDENT. DESIGN BASIS

1-109965 ALSO IN CATEGORY 18 DATED 1974
GRAHAM J
SELECTION OF SAFETY DESIGN BASES FOR FAST POWER REACTORS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740401-P3 +. 12 PPS. PP. 1647-59. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE SAFETY OF FAST REACTORS DESIGNED AND BUILT TO DATE IS REAL - IT IS NOT HYPOTHETICAL. REACTOR PLANTS ARE DESIGNED TO PREVENT FAULTS FROM OCCURRING AND TO PROTECT AGAINST FAULTS EVEN IF THEY

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-109965 *CONTINUED*
SHOULD OCCUR. MOREOVER, THEY HAVE EXTRA CAPABILITY IN HEAT REMOVAL AND CONTAINMENT THAT PROVIDES AN ADDED MARGIN OF SAFETY EVEN BEYOND THAT OF THE MULTIPLE PROTECTIVE SYSTEMS AND DEVICES. HOWEVER, THESE PLANTS ALSO HAVE BEEN DESIGNED IN ONE WAY OR ANOTHER TO ACCOMMODATE CERTAIN HYPOTHETICAL ACCIDENTS CHOSEN EITHER TO EVALUATE THE EXTRA MARGIN INHERENT IN THE DESIGN, OR TO DEFINE EXTRA MARGIN BY THE ADDITION OF SPECIFIC SAFETY FEATURES. THIS PAPER IS AIMED AT A DISCUSSION OF THE VALUE OF THIS HYPOTHETICAL SAFETY, ITS POSSIBLE CONSEQUENCES AND A SUGGESTED RATIONAL ALTERNATIVE TO ENSURING THE HEALTH AND SAFETY OF THE PUBLIC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, HYPOTHETICAL + *SAFETY EVALUATION + *ACCIDENT, DESIGN BASIS + COMPARISON

1-109967 ALSO IN CATEGORY 18 DATED 1974
KINTNER EE
SELECTION OF SAFETY DESIGN BASIS FOR FAST POWER REACTORS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
CONF-740401-P3 +. 5 PPS, PP. 1669-73, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN BASES FOR SAFETY FOR LMFBR'S IN THE IMMEDIATE FUTURE OUGHT NOT TO BE CHOSEN PRIMARILY ON THE BASIS OF EASING THE LICENSING PROCESS FOR THE FFTF AND THE DEMONSTRATION PLANT, BUT MOST IMPORTANTLY, THEY SHOULD BE CHOSEN FOR THEIR POTENTIAL EFFECT ON THE SAFETY OF THE HUNDREDS OF LMFBR'S ON WHICH WE MUST DEPEND DURING THE NEXT CENTURY. THIS LATTER FUNCTION OF DESIGN BASES HAS BEEN OFTEN OVERLOOKED IN THE PAST AND IS IN GRAVE DANGER OF BEING OVERLOOKED NOW IN THE LMFBR PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *ACCIDENT, DESIGN BASIS

1-109971 DATED 1974
COCHRAN TB
ACCEPTABLE PUBLIC RISK AND WHY
NATURAL RESOURCES DEFENCE COUNCIL
CONF-740401-P3 +. 4 PPS, PP. 1699-1702, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

NOTES THAT DIFFERENT PEOPLE PERCEIVE RISKS IN DIFFERENT WAYS AND THAT WHAT IS ACCEPTABLE TO ONE PERSON IS NOT ACCEPTABLE TO ANOTHER. SOME RISKS ARE ASSUMED BY MOST IF NOT ALL WITHOUT CHOICE SUCH AS 'ACTS OF GOD'. OTHERS HAVE BEEN PLACED ON SOCIETY HISTORICALLY, THROUGH TECHNOLOGICAL DEVELOPMENT. THESE RISKS IN MANY CASES ALSO HAVE BEEN ASSUMED FOR ONE REASON, OR ANOTHER, WITHOUT PUBLIC CHOICE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + POPULATION + *BENEFIT VS RISK + PUBLIC RELATIONS

1-109972 DATED 1974
FARMER FR
ACCEPTABLE LEVELS OF RISK TO THE PUBLIC AND WHY
UKAEA SAFETY & RELIABILITY DIRECTORATE, UK
CONF-740401-P3 +. 3 PPS, PP. 1703-05, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

FARMER'S WORK HAS MOSTLY BEEN CONCERNED WITH NUCLEAR REACTORS AND ASSOCIATED CHEMICAL PLANTS, THEIR DESIGN, AND THEIR ASSOCIATED RISKS OF FAILURE. REFERRING TO A MAJOR ACCIDENT IN A THERMAL REACTOR ON AN AVERAGE SITE, IF REACTORS COULD BE DESIGNED AND OPERATED TO MAKE THE RISK OF THIS EVENT ONE PER MILLION PER YEAR, THEN THERE WOULD ONLY BE ABOUT ONE IN ONE HUNDRED CHANCE THAT THIS EVENT COULD OCCUR THIS CENTURY. INDEED, IT WOULD NOT BE ALTOGETHER UNREASONABLE TO ACCEPT A SLIGHTLY HIGHER RISK RATE OF 10 (EXP -5) OR EVEN 10 (EXP -4) PER REACTOR PER YEAR, ALTHOUGH THE ACCEPTABILITY OF THE EVENT DOES DEPEND ON WHETHER THE EVENT HAPPENS SHORTLY OR AFTER ANOTHER TWENTY YEARS OR SO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + *POPULATION + *BENEFIT VS RISK + PUBLIC RELATIONS

1-109973 DATED 1974
MOGLEWER S
ACCEPTABLE LEVELS OF NUCLEAR RISK AND WHY
SIERRA CLUB
CONF-740401-P3 +. 2 PPS, PP. 1706-7, FROM CONFERENCE OF FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE ISSUES INVOLVED IN THE ASSESSMENT OF NUCLEAR RISK ARE COMPLEX AND STRIKE AT THE VERY HEART OF OUR SOCIAL FABRIC. THE SIERRA CLUB HAS LONG BEEN CONCERNED THAT AN ACCEPTABLE LEVEL OF RISK BE ACHIEVED. UNFORTUNATELY, OUR PRESENT INSTITUTIONAL MECHANISMS AND POLITICAL MANAGEMENT LEAVE MUCH TO BE DESIRED. IT IS THE SIERRA CLUB CONTENTION THAT THE BASIC PROBLEM IS NOT ONE OF

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-109973 *CONTINUED*
POTENTIAL TECHNOLOGICAL SOLUTION BUT, RATHER, A CULTURAL/POLITICAL/SOCIAL BREAKDOWN IN THE MANAGEMENT OF THIS NEW TECHNOLOGY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + *REACTOR, POWER + POPULATION + *BENEFIT VS RISK + *OPPONENT + PUBLIC RELATIONS

1-109974 DATED 1974
BALENT R
THE LMFBR AND ITS PLACE IN ENERGY SUPPLY
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
CONF-740401-P3 +. 5 PPS, PP. 1713-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RATE OF GROWTH OF NUCLEAR POWER AS WELL AS THE OPTIMUM APPROACH VARIES AMONG THE VARIOUS GROUPS WHO ARE ATTEMPTING TO SOLVE THE 'ENERGY PROBLEM' OR 'CRISIS' AS IT HAS BEEN CALLED SINCE THE ARAB OIL EMBARGO OF LAST YEAR. THE INESCAPABLE CONCLUSION IS THAT NUCLEAR POWER VIA THE FISSION PROCESS IS GOING TO HAVE TO PLAY A SIGNIFICANT ROLE IF THE U.S. IS GOING TO EVEN COME CLOSE TO THE GOAL OF 'ENERGY SELF-SUFFICIENCY' WITHIN THE NEXT DECADE OR TWO. THIS CONCLUSION TAKES INTO ACCOUNT REASONABLE PROJECTIONS OF THE STANDARD OF LIVING, INDUSTRIAL GROWTH, CONCERN FOR THE TOTAL ENVIRONMENT, AND DUE REGARD TO CONSERVATION OF OUR NATURAL RESOURCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ENERGY SOURCE + HAZARD, RELATIVE + *REACTOR, POWER + POPULATION + *BENEFIT VS RISK + PUBLIC RELATIONS

1-109995 DATED 1975
SCHROEDER R + WAGNER J
SURVEY OF THE IMPACT OF INTRODUCING FAST BREEDER REACTORS IN THE DEBENELUX REGION (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-EXT-25/75-1 +. 232 PPS, JUNE 1975

GIVES A SUMMARY OF THE IMPACT OF INTRODUCING SODIUM-COOLED FAST BREEDER REACTORS IN THE FEDERAL REPUBLIC OF GERMANY AND THE BENELUX COUNTRIES. THE SUPPLY SITUATION WITH RESPECT TO ELECTRIC AND THERMAL ENERGY IS STUDIED IN PARTICULAR, TOGETHER WITH ASPECTS OF ECONOMY AND ENVIRONMENTAL IMPACT. THE POTENTIAL AND CONSEQUENCES OF A BREEDER ECONOMY, THE PRESENT STATUS AND FUTURE R AND D WORK ARE DISCUSSED. IN ADDITION TO SODIUM-COOLED FAST BREEDER REACTORS WITH OXIDE OR CARBIDE FUEL, ALTERNATIVE SOLUTIONS ARE: LIGHT WATER AND HIGH TEMPERATURE REACTORS, HELIUM-COOLED FAST BREEDER REACTORS, GEOTHERMAL ENERGY, SOLAR ENERGY AND FUSION ENERGY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + GERMANY + REVIEW + EFFECT + INDUSTRY, UTILITY

1-110002 ALSO IN CATEGORY 18 DATED 1975
MCGOUGH CB
FFTF: ROSETTA STONE OF THE U.S. BREEDER REACTOR PROGRAM
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-SA-934 + CONF-750464-1 +. 44 PPS, FROM JOINT MEETING OF THE ASME AND AIEEE HAWAII SECTIONS, HONOLULU, APRIL 17, 1975

SUMMARIZES THE IMPORTANT FEATURES OF THE FAST FLUX TEST FACILITY AND EXPLAINS ITS PLACE IN THE U.S. LIQUID METAL FAST BREEDER REACTOR PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FFTF (TR) + *REVIEW

1-110051 ALSO IN CATEGORIES 8 AND 11 AND 12 DATED 1976
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 279 PGS, AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REVISES THE PRELIMINARY SAR BY SUBMITTING NEW APPENDICES 17D, AND LEAD REACTOR MANUFACTURER QA PROGRAM. INCLUDES THE REVISIONS TO THE QA SECTION. RESPONSES TO NRC QUESTIONS CONCERN ECCS, TRANSIENTS DURING SODIUM FIRES, CONTAINMENT LEAK RATE DURING ACCIDENT, SECURITY, AND TRAINING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT + FIRE + *REPORT, PSAR + QUALITY ASSURANCE + SYSTEM OPERABILITY IN ACCIDENT + LEAK RATE + EMERGENCY COOLING SYSTEM + TRANSIENT + *CLINCH RIVER (LMFBR)

1-110066 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 421.7 - INTRUSION ALARM ON CONTROLLED ACCESS POINTS

CATEGORY 1
GENERAL SAFETY CONSIDERATIONS

1-110068 *CONTINUED*
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q421.7-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537.
TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL CARD-KEY CONTROLLED ACCESS POINTS ARE PROVIDED WITH INTRUSION ALARMS. THE CARD-KEY SYSTEM, IN ADDITION TO PROVIDING OPERATIONAL SURVEILLANCE TO VITAL AREA ACCESS POINTS, ALSO PROVIDES CONTINUOUS MONITORING OF THE STATUS OF THE DOORS UNDER CARD-KEY CONTROL. THE SYSTEM WILL MONITOR THE STATUS OF EACH DOOR WHETHER OPEN OR CLOSED AND WILL PROVIDE AN AUDIBLE AND VISUAL ALARM SIGNAL IN THE EVENT A DOOR REMAINS OPEN LONGER THAN A PRESET TIME LIMIT, CONTROL WIRING TO A DOOR IS CUT, POWER SUPPLY TO A DOOR STRIKE FAILS OR A DOOR IS FORCED OPEN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *SECURITY + CLINCH RIVER (LMFBR) + *ANNUNCIATORS

1-110077 ALSO IN CATEGORIES 5 AND 12 AND 18 DATED 1975
ZEMANICK PP + BROWN NW
DECAY HEAT REMOVAL FOR THE LIQUID METAL FAST BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
CONF-750468-1 +, 62 PGS., FROM SPECIALIST MEETING ON RELIABILITY OF DECAY HEAT REMOVAL SYSTEMS PROPOSED FOR FAST REACTORS, HARWELL, UK, APRIL 28, 1975

THE FUNCTIONAL AND RELIABILITY REQUIREMENTS OF THE DECAY HEAT REMOVAL SYSTEMS ARE DESCRIBED. THE RELIABILITY REQUIREMENT AND ITS RATIONALE AS ADEQUATE ASSURANCE THAT PUBLIC HEALTH AND SAFETY ARE SAFEGUARDED ARE PRESENTED. THE MEANS BY WHICH THE RELIABILITY OF THE DECAY HEAT REMOVAL SYSTEMS ARE ESTABLISHED TO MEET THEIR REQUIREMENT ARE IDENTIFIED. THE HEAT REMOVAL SYSTEMS AND THEIR OPERATING CHARACTERISTICS ARE DESCRIBED. THE DISCUSSION INCLUDES THE OVERFLOW HEAT REMOVAL SERVICE AND ITS ROLE IN DECAY HEAT REMOVAL IF NEEDED. THE DETAILS OF THE SYSTEMS ARE DESCRIBED TO DEMONSTRATE THE ELEMENTS OF REDUNDANCY AND DIVERSITY IN THE SYSTEMS DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + RELIABILITY, SYSTEM + EMERGENCY COOLING + *SHUTDOWN COOLING SYSTEM + R AND D PROGRAM

1-110132 ALSO IN CATEGORY 5 DATED 1975
RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
GEAP-14045-3 +, 31 PPS, 4 TABS, 20 REFS, AUG. 1975

THE THIRD QUARTERLY REPORT DESCRIBES LMFBR SHUTDOWN HEAT REMOVAL SYSTEMS RELIABILITY ACTIVITIES FOR THE PERIOD BEGINNING IN JUNE 1975 AND ENDING IN AUGUST 1975. ACTIVITIES REPORTED INCLUDE COMPLETION OF A PRELIMINARY 'RELIABILITY ALLOCATION AND APPORTIONMENT FOR LMFBR SHUTDOWN HEAT REMOVAL SYSTEMS,' AND COMPLETION OF THE TEST PLAN DEFINITION FOR THE SHUTDOWN HEAT REMOVAL AND STRUCTURAL RELIABILITY PROGRAM.' IN ADDITION, A PROBABILISTIC DATA REPORT WAS PREPARED WHICH PROVIDES THE FAILURE RATE FOR ALL FAILURE MODES OF EACH COMPONENT NECESSARY FOR SHUTDOWN HEAT REMOVAL USING A PROBABILISTIC DATA SHEET FOR EACH EVENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, COMPONENT + DECAY HEAT + RELIABILITY, SYSTEM + SHUTDOWN COOLING SYSTEM + PROBABILITY

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-100661 ALSO IN CATEGORY 18 DATED 1974
POWER PLANT DESIGN AND SITING IN EUROPE AND THE UNITED STATES
3 PAGES, 3 FIGURES, ELECTRICAL REVIEW, 195(17), PP. 595-597 (NOV. 8, 1974)

REPORTS ON THE AIM CONFERENCE IN LIEGE, BELGUIM IN OCTOBER. EUROPE NOW HAS 68 NUCLEAR POWER STATIONS, EITHER IN OPERATION OR UNDER CONSTRUCTION, OF WHICH 21 STATIONS HAVE 35 GCR'S, 46 STATIONS HAVE 33 PWR'S AND 26 BWR'S. IN THE FUTURE, MORE SITES WILL BE NEAR THE SEA. RELATIVE MERITS OF LMC AND GC FAST BREEDERS WERE DISCUSSED. CONCEPTUAL STUDIES OF THE NUCLEAR GASIFICATION OF COAL WERE MENTIONED. HYDRAULIC PUMPED STORAGE AND COMPRESSED AIR STORAGE WERE DISCUSSED. FOR THE LATTER A GERMAN PLANT WILL USE TWO UNDERGROUND CAVERNS WITH A TOTAL VOLUME OF 300,000 M3 AND STORE THE COMPRESSED AIR AT 50-75 BAR.

REACTOR, BWR + REACTOR, PWR + SITING + REACTOR, LWR + REFUELING + FLUOR BOPSSAR (PWR) + REACTOR, HTGR + FUEL, FOSSIL + FUEL, NUCLEAR + PUMPS

2-105675 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 110.14 - SEISMIC QUALIFICATION PROGRAM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q110.14-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SEISMIC QUALIFICATION PROGRAM WHICH WILL BE EMPLOYED TO QUALIFY ALL SAFETY-RELATED EQUIPMENT WILL BE DESCRIBED FULLY IN THE FSAR. THE PURPOSE OF THIS PROGRAM WILL BE TO CONFIRM THE ABILITY OF ALL SEISMIC CATEGORY I MECHANICAL EQUIPMENT TO FUNCTION AS NEEDED DURING AND AFTER AN EARTHQUAKE OF MAGNITUDE UP TO AND INCLUDING THE SSE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*TEST, PROOF + TEST, PREOPERATIONAL + RESPONSE TO NRC QUESTION + EQUIPMENT + ENGINEERED SAFETY FEATURE + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

2-106001 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.4 - LUMPED MASS SEISMIC SYSTEM ANALYSIS
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q130.4-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN A LUMPED MASS SEISMIC SYSTEM ANALYSIS, THE MASSES ARE CONCENTRATED AT A SERIES OF MASS-POINTS OR NODES. THE NODES ARE SELECTED AT CHANGE OF SECTIONS, AT LOCATIONS OF EQUIPMENT SUPPORT WHERE THE EQUIPMENT'S MASS IS LUMPED, AT LOCATIONS WHERE THE DYNAMIC RESPONSE IS DESIRED, AND AT INTERMEDIATE LOCATIONS TO LIMIT THE LENGTH OF THE ELEMENTS SO THAT THE MATHEMATICAL MODEL WILL ADEQUATELY REPRESENT THE ACTUAL SYSTEM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + *STRUCTURAL ANALYSIS, DYNAMIC + SEISMIC DESIGN + CLINCH RIVER (LMFBR)

2-106006 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.45 - RADIOMETRIC DATING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q323.45-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES ALL AVAILABLE DATA USED TO DEVELOP RADIOMETRIC DATES FOR MYLONITES ALONG THE COPPER CREEK FAULT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GEOLOGY + ARGON + DATA PROCESSING + POTASSIUM + *RADIOCHEMICAL ANALYSIS + RESPONSE TO NRC QUESTION + *FAULT + CLINCH RIVER (LMFBR)

2-106771 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION D24 - ADDITIONAL DETAILS REGARDING THE RIVER BOTTOM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +, 1 PG, 1 FIG, PP. A1-239 THRU A1-240 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

BORINGS WERE MADE IN THE RIVER BOTTOM TO EVALUATE FOUNDATION CONDITIONS AT SELECTED INTAKE AND DISCHARGE SITES. THE GEOLOGIC LOGS OF THE BORINGS IN AND NEAR THE RIVER ARE CONTAINED IN A REPORT SUBMITTED TO BURNS & ROE, INC., REPORT OF PRELIMINARY FOUNDATION INVESTIGATION, GEOTECHNICAL REPORT NUMBER 3, CREEP, S.A. -679, LAW ENGINEERING, FEBRUARY 12, 1975. THESE BORINGS INDICATED A THIN (0-2 FEET) LAYER OF SANDY, CLAYEY SILT OVERLYING BEDROCK. BEDROCK IN THESE AREAS WAS LIMESTONE AND SILTSTONE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GEOLOGY + RIVER + PROPERTY, PHYSICAL + RESPONSE TO NRC QUESTION + COMPOSITION + CLINCH RIVER (LMFBR)

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-106777 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION E4 - WATER INTAKE FOR ORGDP
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-259 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE WATER INTAKE LOCATED ON THE NORTH BANK OF THE CLINCH RIVER AT (APPROXIMATELY) CRM 14.5 IS USED BY THE OAK RIDGE GASEOUS DIFFUSION PLANT (ORGDP) FOR SANITARY AND POTABLE PURPOSES. APPROXIMATELY FOUR MILLION GALLONS PER DAY ARE PUMPED FROM THE CLINCH RIVER TO A NEARBY TREATMENT PLANT, PROCESSED THROUGH A SAND FILTRATION UNIT, CHLORINATED AND DISTRIBUTED TO ORGDP.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

WATER + RESPONSE TO NRC QUESTION + INTAKE + CLINCH RIVER (LMFBR)

2-106786 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION D14 - SITE AQUIFER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-214 THRU A1-215 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES DATA ON PERMEABILITIES IN THE MORE WEATHERED ZONES OF THE AQUIFER, AND ESTIMATES THE MAXIMUM PERMEABILITIES OF THE AQUIFER AT THE SITE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + GROUND WATER, PROPERTY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

2-106787 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION D15 - GROUNDWATER CONTOURS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-216 THRU A1-217 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE STATEMENT THAT GROUNDWATER MOVES IN A DIRECTION NORMAL TO CONTOURS OF CONSTANT HEAD IS TRUE WHENEVER THE FLOW IS OCCURRING THROUGH A MEDIUM WHOSE HYDRAULIC PROPERTIES DO NOT CHANGE WITH LOCATION OR DIRECTION. SUCH A MEDIUM IS CALLED HOMOGENEOUS AND ISOTROPIC.

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GEOLOGY + GROUND WATER + GROUND WATER, PROPERTY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

2-106788 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION D16 - DEWATERING FOR CONSTRUCTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-218 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DEWATERING DURING THE CONSTRUCTION OF THE PLANT ISLAND WILL BE ACCOMPLISHED BY PUMPING FROM OPEN SUMPS WITHIN THE EXCAVATION. THE FOUNDATION OF THE PLANT ISLAND STRUCTURES IS TO BE PLACED AT ELEVATION 720, SO THE SUMPS WILL BE AT OR SLIGHTLY BELOW THIS ELEVATION. THE BASE OF THE AQUIFER IN THIS AREA IS ABOVE ELEVATION 720; THEREFORE, WATER LEVELS WILL BE DRAWN DOWN TO NEAR THE BOTTOM OF THE AQUIFER AT THE EDGE OF THE EXCAVATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + CLINCH RIVER (LMFBR)

2-106799 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION G2 - PLANT IMPACT ON HISTORICAL AND CULTURAL RESOURCES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 5 PGS. PP. A1-289 THRU A1-293 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

TVA SUBMITTED PROJECT PLANS AND LOCATIONS TO THE TENNESSEE HISTORICAL COMMISSION ON MAY 23, 1973, ALONG WITH AN ARCHAEOLOGICAL SURVEY OF THE SITE. WE ASKED THE COMMISSION TO ADVISE US OF IMPACT ON ANY HISTORICAL RESOURCES. THE COMMISSION RESPONDED BY LETTER OF JUNE 5, 1973, THAT "IT DOES NOT APPEAR THAT ANY STRUCTURES OF HISTORICAL SIGNIFICANCE OR ANY ARCHAEOLOGICAL SITES THAT WOULD QUALIFY FOR THE NATIONAL REGISTER WOULD BE AFFECTED."

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SITING + RESPONSE TO NRC QUESTION + EFFECT + CULTURE + CLINCH RIVER (LMFBR)

2-106802 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION G8 - EROSION CONTROL PRACTICES DURING TRANSMISSION LINE CONSTRUCTION

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-106802 *CONTINUED*
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-304 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRIOR TO CLEARING OF THE TRANSMISSION LINE RIGHT-OF-WAY, AN ENGINEER WALKS THE RIGHT-OF-WAY TO ESTIMATE THE COST OF CLEARING AND NOTES ANY UNUSUAL CONDITIONS WHERE EROSION CONTROL MEASURES SHOULD BE TAKEN TO AVOID RUNOFF AND SILTATION. BASED ON THE ON-SITE VISIT AND A REVIEW OF THE DRAWINGS, THERE ARE NO STREAM CROSSINGS OF ANY SIGNIFICANCE ON THE TRANSMISSION LINE CORRIDOR. THE CONSTRUCTION OF THIS LINE WILL BE DONE DURING THE DRY TIME OF THE YEAR WHICH WILL NOT AFFECT ANY WET WEATHER STREAMS. ON SLOPES, CONTOURS OR WATER SWELLS ARE INSTALLED TO CHECK RUNOFF AND PREVENT EROSION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITING + EROSION + RESPONSE TO NRC QUESTION + CONSTRUCTION + POWER TRANSMISSION + CLINCH RIVER (LMFBR)

2-106803 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION G11 - HIGHWAY CONGESTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-308 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO PRELIMINARY PLANS HAVE BEEN DEVELOPED FOR HIGHWAY CONGESTION. HOWEVER, STAGGERED STARTING TIMES WOULD PROBABLY BE CONSIDERED IN SUCH PLANS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONCENTRATION + MAN + ON SITE + CLINCH RIVER (LMFBR)

2-106804 ALSO IN CATEGORIES 10 AND 18 DATED 1975
RESPONSE TO QUESTION G12 - MITIGATION OF CONSTRUCTION ACTIVITIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-309 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DESCRIBES THE CONTROL PROGRAM INCLUDING PERIODIC REVIEW OF ALL CONSTRUCTION ACTIVITIES TO ASSURE THAT APPROPRIATE MITIGATING ACTIONS WILL BE TAKEN TO AVOID UNNECESSARY ADVERSE ENVIRONMENTAL IMPACTS DURING PLANT AND TRANSMISSION LINES CONSTRUCTION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ADMINISTRATIVE CONTROL + RESPONSE TO NRC QUESTION + EFFECT + CONSTRUCTION + CLINCH RIVER (LMFBR)

2-107073 ALSO IN CATEGORIES 9 AND 10 AND 11 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
127 PGS, AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS THE PROJECT'S SITE SUITABILITY SOURCE TERM FROM THE CRBRP PARALLEL DESIGN AND NEW AND REVISED PAGES TO THE PRELIMINARY SAR. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING RELIABILITY ANALYSIS, WEATHER DATA, SEISMIC RESPONSES DURING WASTE INJECTIONS, AND SODIUM FIRES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + DESIGN CRITERIA + RELIABILITY ANALYSIS + SEISMOLOGY + SITING, REACTOR + SOURCE, RADIATION + *REPORT, PSAR + ENGINEERED SAFETY FEATURE + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR)

2-107711 ALSO IN CATEGORIES 11 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 359 PGS, AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING AN UPDATED SEISMIC MODEL, FLOOD DESIGN, WEATHER STATISTICS, LOGS OF BORINGS, AND FUEL ASSEMBLY DESIGN. RESPONSES TO NRC QUESTIONS ARE GENERALLY GIVEN AS REFERENCES TO REVISED SECTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + GEOLOGY + RIVER + SITING, REACTOR + SITE CLIMATOLOGY + SOIL PROPERTY + *REPORT, PSAR + WEATHER, SEVERE + FLOOD + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR) + FUEL ELEMENTS

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-107717 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.18 - DECONVOLUTION ANALYSIS PROCEDURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q130.18-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN RESPONSE SPECTRA ARE APPLIED DIRECTLY AT THE FOUNDATION LEVEL; THEREFORE, THERE IS NO DECONVOLUTION FROM THE FINISHED GRADE TO THE FOUNDATION LEVEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

STRESS ANALYSIS + RESPONSE TO NRC QUESTION + RESPONSE SPECTRUM + *STRUCTURAL ANALYSIS, DYNAMIC + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

2-107720 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.26 - LOCATION OF DRAG FOLDS IN THE SITE AREA
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, 1 FIG, PP. Q323.26-1 THRU Q323.26-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

'MINOR (SHEAR) DISLOCATIONS' AND 'OFFSETS' ARE DISPLACEMENTS OF TRACEABLE BEDS MEASURED IN TERMS OF INCHES OR AT MOST A FEW FEET. THESE TERMS ARE USED INTERCHANGEABLY IN THE PSAR. MINOR SHEAR DISLOCATIONS AND OFFSETS ARE INTERBED ADJUSTMENTS WHICH FORMED CONTEMPORANEOUSLY WITH THE REGIONAL THRUST FAULTS. DURING GEOLOGIC SURFACE MAPPING FOR THE CRBRP SITE INVESTIGATION, A SMALL TIGHT FOLD AND THREE MINOR SHEAR DISLOCATIONS WERE OBSERVED. SINCE THE ORIGINAL MAPPING, AN ADDITIONAL SMALL TIGHT FOLD WAS EXPOSED IN A BANK OF A NEWLY CONSTRUCTED ROAD.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*GEOLOGY + SITING, REACTOR + RESPONSE TO NRC QUESTION + DISPLACEMENT + *FAULT + CLINCH RIVER (LMFBR)

2-107721 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.28 - RESIDUAL STRESS IN ROCK
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q323.28-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE FOUNDATION ROCKS FOR THE BELLEFONTE NUCLEAR PLANT ARE THE SAME AS THE FOUNDATION ROCKS FOR THE CLINCH RIVER BREEDER REACTOR PROJECT. THE CHICKAMAUGA FORMATION OF MIDDLE ORDOVICIAN AGE. TENNESSEE VALLEY AUTHORITY HAS INDICATED THAT THEIR EXPERIENCE IN NUMEROUS PREVIOUS MAJOR CONSTRUCTION PROJECTS HAS SHOWN THAT UNRELIEVED RESIDUAL STRESS IN THE BEDROCK IS NOT A MAJOR CONSIDERATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SITING, REACTOR + *STRESS + RESPONSE TO NRC QUESTION + *SOIL PROPERTY, IN SITU + COMPARISON + CLINCH RIVER (LMFBR)

2-107722 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.35 - CLAY SEAMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
3 PGS, PP. Q323.35-1 THRU Q323.35-3 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE GRAPHIC LOG FORMAT WAS INITIALLY DEVELOPED FOR THE 24 PRELIMINARY BORINGS, BORINGS 1 THROUGH 24. FOR THESE BORINGS THE TERM 'CLAY SEAM' WAS USED TO DESIGNATE AN INTERVAL OF CLAY WITHIN THE ROCK GENERALLY LESS THAN 1/2IN THICK. THE TERM 'CAVITY' WAS USED TO DESIGNATE INTERVALS OF CLAY THICKER THAN 1/2IN OR OPEN VOIDS IN THE ROCK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

GEOLOGY + TESTING + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + *SOIL PROPERTY, IN SITU + CLINCH RIVER (LMFBR)

2-107723 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.38 - BACKFILL INFORMATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q323.38-1 THRU Q323.38-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL CATEGORY I STRUCTURES WILL BE SUPPORTED ON COMPETENT SILTSTONE AND CONSEQUENTLY CLASS A FILL WILL ONLY BE REQUIRED AROUND AND IN THE IMMEDIATE VICINITY OF THE NUCLEAR PLANT ISLAND AND EMERGENCY COOLING TOWER. COOLING WATER PIPELINES WILL BE EMBEDDED IN CLASS A FILL. A DETAILED EVALUATION HAS BEEN MADE OF THE RESIDUAL CLAYS AND TERRACE DEPOSITS OCCURRING AT THE SITE TO

CATEGORY 2
SITING OF NUCLEAR FACILITIES

2-107723 *CONTINUED*
DETERMINE THEIR ACCEPTABILITY FOR USE AS CLASS A STRUCTURAL FILL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*MATERIAL + SOIL PROPERTY + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + INTERACTION, SOIL AND STRUCTURE + *FILL + CLINCH RIVER (LMFBR)

2-107725 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 323.42 - MARYVILLE, TENNESSEE EARTHQUAKE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q323.42-1 THRU Q323.42-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MARYVILLE-ALOCA, TENNESSEE EARTHQUAKE OCCURRED AT 2:48 A.M. EST, NOVEMBER 30, 1973 AT LATITUTE 35.80 DEGREES NORTH AND LONGITUDE 83.96 DEGREES WEST. INTENSITY REPORTS FROM SURROUNDING COMMUNITIES DETERMINED THAT THE EARTHQUAKE FELT AREA WAS ABOUT 65,000 SQUARE KILOMETERS (25,000 SQUARE MILES) AND THAT THE EPICENTRAL INTENSITY WAS VI MM. THE NEAREST SEISMIC RECORDING STATION TO THE EPICENTER THAT RECORDED THE EARTHQUAKE WAS THE CUMBERLAND PLATEAU OBSERVATORY WHICH IS 90 MILES WEST OF THE EPICENTER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

GEOLOGY + SEISMOLOGY + SITING, REACTOR + RESPONSE TO NRC QUESTION + *EARTHQUAKE RECORDS + CLINCH RIVER (LMFBR)

2-107737 ALSO IN CATEGORIES 11 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
271 PGS, AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING CHAPTER AND APPENDIX SUMMARIES, GENERAL DESCRIPTION OF THE PLANT, RELIABILITY PROGRAM, EQUIPMENT ARRANGEMENT DIAGRAMS, ORGANIZATION, TORNADO LOADINGS, MISSILE PROTECTION, RADIOLOGICAL MONITORING SYSTEM, MANUFACTURER'S QUALITY ASSURANCE PROGRAM, AND COMPUTER CODES. RESPONSES TO NRC QUESTIONS CONCERN THESE SAME TOPICS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT DESIGN + MISSILE GENERATION AND PROTECTION + REACTOR DESCRIPTION + SITING, REACTOR + RELIABILITY, SYSTEM + MONITORING SYSTEM, RADIATION + DESTRUCTIVE WIND + *REPORT, PSAR + QUALITY ASSURANCE + *CLINCH RIVER (LMFBR)

CATEGORY 3
TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS

3-104231 ALSO IN CATEGORY 5 DATED 1975
IRVINE AR
LMFBR SPENT FUEL TRANSPORT: EFFECTS OF USE OF DOWTHERM AS CASK COOLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4986 +. 23 PPS, 4 FIGS, 12 REFS. AUG. 1975

THE EFFECTS OF USE OF DOWTHERM AS A CASK COOLANT ON FACILITIES AT THE REACTOR AND REPROCESSING SITES AND ON SAFETY OF SPENT FUEL SHIPMENT ARE EXAMINED. SIGNIFICANT DISADVANTAGES IN THE USE OF DOWTHERM WERE FOUND AT EACH OF THE AREAS; HOWEVER, AN ENGINEERING SOLUTION IS AVAILABLE TO ACCOMMODATE EACH NEGATIVE EFFECT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL HANDLING + *SHIPPING CONTAINER + TRANSPORTATION AND HANDLING + *COOLING + *FUEL ELEMENTS

3-105076 DATED 1974
SAFETY ANALYSIS REPORT FOR THE SHIPMENT OF FFTF FUEL IN THE F-144-1 SHIPPING CONTAINER
BATTELLE COLUMBUS LABS., OHIO
TID-26589 +. 74 PPS, MAY 20, 1974

THIS REPORT PRESENTS A SAFETY EVALUATION OF THE F-144-1 SHIPPING CONTAINER WHICH IS TO BE USED IN THE TRANSPORTATION OF UNIRRADIATED FFTF AND OTHER LMFBR FUEL ELEMENT ASSEMBLIES OR FUEL PINS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SHIPPING CONTAINER + *TRANSPORTATION AND HANDLING + SHIPPING ANALYSIS + SPECIAL NUCLEAR MATERIAL + REACTOR, PLUTONIUM

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-093125 ALSO IN CATEGORY 18 DATED 1974
STEAM GENERATOR TEST LOOP FOR SODIUM COOLED FAST BREEDER REACTOR
11 PAGES, ISHIKAWAHIMA-HARIMA GIHC, 14(1), PP. 66-77 (JAN. 1974) (IN JAPANESE)

IN THE DEVELOPMENT OF THE LIQUID METAL FAST BREEDER REACTOR (LMFBR), THE STEAM GENERATOR (SG) IS CONSIDERED A COMPONENT WHICH REQUIRES PREFERENTIAL DEVELOPMENT. IN JAPAN, THE HELICAL COILED HEAT TRANSFER TUBE TYPE SG WAS CHOSEN AS ONE OF THE SG TYPES FOR THE LMFBR, AND RESEARCH AND DEVELOPMENT WILL PROCEED. HOWEVER, THIS TYPE POSSESSES SOME PROBLEMS TO BE SOLVED, SUCH AS BOILING IN THE DOWNCOMER AND MULTI-CHANNEL FLOW INSTABILITY DURING LOW LOAD OPERATION. A TEST LOOP WAS DESIGNED AND MANUFACTURED FOR THE PURPOSE OF PROVING THERMAL AND HYDRODYNAMIC PERFORMANCE AND OBTAINING BASIC EXPERIMENTAL DATA FOR THE PROBLEMS MENTIONED.

JAPAN + SYSTEM DESCRIPTION + R AND D PROGRAM + STEAM GENERATOR

5-093231 DATED 1973
HAYDEN O
IMPROVEMENTS IN TUBULAR HEAT EXCHANGERS
BRITISH PATENT 1,336,555 +. 4 PAGES, NOVEMBER 7, 1973

REFERENCE IS MADE TO 'TUBE-IN-SHELL' TYPES OF HEAT EXCHANGERS. A PROBLEM ARISES IN THE USE OF SUCH HEAT EXCHANGERS AS STEAM GENERATORS IN LIQUID-METAL COOLED REACTORS. IN THE SYSTEM DESCRIBED A PLATE IS PROVIDED, PENETRATED BY THE TUBES WITH CLEARANCE, AND LOCATED SO AS TO ACT AS A BARRIER AGAINST AN EROSIVE JET FROM ANY ONE TUBE. SEVERAL ALTERNATIVE METHODS FOR FABRICATION ARE DESCRIBED.

AVAILABILITY - THE PATENT OFFICE, 25 SOUTHAMPTON BLDG., LONDON, W.C.2, ENGLAND

UNITED KINGDOM + MODIFICATION + EQUIPMENT DESIGN + PATENT + HEAT EXCHANGERS

5-093597 DATED 1972
SCHMIDT G
MECHANISM FOR PREVENTING COOLING DISTURBANCES OR POWER EXCURSIONS
GERMAN PATENT 2,055,455 +. 3 PAGES, MAY 18, 1972

THE PATENT CLAIMS REFER TO A DEVICE FOR THE PREVENTION OF OPERATING DISTURBANCES DUE TO SUPERHEATING OF THE COOLANT IN A LIQUID-METAL COOLED BREEDER REACTOR. FOR THIS PURPOSE, AN APPROPRIATE MATERIAL CONTINUOUSLY REGENERATING HELIUM OR HYDROGEN NUCLEATES IS PROVIDED FOR IN AT LEAST ONE COOLANT PASSAGE BETWEEN THE FUEL ELEMENTS IN THE REACTOR CORE. THESE HELIUM OR HYDROGEN NUCLEATES WILL INDUCE NUCLEATE BOILING IN CASE THE COOLANT REACHES ITS BOILING TEMPERATURE. THEY ARE PRODUCED BY NUCLEAR EVENTS.

AVAILABILITY - PHOTOCOPY - U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

HYDROGEN + SUPERHEAT + REACTOR COOLANT + GERMANY + HELIUM + NUCLEATE BOILING + PATENT + NUCLEOTIDE

5-093643 ALSO IN CATEGORIES 6 AND 8 AND 18 DATED 1974
NICHOLSON RE
DESIGN BASIS ACCIDENT STUDIES - FINAL REPORT
THE OHIO STATE UNIVERSITY
COO-2286-3 +. 260 PAGES, TABLES, REFERENCES, JUNE 22, 1974

AN EXTENSION OF THE ANL EQUATION OF STATE IN THE VENUS-II PROGRAM TO INCLUDE LOWER PRESSURE CONDITIONS AND AN ISENTROPIC EXPANSION CALCULATION SHOWS THAT THE ENERGY AVAILABLE FOR MECHANICAL DAMAGE IS STRONGLY DEPENDENT UPON HOW FAR THE EXPANSION CAN PROCEED. EXPANSION TO ONE ATMOSPHERE IN WEAK ACCIDENTS CAN LEAD TO ONE TO TWO ORDERS OF MAGNITUDE MORE ENERGY THAN R. W. STRATTON'S EIGHT-FOLD VOLUME EXPANSION. THE MODIFIED BETHE-TAIT METHOD OF EDWARDS AND MATHER IS APPROXIMATELY REPRODUCED AND VERIFIED BUT AT HIGH DOPPLER EFFECT, LOW EXCURSION ENERGY CONDITIONS. THE ANL EQUATION OF STATE IN VENUS LEADS TO SIGNIFICANTLY GREATER ENERGY RELEASE. A POTENTIALLY AUTOCATALYTIC EFFECT, ASSOCIATED WITH NEUTRON STREAMING THROUGH VOIDS, CANNOT BE DISREGARDED IN HCDA ANALYSIS. MORE WORK IS REQUIRED TO ESTABLISH ITS QUANTITATIVE SIGNIFICANCE. MOST OF THE SAS-2A COMPUTER PROGRAM MODELING IS FOUND TO BE BASED ON SOUND PRINCIPLES. WE ARE GENERALLY IN AGREEMENT WITH ANL ON THE FEW WEAKNESSES OF THE MODELING. THE DBA CONCEPT AS A BASIS FOR BREEDER CONTAINMENT DESIGN IS FOUND TO BE A SOUND CONCEPT WHEN ACCOMPANIED BY A COMMITMENT TO PROVIDE THE HIGHEST PRACTICABLE CONTAINMENT CAPACITY AND BY A COMMITMENT TO ASSURE RESPONSIBILITY AND VISABILITY IN CONTAINMENT DESIGN DECISIONS

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BETHE TAIT + COMPUTER PROGRAM + DOPPLER EFFECT + ENERGY SOURCE + EQUATION OF STATE + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + NEUTRON + ACCIDENT, DESIGN BASIS + VOID + ACCIDENT, CORE DISRUPTIVE

5-093651 DATED 1974
FONTANA MH + GNADT PA + KRESS TS + MACPHERSON RE + PARSLY LF + WANTLAND JL
TEMPERATURE DISTRIBUTION IN A 19-ROD SIMULATED LMFBR FUEL ASSEMBLY WITH AN EDGE BLOCKAGE (OUT-OF-REACTOR TEST FOR ANL FEFP P1 EXPERIMENT) - RECORD OF EXPERIMENTAL DATA FOR FUEL FAILURE MOCKUP BUNDLE 5A
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4633 +. 225 PAGES, 12 FIGURES, 15 REFERENCES, NOVEMBER 1974

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-093651 *CONTINUED*

THIS REPORT IS A RECORD OF UNEVALUATED EXPERIMENTAL DATA OBTAINED FROM FUEL FAILURE MOCKUP BUNDLE 5A, WHICH SIMULATED THE CONFIGURATION OF THE FUEL ELEMENT FAILURE PROPAGATION P1 EXPERIMENT TO BE CONDUCTED BY ARGONNE NATIONAL LABORATORY. BUNDLE 5A CONSISTED OF 19 ELECTRIC CARTRIDGE HEATERS WITH OUTSIDE DIAMETERS OF 0.23 IN. SPACED BY 0.056-IN. WIRE WRAPS ON A 12-IN. PITCH. AT THE EDGE OF THE BUNDLE, THE DIAMETER OF WIRE WRAPS WAS REDUCED TO 0.028 IN., SO THAT THE FLOW PASSAGES CONTIGUOUS TO THE CHANNEL WALL WERE REDUCED IN CROSS-SECTIONAL AREA. A STAINLESS STEEL BLOCKAGE PLATE, ATTACHED 4 IN. DOWNSTREAM FROM THE START OF THE HEATED SECTION, BLOCKED APPROXIMATELY ONE-THIRD OF THE FLOW CROSS-SECTIONAL AREA ALONG TWO ADJACENT FLATS OF THE HEXAGONAL DUCT. THE PURPOSE OF THIS TEST SERIES WAS TO DETERMINE THE EFFICACY OF THE BLOCKAGE FOR INDUCING FUEL FAILURE IN THE FFEP P1 EXPERIMENT AND TO PREVIEW THERMAL-HYDRAULIC COOLANT BEHAVIOR OF THE FFEP ROD BUNDLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + HYDRAULIC EXPERIMENT + MOCKUP + THERMAL EXPERIMENT + FLOW BLOCKAGE + DATA COLLECTION + HEATERS + FUEL ELEMENTS

5-093654 ALSO IN CATEGORY 7 DATED 1974
CHASANOV MG + FISCHER DF + FREDRICKSON DR + GABELNICK SD + KUMAR R + LEIBOWITZ L + REEDY GT + CAFASSO FA + BURRIS L
CHEMICAL ENGINEERING DIVISION REACTOR SAFETY AND PHYSICAL PROPERTY STUDIES ANNUAL REPORT, JULY 1973-JUNE 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8120 +, 108 PAGES, 23 TABLES, 35 FIGURES, 1974

THE REPORT INCLUDES THE FOLLOWING: RESULTS ON THE STUDY OF THE BEHAVIOR OF IRRADIATED FUEL UNDER POWER-TRANSIENT SIMULATION USING DIRECT ELECTRICAL HEATING; INFORMATION ON THE DEVELOPMENT OF EQUIPMENT TO MEASURE THE ELECTRICAL RESISTIVITY OF MIXED-OXIDE FUEL MATERIALS; DETERMINATION OF THE ENTHALPY OF CS(SUB 2)MOO(SUB 4) BY DROP CALORIMETRY; CALCULATIONS OF HIGH-TEMPERATURE THERMOPHYSICAL PROPERTIES OF SODIUM FROM VARIOUS ESTIMATES OF CRITICAL PARAMETERS; A PROGRESS REPORT ON STUDIES AIMED AT THE DETERMINATION OF THE THERMAL DIFFUSIVITY OF MOLTEN UO(SUB 2); MEASUREMENTS ON THE SOLUBILITY OF UO(SUB 2) IN MOLTEN BASALT AND THE VISCOSITY OF SUCH SOLUTIONS; RESULTS OF AN INVESTIGATION OF THE INTERACTION OF BASALT WITH MOLTEN SODIUM AT APPROXIMATELY 900 C; AND ANALYSIS OF THE EFFECTS OF SACRIFICIAL BARRIER MATERIALS ON THE POST-ACCIDENT HEAT-REMOVAL REQUIREMENTS FOLLOWING A HYPOTHETICAL CORE-DISRUPTIVE ACCIDENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + REACTOR TRANSIENT + URANIUM DIOXIDE + IRRADIATION TESTING + PROPERTY, PHYSICAL + PLUTONIUM DIOXIDE + SOLUBILITY + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE + HEATERS + FUEL ELEMENTS

5-099485 ALSO IN CATEGORY 18 DATED 1974
WILLIAMS LS
FINAL RADIAL SHIELD ORIFICE TESTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 73-87 +, 24 PAGES, 12 FIGURES, OCTOBER 1974

THIS REPORT DESCRIBES THE FINAL HYDRAULIC TESTING PERFORMED IN SUPPORT OF THE ENGINEERING DESIGN OF THE ORIFICES FOR THE FFTF RADIAL SHIELDS. THE END USE OF ALL THE TEST DATA WAS THE ENGINEERING DESIGN PREDICTION OF THE FINAL ORIFICE SIZE WHICH WOULD DELIVER THE DESIRED FLOWRATES TO THE RADIAL SHIELD IN THE FFTF.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

HYDRAULIC EXPERIMENT + REACTOR, TEST + TESTING + FFTF (TR) + CORE COMPONENTS + ORIFICE + R AND D PROGRAM + FLOW

5-099494 DATED 1974
TODREAS NE
COOLANT MIXING IN LMFBR ROD BUNDLES - QUARTERLY PROGRESS REPORT, JUNE 1-AUGUST 31, 1974
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-13 +, 25 PAGES, 10 FIGURES, 10 REFERENCES, 1974

REPORTS PROGRESS ON THE FOLLOWING SUBJECTS: (1) EXPERIMENTAL BUNDLE WATER MIXING INVESTIGATION, (2) BUNDLE PERIPHERAL VELOCITY MEASUREMENTS, (3) ANALYTIC MODEL DEVELOPMENT, (4) SUBCHANNEL WATER MIXING, AND (5) SUBCHANNEL LOCAL PARAMETER MEASUREMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MEASUREMENT + ANALYTICAL MODEL + HEAT TRANSFER EXPERIMENT + R AND D PROGRAM + FLOW + FLOW, MIXING + COOLING + MIXING ZONE

5-099501 ALSO IN CATEGORIES 6 AND 18 DATED 1974
SLEMBER RJ
HEDL QUARTERLY TECHNICAL REPORT JULY, AUGUST, SEPTEMBER, 1974. VOLUME 3 - REACTOR AND SAFETY ENGINEERING

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-099501 *CONTINUED*
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL. 3) +. 34 PAGES, 6 FIGURES, OCTOBER 1974

REPORTS ACTIVITIES ON (1) LMFBR DOUBLING TIME, (2) CLOSED LOOP IN-REACTOR SAFETY ANALYSIS, (3) REACTOR VESSEL AND HEAT RESPONSE TO A LOSS OF FLOW HYPOTHETICAL CORE DISRUPTIVE ACCIDENT, (4) INTERNAL FLUID HYDRODYNAMICS, AND (5) CORE ENGINEERING AND PHYSICS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + FFTF (TR) + R AND D PROGRAM + PRESSURE TRANSIENT + ACCIDENT, CORE DISRUPTIVE

5-099643 ALSO IN CATEGORIES 11 AND 18 DATED 1974
SCHENONE CE + BOLTAX A
ADDENDUM 3, REVISED DATA PACKAGE TO EXTEND GOAL BURNUP TO 12 PERCENT IN EBR-II GRID-TYPE SUBASSMBLY WSA-3
WESTINGHOUSE ELECTRIC CORPORATION
WARD-DX-3045-5(ADD.3) +. 39 PAGES, 11 FIGURES, 15 REFERENCES, NOVEMBER 1974

REVISED DESIGN AND SAFETY ANALYSES OF THE FUEL PINS AND SUBASSEMBLY HARDWARE PERTINENT TO CHANGES IN GOAL BURNUP, EBR-II ENVIRONMENT AND EXPERIMENTAL REQUIREMENTS ARE DESCRIBED IN THIS REPORT. THE ANALYSES WERE PERFORMED IN ACCORDANCE WITH THE 'GUIDE FOR IRRADIATION EXPERIMENTS IN EBR-II, REVISION 00', DATED SEPTEMBER 15, 1973. INFORMATION IS PRESENTED ONLY FOR (1) ITEMS DISCUSSED IN PREVIOUS DATA PACKAGES WHICH ARE AFFECTED BY THE CHANGE IN TARGET BURNUP, (2) NEW REQUIREMENTS OF REVISION 00 OF THE GUIDE, AND (3) SPECIFIC REQUESTS OF THE EBR-II PROJECT. THE CONCLUSION OF THE ANALYSES IS THAT CONTINUATION OF THE IRRADIATION OF WSA-3 TO 12% BURNUP DOES NOT POSE ANY UNUSUAL OR UNACCEPTABLE HAZARDS TO THE OPERATION OF EBR-II.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + FUEL BURNUP + THERMAL ANALYSIS + STRESS ANALYSIS + IRRADIATION TESTING + SAFETY ANALYSIS + R AND D PROGRAM + FUEL ELEMENTS

5-100013 DATED 1974
BRUKX JFLM
CSDT SIMULATION MODEL FOR PREDICTION OF IHX TRANSIENT BEHAVIOR USING S/360 CSMP
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8118 +. 86 PAGES, 19 FIGURES, 40 REFERENCES, AUGUST 1974

PREDICTS THE TRANSIENT BEHAVIOR OF SODIUM-TO-SODIUM COUNTERFLOW HEAT EXCHANGERS. THE MODEL IS PROGRAMMED FOR AN IMB S/360 MODEL 75 COMPUTER USING THE S/360 CONTINUOUS SYSTEM MODELING PROGRAM (CSMP) AS THE BASIC PROGRAMMING TOOL. THE EQUATIONS OF THE MATHEMATICAL MODEL ARE SOLVED THROUGH USE OF THE SERIAL OR CONTINUOUS-SPACE/DISCRETE-TIME (CSDT) METHOD; THE NATURE OF THE PROBLEM THEREBY REQUIRES AN ITERATIVE SOLUTION SEARCH FOR EACH INSTANT OF TIME. AXIAL TEMPERATURE DISTRIBUTIONS OF SODIUM AND TUBE-WALL SURFACE ARE OBTAINED AT EVERY TIME STEP.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + HEAT TRANSFER + SIMULATION + THERMAL TRANSIENT + HEAT EXCHANGERS

5-101522 DATED 1975
HENRY RE + SINGER RM + QUINN DJ
OPERA SINGLE-PIN PUMP - COASTDOWN EXPULSIONS AND REENTRY TEST
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-17 +. 44 PAGES, 26 FIGURES, 4 REFERENCES, FEBRUARY 1975

REPORTS TRANSIENT BOILING RESULTS FOR SODIUM BOILING IN A NARROW ANNULAR CHANNEL WITH HIGH HEAT-FLUX INPUT. SIMULATES A LOSS OF PRIMARY PUMP POWER ACCIDENT IN A LMFBR BY EXPONENTIALLY DECREASING THE LIQUID COOLANT FLOW RATE, THUS INITIATING BOILING. RESULTS GIVEN IN GRAPHICAL FORM, SHOW INCEPTION OF BOILING AT END OF HEATED ZONE. DESCRIBES VOIDING PATTERNS AND VAPOR ZONE GROWTH WHICH OCCURS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, LOSS OF FLOW + ACCIDENT, LOSS OF POWER + OUT OF PILE EXPERIMENT + FLOW, ANNULAR + BOILING + PUMPS

5-101841 DATED 1974
CAMPOLUNGHI F + CUMO M + FERRARI G
HEAT TRANSFER TO DRY AND SUPERHEATED STEAM IN ONCE-THROUGH STEAM GENERATORS FOR LMFBR'S
COMITATO NAZIONALE PER L'ENERGIA NUCLEARE, ROME
RT/ING(74)18 +. 29 PAGES, JUNE 1974

DESCRIBES EXPERIMENTS WHICH MAKE FULL SCALE MEASUREMENTS OF THE HEAT TRANSFER COEFFICIENTS OF DRY AND SUPERHEATED STEAM IN A 22 METER STAINLESS STEEL TEST SECTION. THE CHANNEL IS ELECTRICALLY HEATED, AND THE HEAT TRANSFER COEFFICIENT IS COMPUTED BY MEASURING THE EXTERNAL WALL TEMPERATURE AND THEN DEDUCING THE INNER WALL TEMPERATURE.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-101841 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STEAM + CUT OF PILE EXPERIMENT + MEASUREMENT, TEMPERATURE + HEAT TRANSFER EXPERIMENT + STEAM GENERATOR + HEAT TRANSFER COEFFICIENT

5-101867 ALSO IN CATEGORY 11 DATED 1975
BRATIS JC + MARCINIAK TJ + GVILDYS J
REXCO-HT: A HYDRODYNAMIC CONTAINMENT CODE INCLUDING MOLTEN-FUEL-COOLANT INTERACTIONS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-15 +. 69 PAGES, 17 FIGURES, 13 REFERENCES, FEB. 1975

IN THE PRESENT WORK, SOPHISTICATED FUEL-COOLANT INTERACTION MODELS AND A THERMODYNAMICALLY CONSISTENT EQUATION OF STATE FOR SODIUM ARE INTRODUCED INTO THE REXCO-H CODE. THESE ARE FIRST PRESENTED, FOLLOWED BY DETAILED INFORMATION OF THE REQUIRED INPUT. NEXT, A DESCRIPTION OF THE OUTPUT FORMATS AND THE LIMITATIONS OF THE CODE ARE GIVEN. FINALLY, RESULTS OBTAINED THROUGH APPLICATION OF THE CODE TO THREE DIFFERENT CONFIGURATIONS ARE PRESENTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CONTAINMENT + EQUATION OF STATE + THERMODYNAMICS + MOLTEN FUEL + ACCIDENT, HYPOTHETICAL + HYDRODYNAMIC ANALYSIS + FUEL COOLANT INTERACTION

5-101915 DATED 1974
HAGA K + OHTSUBO A + KIKUCHI Y
EFFECT OF BOWING DISTORTIONS ON HEAT TRANSFER IN A SEVEN-PIN BUNDLE
POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORP., JAPAN
JAPFNR-175 +. 10 PAGES, 11 FIGURES, NOV. 1974

DEALS WITH THE EXPERIMENTAL RESULTS OF HEAT TRANSFER IN SODIUM FLOWING IN AN ELECTRICALLY HEATED SEVEN PIN BUNDLE WHERE A PIN WAS BOWED TO FORM A POINT CONTACT. EXPERIMENTS WERE CARRIED OUT BOTH IN TIGHTLY PACKED HEXAGONAL BUNDLES IN WHICH THE CENTRAL PIN WAS BOWED SYMMETRICALLY NEAR THE AXIAL MID-PLANE. NORMAL PIN BUNDLES WERE USED AS REFERENCE CASES. EXPERIMENTAL CONDITIONS AND RESULTS ARE PRESENTED IN GRAPHICAL AND TABULAR FORM. RESULTS COMPARE FAIRLY WELL WITH CALCULATION BY THE PICO COMPUTER CODE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL ELEMENT BOWING + COMPARISON, THEORY AND EXPERIENCE + TEMPERATURE GRADIENT + HEAT TRANSFER EXPERIMENT + FUEL ELEMENT CLUSTER + THERMAL HYDRAULIC ANALYSIS

5-102025 DATED 1974
KHAN EU + ROHSENOW WM + SONIN AA + TODREAS NE
ANALYSIS OF MIXING DATA RELEVANT TO WIRE-WRAPPED FUEL ASSEMBLY THERMAL-HYDRAULIC DESIGN
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-12 + MITNE-165 +. 162 PAGES, 37 FIGURES, 30 REFERENCES, SEPT. 1974

ANALYSIS OF RECENT EXPERIMENTAL DATA IS PRESENTED USING THE ENERGY CODE. A COMPARISON OF THE ACCURACY OF THREE TYPES OF EXPERIMENTS IS ALSO PRESENTED ALONG WITH A DISCUSSION OF UNCERTAINTIES IN UTILIZING THIS DATA FOR VARIOUS CODE CALIBRATION PURPOSES. THE EXISTENCE OF INTERNAL SWIRL IS DISCUSSED. THE TWO EMPIRICAL COEFFICIENTS IN ENERGY ARE DETERMINED FROM THE DATA WITHIN A CERTAIN RANGE OF ACCURACY. THIS RANGE IS DICTATED TO A LARGER EXTENT BY THE ACCURACY OF THE EXPERIMENTS AND TO A SMALLER EXTENT BY THE ABILITY OF THE CODE TO UTILIZE ALL SETS OF DATA IN EACH EXPERIMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + REACTOR COOLANT + TEMPERATURE GRADIENT + EXPERIMENT + CORE COMPONENTS + R AND D PROGRAM + FUEL ELEMENT CLUSTER + THERMAL HYDRAULIC ANALYSIS

5-102072 ALSO IN CATEGORY 18 DATED 1974
GROTZEACH G + KUSSMAUL G
THE BEHAVIOR OF THE CORE OF A FAST SODIUM-COOLED REACTOR AFTER SERIOUS HYPOTHETICAL ACCIDENTS
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1213 + KFK-1928 +. 108 PAGES, 28 FIGURES, 68 REFERENCES, AUG. 1974

CONCEIVABLE INITIATING SITUATIONS WERE DEFINED FOR BOTH THE REACTIVITY ACCIDENT AND FOR THE TOTAL PUMP FAILURE ACCIDENT. A CONSERVATIVE ESTIMATION OF THE MASSES OF FUEL WHICH RETURN TO THE CORE AFTER AN ACCIDENT LEADS TO VALUES OF 70-90% OF THE ORIGINAL FUEL INVENTORY. AN ESTIMATE OF THE EFFECTS OF FULLY MAINTAINED COOLANT FLOW PRODUCES NO DECISIVE CHANGE IN THE PERCENTAGE OF FUEL RETURNED TO THE CORE. THE FUEL/STEEL ASSEMBLIES INVESTIGATED REMAIN SUBCRITICAL IF MORE THAN 50% OF THE FUEL INVENTORY IS EXPELLED FROM THE CORE DURING AND AFTER THE HYPOTHETICAL ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + ACCIDENT, HYPOTHETICAL + CORE MELTDOWN + GERMANY + FLOW BLOCKAGE + PUMPS

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-102216 ALSO IN CATEGORY 11 DATED 1974
CARAJILESCOV P + TODREAS NE
EXPANSION OF THE METHOD OF CORRELATED TEMPERATURES TO CLAD AND FUEL DESIGN ANALYSES
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
16 PAGES, 15 FIGURES, 8 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 30(1), PP. 3-19 (JULY 1974)

IN THE THERMAL DESIGN OF NUCLEAR REACTOR CORES, SPECIFIED DESIGN LIMITS (TEMPERATURES AND LINEAR POWER RATING) SHOULD NOT BE EXCEEDED BY THE OPERATING VALUES OF CERTAIN ELEMENTS (COOLANT, CLAD AND FUEL). AN EXPANSION OF THE METHOD OF CORRELATED TEMPERATURES, DEVELOPED FOR COOLANT TEMPERATURE ANALYSIS, WAS PERFORMED TO ENABLE CLAD TEMPERATURE AND FUEL CENTERLINE MELTING ANALYSES FOR REACTOR CORE RELIABILITY STUDIES. SINCE GENERATION OF RANDOM NUMBERS IS INVOLVED, CALCULATIONAL PROCEDURES, TAILORED TO DESIGNER NEEDS, WERE DEVELOPED IN ORDER TO REDUCE COMPUTATIONAL TIME. THE METHOD IS APPLIED TO A TYPICAL LMFBR CORE AND RESULTS ARE PRESENTED FOR VARIOUS ASSUMED CLAD AND FUEL DESIGN LIMITS.

CLADDING + MEASUREMENT + ANALYTICAL TECHNIQUE + MEASUREMENT, TEMPERATURE + DESIGN STUDY + COMPARISON + TEMPERATURE

5-102456 DATED 1975
KIRSCH D
INVESTIGATIONS OF THE FLOW AND TEMPERATURE DISTRIBUTION DOWNSTREAM OF LOCAL COOLANT BLOCKAGES IN ROD BUNDLE SUBASSEMBLIES
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
13 PAGES, 9 FIGURES, 19 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 31(2), PP. 266-79 (JAN. 1975)

EXPERIMENTAL AND THEORETICAL INVESTIGATIONS ARE REPORTED ON THE FLOW AND TEMPERATURE DISTRIBUTION IN LOCAL RECIRCULATING FLOWS IN ROD BUNDLES, DOWNSTREAM OF A BLOCKAGE. A MEAN COOLANT TEMPERATURE IN THIS RECIRCULATION ZONE CAN BE CALCULATED FROM THE DIMENSION OF THE RECIRCULATION ZONE AND THE MASS EXCHANGE RATE WITH THE MAIN FLOW. SIMILARITY ANALYSIS FOR RECIRCULATING FLOW IN A SIMPLE GEOMETRY WITHOUT RODS SHOWS THAT WITH A SUFFICIENTLY HIGH REYNOLDS NUMBER, SIMILAR GEOMETRY AND SIMILAR HEAT SOURCE DISTRIBUTION, THE DIMENSIONLESS TEMPERATURE FIELDS IN RECIRCULATING FLOWS ARE EQUAL AND INDEPENDENT OF THE REYNOLDS AND PRANDTL NUMBERS. THIS RESULT IS ALSO OBSERVED TO BE TRUE FOR ROD BUNDLES, JUSTIFYING TEMPERATURE DISTRIBUTION MEASUREMENTS TO BE PERFORMED WITH WATER INSTEAD OF SODIUM. TYPICAL RESULTS ARE GIVEN.

*FLOW THEORY AND EXPERIMENTS + *FLOW BLOCKAGE + FUEL ROD + COOLING

5-102458 ALSO IN CATEGORY 11 DATED 1975
KUCZERA B
SIMULATION OF THE TRANSIENT BEHAVIOR OF LMFBR FUEL PINS UNDER CONSIDERATION OF SPECIAL BURNUP PHENOMENA USING THE BREDA-II MODEL
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
14 PAGES, 9 FIGURES, 28 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 31, (2), PP. 294-307 (JAN. 1975)

A NEW FUEL PIN MODEL HAS BEEN USED FOR TRANSIENT FUEL PIN DEFORMATION ANALYSIS DURING HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS (HCDA) AND FOR THE PURPOSE OF INTERPRETING FUEL PIN FAILURE TESTS. THE FUEL PIN MODEL IS BASED ON THE EQUATIONS OF THE QUASI-STATIC THEORY OF THERMAL ELASTICITY. THE FUEL IS REGARDED AS ELASTIC AND THE CLADDING AS ELASTO-PLASTIC MATERIAL. THE EQUATIONS FOR THE STRESS-STRAIN ANALYSIS ARE BASED ON THE PLANE STRAIN APPROXIMATION. A MULTIREGION FUEL PIN MODEL ALLOWS TO SIMULATE LONG-TIME AND TRANSIENT BURNUP PHENOMENA. THE LONG-TIME EFFECTS TAKEN INTO ACCOUNT ARE THE STEADY STATE SWELLING OF FUEL, THE CHANGE IN FUEL POROSITY AND THE PRODUCTION AND PARTIAL RELEASE OF FISSION GASES.

FUEL BURNUP + FAILURE, FUEL ELEMENT + *ANALYTICAL MODEL + STRESS ANALYSIS + DEFORMATION + *SIMULATION + FUEL SWELLING + *FUEL ELEMENTS

5-102673 DATED 1975
CHEN WL
HEAT LOSS TO COLD STRUCTURE DURING AN LMFBR HYPOTHETICAL CORE DISRUPTIVE ACCIDENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
6 PAGES, 4 FIGURES, 8 REFERENCES, NUCLEAR TECHNOLOGY, 25(3), PP. 471-76 (MARCH 1975)

A SIMPLE METHOD HAS BEEN DEVELOPED FOR CALCULATION OF TRANSIENT HEAT LOSSES THAT OCCUR AS A HOT FLUID PRODUCED DURING A LIQUID-METAL FAST BREEDER REACTOR HYPOTHETICAL CORE-DISRUPTIVE ACCIDENT EXPANDS THROUGH THE FISSION-GAS PLENUM REGION. THE HEAT-CONDUCTION EQUATION OF THE PLENUM CLADDING IS FORMALLY SOLVED BY THE LAPLACE TRANSFORM FOR A TIME-DEPENDENT CLADDING SURFACE TEMPERATURE, AND THE RESULTING SOLUTION IS NUMERICALLY EVALUATED USING AN INTEGRATION METHOD BASED ON THE TRAPEZOIDAL RULE. THE EXPANDING HOT FLUID MAY BE A TWO-PHASE MIXTURE OF SODIUM PRODUCED BY A FUEL-COOLANT INTERACTION OR A TWO-PHASE MIXTURE OF FUEL PRODUCED BY A SEVERE NUCLEAR EXCURSION.

FFTF (TR) + EXCURSION, LARGE + MATHEMATICAL TREATMENT + NUMERICAL METHOD + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

5-102684 ALSO IN CATEGORY 18 DATED 1974
ROBIN MG + CUCHATELLE L + DENUCHEZE L
STEAM GENERATOR PERFORMANCES OF PHENIX IN STEADY STATE: COMPARISON WITH FORECASTS
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-102684 *CONTINUED*
ERDA-TR-4 + CONF-741085-5 +. 24 PAGES. PRESENTED AT THE SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS. HELD IN BENSBERG. F.R. GERMANY. OCT. 14. 1974

THEORETICAL AND EXPERIMENTAL PERFORMANCE AND TEMPERATURE DEVELOPMENT WERE CALCULATED AND MEASURED ON A COMPARATIVE BASIS IN STEADY STATE USING PROTOTYPES AND STEAM GENERATORS OF THE PHENIX FAST BREEDER DEMONSTRATION POWER STATION. IT IS SHOWN THAT. AS EARLY AS 1969. IT WAS POSSIBLE TO MAKE A FAIR PREDICTION OF FULL LOAD PERFORMANCE OF THE STEAM GENERATOR SELECTED FOR PHENIX.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

FRANCE + *COMPARISON. THEORY AND EXPERIENCE + ANALYTICAL TECHNIQUE + *STEAM GENERATOR + *PERFORMANCE

5-102690 DATED 1974
FRY DN + KERLIN TW + SIDES WH
DYNAMIC HEAT TRANSFER EXPERIMENTS IN AN ELECTRICALLY HEATED LMFBR FUEL ELEMENT MOCKUP
OAK RIDGE NATIONAL LABORATORY. TENN.
CONF-741065-42 +. 3 PAGES. PRESENTED AT EACRP SPECIALIST MEETING ON REACTOR NOISE FROM CRITICAL ASSEMBLIES TO POWER PLANTS. HELD IN ROME. ITALY. OCT. 21. 9174

EXPERIMENTS WERE PERFORMED AT THE FUEL FAILURE MOCKUP FACILITY TO OBTAIN DATA FOR USE IN DETERMINING HEAT TRANSFER AND FLOW PATHS IN SIMULATED LMFBR FUEL BUNDLES THAT WERE OPERATED WITH AND WITHOUT FLOW BLOCKAGES. THE HEAT INPUT TO ONE ROD OF A 19-ROD ASSEMBLY WAS MODULATED. AND THE TEMPERATURE RESPONSES WERE MONITORED WITH THERMOCOUPLES AT VARIOUS POSITIONS IN THE BUNDLE. THE EXPERIMENTAL DATA WERE PROCESSED TO YIELD FREQUENCY RESPONSES FOR THE MEASURED THERMOCOUPLE-HEATER PAIRS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

HEAT TRANSFER + HYDRAULIC EXPERIMENT + THERMAL EXPERIMENT + MEASUREMENT. TEMPERATURE + FLOW DISTRIBUTION + FLOW BLOCKAGE + PRESSURE PULSE + FUEL ELEMENT CLUSTER + FREQUENCY ANALYSIS

5-102951 ALSO IN CATEGORY 18 DATED 1974
ROWE DS + STEWART CW + WHEELER CL
PROGRESS REPORT SUBCHANNEL CODE DEVELOPMENT AND DATA ANALYSIS
BATTELLE PACIFIC NORTHWEST LABS.. RICHLAND. WASHINGTON
BNWL-B-390-1 +. 30 PAGES. 2 TABLES. 6 REFERENCES. DEC. 1974

CONCERNED PRIMARILY WITH COBRA CODE. DISCUSSES TWO BASICALLY DIFFERENT NUMERICAL TECHNIQUES FOR CALCULATING FLOW REVERSALS IN THE PRESENCE OF PRESSURE BOUNDARY CONDITIONS. SEVERAL MAJOR CHANGES WHICH ALLOW ANALYSIS OF LARGE BUNDLES (217 PINS). LMFBR DATA ANALYSIS. FLOW AND ENTHALPY DISTRIBUTIONS IN LMFBR BUNDLES UNDER BOILING CONDITIONS AND EXPERIMENTAL PROGRAM TO STUDY BUOYANCY DOMINATED FLOWS THROUGH A HEATED ROD BUNDLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*COMPUTER PROGRAM + *DATA PROCESSING + FLOW DISTRIBUTION + BUOYANT RISE + FUEL ELEMENTS

5-102972 ALSO IN CATEGORY 18 DATED 1975
ERDMAN CA + HAAS PM
A REVIEW OF METHODS FOR ANALYSIS OF THE TRANSIENT OVERPOWER ACCIDENT IN THE LIQUID-METAL-COOLED FAST BREEDER REACTOR
BROOKHAVEN NATIONAL LABORATORY. UPTON. N.Y.
BNL-19877 + BNL/FRS 75-1 +. 65 PAGES. 10 FIGURES. 47 REFERENCES. JAN. 1975

THE CURRENT STATUS OF METHODS FOR TREATING CERTAIN CRITICAL PROBLEMS IN THE ANALYSIS OF THE UNPROTECTED TRANSIENT OVERPOWER ACCIDENT IS DISCUSSED. WITH EMPHASIS ON THE MODELS USED IN FOUR SPECIFIC COMPUTER CODES: SAS3A. PLUTO. HOPE. AND MELT-III. THE ANALYSIS PROBLEMS ARE GROUPED INTO THE FOLLOWING FOUR GENERAL CATEGORIES: STEADY-STATE INITIALIZATION. PIN CAVITY DYNAMICS. FUEL-PIN FAILURE. AND CHANNEL PHENOMENA. SPECIAL TREATMENT IS GIVEN TO THE QUESTIONS OF FUEL PLATEOUT AND PLUGGING AND TO LARGE-SCALE FISSION-GAS RELEASE. THE MAJOR CONCLUSION IS THAT CURRENTLY AVAILABLE CODES SHOULD CONTINUE TO BE USED IN A CONSERVATIVE MANNER BECAUSE OF THE UNCERTAINTIES ASSOCIATED WITH USING THE PRIMARILY PARAMETRIC MODELS OF KEY PHENOMENA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*COMPUTER PROGRAM + FAILURE + FISSION GAS RELEASE + ACCIDENT. LOSS OF FLOW + ACCIDENT. REACTIVITY + FFTF (TR) + FAILURE. CLADDING + *REVIEW + *THERMAL TRANSIENT + FUEL COOLANT INTERACTION + CLINCH RIVER (LMFBR)

5-103571 DATED 1974
BARRETT PR
HEAT TRANSFER IN LMFBR FUEL ELEMENTS - PART I: EFFECTS OF FUEL PELLET DISPLACEMENT
UNIVERSITY OF NEW SOUTH WALES. AUSTRALIA
12 PAGES. 15 REFERENCES. NUCLEAR ENGINEERING & DESIGN. 26(3). PP. 376-87 (FEB. 1974)

RANDOM DISPLACEMENT OF MIXED OXIDE FUEL PELLET AXES FROM THE CENTER AXIS OF THEIR OVERALL LIQUID METAL FAST BREEDER REACTOR FUEL ELEMENT OCCURS WHEN THE PELLETS ARE RANDOMLY LOADED WITHIN THE FUEL ELEMENT CLADDING SHEATH. ASSUMING AZIMUTHALLY SYMMETRIC HEAT TRANSFER FROM THE OUTER CLADDING SURFACE TO THE BULK COOLANT. THE INFLUENCE OF THIS RANDOM DISPLACEMENT UPON THE

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-103571 *CONTINUED*
TEMPERATURE DISTRIBUTION THROUGHOUT THE FUEL ELEMENT IS EXAMINED WHEN THE GRANULAR OR POROUS DETAILED FUEL STRUCTURE AND CRACKS IN THE FUEL ARE IGNORED. IT IS SHOWN THAT FOR A TYPICAL EXAMPLE, IN WHICH THE MAXIMUM DISPLACEMENT IS ONLY 0.0075 CM AND THE FUEL PELLET RADIUS IS 0.2465 CM, THE VARIANCE OF THE MAXIMUM FUEL TEMPERATURE IS IN THE VICINITY OF 115 C.

CLADDING + FUEL, PELLET TYPE + CENTERLINE MELTING + HEAT TRANSFER ANALYSIS + MATHEMATICAL TREATMENT + FUEL ELEMENTS

5-103573 DATED 1974
BARRETT PR
HEAT TRANSFER IN LMFBR FUEL ELEMENTS - PART II: EFFECTS OF FUEL PELLET CRACKS, GRANULAR FUEL STRUCTURE, AND AZIMUTHALLY NON-UNIFORM HEAT TRANSFER FROM CLADDING TO BULK COOLANT
UNIVERSITY OF NEW SOUTH WALES, AUSTRALIA
16 PAGES, 8 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 26(3), PP. 388-403 (FEB. 1974)

ASSUMES THAT THE CROSS SECTIONS OF FUEL PELLET CRACKS MAY BE APPROXIMATED BY TRIANGULAR SLITS, AND SHOWS THAT EVEN IN SEVERE CRACKING THE TEMPERATURE DISTRIBUTION IS LITTLE INFLUENCED BY CRACKS. EXAMINES THE PROBLEM OF THE STATISTICAL EFFECTS INTRODUCED BY THE GRANULAR STRUCTURE OF MIXED OXIDE FUEL, AND ALSO DISCUSSES THE AZIMUTHAL DEPENDENCE OF THE EXPECTED MOMENTS OF THE TEMPERATURE DISTRIBUTION INTRODUCED BY AZIMUTHALLY VARIABLE HEAT TRANSFER FROM CLADDING TO COOLANT.

CLADDING + FUEL, PELLET TYPE + HEAT TRANSFER ANALYSIS + MATHEMATICAL TREATMENT + FUEL COOLANT INTERACTION + FUEL ELEMENTS

5-103915 ALSO IN CATEGORY 18 DATED 1975
TODREAS NE + GOLAY MW
COOLANT MIXING IN LMFBR ROD BUNDLES AND OUTLET PLENUM MIXING TRANSIENTS: PROGRESS REPORT, DECEMBER 1, 1974-FEBRUARY 28, 1975
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-15 +, 32 PAGES, 16 FIGURES, 8 REFERENCES, FEB. 28, 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING TASKS: BUNDLE GEOMETRY, WRAPPED AND BARE RODS; SUBCHANNEL GEOMETRY, BARE RODS; AND LMFBR OUTLET PLENUM FLOW MIXING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR COOLANT + R AND D PROGRAM + *FLOW, MIXING + *MIXING COEFFICIENT

5-103931 ALSO IN CATEGORIES 7 AND 18 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR OCTOBER-DECEMBER 1974. III. LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4805(VOL.3) +, 27 PAGES, 11 FIGURES, APRIL 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING FISSION PRODUCT TRANSIENT RELEASE FROM LMFBR FUEL, AND EFFECTS OF SODIUM SPILLS ON STEEL-LINED EQUIPMENT CELLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, CONSEQUENCES + FISSION PRODUCT RELEASE + AEROSOL PRODUCTION + *R AND D PROGRAM + CONTAINMENT LINER + FUEL ROD + *TRANSIENT

5-103946 ALSO IN CATEGORY 18 DATED 1975
GASSER RD
POST ACCIDENT HEAT REMOVAL WITH ADVANCED LMFBR FUELS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7518 +, 86 PAGES, 49 FIGURES, 41 REFERENCES, MARCH 1975

AN ANALYSIS IS PERFORMED TO STUDY THE PROBLEMS ASSOCIATED WITH RETAINING AND COOLING THE DEBRIS SUBSEQUENT TO A POSTULATED LMFBR CORE DISASSEMBLY AND MELTDOWN ACCIDENT, WITH EMPHASIS PLACED ON ADVANCED REACTOR FUELS SUCH AS THE CARBIDES AND NITRIDES OF URANIUM AND PLUTONIUM. A HEAT TRANSFER MODEL FOR THE FLUIDIZED PARTICLE BED IS CONSTRUCTED, AND A SOLUTION GENERATED TO OBTAIN MAXIMUM BED DEPTH AT WHICH INCIPIENT SODIUM BOILING OCCURS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + CORE MELTDOWN + *HEAT TRANSFER ANALYSIS + FLUIDIZED BED + ACCIDENT, CORE DISRUPTIVE

5-103947 ALSO IN CATEGORY 18 DATED 1975
KEOWEN RS + CATTON I
DRY-OUT OF A FLUIDIZED PARTICLE BED WITH INTERNAL HEAT GENERATION
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7519 +, 52 PAGES, 6 TABLES, 22 FIGURES, MARCH 1975

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-103947 *CONTINUED*
THE TEMPERATURE RESPONSE AND DRYOUT CONDITION WAS DETERMINED FOR VARIOUS BED LEVELS, PARTICLE DIAMETERS, AND HEAT FLUXES. ANALYSIS OF THE DATA RETRIEVED FROM THE BED WAS USED TO GENERATE A FAMILY OF CURVES TO PREDICT THE NECESSARY CONDITIONS FOR DRYOUT TO OCCUR WITHIN A FLUIDIZED PARTICLE BED WITH INTERNAL HEAT GENERATION. THE RESULTS SHOW THAT PREVIOUS RESULTS WITH BOTTOM HEATING AND VOLUME HEATING ARE CONSERVATIVE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + CORE MELTDOWN + *FLUIDIZED BED + *HEAT FLUX, DRYOUT + ACCIDENT, CORE DISRUPTIVE

5-103948 ALSO IN CATEGORY 18 DATED 1975
CATTON I
LAMINAR NATURAL CONVECTION FROM BLUNT BODIES WITH ARBITRARY SURFACE HEAT FLUX OR SURFACE TEMPERATURE
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7527 +. 82 PAGES, 4 FIGURES, 33 REFERENCES, APRIL 1975

THE LAMINAR BOUNDARY LAYER EQUATIONS FOR FREE CONVECTION OVER BODIES OF ARBITRARY SHAPE AND WITH ARBITRARY SURFACE HEAT FLUX OR SURFACE TEMPERATURE ARE SOLVED IN LOCAL CARTESIAN COORDINATES. BOTH TWO-DIMENSIONAL AXISYMMETRIC BODIES (E.G. HORIZONTAL CYLINDERS) AND THREE-DIMENSIONAL AXISYMMETRIC BODIES (E.G. SPHERES) WITH FINITE RADII OF CURVATURE AT THEIR STAGNATION POINTS ARE CONSIDERED. A BLASIUS SERIES EXPANSION IS APPLIED TO CONVERT FROM PARTIAL TO ORDINARY DIFFERENTIAL EQUATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CORE MELTDOWN + DESIGN STUDY + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER ANALYSIS + *CORE CATCHER

5-103969 ALSO IN CATEGORY 18 DATED 1975
PHYSICS OF REACTOR SAFETY QUARTERLY REPORT: JANUARY-MARCH 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-31 +. 33 PAGES, 8 TABLES, 23 REFERENCES, MARCH 1975

PROGRESS IN REACTOR SAFETY RESEARCH AND TECHNICAL COORDINATION OF THE RSR SAFETY ANALYSIS PROGRAM IS REPORTED. PUMP COASTDOWN CALCULATIONS HAVE BEEN CARRIED OUT FOR AN IMPROVED MODEL OF THE CRBR, WITH RESULTS SIMILAR TO PREVIOUS ONES. A MILD INITIAL DISASSEMBLY IS OBTAINED, BUT THERE IS A REMOTE POSSIBILITY OF A MORE SEVERE ONE FROM FAILURE OF LOW-POWER PINS IN THE PRESENCE OF SODIUM. THE PLUTO CODE HAS BEEN APPLIED TO THIS PROBLEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ANALYTICAL MODEL + CORE MELTDOWN + *R AND D PROGRAM + *ACCIDENT, CORE DISRUPTIVE

5-104133 DATED 1973
REYNOLDS AB + KENNEDY MF
METHODS FOR CALCULATING VAPOR AND FUEL TRANSPORT TO THE SECONDARY CONTAINMENT IN AN LMFBR ACCIDENT
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE
12 PAGES, 10 FIGURES, NUCLEAR TECHNOLOGY, 20(3), PP. 149-60 (DEC. 1973)

CALCULATIONAL MODELS WERE DEVELOPED FOR ESTIMATING THE TRANSPORT OF SODIUM VAPOR AND THE RELATIVELY LARGE (GREATER THAN OR EQUAL TO 10 MICRO-M) FUEL PARTICLES RESULTING FROM A FUEL-COOLANT INTERACTION TO THE SECONDARY CONTAINMENT IN AN LMFBR CORE DISRUPTIVE ACCIDENT. FOLLOWING THE FORMATION OF A LARGE SODIUM VAPOR BUBBLE RESULTING FROM A FUEL-COOLANT INTERACTION, A POTENTIAL SEQUENCE OF EVENTS WAS ANALYZED. THIS ANALYSIS COVERS BUBBLE CONDENSATION, BUBBLE RISE TIME, AEROSOL FALLOUT DURING THE BUBBLE RISE, GAS FLOW RATE THROUGH THE COVER, COVER-GAS ESCAPE DURING THE BUBBLE RISE, BUBBLE AND COVER-GAS MIXING, AND AEROSOL ESCAPE TO THE SECONDARY CONTAINMENT.

COVER GAS + AEROSOL, RADIOACTIVE + CONTAINMENT STRUCTURE + BUBBLE NUCLEATION + MATHEMATICAL TREATMENT + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

5-104134 DATED 1975
OHTSUBO A
ANALYTICAL CODE 'PICO' FOR FUEL PIN CONTACT ACCIDENT
POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORP., TOKYO
JAPFNR-175 +. 36 PAGES, JULY 1974

THIS ANALYTICAL CODE 'PICO' WAS DEVELOPED DURING THE PERIOD FROM APRIL 1, 1971 TO MARCH 31, 1974 FOR THE PURPOSE OF APPLYING IT TO CALCULATION OF TEMPERATURES OF CLADDING TUBES AT SUCH CONTACT POINTS WHERE TWO FUEL PINS MAY ACCIDENTALLY CONTACT WITH EACH OTHER INSIDE THE FBR CORE FUEL ASSEMBLY. THIS ANALYTICAL CODE IS BASED ON THE MULTI-FLOW CHANNEL THERMAL HYDRUALIC ANALYTICAL CODE 'HECTIC-II.'

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + COMPUTER PROGRAM + CLADDING + FUEL ELEMENT BOWING + TEMPERATURE GRADIENT + FUEL ELEMENTS

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-104231 ALSO IN CATEGORY 3 DATED 1975
IRVINE AR
LMFBR SPENT FUEL TRANSPORT: EFFECTS OF USE OF DOWTHERM AS CASK COOLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4586 +. 23 PPS, 4 FIGS, 12 REFS, AUG. 1975

THE EFFECTS OF USE OF DOWTHERM AS A CASK COOLANT ON FACILITIES AT THE REACTOR AND REPROCESSING SITES AND ON SAFETY OF SPENT FUEL SHIPMENT ARE EXAMINED. SIGNIFICANT DISADVANTAGES IN THE USE OF DOWTHERM WERE FOUND AT EACH OF THE AREAS; HOWEVER, AN ENGINEERING SOLUTION IS AVAILABLE TO ACCOMMODATE EACH NEGATIVE EFFECT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL HANDLING + *SHIPPING CONTAINER + TRANSPORTATION AND HANDLING + *COOLING + *FUEL ELEMENTS

5-104244 ALSO IN CATEGORY 18 DATED 1975
ABRAMSON PB
POOL - A TWO-DIMENSIONAL THREE-COMPONENT COUPLED HYDRODYNAMIC THERMODYNAMIC COMPUTER MODEL FOR BOILING POOLS OF FUEL AND STEEL
ARGONNE NATIONAL LABORATORY, ILLINOIS
RSA-TM-3 +. 70 PAGES, 10 FIGS., 23 REFS., MAY 1, 1975

THIS MODEL WAS DEVELOPED AS A SUBSTITUTE FOR VENUS II AND HAS BEEN COUPLED TO FX 2 TO YIELD A COMPLETELY INTERACTIVE THERMOHYDRAULIC-NEUTRONIC COMPUTER PORGRAM WHICH DESCRIBES THE INTERACTIONS IN A BOILING CLINDRICAL POOL OF FUEL AND STEEL. THE MODEL TREATS THE EULERIAN HYDRODYNAMICS AND THERMODYNAMICS OF THE INTERACTIONS IN THE POOL AND FEEDS BACK TO FX2 FOR NEUTRONIC COUPLING. SPECIFICALLY TREATED IN THIS MODEL ARE: HEAT TRANSFER BETWEEN FUEL AND STEEL BOTH INSIDE THE POOL AND AT THE BOUNDARIES; BOILING OF STEEL AND FUEL, MELTING OF STEEL AT THE POOL CONTACT BOUNDARIES AND CONDENSATION OF VAPOR AT THE TOP BOUNDARIES; PRESSURIZATION INSIDE THE POOL AND ON TOP; HYDRODYNAMIC (NAVIER STOKES AND CONTINUITY) INTERNAL MOTION; AND THERMODYNAMIC HEAT DIFFUSION/CONVECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER, BOILING + *COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + CORE MELTDOWN + POOL BOILING + *BOILING + *THERMAL HYDRAULIC ANALYSIS

5-104250 DATED 1973
DICKERMAN CE
U.S. STUDIES ON LMFBR FUEL BEHAVIOR UNDER ACCIDENT CONDITIONS
ARGONNE NATIONAL LABORATORY, ILLINOIS
7 PAGES, 24 REFERENCES, NUCLEAR SAFETY, 14(5), PP. 452-58 (SEPT.-OCT. 1973)

PRESENTS A BRIEF REVIEW OF THE U.S. EFFORT, BETWEEN FALL 1969 AND SPRING 1972, RELATING TO EVALUATION OF THE BEHAVIOR OF THE FUEL AND COOLANT IN LIQUID-METAL-COOLED FAST BREEDER REACTORS UNDER ACCIDENT CONDITIONS. THE EXPERIMENTAL WORK IS CENTERED LARGELY AROUND THE TRANSIENT REACTOR TEST FACILITY. INVESTIGATIONS OF STEADY-STATE POWER OPERATION SUGGEST THAT SAFETY AND RELIABILITY CAN BE ATTAINED EVEN WITH PARTIAL BLOCKAGES OF COOLANT FLOW. RESULTS OF TRANSIENT TESTS ARE LESS SEVERE THAN PREDICTIONS BASED ON PESSIMISTIC ASSUMPTIONS, AND ADDITIONAL EFFORT IS REQUIRED TO PERMIT ACCURATE MODELING OF DETAILED BEHAVIOR.

ACCIDENT ANALYSIS + FAILURE, FUEL ELEMENT + TREAT (PRR) + ACCIDENT, FUEL SLUMP + ACCIDENT MODEL + FUEL COOLANT INTERACTION

5-104252 DATED 1975
TROMBETTI T
PRESSURE WAVES IN SODIUM DURING A FAST REACTOR ACCIDENT
CNEN, ROME, ITALY
RT/ING(74) +. 30 PAGES, AUG. 1974

DEALS WITH THE VIOLENT PROCESS OF SODIUM HEATING AND VAPORIZATION RESULTING FROM MOLTEN FUEL-LIQUID SODIUM INTERACTION IN THE COURSE OF A FAST REACTOR ACCIDENT. DESCRIBES PRESSURE WAVE PROPAGATION IN SODIUM IN ONE-DIMENSIONAL PLANE GEOMETRY, WHICH APPEARS AS THE MOST REASONABLE REPRESENTATION OF THE SODIUM GAP WHICH, AFTER SUBASSEMBLY DRYOUT AND SODIUM REENTRY, SEPARATES THE OUTER RING OF HOT-FUEL PINS FROM A FACE OF THE WRAPPER CAN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + HEAT TRANSFER + MOLTEN FUEL + ACCIDENT MODEL + PRESSURE PULSE + FUEL COOLANT INTERACTION

5-104273 DATED 1974
DURHAM ME
PREDICTION OF LAMINAR FLOW AND HEAT TRANSFER IN A PIPE AND IN AN ABRUPT EXPANSION IN A PIPE
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
RD/B/N-3040 +. 27 PAGES, 11 FIGURES, JUNE 1974

LAMINAR FLOW AND HEAT TRANSFER IN A PIPE AND IN AN ABRUPT EXPANSION IN A PIPE ARE STUDIED BY

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-104273 *CONTINUED*
OBTAINING NUMERICAL SOLUTION TO THE NAVIER-STOKES EQUATIONS. COMPARISON BETWEEN THE PREDICTIONS AND DATA AVAILABLE IS GOOD. INFORMATION ON THE WALL SHEAR STRESS, AND ON HEAT TRANSFER IN AN ABRUPT EXPANSION IS GIVEN WHICH HAS NOT BEEN PUBLISHED PREVIOUSLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + HEAT TRANSFER + FLOW, LAMINAR + FLOW, TURBULENT + NUMERICAL METHOD

5-104275 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY - III: LOSS-OF FLOW ACCIDENT ANALYSIS
7 PAGES, TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 295-301, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON LOSS-OF-FLOW ACCIDENT ANALYSIS. THE TOPICS INCLUDE: RESPONSE OF THE GAS-COOLED FAST BREEDER REACTOR TO FLOW REDUCTION ACCIDENTS; LOSS-OF-FLOW ACCIDENT PHENOMENOLOGY IN THE GCFR; CORE DISRUPTIVE ACCIDENT ANALYSIS OF GAS COOLED FAST BREEDER REACTOR; ANALYSIS OF LOSS-OF-FLOW ACCIDENTS FOR THE SNR-300 MARK 1A CORE; SAFETY STUDIES FOR 1000-MWE OXIDE AND CARBIDE FAST BREEDER REACTORS; A CODE FOR ANALYZING PARALLEL-CHANNEL THERMAL-HYDRAULICS IN EBR-2 DURING NATURAL CONVECTION CONDITIONS; AND FLOW-CONTROLLED COASTDOWN TESTS ON BOILING IN A SODIUM-COOLED 19-ROD BUNDLE.

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *ACCIDENT, LOSS OF FLOW + REACTOR, GCFR + THERMAL HYDRAULIC ANALYSIS + ACCIDENT, CORE DISRUPTIVE

5-104277 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY - I: HCDA ANALYSIS
8 PAGES, TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 279-86, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS. THE TOPICS INCLUDE: HYDRODYNAMICS OF FUEL EXPANSION FOLLOWING DISASSEMBLY IN AN LMFBR CORE-DISRUPTIVE ACCIDENT; LMFBR/HCDA ENERGY YIELD-FLUID DYNAMIC ASPECTS; HYDRODYNAMIC ASPECTS OF MILD LMFBR CORE DISASSEMBLY; REACTIVITY CHANGES DUE TO BUBBLE GROWTH OR COLLAPSE IN MOLTEN FUEL SYSTEMS; CONSEQUENCES OF CHANNEL PLUGGING DURING FAST REACTOR OVERPOWER EXCURSIONS; ASSESSING RECRITICALITY IN LMFBR CORE DISRUPTIVE ACCIDENTS; AND FX2POOL - A DYNAMIC TWO-DIMENSIONAL MULTIFLUID HYDRO/THERMODYNAMIC AND NEUTRONICS MODEL FOR BOILING POOLS.

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + HYDRODYNAMIC ANALYSIS + *ACCIDENT, CORE DISRUPTIVE

5-104279 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY - V: POST-ACCIDENT HEAT REMOVAL AND STRUCTURAL DYNAMICS
6 PAGES, FIGS., TRANS., AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 309-14, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 6 PAPERS ON THE FOLLOWING SUBJECTS: POST-ACCIDENT HEAT REMOVAL WITH ADVANCED LMFBR FUELS; CORE DEBRIS RETENTION IN THE BELOW-CORE STRUCTURE FOLLOWING AN LMFBR DISASSEMBLY; POST-ACCIDENT DOWNWARD FUEL RELOCATION IN THE LMFBR; MELTING RATES FOR THE ATTACK OF STEEL STRUCTURE BY UO2 FUEL OR STEEL VAPOR; PROPAGATION OF HCDA PRESSURE PULSES IN A PLASTICALLY DEFORMING PIPING LOOP; AND RESPONSE OF A HEXAGONAL FUEL SUBASSEMBLY WALL DUE TO AN AXISYMETRIC PRESSURE SOURCE.

*ACCIDENT, CONSEQUENCES + *DECAY HEAT + EMERGENCY COOLING CONSIDERATIONS + ACCIDENT, CORE DISRUPTIVE

5-104280 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY - VI: LOCALIZED CORE EVENTS
6 PAGES, FIGS., TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 315-20, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 5 PAPERS ON THE FOLLOWING SUBJECTS: ASSESSMENT OF LOCAL BLOCKAGES IN CARBIDE ASSEMBLIES; COOLANT RECOVERY RATE FOLLOWING FISSION GAS RELEASE FROM A POSTULATED MULTIPLE PIN FAILURE IN AN LFMBR SUBASSEMBLY; TEMPERATURE NOISE MEASUREMENTS IN BLOCKED AND UNBLOCKED 19-PIN ELECTRICALLY HEATED LMFBR FUEL MOCKUPS; EFFECT OF GAS BUBBLE PASSAGE THROUGH CRBR CORE; AND PRELIMINARY ASSESSMENT OF SUBASSEMBLY TO SUBASSEMBLY PROPAGATION IN LMFBR'S.

FUEL MELTDOWN + NOISE ANALYSIS + FUEL ROD + BOILING + *EMERGENCY COOLING CONSIDERATIONS

5-104283 DATED 1974
NIJSING R + EIFLER W
A COMPUTATION METHOD FOR THE STEADY STATE THERMOHYDRAULIC ANALYSIS OF FUEL ROD BUNDLES WITH SINGLE PHASE COOLING
EURATOM, JOINT RESEARCH CENTRE, ITALY
50 PAGES, 38 FIGS., 62 REFS., NUCLEAR ENGINEERING & DESIGN, 30(2), PP. 145-85 (SEPT. 1974)

BOTH GRID SPACERS AND HELICAL WIRE SPACERS ARE CONSIDERED. AN ANALYTICAL APPROACH HAS BEEN ADOPTED FOR COMPUTING THE AXIAL DISTRIBUTION OF SUBCHANNEL COOLANT TEMPERATURES. THE COMPUTATION METHOD HAS BEEN APPLIED TO FAST REACTOR FUEL ELEMENTS WITH LIQUID METAL COOLING.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-104283 *CONTINUED*
INTERSUBCHANNEL HEAT TRANSPORT MECHANISMS ARE DISCUSSED IN DETAIL. NUMERICAL RESULTS CENTER ON THE EFFECT A LATERAL POWER GRADIENT HAS ON THE TEMPERATURE FIELD IN A HEXAGONAL FAST REACTOR FUEL ROD ASSEMBLY. AN IMPORTANT RESULT OBTAINED, IS THAT FOR LARGE HEXAGONAL FUEL ROD ASSEMBLIES INTERSUBCHANNEL HEAT TRANSPORT DOES NOT CONTRIBUTE TO THE ATTENUATION OF CIRCUMFERENTIAL FLOW DUCT TEMPERATURE DIFFERENCES. THIS HOLDS BOTH FOR ASSEMBLIES WITH GRID SPACERS AND THOSE WITH HELICAL WIRE SPACERS.

*POWER DISTRIBUTION + ANALYTICAL TECHNIQUE + *TEMPERATURE GRADIENT + *METAL, LIQUID + *HEAT TRANSFER ANALYSIS + FLOW, TURBULENT + *MATHEMATICAL TREATMENT + FUEL ELEMENT CLUSTER + *THERMAL HYDRAULIC ANALYSIS

5-104414 ALSO IN CATEGORY 18 DATED 1974
DUNN FE + FISCHER GJ + HEAMES TK
THE SASZA LMFBR ACCIDENT ANALYSIS COMPUTER CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8138 +, 351 PAGES, 24 FIGS., 18 REFS., OCT. 1974

THE CODE CALCULATES THE INITIAL CONSEQUENCES OF AN ACCIDENT, FROM STEADY-STATE, PREACCIDENT CONDITIONS UP TO THE POINT OF LARGE-SCALE FUEL MOTION OR DISASSEMBLY. THE CODE STARTS WITH A STEADY-STATE THERMAL-HYDRAULICS CALCULATION TO INITIALIZE THE FUEL TEMPERATURES, FUEL AND CLADDING THERMAL EXPANSION, AND THE COOLANT TEMPERATURES, PRESSURES, AND FLOW RATES. THE CODE THEN STARTS A USER-SPECIFIED PERTURBATION IN POWER LEVEL OR FLOW RATE, AND CALCULATES TRANSIENT TEMPERATURES IN FUEL, CLADDING, AND COOLANT. TRANSIENT STRESSES AND STRAINS IN THE FUEL AND CLADDING, AND TRANSIENT COOLANT PRESSURES AND FLOW RATES ARE ALSO CALCULATED, AS WELL AS SODIUM BOILING, FILM DRYOUT, CLADDING MELTING, AND FUEL MELTING. NEUTRON KINETICS IS HANDLED WITH A POINT-KINETICS APPROXIMATION, WITH REACTIVITY FEEDBACK FROM THE DOPPLER EFFECT, FUEL THERMAL EXPANSION, SODIUM VOIDING, USER-SUPPLIED TABLE-LOOKUP FUEL SLUMPING, AND SCRAM REACTIVITY, AS WELL AS USER-SPECIFIED PROGRAMMED REACTIVITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FUEL MELTDOWN + DEFORMATION + REACTIVITY EFFECT, SLUMP + HEAT TRANSFER ANALYSIS + FLOW BLOCKAGE + BUBBLE + *THERMAL HYDRAULIC ANALYSIS

5-104425 ALSO IN CATEGORIES 11 AND 18 DATED 1973
CLAXTON KT + COLLIER JG
MASS TRANSPORT OF STAINLESS STEEL CORROSION PRODUCTS IN FLOWING LIQUID SODIUM
UKAEA RESEARCH GROUP, HARWELL
13 PAGES, 8 TABS., 13 FIGS., J. BRITISH NUCLEAR ENERGY SOCIETY, 12(1), PP. 63-75 (JAN. 1973)

THE MASS TRANSPORT OF CORROSION PRODUCTS LIKELY TO BE ENCOUNTERED IN A FAST REACTOR THROUGH EXPOSURE OF STAINLESS STEEL TO FLOWING LIQUID SODIUM IS DISCUSSED. A PUMPED SODIUM LOOP CAPABLE OF FLOW RATES OF 1100 KG/H AT A TEMPERATURE OF 600 C HAS BEEN COMMISSIONED. THIS RIG INCORPORATES AN INDIRECTLY HEATED ACTIVE CYLINDRICAL TEST SECTION AND COLD TRAPPING AND FILTERING FACILITIES. IT HAS BEEN OPERATED UNDER CONDITIONS WHICH SIMULATE THOSE OBTAINING IN A SINGLE TUBE OF THE INTERMEDIATE HEAT EXCHANGER OF PFR. THE INITIAL EXPERIMENTS HAVE INVESTIGATED THE TRANSPORT AND DEPOSITION CHARACTERISTICS OF FE, MN AND CO. MANGANESE-54 BEHAVIOUR IS CHARACTERIZED BY ITS RAPID AND HIGHLY PREFERENTIAL MIGRATION TO THE DIFFUSION COLD TRAP, THE COLDEST PART OF THE CIRCUIT. EXPERIMENTS WITH 60-CO HAVE INDICATED THAT ITS TRANSPORT IS MORE LIMITED THAN 54-FE AND THAT THE DEPOSIT IS LESS STRONGLY ATTACHED BEING EASILY DISLODGED THROUGH VELOCITY CHANGES IN THE CIRCUIT.

COBALT + MANGANESE + STEEL, STAINLESS + IRON + CORROSION + IN PILE EXPERIMENT + MASS TRANSFER

5-104437 ALSO IN CATEGORY 18 DATED 1975
KENNEDY JM + BELYTSCHKO TB
ENERGY SOURCE AND FLUID REPRESENTATION IN A STRUCTURAL RESPONSE CODE - STRAW
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8140 +, 76 PAGES, 75 FIGS, 12 REFS., MAY 1975

DESCRIBES ADDITIONAL DEVELOPMENTS IN THE STRAW CODE FOR SIMULATING THE SURROUNDINGS OF A FUEL SUBASSEMBLY IN A REACTOR CORE AND GIVES SOME RESULTS OBTAINED WITH THE NEW FEATURES. TWO NEW ELEMENTS ARE ADDED TO THE EXISTING PROGRAM: A HYDRODYNAMIC FINITE ELEMENT REPRESENTING THE PLANE MOTION OF THE FLUID SURROUNDING AND WITHIN THE SUBASSEMBLIES, AND A SUPERIMPOSED SUPERELEMENT REPRESENTING THE EFFECTS OF AXIAL FLOW. AN ENERGY-SOURCE MODEL IS INCORPORATED TO MODEL MOLTEN-FUEL-COOLANT INTERACTIONS (MFCI) OR OTHER POSSIBLE ENERGY-RELEASE SOURCES. ALSO, AN OPTION FOR COMPUTING THE INTERNAL ENERGIES OF ANY ELEMENT OR GROUPS OF ELEMENTS. THE TOTAL KINETIC AND INTERNAL ENERGIES, AND THE EXTERNAL WORK OF FORCING FUNCTIONS WAS ADDED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + ENERGY SOURCE + HEAT TRANSFER + HYDRODYNAMIC ANALYSIS + *FUEL ELEMENT CLUSTER + THERMAL TRANSIENT + *FUEL COOLANT INTERACTION + *FUEL ELEMENTS

5-104540 DATED 1975
RAMM H + JOHANNSEN K
PREDICTION OF LOCAL AND INTEGRAL TURBULENT TRANSPORT PROPERTIES FOR LIQUID-METAL HEAT TRANSFER IN EQUILATERAL TRIANGULAR ROD ARRAYS

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-104540 *CONTINUED*
TECHNISCHE UNIVERSITAT BERLIN, GERMANY
6 PAGES, 7 FIGS., 10 REFS., J. HEAT TRANSFER (TRANS. ASME); 95(2), SERIES C, PP. 238-43 (MAY 1975)

A THEORETICAL METHOD BASED ON PHENOMENOLOGICAL TURBULENCE MODEL HAS BEEN APPLIED TO EVAULATE TURBULENT TRANSPORT PROPERTIES FOR LIQUID METAL HEAT TRANSFER IN BARE EQUILATERAL ROD BUNDLES. RESULTS OBTAINED FOR LOCAL DISTRIBUTIONS OF THERMAL EDDY DIFFUSIVITY IN THE VARIOUS DIRECTIONS ARE PRESENTED IN TERMS OF CORRELATIONS. THE STUDY IS APPLICABLE TO PRESENT LMFBR FUEL PIN DESIGNS.

HEAT TRANSFER + METAL, LIQUID + FLOW, TURBULENT + THEORETICAL INVESTIGATION + FLOW + FUEL ELEMENTS

5-104562 DATED 1975
ISHII M + CHAWLA TC
A THERMAL ANALYSIS OF HOT SPOTS ON FAST-REACTOR FUEL CLADDING DUE TO DEPOSITION OF LOW-CONDUCTIVITY MATERIALS
ARGONNE NATIONAL LABORATORY, ILLINOIS
8 PAGES, 8 FIGS., 11 REFS., NUCLEAR SCIENCE & ENGINEERING, 56(2), PP. 188-95 (FEB. 1975)

THE FORMATION OF HOT SPOTS IN FUEL CLADDING DUE TO THE DEPOSITION OF A LOW-CONDUCTIVITY HEAT-GENERATING FUEL OR DUE TO FISSION-GAS-JET IMPINGEMENT IS A VERY CREDIBLE EVENT AND CAN SIGNIFICANTLY INFLUENCE THE PROBABILITY FOR SLOW FUEL-FAILURE PROPAGATION IN A SUBASSEMBLY OF A LIQUID-METAL FAST BREEDER REACTOR. BY ASSUMING STEADY-STATE CONDITIONS, A GENERAL EXPRESSION IS OBTAINED FOR THE TEMPERATURE DISTRIBUTION IN THESE HOT SPOTS. AS SPECIAL CASES, EXPRESSIONS ARE OBTAINED FOR TEMPERATURE DISTRIBUTIONS IN HOT SPOTS CAUSED BY FISSION-GAS-JET IMPINGEMENT AND PARTIAL OR TOTAL CHANNEL BLOCKAGE BY FUEL DEBRIS.

CLADDING + HEAT TRANSFER + HOT SPOT + MATHEMATICAL TREATMENT + FUEL ELEMENTS

5-104904 DATED 1975
PIERSON ES
ELECTROMAGNETIC SELF-EXCITATION IN THE LIQUID-METAL FAST BREEDER REACTOR
ARGONNE NATIONAL LABORATORY, ILLINOIS
8 PPS, 11 FIGS, 6 REFS, NUCLEAR SCIENCE & ENGINEERING, 57(2), PP. 155-63 (JUNE 1975)

COOLANT FLOW IN A LIQUID METAL COOLED FAST BREEDER REACTOR CAN BECOME ELECTROMAGNETICALLY SELF-EXCITED, WHICH WOULD RESULT IN A HIGHER PRESSURE DROP OVER THE FLOW PATH AND/OR A REDUCED COOLANT FLOW, AND PROBABLY REDUCED HEAT TRANSFER BETWEEN THE COOLANT AND FUEL. THIS PAPER ANALYZES THE FLOW IN THE REACTOR COOLING DUCTS AND CONCLUDES THAT SELF-EXCITATION IS NOT EXPECTED TO OCCUR.

METAL, LIQUID + FLOW DISTRIBUTION + FLOW STABILITY + SAFETY ANALYSIS + FLOW

5-104906 DATED 1975
WINTERTON RHS
LIQUID METAL SUPERHEAT IN FORCED CONVECTION
UNIVERSITY OF BIRMINGHAM, ENGLAND
7 PPS, 6 FIGS, 13 REFS, INTERNATIONAL J. HEAT & MASS TRANSFER, 18(2), PP. 205-212 (FEB. 1975)

ANALYSIS OF INERT GAS MASS TRANSFER IN SYSTEMS USED FOR THE EXPERIMENTAL MEASUREMENT OF SUPERHEAT SHOWS THAT THE FLOW IS LIKELY TO CONTAIN GAS BUBBLES THAT HAVE COME OUT OF SOLUTION, AND THE NUMBER OF BUBBLES WILL INCREASE RAPIDLY IF THE VELOCITY IN THE COLD PIPEWORK, WHERE THE BUBBLES ARE PRECIPITATED, IS RAISED. THE PAPER EXAMINES THE EFFECT THESE BUBBLES COULD HAVE ON SUPERHEAT MEASUREMENTS. DEPENDING ON THE WAY IN WHICH THE EXPERIMENT IS CONDUCTED, THERE CAN BE AN APPARENT EFFECT OF INCREASING SUPERHEAT AS THE HEAT FLUX OR TEMPERRATURE RAMP IS INCREASED, OR DECREASING SUPERHEAT AS THE FLOW VELOCITY IS INCREASED.

SUPERHEAT + METAL, LIQUID + BUBBLE NUCLEATION + HEAT TRANSFER, CONVECTION + BUBBLE + FLOW

5-104913 DATED 1975
ZIVI SM + EPSTEIN M + WRIGHT RW
AN IN-PILE STUDY OF THERMAL INTERACTIONS BETWEEN HIGH-ENERGY MOLTEN UO2 FUEL AND LIQUID SODIUM
ARGONNE NATIONAL LABORATORY, ILLINOIS
11 PPS, 9 FIGS, 20 REFS, NUCLEAR SCIENCE & ENGINEERING, 56(3), PP. 229-40 (MARCH 1975)

TWO IN-PILE TRANSIENT EXPERIMENTS WERE PERFORMED IN THE TREAT REACTOR FACILITY TO INVESTIGATE FUEL-COOLANT INTERACTION PHENOMENA THAT MIGHT OCCUR IN A HYPOTHETICAL PROMPT-BURST DISASSEMBLY ACCIDENT INVOLVING EXTENSIVE FUEL VAPORIZATION IN A NEARLY UNVOIDED LIQUID-METAL FAST BREEDER REACTOR CORE. IN THESE TESTS, A SINGLE FUEL PIN CONTAINING 28 G OF UO2 WAS SUBJECTED TO A SELF-LIMITED 23-MSEC-PERIOD TREAT POWER EXCURSION WHICH DEPOSITED FISSION ENERGY OF 1700 CAL/G OF UO2 IN THE FUEL. RESULTS OF THESE TESTS INDICATED THAT NO ENERGETIC FUEL-COOLANT INTERACTION WAS PRODUCED AND THAT THE MEASURED TRANSIENT PRESSURES CAN BE REASONABLY DESCRIBED BY THE TIME HISTORY OF THE FUEL VAPOR PRESSURE.

ACCIDENT + TREAT (PRR) + VAPOR PRESSURE + EXCURSION, LARGE + IN PILE EXPERIMENT + URANIUM DIOXIDE + FUEL COOLANT INTERACTION + FUEL ELEMENTS

5-105003 ALSO IN CATEGORY 17 DATED 1975

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105003 *CONTINUED*
ZWAHR H
STEAM TURBINES FOR NUCLEAR POWER PLANTS
TECHNISCHE UNIVERSITAT HANNOVER, GERMANY
9 PPS, 11 FIGS, 14 REFS, KERNTECHNIK, 17(3), PP. 119-27 (MARCH 1975)

THE BASIC THERMODYNAMIC SCHEMATA OF THE STEAM CYCLE OF VARIOUS NUCLEAR POWER PLANT TYPES ARE GIVEN AND DISCUSSED. THE SATURATED OR WET STEAM TURBINES USED WITH LIGHT WATER REACTORS ARE DISCUSSED IN DETAIL. IN PROSPECT, UNIT RATINGS OF THE ORDER OF 2000 MW MAY BE EXPECTED IN ABOUT 1985. A PROBABLE DEVELOPMENT IN THE FIELD OF GAS-COOLED HIGH TEMP. REACTORS IS THE TRANSITION FROM THE INDIRECT TO THE DIRECT CYCLE IN WHICH THE FUNCTION OF THE STEAM TURBINES WILL BE TAKEN OVER BY GAS TURBINES.

REACTOR, BWR + REACTOR, PWR + *STEAM + THERMODYNAMICS + GERMANY + REACTOR, LWR + REACTOR, HTGR + *TURBINE + POWER PLANT, NUCLEAR

5-105016 DATED 1974
NISHIHARA H
TRIANGULATION OF LOCAL COOLANT BOILING BY CROSS-CORRELATING ACOUSTIC NOISE SIGNALS
KYOTO UNIVERSITY, JAPAN
11 PPS, 13 FIGS, 15 REFS, NUCLEAR TECHNOLOGY, 23(3), PP. 222-32 (SEPT. 1974)

THE CHARACTERISTICS OF THE CROSS-CORRELATION FUNCTIONS OF ACOUSTIC BOILING NOISE WERE INVESTIGATED EXPERIMENTALLY. A PAIR OF HYDROPHONES DETECTED LOCAL BOILING OF WATER IN A CONTAINER TANK. THE NUCLEATE LOCAL BOILING WAS GENERATED IN THE TANK BY ELECTRICALLY HEATING A SMALL SEGMENT OF SIMULATED FUEL ROD. MEASUREMENTS WERE TAKEN IN PURE WATER AS WELL AS IN A HETEROGENEOUS MEDIUM WITH SIMULATED ROD BUNDLES.

MEASUREMENT, NOISE + NUCLEATE BOILING + FLOW BLOCKAGE + BOILING + ACOUSTICS + LABORATORY EXPERIMENT

5-105018 DATED 1974
WHITTINGHAM AC
LIQUID SODIUM-HYDROGEN SYSTEM: EQUILIBRIUM AND KINETIC MEASUREMENTS IN THE 610-677 K TEMPERATURE RANGE
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
RD/B/N-2550 +. 47 PPS, 23 FIGS, AUG. 1974

DEALS WITH THE DETECTION OF SODIUM-WATER LEAKS IN THE SECONDARY HEAT EXCHANGERS OF AN LMFBR BY MEASURING THE HYDROGEN PRODUCED BY THE SODIUM-WATER REACTION. MEASUREMENTS WERE MADE IN AN ISOTHERMAL, CONSTANT VOLUME STAINLESS STEEL CONTAINER. THE TECHNIQUE CONSISTED OF MEASURING MANOMETRICALLY THE ABSORPTION OF KNOWN AMOUNTS OF HYDROGEN TO EQUILIBRIUM BY A VIGOROUSLY STIRRED EXCESS OF LOW OXYGEN SODIUM IN THE TEMPERATURE RANGE 610-677 K.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDROGEN + WATER + CHEMICAL EQUILIBRIUM + ABSORPTION + TEST, LEAK + HEAT EXCHANGERS

5-105021 DATED 1975
FONTANA MH + THOMAS DG + KRESS TS + WANTLAND JL
THERMAL-HYDRAULIC EFFECTS OF PARTIAL BLOCKAGES IN SIMULATED LMFBR FUEL ASSEMBLIES WITH APPLICATIONS TO CRBR
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4779 +. 65 PPS, 39 FIGS, 19 REFS, JULY 1975

SUPPLEMENTS AN EARLIER ORNL REPORT THAT SUMMARIZED EXPERIMENTAL RESULTS ON THE EFFECTS OF BLOCKAGES IN ROD BUNDLES. REVIEWS ADDITIONAL DATA ON 14-SUBCHANNEL EDGE BLOCKAGES AGAINST THE DUCT WALL IN THE HEATED ZONES OF SODIUM-COOLED SIMULATED FUEL ASSEMBLIES TESTED IN THE FUEL FAILURE MOCKUP. GENERALIZATIONS OBTAINED FROM SEVERAL EXPERIMENTS WITH DIFFERENT BLOCKAGES IN THE FFM WATER MOCKUP ARE PRESENTED. ESTIMATES THE EFFECTS OF PARTIAL BLOCKAGES IN THE FUEL, RADIAL BLANKET, AND CONTROL ASSEMBLIES OF THE CLINCH RIVER BREEDER REACTOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

THERMAL EXPERIMENT + FLOW BLOCKAGE + SIMULATION + FUEL ELEMENT CLUSTER + CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + BLANKET

5-105074 DATED 1973
CATTON I + EROMANN RC
POST-ACCIDENT CORE RETENTION FOR LMFBR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7343 +. 215 PPS, 11 TABS, 66 FIGS, 140 REFS, JULY 1973

THE SUCCEEDING SECTIONS OF THIS REPORT SUMMARIZE THE EFFORTS OF THE UCLA GROUP DURING FISCAL YEAR 1973 IN THE FOLLOWING AREAS: (A) DESIGN REVIEW AND ANALYSIS OF PROPOSED POST-ACCIDENT CORE RETENTION SYSTEMS. (B) REVIEW OF EXPERIMENTS AND PREPARATION OF DATA FILE. (C) EXAMINATION OF RETENTION PHENOMENA AND APPLICATION TO CORE RETENTION DESIGN. (D) RECRITICALITY CONSIDERATIONS. (E) SUMMARY AND CONCLUSIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105074 *CONTINUED*
*DECAY HEAT + *HEAT TRANSFER + *MOLTEN FUEL + *ACCIDENT, HYPOTHETICAL + *FISSION PRODUCT RETENTION + *PROPERTY, PHYSICAL + *RETENTION + *FUEL COOLANT INTERACTION + *ACCIDENT, CORE DISRUPTIVE

5-105116 ALSO IN CATEGORY 11 DATED 1975
CHANG YW + GVILDYS J
REXCO-HEP: A TWO DIMENSIONAL COMPUTER CODE FOR CALCULATING THE PRIMARY SYSTEM RESPONSE IN FAST REACTORS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-19 +. 120 PPS, 2 TABS, 57 FIGS, 24 REFS, JUNE 1975

THIS REPORT DESCRIBES THE HYDRODYNAMIC-ELASTIC-PLASTIC VERSION OF THE REXCO CODE (REXCO-HEP, RELEASE 2), WHICH TREATS NOT ONLY THE HYDRODYNAMICS, BUT ALSO THE ELASTIC AND PLASTIC DEFORMATION OF THE REACTOR MATERIALS. THE BASIC EQUATIONS AND NUMERICAL TECHNIQUES USED IN THE REXCO-HEP CODE ARE DESCRIBED IN DETAIL, TOGETHER WITH THE ASSUMPTIONS AND LIMITATIONS OF THE MATHEMATICAL MODEL USED IN THE ANALYSIS. THE RESULTS OF COMPARISON OF THE CODE PREDICTIONS WITH ANALYTICAL SOLUTIONS AND EXISTING EXPERIMENTAL EXCURSION DATA ARE ALSO GIVEN. INPUT INSTRUCTIONS AND OUTPUT OPTIONS OF THE COMPUTER PROGRAM ARE INCLUDED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + *ANALYTICAL MODEL + ELASTICITY + HYDRODYNAMIC ANALYSIS + PLASTICITY + PRESSURE PULSE + STRUCTURAL ANALYSIS, DYNAMIC

5-105123 DATED 1973
ABE Y + NAITA M + UEDA S
HEAT TRANSFER TESTS ON INTERMEDIATE HEAT EXCHANGER MODEL FOR LMFBR
MITSUBISHI HEAVY INDUSTRIES LTD., JAPAN
9 PPS, MITSUBISHI JUKO GIHO, 10(2), PP. 175-83 (MARCH 1973) (IN JAPANESE)

TWO SODIUM TEST LOOPS WERE CONSTRUCTED IN KOBE TECHNICAL INSTITUTE. ONE IS THE SHINMEI SODIUM LOOP (KL-1) WHICH HAS BEEN USED TO DEVELOP COMPONENTS. THE OTHER IS THE MASS TRANSFER TEST LOOP (KL-2) FOR MASS TRANSFER STUDY. THE DETAILS OF KK-1 LOOP ARE PRESENTED. EXPERIMENTAL TESTS ON HEAT TRANSFER IN THE IHX OF THE SHINMEI SODIUM LOOP WERE PERFORMED. THE DESIGN OF THE IHX IS CROSS FLOW TYPE WITH SEMI-CIRCULAR BAFFLES AND FLOATING HEAD. TEST RESULTS INDICATED THAT THE APPLICATION OF THE LUBARSKY-KAUFMAN'S EQUATION TO THE TUBE SIDE HEAT TRANSFER AND THE MODIFIED DONOHUE'S EQUATION TO THE SHELL SIDE HEAT TRANSFER WAS SATISFACTORY AT DESIGN CONDITIONS.

OUT OF PILE EXPERIMENT + HEAT TRANSFER EXPERIMENT + MASS TRANSFER + HEAT EXCHANGERS

5-105153 DATED 1975
VAN ERP JB + CHAWLA TC + WILSON RE + FAUSKE HK
PIN-TO-PIN FAILURE PROPAGATION IN LIQUID-METAL-COOLED FAST BREEDER REACTOR FUEL SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
17 PPS, 8 FIGS, 98 REFS, NUCLEAR SAFETY, 16(3), PP. 291-307 (MAY-JUNE 1975)

THIS ARTICLE IS A REVIEW OF RECENT EXPERIMENTAL AND ANALYTICAL WORK PERFORMED WITH THE OBJECTIVE OF EVALUATING THE POTENTIAL FOR PIN-TO-PIN FAILURE PROPAGATION WITHIN FUEL SUBASSEMBLIES OF LIQUID-METAL-COOLED FAST BREEDER REACTORS (LMFBRS) OF CURRENT DESIGN. IT IS CONCLUDED THAT (1) *PIN-TO-PIN FUEL-FAILURE PROPAGATION FOR CURRENT LMFBR DESIGNS IS UNLIKELY*, AND (2) IF FAILURE PROPAGATION OCCURS AT ALL, IT WILL BE SELF-LIMITING OR ITS PROGRESSION WILL BE SLOW, THUS ALLOWING AMPLE TIME FOR DETECTION AND CORRECTIVE ACTION IF APPROPRIATE INSTRUMENT SYSTEMS ARE PROVIDED.

FAILURE, FUEL ELEMENT + PLUTONIUM OXIDE + FAILURE, CLADDING + FLOW BLOCKAGE + FUEL ELEMENT CLUSTER

5-105154 DATED 1975
HAAS PM + ERDMAN CA + GARNER PL
NONCOHERENCE AND TWO-PHASE HEAT TRANSFER IN LMFBR FUEL-COOLANT INTERACTION
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE
19 PPS, 5 TABS, 10 FIGS, 28 REFS, NUCLEAR TECHNOLOGY, 26(2), PP. 146-64 (JUNE 1975)

MODELS WERE DEVELOPED FOR THE ANALYSIS OF NONCOHERENT MIXING OF FUEL AND SODIUM, REDUCTION IN TWO-PHASE HEAT TRANSFER BETWEEN FUEL AND SODIUM, AND HEAT LOSS FROM SODIUM TO CLADDING DURING A FUEL-COOLANT INTERACTION IN A LIQUID-METAL FAST BREEDER REACTOR (LMFBR). THE ANALYSIS IS BASED ON THE SUPPOSITION THAT FRAGMENTATION OF MOLTEN FUEL FOLLOWED BY ITS RELATIVELY RAPID INTIMATE MIXING WITH SODIUM CAN OCCUR IN AN LMFBR ACCIDENT, A SUPPOSITION STILL UNDER WIDESPREAD INVESTIGATION. CALCULATIONS WERE MADE FOR WHOLE-CORE ACCIDENTS TO EVALUATE THE EXTENT TO WHICH REDUCTIONS IN MECHANICAL WORK MIGHT BE EXPECTED FROM THESE PHENOMENA.

ACCIDENT ANALYSIS + FUEL MELTDOWN + HEAT TRANSFER ANALYSIS + HEAT TRANSFER, TWO PHASE + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

5-105573 ALSO IN CATEGORY 18 DATED 1975
JOHNSON HG
SIMULATION OF COOLANT TRANSPORT AND HEAT EXCHANGE IN PIPE RUNS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105573 *CONTINUED*
HEDL-TME 75-39 +. 98 PPS, 32 FIGS, 5 REFS, MAY 1975

PIPE RUNS FOR SODIUM COOLANT SYSTEMS ARE SATISFACTORILY SIMULATED BY SIMPLIFIED MODELS WITH NO MORE THAN 24 AXIAL BY RADIAL NODES, CONSISTING OF COOLANT, PIPE WALL AND AMBIENT NODAL POINTS. HEAT LOSSES FROM THE INSULATED PIPE TO ITS SURROUNDINGS ARE INCLUDED BY A CONSTANT HEAT TRANSFER RESISTANCE FROM THE PIPE'S OUTSIDE SURFACE TO THE AMBIENT. THE BEST ACCURACY FOR SIMPLIFIED MODELS IS OBTAINED BY SIMULATING THE DELTA T/DELTA K DERIVATIVE BY THREE-POINT DIFFERENCE APPROXIMATIONS. AN EXPLICIT NUMERICAL INTEGRATION METHOD IS USED WITH THESE SIMPLIFIED MODELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *ANALYTICAL MODEL + *HEAT TRANSFER ANALYSIS + SIMULATION + R AND D PROGRAM + *COOLING

5-105577 ALSO IN CATEGORY 18 DATED 1974
SODIUM TECHNOLOGY
POWER REACTOR & NUCLEAR FUEL DEVELOPMENT CORP., TOKYO
JAPFNR-186 +. 107 PPS, 11 TABS, 35 FIGS, OCT. 1974

DESCRIBES THE STATUS, PROBLEMS, AND PLANS FOR FUTURE R AND D SODIUM TECHNOLOGY. TOPICS DISCUSSED INCLUDE PHYSICAL PROPERTIES OF SODIUM, FLOW AND HEAT TRANSFER, CHEMICAL ANALYSIS, PURITY CONTROL, INSTRUMENTATION, AND A LIST OF SODIUM TEST LOOPS IN THE WORLD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER + *CHEMICAL ANALYSIS + COOLANT CHEMISTRY + JAPAN + PROPERTY, PHYSICAL + REVIEW + R AND D PROGRAM

5-105592 ALSO IN CATEGORY 18 DATED 1975
WARD JT
GAMMA HEATING RATES IN FTR EUROPIA CONTROL ASSEMBLIES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-35 +. 61 PPS, 11 TABS, 5 FIGS, MAY 1975

GAMMA HEATING RATES WERE CALCULATED FOR SEVERAL MATERIALS IN PROPOSED FAST TEST REACTOR (FTR) EUROPIA ABSORBER ASSEMBLIES. THE THREE-DIMENSIONAL FTR ANALYSIS FOUND GAMMA HEATING TO PEAK AT 12.8 WATTS/GM OF EUROPIA NEAR THE TIP OF A HALF-INSERTED ROW 5 CONTROL ROD. EXPERIMENTAL VERIFICATION WAS OBTAINED. SPATIALLY LOCALIZED HEATING GRADIENTS IN THE VICINITY OF A SINGLE ABSORBER ASSEMBLY WERE FOUND TO BE UNIMPORTANT IN AFFECTING PEAK HEATING RATES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

GAMMA + HEAT GENERATION, INTERNAL + EUROPIUM + *THERMAL HYDRAULIC ANALYSIS + *CONTROL RODS + *FTR (TR)

5-105631 ALSO IN CATEGORIES 11 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 916 PAGES, AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING NEW FLOW DIAGRAMS, INDUSTRIAL SECURITY, MISSILE PROTECTION, REACTOR VESSEL DESIGN., TRANSIENT EFFECTS, RADWASTE SYSTEMS, AND AIRBORNE RADIOACTIVITY MONITORING. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING THE SAME SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + MISSILE GENERATION AND PROTECTION + WASTE TREATMENT + MONITORING SYSTEM, RADIATION + *REPORT, PSAR + TRANSIENT + SECURITY + *CLINCH RIVER (LMFBR) + PRESSURE VESSELS

5-105632 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.2 - APPENDIX D AS PART OF REFERENCE DESIGN
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.2-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

APPENDIX D IS CONSIDERED PART OF THE REFERENCE DESIGN SUBMITTAL. THE PSAR DISCUSSES THE DERIVATION OF THE DYNAMIC MECHANICAL LOADING REQUIREMENTS, WHICH FORM PART OF THE THIRD LEVEL DESIGN. THE THIRD LEVEL MARGIN REQUIREMENTS WERE BASED ON FFTF EXPERIENCE AND A MEASURE OF ENGINEERING JUDGEMENT, REPRESENTING AN ENERGY RELEASE OF APPROXIMATELY 300 MWSEC. AT THE TIME OF THEIR SELECTION, THE CRBRP HCDA ANALYSES WERE IN A VERY PRELIMINARY STAGE AND WERE NOT UTILIZED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *DESIGN CRITERIA + RELEASE RATE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *ACCIDENT, CORE DISRUPTIVE

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105655 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.129 - MAINTAINING CIRCULATION WITH NATURAL CONVECTION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.129-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE PLANT TRANSIENT COMPUTER PROGRAM DEMO IS USED TO CALCULATE THE NATURAL CIRCULATION FLOW RATES. THE IHX MODEL PROGRAM IS HIGHLY NODALIZED (45 NODES IN THE DIRECTION OF FLOW PATH ON EACH SIDE). HEAT TRANSFER IS INDIVIDUALLY CALCULATED AT EACH NODE. AS A RESULT, SHIFTS IN THERMAL CENTER ELEVATION ARE INHERENTLY CALCULATED BY THIS MODEL. CONSEQUENTLY, THE TRANSIENT RESULTS PRESENTED INCLUDE CHANGES IN COOLANT CIRCULATION DUE TO THE SHIFT OF THE THERMAL CENTER.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CIRCULATION. NATURAL + ANALYTICAL MODEL + *HEAT TRANSFER. NATURAL CONVECTION + *FLOW DISTRIBUTION + RESPONSE TO NRC QUESTION + FLOW + CLINCH RIVER (LMFBR)

5-105671 ALSO IN CATEGORIES 12 AND 18 DATED 1975
RESPONSE TO QUESTION 20.19 - DECAY HEAT REMOVAL SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q020.19-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE STEAM GENERATOR AUXILIARY HEAT REMOVAL SYSTEM PROVIDES PRIMARY HEAT REMOVAL FOR THE REACTOR DECAY HEAT. THE OVERFLOW HEAT REMOVAL SYSTEM PROVIDES BACKUP FOR THE SGAHRS AS A SECONDARY MEANS FOR THE REACTOR DECAY HEAT REMOVAL. THE 100% REDUNDANT EX-VESSEL STORAGE TANK COOLING SYSTEM (EVS) PROVIDES SPENT FUEL DECAY HEAT REMOVAL SERVICE. ALL THREE SYSTEMS USE THE ATMOSPHERE AS AN ULTIMATE HEAT SINK. THE EMERGENCY PLANT SERVICE WATER SYSTEM WITH THE EMERGENCY COOLING TOWERS PROVIDES AUXILIARY HEAT REMOVAL TO SUPPORT THE OPERATION OF THE ABOVE SYSTEMS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DECAY HEAT + FUEL STORAGE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + COOLING + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

5-105660 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.10 - EFFECT OF THERMAL LINER BY-PASS COOLANT FLOW
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q120.10-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE MIXING OF COOLER BY-PASS FLOW AT A TEMPERATURE BETWEEN 800 AND 900 F WITH THE OUTLET PLENUM COOLANT AT 1050 F AT THE TOP OF THE VESSEL LINER HAS BEEN RECOGNIZED AS A POTENTIAL FOR HIGH CYCLE FATIGUE ON THE LINER INNER SURFACE. THE BASELINE DESIGN UTILIZES A WEIR BOX ARRANGEMENT AT THE TOP OF THE LINER WHICH WOULD PROVIDE AN INTERMEDIATE TEMPERATURE MIXING REGION THAT WOULD MITIGATE THE MIXING/FATIGUE PROBLEM BUT NOT IN ITSELF TOTALLY RESOLVE THE PROBLEM.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

STRESS + RESPONSE TO NRC QUESTION + *THERMAL SHIELD + *FLOW. MIXING + COOLING + TEMPERATURE + CLINCH RIVER (LMFBR)

5-105695 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 310.17 - CONTAINMENT BUILDING COOLERS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 4 PAGES. PP. Q310.17-1 THRU Q310.17-4 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

INDICATES THE LOCATION OF THE COOLERS WITHIN THE PRIMARY CONTAINMENT AND THE TOTAL QUANTITY OF THIS FLUID WITHIN THE COOLING UNITS IN THIS AREA. EVALUATES THE EFFECTS OF A DOWTHERM J FIRE ON THE GASKETING MATERIAL USED ON THESE VALVES AND OTHER SEALED OPENINGS SUCH AS PERSONNEL AND EQUIPMENT HATCHES.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

ACCIDENT ANALYSIS + CONTAINMENT + *FIRE + BUILDING + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + *COOLING + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

5-105741 ALSO IN CATEGORIES 6 AND 11 AND 18 DATED 1974
KASTENBERG WE
TRANSIENT ANALYSIS OF LMFBR OXIDE FUEL ELEMENTS DURING ACCIDENTS. FINAL REPORT FOR THE PERIOD 1 JULY 1973-30 JUNE 1974
UNIVERSITY OF CALIFORNIA. LOS ANGELES
UCLA-ENG-7468 +. 136 PPS. 68 FIGS. 137 REFS. AUG. 1974

REPORTS ON A STUDY OF THE MODE OF FAILURE FOR LMFBR OXIDE FUEL PINS DURING AN OVERPOWER TRANSIENT AND THE IMPLICATIONS ON THE COURSE OF AN UNPROTECTED OVERPOWER TRANSIENT ACCIDENT. SECTION 2 IS DEVOTED TO FAILURE MECHANISM; SECTION 3 ADDRESSES LOCATION AND MODE OF FAILURE; AND SECTION 4

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105741 *CONTINUED*
CONTAINS A SUMMARY AND THE MAJOR CONCLUSIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + FUEL ROD + FAILURE MODE ANALYSIS + *TRANSIENT

5-105743 ALSO IN CATEGORY 18 DATED 1975
KNAPP RB
THERMAL STRESS INITIATED FRACTURE AS A FRAGMENTATION MECHANISM IN THE UO2-SODIUM FUEL-COOLANT INTERACTION
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
TID-26827 +. 201 PPS, 59 FIGS, 134 REFS, MAY 1975

AN ANALYTIC STUDY WAS CARRIED OUT TO DETERMINE THE APPLICABILITY OF THE CONCEPT OF THERMAL STRESS FRAGMENTATION TO THE UO2/SODIUM FUEL-COOLANT INTERACTION. MAJOR EMPHASIS WAS PUT ON THE FRACTURE MECHANICS APPROACH TO ASSESSING WHETHER OR NOT THE SOLIDIFYING UO2 WOULD FRACTURE UNDER THE THERMALLY INDUCED STRESSES. IT WAS FOUND THAT THE STRESS LEVELS WERE SUFFICIENT TO GENERATING K(SUB I) VALUES SUBSTANTIALLY IN EXCESS OF THE UO2 FRACTURE TOUGHNESS, K(SUB IC). THUS, RAPID INSTANTANEOUS PROPAGATION OF INHERENT FLAWS IS ANTICIPATED. PARAMETRIC STUDIES IN WHICH THE SURFACE HEAT TRANSFER BOUNDARY CONDITION WAS VARIED DID NOT ALTER THIS CONCLUSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STRESS + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + FRACTURE TOUGHNESS + *FUEL COOLANT INTERACTION

5-105757 ALSO IN CATEGORIES 6 AND 8 AND 11 A DATED 1975
A COMPENDIUM OF COMPUTER CODES FOR THE SAFETY ANALYSES OF LMFBR'S
U.S. ERDA, WASHINGTON
ERDA-31 +. 189 PPS, JUNE 1975

AN ALPHABETICAL LIST OF 55 COMPUTER CODES. GIVES A BRIEF STATEMENT OF THE PROBLEM SOLVED, THE STATUS OF THE CODE, THE MODEL DESCRIPTION, LIMITATIONS, FUTURE EFFORTS TO IMPROVE THE CODE, INTERFACES WITH OTHER CODES AND REFERENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CONTAINMENT + FISSION GAS RELEASE + FUEL MELTDOWN + ACCIDENT, LOSS OF COOLANT + *SAFETY ANALYSIS + PRESSURE PULSE + PRESSURE TRANSIENT + STRUCTURAL ANALYSIS, DYNAMIC + *THERMAL TRANSIENT + COMPARTMENT + FUEL SWELLING + THERMAL HYDRAULIC ANALYSIS + PIPES AND PIPE FITTINGS

5-105769 ALSO IN CATEGORY 18 DATED 1975
DEVERALL JE + KEDDY ES + KEMME JE + PHILLIPS JR
GRAVITY - ASSIST HEAT PIPES FOR THERMAL CONTROL SYSTEMS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5989-MS +. 15 PPS, 17 FIGS, 12 REFS, JUNE 1975

INVESTIGATIONS WERE MADE OF NEW WICK STRUCTURES FOR POTASSIUM HEAT PIPES TO OPERATE AT LOWER TEMPERATURES AND HIGHER HEAT TRANSFER RATES, AND A HELICAL TROUGH WICK STRUCTURE WAS DEVELOPED WITH AN IMPROVED HEAT TRANSFER CAPABILITY IN THE TEMPERATURE RANGE OF INTEREST. TEST RESULTS OF THESE HEAT PIPES LED TO THE STUDY OF A NEW HEAT PIPE LIMIT WHICH HAD NOT PREVIOUSLY BEEN CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MATERIAL + IRRADIATION TESTING + SYSTEM DESCRIPTION + R AND D PROGRAM + *HEAT PIPE

5-105774 ALSO IN CATEGORY 18 DATED 1974
WALTAR AE + PARTAIN WL + KOLESAR EC + SHIELDS RJ
MELT III - A NEUTRONICS, THERMAL-HYDRAULICS COMPUTER PROGRAM FOR FAST REACTOR SAFETY ANALYSIS - VOLUME I
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-47 (VOL. I) +. 480 PAGES, 60 FIG, 22 REF, DEC. 1974

A CODE FOR INVESTIGATING THE TRANSIENT BEHAVIOR OF A FAST REACTOR DURING POSTULATED ACCIDENT CONDITIONS. REACTIVITY FEEDBACK RESULTING FROM DOPPLER BROADENING, COOLING DENSITY CHANGE AND EXPANSION, AND FUEL MOVEMENT ARE EXPLICITLY TAKEN INTO ACCOUNT. ALTHOUGH A WIDE VARIETY OF ACCIDENT CONDITIONS MAY BE INVESTIGATED, PARTICULAR MODELING EMPHASIS HAS BEEN PLACED ON THE SIMULATION CAPABILITIES FOR AN UNPROTECTED TRANSIENT OVERPOWER ACCIDENT SEQUENCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + DOPPLER EFFECT + *FAILURE, FUEL ELEMENT + MOLTEN FUEL + *SAFETY ANALYSIS + VOID + TRANSIENT + FUEL COOLANT INTERACTION + THERMAL HYDRAULIC ANALYSIS

5-105786 ALSO IN CATEGORIES 7 AND 18 DATED 1975
KERRISK JF
PINTEMP: A COMPUTER PROGRAM FOR FUEL ELEMENT DESIGN CALCULATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105786 *CONTINUED*
LA-5868-MS +. 26 PPS. 2 TABS. 19 REFS. FEB. 1975

PINTEMP PERFORMS DESIGN CALCULATIONS FOR FUEL ELEMENTS IN THE EBR-II REACTOR. THE PROGRAM CALCULATES FUEL ELEMENT AND SODIUM COOLANT TEMPERATURES, THERMAL STRESSES IN THE CLAD AND FISSION GAS GENERATED IN THE FUEL DURING STEADY STATE IRRADIATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + EBR 1 AND 2 (RE) + FISSION GAS RELEASE + KRYPTON + STRESS + THERMAL MECHANICAL EFFECT + XENON + ARGON + TEMPERATURE + *FUEL ELEMENTS

5-105884 ALSO IN CATEGORIES 9 AND 18 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM. RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL. FIRST QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14045-1 +. 14 PPS. 5 FIGS. 3 REFS. MARCH 1975

THE OBJECTIVES OF THE LMFBR SHUTDOWN HEAT REMOVAL (SHR) RELIABILITY PROGRAM ARE TO ASSESS ANALYTICALLY AND EMPIRICALLY THE RELIABILITY OF HEAT REMOVAL SYSTEMS TO REMOVE HEAT FROM THE REACTOR AFTER SCRAM OR NORMAL SHUTDOWN AND TO PROVIDE TECHNOLOGY FOR ASSURING THAT RELIABILITY OBJECTIVES ARE ACHIEVED. THIS REPORT OUTLINES LMFBR SHR RELIABILITY PROGRAM ACTIVITIES AND RESULTS OF THOSE ACTIVITIES FROM JULY 1974 THROUGH FEBRUARY 1975. THE MAJORITY OF EFFORT TO DATE HAS BEEN CONCENTRATED ON INITIATING AND IMPLEMENTING RELIABILITY TASKS FOR THE CLINCH RIVER BREEDER REACTOR PLANT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + RELIABILITY ANALYSIS + *RELIABILITY, SYSTEM + *SHUTDOWN COOLING SYSTEM + CLINCH RIVER (LMFBR)

5-105982 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.28 - LOSS OF HEAT REMOVAL SYSTEM TO HEAD ACCESS AREA
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.28-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE LOSS OF THE HEAT REMOVAL SYSTEM FOR THE HEAD ACCESS AREA WOULD RESULT IN A NATURAL CONVECTIVE AIR FLOW THAT WOULD TRANSFER HEAT TO THE REACTOR CONTAINMENT BUILDING ATMOSPHERE. IN THE WORST CASE (LOSS OF OFF-SITE POWER AND POWER TO THE HEAD ACCESS AREA COOLING SYSTEM) THE RCB ATMOSPHERE IS EXPECTED TO RISE TO A MAXIMUM OF 120 F FROM ITS NORMAL TEMPERATURE OF 80 TO 85 F. THIS WOULD RESULT IN A TEMPERATURE RISE OF THE COMPONENTS WITHIN THE HEAD ACCESS AREA WHICH WILL NOT EXCEED 40 F.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + CONTAINMENT + HEAT TRANSFER + *ACCIDENT, LOSS OF POWER + RESPONSE TO NRC QUESTION + *COOLING + COMPARTMENT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

5-105992 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.188 - DESIGN BASIS FOR EVST COOLING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.188-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN BASIS DECAY HEAT LOADS FOR THE EVST AND ITS COOLING SYSTEM, GIVEN IN SECTION 9.1.3.1.1 (1103 KW AND 1332 KW), ARE RELATED TO THE TYPE AND NUMBER OF ASSEMBLIES, THEIR OPERATING AND DECAY TIMES, AND POWER LEVELS, AND THEIR BURNUP AS SHOWN IN TABLE Q001.188-7. THESE CALCULATIONS WERE PERFORMED AT AN EARLY TIME IN THE CRBRP PROGRAM AND CONTAIN DESIGN MARGINS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DECAY HEAT + DESIGN CRITERIA + FUEL STORAGE + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *COOLING + CLINCH RIVER (LMFBR)

5-105993 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.189 - FHC SPENT FUEL STORAGE TANK COOLING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.189-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN BASIS DECAY LOADS FOR THE FHC SPENT FUEL STORAGE TANK AND ITS COOLING SYSTEM, GIVEN IN SECTION 9.1.3.2.1 (51 KW AND 36 KW) ARE RELATED TO THE TYPE AND NUMBER OF ASSEMBLIES AND DECAY POWER LEVELS AS SHOWN IN TABLE Q001.189-1. THESE DESIGN CONDITIONS CONTAIN CONSERVATIVE DESIGN MARGINS AND CAN ACCOMMODATE FUTURE CHANGES IN THE REFUELING SCHEMES AND FUEL MANAGEMENT. AN EXPLANATION OF THE DESIGN HEAT LOADS IS GIVEN.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-105993 *CONTINUED*
DECAY HEAT + DESIGN CRITERIA + FUEL STORAGE + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *COOLING + CLINCH RIVER (LMFBR)

5-106094 ALSO IN CATEGORY 9 DATED 1975
SRIGHT SA + ALBRECHT RW + EDELMANN MF
CROSS CORRELATION OF NEUTRONIC AND ACOUSTIC NOISE SIGNALS FROM LOCAL BOILING
GESELLSCHAFT FUR KERNFORSCHUNG MBH, F.R. GERMANY
12 PPS, 11 FIGS, 9 REFS, ANNALS OF NUCL. ENERGY, 2(2-5), PP. 367-78 (JUNE 1975)

A BOILING SIMULATOR WAS CONSTRUCTED TO MODEL THE VOID AND PRESSURE EFFECTS OF LOCAL BOILING IN AN LMFBR. BY FORCING SUPERHEATED STEAM INTO SUBCOOLED WATER THE BOILING SIMULATOR PRODUCED A SERIES OF SINGLE BUBBLES SEPARATED BY WAITING TIMES. THE BOILING SIMULATOR WAS PLACED IN THE CORE OF A ZERO POWER REACTOR (GFC, ARK), AND THE NEUTRON AND PRESSURE SIGNALS WERE RECORDED AND CROSS CORRELATED. THE NEUTRON-PRESSURE CROSS CORRELATION EXHIBITED AN ALMOST PERFECT CORRELATION AT THE BUBBLE REPETITION FREQUENCY (7 HZ).

*NOISE ANALYSIS + CORRELATION + NEUTRON + SIMULATION + *BOILING + ACOUSTICS + COMPARISON

5-106099 ALSO IN CATEGORY 9 DATED 1975
FRY DN
TEMPERATURE NOISE MEASUREMENTS IN BLOCKED AND UNBLOCKED 19-PIN ELECTRICALLY HEATED LMFBR FUEL SUBASSEMBLY MOCKUPS
OAK RIDGE NATIONAL LABORATORY, TENN.
2 PPS, 1 FIG, 3 REFS, ANNALS OF NUCL. ENERGY, 2(2-5), PP. 233-34 (JUNE 1975)

SODIUM TEMPERATURE NOISE WAS MEASURED AT THE EXIT OF A SIMULATED FAST REACTOR FUEL SUBASSEMBLY TO DETERMINE THE FEASIBILITY OF USING TEMPERATURE NOISE MONITORS TO DETECT FLOW BLOCKAGES IN FAST REACTORS, A MATTER OF EVER-INCREASING CONCERN IN THE LMFBR PROGRAM. NOISE FROM BOTH BLOCKED AND UNBLOCKED TEST BUNDLES WAS CHARACTERIZED USING VARIOUS NOISE SIGNAL DESCRIPTORS SUCH AS POWER SPECTRAL DENSITY, CROSS SPECTRAL DENSITY, AMPLITUDE PROBABILITY DISTRIBUTION, AND ROOT MEAN SQUARE (RMS).

NOISE + *MEASUREMENT, TEMPERATURE + NOISE ANALYSIS + *MEASUREMENT, NOISE + SIMULATION + FUEL ELEMENT CLUSTER

5-106141 DATED 1975
FUJISHIRO T + SANOKAWA K + TORIKAI K
EXPERIMENTAL STUDY ON SODIUM POOL BOILING (MEASUREMENT OF SUPERHEAT AT BOILING INCIPIENCE AND HEAT TRANSFER)
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE, TOKAI-MURA
6 PPS, 14 FIGS, 12 REFS, BULLETIN OF THE JSME, 18(118), PP. 405-10 (APRIL 1975)

A PRECISE DETERMINATION OF BOTH SUPERHEATS AT BOILING INCIPIENCE AND BOILING HEAT TRANSFER OF LIQUID METALS IS REQUIRED FOR PRACTICAL ENGINEERING PROBLEMS. FOR THIS POINT OF VIEW, NUMEROUS EXPERIMENTS ON BOILING HEAT TRANSFER IN LIQUID METALS HAVE BEEN REPORTED SINCE MORE THAN TEN YEARS AGO. THERE EXISTS, HOWEVER, A LARGE SCATTER AMONG THESE EXPERIMENTAL DATA. THE MAIN PURPOSE OF THIS EXPERIMENT IS TO TRY TO FIND A DOMINANT FACTOR BY WHICH SO LARGE A SCATTER IS CAUSED.

COMPARISON, THEORY AND EXPERIENCE + SUPERHEAT + HEAT TRANSFER EXPERIMENT + POOL BOILING + HEAT TRANSFER COEFFICIENT

5-106145 DATED 1975
CHAWLA TC + HAUSER GM + GROLMES MA
RECOVERY OF COOLANT FLOW FOLLOWING RAPID RELEASE OF FISSION GAS FROM A POSTULATED MULTIPLE PIN FAILURE IN A LIQUID-METAL FAST BREEDER REACTOR SUBASSEMBLY
ARGONNE NATIONAL LABORATORY, ILLINOIS
12 PPS, 10 FIGS, 11 REFS, NUCL. SCIENCE & ENGINEERING, 58(1), PP. 21-32 (SEPT. 1975)

A PREVIOUS SINGLE BUBBLE MODEL DESCRIBING THE COOLANT MOTION WITHIN AN OXIDE FUEL SUBASSEMBLY OF AN LMFBR DUE TO RAPID GAS RELEASE FROM A MULTIPLE PIN FAILURE HAS BEEN EXTENDED TO INCLUDE THE DESCRIPTION OF COOLANT MOTION FOLLOWING THE RELEASE OF FISSION GAS INTO THE EXIT COOLANT PLENUM. THE MODEL FOLLOWS THE MOTION OF THE LOWER GAS-LIQUID INTERFACE; IT ASSUMES THAT THE MOTION OF THE LIQUID SURROUNDING THE EXPANDING BUBBLE CAN BE DESCRIBED BY POTENTIAL FLOW THEORY.

FISSION GAS RELEASE + FAILURE, FUEL ELEMENT + REACTOR COOLANT + ACCIDENT MODEL + FFTF (TR) + FLOW

5-106150 DATED 1974
CAMPOLUNGHY F + CUMO M + FERRARI G
BOILING HEAT TRANSFER IN LMFBR STEAM GENERATORS
CNEN, ROME, ITALY
RT/ING-74(17) +, 39 PPS, 7 REFS, JUNE 1974

LOOKS AT THE BEHAVIOR OF THE PRINCIPLE BOILING HEAT TRANSFER EQUATIONS WITH RESPECT TO THE THERMAL DESIGN OF STEAM GENERATORS, AND WITH PARTICULAR REFERENCE TO ONCE-THROUGH STEAM GENERATORS FOR LMFBR'S. THE EXPERIMENTS WERE CARRIED OUT IN A 4 Mw, STAINLESS STEEL LOOP, WHICH HAD A HEATED LENGTH OF 22 METERS. PRESSURE WAS VARIED FROM 60 TO 160 KG/CM SQ, AND SPECIFIC MASS FLOWRATE FROM 150 TO 250 GRAMS PER CM SQUARED PER SECOND.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-106150 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER, BOILING + CORRELATION + HEAT TRANSFER EXPERIMENT + PRESSURE DROP + STEAM GENERATOR + FLOW

5-106467 ALSO IN CATEGORY 18 DATED 1975
DUTT DS + BAKER RB +
SIEX - A CORRELATED CODE FOR THE PREDICTION OF LIQUID METAL FAST BREEDER REACTOR (LMFBR) FUEL THERMAL PERFORMANCE
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-55 +. 77 PPS, 21 FIGS, 24 REFS, JUNE 1975

THE SIEX COMPUTER PROGRAM IS A STEADY STATE HEAT TRANSFER CODE DEVELOPED TO PROVIDE THERMAL PERFORMANCE CALCULATIONS FOR A MIXED-OXIDE FUEL ELEMENT IN A FAST NEUTRON ENVIRONMENT. FUEL RESTRUCTURING, FUEL-CLADDING HEAT CONDUCTION AND FISSION GAS RELEASE ARE MODELED TO PROVIDE ASSESSMENT OF THE TEMPERATURES. MODELING EMPHASIS HAS BEEN PLACED ON CORRELATIONS TO MEASURABLE QUANTITIES FROM EBR-II IRRADIATION TESTS AND THE INCLUSION OF THESE CORRELATIONS IN A PHYSICALLY BASED COMPUTATIONAL SCHEME. SIEX IS COMPLETELY MODULAR IN CONSTRUCTION ALLOWING THE WEAR OPTIONS FOR MATERIAL PROPERTIES AND CORRELATED MODELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + HEAT TRANSFER + THERMAL ANALYSIS + HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ROD + *PERFORMANCE

5-106672 ALSO IN CATEGORIES 7 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., TENN.
400 PGS, LTR W/AMENDMENT 5 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, OCT. 6, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

AMENDS THE PRELIMINARY SAR BY SUBMITTING TWO APPENDICES, (E) PRIMARY PIPE RUPTURE FALLBACK POSITION AND (F) CORE DISRUPTIVE ACCIDENT ACCOMMODATION. THESE INCLUDE DETAILS OF THE PARALLEL DESIGN IN WHICH A PRIMARY PIPE RUPTURE AND A CORE DISRUPTIVE ACCIDENT RESPECTIVELY ARE TREATED AS DESSIGN BASIS ACCIDENTS. INCLUDES DESCRIPTIONS OF THE INITIATING ACCIDENTS, EVALUATIONS, DESIGN REQUIREMENTS, ALTERNATIVE ADDITIONAL PARALLEL DESIGN FEATURES AND ASSESSMENT OF DESIGN CAPABILITIES NECESSARY FOR TREATMENT OF THESE EXTREME AND LOW PROBABILITY ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + ACCIDENT + DESIGN CRITERIA + *REPORT, PSAR + MAIN COOLING SYSTEM + SYSTEM CAPABILITY + ACCIDENT, DESIGN BASIS + *CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS + ACCIDENT, CORE DISRUPTIVE

5-106938 ALSO IN CATEGORY 18 DATED 1975
EVANS SK + AITKEN EA
OXYGEN REDISTRIBUTION IN (U,PU)O/SUB 2-X/FUELS
GENERAL ELECTRIC COMPANY
GEAP-14036 +. 34 PPS, 23 FIGS, 21 REFS, JAN. 1975

DESCRIBES EXPERIMENTAL DATA WHICH CHARACTERIZE THE OXYGEN TRANSPORT IN MIXED OXIDE FUEL SUBJECTED TO A TEMPERATURE GRADIENT. THE EXPERIMENTS ARE ANALYZED IN A MANNER WHICH LEND THEMSELVES TO INTEGRATION WITH ANALYSES OF IRRADIATED FUEL BEHAVIOR. USE OF THESE DATA AND ASSOCIATED ANALYSES MAKE POSSIBLE AN UNDERSTANDING OF IRRADIATED FUEL BEHAVIOR WHICH IS BASED ON STOICHIOMETRY-DEPENDENT PARAMETERS. SUCH ANALYSES WILL RESULT IN BETTER PREDICTIONS OF FUEL THERMAL, CHEMICAL, AND MECHANICAL BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + OXIDE + *OXYGEN + PLUTONIUM + TEMPERATURE GRADIENT + *TRANSPORT PROPERTY + STOICHIOMETRY + R AND D PROGRAM + FUEL ROD + DISTRIBUTION + DISTRIBUTION, MICRO

5-106939 DATED 1975
BOBER M + SCHUMACHER G
CALCULATION OF THE VARIATION IN STOICHIOMETRY AS A FUNCTION OF BURNUP AND OF THE RADIAL OXYGEN DISTRIBUTION IN HYPOSTOICHIOMETRIC MIXED OXIDE FUEL PINS (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-1965 +. 34 PPS, 7 FIGS, 22 REFS, MAY 1975

THE CALCULATION OF THE VARIATION IN STOICHIOMETRY AS A FUNCTION OF BURNUP INVOLVES THE INFLUENCES OF THE NEUTRON FLUX SPECTRUM, THE ISOTOPIC COMPOSITION OF ACTINIDES, THE CONCENTRATION OF PLUTONIUM OXIDE AND THE INITIAL FUEL STOICHIOMETRY. AS EXAMPLES THE EFFECTS ARE CALCULATED FOR FUEL PINS OF AN IRRADIATION EXPERIMENT IN THE RAPSODIE REACTOR AND FOR THE MARK 1A CORE THE SNR-300. THE LARGEST DIFFERENCES IN THE EFFECTS OCCUR BOTH WHEN THE DEGREE OF ENRICHMENT OF U-235 IN URANIUM AND THE CONCENTRATION OF PLUTONIUM ARE CHANGED. THEIR INCREASE CAUSES A REDUCTION OF THE VARIATION IN STOICHIOMETRY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-106939 *CONTINUED*
FUEL BURNUP + OXIDE + OXYGEN + PLUTONIUM + TRANSPORT PROPERTY + *STOICHIOMETRY + DISTRIBUTION + DISTRIBUTION, MICRO + MIXED OXIDE

5-106943 ALSO IN CATEGORIES 7 AND 18 DATED 1975
RADIOLOGICAL ASSESSMENT MODELS THIRD QUARTERLY REPORT, MARCH-MAY 1975
GENERAL ELECTRIC COMPANY
GEAP-14034-3 +. 60 PPS, 18 FIGS, 63 REFS, JUNE 1975

THE OBJECTIVES OF THIS PROGRAM ARE TO DEVELOP MODELS FOR ANALYZING AND EVALUATING POSTULATED RADIOLOGICAL SOURCES, AEROSOL DYNAMICS, SODIUM FIRES, AND RADIOLOGICAL DOSAGES ARISING IN THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT OF LIQUID METAL FAST BREEDER REACTOR. THE WORK PERFORMED DURING THIS REPORTING PERIOD CONTINUED THE REVIEW AND EVALUATING OF CURRENT TECHNOLOGY, EXPERIMENTS, ANALYTICAL MODELS, AND COMPUTER CODES USED IN RADIOLOGICAL MODELING AND ASSESSMENT. THE IMMEDIATE OBJECTIVE IS TO DEVELOP A PRELIMINARY, OVER-ALL RADIOLOGICAL ASSESSMENT MODEL FOR THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + AEROSOL + FIRE + *FISSION GAS RELEASE + FISSION PRODUCT RELEASE + SOURCE, RADIATION + ANALYTICAL MODEL + ACCIDENT MODEL + *ACCIDENT, CORE DISRUPTIVE

5-107033 DATED 1975
KRESS TS + PARKER GW + FONTANA MH
WORK PLAN: TRANSIENT RELEASE FROM LMFBR FUEL
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4875 +. 121 PPS, 20 FIGS, 21 REFS, SEPT. 1975

THE PROPOSED LMFBR TRANSIENT RELEASE PROGRAM AT ORNL IS DESIGNED TO INVESTIGATE, BY MEANS OF EX-REACTOR EXPERIMENTS AND ANALYTICAL MODELING, THE RELEASE AND TRANSPORT OF FUEL, FISSION PRODUCTS, AND TRANSURANIC ELEMENTS FROM FAST REACTOR CORES IN THE EVENT OF CERTAIN HYPOTHETICAL ACCIDENTS. IT IS DESIRED TO EXPERIMENTALLY PRODUCE ENERGY DEPOSITIONS THAT ARE CHARACTERISTIC OF SEVERE HYPOTHETICAL REACTOR TRANSIENTS BY THE APPLICATION OF DIRECT ELECTRICAL CURRENT TO MIXED-OXIDE FUELS UNDER SODIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION PRODUCT RELEASE + ANALYTICAL MODEL + TRANSURANIUM ELEMENT + FUEL, NUCLEAR + TRANSIENT + MIXED OXIDE

5-107191 ALSO IN CATEGORY 18 DATED 1975
LORENZ JJ
MIX: A COMPUTER CODE FOR TRANSIENT THERMAL HYDRAULIC ANALYSIS OF LMFBR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-41 +. 111 PPS, 27 FIGS, 16 REFS, MAY 1975

MIX IS A TWO DIMENSIONAL PLENUM ANALYSIS CODE DEVELOPED UNDER CRBRP UPPER PLENUM MIXING PROGRAM. THE GOVERNING EQUATIONS AND BOUNDARY CONDITIONS ARE DEVELOPED AND THE CORRESPONDING FINITE DIFFERENCE FORMULATIONS ARE PRESENTED. COMPARISONS WITH EXPERIMENTAL DATA ARE GIVEN.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + COMPARISON, THEORY AND EXPERIENCE + THERMAL TRANSIENT + MIXING COEFFICIENT + *MIXING ZONE + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

5-107288 DATED 1975
FROHLICH R + SCHMUCK P + THIEM D
SENSITIVITY STUDIES FOR FAST REACTOR WHOLE CORE ACCIDENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2086 + EURFNR-1254 +. 40 PPS, 14 FIGS, MARCH 1975

THE ENERGY YIELD OF A HYPOTHETICAL TRANSIENT OVERPOWER ACCIDENT OF AN LMFBR IS STRONGLY INFLUENCED BY CORE DESIGN PARAMETERS. THE SENSITIVITY OF THIS TYPE OF ACCIDENT ON SOME INTERESTING DESIGN PARAMETERS IS STUDIED FOR THE FRESH SNR 300 MARK 1 CORE. IN ADDITION THE SENSITIVITY OF THE ENERGY YIELD ON OTHER PARAMETERS OF MORE SPECULATIVE NATURE, E.G. THE FUEL COOLANT INTERACTION PARAMETERS AND THE PIN FAILURE LOCATION, IS ANALYSED. THE CODES CARMEN 2 AND KADIS ARE USED FOR THE ANALYSES OF THE PREDISASSEMBLY AND DISASSEMBLY PHASES RESPECTIVELY. MOST OF THE PARAMETER VARIATIONS ARE PERFORMED CONSISTENTLY FOR THE PREDISASSEMBLY AND THE DISASSEMBLY PHASES. AREAS ARE INDICATED WHERE FURTHER EXPERIMENTAL AND THEORETICAL WORK IS NEEDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + REACTIVITY COEFFICIENT + REACTOR TRANSIENT + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

5-107285 DATED 1973

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-107289 *CONTINUED*
KIRSCH D
INVESTIGATIONS ON THE FLOW AND TEMPERATURE DISTRIBUTION DOWNSTREAM OF LOCAL COOLANT BLOCKAGES IN ROD BUNDLE ASSEMBLIES (IN GERMAN)
KERNFORSCHUNGZENTRUM KARLSRUHE, F.R. GERMANY
KFK-1794 +. 100 PPS, 31 FIGS, MAY 1973

WITH SAFETY INVESTIGATIONS FOR LIQUID-METAL COOLED FAST BREEDER REACTORS (LMFBRS) A POSSIBLE PROPAGATION OF A FAULT IS CONSIDERED, WHICH COULD BE INITIATED BY A LOCAL COOLANT BLOCKAGE ARISING FROM AN ACCUMULATION OF SMALL PARTICLES AT A SPACER GRID OF A ROD BUNDLE SUBASSEMBLY. IN ORDER TO EVALUATE THE COOLANT TEMPERATURE RISE CLOSE TO SUCH BLOCKAGES, FLOW AND TEMPERATURE DISTRIBUTIONS DOWNSTREAM OF SIMULATED LOCAL BLOCKAGES HAVE BEEN INVESTIGATED.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

COMPUTER PROGRAM + REACTOR COOLANT + FLOW DISTRIBUTION + FLOW BLOCKAGE + FUEL ELEMENT CLUSTER + TEMPERATURE

5-107291 DATED 1974
CHAWLA TC
ANALYSIS OF KELVIN-HELMHOLTZ INSTABILITY AT THE GAS-LIQUID INTERFACE OF LIQUID-SUBMERGED SUBSONIC AND SONIC GAS JETS RELATIVE TO FISSION-GAS JET IMPINGEMENT IN LMFBR SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8094 +. 55 PPS, 15 FIGS, 14 REFS, MARCH 1974

THE ANALYSIS OF THE STABILITY OF THE GAS-LIQUID INTERFACE OF SUBSONIC AND SONIC GAS JETS SUBMERGED IN A LIQUID IS OF PRIMARY IMPORTANCE FOR THE DETERMINATION OF THE RATE OF LIQUID ENTRAINMENT AND THE SIZE OF THE DROPLETS FORMED. THE DETERMINATION OF THESE QUANTITIES IS REQUIRED IN FORMULATING A CORRELATION FOR THE HEAT-TRANSFER COEFFICIENT IN THE SPRAY-COOLED REGION OF THE FISSION-GAS JET IMPINGEMENT IN LMFBR SUBASSEMBLIES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FISSION GAS RELEASE + DROPLET + MATHEMATICAL TREATMENT + GAS + STRUCTURE

5-107328 DATED 1971
EFFECTS OF SODIUM EXPOSURE ON THE CORROSION AND STRENGTH OF STAINLESS STEELS: SUMMARY REPORT, SODIUM MASS TRANSFER PROGRAM
GENERAL ELECTRIC COMPANY
GEAP-10394 +. 117 PPS, FIGS, AUG. 1971

THIS DOCUMENT INCLUDES RESULTS OF INVESTIGATIONS ON THE EFFECTS OF HIGH TEMPERATURE (TO 1300 F) FLOWING SODIUM ON FIVE STAINLESS STEEL ALLOYS WHICH ARE CANDIDATES FOR USE AS STRUCTURAL MATERIALS OF LMFBR PRIMARY COOLANT SYSTEMS. PRECISION OF CONTROL AND MEASUREMENT OF PARAMETERS SUCH AS OXYGEN CONCENTRATION AND TEMPERATURE WERE SUBSTANTIALLY IMPROVED RELATIVE TO PRIOR WORK. MECHANICAL PROPERTIES IMPORTANT TO CLADDING DESIGN WERE SIGNIFICANTLY DEGRADED BY EXPOSURE TO TYPICAL CENTRAL CORE SODIUM CONDITIONS. THE DEGRADATION WAS FOUND TO BE CAUSED BY BOTH CHANGES IN CHEMICAL COMPOSITION AND MASS TRANSFER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + OXYGEN + STEEL, STAINLESS + CORROSION + HIGH TEMPERATURE

5-107718 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 321.9 - EFFECTS OF TELLICO DAM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q321.9-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONSTRUCTION AND OPERATION OF TELLICO DAM WILL HAVE NO INFLUENCE ON THE WATER SUPPLY, WATER LEVELS, AND FLOW VELOCITIES AT THE SITE. AN ADDITIONAL 118,500 SFD OF WATER WILL BE STORED BEHIND THE DAM WHICH COULD BE USED TO MAINTAIN WATER LEVELS IN WATTS BAR RESERVOIR IN THE UNLIKELY EVENT THAT AUGMENTATION WOULD BE REQUIRED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RIVER + HEAT SINK + RESPONSE TO NRC QUESTION + *EFFECT + *DAM + CLINCH RIVER (LMFBR)

5-107748 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.92 - LIMITING VALUE FOR HEAT TRANSPORT SYSTEMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.92-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRELIMINARY ANALYSIS OF THE PRIMARY PIPING FOR THIRD LEVEL MARGIN PRESSURE LOADINGS AND THE REACTOR VESSEL MOVEMENTS SHOW THAT THESE CONDITIONS DO NOT ESTABLISH OR LIMIT THE DESIGN OF THE PRIMARY PIPING BOUNDARY. CHAPTER 15 OF THE PSAR GIVES A SUMMARY OF THESE INITIAL ANALYSES. SIMILARLY, PRELIMINARY ESTIMATES OF THE THIRD LEVEL MARGIN LOADINGS FOR THE CHECK VALVE, PUMP AND IHX INDICATE THAT THIS LOADING IS NOT LIMITING UPON THESE COMPONENTS.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-107748 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*HEAT TRANSFER + RESPONSE TO NRC QUESTION + COMPONENTS + ACCIDENT, DESIGN BASIS + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + ACCIDENT, CORE DISRUPTIVE

5-107751 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.113 - OSCILLATIONS IN FREE SURFACE LEVELS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.113-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THERE ARE NO OSCILLATIONS IN FREE SURFACE LEVELS NOR OSCILLATIONS IN LOOP FLOWS WHICH MAY BE ASSOCIATED WITH OSCILLATING FREE SURFACE LEVELS. THE DEMO CODE USED IN THE NATURAL CIRCULATION ANALYSIS INCLUDES A MODEL OF THE COVER GAS SYSTEM AND COMPUTES SODIUM LEVELS IN THE PUMPS AND REACTOR VESSEL AS A FUNCTION OF TIME. INCLUDING THESE EFFECTS IN THE CALCULATION DOES NOT SIGNIFICANTLY AFFECT THE RESULTING CLADDING TEMPERATURES FOR NATURAL CIRCULATION EVENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + FLOW + *OSCILLATION + FLOW, CONVECTION + *EFFECT + CLINCH RIVER (LMFBR)

5-107845 ALSO IN CATEGORY 6 DATED 1974
EBERHARDT J
STUDIES ON THE DETECTION OF GENERAL SODIUM BOILING
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1211 +. 100 PPS, AUG. 1974

THE AIM OF THE PRESENT STUDIES WAS TO DEVELOP AND TEST A METHOD OF DETECTION ENABLING GENERAL SODIUM BOILING IN FAST SODIUM-COOLED REACTORS TO BE DETECTED SUFFICIENTLY EARLY FOR THE CONSEQUENTIAL DAMAGE TO BE LARGELY PREVENTED BY SUITABLE COUNTER MEASURES. BECAUSE THE CONVENTIONAL DETECTION METHODS OF INSTALLING THERMOCOUPLES AND FLOWMETERS IN THE INDIVIDUAL FUEL RODS PRESENTS PROBLEMS, THE SUITABILITY OF INDIRECTLY DETECTING BOILING BY OBSERVING REACTIVITY EFFECTS IS EXAMINED.

REACTIVITY EFFECT + MATHEMATICAL TREATMENT + REACTIVITY EFFECT, VOID + OSCILLATION + BOILING

5-107867 DATED 1975
ANDERSON TT + BOBIS JP + GAVIN AP
ACOUSTIC DETECTION OF SODIUM VOIDS IN THE LMFBR HEAT TRANSFER SIMULATION LOOP
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-32 +. 38 PPS, 14 FIGS, 4 REFS, FEB. 1975

ACOUSTIC SENSORS LOCATED IN THE UPPER PLENUM OF THE LMFBR HEAT TRANSFER SIMULATION LOOP WERE USED TO MEASURE ABSOLUTE ACOUSTIC PRESSURE LEVELS. THE SENSORS, A SODIUM-IMMERSED MICROPHONE, AND A WAVEGUIDE WERE UNAFFECTED BY A YEAR OF IMMERSION IN SODIUM. MAPS OF BUBBLE POSITION VERSUS TIME WERE PROVIDED FROM THE MTSL DATA SYSTEM. ACOUSTIC IMPULSE SIGNALS WERE OBSERVED AT TIMES CORRESPONDING TO BUBBLE GROWTH, BUBBLE DISAPPEARANCE, AND ARRIVAL OF BUBBLES AT THE PLENUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

HEAT TRANSFER + BUBBLE NUCLEATION + BUBBLE + ACOUSTICS + VOID

5-107873 DATED 1975
DEITRICH LW
APPLICATIONS OF UNDERSTANDING OF TRANSIENT FUEL FAILURE MECHANISMS IN DESIGN AND LICENSING OF LMFBRS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-750827-1 +. 15 PPS, FROM INTERNATIONAL WORKING GROUP ON FUEL FAILURE MECHANISMS, SEATTLE, WASHINGTON, MAY 11, 1975

IN THIS PAPER, SOME OF THE APPLICATIONS OF FUEL FAILURE TECHNOLOGY IN DESIGN AND LICENSING EFFORTS ARE DISCUSSED. SUCH APPLICATIONS ARE VERY NUMEROUS AND DIVERSE, RANGING FROM FUEL DESIGN FOR STEADY-STATE OPERATION, THROUGH ANALYSIS OF OFF-NORMAL CONDITIONS AND ASSESSMENT OF THEIR IMPACT ON FUEL LIFETIME, TO VARIOUS HYPOTHETICAL ACCIDENT ANALYSES OF WHICH FUEL FAILURE IS AN ESSENTIAL ELEMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + DESIGN CRITERIA + FAILURE, FUEL ELEMENT + ACCIDENT, LOSS OF FLOW + TRANSIENT + LICENSING PROCESS

5-107874 DATED 1975
ROWE DS + STEWART CW

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-107874 *CONTINUED*
TRANSIENT HYDRAULIC ANALYSIS FOR REACTOR CORES
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASHINGTON
BNWL-SA-5183 + CONF-750406-3 +. 7 PPS, FROM ANS TOPICAL MEETING ON COMPUTATIONAL METHODS IN NUCLEAR ENGINEERING, HELD IN CHARLESTON, S.C., APRIL 15, 1975

THE OBJECTIVE OF THIS PAPER IS TO PRESENT MATHEMATICAL SOLUTION APPROACHES FOR LUMPED-PARAMETER EQUATIONS USED IN NUCLEAR ROD-BUNDLE THERMAL-HYDRAULIC ANALYSIS. IN THE LUMPED-PARAMETER APPROACH THE CROSS SECTION IS DIVIDED INTO SUBCHANNELS WHICH ARE FURTHER SUBDIVIDED AXIALLY TO FORM A THREE-DIMENSIONAL ARRAY OF CONTROL VOLUMES FOR ANALYSIS. THE LUMPED PARAMETER MATHEMATICAL MODELS ARE WRITTEN IN VARIOUS DEGREES OF SOPHISTICATION FOR BOTH SINGLE-AND-TWO-PHASE FLOWS FOR WATER, LIQUID-METAL AND GAS-COOLED REACTORS. FOR PURPOSES OF DISCUSSION, THIS PAPER IS LIMITED TO A HOMOGENEOUS THERMAL-EQUILIBRIUM FLOW WITHOUT SONIC VELOCITY PROPAGATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EQUATION + REACTOR, LWR + FLOW, TWO PHASE + MATHEMATICAL TREATMENT + FUEL ELEMENT CLUSTER + TRANSIENT + THERMAL HYDRAULIC ANALYSIS

5-108108 ALSO IN CATEGORY 18 DATED 1975
FROHLICH R
SENSITIVITY STUDIES FOR FAST REACTOR WHOLE CORE ACCIDENTS
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE, F.R. GERMANY
EURFNR-1254 + KFK-2086 +. 30 PPS, 6 TABS, 14 FIGS, 7 REFS, MARCH 1975

THE ENERGY YIELD OF A HYPOTHETICAL TRANSIENT OVERPOWER ACCIDENT OF AN LMFBR IS STRONGLY INFLUENCED BY CORE DESIGN PARAMETERS. THE SENSITIVITY OF THIS TYPE OF ACCIDENT ON SOME INTERESTING DESIGN PARAMETERS IS STUDIED FOR THE FRESH SNR 300 MARK 1 CORE. IN ADDITION THE SENSITIVITY OF THE ENERGY YIELD ON OTHER PARAMETERS OF MORE SPECULATIVE NATURE, E.G. THE FUEL COOLANT INTERACTION PARAMETERS AND THE PIN FAILURE LOCATION, IS ANALYSED. THE CODES CARMEN 2 AND KADIS ARE USED FOR THE ANALYSES OF THE PREDISASSEMBLY AND DISASSEMBLY PHASES RESPECTIVELY. MOST OF THE PARAMETER VARIATIONS ARE PERFORMED CONSISTENTLY FOR THE PREDISASSEMBLY AND THE DISASSEMBLY PHASES. AREAS ARE INDICATED WHERE FURTHER EXPERIMENTAL AND THEORETICAL WORK IS NEEDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + GERMANY + *SENSITIVITY ANALYSIS + FUEL COOLANT INTERACTION

5-108109 ALSO IN CATEGORY 18 DATED 1975
JACOBI S + KRAMER W + SCHLEISIEK K
THE PROBLEM OF PIN-TO-PIN FAILURE PROPAGATION IN SODIUM-COOLED FAST BREEDER REACTORS
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1242 + KFK-2047 +. 30 PPS, 55 REFS, FEB. 1975

THE POSSIBILITY OF A PIN TO PIN FAILURE PROPAGATION IS AN IMPORTANT QUESTION IN CONNECTION WITH THE SAFETY ANALYSIS OF LMFBR. THIS REPORT GIVES A BRIEF REVIEW OF THE PRESENT STATE OF KNOWLEDGE. CONCEIVABLE MECHANISMS OF AN ACCIDENT SEQUENCE ARE DISCUSSED AND THE POSSIBILITIES FOR FAST FAILURE PROPAGATION ARE DEMONSTRATED. AS A RESULT OF THE PRESENT INVESTIGATION TO THIS QUESTION A PIN TO PIN FAILURE PROPAGATION IS CONSIDERED TO BE RATHER UNLIKELY BUT IT MAY NOT BE EXCLUDED COMPLETELY UNDER CERTAIN ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *FAILURE, FUEL ELEMENT + FAILURE, SEQUENTIAL

5-108115 ALSO IN CATEGORY 18 DATED 1974
ARMSTRONG GR
POSTACCIDENT HEAT REMOVAL ASSESSMENT FOR THE FFTF
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-60 +. 75 PPS, 34 FIGS, 8 REFS, NOV. 1974

AN ASSESSMENT OF THE POTENTIAL FOR SAFELY REMOVING THE RESIDUAL HEAT GENERATED BY FISSION PRODUCT DECAY AFTER POSTULATED HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS WAS PERFORMED USING AVAILABLE ANALYTICAL AND EXPERIMENTAL DATA. THE RESULTANT STRUCTURAL CONFIGURATION, FLOW CONDITIONS, AND CORE DEBRIS DISTRIBUTION AND CHARACTERISTICS WERE THE MAJOR AREAS ADDRESSED. THE RESULTS CONFIRM THAT 100% OF THE DISPERSED CORE RESULTING FROM THE POSTULATED INITIATION HCDA EVENTS IN THE FFTF CAN BE ADEQUATELY COOLED AND PERMANENTLY RETAINED IN THE REACTOR VESSEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*DECAY HEAT + FFTF (TR) + EMERGENCY COOLING CONSIDERATIONS + *ACCIDENT, CORE DISRUPTIVE

5-108127 ALSO IN CATEGORIES 6 AND 11 AND 18 DATED 1975
NICKERSON G + KASTENBERG WE
PRELIMINARY ASSESSMENTS OF CARBIDE FUEL PINS DURING MILD OVERPOWER TRANSIENTS
UNIVERISTY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7562 +. 72 PPS, 16 TABS, 64 REFS, OCT. 1975

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-106127 *CONTINUED*
SEVERAL ASPECTS OF CARBIDE FUELED LMFBR'S ARE STUDIED. DISCUSSES THE STATE OF DEVELOPMENT OF CARBIDE FUEL AND CURRENT INFORMATION ABOUT AVAILABLE THERMOPHYSICAL PROPERTIES OF THIS MATERIAL IS PRESENTED. DESCRIBES THE CONCEPTUAL CARBIDE CORE DESIGN THAT IS STUDIED BY HOPE AND COMPARES IT WITH CRBRP DESIGN DATA. THE SCOPE OF THE BULK BOILING STUDY UNDERTAKEN WITH HOPE AND THE RESULTS OF THIS STUDY ARE ALSO PRESENTED IN THIS CHAPTER. A SUMMARY OF THE THESIS, CONCLUSIONS DRAWN FROM THE WORK COMPLETED, AND SOME RECOMMENDATIONS FOR FUTURE RESEARCH NEEDS ARE PRESENTED.

AVAILABILITY - ENERGY & KINETICS DEPARTMENT, SCHOOL OF ENGINEERING AND APPLIED SCIENCE, UNIV. OF CALIFORNIA, LOS ANGELES, CALIF.

*CARBIDE + COMPUTER PROGRAM + REACTOR TRANSIENT + DESIGN STUDY + *FUEL ROD + BOILING

5-108128 DATED 1975
SHIN YW + KOT CA
TWO-DIMENSIONAL FLUID-HAMMER ANALYSIS BY THE METHOD OF NEARCHARACTERISTICS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-21 +. 27 PPS, 12 FIGS, 16 REFS, MAY 1975

A NUMERICAL TECHNIQUE BASED ON THE METHOD OF NEARCHARACTERISTICS IS CONSIDERED FOR SOLVING PROPAGATION OF FLUID-HAMMER WAVES IN A TWO-DIMENSIONAL GEOMETRY. THE SOLUTION IS CONSTRUCTED BY RELATING FLOW CONDITIONS BY COMPATIBILITY EQUATIONS ALONG LINES CALLED NEARCHARACTERISTICS. THREE CHOICES ARE CONSIDERED IN THE NUMERICAL SCHEME THAT ARE ACCURATE WITHIN AN ERROR OF THE ORDER OF MAGNITUDE OF THE TIME STEP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDRAULIC ANALYSIS + *HYDRAULIC EFFECT + SHOCK WAVE + *ANALYTICAL TECHNIQUE + FLOW

5-108196 ALSO IN CATEGORIES 6 AND 18 DATED 1975
SLEMBER RJ
REACTOR AND SAFETY ENGINEERING TECHNICAL PROGRESS REPORT - APRIL, MAY, JUNE 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-70 +. 144 PPS, 21 TABS, 41 FIGS, AUG. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING CORE PHYSICS, RADIATION AND SHIELD ANALYSIS, REACTOR DYNAMICS, REACTOR SAFETY, SAFETY DEVELOPMENT, AND SYSTEMS SAFETY ANALYSIS. SPECIFIC TOPICS INCLUDE ASSESSMENT OF FTR STABILITY, REACTIVITY EFFECTS OF NEUTRON STREAMING THROUGH VOIDS IN MOLTEN FUEL, COOLANT BOILING, FUEL MOTION DURING FAST REACTOR OVERPOWER TRANSIENTS, CONTAINMENT ANALYSIS CODE, AND CORE REDISTRIBUTION ASSUMING LOSS OF FLOW.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CONTAINMENT + ACCIDENT, LOSS OF FLOW + REACTIVITY EFFECT + REACTOR STABILITY + FFTF (TR) + SHIELDING + REACTOR PHYSICS + *R AND D PROGRAM + *BOILING + TRANSIENT

5-108594 DATED 1975
LORENZ JJ + CARLSON RD + HOWARD PA
FFTF UPPER PLENUM MIXING STUDIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-45 +. 73 PPS, 34 FIGS, 4 REFS, JUNE 1975

EXPERIMENTAL TESTING AND ANALYTICAL MODELING OF THE FLOW PATTERNS WITHIN THE UPPER PLENUM OF FFTF FOLLOWING A REACTOR SCRAM ARE DESCRIBED. TWO COMPLEMENTARY SERIES OF TESTS WERE CONDUCTED AT 1/15 SCALE WHERE ONE SERIES SIMULATED THE TRANSIENT WITH SODIUM WHILE THE OTHER SERIES WAS CONDUCTED WITH WATER AND BRINE. A COMPARISON OF THE DATA SHOW WATER AND BRINE TO BE AN EFFECTIVE TEST MECHANISM YIELDING CONSERVATIVE ESTIMATES OF THE THERMAL TRANSIENTS AND TO BE A VALID EXPERIMENTAL APPROACH TO SIMULATION TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + ANALYTICAL MODEL + FFTF (TR) + FLOW DISTRIBUTION + FLOW STABILITY + SIMULATION + *FLOW + THERMAL TRANSIENT

5-108672 ALSO IN CATEGORIES 12 AND 18 DATED 1975
RESPONSE TO QUESTION 001.61 - DECAY HEAT REMOVAL CAPABILITY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.61-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE VERIFICATION OF NATURAL CIRCULATION DECAY HEAT REMOVAL CAPABILITY OF CRBRP WILL BE BASED ON ANALYSIS USING DATA FROM COMPONENT TESTS. THE SYSTEM RESISTANCE FLOW TESTS ON KEY COMPONENTS. THAT IS, THE SPECIFIED REQUIREMENTS FOR DELTA P AS A FUNCTION OF FLOW WILL BE VERIFIED BY TESTS ON AN INDIVIDUAL COMPONENT BASIS. THE REACTOR PRESSURE DROPS WILL BE DETERMINED BY OUT-OF-REACTOR TESTS ON INDIVIDUAL COMPONENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-108672 *CONTINUED*
CHARGE $2.00)

DECAY HEAT + TESTING + RESPONSE TO NRC QUESTION + COMPONENTS + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + CLINCH RIVER (LMFBR)

5-108673 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.87 - NATURAL CONVECTION DECAY HEAT REMOVAL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.87-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

VERIFICATION OF NATURAL CONVECTION DECAY HEAT REMOVAL IS DISCUSSED IN THE RESPONSE TO QUESTION 001.61. NO SINGLE LOOP OPERATION IS PLANNED FOR CRBR. WITH REGARD TO THE CHECK VALVE CONTRIBUTION TO THE SYSTEM PRESSURE DROP, PRELIMINARY ANALYSES INDICATE THAT THE CHECK VALVE PRESSURE DROP AT 3% FLOW WILL BE LESS THAN 21% OF THE TOTAL SYSTEM PRESSURE DROP FOR THE THREE LOOP NATURAL CONVECTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DECAY HEAT + *TESTING + HEAT TRANSFER, NATURAL CONVECTION + PRESSURE DROP + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + CLINCH RIVER (LMFBR)

5-108680 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.241 - CALCULATION OF PRESSURE DECAY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
3 PGS, 2 REFS, PP. Q001.241-1 THRU Q001-241-3 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE OVERALL PRESSURE IN A CONTAINMENT SPACE IS CALCULATED BY THE SOFIRE II CODE WHICH RELATES THE DENSITY AND TEMPERATURE EFFECTS OF THE CONTAINED GASES TO THE HEAT INPUT AND REMOVAL RATES THROUGH THE UTILIZATION OF THE PERFECT GAS EQUATIONS. THE PRESSURE STARTS TO DECREASE AND DECAYS CONTINUOUSLY AS THE HEAT LOSSES TO THE OUTSIDE ATMOSPHERE AND TO THE STRUCTURAL HEAT SINKS WITHIN THE CONTAINMENT CELL OVERCOME THE RATE OF HEAT ADDITION VIA SODIUM COMBUSTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + CONTAINMENT + RESPONSE TO NRC QUESTION + *PRESSURE TRANSIENT + COMPARTMENT + CLINCH RIVER (LMFBR)

5-108706 DATED 1975
FRY DN
TEMPERATURE NOISE MEASUREMENTS IN BLOCKED AND UNBLOCKED 19-PIN ELECTRICALLY HEATED LMFBR FUEL SUBASSEMBLY MOCKUPS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-750624-2 +. 4 PPS, FROM AMERICAN NUCLEAR SOCIETY MEETING, NEW ORLEANS, JUNE 8, 1975

SODIUM TEMPERATURE NOISE WAS MEASURED AT THE EXIT OF A SIMULATED FAST REACTOR FUEL SUBASSEMBLY TO DETERMINE THE FEASIBILITY OF USING TEMPERATURE NOISE MONITORS TO DETECT FLOW BLOCKAGE IN FAST REACTORS, A MATTER OF EVER-INCREASING CONCERN IN THE LMFBR PROGRAM. NOISE FROM BOTH BLOCKED AND UNBLOCKED TEST BUNDLES WAS CHARACTERIZED USING VARIOUS NOISE SIGNAL DESCRIPTORS SUCH AS POWER SPECTRAL DENSITY, CRUSS SPECTRAL DENSITY, AMPLITUDE PROBABILITY DISTRIBUTION, AND ROOT MEAN SQUARE (RMS).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MOCKUP + MEASUREMENT, NOISE + FLOW BLOCKAGE + FUEL ELEMENT CLUSTER + TEMPERATURE

5-108707 DATED 1974
VEGTER BJ + ROIDT RM + PECHERSKY MJ
MEASUREMENTS OF VELOCITIES DOWNSTREAM OF BLOCKED SUBCHANNELS IN A MODEL REACTOR ROD BUNDLE
WESTINGHOUSE ELECTRIC CORPORATION
CONF-750804-9 +. 37 PPS, FROM CONFERENCE ON HEAT TRANSFER, SAN FRANCISCO, CALIF., AUG. 11, 1975

TWO BLOCKAGE CONFIGURATIONS WERE INSTALLED ON THE UPSTREAM END OF A HEXAGONAL GRID IN AN 11:1 SCALE 39 ROD BUNDLE AIR MODEL OF A LIQUID METAL FAST BREEDER REACTOR. VELOCITIES WERE MEASURED IN SUBCHANNELS BEHIND AND ADJOINING THE BLOCKAGES. THE REGION OF SEPARATED FLOW WAS FOUND TO BE FIVE TIMES A CHARACTERISTIC HEIGHT OF THE BLOCAKGES, CONSISTENT WITH OTHER EXPERIMENTAL RESULTS. THE EFFECT OF THE GRIDS ON THE LENGTH OF SEPARATED FLOW WAS MINIMAL. FLOW RATES IN SUBCHANNELS CENTERED DOWNSTREAM OF THE BLOCKAGES RECOVERED TO 90% OF THE UPSTREAM FLOW RATES IN THE 28 ROD DIAMETER LENGTH BETWEEN GRIDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MEASUREMENT + MOCKUP + HOT SPOT + FLOW BLOCKAGE

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-108759 ALSO IN CATEGORIES 6 AND 8 AND 11 A DATED 19758
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

5-108761 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.107 - TECHNIQUE FOR SELECTING HEAT TRANSFER COEFFICIENTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, PP. Q001.107-1 THRU Q001.107-2 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE THERMAL/HYDRAULIC DESIGN CONDITIONS GIVEN IN TABLE 5.3-1 OF THE PSAR HAD THEIR ORIGIN IN A SYSTEM ANALYSIS WHICH USED A MONTE CARLO TECHNIQUE FOR ESTABLISHING THESE PARAMETRIC VALUES. THE IDEA WAS THAT IF A SET OF PRINCIPAL PLANT PARAMETERS WERE SELECTED, AND INDIVIDUAL COMPONENTS SUCH AS THE IHX, THE STEAM GENERATOR MODULES, THE MAIN SODIUM PUMPS AND THE RECIRCULATING PUMPS WERE DESIGNED WITH THEIR OWN MARGINS TO ACCOUNT FOR UNCERTAINTIES IN HEAT TRANSFER COEFFICIENTS, PRESSURE DROPS AND HEAD-FLOW CAPABILITIES, THE PROBABILITY OF ACTUALLY OPERATING THE PLANT AT THE SELECTED SET OF PRINCIPAL PLANT PARAMETERS WOULD BE SMALL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + HEAT TRANSFER + RESPONSE TO NRC QUESTION + COMPONENTS + *HEAT TRANSFER COEFFICIENT + CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

5-108768 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.280 - CALCULATION OF CLAD HOT SPOT TEMPERATURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.280-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CURVES SHOWN BY FIGURES 4.2-19 AND 20 SERVE AS TRANSIENT ENVELOPES, AND AS SUCH SHOULD NOT BE CONSIDERED TO BE CALCULATED INFORMATION. THE CALCULATED HOT SPOT CLADDING TEMPERATURES FOR VARIOUS UNDERCOOLING AND OVERPOWER TRANSIENTS SUCH AS THOSE DESCRIBED IN CHAPTER 15.0 ARE THEN COMPARED TO THE ENVELOPE. IF THE TRANSIENT HAS TEMPERATURES LESS THAN THE ENVELOPE, THE 'UMBRELLAING' PROCESS IS ASSUMED TO BE VAILD. IF THE TRANSIENT HAS TEMPERATURES OVER THE ENVELOPE, THE PARTICULAR EVENT HAS TO BE INDIVIDUALLY ANALYZED, AND THE ADDITIONAL CLADDING DAMAGE INCLUDED IN THE ROD DESIGN EVALUATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *HOT SPOT FACTOR ANALYSIS + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + TEMPERATURE + CLINCH RIVER (LMFBR)

5-108769 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.295 - MAXIMUM CLAD MIDWALL TEMPERATURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.295-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MAXIMUM CLADDING MIDWALL TEMPERATURES ON WHICH THE ORIFICING SCHEME HAS BEEN DERIVED, ARE BASED ON EQUALIZING THE END-OF-LIFE TEMPERATURES AT THE 2 SIGMA LEVEL IN THE HOTTEST ASSEMBLY PER ORIFICING ZONE. THE HOTTEST ASSEMBLY PER ZONE IS IDENTIFIED IN FIGURE 4.4-30; THE CORRESPONDING TEMPERATURES CAN BE FOUND IN FIGURE 4.4-24.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CLADDING + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + *TEMPERATURE + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

5-108770 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.298 - PLANNED SCALE MODEL TESTS

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-108770 *CONTINUED*
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.298-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE TITLE OF PSAR SECTION 4.4.4.2 INADVERTENTLY IMPLIES THAT PHASE II TESTING IN THE INTEGRAL REACTOR FLOW MODEL (IRFM), WILL UTILIZE A COMPLETE REACTOR HYDRAULIC SIMULATION. THE SCALE OF THE IRFM WAS SELECTED TO MATCH THAT OF THE INLET PLENUM FLOW MODEL (IPFM), TO PERMIT COMBINATION OF THE TWO MODELS INTO A COMPLETE REACTOR HYDRAULIC SIMULATION, SHOULD THIS BE SHOWN TO BE REQUIRED. PHASE II TESTING HAS NOT BEEN COMPLETELY DEFINED, AND ADDITIONAL WORK IS REQUIRED TO DETERMINE IF A COMPLETE REACTOR STRUCTURE SIMULATION IS REQUIRED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FLOW THEORY AND EXPERIMENTS + FLOW DISTRIBUTION + RESPONSE TO NRC QUESTION + *MODEL TESTING + FLOW + CLINCH RIVER (LMFBR)

5-108772 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.325 - LOCATION OF HEAT-GENERATING BLOCKAGE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.325-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE POSTULATED FORMATION OF A HEAT GENERATING BLOCKAGE IMPLIES THE PRESENCE OF FUEL MATERIAL IN THE FLOW CHANNEL. CONSEQUENTLY, THIS IMPLIES THAT A FUEL PIN HAS ALREADY FAILED. ANY MATERIAL FROM THAT FAILED FUEL PIN HAVING BLOCKAGE POTENTIAL WOULD BE EXPECTED TO REMAIN ADJACENT TO THE FAILURE LOCATION. OTHERWISE IT WOULD BE SWEPT OUT OF THE ASSEMBLY DUE TO THE DISPERSIVE NATURE OF FLOW IN A WIRE WRAP ASSEMBLY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + RESPONSE TO NRC QUESTION + *FLOW BLOCKAGE + FUEL ROD + CLINCH RIVER (LMFBR) + *FUEL ELEMENTS

5-108891 ALSO IN CATEGORY 18 DATED 1975
CARRE FC + TORDREAS NE
DEVELOPMENT OF INPUT DATA TO ENERGY CODE FOR ANALYSIS OF REACTOR FUEL BUNDLES
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
COO-2245-21TR +. 180 PPS, 44 FIGS, MAY 1975

THE ENERGY I CODE IS A SEMI-EMPERICAL METHOD FOR PREDICTING TEMPERATURE DISTRIBUTIONS IN WIRE WRAPPED ROD BUNDLES OF AN LMFBR. FOUR SEPARATE STUDIES WERE MADE TO DETERMINE MORE ACCURATELY THE LIMITS WITHIN WHICH THE SIMPLIFIED FLOW MODEL ASSUMED IN THE CODE LEADS TO CORRECT PREDICTIONS. (1) COMPARISON OF ENERGY I WITH ITS GERMAN ALTERNATE MISTRAL II. (2) PREDICTION OF TEMPERATURE DISTRIBUTION. (3) TRACER INJECTION EXPERIMENTS. (4) ANALYSIS OF THE VALIDITY OF ENERGY I'S RESULTS WHEN THE SIZE OF THE GAP AT THE PERIPHERY OF THE BUNDLE IS REDUCED TO ITS HALF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + FLOW, AXIAL + FLOW, CROSS + *FLOW + *FUEL ELEMENT CLUSTER + DISTRIBUTION + TEMPERATURE

5-109169 ALSO IN CATEGORY 9 DATED 1975
PATTERSON JF
RADIAL BLANKET ASSEMBLY ORIFICING ARRANGEMENT
U.S. PATENT 3,892,625 +. JULY 1, 1975

THIS PATENT RELATES TO A NUCLEAR REACTOR CORE FOR A LIQUID METAL COOLED FAST BREEDER REACTOR IN WHICH MEANS ARE PROVIDED FOR INCREASING THE COOLANT FLOW THROUGH THE REACTOR FUEL ASSEMBLIES AS THE REACTOR AGES BY VARYING THE COOLANT FLOW RATE WITH THE CHANGING COOLANT REQUIREMENTS DURING THE CORE OPERATING LIFETIME.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

*CONTROL SYSTEM + *FLOW DISTRIBUTION + UNITED STATES + PATENT + MAIN COOLING SYSTEM + FLOW

5-109218 ALSO IN CATEGORY 9 DATED 1975
LEAVELL WH + SIDES WH
EFFECTS OF ENTRAINED GAS ON THE ACOUSTIC DETECTION OF SODIUM BOILING IN A SIMULATED LMFBR FUEL BUNDLE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-751101-8 +. 6 PPS, FROM JOINT MEETING OF THE AMERICAN NUCLEAR SOCIETY & ATOMIC INDUSTRIAL FORUM, SAN FRANCISCO, CALIF. NOV. 16, 1975

THE ABILITY WITH WHICH AN ACOUSTIC MONITORING SYSTEM CAN DETECT LOCALIZED NUCLEATE BOILING OF A LMFBR'S SODIUM COOLANT IS DEPENDENT ON THE BACKGROUND NOISE INTENSITY FOUND IN THE REACTOR'S CORE ENVIRONMENT. BRET ET AL. MEASURED THE INTENSITY OF THE ACOUSTIC BACKGROUND NOISE IN RAPSODIE FOR VARIOUS COMBINATIONS OF PLANT PARAMETERS AND DETERMINED THAT THE INTENSITY OF THE NOISE IS DEPENDENT ON THE AMOUNT OF COVER GAS ENTRAINED IN THE COOLANT. IN EXPERIMENTS PERFORMED AT THE ORNL FUEL FAILURE MOCK-UP FACILITY, WE HAVE SOUGHT THE RELATIONSHIP BETWEEN

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109218 *CONTINUED*
ACOUSTIC INTENSITY OF NUCLEATE BOILING AND VOID FRACTION IN THE SODIUM COOLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR + *NUCLEATE BOILING + FUEL ELEMENT CLUSTER + VOID FRACTION + GAS + *ACOUSTICS + EFFECT

5-109343 ALSO IN CATEGORIES 11 AND 18 DATED 1975
KERRISK JF
THE CONSEQUENCES OF SODIUM BOND LOSS FROM AN LMFBR CARBIDE FUEL ELEMENT
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6095-MS +. 20 PPS, 7 FIGS, 36 REFS, OCT. 1975

THE CONSEQUENCES OF SODIUM BOND LOSS FROM A URANIUM-PLUTONIUM CARBIDE FUEL ELEMENT DURING NORMAL STEADY STATE OPERATION HAVE BEEN ASSESSED. THE ELEMENTS CONSIDERED ARE TYPICAL OF THOSE CURRENTLY BEING IRRADIATED IN EBR-II, AND INCLUDE ELEMENTS WITH AND WITHOUT SHROUD TUBES. THE ANALYSIS PRESENTED IS VERY CONSERVATIVE IN THAT THE MANY SIMPLIFYING ASSUMPTIONS REQUIRED WERE MADE TO PREDICT WORSE CONSEQUENCES THAN WOULD BE FOUND IN A REALISTIC ANALYSIS. FOLLOWING SODIUM BOND LOSS, FUEL MELTING OCCURS, BUT THE FUEL RAPIDLY RESOLIDIFIES AFTER SLUMPING OUT TO CONTACT THE CLAD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + CLADDING + FUEL MELTDOWN + FAILURE, CLADDING + *HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ELEMENTS

5-109425 ALSO IN CATEGORIES 6 AND 18 DATED 1975
FULFORD FJ + FOX JN + YACKLE TR
CORTAC: A CORE RESTRAINT TRANSIENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-76-10 +. 181 PPS, 11 FIGS, JULY 1975

CORTAC TREATS THE REACTOR CORE SYSTEM AS AN AXISYMMETRIC MODEL CONSISTING OF A CENTRAL CYLINDRICAL REGION AND FIFTEEN CONCENTRIC ANNULAR REGIONS. THE THERMAL-HYDRAULIC SIMULATION INCLUDES HEAT CONDUCTION BETWEEN RADIAL REGIONS, GAMMA AND NEUTRON HEATING OF STRUCTURE AND COOLANT, AND TIME DEPENDENT FLOW RATES WITHIN AND BETWEEN EACH REGION. EACH RADIAL REGION IS DIVIDED INTO A MAXIMUM OF NINE NODES, INCLUDING FOUR REPRESENTATIVE FUEL PIN NODES, AND UP TO THIRTY AXIAL SECTIONS. THE TRANSIENT TEMPERATURE EQUATIONS USE A RECENTLY DEVELOPED CONDUCTION-CONVECTION HEAT TRANSFER COMPUTATIONAL TECHNIQUE. STRUCTURAL RESPONSE OF THE CORE ASSEMBLIES IS SIMULATED BY A ROUTINE BASED ON THE NUBOW CODE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + HEAT TRANSFER + REACTOR KINETICS + TRANSIENT + *CORE RESTRAINT + *THERMAL HYDRAULIC ANALYSIS

5-109475 ALSO IN CATEGORIES 12 AND 18 DATED 1975
CATTON I
POST-ACCIDENT HEAT REMOVAL FOR LMFBR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7593 +. 54 PPS, 4 FIGS, 29 REFS, NOV. 1975

PREDICTIONS OF DRYOUT CONDITIONS FOR FFTF ARE MADE AND FOUND TO DIFFER FROM THOSE PREVIOSULY REPORTED. AN APPROXIMATE CRITERION FOR CORE DISPERSAL IS PRESENTED WHICH INDICATES THAT MUCH HIGHER DECAY HEAT LEVELS MAY BE REQUIRED FOR CORE DISPERSAL THAN PREDICTED. APPLICATION OF RECENT WORK ON PREDICTION OF HEAT TRANSFER FROM DOWNWARD FACING SURFACES INDICATES THAT NON-UNIFORM HEAT FLUX HAS A SIGNIFICANT EFFECT ON THE FFTF LOWER DOME THICKNESS.

AVAILABILITY - UNIVERSITY OF CALIFORNIA, SCHOOL OF ENGINEERING & APPLIED SCIENCE, ENERGY AND KINETICS DEPARTMENT, LOS ANGELES, CALIFORNIA

DECAY HEAT + *FFTF (TR) + CORE MELTDOWN + HEAT TRANSFER ANALYSIS + HEAT FLUX, DRYOUT + EMERGENCY COOLING + *ACCIDENT, CORE DISRUPTIVE

5-109490 DATED 1975
ROIDT RM + VEGTER BJ + PECHERSKY MJ
11:1 SCALE ROD BUNDLE FLOW TESTS PARTS 8 AND 9 . MEASUREMENTS OF VELOCITIES DOWNSTREAM OF BLOCKED SUBCHANNELS IN A MODEL REACTOR ROD BUNDLE
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA
WARD-DX-3045-6(VOL.2) +. 85 PPS, 4 TABS, 19 FIGS, OCT. 1975

TWO BLOCKAGE CONFIGURATIONS WERE INSTALLED ON THE UPSTREAM END OF A HEXAGONAL GRID IN AN 11:1 SCALE 39 ROD BUNDLE AIR FLOW MODEL OF A LIQUID METAL FAST BREEDER REACTOR. VELOCITIES WERE MEASURED IN SUBCHANNELS BEHIND AND ADJOINING THE BLOCKAGES. THE REGION OF SEPARATED FLOW WAS FOUND TO BE FIVE TIMES A CHARACTERISTIC WIDTH OF THE BLOCKAGES, CONSISTENT WITH OTHER EXPERIMENTAL RESULTS. THE EFFECT OF THE GRIDS ON THE LENGTH OF SEPARATED FLOW WAS MINIMAL. FLOW RATES IN SUBCHANNELS CENTERED DOWNSTREAM OF THE BLOCKAGES RECOVERED TO 90 PERCENT OF THE UPSTREAM FLOW RATES IN THE 28-ROD DIAMETER LENGTH BETWEEN GRIDS.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109490 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FLOW DISTRIBUTION + *FLOW BLOCKAGE + *MODEL TESTING + FUEL ELEMENTS

5-109510 DATED 1975
HARTS EW + DEITRICH LW + EBERHART JG
SUMMARY AND EVALUATION - FUEL DYNAMICS LOSS-OF-FLOW EXPERIMENTS (TEST L2, L3, AND L4)
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-57 +. 76 PPS, 59 FIGS, 12 REFS, SEPT. 1975

THREE SIMILAR EXPERIMENTS CONDUCTED TO SUPPORT THE ANALYSES OF HYPOTHETICAL LMFBR UNPROTECTED-LOSS-OF-FLOW ACCIDENTS ARE SUMMARIZED AND EVALUATED IN THIS REPORT. THE TESTS, DESIGNATED L2, L3, AND L4, PROVIDED EXPERIMENTAL DATA AGAINST WHICH ACCIDENT-ANALYSIS CODES COULD BE COMPARED, SO AS TO GUIDE FURTHER ANALYSIS AND MODELING OF THE INITIATING PHASES OF THE HYPOTHETICAL ACCIDENT. THE TESTS WERE CONDUCTED USING SEVEN-PIN BUNDLES OF MIXED-OXIDE FUEL PINS IN MARK-II FLOWING-SODIUM LOOPS IN THE TREAT REACTOR. TEST L2 USED FRESH FUEL. TESTS L3 AND L4 USED IRRADIATED FUEL PINS HAVING, RESPECTIVELY, INTERMEDIATE-POWER* (NO CENTRAL VOID) AND *HIGH-POWER* (FULLY DEVELOPED CENTRAL VOID) MICROSTRUCTURE. THE REPORT DOES NOT INCLUDE THE POSTTEST EXAMINATION RESULTS FOR L3 AND L4, NOR DOES THE REPORT CONTAIN THE FINAL HODOSCOPE RESULTS. CONCLUSIONS BASED ON THE AVAILABLE TEST DATA ARE PRESENTED WITH PARTICULAR EMPHASIS ON FUEL DYNAMICS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, LOSS OF FLOW + TREAT (PRR) + MIXED OXIDE + FUEL ELEMENTS

5-109551 DATED 1975
PROCEEDINGS OF THE U.S.-JAPAN SPECIALISTS MEETING ON FAST REACTOR THERMAL TRANSIENTS
U.S. ERDA, WASHINGTON
ERDA-81 +. 445 PPS, MEETING HELD IN WASHINGTON, D.C., JUNE 19-20, 1975

THIS REPORT CONTAINS 20 PAPERS PRESENTED AT THE U.S.-JAPAN SPECIALISTS' MEETING ON FAST REACTOR THERMAL TRANSIENTS, HELD AT USERDA'S GERMANTOWN FACILITY ON JUNE 19-20, 1975.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

STRESS ANALYSIS + DESIGN STUDY + JAPAN + COMPONENTS + THERMAL TRANSIENT

5-109552 DATED 1975
FONTANA MH + MACPHERSON RE + GNADT PA + PARSLY LF + KRESS TS + WANTLAND JL
TEMPERATURE DISTRIBUTION IN A 19-ROD SIMULATED LMFBR FUEL ASSEMBLY IN A SCALLOPED DUCT (FUEL FAILURE MOCKUP BUNDLE 1B) - RECORD OF EXPERIMENTAL DATA
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4939 +. 175 PPS, 6 TABS, 7 FIGS, 11 REFS, NOV. 1975

THIS REPORT IS A RECORD OF EXPERIMENTAL DATA OBTAINED FROM FUEL FAILURE MOCKUP BUNDLE 1B, WHICH SIMULATED THE CONFIGURATION AND POWER LEVEL OF A SEGMENT OF A FAST TEST REACTOR FUEL SUBASSEMBLY. THE PURPOSE OF THIS TEST SERIES WAS TO OBTAIN THERMAL-HYDRAULIC DATA FOR USE IN DESIGN OF THE FAST TEST REACTOR CORE. THE REPORT INCLUDES A DESCRIPTION OF THE SYSTEM AND THE EXPERIMENTAL PROCEDURES, A DISCUSSION OF THE DATA REDUCTION PROCEDURES, AND TABULATED DATA FROM THE EXPERIMENTS PERFORMED IN THIS SERIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + HYDRAULIC EXPERIMENT + THERMAL EXPERIMENT + DATA COLLECTION + FUEL ELEMENTS

5-109563 ALSO IN CATEGORIES 7 AND 18 DATED 1975
GIESEKE JA + REED LD
WORK PLAN: AEROSOL BEHAVIOR MODELLING FOR FAST REACTOR SAFETY. TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-663 +. 22 PPS, 1 FIG, AUG. 1975

A WORK PLAN FOR EFFORTS IN THE TIME PERIOD FROM JULY 1, 1974, THROUGH JUNE 31, 1977, (FY 75, 76, AND 77) IS DESCRIBED. THE OVERALL GOALS OF THIS STUDY ARE TO PROVIDE IMPROVEMENTS IN THE CAPABILITY TO PREDICT AEROSOL BEHAVIOR IN POSTULATED FAST REACTOR ACCIDENT SITUATIONS AND VERIFY THIS BEHAVIOR TO THE EXTENT POSSIBLE BY COMPARISON WITH AVAILABLE EXPERIMENTAL RESULTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *AEROSOL + ANALYTICAL MODEL + *AEROSOL PROPERTIES + *BEHAVIOR

5-109571 ALSO IN CATEGORIES 11 AND 18 DATED 1975
KLIMA BB

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109571 *CONTINUED*
LMFBR SPENT FUEL TRANSPORT: SINGLE ASSEMBLY HEAT TRANSPORT TEST
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4936 +. 100 PPS, 8 TABS, 20 FIGS, OCT. 1975

THE SINGLE ASSEMBLY HEAT TRANSPORT TEST FACILITY OPERATING EXPERIENCE AND TEST DATA ARE PRESENTED. THIS FACILITY WAS SET UP TO TEST THE HEAT TRANSPORT OF A SIMULATED LMFBR SINGLE FUEL ASSEMBLY CONSISTING OF 217 STAINLESS STEEL TUBES EACH OF WHICH WAS INDIVIDUALLY WRAPPED WITH 0.091-IN.-DIAM WIRE. THIS ASSEMBLY FAILED AND WAS REPLACED BY AN ASSEMBLY WIHT 0.060-IN.-WIRE WRAPPING. HEAT TRANSPORT WAS TESTED USING SODIUM, HELIUM AND ARGON GASES, DOWTHERM A, AND A VACUUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION. SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + FUEL BURNUP + *HEAT TRANSFER + TESTING + TRANSPORT PROPERTY + *FUEL ELEMENTS

5-109576 ALSO IN CATEGORIES 11 AND 18 DATED 1975
SHIN YS + WAMBSGANSS MW
FLOW-INDUCED VIBRATION IN LMFBR STEAM GENERATORS: A STATE-OF-THE-ART REVIEW
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-16 +. 76 PPS, 38 FIGS, 119 REFS, MAY 1975

IDENTIFIES AND DISCUSSES EXISTING METHODS OF FLOW-INDUCED VIBRATION ANALYSIS APPLICABLE TO STEAM GENERATORS, THEIR LIMITATIONS, AND BASE-TECHNOLOGY NEEDS. ALSO INCLUDED ARE DISCUSSIONS OF FIVE DIFFERENT LMFBR STEAM-GENERATOR CONFIGURATIONS AND IMPORTANT DESIGN CONSIDERATIONS, FAILURE EXPERIENCES, POSSIBLE FLOW-INDUCED EXCITATION MECHANISMS, VIBRATION TESTING, AND AVAILABLE METHODS OF VIBRATION ANALYSIS. THE OBJECTIVES ARE TO AID LMFBR STEAM-GENERATOR DESIGNERS IN MAKING THE BEST POSSIBLE EVALUATION OF POTENTIAL VIBRATION IN STEAM-GENERATOR INTERNALS AND TO PROVIDE THE BASIS FOR DEVELOPMENT OF DESIGN GUIDELINES TO AVOID DETRIMENTAL FLOW-INDUCED VIBRATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDRAULIC EFFECT + DESIGN STUDY + *VIBRATION + *STEAM GENERATOR + FLOW + EFFECT

5-109586 ALSO IN CATEGORY 18 DATED 1975
VALIDATION OF HIGH TEMPERATURE DESIGN METHODS AND CRITERIA QUARTERLY PROGRESS REPORT FOR PERIOD ENDING FEBRUARY 28, 1975
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA.
WARD-HT-3045-11 +. 125 PPS, 14 TABS, 55 FIGS, AUG. 1975

BASIC SPECIMEN TESTING CONTINUED WITH TESTS ON WELDED PLATE WITH A CENTRAL HOLE, NOTCHED BAR BASE METAL, NOTCHED BAR WITH A TRANSVERSE WELD, AND AN ECCENTRICALLY LOADED PLATE. MULTIAXIAL, VARIABLE LOAD (STEP-LOADED) CREEP TESTING IS CONTINUING, AS IS PROGRESS ON THE MULTIAXIAL, VARIABLE LOAD TEST MATRIX FOR THE TYPE 304 STAINLESS STEEL TUBULAR SPECIMENS. HARDNESS MEASUREMENTS AND EXAMINATION OF GRAIN SIZE DISTRIBUTION, CRACKING CHARACTERISTICS, AND ANISOTROPY EFFECTS WERE PERFORMED TO COMPLETE MICROSTRUCTURAL CHARACTERIZATION OF POST-TEST SPECIMENS. A CONTROLLED TEST HAS BEEN SET UP TO DETERMINE AND MINIMIZE THE SOURCE OF ERRORS INTRODUCED IN THE MEASUREMENT OF PHOTOGRAPHIC PLATES RESULTING FROM THE STRAIN-GRID TECHNIQUE WHICH IS TO BE USED TO MEASURE STRAINS IN THE BASIC SPECIMENS AT ELEVATED TEMPERATURES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION. SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + FFTF (TR) + HIGH TEMPERATURE + DESIGN STUDY + CREEP + *R AND D PROGRAM + *METALLURGY + HEAT EXCHANGERS

5-109734 DATED 1975
BISHOP AA + ENGEL FC + MARKLEY RA
PARTIAL FLOW BLOCKAGE EFFECTS WITHIN A LMFBR FUEL ASSEMBLY
WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
CONF-750804-5 +. 38 PGS., FROM CONFERENCE ON HEAT TRANSFER, SAN FRANCISCO, CALIF., AUG. 11, 1975

A LUMPED THERMAL-HYDRAULIC MODEL WAS USED TO CALCULATE THE INCREASE IN THE SODIUM AND CLADDING TEMPERATURES IN THE WAKE BEHIND A NON-POROUS PARTIAL FLOW BLOCKAGE WITHIN A TYPICAL LMFBR FUEL ROD ASSEMBLY. THE MODEL PREDICTS THAT OVER 25% OF THE CROSS SECTIONAL FLOW AREA MAY BE BLOCKED BEFORE THE WAKE FLUID TEMPERATURE REACHES BOILING. THE ACTUAL SIZE DEPENDS ON THE BLOCKAGE AXIAL LOCATION AND RADIAL LOCATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FLOW BLOCKAGE + FUEL ELEMENT CLUSTER + MODEL + THERMAL HYDRAULIC ANALYSIS

5-109745 ALSO IN CATEGORY 18 DATED 1975
CHEN BCJ + TODREAS NE
PREDICTION OF COOLANT TEMPERATURE FIELD IN A BREEDER REACTOR INCLUDING INTERASSEMBLY HEAT TRANSFER
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-20TR +. 131 PPS, 2 TABS, 38 FIGS, 8 REFS, MAY 1975

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109745 *CONTINUED*
A GENERAL MULTI-ASSEMBLY COMPUTER CODE, SUPERENERGY, FOR INVESTIGATING THE EFFECT OF THE INTERASSEMBLY HEAT TRANSFER ON THE TEMPERATURE FIELD OF A BREEDER REACTOR IS DISCUSSED ALONG WITH A LISTING OF THE CODE AND A SAMPLE PROBLEM USING CRBR INPUT. THIS CODE WAS USED TO STUDY THE EFFECT OF INCLUDING VARIOUS RINGS OF COUPLED ASSEMBLIES ON THE TEMPERATURE PREDICTION OF THE CENTRAL CRBR ASSEMBLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TEMPERATURE GRADIENT + HEAT TRANSFER ANALYSIS + COMPUTER PROGRAM, DIGITAL + CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

5-109830 ALSO IN CATEGORY 18 DATED 1975
SLAFTER W + ROODBERGEN HA
NUMERICAL CALCULATION OF TEMPERATURE FIELDS IN ROD ASSEMBLIES WITH LIQUID METAL COOLING
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
RCN-227 +. 34 PPS, 10 FIGS, 13 REFS, JULY 1975

THE FINITE ELEMENT METHOD IS USED TO NUMERICALLY PREDICT 3-D TEMPERATURE DISTRIBUTION IN SMALL REGIONS OF HEXAGONAL LMFBR FUEL ASSEMBLIES COOLED BY LIQUID METAL. THE STUDY ASSUMES STEADY-STATE HEAT TRANSFER WITH A PRESCRIBED HEAT FLUX AND SLUG FLOW. COMPARISON WITH AVAILABLE EXPERIMENTAL AND THEORETICAL RESULTS SHOWED THAT CONTRIBUTION OF TURBULENCE TO INTERSUBCHANNEL HEAT TRANSPORT IN SODIUM EQUALS THAT DUE TO CONDUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + ANALYTICAL MODEL + FUEL ROD + THERMAL HYDRAULIC ANALYSIS

5-109831 ALSO IN CATEGORY 18 DATED 1976
FONTANA MH + GNADT PA + KRESS TS + MACPHERSON RE
TEMPERATURE DISTRIBUTION IN 19-ROD SIMULATED LMFBR FUEL ASSEMBLIES WITH AND WITHOUT EDGE BLOCKAGES (OUT-OF-REACTOR TESTS FOR ANL SLSF P1 EXPERIMENT)-RECORD OF EXPERIMENTAL DATA FOR FUEL FAILURE MOCKUP BUNDLES 5B AND 5C
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5003 +. 60 PPS, 16 TABS, 26 FIGS, 21 REFS, JAN. 1976

A RECORD OF UNEVALUATED EXPERIMENTAL DATA IS GIVEN FOR LMFBR-FUEL FAILURE MOCKUP (FFM) BUNDLES 5B AND 5C. BUNDLE 5B, IS A 19-ROD BUNDLE WITH A PARTIAL BLOCKAGE FLUSH AGAINST THE DUCT WALL. BUNDLE 5C IS THE SAME AS BUNDLE 5B, BUT WITHOUT BLOCKAGE. PURPOSE OF TESTS WAS TO DETERMINE EFFICACY OF THE BLOCKAGE FOR INDUCING FUEL FAILURE IN THE SLSF-P1 EXPERIMENT (TO BE CONDUCTED BY ANL) AND TO PREVIEW THERMAL-HYDRAULIC COOLANT BEHAVIOR OF THE SLSF ROD BUNDLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + HYDRAULIC EXPERIMENT + REACTOR, SAFETY RESEARCH + OUT OF PILE EXPERIMENT + THERMAL EXPERIMENT + HEAT TRANSFER EXPERIMENT + FLOW BLOCKAGE + DATA COLLECTION + HEATERS

5-109834 ALSO IN CATEGORY 11 DATED 1975
PECHERSKY MJ + MARKELY RA + CHUANG MC + KOTHMANN RE
CLADDING CIRCUMFERENTIAL HOT SPOT FACTORS FOR FUEL AND BLANKET RODS
WESTINGHOUSE ELECTRIC CORP., MADISON AND PITTSBURGH, PA.
8 PPS, 14 FIGS, 5 REFS, NUCLEAR ENGINEERING & DESIGN, 35(1), PP. 21-28 (DEC. 1975)

TO EVALUATE THE PERFORMANCE OF A WIRE-WRAPPED LMFBR FUEL OR BLANKET ASSEMBLY, THE EFFECT OF THE WIRE WRAP ON THE LOCAL CLADDING TEMPERATURE PROFILE MUST BE ASCERTAINED. THERE IS AN INCREASE IN THE LOCAL CLADDING TEMPERATURE IN THE VICINITY OF THE CONTACT POINT BETWEEN THE ROD AND THE WIRE. RESULTS OF A STUDY TO DETERMINE CLADDING CIRCUMFERENTIAL TEMPERATURE PROFILES IN FUEL AND BLANKET RODS ARE PRESENTED. CALCULATIONS WERE ALSO PERFORMED FOR 'BARE' RODS TO DETERMINE THE NET EFFECT OF THE WIRE WRAP. CALCULATIONS WERE PERFORMED WITH THE FATHOM-II COMPUTER PROGRAM, WHICH SOLVES THE MOMENTUM AND ENERGY EQUATIONS IN THE COOLANT SURROUNDING THE FUEL ROD AND THE CONDUCTION EQUATIONS IN THE CLADDING AND WIRE WRAP. THIS PAPER STUDIES THE MOST SEVERE CONDITION OF THE HOT SPOT TEMPERATURE.

COMPUTER PROGRAM + *CLADDING + *HOT SPOT + FUEL ROD + TEMPERATURE + BLANKET

5-109901 ALSO IN CATEGORY 11 DATED 1974
ALEXAS A + LINDNER W + SCHIKARSKI W
OUT-OF-PILE SIMULATION OF FUEL PIN BEHAVIOR IN SODIUM-COOLED FAST BREEDER REACTORS BY UO2 RODS HEATED BY ELECTRICAL CURRENT
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 14 PPS, PP. 535-49, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

FUEL PIN BEHAVIOR IN ALL TYPES OF NUCLEAR REACTORS UNDER BOTH STEADY STATE AND TRANSIENT OVERPOWER CONDITIONS IS STILL ONE OF THE MAJOR PROBLEMS IN REACTOR SAFETY. PIN BEHAVIOR IN FAST BREEDER REACTORS (OF BOTH SODIUM AND GAS COOLED TYPE) IS OF PARTICULAR INTEREST SINCE IN THE PRESENT STATE OF THE SAFETY ANALYSIS POWER EXCURSION INCIDENTS IN FAST REACTOR CORES ARE CONSIDERED CREDIBLE AT LEAST IN UNPROTECTED HYPOTHETICAL ACCIDENTS.

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109901 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *TESTING + SIMULATION + *BEHAVIOR + *FUEL ELEMENTS

5-109902 ALSO IN CATEGORY 11 DATED 1974
KWAST H
THE BEHAVIOR OF FAST REACTOR FUEL PINS UNDER LOSS OF COOLANT FLOW CONDITIONS
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
CONF-740401-P2 +. 14 PPS, PP. 550-64, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE EXPERIMENTAL PROGRAM ON FAST REACTOR SAFETY, IN PROGRESS AT RCN, INCLUDES IRRADIATIONS OF SINGLE FUEL PINS UNDER LOSS OF COOLANT FLOW CONDITIONS. TWO TYPES OF EXPERIMENTS ARE PERFORMED: CLAD FAILURE EXPERIMENTS, DESIGNATED AS SHOT AND LOSS OF COOLING EXPERIMENTS, DESIGNATED AS LOC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *ACCIDENT, LOSS OF COOLANT + FAILURE, CLADDING + *BEHAVIOR + *FUEL ELEMENTS

5-109903 ALSO IN CATEGORY 11 DATED 1974
HUNTER CW + FISH RL
DEFORMATION AND FAILURE OF FAST REACTOR CLADDING DURING SIMULATED LOSS-OF-FLOW TYPE TRANSIENTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 15 PPS, PP. 565-79, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DEFORMATION AND FAILURE BEHAVIOR OF 20% COLD WORKED TYPE 316 STAINLESS STEEL FUEL CLADDING WAS EXPERIMENTALLY DETERMINED UNDER THERMAL TRANSIENTS AND INTERNAL GAS PRESSURES, WHICH SIMULATED HYPOTHETICAL LOSS-OF-FLOW ACCIDENT CONDITIONS. BOTH UNIRRADIATED AND EBR-II IRRADIATED TUBULAR CLADDING SPECIMENS (7.4-9.0 X 10 (EXP 21) N/CM SQUARED, EN > 0.1 MEV) WERE SUBJECTED TO HEATING RATES OF 10 AND 200 DEG F/SEC, WITH HOOP STRESS LOADINGS OF 1300 TO 6480 PSI. THESE TEST CONDITIONS PRODUCED CLADDING FAILURE AT TEMPERATURES FROM 2000 TO 2400 DEG F.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + FAILURE + FAILURE, FUEL ELEMENT + *DEFORMATION + *FAILURE, CLADDING + BEHAVIOR + FUEL ELEMENTS

5-109904 ALSO IN CATEGORY 11 DATED 1974
MARR WW + WANG PY + MISRA B
SUBASSEMBLY-TO-SUBASSEMBLY FAILURE PROPAGATION: THERMAL LOADING OF ADJACENT SUBASSEMBLY
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2. 16 PPS, PP. 598-614, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

PRESENTS THE RESULTS OF SOME ANALYTICAL STUDIES ON SUBASSEMBLY FAILURE PROPAGATION. THIS IS BEING DONE TO PROVIDE A VISIBLE DEMONSTRATION OF LMFBR SAFETY FOR SEVERAL POSTULATED INITIATING ACCIDENTS EVEN THOUGH THEY ARE CONSIDERED TO BE VERY UNLIKELY. IT IS WORTH NOTING THAT THERE HAS BEEN NO EVIDENCE OF SUBASSEMBLY FAILURE PROPAGATION IN CURRENT OPERATING NUCLEAR REACTORS, EVEN THOUGH FUEL FAILURES AND, IN SOME CASES, EXTENSIVE FUEL MELTING HAVE OCCURRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *FUEL ELEMENT CLUSTER + *FAILURE MODE ANALYSIS + BEHAVIOR + FUEL ELEMENTS

5-109905 ALSO IN CATEGORY 11 DATED 1974
VAN ERP JE + CHAWLA TC + FAUSKE HK
AN EVALUATION OF PIN-TO-PIN FAILURE PROPAGATION IN LMFBR FUEL SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 40 PPS, PP. 615-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A SURVEY IS PRESENTED CONCERNING EXPERIMENTAL AND ANALYTICAL WORK PERFORMED WITH THE AIM OF EVALUATING THE POTENTIAL FOR PIN-TO-PIN FAILURE PROPAGATION WITHIN FUEL SUBASSEMBLIES OF LIQUID METAL COOLED FAST BREEDER REACTORS (LMFBRS) OF CURRENT DESIGN (MIXED U-PU OXIDE PELLETS, STAINLESS STEEL CLADDING). IT IS CONCLUDED THAT (1) THE OCCURRENCE OF PIN-TO-PIN FUEL FAILURE PROPAGATION FOR CURRENT LMFBR FUEL DESIGNS IS IMPROBABLE FOR ANY OF THE POSTULATED PROPAGATION MECHANISMS, AND (2) IF FAILURE PROPAGATION WERE TO OCCUR AT ALL, THEN EITHER IT WILL BE SELF-LIMITING OR ITS PROGRESSION WILL BE SLOW, ALLOWING AMPLE TIME FOR DETECTION (E.G., BY MEANS OF MONITORING SYSTEMS FOR FISSION PRODUCTS IN COVER GAS AND REACTOR COOLANT), AND FOR CORRECTIVE ACTION, IF NECESSARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + *FAILURE, FUEL ELEMENT + *FUEL ELEMENT CLUSTER + FAILURE MODE ANALYSIS + BEHAVIOR + FUEL ELEMENTS

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109906 ALSO IN CATEGORIES 7 AND 11 DATED 1974
WEBER ET + SLAGLE OD + HINMAN CA
LABORATORY STUDIES ON MELTING AND GAS RELEASE BEHAVIOR OF IRRADIATED FUEL
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 22 PPS, PP. 641-63. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RESPONSE OF IRRADIATED FUELS TO RAPID HEATING IS A MAJOR FACTOR WHICH MUST BE CONSIDERED IN SAFETY ANALYSES FOR FAST REACTORS. A SERIES OF EXPERIMENTS AT HEDL PROVIDE OBSERVATIONS AND DATA ON THE RESPONSE OF FAST FLUX (EBR-II) IRRADIATED FUEL MATERIALS WHEN SUBJECTED TO RAPID HEATING IN THE LABORATORY. FUEL SAMPLES WITHIN A RESISTIVELY HEATED TUNGSTEN TUBE ARE SUBJECTED TO THERMAL TRANSIENTS IN A SYSTEM PROVIDING FOR TEMPERATURE AND PRESSURE MEASUREMENTS, IN ADDITION TO CONTINUOUS GAMMA RADIOGRAPHY OF THE SAMPLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

FAILURE + FAILURE, FUEL ELEMENT + THERMAL CONSIDERATION + *IRRADIATION TESTING + BEHAVIOR + *FUEL ELEMENTS

5-109907 ALSO IN CATEGORY 11 DATED 1974
VONKA V + BOSWINKEL HH + HEIL JA
A FUEL PIN BOWING UNDER LMFBR CONDITIONS
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
CONF-740401-P2 +. 15 PPS, PP. 664-78. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RESULTS AND CONCLUSIONS OF A THEORETICAL AND EXPERIMENTAL INVESTIGATION ON ROD BOWING, UNDER LIQUID METAL FAST BREEDER REACTOR CONDITIONS, IN 4, 7 AND 12 ROD ELECTRICALLY HEATED MOCK UPS OF FUEL ELEMENTS IS REPORTED. SEVERE ROD BOWING WAS OBSERVED, UPON VISUAL AND RADIO-NEUTROGRAPHIC INSPECTION AFTER OPERATION OF ABOVE-MENTIONED CLUSTERS, CAUSED BY RADIAL TEMPERATURE GRADIENTS. THIS KIND OF BOWING WAS OF A PROGRESSIVE NATURE, AS THE BOWING CAUSES A CHANGING SUBCHANNEL GEOMETRY AND THEREBY A CHANGE OF THE INITIATING TEMPERATURE GRADIENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *COMPARISON, THEORY AND EXPERIENCE + *DEFORMATION + BEHAVIOR + FUEL ELEMENTS

5-109912 ALSO IN CATEGORIES 8 AND 11 AND 18 DATED 1974
KRIEG R + CRAWFORD RM
DEFORMATION IN A 19-PIN BUNDLE DUE TO A SUDDEN FLUID EXPANSION
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 15 PPS, PP. 748-62. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE TRANSIENT FLOW AND PRESSURE FIELDS AS WELL AS THE PIN DEFORMATIONS ARE DETERMINED FOR A FLEXIBLE TWO-ROW PIN BUNDLE SURROUNDED BY AN INFINITE FLUID WITH A TRANSIENT FLUID SOURCE IN THE BUNDLE CENTER. BY NEGLECTING THE FLUID COMPRESSIBILITY AND VISCOSITY, THE SOLUTION FOR THE FLOW PROBLEM IS OBTAINED BY SUPERPOSITION OF SOLUTIONS FOR CERTAIN SINGULARITIES (SOURCES, DIPOLES, QUADRUPOLES). THE FLEXIBILITY OF THE PINS IS ESSENTIALLY APPROXIMATED BY ELASTIC PIN-BUNDLE DEFORMATIONS DUE TO A FUEL-COOLANT INTERACTION CAUSED BY A FAILED PIN IN A LIQUID-METAL-COOLED REACTOR. THE RESULTS MAY HELP TO ESTIMATE THE POTENTIAL FOR FAILURE PROPAGATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FLOW THEORY AND EXPERIMENTS + *DEFORMATION + EXPANSION + *FUEL ELEMENT CLUSTER + STRUCTURAL ANALYSIS, DYNAMIC

5-109914 ALSO IN CATEGORY 12 DATED 1974
ANTONAKAS D + ZALESKI CP + MALAVAL M + CHALOT A
DECAY HEAT REMOVAL IN AN LMFBR
COMMISSARIAT A L'ENERGIE ATOMIQUE + ELECTRICITE DE FRANCE
CONF 740401-P2 +. 16 PPS, PP. 785-801. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THIS PAPER DISCUSSES CRITERIA PERTINENT TO DECAY HEAT REMOVAL PRESENTLY UNDER CONSIDERATION FOR LMFBR'S IN FRANCE; AND DESCRIBES THE SOLUTIONS RETAINED IN SUPER PHENIX PROJECT, NOW IN THE DETAILED DESIGN PHASE, AND IN PHENIX DEMONSTRATION PLANT, NOW IN OPERATION. SOME THOUGHTS ABOUT DECAY HEAT REMOVAL AFTER AN EVENTUAL CORE MELT DOWN ACCIDENT ARE PRESENTED AND AN EVALUATION OF DIFFERENT DECAY HEAT REMOVAL SYSTEMS BY PROBABILISTIC METHODS IS GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + FRANCE + *EMERGENCY COOLING + COOLING

5-109915 ALSO IN CATEGORIES 11 AND 18 DATED 1974
PECKOVER RS
THE THERMAL CONTAINMENT OF REACTOR CORE MATERIAL AFTER SHUTDOWN
UKAEA CULHAM LABORATORY, UK
CONF-740401-P2 +. 20 PPS, PP. 802-22. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109915 *CONTINUED*
A TEMPERATURE EXCURSION ARISING THROUGH SOME HYPOTHETICAL BLOCKAGE OF THE COOLING SYSTEM IN A LIQUID COOLED REACTOR SYSTEM COULD LEAD TO THE MELT-OUT OF THE CORE OR PART OF THE CORE. ONE WAY OF CONTAINING THE CORE DEBRIS MAY BE TO ALLOW IT TO FALL INTO SUITABLY DESIGNED CORE CATCHERS PLACED BELOW THE CORE SUBASSEMBLIES. AN ALTERNATIVE APPROACH WOULD BE TO ALLOW THE CORE MATERIAL TO SETTLE ON THE BOTTOM OF THE REACTOR POT WHICH IS COOLED FROM BELOW BY FORCED CONVECTION. A THIRD POSSIBILITY IS TO ALLOW THE CORE TO FALL INTO A SUBTERRANEAN CAVITY BUILT ESPECIALLY FOR THE PURPOSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + EMERGENCY COOLING + COOLING + *CORE CATCHER

5-109916 ALSO IN CATEGORY 18 DATED 1974
GABOR JD + SOWA ES + BAKER L
STUDIES AND EXPERIMENTS ON HEAT REMOVAL FROM FUEL DEBRIS IN SODIUM
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 21 PPS, PP. 823-44, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DEBRIS-BED HEAT TRANSFER AND SELF-LEVELING EXPERIMENTS WERE CARRIED OUT TO PROVIDE INFORMATION NEEDED FOR POSTACCIDENT HEAT REMOVAL ANALYSIS OF SODIUM-COOLED REACTORS. THE EXPERIMENTS WERE WITH PARTICULATE UO2 IN WATER, WITH PARTICULATE UO2 IN SODIUM, AND WITH PARTICULATE UO2 AND STAINLESS STEEL IN SODIUM. TWO TYPES OF EXPERIMENTS WERE PERFORMED: (1) BOTTOM-HEATING FROM FLAME SOURCES AND (2) ELECTRICAL HEATING WITHIN THE COOLANT PHASE OF THE BEDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + HEAT TRANSFER + *THERMAL EXPERIMENT + EMERGENCY COOLING + COOLING

5-109917 DATED 1974
CATTON I + ERDMANN RC + SUO-ANTTILA AJ
BOILING HEAT TRANSFER FROM MOLTEN FUEL LAYERS
UNIVERISTY OF CALIFORNIA, LOS ANGELES
CONF-740401-P2 +. 20 PPS, PP. 845-64, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

EXPERIMENTAL RESULTS ARE USED TO ESTABLISH THE MAXIMUM TEMPERATURE IN THE MOLTEN LAYER. AVAILABLE MOLTEN UO2 PROPERTIES HAVE BEEN OBTAINED AND UPPER AND LOWER BOUNDS ON THE MAXIMUM TEMPERATURE ARE OBTAINED AS A FUNCTION OF THE MOLTEN FUEL LAYER AND THE MAGNITUDE OF THE DECAY HEAT. RESULTS ARE PRESENTED IN TERMS OF THE REQUIRED DECAY HEAT TO INITIATE BOILING AS A FUNCTION OF LAYER DEPTH. A MODEL OF THE BOILING MOLTEN FUEL LAYER IS DEVELOPED WHICH INCLUDES BUBBLE NUCLEATION, GROWTH AND BUBBLE INDUCED FLUID CIRCULATIONS. THE MODEL IS CORRELATED WITH EXISTING DATA FOR JOULE HEATED SALT WATER AND FOUND TO BE REASONABLE OVER A WIDE RANGE OF HEATING RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + HEAT TRANSFER + *THERMAL EXPERIMENT + MOLTEN FUEL + *BUBBLE NUCLEATION + EMERGENCY COOLING + COOLING + BOILING

5-109918 DATED 1974
STEIN RP + HESSON JC + GUNTHER WH
STUDIES OF HEAT REMOVAL FROM HEATING GENERATING BOILING POOLS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 17 PPS, PP. 865-82, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

FIRST-OF-A-KIND EXPERIMENTS WERE PERFORMED IN WHICH WATER WAS BOILED IN OPEN RECTANGULAR CONTAINERS BY INTERNAL HEAT GENERATION. SMALL AMOUNTS OF SALT WERE ADDED TO THE WATER SO THAT IT WOULD BE ELECTRICALLY CONDUCTING. INTERNAL HEATING WAS OBTAINED BY THE PASSAGE OF ELECTRICAL CURRENT THROUGH THE LIQUID. FOR THE FIRST SERIES OF EXPERIMENTS, THE BOILING POOL WAS COOLED AT THE BOTTOM SURFACE ONLY. FOR THE SECOND SERIES OF EXPERIMENTS, THE POOL WAS ALSO COOLED AT TWO OPPOSING VERTICAL SIDES OF THE CONTAINER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + *THERMAL EXPERIMENT + EMERGENCY COOLING + COOLING

5-109922 ALSO IN CATEGORY 8 DATED 1974
HENRY RE + GABOR JD + WINSCH IO
LARGE SCALE VAPOR PROBLEMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 12 PPS, PP. 922-34, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

LARGE SCALE THERMAL INTERACTION STUDIES HAVE BEEN CARRIED OUT WITH BOTH SIMULANT FLUIDS AND REACTOR MATERIALS TO INVESTIGATE THE VALIDITY OF PROPOSED VAPOR EXPLOSION MODELS AND THE LIKELIHOOD OF SUCH EVENTS IN A LIQUID METAL FAST BREEDER REACTOR. EXPERIMENTAL RESULTS WITH FREON-22 AND WATER SHOW THAT THE INTERFACE TEMPERATURE, HOMOGENEOUS NUCLEATION MODEL ACCURATELY

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109922 *CONTINUED*
PREDICTS THE NECESSARY TEMPERATURE CONDITIONS FOR THE ONSET OF LARGE SCALE VAPOR EXPLOSIONS. LARGE SCALE THERMAL INTERACTION EXPERIMENTS WITH REACTOR MATERIALS, IN WHICH MOLTEN URANIUM DIOXIDE WAS INJECTED BELOW THE SURFACE OF A SODIUM POOL, DID NOT PRODUCE ANY MEASURABLE THERMALLY EXPLOSIVE EVENTS. THIS RESULT IS ALSO IN AGREEMENT WITH THE INTERFACE TEMPERATURE, HOMOGENEOUS NUCLEATION MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + *THERMAL EXPERIMENT + VAPOR PRESSURE + *FUEL COOLANT INTERACTION

5-109923 ALSO IN CATEGORY 8 DATED 1974
BOARD SJ + HALL RW + BROWN GE
THE ROLE OF SPONTANEOUS NUCLEATION IN THERMAL EXPLOSIONS-FREON/WATER EXPERIMENTS
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
CONF-740401-P2 +. 2 PPS, PP. 935-36, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE CASE OF SODIUM-UO2 EXPLOSIONS, ALTHOUGH STABLE FILM-BOILING IS UNLIKELY, EXPERIMENTS IN WHICH SODIUM IS INJECTED INTO UO2 PRODUCE VIGOROUS EXPLOSIONS. IT IS SUGGESTED THAT A STABILIZING SHELL OF FROZEN UO2 MAY DEVELOP AND THAT THIS COULD DELAY THE INTERACTION IN THE SAME WAY AS A VAPOUR FILM. MOREOVER, IN A PROMPT-CRITICALITY INCIDENT THE FUEL MAY BE ALREADY SURROUNDED BY COOLANT BEFORE THE EXCURSION SO THAT A DELAY IS NOT NECESSARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + URANIUM DIOXIDE + *FUEL COOLANT INTERACTION

5-109924 ALSO IN CATEGORY 8 DATED 1974
CALDAROLA L + KASTENBERG WE
ON THE MECHANISM OF FRAGMENTATION DURING MOLTEN FUEL/COOLANT THERMAL INTERACTIONS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 17 PPS, PP. 937-54, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A MATHEMATICAL MODEL FOR THE FRAGMENTATION OF UO2 DURING THE MOLTEN UO2/SODIUM THERMAL INTERACTION IS PRESENTED. THE MODEL IS BASED UPON RESULTS OF SIMULATION EXPERIMENTS WITH METAL/WATER INTERACTIONS IN WHICH BUBBLE VAPOR GROWTH AND COLLAPSE IS OBSERVED. PRELIMINARY NUMERICAL CALCULATIONS WITH THE MODEL YIELD QUALITATIVE AGREEMENT WITH MOLTEN STAINLESS STEEL/SODIUM EXPERIMENTS AND HAVE A SIMILARITY TO THE RECENTLY PUBLISHED PRESSURE/TEMPERATURE, UNSTABLE FILM BOILING CURVE OF FARAHAT. AREAS OF NEEDED IMPROVEMENTS IN THE MODEL ARE ALSO PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANALYTICAL MODEL + URANIUM DIOXIDE + BOILING + *FUEL COOLANT INTERACTION

5-109925 ALSO IN CATEGORY 8 DATED 1974
ERDMAN CA + GARNER PL + HAAS PM
IMPROVEMENTS IN MODELING FUEL-COOLANT INTERACTIONS AND INTERPRETATION OF THE S-11 TREAT TEST
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE
CONF-740401-P2 +. 13 PPS, PP. 955-68, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THREE CONSTRAINT MODELS USED IN FUEL-COOLANT INTERACTION (FCI) CALCULATIONS AT THE UNIVERSITY OF VIRGINIA ARE COMPARED, INCLUDING A NEW TWO-DIMENSIONAL CONSTRAINT. THE NEW CONSTRAINT MODEL PROVIDES AN ESTIMATE OF ENERGY PARTITIONING NOT AVAILABLE FROM THE TWO OTHER CONSTRAINTS. A SIMPLE MODEL FOR REPRESENTING HEAT LOSSES FROM THE FCI ZONE IS DESCRIBED. VALIDITY OF THE MODEL FOR FCI CALCULATIONS IS DEMONSTRATED BY COMPARISON WITH A MORE COMPLEX MODEL. THE EFFECT OF ZONE HEAT LOSSES ON FCI CALCULATIONS IS SHOWN FOR THREE DIFFERENT SETS OF INITIAL FCI ZONE CONDITIONS. ADDITIONAL ANALYSIS OF THE S-11 TREAT TEST IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *ANALYTICAL MODEL + *COMPARISON + *FUEL COOLANT INTERACTION

5-109926 ALSO IN CATEGORY 8 DATED 1974
FAUSKE HK
SOME ASPECTS OF LIQUID-LIQUID HEAT TRANSFER AND EXPLOSIVE BOILING
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 16 PPS, PP. 992-1008, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

MOLTEN STEEL- AND FUEL-COOLANT INTERACTIONS BECOME OF INTEREST IF, DURING THE COURSE OF A POSTULATED ACCIDENT FUEL, CLADDING, OR STRUCTURAL MATERIALS BECOME MOLTEN AND CAN CONTACT SODIUM. THE POTENTIAL FOR EXPLOSIVE INTERACTIONS (VAPOR EXPLOSIONS) BETWEEN THESE MATERIALS HAS BEEN OF PRIMARY CONCERN FOR SOME TIME. THIS CONCERN IS SIMPLIFIED BY THE FACT THAT IT HAS BEEN KNOWN FOR YEARS THAT VIOLENT INTERACTIONS CAN OCCUR WHEN HOT LIQUIDS COME INTO CONTACT WITH COLD LIQUIDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109926 *CONTINUED*
EXPLOSION + *HEAT TRANSFER + LIQUID + BOILING + *FUEL COOLANT INTERACTION

5-109927 ALSO IN CATEGORY 8 DATED 1974
CALDAROLA L + KOUTSOUVELIS G
A THEORETICAL MODEL WITH VARIABLE MASSES FOR MOLTEN FUEL-SODIUM THERMAL INTERACTIONS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 22 PPS, PP. 969-91, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE MODEL PROPOSED IN THIS PAPER, THE REACTION HAS BEEN ASSUMED TO OCCUR IN TWO SUCCESSIVE PHASES. PHASE A - A GIVEN NUMBER (FUNCTION OF TIME) OF FUEL PARTICLES COMES IN INTIMATE CONTACT WITH A GIVEN MASS OF LIQUID SODIUM (FUNCTION OF TIME). THE HEAT TRANSFER PROCESS IS CHARACTERIZED BY VERY GOOD THERMAL CONTACT BETWEEN THE FUEL AND THE COOLANT, AND BY A LARGE CONTACT AREA DUE TO THE SMALL SIZE OF THE PARTICLES AND THE HEAT TRANSFER COEFFICIENT DECREASES WITH TIME. PHASE B - THE HEAT TRANSFER PROCESS IS CHARACTERIZED BY A VERY LARGE CONTACT AREA, AND BY A THERMAL CONTACT BETWEEN THE FUEL AND THE COOLANT WHICH BECOMES INCREASINGLY WORSE WITH TIME, DUE TO THE FORMATION OF A SODIUM VAPOUR LAYER AT THE EXTERNAL SURFACE OF THE FUEL FRAGMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANALYTICAL MODEL + THEORETICAL INVESTIGATION + *FUEL COOLANT INTERACTION

5-109930 ALSO IN CATEGORY 18 DATED 1974
GOETZMANN CA + CALLE DONNE M
DESIGN AND SAFETY STUDIES FOR A 1000-MWE GAS-COOLED FAST REACTOR
GESELLSCHAFT FUR KERNFORSCHUNG M.B.H., KARLSRUHE
CONF-740401-P2 +. 21 PPS, PP. 1061-82, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

REVIEWS THE WORK THAT IS CURRENTLY BEING DONE IN THE FEDERAL REPUBLIC OF GERMANY ON THE DESIGN AND SAFETY ASPECTS OF A LARGE 1000 MWE GAS COOLED FAST REACTOR. MENTION IS MADE OF THE CONCURRENT EXPERIMENTAL PROGRAM AIMED AT THE INPILE TESTING OF A REDUCED SIZED FUEL ELEMENT HAVING FEATURES TYPICAL FOR THE GAS COOLED FAST REACTOR SYSTEM. THE DESIGN STUDIES COMPRISE THE LAYOUT OF BOTH THE PRIMARY AND SECONDARY SYSTEM, THE LATTER TO THE EXTENT NECESSARY TO DETERMINE ITS FEED BACK ON THE PRIMARY SYSTEM. DATA RELATING TO THE NUCLEAR AND THERMO-HYDRAULIC CORE DESIGN AND ITS DEPENDENCE ON ENRICHMENT ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *REACTOR, CCR + *DESIGN STUDY + GERMANY + SAFETY EVALUATION + R AND D PROGRAM

5-109932 ALSO IN CATEGORY 18 DATED 1974
GAST K + PEPPLER W + SMIDT D
SODIUM BOILING EXPERIMENTS AND THEIR IMPORTANCE FOR THE REACTOR SAFETY
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 17 PPS, PP. 1121-38, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

WITHIN THE SCOPE OF THE R AND D PROGRAM OF THE LMFBR'S (SNR) THE BEHAVIOR OF LOCAL AND INTEGRAL COOLING-DISTRUBANCES IN SUBASSEMBLIES IS INVESTIGATED UP TO BOILING. THESE PROCESSES ARE OF INTEREST WITH RESPECT TO THE FAILURE PROPAGATION AND THE COURSE OF SEVERE HYPOTHETICAL ACCIDENTS. A SHORT SURVEY IS GIVEN OF THE DIFFERENT SAFETY REQUIREMENTS WITH RESPECT TO THE NATIONAL REACTOR CONCEPTS. THE KARLSRUHE WORK ON THE PROBLEMS OF COOLING DISTURBANCES, DETECTION AND SODIUM BOILING IS REVIEWED AND FUTURE PROSPECTS ARE INDICATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*GERMANY + NUCLEATE BOILING + *R AND D PROGRAM + *BOILING

5-109933 ALSO IN CATEGORY 18 DATED 1974
FONTANA MH + GNADT PA + KRESS TS
EFFECT OF PARTIAL BLOCKAGES IN SIMULATED LMFBR FUEL ASSEMBLIES
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-740401-P3 +. 21 PPS, PP. 1139-60, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

EXPERIMENTAL DATA ON THE EFFECTS OF PARTIAL BLOCKAGES IN SIMULATED LMFBR ROD BUNDLES ARE REVIEWED AND THE RESULTS PRESENTED. EXPERIMENTS PERFORMED IN THE ORNL FUEL FAILURE MOCKUP WITH 13- AND 24-CHANNEL INLET BLOCKAGES IN 19-ROD SODIUM-COOLED ELECTRICALLY HEATED ROD BUNDLES INDICATE THAT EXCESSIVE TEMPERATURES DO NOT OCCUR AS A RESULT OF THE BLOCKAGES. A SIMPLE REPRESENTATION OF FLOW RECIRCULATION IN THE WAKE OF THE BLOCKAGE INDICATES THAT A SMALL RECIRCULATING FLOW SIGNIFICANTLY REDUCES TEMPERATURES IN THE WAKE ZONE. CALCULATIONS OF TEMPERATURES WITHIN HEAT-GENERATING BLOCKAGES INDICATE THAT IN ORDER TO OBTAIN TEMPERATURES ABOVE THE CLADDING LIMIT MORE THAN ONE SUBCHANNEL MUST BE BLOCKED OVER A LENGTH IN EXCESS OF 0.5 IN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FLOW THEORY AND EXPERIMENTS + *FLOW BLOCKAGE + *SIMULATION + FUEL ROD + BOILING

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109934 ALSO IN CATEGORY 9 DATED 1974
CLARE AJ + BOARD SJ + HALL RS
STUDIES OF THE DEVELOPMENT OF COOLANT BOILING IN A FAST REACTOR
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, ENGLAND
CONF-740401-P3 +. 11 PPS, PP. 1161-72, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

INFORMATION OBTAINED ABOUT THE ONSET AND DEVELOPMENT OF COOLANT BOILING IN A FAST REACTOR IS OF CONSIDERABLE IMPORTANCE IN DETERMINING ITS ULTIMATE SAFETY CONSEQUENCES, AND IS ALSO ESSENTIAL AS AN AID TO QUANTIFYING THE DETECTABLE SIGNALS WHICH MAY BE GENERATED BY THE PROCESSES. EXPERIMENTS IN A WATER RIG ARE DESCRIBED WHICH AIM TO DEFINE THE TEMPERATURE DISTRIBUTION AROUND BLOCKAGES IN A PIN-CLUSTER, AND THE CONSEQUENT COOLANT BOILING PATTERNS. ANALYSIS OF THE DATA HAS SHOWN THE EFFECTS OF THE INTERACTION OF THE VAPOUR BUBBLES WITH THE FLOW AND TEMPERATURE FIELDS. THE REQUIREMENTS OF A COOLANT BOILING MODEL ARE DISCUSSED, INCLUDING THE EFFECT OF PERTURBATIONS SUCH AS THE RELEASE OF GAS FROM FAILED FUEL PINS. THE IMPLICATIONS OF THE PROGRAMME OF WORK ON REACTOR SAFETY, AND FAULT DETECTION, ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FLOW THEORY AND EXPERIMENTS + *NUCLEATE BOILING + *BOILING

5-109935 DATED 1974
KOTTOWSKI HM + MOL MJ + MORANDI A
MEASUREMENT OF THE LIQUID METAL RESIDUAL FILM LEFT BEHIND COOLANT EXPULSION IN NARROW CHANNELS
UNIVERSITY OF BOLOGNA, ITALY + EURATOM, ISPRA, ITALY
CONF-740401-P3 +. 14 PPS, PP. 1173-87, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN ORDER TO OBTAIN QUANTITATIVE INFORMATION ON THE HYDRODYNAMICS OF THE LIQUID METAL FILM, WHICH HAS BEEN LEFT BEHIND A COOLANT EJECTION IN A CHANNEL, THE FOLLOWING EXPERIMENTAL AND THEORETICAL PROGRAM HAS BEEN ACCOMPLISHED: (A) MEASUREMENT OF THE LOCAL AND AVERAGE FILM THICKNESS AS A FUNCTION OF: - OVERPRESSURE DELTA P BETWEEN THE (VAPOUR) BUBBLE AND THE BLANKET (I.E. VELOCITY AND ACCELERATION OF THE COOLANT DURING THE EJECTION) AND OF THE DIAMETER OF THE CHANNEL; (B) MEASUREMENT OF THE ONSET OF TURBULENCE; AND (C) DEVELOPMENT OF THEORETICAL EQUATIONS FOR THE CALCULATION OF THE FILM THICKNESS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FLOW THEORY AND EXPERIMENTS + MEASUREMENT + FLOW, TURBULENT + *BOILING

5-109936 ALSO IN CATEGORIES 8 AND 18 DATED 1974
HENRY RE + SINGER RM + LAMBERT GA
SODIUM EXPULSION TESTS FOR THE SEVEN-PIN GEOMETRY
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 13 PPS, PP. 1188-1201, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

SODIUM EXPULSION DATA ARE REPORTED FOR SINGLE- AND SEVEN-PIN GEOMETRIES WITH LMFBR HEAT FLUX CONDITIONS FOLLOWING PUMP COASTDOWN FLOW TRANSIENTS. ANALYSIS OF THE DATA SHOWS THAT IN BOTH CASES BOILING INCEPTION OCCURRED AT THE END OF THE HEATED ZONE WITH A SMALL SUPERHEAT. NET POSITIVE FLOW WAS OBSERVED DURING THE EARLY VOIDING STAGE AND THE GENERAL FLOW PATTERN APPEARS TO BE ANNULAR

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

*FLOW THEORY AND EXPERIMENTS + VOID FRACTION + BOILING + VOID

5-109937 DATED 1974
COSTA J + LAFAY J + PLAS R
OUT-OF-PILE STUDIES IN FRANCE ON SODIUM BOILING
CENTRE D'ETUDES NUCLEAIRES DE GRENOBLE, FRANCE
CONF-740401-P3 +. 20 PPS, PP. 1202-22, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

PRESENTS THE EFFORT BEING MADE AT THE C.E.A. ON OUT-OF-PILE STUDIES ON SODIUM BOILING. PROGRESS CONCERNING THE DIFFERENT STAGES OF THE PROGRAMME IS GIVEN FOR DEVELOPMENT OF HIGH HEAT FLUX HEATERS, SINGLE AND MULTI-PIN BOILING EXPERIMENTS IN SODIUM AND WATER, AND COMPUTER CODES.

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COMPUTER PROGRAM + *FLOW THEORY AND EXPERIMENTS + FRANCE + *R AND D PROGRAM + BOILING

5-109941 ALSO IN CATEGORY 18 DATED 1974
FRANCOIS P + ANTONAKAS D + FORTUNATO M
SOME PROBLEMS CONCERNING FAST REACTOR SAFETY
ELECTRICITE DE FRANCE
CONF-740401-P3 +. 12 PPS, PP. 1290-1302, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109941 *CONTINUED*
DISCUSSES PROBABLE ACCIDENTS IN A MECHANISTIC WAY. DESCRIBES THE TREES OF EVENTS ISSUED FROM ANY INITIAL DEFECT, QUALITATIVELY AND QUANTITATIVELY. THE COURSES OF EVENTS WHICH CAN BE DESCRIBED IN A MECHANISTIC WAY ARE ANALYSED. CLASSICAL INCIDENTS SUCH AS A BLOCKAGE, OR ACCIDENTS WHICH ASSUME A SIMULTANEOUS FAILURE OF TWO LEVELS OF PROTECTION-DETECTION AND SHUTDOWN ARE CONSIDERED. A PARAMETRIC ANALYSIS OF AN UNREALISTIC ACCIDENT IS PERFORMED, WHICH GIVES AN EXAMPLE TO ILLUSTRATE THE POSSIBILITIES OF THE CODES UNDER DEVELOPMENT IN THE CEA.

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*ACCIDENT ANALYSIS + ACCIDENT, HYPOTHETICAL + FLOW BLOCKAGE + FAULT TREE ANALYSIS + *ACCIDENT, ATWS

5-109942 ALSO IN CATEGORIES 6 AND 18 DATED 1974
STEVENSON MG + EDHL WR + DUNN FE
CURRENT STATUS AND EXPERIMENTAL BASIS OF THE SAS LMFBR ACCIDENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 18 PPS, PP. 1303-21, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE LATEST VERSION, SAS3A, INCLUDES MODELS WHICH ALLOW AN INTEGRAL TREATMENT OF BOTH TRANSIENT OVERPOWER AND LOSS-OF-FLOW UNPROTECTED ACCIDENT SEQUENCES THROUGH FUEL-PIN DISRUPTION AND UP TO THE POINT OF SUBASSEMBLY DISRUPTION. IN SOME CASES, THESE MODELS CAN FOLLOW THE SEQUENCE FROM INITIATION TO NEUTRONIC SHUTDOWN BY DISPERSIVE FUEL MOTION AND CAN BE USED TO EVALUATE THE POSSIBILITY OF ESTABLISHING IN-PLACE COOLING. FOR CASES WHICH PROCEED TO AN ENERGETIC CORE DISASSEMBLY, THE NEW MODELS PROVIDE AN IMPROVED DEFINITION OF CORE CONDITIONS AND REACTIVITY INSERTION RATE AT THE TIME OF A TRANSITION TO VENUS-II. THE NEW CAPABILITIES PROVIDED BY SAS3A INCLUDE A STEADY-STATE FUELS-INITIALIZATION ROUTINE, A PRIMARY-LOOP HYDRAULICS MODEL, A FUEL-COOLANT-INTERACTION MODEL FOR TRANSIENT OVERPOWER CONDITIONS, A NEW MOVING-FILM TREATMENT IN THE MULTIBUBBLE SODIUM-BOILING MODEL, AND CLADDING AND FUEL MOTION MODELS FOR VOIDED ASSEMBLIES IN A LOSS-OF-FLOW ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, REACTIVITY + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

5-109943 ALSO IN CATEGORIES 6 AND 18 DATED 1974
BLEIWEIS PB + OKRENT D + KASTENBERG WE
A COMPARISON STUDY AND ANALYSIS OF MODELS FOR 1000 MWE AND 4000 MWE LMFBR HYPOTHETICAL ACCIDENTS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-740401-P3 +. 10 PPS, PP. 1322-32, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A 1000 MWE AND TWO 4000 MWE LMFBR'S WERE ANALYZED FOR UNPROTECTED LOSS-OF-COOLANT FLOW AND REACTIVITY INSERTION ACCIDENTS USING A VERSION OF THE SAS-VENUS COMPUTER CODE. FOR SIMILAR ACCIDENTS, THE FINAL ENERGY DEPOSITED IN THE MOLTEN FUEL INCREASED NEARLY DIRECTLY PROPORTIONAL TO THE CORE MASS. A FOUR ZONE, MORE HIGHLY FLATTENED 4000 MWE REACTOR YIELDED BETWEEN 5% AND 15% MORE ENERGY IN MOLTEN FUEL THAN A TWO ZONE REACTOR FOR THE SAME ACCIDENT CONDITIONS. THE ENERGY YIELDS WERE RELATIVELY INSENSITIVE TO THE ASSUMED VALUES OF SODIUM SUPERHEAT. THE COMPUTER CODE WAS FOUND TO INTRODUCE POTENTIALLY LARGE ERRORS BECAUSE OF THE MANNER IN WHICH REACTIVITY INSERTION RATES WERE SELECTED FOR THE DISASSEMBLY PHASE AT THE TIME OF SWITCHING TO THE VENUS MODULE (AT A PRE-SPECIFIED PEAK CORE FUEL TEMPERATURE). FURTHER ATTENTION SHOULD BE GIVEN TO THIS ASPECT OF COUPLED-CODE ACCIDENT ANALYSES.

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*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *COMPARISON

5-109944 ALSO IN CATEGORIES 6 AND 7 AND 18 DATED 1974
BOGENSBERGER HG + FISCHER EA + SCHMUCK F
ON THE EQUATION OF STATE OF MIXED OXIDE FUEL FOR THE ANALYSIS OF FAST REACTOR DISASSEMBLY ACCIDENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1333-48, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE VAPOR PRESSURE FOR MIXED OXIDE IS CALCULATED BY FOLLOWING THE METHOD USED BY RAND AND MARKIN. THE VAPOR PRESSURE OF THE FISSION PRODUCTS IS ALSO CALCULATED, AND FOUND TO BE MUCH LARGER THAN THAT OF MIXED OXIDE AT TEMPERATURES AROUND THE MELTING POINT. THE DISASSEMBLY PHASE OF AN UNPROTECTED REACTIVITY ACCIDENT IN A LMFBR IS ANALYZED USING THESE VAPOR PRESSURE DATA. THE ACCIDENT IS INITIATED BY A 5 $/SEC REACTIVITY RAMP; THE PREDISASSEMBLY PART WAS ANALYZED EARLIER WITH THE SAS-2A CODE. IT IS FOUND THAT THE VAPOR PRESSURE OF THE FISSION PRODUCTS HAS THE EFFECT OF GREATLY REDUCING THE ENERGY RELEASE IN THE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + VAPOR PRESSURE + MIXED OXIDE + *ACCIDENT, CORE DISRUPTIVE

5-109957 ALSO IN CATEGORIES 6 AND 18 DATED 1974

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-109957 *CONTINUED*
STRUWE D + ROYL P + WIRTZ P
CAPRI - A COMPUTER CODE FOR THE ANALYSIS OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS IN THE PREDISASSEMBLY PHASE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1525-40. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE NEWLY DEVELOPED CODE SYSTEM CAPRI-2 IS DESCRIBED. RESULTS OF A PARAMETRIC STUDY FOR THE PREDISASSEMBLY PHASE OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS FOR THE MARK I-CORE OF THE SNR-300 ARE PRESENTED. FOR THE OVERPOWER ACCIDENT THE INFLUENCE OF DIFFERENT RAMP RATES AND FOR THE PUMP FLOW COAST DOWN THE INFLUENCE OF DIFFERENT THERMOHYDRAULIC DESIGN DATA IS ANALYSED.

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ACCIDENT ANALYSIS + *COMPUTER PROGRAM + ACCIDENT, HYPOTHETICAL + *ACCIDENT, CORE DISRUPTIVE

5-109960 ALSO IN CATEGORIES 6 AND 18 DATED 1974
WILLENBERG HJ + PARTAIN WL + WALTAR AE
DYNAMICS OF MOLTEN FUEL MOTION DURING A FAST-REACTOR OVERPOWER TRANSIENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P3 +. 17 PPS, PP. 1572-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A TREATMENT OF THE INTERNAL MOLTEN FUEL/GAS MIXTURE AS A TWO-PHASE, COMPRESSIBLE FLUID YIELDS A MARKEDLY DIFFERENT REACTIVITY FEEDBACK THAN THAT PREDICTED WITH A FLUID OF UNIFORM INTERNAL DENSITY AND COMPOSITION, BUT DOES NOT APPEAR TO SUBSTANTIALLY ALTER PREVIOUS CONCLUSIONS REGARDING THE ABILITY OF A REACTOR TO ULTIMATELY SHUT DOWN SAFELY. DESPITE RATHER PEAKED DENSITY SKEWING DISTRIBUTIONS POSTULATED FOR FUEL BEING SWEPT OUT INTO THE COOLANT CHANNEL, THE OVERALL TRANSIENT BEHAVIOR DOES NOT APPEAR TO VARY APPRECIABLY FROM PREVIOUS STUDIES, SO LONG AS OFF-CENTER FAILURES PREDOMINATE. EARLY FUEL PLATEOUT DOES NOT APPRECIABLY ALTER THE REACTIVITY SHUTDOWN MECHANISM, ALTHOUGH IT MAY BECOME A FACTOR REGARDING LONG-TERM HEAT REMOVAL QUESTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + POWER DISTRIBUTION + REACTOR POWER + TRANSIENT + *FUEL COOLANT INTERACTION

5-109999 ALSO IN CATEGORIES 9 AND 18 DATED 1976
FONTANA MH + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR APRIL-JUNE 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5076 +. 134 PPS, FIGS, REFS, JAN. 1976

A CODE WAS DEVELOPED FOR ANALYZING FLOW IN THE FFM LOOP DURING FLOW TRANSIENTS, AND ANALYSES ARE BEING MADE TO DETERMINE THE POWER TRANSIENTS THAT MUST BE PRODUCED IN THE ELECTRICAL HEATERS TO SIMULATE THE APPLICABLE NUCLEAR FLUX TRANSIENTS. AN EVALUATION WAS MADE OF ONE FLOW TRANSIENT TEST IN BUNDLE 3B (WITH A SIX-CHANNEL CENTRAL BLOCKAGE) IN WHICH SODIUM BOILING WAS INITIATED AND SUSTAINED IN THE BLOCKED CHANNELS DURING A 14-SEC PERIOD. THE ANALYSIS SHOWS THAT BOILING IN THE FIRST 6 IN. DOWNSTREAM OF THE BLOCKAGE APPEARS NEITHER TO HAVE SPREAD NOR TO HAVE INCREASED THE TEMPERATURES AT THE 2-IN AND 4-IN. LEVELS IN THE ADJACENT UNBLOCKED CHANNELS. THE EFFECTS OF ENTRAINED ARGON GAS ON ACOUSTIC INTENSITIES OF NUCLEATE SODIUM BOILING WERE INVESTIGATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + HEAT TRANSFER + ORNL + NOISE ANALYSIS + FLOW BLOCKAGE + *R AND D PROGRAM + FLOW + *BOILING + ACOUSTICS + TRANSIENT

5-110055 ALSO IN CATEGORIES 8 AND 11 AND 18 DATED 1976
RESPONSE TO QUESTION 001.179 - PASSIVE POST ACCIDENT HEAT REJECTION BY CONTAINMENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, 1 REF, PP. Q001.179-1 THRU Q001.179-2 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFC--WEST., AE--BURNS & ROE

THE SOFIRE-II COMPUTER CODE IS USED TO DETERMINE THE RATE OF SODIUM COMBUSTION AND HEAT INPUT TO CONTAINMENT AND THE RESULTANT TEMPERATURE AND PRESSURE HISTORIES OF THE CONTAINMENT. THE PREDOMINANT MECHANISM FOR HEAT REJECTION FROM THE CONTAINMENT ATMOSPHERE IS NATURAL CONVECTION HEAT TRANSFER TO THE CONTAINMENT VESSEL STEEL SHELL. HEAT THEN CONDUCTS THROUGH THE STEEL SHELL AND INSULATION ON THE OUTER SURFACE OF THE STEEL SHELL TO THE ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT + FIRE + *HEAT TRANSFER + HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

5-110077 ALSO IN CATEGORIES 1 AND 12 AND 18 DATED 1975
ZEMANICK PP + BROWN NW

CATEGORY 5
HEAT TRANSFER AND THERMAL TRANSIENTS

5-110077 *CONTINUED*
DECAY HEAT REMOVAL FOR THE LIQUID METAL FAST BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
CONF-750468-1 +. 62 PGS., FROM SPECIALIST MEETING ON RELIABILITY OF DECAY HEAT REMOVAL SYSTEMS PROPOSED FOR FAST REACTORS, HARWELL, UK, APRIL 28, 1975

THE FUNCTIONAL AND RELIABILITY REQUIREMENTS OF THE DECAY HEAT REMOVAL SYSTEMS ARE DESCRIBED. THE RELIABILITY REQUIREMENT AND ITS RATIONALE AS ADEQUATE ASSURANCE THAT PUBLIC HEALTH AND SAFETY ARE SAFEGUARDED ARE PRESENTED. THE MEANS BY WHICH THE RELIABILITY OF THE DECAY HEAT REMOVAL SYSTEMS ARE ESTABLISHED TO MEET THEIR REQUIREMENT ARE IDENTIFIED. THE HEAT REMOVAL SYSTEMS AND THEIR OPERATING CHARACTERISTICS ARE DESCRIBED. THE DISCUSSION INCLUDES THE OVERFLOW HEAT REMOVAL SERVICE AND ITS ROLE IN DECAY HEAT REMOVAL IF NEEDED. THE DETAILS OF THE SYSTEMS ARE DESCRIBED TO DEMONSTRATE THE ELEMENTS OF REDUNDANCY AND DIVERSITY IN THE SYSTEMS DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + RELIABILITY, SYSTEM + EMERGENCY COOLING + *SHUTDOWN COOLING SYSTEM + R AND D PROGRAM

5-110124 DATED 1976
SHA WT + SCHMITT RC + HUEBOTTER PR
BOUNDARY VALUE THERMAL HYDRAULIC ANALYSIS OF A REACTOR FUEL ROD BUNDLE
ARGONNE NATIONAL LABORATORY, ILLINOIS
20 PPS, 20 FIGS, 49 REFS, NUCLEAR SCIENCE & ENGINEERING, 59(2), PP. 140-60, FEB. 1976

A NEW COMPUTATIONAL MODEL FOR STEADY-STATE, SINGLE-PHASE, THERMAL-HYDRAULIC, MULTICHANNEL ANALYSIS OF FLUID FLOW THROUGH NUCLEAR REACTOR FUEL ELEMENTS IS PRESENTED. THE MODEL ACCOUNTS FOR THE CONSERVATION OF MASS, ENERGY, AND MOMENTUM SUBJECT TO PRESSURE-DROP BOUNDARY CONDITIONS AND LEADS TO A NONLINEAR MULTIPOINT BOUNDARY-VALUE PROBLEM. THE TURBULENT INTERCHANGE, RADIAL THERMAL CONDUCTION, AND FORCED FLOW DUE TO THE WIRE-WRAP OR GRID BETWEEN THE CHANNELS ARE EXPLICITY TAKEN INTO ACCOUNT. THE TEMPERATURE DISTRIBUTION OF THE COOLANT, CLADDING, AND FUEL, AND THE SIZE OF THE CENTRAL VOID OF THE OXIDE FUEL AFTER THERMAL RESTRUCTURING ARE COMPUTED IN THE MODEL.

BOUNDARY LAYER + ANALYTICAL MODEL + METAL, LIQUID + FLOW + FUEL ELEMENT CLUSTER + THERMAL HYDRAULIC ANALYSIS

5-110132 ALSO IN CATEGORY 1 DATED 1975
RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
GEAP-14045-3 +. 31 PPS, 4 TABS, 20 REFS, AUG. 1975

THE THIRD QUARTERLY REPORT DESCRIBES LMFBR SHUTDOWN HEAT REMOVAL SYSTEMS RELIABILITY ACTIVITIES FOR THE PERIOD BEGINNING IN JUNE 1975 AND ENDING IN AUGUST 1975. ACTIVITIES REPORTED INCLUDE COMPLETION OF A PRELIMINARY "RELIABILITY ALLOCATION AND APPORTIONMENT FOR LMFBR SHUTDOWN HEAT REMOVAL SYSTEMS," AND COMPLETION OF THE TEST PLAN DEFINITION FOR THE SHUTDOWN HEAT REMOVAL AND STRUCTURAL RELIABILITY PROGRAM." IN ADDITION, A PROBABILISTIC DATA REPORT WAS PREPARED WHICH PROVIDES THE FAILURE RATE FOR ALL FAILURE MODES OF EACH COMPONENT NECESSARY FOR SHUTDOWN HEAT REMOVAL USING A PROBABILISTIC DATA SHEET FOR EACH EVENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, COMPONENT + DECAY HEAT + RELIABILITY, SYSTEM + SHUTDOWN COOLING SYSTEM + PROBABILITY

5-110134 ALSO IN CATEGORIES 7 AND 11 AND 18 DATED 1976
KAZIMI MS
ANALYSIS OF PRESSURE PULSE GENERATION DUE TO GAS RELEASE FROM FAILED FUEL PINS IN A LIQUID METAL FAST BREEDER REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY
11 PPS, 11 FIGS, NUCLEAR SCIENCE & ENGINEERING, 59(1), PP. 1-11 (JAN. 1976)

A MODEL FOR THE ANALYSIS OF PRESSURE PULSE GENERATION DUE TO SUDDEN GAS RELEASE FROM FAILED PINS IN A LIQUID-METAL FAST BREEDER REACTOR IS PRESENTED. THE PREDICTIONS OF THE MODEL ARE COMPARED TO EXPERIMENTAL DATA ON SUDDEN GAS RELEASE IN THE DUCTS OF THE EXPERIMENTAL BREEDER REACTOR II. THE PREDICTED MAGNITUDES OF PRESSURE PULSES ARE IN GOOD AGREEMENT WITH THE EXPERIMENTAL OBSERVATIONS. THE PREDICTED PRESSURE PULSE, HOWEVER, SEEMS TO DECAY AT A FASTER RATE THAN THE EXPERIMENTALLY OBSERVED RATE. THE EFFECTS OF THE PIN INTERNAL PRESSURE UPON RUPTURE, THE RUPTURE AREA, AND THE AMOUNT OF COMPRESSED GAS ARE STUDIED PARAMETRICALLY.

EBR 1 AND 2 (RE) + FISSION GAS RELEASE + FAILURE, FUEL ELEMENT + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL MODEL + PRESSURE PULSE

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-093191 DATED 1975
MCCORMICK NJ
A COMPUTATIONAL TECHNIQUE TO ACCESS PROCEDURES FOR FAILED-FUEL IDENTIFICATION
UNIVERSITY OF WASHINGTON, SEATTLE
10 PAGES, 5 FIGURES, 28 REFERENCES, NUCLEAR SCIENCE AND ENGINEERING, 56(1), PP. 7-15 (JANUARY 1975)

PRINCIPLES FROM INFORMATION THEORY ARE USED TO OBTAIN THE MINIMUM OF THE AVERAGE NUMBER OF SHUTDOWNS NEEDED WITH A TRIAL-AND-ERROR TESTING PROCEDURE FOR IDENTIFYING FAILED FUEL IN NUCLEAR REACTORS, BASED ON A PRIORI FAILURE PROBABILITIES OF EACH ASSEMBLY. ALSO PRESENTED IS THE AVERAGE REDUCTION IN THE NUMBER OF SHUTDOWNS IF OTHER INFORMATION ABOUT FAILURE IS INCORPORATED, SO THE MERIT OF THIS OTHER INFORMATION CAN BE ASSESSED QUANTITATIVELY. ILLUSTRATIVE EXAMPLES ARE GIVEN FOR APPLICATIONS INVOLVING THE USE OF INFORMATION FROM FLUX TILTING IN A PRESSURIZED WATER REACTOR, GAS TAGGING IN A LIQUID-METAL FAST BREEDER REACTOR, AND BURNUP IN THE EXPERIMENTAL BREEDER REACTOR II.

EBR 1 AND 2 (RE) + FUEL BURNUP + FAILURE, FUEL ELEMENT + REACTOR, PWR + MATHEMATICAL TREATMENT

6-093643 ALSO IN CATEGORIES 5 AND 8 AND 18 DATED 1974
NICHOLSON RE
DESIGN BASIS ACCIDENT STUDIES - FINAL REPORT
THE OHIO STATE UNIVERSITY
COO-2286-3 +, 260 PAGES, TABLES, REFERENCES, JUNE 22, 1974

AN EXTENSION OF THE ANL EQUATION OF STATE IN THE VENUS-II PROGRAM TO INCLUDE LOWER PRESSURE CONDITIONS AND AN ISENTROPIC EXPANSION CALCULATION SHOWS THAT THE ENERGY AVAILABLE FOR MECHANICAL DAMAGE IS STRONGLY DEPENDENT UPON HOW FAR THE EXPANSION CAN PROCEED. EXPANSION TO ONE ATMOSPHERE IN WEAK ACCIDENTS CAN LEAD TO ONE TO TWO ORDERS OF MAGNITUDE MORE ENERGY THAN R. W. STRATTON'S EIGHT-FOLD VOLUME EXPANSION. THE MODIFIED BETHE-TAIT METHOD OF EDWARDS AND MATHER IS APPROXIMATELY REPRODUCED AND VERIFIED BUT AT HIGH DOPPLER EFFECT, LOW EXCURSION ENERGY CONDITIONS, THE ANL EQUATION OF STATE IN VENUS LEADS TO SIGNIFICANTLY GREATER ENERGY RELEASE. A POTENTIALLY AUTOCATALYTIC EFFECT, ASSOCIATED WITH NEUTRON STREAMING THROUGH VOIDS, CANNOT BE DISREGARDED IN HCDA ANALYSIS. MORE WORK IS REQUIRED TO ESTABLISH ITS QUANTITATIVE SIGNIFICANCE. MOST OF THE SAS-2A COMPUTER PROGRAM MODELING IS FOUND TO BE BASED ON SOUND PRINCIPLES. WE ARE GENERALLY IN AGREEMENT WITH ANL ON THE FEW WEAKNESSES OF THE MODELING. THE DBA CONCEPT AS A BASIS FOR BREEDER CONTAINMENT DESIGN IS FOUND TO BE A SOUND CONCEPT WHEN ACCOMPANIED BY A COMMITMENT TO PROVIDE THE HIGHEST PRACTICABLE CONTAINMENT CAPACITY AND BY A COMMITMENT TO ASSURE RESPONSIBILITY AND VISABILITY IN CONTAINMENT DESIGN DECISIONS

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BETHE TAIT + COMPUTER PROGRAM + DOPPLER EFFECT + ENERGY SOURCE + EQUATION OF STATE + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + NEUTRON + ACCIDENT, DESIGN BASIS + VOID + ACCIDENT, CORE DISRUPTIVE

6-093655 ALSO IN CATEGORIES 11 AND 18 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-33 +, 142 PAGES, FIGURES, DECEMBER 6, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

6-093656 ALSO IN CATEGORIES 11 AND 18 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, SEPTEMBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-32 +, 160 PAGES, FIGURES, NOVEMBER 1, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-098129 DATED 1974
STEWART SL + HARTMAN AK + CRICK SC
EVALUATION AND ANALYSIS OF ZPPR ASSEMBLY 3 CRITICAL EXPERIMENTS
GENERAL ELECTRIC COMPANY
GEAP-14001 +. 221 PAGES. 38 TABLES. 41 FIGURES. FEBRUARY 1974

A SERIES OF CRITICAL EXPERIMENTS HAVE BEEN PERFORMED IN ZPPR ASSEMBLY 3 TO INVESTIGATE THE EFFECTS OF THE CONTROL SYSTEM ON NUCLEAR PARAMETERS OF A DEMONSTRATION PLANT AS PART OF THE DEMONSTRATION PLANT BENCHMARK CRITICAL PROGRAM. THE INTENT OF ZPPR-3 WAS TO EXAMINE THE INFLUENCE OF A SPECIFIC CONTROL SYSTEM DESIGN ON THE NUCLEAR PARAMETERS OF A TYPICAL LMFBR DEMONSTRATION REACTOR. THE PRINCIPAL REACTOR PARAMETERS EXPERIMENTALLY STUDIED IN ZPPR-3 WERE POWER DISTRIBUTION, CONTROL WORTH, AND SODIUM VOID REACTIVITY EFFECTS. ZPPR-3 WAS A 2400 LITER TWO ENRICHMENT ZONE CORE WITH 19 SIMULATED CONTROL RODS. THE EXPERIMENTAL PROGRAM IS DIVIDED INTO 3 PHASES CORRESPONDING TO END-OF-CYCLE, MIDDLE-OF-CYCLE, AND BEGINNING-OF-CYCLE CONTROL CONDITIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTROL ROD WORTH + PLUTONIUM + SODIUM COEFFICIENT + COMPARISON, THEORY AND EXPERIENCE + VOID COEFFICIENT + REACTOR CONTROL + CRITICALITY EXPERIMENT + ZPPR (CAF)

6-099299 ALSO IN CATEGORY 11 DATED 1974
HESS AL + THALGOTT FW
SPECIFICATIONS AND RESULTS OF A DESIGN-BASIS-ACCIDENT CALCULATION FOR ZPPR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7471(ADD. 1) +. 26 PAGES. 4 FIGURES 4 REFERENCES. SEPTEMBER 1974

THIS REPORT DOCUMENTS AN ANALYSIS CARRIED OUT FOR AN EXCURSION OF MORE SERIOUS CONSEQUENCES FOR A 6000-LITER, TWO-ZONE CORE, SIMULATING AN LMFBR FUELED WITH A UO(SUB 2)-PUO(SUB 2) MIXTURE AND USING A MORE TOXIC PLUTONIUM ISOTOPIC MIXTURE. POSTULATIONS AND PROCEDURES USED IN THE ANALYSIS WERE THE SAME AS PRESCRIBED FOR THE DBA IN THE FSAR. ALTHOUGH THE NEW OFF-SITE DOSE CALCULATED IS HIGHER BY A FACTOR OF SEVEN THAN THE DOSE IN THE FSAR DBA, IT IS STILL A FRACTION OF THE AEC-PERMITTED OCCUPATIONAL BURDEN. FURTHERMORE, THE ANALYSIS CONFIRMS THE CAPABILITY OF THE CONTAINMENT STRUCTURE FOR A MORE ENERGETIC EXCURSION THAN IN THE FSAR DBA, AND SHOWS AGAIN THAT OPERATION OF THE ZPPR POSES NO UNACCEPTABLE RISK.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + ACCIDENT, CONSEQUENCES + CRITICAL ASSEMBLY + PLUTONIUM + EXCURSION, LARGE + ZPPR (CAF)

6-099301 DATED 1974
ERDMANN RC
TRANSIENT ANALYSIS OF LMFBR OXIDE FUEL ELEMENTS DURING ACCIDENTS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7362 +. 316 PAGES. 63 FIGURES. AUGUST 1974

DESCRIBES OXIDE FUEL PIN FAILURE DUE TO EXPERIMENTALLY OBSERVED TRANSIENT OVERPOWER CLADDING DEFORMATION IN THE TREAT TEST REACTOR. THE DAMAGE MECHANISMS TREATED ARE: DIFFERENTIAL FUEL CLADDING THERMAL EXPANSION, EXPANSION OF FISSION GASES DUE TO TRANSIENT TEMPERATURE INCREASE IN THE FUEL, AND INTERGRANULAR FISSION GAS INDUCED FUEL SWELLING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + FAILURE, FUEL ELEMENT + REACTOR TRANSIENT + TREAT (PRR) + FAILURE, CLADDING

6-099495 DATED 1900
CRITICAL EXPERIMENTS AND ANALYSIS TWELFTH QUARTERLY REPORT, JULY-SEPTEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-13771-12 +. 50 PAGES. 18 FIGURES. 13 REFERENCES. SEPTEMBER 1974

THIS REPORT IS THE TWELFTH IN A SERIES OF QUARTERLY PROGRESS REPORTS PUBLISHED UNDER THE LMFBR CRITICAL EXPERIMENTS AND ANALYSIS PROGRAM. CURRENT ACTIVITIES AND TECHNICAL PROGRESS FOR THE PERIOD JULY THROUGH SEPTEMBER 1974 ARE REPORTED FOR TWO SUBTASKS. SUBTASK A COVERS THE TECHNICAL DIRECTION FOR CRITICAL EXPERIMENTS AND ANALYSIS AS APPLICABLE TO LMFBR COMMERCIAL PLANTS AND THE CLINCH RIVER BREEDER REACTOR PLANT BENCHMARK CRITICAL EXPERIMENTS IN ZPPR ASSEMBLY 4 AND THE CRBRP EMC. SUBTASK B IS DIRECTED TOWARD THE DEVELOPMENT OF LMFBR PLANT CALCULATIONAL METHODS THAT ALSO CAN BE USED AT THE SITES OF THE CLINCH RIVER BREEDER REACTOR TO DETERMINE THE REACTOR POWER DISTRIBUTION, REACTIVITY AND FUEL STATUS, AND FOR CONSIDERATION OF ALTERNATE FUEL AND CONTROL MANAGEMENT SCHEMES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + POWER DISTRIBUTION + CRITICALITY EXPERIMENT + MEASUREMENT, REACTIVITY + EXPERIMENT + MATHEMATICAL TREATMENT + FUEL MANAGEMENT + CLINCH RIVER (LMFBR)

6-099498 DATED 1900
SAFETY ENGINEERING SEVENTH QUARTERLY REPORT, FEBRUARY-APRIL 1974

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-099498 *CONTINUED*
GENERAL ELECTRIC COMPANY
GEAP-13923-7 +. 22 PAGES, 12 FIGURES, 6 REFERENCES, JUNE 1974

IN APRIL A REVIEW OF THE CURRENT STATUS OF THE EFFORTS VERSUS GOALS OF THE APPLIED BASE PROGRAM (HCDA STUDY FOR CLINCH RIVER BREEDER REACTOR) RESULTED IN AN AEC REDIRECTION OF EFFORT ON SAFETY ENGINEERING BASE PROGRAM TO DIRECTLY SUPPORT THE APPLIED BASE PROGRAM. AS A CONSEQUENCE, THE BASE PROGRAM WORKSCOPE WAS REDUCED AS FOLLOWS: ADDITIONAL TRANSIENT OVERPOWER (TOP) FUEL MOTION STUDY FY-74 EFFORTS WILL CEASE FOR TREAT EXPERIMENTS C4G, C4H, E1, E2, AND H2. ADDITIONAL EFFORTS ON THE TRANSIENT UNDERCOOLING FUEL AND CLADDING MOTION STUDY WILL CEASE FOR THE REMAINDER OF FY-74. THE THERMAL ANALYSIS OF THE GE TREAT EXPERIMENT C4A WAS COMPLETED USING THE IMPROVED GE NUCLEAR-PHYSICS MODELING OF THE TREAT CORE-TEST CAPSULE POWER COUPLING AND CAPSULE SPATIAL POWER DISTRIBUTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + REACTOR TRANSIENT + THERMAL ANALYSIS + TREAT (PRR) + EXPERIMENT + R AND D PROGRAM + MODEL + THERMAL TRANSIENT

6-099501 ALSO IN CATEGORIES 5 AND 18 DATED 1974
SLEMBER RJ
HEDL QUARTERLY TECHNICAL REPORT JULY, AUGUST, SEPTEMBER, 1974. VOLUME 3 - REACTOR AND SAFETY ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL. 3) +. 34 PAGES, 6 FIGURES, OCTOBER 1974

REPORTS ACTIVITIES ON (1) LMFBR DOUBLING TIME, (2) CLOSED LOOP IN-REACTOR SAFETY ANALYSIS, (3) REACTOR VESSEL AND HEAT RESPONSE TO A LOSS OF FLOW HYPOTHETICAL CORE DISRUPTIVE ACCIDENT, (4) INTERNAL FLUID HYDRODYNAMICS, AND (5) CORE ENGINEERING AND PHYSICS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + FFTF (TR) + R AND D PROGRAM + PRESSURE TRANSIENT + ACCIDENT, CORE DISRUPTIVE

6-099645 ALSO IN CATEGORY 7 DATED 1974
GNEITING BC + BARD FE
PECT-2T PRETEST ANALYSIS OF THE HUT-CAL-2 TRANSIENT TEST
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-15 +. 47 PAGES, 20 FIGURES, 20 REFERENCES, APRIL 1974

DESCRIBES THE PRETEST THERMAL/DEFORMATION ANALYSES USED TO OBTAIN TEST REQUIREMENTS FOR THE HUT-CAL-2 TRANSIENT TEST. THE PECT-2T THERMAL/MECHANICAL PERFORMANCE CODE WAS USED TO OBTAIN THE RECOMMENDED TREAT TRANSIENT BY SYSTEMATICALLY ADJUSTING BOTH THE REACTOR POWER AND THE CAPSULE PREHEAT TEMPERATURE UNTIL A MAXIMUM CLADDING EFFECTIVE NONELASTIC STRAIN OF 1.9% AND A MAXIMUM FUEL AREA MELT OF APPROXIMATELY 54% WAS CALCULATED. THE MATERIAL PRESENTED IN THIS REPORT AS WELL AS POST-TEST MEASUREMENTS ON THIS WELL CHARACTERIZED, VARIABLY DIMENSIONED FUEL PIN WILL BE USED TO VERIFY AND CALIBRATE THE EXISTING MATERIAL MODEL IN PECT-2T. ALSO PRESENTS THE CURRENT PECT-2T GAP CONDUCTANCE MODEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + CLADDING + THERMAL ANALYSIS + DEFORMATION + FAILURE, CLADDING + HEAT CONDUCTANCE, FUEL TO CLAD + PROPERTY, MECHANICAL + MODEL + THERMAL TRANSIENT + FUEL ELEMENTS

6-101230 ALSO IN CATEGORY 7 DATED 1974
MCELROY WN
LMFBR REACTION RATE AND DOSIMETRY 9TH PROGRESS REPORT FOR PERIOD OCTOBER 1973 THROUGH MAY 1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-45 +. 250 PAGES, FIGURES, NOVEMBER 1974

DESCRIBES PROGRESS MADE DURING THE REPORTING PERIOD. TOPICS INCLUDE FISSION PRODUCT ACTIVITIES, FISSION YIELDS, SELF-SHIELDING REACTION RATES, INTEGRAL CROSS SECTION BY HELIUM MEASUREMENT, AND DOSIMETER SAMPLE PREPARATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSIMETRY + MATERIAL + IRRADIATION TESTING + CROSS SECTION + REACTOR PHYSICS + R AND D PROGRAM + FUEL ELEMENTS

6-101275 ALSO IN CATEGORIES 11 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT DEC. 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-35 +. 170 PAGES, FIGURES, JANUARY 31, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICS, AND (7) REACTOR SAFETY.

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-101275 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

6-101517 DATED 1974
KAGANOVE JJ + DEAN EM + CAMPISE AV
EBR-II REACTOR OPERATOR SIMULATOR VOLUME I. A DESCRIPTION OF EROS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7981 +. 67 PAGES, 5 FIGURES, 18 REFERENCES, AUGUST 1974

EROS SOLVES THE SPACE-INDEPENDENT REACTOR-KINETICS EQUATIONS AND COMPUTES THE TEMPERATURE-INDUCED REACTIVITY FEEDBACK IN THE SYSTEM BY SOLVING A SET OF EQUATIONS REPRESENTING THE SPATIAL HEAT AND MASS TRANSFER. UP TO 20 CHANNELS OR 1000 FEEDBACK EQUATIONS ARE AVAILABLE FOR MODELING A REACTOR-SYSTEM FEEDBACK NETWORK. TRIPS CAN BE INITIATED BY DELAYED SIGNALS FROM INSTRUMENTS THAT SENSE ANY QUANTITY CALCULATED--E.G., POWER INVERSE PERIOD, REACTIVITY, OR TEMPERATURE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + EBR 1 AND 2 (RE) + REACTOR KINETICS + REACTOR STABILITY + REACTOR CONTROL + SIMULATION + MODEL

6-102044 ALSO IN CATEGORIES 11 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGESS REPORT, JANUARY 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-36 +. 148 PAGES, FIGURES, FEB. 27, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICAL, AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

6-102102 ALSO IN CATEGORY 18 DATED 1974
LAKE JA + DONCALS RA + RATHBUN RW
BREEDING RATIO AND DOUBLING TIME CHARACTERISTICS OF THE CLINCH RIVER BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740903-15 +. 12 PAGES, PRESENTED AT MEETING ON ADVANCED REACTORS; PHYSICS, DESIGN & ECONOMICS, ATLANTA, GA., SEPT. 8, 1974

THE CLINCH RIVER BREEDER REACTOR, PER THE CURRENT DESIGN, WILL HAVE A BREEDING RATIO OF 1.20 AT THE START-OF-LIFE AND 1.23 AT THE END OF THE FIRST CYCLE. THIS VALUE IS EXPECTED TO DROP TO APPROXIMATELY 1.12 IN THE EQUILIBRIUM CYCLES IF THE PRESENT TYPE FUEL AND BLANKET ASSEMBLY DESIGNS ARE RETAINED. HOWEVER, WITH REASONABLE ANTICIPATED ADVANCES IN FUEL DESIGN TECHNOLOGY, A BREEDING RATIO OF AT LEAST 1.20 CAN BE MAINTAINED THROUGHOUT THE LIFE OF THE PLANT. POTENTIAL EQUILIBRIUM FUEL ASSEMBLY DESIGNS HAVE BEEN PROPOSED WHICH WILL ACCOMPLISH THIS OBJECTIVE AS WELL AS ACHIEVE THE DESIGN GOAL BURNUP OF 150,000 MWD/T. CRBR, WITH A PEAK LINEAR POWER RATING OF 14.5KW/FT AND AN EQUILIBRIUM BREEDING RATIO OF 1.20, HAS A COMPOUND SYSTEM DOUBLING TIME OF APPROXIMATELY 34 YEARS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + ECONOMICS + FUEL BURNUP + REVIEW + CLINCH RIVER (LMFBR)

6-102103 ALSO IN CATEGORY 18 DATED 1974
RILEY DR + EUHL AR + DONCALS RA + GREEBLER PW
NUCLEAR DESIGN OF THE CLINCH RIVER BREEDER REACTOR SYSTEM
U.S. ATOMIC ENERGY COMMISSION + WESTINGHOUSE ELECTRIC CORP. + GENERAL ELECTRIC CO.
CONF-740903-16 +. 16 PAGES, PRESENTED AT THE MEETING ON ADVANCED REACTORS; PHYSICS, DESIGN & ECONOMICS, ATLANTA, GA., SEPT. 8, 1974

REVIEWS THE REACTOR SYSTEM DESIGN, NUCLEAR DATA, COMPUTATIONAL METHODS, AND CRITICAL EXPERIMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR DESCRIPTION + ANALYTICAL TECHNIQUE + SYSTEM DESCRIPTION + CLINCH RIVER (LMFBR)

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-102847 ALSO IN CATEGORY 18 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 1
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P1 +. 600 PAGES. FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS. TOKYO. JAPAN. OCT. 16. 1973

PRESENTS THE TEXT OF 28 PAPERS PRESENTED AT THE SYMPOSIUM ON THE FOLLOWING TOPICS: REVIEWS OF NATIONAL PROGRAMS. PHYSICS EXPERIENCES WITH REACTORS. AND EXPERIMENTS WITH CRITICAL FACILITIES.

AVAILABILITY - UNIPUB. INC.. P.O. BOX 433. NEW YORK. N.Y. 10016

UNITED KINGDOM + CRITICALITY EXPERIMENT + GERMANY + ITALY + JAPAN + *REVIEW + *REACTOR PHYSICS

6-102848 ALSO IN CATEGORY 18 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 2
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P2 +. 512 PAGES. FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS. TOKYO. JAPAN. OCT. 16. 1973

PRESENTS THE TEXT OF 25 PAPERS ON THE FOLLOWING TOPICS: NUCLEAR DATA. NUMERICAL AND ANALYTICAL TECHNIQUES. NEUTRON SPECTRUM AND REACTIVITY COEFFICIENTS. AND EXPERIMENTS WITH CRITICAL FACILITIES.

AVAILABILITY - UNIPUB. INC.. P.O. BOX 433. NEW YORK. N.Y. 10016

CRITICAL ASSEMBLY + FLUX DISTRIBUTION + REACTIVITY COEFFICIENT + ANALYTICAL TECHNIQUE + JAPAN + REVIEW + *REACTOR PHYSICS

6-102849 ALSO IN CATEGORY 18 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 3
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P3 +. 464 PAGES. FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS. TOKYO. JAPAN. OCT. 16. 1973

PRESENTS THE TEXT OF 23 PAPERS ON THE FOLLOWING TOPICS: DEVELOPMENT OF METHODS AND DATA. AND REACTOR DESIGN PROBLEMS.

AVAILABILITY - UNIPUB. INC.. P.O. BOX 433. NEW YORK. N.Y. 10016

DATA PROCESSING + DESIGN STUDY + JAPAN + REVIEW + *REACTOR PHYSICS + R AND D PROGRAM

6-102935 ALSO IN CATEGORIES 11 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT FEB. 1975
ARGONNE NATIONAL LABORATORY. ILLINOIS
ANL-RDP-37 +. 151 PAGES. FIGURES. MARCH 31. 1975

DISCUSSES THE (1) R&D PROGRAM FOR EBR-2. (2) HOT FUEL EXAMINATION FACILITY. (3) LMFBR DESIGN SUPPORT. (4) INSTRUMENTATION AND CONTROL. (5) FUEL AND MATERIAL DEVELOPMENT. (6) REACTOR PHYSICS. AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT. LOSS OF FLOW + *TREAT (PRR) + *CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + *IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS. DYNAMIC + *MODEL + *VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

6-103382 ALSO IN CATEGORY 18 DATED 1975
KOBAYASHI Y + KONDO S + TOGO Y
REGRESSION MODEL FOR NUCLEAR CHARACTERISTICS OF SODIUM-COOLED FAST REACTOR CORE
UNIVERSITY OF TOKYO
3 PAGES. 2 TABLES. 3 REFERENCES. J. NUCLEAR SCIENCE & TECHNOLOGY. 12(1). PP. 61-63 (JAN. 1975)

IN STUDYING THE OPTIMUM DESIGN OR OPTIMUM CONTROL PROBLEM FOR A NUCLEAR REACTOR. NUMERICAL ANALYSIS IS NECESSARY TO OBTAIN THE NUCLEAR CHARACTERISTICS OF THE REACTOR CORE. DESCRIBES IN PRELIMINARY FORM A METHOD FOR THE REGRESSION PROCEDURE AND SOME RESULTS OBTAINED THEREWITH ON THE NUCLEAR CHARACTERISTICS OF A TYPICAL MIXED-OXIDE-FUELED SODIUM-COOLED FAST REACTOR CORE.

ANALYTICAL MODEL + ANALYTICAL TECHNIQUE + *REACTOR CONTROL + *DESIGN STUDY + REACTOR PHYSICS

6-104245 DATED 1975
THIRTEENTH QUARTERLY REPORT: CRITICAL EXPERIMENTS AND ANALYSIS. OCT.-DEC. 1974
GENERAL ELECTRIC COMPANY
GEAP-13771-13 +. 75 PAGES. 29 FIGURES. JAN. 1975

THIS REPORT IS THE THIRTEENTH IN A SERIES OF QUARTERLY REPORTS PUBLISHED UNDER THE LMFBR CRITICAL EXPERIMENTS AND ANALYSIS PROGRAM. CURRENT ACTIVITIES AND TECHNICAL PROGRESS FOR THE PERIOD OCTOBER THROUGH DECEMBER 1974 ARE REPORTED FOR TWO SUBTASKS. SUBTASK A COVERS THE TECHNICAL

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-104245 *CONTINUED*
DIRECTION FOR CRITICAL EXPERIMENTS AND ANALYSIS AS APPLICABLE TO LMFBR COMMERCIAL PLANTS AND THE CLINCH RIVER BREEDER REACTOR PLANT BENCHMARK CRITICAL EXPERIMENTS IN ZPPR ASSEMBLY 4 AND THE CRERP EMC. SUBTASK B IS DIRECTED TOWARD THE DEVELOPMENT OF LMFBR PLANT CALCULATIONAL METHODS THAT ALSO CAN BE USED AT THE SITES OF THE CLINCH RIVER BREEDER REACTOR TO DETERMINE THE REACTOR POWER DISTRIBUTION, REACTIVITY AND FUEL STATUS, AND FOR CONSIDERATION OF ALTERNATIVE FUEL AND CONTROL MANAGEMENT SCHEMES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*REACTIVITY EFFECT + CONTROL + POWER DISTRIBUTION + CRITICALITY EXPERIMENT + ZPPR (CAF) + CLINCH RIVER (LMFBR)

6-104563 DATED 1975
PARE VK + MIHALCZO JT
REACTIVITY FROM POWER SPECTRAL DENSITY MEASUREMENTS WITH CALIFORNIUM-252
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
5 PAGES, 2 FIGS., 17 REFS., NUCLEAR SCIENCE & ENGINEERING, 56(2), PP. 213-17 (FEB. 1975)

DESCRIBES A METHOD OF DETERMINING REACTIVITY USING AN IONIZATION CHAMBER USING CF-252. THIS METHOD DOES NOT REQUIRE A CALIBRATION NEAR DELAYED CRITICALITY, SO IT MAY BE USED IN THE INITIAL LOADING OF A REACTOR TO DETERMINE CRITICALITY BEFORE CRITICALITY IS ACHIEVED. THE METHOD IS ALSO INDEPENDENT OF DETECTION EFFICIENCY SO IT MAY BE USED DURING INITIAL LOADING, SINCE LARGE CHANGES IN DETECTION EFFICIENCY CAN OCCUR WITH LOADING.

MEASUREMENT, SUBCRITICALITY + FFTF (TR) + MEASUREMENT, REACTIVITY + CALIFORNIUM + MATHEMATICAL TREATMENT

6-105152 DATED 1975
HARDIE RW + SCHENTER RE + WILSON RE
AN ANALYSIS OF SELECTED FAST CRITICAL ASSEMBLIES USING ENDF/B-IV NEUTRON CROSS SECTIONS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
17 PPS, 23 TABS, 9 REFS, NUCLEAR SCIENCE & ENGINEERING, 57(3), PP. 222-38 (JULY 1975)

MEASURED INTEGRAL QUANTITIES SUCH AS K(EFF), CENTRAL REACTION-RATE RATIOS, AND CENTRAL REACTIVITY COEFFICIENTS FOR 18 FAST CRITICAL ASSEMBLIES WERE CALCULATED USING THE ENDF/B-IV NEUTRON CROSS-SECTION SET. THE CORRELATIONS BETWEEN CALCULATION AND EXPERIMENT USING VERSION IV WERE THEN COMPARED TO THOSE OBTAINED WITH EARLIER CROSS-SECTION DATA, SPECIFICALLY, VERSIONS I, II, AND III OF ENDF/B AND THE BONDARENKO CROSS-SECTION SET. IN GENERAL, ENFF/B-IV WAS FOUND TO DO AN EXCELLENT JOB OF CALCULATING K(EFF). HOWEVER, DISCREPANCIES BETWEEN CALCULATION AND EXPERIMENT DID EXIST FOR BOTH REACTION-RATE RATIOS AND REACTIVITY COEFFICIENTS.

CRITICAL ASSEMBLY + REACTIVITY COEFFICIENT + ZPPR (CAF) + CROSS SECTION

6-105741 ALSO IN CATEGORIES 5 AND 11 AND 18 DATED 1974
KASTENBERG WE
TRANSIENT ANALYSIS OF LMFBR OXIDE FUEL ELEMENTS DURING ACCIDENTS. FINAL REPORT FOR THE PERIOD 1 JULY 1973-30 JUNE 1974
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7468 +. 136 PPS, 68 FIGS, 137 REFS, AUG. 1974

REPORTS ON A STUDY OF THE MODE OF FAILURE FOR LMFBR OXIDE FUEL PINS DURING AN OVERPOWER TRANSIENT AND THE IMPLICATIONS ON THE COURSE OF AN UNPROTECTED OVERPOWER TRANSIENT ACCIDENT. SECTION 2 IS DEVOTED TO FAILURE MECHANISM; SECTION 3 ADDRESSES LOCATION AND MODE OF FAILURE; AND SECTION 4 CONTAINS A SUMMARY AND THE MAJOR CONCLUSIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + FUEL ROD + FAILURE MODE ANALYSIS + *TRANSIENT

6-105757 ALSO IN CATEGORIES 5 AND 8 AND 11 A DATED 1975
A COMPENDIUM OF COMPUTER CODES FOR THE SAFETY ANALYSES OF LMFBR'S
U.S. ERDA, WASHINGTON
ERDA-31 +. 189 PPS, JUNE 1975

AN ALPHABETICAL LIST OF 55 COMPUTER CODES. GIVES A BRIEF STATEMENT OF THE PROBLEM SOLVED, THE STATUS OF THE CODE, THE MODEL DESCRIPTION, LIMITATIONS, FUTURE EFFORTS TO IMPROVE THE CODE, INTERFACES WITH OTHER CODES AND REFERENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CONTAINMENT + FISSION GAS RELEASE + FUEL MELTDOWN + ACCIDENT, LOSS OF COOLANT + *SAFETY ANALYSIS + PRESSURE PULSE + PRESSURE TRANSIENT + STRUCTURAL ANALYSIS, DYNAMIC + *THERMAL TRANSIENT + COMPARTMENT + FUEL SWELLING + THERMAL HYDRAULIC ANALYSIS + PIPES AND PIPE FITTINGS

6-105825 ALSO IN CATEGORIES 9 AND 18 DATED 1975
BAGSABAROV YE
SOVIET-FRENCH SEMINAR ON CORE DIAGNOSIS AND SAFETY OF FAST REACTORS-CADARACHE, JUNE 9-14, 1974

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-105825 *CONTINUED*
3 PPS, SOVIET ATOMIC ENERGY, 37(5), PP. 1213-15 (MAY 1975)

THE SEMINAR DISCUSSED PROBLEMS ASSOCIATED WITH THE GENERAL APPROACH TO THE SAFETY OF SODIUM-COOLED FAST REACTORS, DESIGN AND OPERATING METHODS OF CORE MONITORING, CONSEQUENCES OF FUEL ELEMENT LEAKS, METHODS OF LEAKAGE INDICATION AND ON-LINE DETERMINATION OF DEFECTIVE FUEL BUNDLES, SPECIFIC PROBLEMS ENCOUNTERED IN WORKING WITH LEAKY FUEL ELEMENTS, METHODS OF DETECTING DEFECTIVE FUEL ELEMENTS WITH THE AID OF LABELED GASES, SYSTEMS AND EQUIPMENT FOR FAST DATA ACQUISITION AND PROCESSING AND REACTOR CONTROL, AND MANY OTHERS.

*FRANCE + OPERATION + DATA PROCESSING + REACTOR CONTROL + *DESIGN STUDY + INSTRUMENT, FAILED FUEL DETECTION + INSTRUMENT, SURVEILLANCE + USSR + CORE COMPONENTS + SAFETY EVALUATION + REACTOR PHYSICS + OPERATING EXPERIENCE

6-106176 DATED 1975
SAEDTLER E
ANALYTICAL ONE-DIMENSIONAL ONE-CHANNEL *MODEL FOR CALCULATION OF THE FREQUENCY RESPONSE AND STABILITY BEHAVIOR OF SODIUM-COOLED REACTOR INSTALLATIONS. (IN GERMAN)
TECHNISCHE UNIV. MUENCHEN, F.R. GERMANY
MRR-136 +. 108 PPS, FIGS, MARCH 1974 (IN GERMAN)

TO MAKE THE MODEL FOR BOTH, A FAST BREEDER AND A THERMAL REACTOR APPLICABLE, TWO VERSIONS OF COOLANT CHANNELS WERE INCLUDED INTO THE MODEL. IN THE CASE OF THE FAST FUEL ELEMENTS A SIMPLE COOLANT CHANNEL WAS ASSUMED CONTAINING A NUMBER OF CYLINDRICAL FUEL RODS. THE LOWER AND UPPER BREEDER REGION OF THE FUEL ELEMENTS CAN THEN BE SIMULATED BY APPROPRIATE CHOICE OF THE REACTIVITY WEIGHTING FUNCTION AND THE AXIAL POWER DISTRIBUTION FUNCTION. IN THE CASE OF THE KNK FUEL ELEMENT TYPE THE CYLINDRICAL FUEL RODS WITH THE UPWARDS FLOWING LIQUID SODIUM ARE SITUATED WITHIN THE ANNULAR INTERSPACE OF TWO HOLLOW-CYLINDRICAL SOLID-STATE MODERATOR ELEMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR KINETICS + REACTOR STABILITY + *ANALYTICAL MODEL + POWER DISTRIBUTION + REACTOR, THERMAL + *REACTOR PHYSICS + FREQUENCY ANALYSIS

6-106831 DATED 1975
BOGENSBERGER HG + CALDAROLA L + MITZEL F
ANALYSIS OF SEFOR EXPERIMENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2095 +. 109 PPS, 39 FIGS, JAN. 1975

DESCRIBES THE MAIN PROCEDURES AND RESULTS OF GFK ANALYSIS OF SEFOR EXPERIMENTS. DOPPLER EFFECT INFORMATION IS DISCUSSED ALONG WITH SEFOR EXPERIENCES CONCERNING CRITICALITY, MATERIAL REACTIVITY WORTH, FISSION RATE DISTRIBUTIONS, EFFECTIVE DECAY CONSTANT OF DELAYED NEUTRONS, PROMPT NEUTRON GENERATION TIME, AND FUEL TIME CONSTANTS FOR CHANGES OF THE TEMPERATURE PROFILE.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

DOPPLER EFFECT + REACTIVITY EFFECT + GERMANY + TEMPERATURE REACTIVITY EFFECT + *SEFOR (RE) + REACTOR PHYSICS

6-107200 ALSO IN CATEGORY 18 DATED 1975
FOURTEENTH QUARTERLY REPORT JANUARY-MARCH 1975. CRITICAL EXPERIMENTS AND ANALYSIS (LMFBR PROGRAM)
GENERAL ELECTRIC COMPANY
GEAP-13,771-14 +. 66 PPS, 19 FIGS, 9 REFS, MAY 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING CRITICAL EXPERIMENTS AND FUEL MANAGEMENT METHODS. TWO DIMENSIONAL CELL CALCULATIONS OF THE GAMMA HEATING INSIDE SEVERAL ZPPR-4 UNIT CELLS HAVE BEEN COMPLETED. THE USE OF INFLUENCE FUNCTIONS TO PREDICT THE CHANGE IN THE FLUX DISTRIBUTION DUE TO CONTROL ROD MOVEMENTS HAS BEEN FOUND TO BE AN EFFECTIVE APPROXIMATION CARRYING OUT FUEL BURNUP CALCULATIONS.

AVAILABILITY - ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + CRITICALITY EXPERIMENT + *R AND D PROGRAM + *FUEL MANAGEMENT + CLINCH RIVER (LMFBR)

6-107636 ALSO IN CATEGORIES 9 AND 18 DATED 1975
BURGESS CA + SHEELY WF
LMFBR REFERENCE CONTROL MATERIALS SEMIANNUAL REPORT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-71 +. 40 PPS, 12 FIGS, JULY 1975

PROGRESS ON NEUTRON ABSORBER DEVELOPMENT ACTIVITIES FROM JANUARY, 1975 THROUGH JUNE, 1975 IS PRESENTED. INCLUDED IN THE REPORT ARE DESCRIPTIONS OF ACTIVITIES RELATED TO PERFORMANCE ANALYSIS, DEVELOPMENT TESTING, AND FABRICATION TECHNOLOGY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + TESTING + CONTROL ROD FABRICATION + FFTF (TR) + MATERIAL + R AND D PROGRAM + PERFORMANCE + *CONTROL RODS

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-10764 ALSO IN CATEGORY 18 DATED 1974
CHRISTENSEN JA
GAS RELEASE VENT PERFORMANCE DURING LMFBR IRRADIATION
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-42 +. 45 PPS, 14 TABS, 6 REFS. JULY 1974

A NINETEEN-PIN SUBASSEMBLY CONTAINING FOURTEEN VENTED BORON CARBIDE PINS WAS IRRADIATED FOR 100 EFFECTIVE FULL POWER DAYS IN EBR-II. FOUR TYPES OF VENTS WERE INCLUDED IN THE TESTS. POSTIRRADIATION EXAMINATION OF THE PINS WAS COMPLETED, AND THE RESULTS PROVIDE A BASIS FOR VENT DESIGN IN FUTURE LMFBR APPLICATIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION. SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + POISON, BURNABLE + *CONTROL ROD BURNUP + DESIGN STUDY + *PRESSURE RELIEF + IRRADIATION TESTING + GAS + RADIATION EFFECT + CONTROL RODS

6-10784 ALSO IN CATEGORY 5 DATED 1974
EBERHARDT J
STUDIES ON THE DETECTION OF GENERAL SODIUM BOILING
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1211 +. 100 PPS, AUG. 1974

THE AIM OF THE PRESENT STUDIES WAS TO DEVELOP AND TEST A METHOD OF DETECTION ENABLING GENERAL SODIUM BOILING IN FAST SODIUM-COOLED REACTORS TO BE DETECTED SUFFICIENTLY EARLY FOR THE CONSEQUENTIAL DAMAGE TO BE LARGELY PREVENTED BY SUITABLE COUNTER MEASURES. BECAUSE THE CONVENTIONAL DETECTION METHODS OF INSTALLING THERMOCOUPLES AND FLOWMETERS IN THE INDIVIDUAL FUEL RODS PRESENTS PROBLEMS, THE SUITABILITY OF INDIRECTLY DETECTING BOILING BY OBSERVING REACTIVITY EFFECTS IS EXAMINED.

REACTIVITY EFFECT + MATHEMATICAL TREATMENT + REACTIVITY EFFECT, VOID + OSCILLATION + BOILING

6-10812 ALSO IN CATEGORIES 5 AND 11 AND 18 DATED 1975
NICKERSON G + KASTENBERG WE
PRELIMINARY ASSESSMENTS OF CARBIDE FUEL PINS DURING MILD OVERPOWER TRANSIENTS
UNIVERISTY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7582 +. 72 PPS, 16 TABS, 64 REFS, OCT. 1975

SEVERAL ASPECTS OF CARBIDE FUELED LMFBR'S ARE STUDIED. DISCUSSES THE STATE OF DEVELOPMENT OF CARBIDE FUEL AND CURRENT INFORMATION ABOUT AVAILABLE THERMOPHYSICAL PROPERTIES OF THIS MATERIAL IS PRESENTED. DESCRIBES THE CONCEPTUAL CARBIDE CORE DESIGN THAT IS STUDIED BY HOPE AND COMPARES IT WITH CRBRP DESIGN DATA. THE SCOPE OF THE BULK BOILING STUDY UNDERTAKEN WITH HOPE AND THE RESULTS OF THIS STUDY ARE ALSO PRESENTED IN THIS CHAPTER. A SUMMARY OF THE THESIS, CONCLUSIONS DRAWN FROM THE WORK COMPLETED, AND SOME RECOMMENDATIONS FOR FUTURE RESEARCH NEEDS ARE PRESENTED.

AVAILABILITY - ENERGY & KINETICS DEPARTMENT, SCHOOL OF ENGINEERING AND APPLIED SCIENCE, UNIV. OF CALIFORNIA, LOS ANGELES, CALIF.

*CARBIDE + COMPUTER PROGRAM + REACTOR TRANSIENT + DESIGN STUDY + *FUEL ROD + BOILING

6-10816 ALSO IN CATEGORY 18 DATED 1975
KASTENBERG WE + FRANK MV
PRELIMINARY ANALYSIS OF THE TRANSIENT OVERPOWER ACCIDENT FOR CRBRP
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7557 +. 64 PPS, 21 FIGS, JULY 1975

SUMMARIZES THE RESULTS OF STUDIES CONDUCTED IN SUPPORT OF THE UNITED STATES NUCLEAR REGULATORY COMMISSION'S REVIEW OF THE PSAR FOR THE CRBRP. IN CHAPTER 2, PRELIMINARY RESULTS FOR THE PREDISASSEMBLY STAGE OF THE UNPROTECTED OVERPOWER TRANSIENT FOR CRBRP USING THE HOPE CODE ARE PRESENTED. CHAPTER 3 CONTAINS A BRIEF REVIEW OF THE MAJOR UNCERTAINTIES IN THE ANALYSIS OF TRANSIENT OVERPOWER ACCIDENTS AND CHAPTER 4 CONTAINS A PROCEDURE FOR ESTIMATION OF THE RANGE OF RAMP RATES THAT CAN BE EXPECTED DURING THE TRANSITION TO DISASSEMBLY FOR THOSE CASES NOT TERMINATED BY HYDRAULIC SWEEPOUT OF FUEL. CHAPTER 5 CONCLUDES THE REPORT WITH A BRIEF SUMMARY AND CONCLUSIONS. EACH CHAPTER CONTAINS ITS OWN SET OF REFERENCES.

AVAILABILITY - WILLIAM E. KASTENBERG, PROFESSOR, ENERGY AND KINETICS DEPARTMENT, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA 90024

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR TRANSIENT + TRANSIENT + CLINCH RIVER (LMFBR)

6-10817 ALSO IN CATEGORY 18 DATED 1975
LMFBR PROGRAM CRITICAL EXPERIMENTS AND ANALYSIS, APRIL-JUNE 1975
GENERAL ELECTRIC COMPANY
GEAP-13771-15 +. 75 PPS, 27 TABS, 19 FIGS, JULY 1975

THE DETAILED SPECIFICATIONS OF THE EMC PHASE 1B EXPERIMENTAL PROGRAM HAVE BEEN COMPLETED. THE PRIMARY OBJECTIVE OF PHASE 1B WILL BE TO GET A SECOND SET OF MATERIAL REDISTRIBUTION WORTHS IN A MINIMUM OF FACILITY TIME. ALSO, INCLUDED IN THE PROGRAM IS A SERIES OF LOW LEVEL FLUX MONITOR

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-108175 *CONTINUED*
EXPERIMENTS AND A SMALL SAMPLE DOPPLER MEASUREMENT FOR 238U. ANALYSIS OF THE SUBCRITICAL MEASUREMENTS OF CONTROL ROD WORTHS PERFORMED IN PHASE 2 OF ZPPR-4 HAS BEEN COMPLETED. A COMPARISON OF THE EXPERIMENTAL AND CALCULATED RESULTS SHOWS A BIAS FACTOR OF 1.01.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTROL ROD WORTH + CRITICAL ASSEMBLY + DOPPLER COEFFICIENT + REACTIVITY EFFECT + *CRITICALITY EXPERIMENT + REACTOR PHYSICS + R AND D PROGRAM

6-108196 ALSO IN CATEGORIES 5 AND 18 DATED 1975
SLEMBER RJ
REACTOR AND SAFETY ENGINEERING TECHNICAL PROGRESS REPORT - APRIL, MAY, JUNE 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-70 +. 144 PPS, 21 TABS, 41 FIGS, AUG. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING CORE PHYSICS, RADIATION AND SHIELD ANALYSIS, REACTOR DYNAMICS, REACTOR SAFETY, SAFETY DEVELOPMENT, AND SYSTEMS SAFETY ANALYSIS. SPECIFIC TOPICS INCLUDE ASSESSMENT OF FTR STABILITY, REACTIVITY EFFECTS OF NEUTRON STREAMING THROUGH VOIDS IN MOLTEN FUEL, COOLANT BOILING, FUEL MOTION DURING FAST REACTOR OVERPOWER TRANSIENTS, CONTAINMENT ANALYSIS CODE, AND CORE REDISTRIBUTION ASSUMING LOSS OF FLOW.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CONTAINMENT + ACCIDENT, LOSS OF FLOW + REACTIVITY EFFECT + REACTOR STABILITY + FFTF (TR) + SHIELDING + REACTOR PHYSICS + *R AND D PROGRAM + *BOILING + TRANSIENT

6-108599 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY
ARGONNE NATIONAL LABORATORY
CONF-750303-6 +. 8 PPS, FROM PROCEEDINGS ON NUCLEAR CROSS SECTION AND TECHNIQUE, WASHINGTON, D.C., MARCH 3, 1975

THE CURRENT STATE OF KNOWLEDGE WITH RESPECT TO THE ANALYSIS OF POTENTIAL ACCIDENT SEQUENCES IN FAST BREEDER REACTORS AND THE UNDERSTANDING OF ASSOCIATED ACCIDENT PHENOMENA, AS WELL AS IMPLICATIONS TO REACTOR DESIGN, ARE REVIEWED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + DOPPLER EFFECT + REACTIVITY COEFFICIENT + REACTIVITY EFFECT + REACTOR KINETICS + SAFETY PROGRAM + REACTOR PHYSICS + REACTIVITY EFFECT, VOID + ACCIDENT, DESIGN BASIS

6-108759 ALSO IN CATEGORIES 5 AND 8 AND 11 A DATED 1975a
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

6-109346 ALSO IN CATEGORY 18 DATED 1975
FIFTEENTH QUARTERLY REPORT, APRIL-JUNE 1975. CRITICAL EXPERIMENTS AND ANALYSIS (LMFBR PROGRAM)
GENERAL ELECTRIC COMPANY
GEAP-13771-15 +. 94 PPS, 27 TABS, 19 FIGS, JULY 1975

CURRENT ACTIVITIES AND TECHNICAL PROGRESS FOR THE PERIOD APRIL THROUGH JUNE 1975 ARE REPORTED FOR TWO SUBTASKS. SUBTASK A COVERS THE TECHNICAL DIRECTION FOR CRITICAL EXPERIMENTS AND ANALYSIS AS APPLICABLE TO LMFBR COMMERCIAL PLANTS AND THE CLINCH RIVER BREEDER REACTOR PLANT BENCHMARK CRITICAL EXPERIMENTS IN ZPPR ASSEMBLY 4 AND THE CRBRP EMC. SUBTASK B IS DIRECTED TOWARD THE DEVELOPMENT OF LMFBR PLANT CALCULATIONAL METHODS THAT ALSO CAN BE USED AT THE SITES OF THE CLINCH RIVER BREEDER REACTOR TO DETERMINE THE REACTOR POWER DISTRIBUTION, REACTIVITY AND FUEL STATUS, AND FOR CONSIDERATION OF ALTERNATIVE FUEL AND CONTROL MANAGEMENT SCHEMES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-109346 *CONTINUED*
POWER DISTRIBUTION + ANALYTICAL TECHNIQUE + CRITICALITY EXPERIMENT + ZPPR (CAF) + REACTOR PHYSICS + *R AND D PROGRAM + *FUEL MANAGEMENT + CLINCH RIVER (LMFBR)

6-109425 ALSO IN CATEGORIES 5 AND 18 DATED 1975
FULFORD PJ + FOX JN + YACKLE TR
CORTAC: A CORE RESTRAINT TRANSIENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-76-10 +. 181 PPS, 11 FIGS, JULY 1975

CORTAC TREATS THE REACTOR CORE SYSTEM AS AN AXISYMMETRIC MODEL CONSISTING OF A CENTRAL CYLINDRICAL REGION AND FIFTEEN CONCENTRIC ANNULAR REGIONS. THE THERMAL-HYDRAULIC SIMULATION INCLUDES HEAT CONDUCTION BETWEEN RADIAL REGIONS, GAMMA AND NEUTRON HEATING OF STRUCTURE AND COOLANT, AND TIME DEPENDENT FLOW RATES WITHIN AND BETWEEN EACH REGION. EACH RADIAL REGION IS DIVIDED INTO A MAXIMUM OF NINE NODES, INCLUDING FOUR REPRESENTATIVE FUEL PIN NODES, AND UP TO THIRTY AXIAL SECTIONS. THE TRANSIENT TEMPERATURE EQUATIONS USE A RECENTLY DEVELOPED CONDUCTION-CONVECTION HEAT TRANSFER COMPUTATIONAL TECHNIQUE. STRUCTURAL RESPONSE OF THE CORE ASSEMBLIES IS SIMULATED BY A ROUTINE BASED ON THE NUBOW CODE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + HEAT TRANSFER + REACTOR KINETICS + TRANSIENT + *CORE RESTRAINT + *THERMAL HYDRAULIC ANALYSIS

6-109592 ALSO IN CATEGORIES 9 AND 11 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1975
ARGONNE NATIONAL LABORATORY
ANL-RDP-44 +. 188 PPS, FIGS, OCT. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING EBR-2 OPERATIONS, LMFBR DESIGN SUPPORT, DEVELOPMENT OF LMFBR INSTRUMENTATION, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, ACCIDENT ANALYSIS, ENERGY AND ENVIRONMENTAL SYSTEMS, GCFR FUELS AND MATERIALS DEVELOPMENT, AND THE SAFETY RESEARCH EXPERIMENT FACILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + TESTING + DESIGN STUDY + SAFETY PROGRAM + REACTOR PHYSICS + R AND D PROGRAM + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

6-109940 ALSO IN CATEGORIES 1 AND 18 DATED 1974
BOUDREAU JE + JACKSON JF
RECRITICALITY CONSIDERATIONS IN LMFBR ACCIDENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 24 PPS, PP. 1265-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

RECENT STUDIES SUGGEST THAT FUEL WHICH IS DISPERSED UPWARD BY A MILD PROMPT CRITICAL BURST MAY REENTER THE CORE REGION CAUSING A SECONDARY EXCURSION. IN THIS PAPER, SEVERAL MODES OF FUEL REENTRY RECRITICALITY ARE EXAMINED, AND PHENOMENA WHICH STRONGLY AFFECT REACTIVITY RAMP RATE ESTIMATES ARE EVALUATED. A BROAD RANGE OF RAMP RATES RESULTS FROM THESE STUDIES. THE RESULTS ALSO INDICATE THAT A NUMBER OF EFFECTS EXPECTED TO BE PRESENT IN REALISTIC SITUATIONS CAN STRONGLY MITIGATE THE REACTIVITY INSERTION RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + *ACCIDENT, HYPOTHETICAL

6-109942 ALSO IN CATEGORIES 5 AND 18 DATED 1974
STEVENSON MG + BOHL WR + DUNN FE
CURRENT STATUS AND EXPERIMENTAL BASIS OF THE SAS LMFBR ACCIDENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 18 PPS, PP. 1303-21, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE LATEST VERSION, SAS3A, INCLUDES MODELS WHICH ALLOW AN INTEGRAL TREATMENT OF BOTH TRANSIENT OVERPOWER AND LOSS-OF-FLOW UNPROTECTED ACCIDENT SEQUENCES THROUGH FUEL-PIN DISRUPTION AND UP TO THE POINT OF SUBASSEMBLY DISRUPTION. IN SOME CASES, THESE MODELS CAN FOLLOW THE SEQUENCE FROM INITIATION TO NEUTRONIC SHUTDOWN BY DISPERSIVE FUEL MOTION AND CAN BE USED TO EVALUATE THE POSSIBILITY OF ESTABLISHING IN-PLACE COOLING. FOR CASES WHICH PROCEED TO AN ENERGETIC CORE DISASSEMBLY, THE NEW MODELS PROVIDE AN IMPROVED DEFINITION OF CORE CONDITIONS AND REACTIVITY INSERTION RATE AT THE TIME OF A TRANSITION TO VENUS-II. THE NEW CAPABILITIES PROVIDED BY SAS3A INCLUDE A STEADY-STATE FUELS-INITIALIZATION ROUTINE, A PRIMARY-LOOP HYDRAULICS MODEL, A FUEL-COOLANT-INTERACTION MODEL FOR TRANSIENT OVERPOWER CONDITIONS, A NEW MOVING-FILM TREATMENT IN THE MULTIBUBBLE SODIUM-BOILING MODEL, AND CLADDING AND FUEL MOTION MODELS FOR VOIDED ASSEMBLIES IN A LOSS-OF-FLOW ACCIDENT.

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-109942 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, REACTIVITY + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

6-109943 ALSO IN CATEGORIES 5 AND 18 DATED 1974
BLEIWEIS PB + OKRENT D + KASTENBERG WE
A COMPARISON STUDY AND ANALYSIS OF MODELS FOR 1000 MWE AND 4000 MWE LMFBR HYPOTHETICAL ACCIDENTS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-740401-P3 +. 10 PPS, PP. 1322-32, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A 1000 MWE AND TWO 4000 MWE LMFBR'S WERE ANALYZED FOR UNPROTECTED LOSS-OF-COOLANT FLOW AND REACTIVITY INSERTION ACCIDENTS USING A VERSION OF THE SAS-VENUS COMPUTER CODE. FOR SIMILAR ACCIDENTS, THE FINAL ENERGY DEPOSITED IN THE MOLTEN FUEL INCREASED NEARLY DIRECTLY PROPORTIONAL TO THE CORE MASS. A FOUR ZONE, MORE HIGHLY FLATTENED 4000 MWE REACTOR YIELDED BETWEEN 5% AND 15% MORE ENERGY IN MOLTEN FUEL THAN A TWO ZONE REACTOR FOR THE SAME ACCIDENT CONDITIONS. THE ENERGY YIELDS WERE RELATIVELY INSENSITIVE TO THE ASSUMED VALUES OF SODIUM SUPERHEAT. THE COMPUTER CODE WAS FOUND TO INTRODUCE POTENTIALLY LARGE ERRORS BECAUSE OF THE MANNER IN WHICH REACTIVITY INSERTION RATES WERE SELECTED FOR THE DISASSEMBLY PHASE AT THE TIME OF SWITCHING TO THE VENUS MODULE (AT A PRE-SPECIFIED PEAK CORE FUEL TEMPERATURE). FURTHER ATTENTION SHOULD BE GIVEN TO THIS ASPECT OF COUPLED-CODE ACCIDENT ANALYSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *COMPARISON

6-109944 ALSO IN CATEGORIES 5 AND 7 AND 18 DATED 1974
BOGENSBERGER HG + FISCHER EA + SCHMUCK F
ON THE EQUATION OF STATE OF MIXED OXIDE FUEL FOR THE ANALYSIS OF FAST REACTOR DISASSEMBLY ACCIDENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1333-48, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE VAPOR PRESSURE FOR MIXED OXIDE IS CALCULATED BY FOLLOWING THE METHOD USED BY RAND AND MARKIN. THE VAPOR PRESSURE OF THE FISSION PRODUCTS IS ALSO CALCULATED, AND FOUND TO BE MUCH LARGER THAN THAT OF MIXED OXIDE AT TEMPERATURES AROUND THE MELTING POINT. THE DISASSEMBLY PHASE OF AN UNPROTECTED REACTIVITY ACCIDENT IN A LMFBR IS ANALYZED USING THESE VAPOR PRESSURE DATA. THE ACCIDENT IS INITIATED BY A 5 $/SEC REACTIVITY RAMP; THE PREDISASSEMBLY PART WAS ANALYZED EARLIER WITH THE SAS-2A CODE. IT IS FOUND THAT THE VAPOR PRESSURE OF THE FISSION PRODUCTS HAS THE EFFECT OF GREATLY REDUCING THE ENERGY RELEASE IN THE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + VAPOR PRESSURE + MIXED OXIDE + *ACCIDENT, CORE DISRUPTIVE

6-109957 ALSO IN CATEGORIES 5 AND 18 DATED 1974
STRUWE D + ROYL P + WIRTZ P
CAPRI - A COMPUTER CODE FOR THE ANALYSIS OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS IN THE PREDISASSEMBLY PHASE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1525-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE NEWLY DEVELOPED CODE SYSTEM CAPRI-2 IS DESCRIBED. RESULTS OF A PARAMETRIC STUDY FOR THE PREDISASSEMBLY PHASE OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS FOR THE MARK I-CORE OF THE SNR-300 ARE PRESENTED. FOR THE OVERPOWER ACCIDENT THE INFLUENCE OF DIFFERENT RAMP RATES AND FOR THE PUMP FLOW COAST DOWN THE INFLUENCE OF DIFFERENT THERMOHYDRAULIC DESIGN DATA IS ANALYSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + ACCIDENT, HYPOTHETICAL + *ACCIDENT, CORE DISRUPTIVE

6-109958 ALSO IN CATEGORIES 8 AND 11 AND 18 DATED 1974
WIDER HU + JACKSON JF + SMITH LL
AN IMPROVED ANALYSIS OF FUEL MOTION DURING AN OVERPOWER EXCURSION
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 14 PPS, PP. 1541-55, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DURING AN OVERPOWER EXCURSION IN A LMFBR, IRRADIATED FUEL PINS ARE EXPECTED TO RUPTURE AND EJECT MOLTEN FUEL AND FISSION GAS INTO THE COOLANT CHANNELS. THE EJECTED FUEL IS SUBSEQUENTLY DISPLACED BY THE INITIAL SODIUM MOMENTUM, BY PRESSURES RESULTING FROM FUEL-COOLANT THERMAL INTERACTIONS, AND BY FISSION GAS RELEASED THROUGH THE CLAD RUPTURE. THIS FUEL AND SODIUM MOTION IN THE CORE REGION AFFECTS THE REACTIVITY OF THE REACTOR AND DETERMINES THE ULTIMATE COURSE OF THE NEUTRONICS TRANSIENT. IN THIS PAPER THE RESULTS OF PLUTO, A NEW MODEL FOR PREDICTING THIS FUEL AND SODIUM MOTION, ARE COMPARED WITH SAS/FCI, A CURRENT FUEL-COOLANT INTERACTION MODEL USED IN WHOLE-CORE ACCIDENT ANALYSIS.

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-109958 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + *COMPARISON + *FUEL COOLANT INTERACTION + FUEL ELEMENTS

6-109959 ALSO IN CATEGORY 18 DATED 1974
KASTENBERG WE + RUMBLE ET + UKKENT D
FUEL MOVEMENT INVESTIGATIONS DURING LMFBR OVERPOWER EXCURSIONS USING A NEW MODEL
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-740401-P3 +. 15 PPS, PP. 1556-71, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

SEVERAL PHYSICAL MODELS APPROXIMATED IN A COMPUTER SIMULATION OF THE PREDISASSEMBLY PHASE OF LMFBR OVERPOWER EXCURSIONS ARE DESCRIBED. RESULTS ARE PRESENTED SHOWING CLAD FAILURE PREDICTIONS, FUEL MOVEMENT AND RELATED PHENOMENA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + ANALYTICAL MODEL + *FAILURE, CLADDING + SIMULATION + *PROBABILITY

6-109960 ALSO IN CATEGORIES 5 AND 18 DATED 1974
WILLENBERG HJ + PARTAIN WL + WALTAR AE
DYNAMICS OF MOLTEN FUEL MOTION DURING A FAST-REACTOR OVERPOWER TRANSIENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P3 +. 17 PPS, PP. 1572-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A TREATMENT OF THE INTERNAL MOLTEN FUEL/GAS MIXTURE AS A TWO-PHASE, COMPRESSIBLE FLUID YIELDS A MARKEDLY DIFFERENT REACTIVITY FEEDBACK THAN THAT PREDICTED WITH A FLUID OF UNIFORM INTERNAL DENSITY AND COMPOSITION, BUT DOES NOT APPEAR TO SUBSTANTIALLY ALTER PREVIOUS CONCLUSIONS REGARDING THE ABILITY OF A REACTOR TO ULTIMATELY SHUT DOWN SAFELY. DESPITE RATHER PEAKED DENSITY SKEWING DISTRIBUTIONS POSTULATED FOR FUEL BEING SWEPT OUT INTO THE COOLANT CHANNEL, THE OVERALL TRANSIENT BEHAVIOR DOES NOT APPEAR TO VARY APPRECIABLY FROM PREVIOUS STUDIES, SO LONG AS OFF-CENTER FAILURES PREDOMINATE. EARLY FUEL PLATEOUT DOES NOT APPRECIABLY ALTER THE REACTIVITY SHUTDOWN MECHANISM, ALTHOUGH IT MAY BECOME A FACTOR REGARDING LONG-TERM HEAT REMOVAL QUESTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + POWER DISTRIBUTION + REACTOR POWER + TRANSIENT + *FUEL COOLANT INTERACTION

6-109961 ALSO IN CATEGORY 18 DATED 1974
ROYL P + SMITH LL + STEVENSON MG
SIMULATION OF AN UNPROTECTED OVERPOWER ACCIDENT IN THE SNR-300 WITH THE SAS 3A CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 12 PPS, PP. 1590-1602, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE UNPROTECTED OVERPOWER ACCIDENT IN AN LMFBR IS ONE OF THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS WHOSE ANALYSIS IS USUALLY CONSIDERED IN THE DESIGN AND LICENSING OF THE REACTOR. EARLIER ANALYSES OF THIS ACCIDENT PERFORMED FOR THE SNR-300 HAVE BEEN OVERLY PESSIMISTIC BECAUSE THE REACTIVITY FEEDBACK DUE TO FUEL MOVEMENT DURING MOLTEN FUEL-SODIUM INTERACTION HAD BEEN NEGLECTED IN THE PREDISASSEMBLY PHASE. KASTENBERG AND RUMBLE HAVE DEVELOPED A SIMPLE MODEL TO CALCULATE FUEL MOTION AND ITS REACTIVITY EFFECT DURING THIS PHASE OF THE ACCIDENT AND HAVE SHOWN ITS POTENTIAL FOR LOWERING THE WORK ENERGY FOR THE SNR-300. HOWEVER, IN THEIR MODEL THE FAILURE CONDITIONS AND THE EJECTION OF MOLTEN FUEL INTO THE COOLANT STREAM COULD ONLY BE POSTULATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + ANALYTICAL MODEL + *ACCIDENT, HYPOTHETICAL + GERMANY + *ACCIDENT, CORE DISRUPTIVE

6-109962 ALSO IN CATEGORIES 9 AND 12 AND 18 DATED 1974
BURGSMULLER P + DEKAIS JJ + KRAHE A
GBR-4 PROTECTION SYSTEMS - FAILURES AND THEIR CONSEQUENCES
GAS-COOLED BREEDER REACTOR ASSOCIATION, EURSSELS, BELGIUM
CONF-740401-P3 +. 15 PPS, PP. 1603-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE GBR-4 DESIGN OF A GAS-COOLED FAST REACTOR, EMPHASIS IS PLACED ON USING TO ADVANTAGE THE SINGLE-PHASE CHARACTER OF THE COOLANT. SPECIFIC FEATURES OF THE PROTECTIVE SYSTEMS ARE FAIL-SAFE NEUTRON ABSORPTION, PERMANENTLY OPERATING AUXILIARY SUPPLIES AND ATMOSPHERIC PRESSURE COOLING. FOR TRANSIENT ANALYSIS A COMPUTER PROGRAM IS APPLIED USING A POINT REACTOR MODEL FOR HEAT TRANSFER AND NEUTRON KINETICS. A DYNAMIC STEAM GENERATOR CODE HAS BEEN EMPLOYED TO DESCRIBE SECONDARY SIDE EFFECTS. ANTICIPATED DISTURBANCES IN OPERATION ARE REACTIVITY INSERTION, LOSS OF SUPPLIES AND LOSS OF COOLANT PRESSURE. FOR THESE ACCIDENTS, FAILURES IN REACTOR PROTECTION ARE POSTULATED IN DECREASING ORDER OF PROBABILITY. THE CONSEQUENCES ARE ANALYSED AND DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 6
REACTOR TRANSIENTS, KINETICS, AND STABILITY

6-109962 *CONTINUED*
*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR, GCR + *REACTOR KINETICS + REACTOR PROTECTION SYSTEM + STEAM GENERATOR + ENGINEERED SAFETY FEATURE

6-109963 ALSO IN CATEGORY 18 DATED 1974
BUTTEMER D + CHI H + REINSCH W
SAFETY ANALYSIS OF A 300 MWE GAS-COOLED FAST BREEDER REACTOR
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
CONF-740401-P3 +. 15 PPS. PP. 1619-34. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

EXTENSIVE SAFETY EVALUATIONS OF THE 300-MWE(E) GCFR DEMONSTRATION PLANT TO DETERMINE THE RESPONSE TO ANTICIPATED PLANT TRANSIENTS AND TO POSTULATED ACCIDENTS ARE SUMMARIZED IN THIS PAPER. CASES PRESENTED INCLUDE NORMAL REACTOR TRIP, LOOP ISOLATION, CONTROL-ROD WITHDRAWAL ACCIDENTS, ACCIDENTS INVOLVING MALFUNCTIONS IN THE CIRCULATOR CONTROL VALVES, AND DEPRESSURIZATION ACCIDENTS. THE RESULTS ARE VERY ENCOURAGING WITH RESPECT TO THE CAPABILITY OF THE GCFR TO SAFELY ACCOMMODATE THE SPECTRUM OF CASES INVESTIGATED WITHOUT EXCEEDING FUEL OR COOLANT-SYSTEM SAFETY LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *REACTOR, GCR + SAFETY EVALUATION + *ACCIDENT, ATWS

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-093654 ALSO IN CATEGORY 5 DATED 1974
CHASANOV MG + FISCHER DF + FREDRICKSON DR + GABELNICK SD + KUMAR R + LEIBOWITZ L + REEDY GT + CAFASSO FA + BURRIS L
CHEMICAL ENGINEERING DIVISION REACTOR SAFETY AND PHYSICAL PROPERTY STUDIES ANNUAL REPORT, JULY 1973-JUNE 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8120 +, 108 PAGES, 23 TABLES, 35 FIGURES, 1974

THE REPORT INCLUDES THE FOLLOWING: RESULTS ON THE STUDY OF THE BEHAVIOR OF IRRADIATED FUEL UNDER POWER-TRANSIENT SIMULATION USING DIRECT ELECTRICAL HEATING; INFORMATION ON THE DEVELOPMENT OF EQUIPMENT TO MEASURE THE ELECTRICAL RESISTIVITY OF MIXED-OXIDE FUEL MATERIALS; DETERMINATION OF THE ENTHALPY OF CS(SUB 2)MOO(SUB 4) BY DROP CALORIMETRY; CALCULATIONS OF HIGH-TEMPERATURE THERMOPHYSICAL PROPERTIES OF SODIUM FROM VARIOUS ESTIMATES OF CRITICAL PARAMETERS; A PROGRESS REPORT ON STUDIES AIMED AT THE DETERMINATION OF THE THERMAL DIFFUSIVITY OF MOLTEN UO(SUB 2); MEASUREMENTS ON THE SOLUBILITY OF UO(SUB 2) IN MOLTEN BASALT AND THE VISCOSITY OF SUCH SOLUTIONS; RESULTS OF AN INVESTIGATION OF THE INTERACTION OF BASALT WITH MOLTEN SODIUM AT APPROXIMATELY 900 C; AND ANALYSIS OF THE EFFECTS OF SACRIFICIAL BARRIER MATERIALS ON THE POST-ACCIDENT HEAT-REMOVAL REQUIREMENTS FOLLOWING A HYPOTHETICAL CORE-DISRUPTIVE ACCIDENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + REACTOR TRANSIENT + URANIUM DIOXIDE + IRRADIATION TESTING + PROPERTY, PHYSICAL + PLUTONIUM DIOXIDE + SOLUBILITY + FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE + HEATERS + FUEL ELEMENTS

7-095165 ALSO IN CATEGORY 12 DATED 1973
ALLAN CG
SOLUBILITIES OF SODIUM BROMIDE AND SODIUM IODIDE IN SODIUM
UKAEA REACTOR GROUP, DOUNREAY
TRG-REPORT-2458 +, 26 PAGES, 6 FIGURES, 6 TABLES, 42 REFERENCES, NOVEMBER 1973

THE SOLUBILITIES OF SODIUM BROMIDE AND SODIUM IODIDE IN REACTOR GRADE SODIUM AT 150 - 450 C ARE REPORTED. THE HALIDES DISSOLVE AS THE DISSOCIATED IONS, SOLVATED BY THE LIQUID METAL, AND THE SOLUTIONS SHOW LARGE DEVIATIONS FROM THE IDEAL AND SMALL DEVIATIONS FROM REGULARITY. THIS IS INTERPRETED IN TERMS OF SHORT-RANGE ORDER IN THE SOLUTION. FISSION PRODUCT HALIDES WILL COLLECT IN THE COOLER PARTS OF FAST REACTOR CIRCUITS, ESPECIALLY FILTRATION COLD TRAPS, AND THE RADIATION LEVELS FROM THESE COMPONENTS WILL BE HIGH. THE ADDITION OF STABLE HALIDE FOLLOWED BY COLD TRAPPING MAY BE AN EFFICIENT METHOD OF REMOVING HALIDE ACTIVITY FROM FAST REACTOR PRIMARY CIRCUITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FILTER, TRAP + COOLANT CHEMISTRY + PROPERTY, PHYSICAL + BROMIDE + IODIDE + SOLUBILITY + SOLUTION

7-098353 ALSO IN CATEGORY 18 DATED 1974
FONTANA MF + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE DIVISION OF REACTOR SAFETY RESEARCH FOR JULY - SEPTEMBER 1974, LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4729(VOL.3) +, 25 PAGES, 8 FIGURES, DECEMBER 1974

REPORTS PROGRESS ON THE INVESTIGATION OF THE RELEASE AND BEHAVIOR OF TRANSURANIC ELEMENTS AND FISSION PRODUCTS RESULTING FROM A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT. A SECOND TALK WAS COMPLETED WITH THE ISSUANCE OF THE REPORT ORNL-TM-4714, A STATE-OF-THE-ART REVIEW OF EQUIPMENT CELL LINERS FOR LMFBRS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FISSION PRODUCT RELEASE + R AND D PROGRAM + CONTAINMENT LINER + ACCIDENT, CORE DISRUPTIVE

7-098354 ALSO IN CATEGORY 18 DATED 1974
FONTANA MH
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE DIVISION OF REACTOR SAFETY RESEARCH FOR APRIL - JUNE 1974, LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4655(VOL 3) +, 39 PAGES, 11 FIGURES, AUGUST 1974

REPORTS PROGRESS ON THE INVESTIGATION OF THE RELEASE AND BEHAVIOR OF TRANSURANIC ELEMENTS AND FISSION PRODUCTS RESULTING FROM THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION PRODUCT RELEASE + R AND D PROGRAM + ACCIDENT, CORE DISRUPTIVE

7-099135 DATED 1972
BRAMMAN JI + YATES G + HUGHES B
AN APPROACH TO THE PROBLEMS ENCOUNTERED IN THE ELECTRON-PROBE ANALYSIS OF IRRADIATED FUEL SECTIONS

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-099135 *CONTINUED*
UKAEA DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT, THURSO, SCOTLAND
CONF-720319 +. 5 PAGES. PAPER PRESENTED AT THE BNES'S EUROPEAN CONFERENCE ON POST-IRRADIATION EXAMINATION TECHNIQUES, HELD IN READING, MARCH 22-23, 1972

MANY HIGHLY-ACTIVE IRRADIATED MIXED OXIDE FUEL SAMPLES HAVE BEEN SUCCESSFULLY EXAMINED USING AN EXTENSIVELY MODIFIED AEI SEM 2 ELECTRON-PROBE MICROANALYSER. THE DESIGN PHILOSOPHY UNDERLYING THE MODIFICATIONS AND THE SPECIALLY DEVISED SPECIMEN PREPARATION AND HANDLING TECHNIQUES ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

URANIUM OXIDE + PLUTONIUM OXIDE + IRRADIATION TESTING + DOUNREAY (LMFBR) + EXAMINATION + FUEL ELEMENTS

7-099475 ALSO IN CATEGORY 12 DATED 1974
NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS QUARTERLY TECHNICAL PROGRESS REPORT, JULY-SEPT. 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13139 +. 16 PAGES, 5 FIGURES, NOVEMBER 15, 1974

THE LARGE TEST VESSEL (LTV) FOR CONDUCTING SODIUM AND WATER JET TESTS WAS DISMANTLED, CLEANED, AND REASSEMBLED, AND ASSOCIATED INSTRUMENTATION CALIBRATED. THE BURNING CHARACTERISTICS OF STATIONARY AND FALLING DROPS OF SODIUM WERE DETERMINED. COMPUTER COMPARISONS BETWEEN SOMIX-1 AND TORRANCIS CYLINDRICAL GEOMETRY CODE FOR THE HIGH GRASHOF NUMBER CASE SHOWED GOOD AGREEMENT. A PARAMETRIC STUDY WAS MADE TO DETERMINE THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF AN FFTF HYPOTHETICAL CORE DISASSEMBLY ACCIDENT. FROM ZERO TO 10,000 LB SODIUM, FROM 1-50% OF THE CORE FUEL AND SOLID FISSION PRODUCTS AND 100% OF THE NOBLE GAS FISSION PRODUCTS WERE CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + ACCIDENT, CONSEQUENCES + FIRE + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + JET + ACCIDENT, HYPOTHETICAL

7-099481 DATED 1974
KABELE TJ + BOHRINGER AP
FFTF FISSION GAS DELAY BEDS: ENGINEERING SCALE TEST FINAL REPORT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-33 +. 10 PAGES, 2 FIGURES, 4 REFERENCES, 1974

THE DYNAMIC ADSORPTION COEFFICIENT OF KR-85 ON ACTIVATED CHARCOAL FROM A NITROGEN CARRIER GAS WAS MEASURED AT -80 AND -120 C AT PRESSURES OF ZERO AND 30 PSIG. THE EFFECTS OF THE PRESENCE OF IMPURITIES IN THE NITROGEN CARRIER GAS (1% OXYGEN, AND 100 VPPM CARBON DIOXIDE) ON THE ADSORPTION COEFFICIENT OF 85-KR WERE ALSO MEASURED. MEASUREMENTS WERE COMPLETED ON THE DYNAMIC ADSORPTION COEFFICIENT OF 133-XE ON ACTIVATED CHARCOAL FROM A PURE ARGON CARRIER GAS. THESE MEASUREMENTS WERE MADE AT -100 C AND AT PRESSURES OF ZERO AND 25 PSIG. THIS REPORT COVERS THE FINAL RESULTS OF A TEST PROGRAM, EARLIER RESULTS OF WHICH REPORTED IN HEDL-TME 73-26.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FISSION GAS RELEASE + KRYPTON + REACTOR, TEST + TESTING + XENON + ARGON + CHARCOAL ADSORBER + NITROGEN + FFTF (TR)

7-099645 ALSO IN CATEGORY 6 DATED 1974
GNEITING BC + BARD FE
PECT-2T PRETEST ANALYSIS OF THE HUT-CAL-2 TRANSIENT TEST
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-15 +. 47 PAGES, 20 FIGURES, 20 REFERENCES, APRIL 1974

DESCRIBES THE PRETEST THERMAL/DEFORMATION ANALYSES USED TO OBTAIN TEST REQUIREMENTS FOR THE HUT-CAL-2 TRANSIENT TEST. THE PECT-2T THERMAL/MECHANICAL PERFORMANCE CODE WAS USED TO OBTAIN THE RECOMMENDED TREAT TRANSIENT BY SYSTEMATICALLY ADJUSTING BOTH THE REACTOR POWER AND THE CAPSULE PREHEAT TEMPERATURE UNTIL A MAXIMUM CLADDING EFFECTIVE NONELASTIC STRAIN OF 1.9% AND A MAXIMUM FUEL AREA MELT OF APPROXIMATELY 54% WAS CALCULATED. THE MATERIAL PRESENTED IN THIS REPORT AS WELL AS POST-TEST MEASUREMENTS ON THIS WELL CHARACTERIZED, VARIABLY DIMENSIONED FUEL PIN WILL BE USED TO VERIFY AND CALIBRATE THE EXISTING MATERIAL MODEL IN PECT-2T. ALSO PRESENTS THE CURRENT PECT-2T GAP CONDUCTANCE MODEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + CLADDING + THERMAL ANALYSIS + DEFORMATION + FAILURE, CLADDING + HEAT CONDUCTANCE, FUEL TO CLAD + PROPERTY, MECHANICAL + MODEL + THERMAL TRANSIENT + FUEL ELEMENTS

7-100243 ALSO IN CATEGORY 12 DATED 1974
JORDAN H + SCHIKARSKI W + WILD H
NUCLEAR AEROSOLS IN A CLOSED SYSTEM
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1227 + KFK-1989 +. 115 PAGES, 37 FIGURES, OCTOBER 1974

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-100242 *CONTINUED*
THE AV PROGRAM WAS SET UP TO INVESTIGATE THE BEHAVIOR OF UO2 AEROSOLS IN A DRY, INERT AND ENCLOSED ATMOSPHERE. SUCH A SYSTEM IS BROUGHT INTO THE CONTEXT OF FAST BREEDER REACTOR SAFETY IN THE INTRODUCTION AND CONCLUSION OF THIS REPORT WHERE THE PRIMARY ROLE OF THE FUEL AEROSOL IN THE EVENT OF A HYPOTHETICAL LMFBR ACCIDENT IS EMPHASIZED. THE RESULT OF THE PROGRAM IS A BASIC UNDERSTANDING OF THE AEROSOL-MECHANICAL PROCESSES THAT DETERMINE THE DYNAMICS OF AN AEROSOL SYSTEM. THESE ARE INCORPORATED IN A COMPUTER CODE THAT SATISFACTORALLY DUPLICATES EXPERIMENTAL FINDINGS AND THAT CAN BE USED TO EXTRAPOLATE THESE TO ACTUAL REACTOR CONTAINMENT SITUATIONS. PARAMETERS OF MAJOR INFLUENCE ON THE HALF-LIFE OF SUSPENDED FUEL MASS HAVE BEEN IDENTIFIED. THESE ARE THE PHYSICAL DIMENSIONS OF THE SYSTEM, ITS TEMPERATURE AND RATE OF HEAT LOSS AND THE TYPE AND INITIAL SIZE DISTRIBUTION OF THE AEROSOL PARTICLES. THE REMAINING UNCERTAINTIES IN THE INFLUENCE OF TYPE AND SIZE DISTRIBUTION OF THE AEROSOL PARTICLES ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + DEPOSITION + PARTICLE SIZE + ANALYTICAL MODEL + AEROSOL PROPERTIES

7-100390 ALSO IN CATEGORY 12 DATED 1974
ZIMMERMANN H
FISSION GAS BEHAVIOR IN OXIDE FUEL ELEMENTS OF FAST BREEDER REACTORS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1228 + KFK-2057 +. 80 PAGES, 30 FIGURES, OCT. 1974 (IN GERMAN)

FUEL ELEMENTS WERE IRRADIATED AND THE AMOUNT OF FISSION GAS WAS MEASURED IN 3 STEPS AS RELEASED FISSION GAS, FISSION GAS RETAINED IN BUBBLES AND PORES, AND FISSION GAS RETAINED IN VERY SMALL INTRAGRANULAR BUBBLES AND CRYSTAL LATTICE SITES. UNDER THE CONDITION PREVAILING IN FAST BREEDER REACTORS THE FRACTIONAL FISSION GAS RELEASE IS ABOUT 90% OR MORE AFTER MEDIUM AND HIGH BURNUPS. THE RELEASE RATE IS NOT CONSTANT, BUT THERE ARE PERIODS WITH HIGH RELEASE RATES (BREAK AWAY RELEASES). A SIMPLE FORMULA DESCRIBING FISSION GAS RELEASE RATES IN 3 TEMPERATURE REGIONS WAS OBTAINED ON THE BASIS OF MEASURED RELEASE RATES AND CONCENTRATIONS OF THE RETAINED FISSION GAS.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

*FISSION GAS RELEASE + FUEL BURNUP + OXIDE + URANIUM + *THERMAL EXPERIMENT + FUEL ROD + FUEL ELEMENTS

7-100541 ALSO IN CATEGORY 12 DATED 1974
FUJII I + OHNO M + TAKEHARA K
DEVELOPMENT OF A SODIUM INPILE LOOP
TOKYO SHIBAURA ELECTRIC CO. LTD., KAWASAKI, JAPAN
4 PAGES, 3 FIGURES, J. BRITISH NUCLEAR ENERGY SOCIETY, 13(4), PP. 403-406 (OCTOBER 1974)

A SODIUM FACILITY HAS BEEN INSTALLED IN THE TOSHIBA TRAINING REACTOR FOR THE PURPOSES OF DEVELOPMENT OF A FAILED FUEL DETECTION SYSTEM, AND THE STUDY OF RADIONUCLIDES DISTRIBUTION AND THEIR CLEAN-UP. THE FACILITY COMPRISES AN INPILE PLUG AND ASSOCIATED SODIUM LOOP. SOME COMMISSIONING TESTS HAVE BEEN CARRIED OUT.

DEPOSITION + FAILURE, FUEL ELEMENT + FISSION PRODUCT TRANSPORT + IN PILE EXPERIMENT

7-100548 ALSO IN CATEGORY 12 DATED 1974
KABELE TJ + BOHRINGER AP
ENGINEERING SCALE TESTS OF AN FFTF FISSION GAS DELAY BED
WESTINGHOUSE HANFORD COMPANY, RICHLAND, WASHINGTON
HEDL-SA-691 + CONF-740807-20 +. 12 PAGES, PRESENTED AT THE 13TH AIR CLEANING CONFERENCE, HELD IN SAN FRANCISCO, CALIF., AUG. 12, 1974

THE DYNAMIC ADSORPTION COEFFICIENT OF 85KR ON ACTIVATED CHARCOAL FROM A NITROGEN CARRIER GAS WAS MEASURED AT -80 AND -120 C AT PRESSURES OF ZERO AND 30 PSIG. THE EFFECTS OF THE PRESENCE OF IMPURITIES IN THE NITROGEN CARRIER GAS (1% OXYGEN, AND 100 VPPM CARBON DIOXIDE) ON THE ADSORPTION COEFFICIENT OF 85 KR WERE ALSO MEASURED. THE 85KR ADSORPTION COEFFICIENT INCREASED WITH DECREASING TEMPERATURE, AND INCREASED WITH INCREASING PRESSURE. THE PRESENCE OF OXYGEN AND CARBON DIOXIDE IMPURITIES IN THE NITROGEN CARRIER GAS HAD NO DISCERNIBLE EFFECT UPON THE ADSORPTION COEFFICIENT. THE ADSORPTION COEFFICIENT FOR 85KR FROM NITROGEN GAS WAS LOWER THAN FOR ADSORPTION OF 85KR FROM AN ARGON GAS STREAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KRYPTON + NITROGEN + CHARCOAL + COOLANT PURIFICATION SYSTEM

7-101230 ALSO IN CATEGORY 6 DATED 1974
MCELROY WN
LMFBR REACTION RATE AND DOSIMETRY 9TH PROGRESS REPORT FOR PERIOD OCTOBER 1973 THROUGH MAY 1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-45 +. 250 PAGES, FIGURES, NOVEMBER 1974

DESCRIBES PROGRESS MADE DURING THE REPORTING PERIOD. TOPICS INCLUDE FISSION PRODUCT ACTIVITIES, FISSION YIELDS, SELF-SHIELDING REACTION RATES, INTEGRAL CROSS SECTION BY HELIUM MEASUREMENT, AND DOSIMETER SAMPLE PREPARATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-101230 *CONTINUED*
DOSIMETRY + MATERIAL + IRRADIATION TESTING + CROSS SECTION + REACTOR PHYSICS + R AND D PROGRAM + FUEL ELEMENTS

7-101232 DATED 1975
FONTANA MH + GNADT PA + KRESS TS + MACPHERSON RE + PARSLY LF + WANTLAND JL
TEMPERATURE DISTRIBUTION IN A 19-ROD SIMULATED LMFBR FUEL ASSEMBLY IN A SCALLOPED DUCT (FUEL FAILURE MOCKUP BUNDLE 1A) - RECORD OF EXPERIMENTAL DATA
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4670 +. 263 PAGES, 5 TABLES, 5 FIGURES, 18 REFERENCES, JANUARY 1975

THIS REPORT IS A RECORD OF EXPERIMENTAL DATA OBTAINED FROM FUEL FAILURE MOCKUP (FFM) BUNDLE 1A, WHICH SIMULATED THE CONFIGURATION AND POWER LEVEL OF THE FAST TEST REACTOR (FTR) FUEL SUBASSEMBLY. BUNDLE 1A CONSISTED OF 19 ELECTRIC CARTRIDGE HEATERS WITH OUTSIDE DIAMETERS OF 0.230 IN. SPACED BY 0.056-IN. WIRE WRAPS ON A 12-IN. PITCH AND ENCLOSED IN A SCALLOPED DUCT. THE PURPOSE OF THIS TEST SERIES WAS TO OBTAIN THERMAL-HYDRAULIC DATA FOR USE IN DESIGN OF THE FTR CORE. THE REPORT INCLUDES A DESCRIPTION OF THE SYSTEM AND OF THE EXPERIMENTAL PROCEDURES, A DISCUSSION OF THE DATA-REDUCTION PROCEDURES, AND TABULATED DATA FROM THE EXPERIMENTS PERFORMED IN THIS SERIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + HYDRAULIC EXPERIMENT + MOCKUP + THERMAL EXPERIMENT + TEMPERATURE GRADIENT + DATA COLLECTION + MODEL + HEATERS + FUEL ELEMENTS

7-101245 ALSO IN CATEGORY 18 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT. NUCLEAR SAFETY - CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS. OCTOBER-DECEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13144 +. 15 PAGES, 6 FIGURES, FEBRUARY 15, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING (1) COMPUTER PROGRAM DEVELOPMENT FOR CALCULATING TRANSIENT CONVECTION PHENOMENA ARISING FROM POSTULATED PIPE BREAKS AND POOL FIRES; (2) DEVELOPMENT OF EXPERIMENTAL PROGRAMS TO CHARACTERIZE BEHAVIOR OF SODIUM, SODIUM OXIDE, FISSION PRODUCTS, AND AEROSOLS GENERATED BY ACCIDENTS; AND (3) DETERMINATION OF THE GENERATION AND TRANSPORT OF AEROSOL ASSOCIATED WITH ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + AEROSOL + FIRE + FISSION PRODUCT TRANSPORT + AEROSOL PRODUCTION + AEROSOL PROPERTIES + R AND D PROGRAM

7-101344 DATED 1975
BOLTAX A + SALING JH
OXIDE FUEL ELEMENT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 30, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-OX-3045-15 +. 57 PAGES, 9 TABLES, 17 FIGURES, JANUARY 1975

THE MIXED-OXIDE FUEL PINS CLAD WITH 20 PERCENT COLD-WORKED TYPE 316 STAINLESS STEEL WERE IRRADIATED IN EBR-II. MAJOR INSTRUMENTATION PROBLEMS OCCURRED DURING THE SECOND BASELINE CALIBRATION RUN OF THE FLOW AND VIBRATION TEST. PRELIMINARY IRRADIATION CREEP AND SWELLING EQUATIONS WERE DEVELOPED FOR ADVANCED STRUCTURAL ALLOYS FOR USE IN EXPLORATORY FUEL PIN AND DUCT BEHAVIOR ANALYSIS. A REVISED TREATMENT OF THE CONVERSION BETWEEN DEFORMED AND UNDEFORMED FUEL RADII IN THE LIFE-III CODE HAS RESOLVED TO A LARGE DEGREE THE OSCILLATION PROBLEMS ENCOUNTERED DURING CODE OPERATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FABRICATION + CLADDING + TESTING + THERMAL MECHANICAL EFFECT + URANIUM OXIDE + PLUTONIUM OXIDE + STEEL, STAINLESS + DEFORMATION + IRRADIATION TESTING + EXAMINATION + MODEL + FUEL ELEMENTS

7-101619 ALSO IN CATEGORY 8 DATED 1970
AMBLARD M + SEMERIA R + VERNIER P + GOUZY A + NAJUC M
CONTACT BETWEEN LIQUID URANIUM DIOXIDE AND A SODIUM AND WATER COOLANT
GRENOBLE NUCLEAR RESEARCH CENTER
EURFNR-811 +. 70 PAGES, TRANSLATION OF REPORT TT 96, MARCH 3, 1970

DETERMINED EXPERIMENTALLY THAT MOLTEN UO2 DROPPED IN SODIUM AT 200 C AND 400 C IS HIGHLY DISPERSED AND CAUSES AN IMPORTANT DYNAMIC SUPPRESSION IN SODIUM. OBSERVED THE FORMATION OF LONG HOLLOW TUBES OF SODIUM WHEN MOLTEN UO2 AND WATER (20 C, ATMOSPHERIC PRESSURE) COME IN CONTACT. BOTH CASES INVOLVED THE FORMATION OF HOLLOW UO2 DROPS FILLED WITH A HERMETICALLY SEALED COLD LIQUID. THE DIFFERENT PROPERTIES OF THE TWO COLD LIQUIDS, ESPECIALLY THERMAL CONDUCTIVITY, SPECIFIC HEAT AND BOILING POINT, CAUSE VIOLENT FRAGMENTATION IN SODIUM AND PLASTIC DEFORMATION OF UO2 IN WATER. OBSERVED THAT WHEN A CYLINDER WAS MELTED BY THE JOULE EFFECT, ENCLOSED IN A STAINLESS-STEEL TUBE, THE LATTER WAS BURST BY THE MOLTEN UO2, WHICH COULD DISPERSE IN THE LOW-TEMPERATURE BATH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-101615 *CONTINUED*
CHEMICAL REACTION + WATER + MOLTEN FUEL + URANIUM DIOXIDE + PROPERTY, PHYSICAL + BOILING + THERMAL CONDUCTIVITY

7-102019 ALSO IN CATEGORY 12 DATED 1975
JOHNSON CE + DUDEY ND + HEINRICH RR + BLACKBURN PE + FLOSS MJ + MALEWOCKI RL + TETENBAUM M + BURRIS L
FUELS AND MATERIALS CHEMISTRY ANNUAL REPORT JULY 1973-JUNE 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8122 +. 97 PAGES, 34 FIGURES, JAN. 1975

TO AID IN EVALUATING THE PERFORMANCE OF FAST-BREEDER REACTOR FUELS, HIGH-TEMPERATURE TRANSPIRATION STUDIES HAVE BEEN MADE OF OXYGEN POTENTIALS OVER THE U-PU-O SYSTEM AT 2150-2550 K AND WHERE PO/(U+PU) = 0.2. A COMPUTER MODEL HAS BEEN WRITTEN TO DETERMINE THE REDISTRIBUTION OF OXYGEN, URANIUM, AND PLUTONIUM IN IRRADIATED FUELS AS A FUNCTION OF TIME AND AT STEADY STATE. OXYGEN MOVEMENT IS CONTROLLED BY IONIC DIFFUSION. STUDIES OF THE VAPORIZATION BEHAVIOR OF SOLID AND LIQUID CESIUM MOLYBDATE HAVE BEEN CARRIED OUT. THE EXISTENCE OF GASEOUS CESIUM MOLYBDATE MOLECULES AS THE PRINCIPAL SPECIES IN THE VAPOR HAS BEEN ESTABLISHED. PERCOLATION THEORY HAS BEEN APPLIED TO THE STUDY OF OXYGEN DIFFUSION IN POROUS HYPERSTOICHIOMETRIC URANIA PELLETS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CESIUM + COMPUTER PROGRAM + DIFFUSION + FUEL BURNUP + MOLYBDENUM + OXYGEN + ANALYTICAL MODEL + POROUS MEDIA + TRANSPIRATION

7-102030 ALSO IN CATEGORY 12 DATED 1974
BUBER M + SCHUMACHER G
INCREASES IN THE CENTERLINE TEMPERATURE OF MIXED OXIDE FAST REACTOR FUEL PINS AS A RESULT OF URANIUM/PLUTONIUM REDISTRIBUTION
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1190 + KFK-1904 +. 43 PAGES, 12 FIGURES, 31 REFERENCES, APRIL 1974

RESULTS OF POST IRRADIATION EXAMINATIONS OF REDISTRIBUTION OF URANIUM AND PLUTONIUM IN FAST REACTOR MIXED OXIDE FUEL PINS ARE REVIEWED. REDISTRIBUTION BY EVAPORATION-CONDENSATION PROCESSES CLEARLY DEPENDS ON STOICHIOMETRY AND ONLY TO A LESS DEGREE ON POWER RATING AND BURNUP. IT MAINLY DEVELOPS IN THE FIRST STAGE OF FUEL RESTRUCTURING. AT THE CENTRAL VOID THE PLUTONIUM ENRICHMENT YIELDS UP TO 170% OF THE AVERAGE CONCENTRATION. THIS CAUSES AN INCREASE IN CENTRAL TEMPERATURE OF TO 150 C.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL BURNUP + PLUTONIUM + THERMAL EXPERIMENT + IRRADIATION TESTING + VOID FRACTION + FUEL ELEMENTS

7-102042 ALSO IN CATEGORY 18 DATED 1974
ANGERER G
TRANSPORT OF CORE MATERIALS DURING ACCIDENTS IN LMFBRS (SLUMPING)
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1192 + KFK-1935 +. 50 PAGES, 11 FIGURES, JUNE 1974

DURING A PUMP-COAST-DOWN ACCIDENT IN AN LMFBR WITH SIMULTANEOUS FAILURE OF THE WHOLE REACTOR PROTECTION SYSTEM FUEL PINS MAY MELT. THE RELOCATION OF THE MATERIALS AS A RESULT OF GRAVITY, GAS AND VAPOR FORCES LEADS TO FEEDBACKS ON THE REACTIVITY AND THEREFORE THE REACTOR POWER, WHICH INFLUENCE THE COURSE OF THE ACCIDENT CONSIDERABLY. THE COMPUTER PROGRAM SLUG IS A FIRST ATTEMPT TO DESCRIBE THE MATERIAL TRANSPORT DURING THE ACCIDENT THEORETICALLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + FUEL MELTDOWN + ACCIDENT, FUEL SLUMP + CORE MELTDOWN + THEORETICAL INVESTIGATION

7-102036 ALSO IN CATEGORY 13 DATED 1975
LEARY JA
LASL ADVANCED PLUTONIUM LMFBR FUEL PROGRAM PUBLICATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5697-MS +. 55 PAGES, FIGURES, JAN. 1975

FORTY ARTICLES PUBLISHED BY LASL AUTHORS ARE SUMMARIZED. SUBJECTS INCLUDE SYNTHESIS, FABRICATION, PROPERTIES, AND IRRADIATION TESTING OF PLUTONIUM ADVANCED FUELS FOR FAST BREEDER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY + CARBIDE + CERAMICS + GLOVE BOX + OXIDE + PLUTONIUM + THERMAL ANALYSIS + THERMODYNAMICS + HIGH TEMPERATURE + NITRIDE + IRRADIATION TESTING + PROPERTY, PHYSICAL + ACTINIDE

7-102037 DATED 1974
AITKEN EA + ADAMSON MG + DUTINA D + EVANS SK
THERMOMIGRATION AND REACTIONS OF FISSION PRODUCTS IN BREEDER REACTOR OXIDE FUELS: II. OUT-OF-PILE INVESTIGATION OF CS AND TE-INDUCED ATTACK OF TYPE 316 STAINLESS STEEL CLADDING
GENERAL ELECTRIC COMPANY

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-102037 *CONTINUED*
GEAP-12538 *. 17 PAGES, 6 FIGURES, 11 REFERENCES, SEPT. 1974

THE RESULTS OF ISOTHERMAL CAPSULE TESTS CONTAINING MIXTURES OF CESIUM AND TELLURIUM WITH VARIOUS OXYGEN BUFFERS AND HEATED BETWEEN 450 AND 1000 C FOR 100 AND 1000 HOURS SHOW INTERGRANULAR ATTACK OF TYPE-316 STAINLESS STEEL OCCURS WHEN THE CS/TE <- 2 AND THE OXYGEN POTENTIAL OF THE BUFFER EXCEEDS THE OXIDATION THRESHOLD FOR STAINLESS STEEL. CARBON INCREASES THE TENDENCY FOR INTERGRANULAR PENETRATION IF THE OXYGEN POTENTIAL IS SLIGHTLY ABOVE THE OXIDATION THRESHOLD. AT HIGH OXYGEN POTENTIALS CARBON HAS NO EFFECT ON ENHANCING THE ATTACK. ACTIVATION ENERGIES FOR CARBON-ASSISTED AND NONCARBON-ASSISTED ATTACK WERE 21.5 AND 17.5 KCAL/MOL, RESPECTIVELY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CESIUM + CHEMICAL REACTION + CLADDING + MOLYBDENUM + OXIDE + OXYGEN + TELLURIUM + THERMAL EXPERIMENT + STEEL, STAINLESS + CORROSION + PROPERTY, CHEMICAL

7-102320 ALSO IN CATEGORY 13 DATED 1975
BURCH WD
LMFBR FUEL RECYCLE DRAGON PROGRESS REPORT FOR PERIOD APRIL TO DEC. 31, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4836 *. 92 PAGES, FIGURES, APRIL 1975

THE LMFBR FUEL RECYCLE DEVELOPMENT PROGRAM IS AIMED AT PROVIDING THE TECHNOLOGY ON WHICH TO BASE THE DESIGN OF COMMERCIAL REPROCESSING FACILITIES THAT WILL BE REQUIRED BY ABOUT 1997. THE PROCESS AND EQUIPMENT DEVELOPMENT PHASE OF THE PROGRAM WILL CULMINATE IN A HOT PILOT-PLANT PROCESS DEMONSTRATION TENTATIVELY SCHEDULED FOR THE 1986 TO 1987 PERIOD, ALLOWING THE REQUISITE LEAD TIME OF ABOUT TEN YEARS FOR THE DESIGN, CONSTRUCTION, AND STARTUP OF COMMERCIAL FACILITIES. FEED FOR THE HOT PILOT PLANT WILL BE AVAILABLE FROM THE FAST-FLUX TEST FACILITY (FFTF) AND THE CLINCH RIVER BREEDER REACTOR (CRBR), WHICH ARE SCHEDULED TO BEGIN DISCHARGING CORE ELEMENTS IN 1980 AND 1983 RESPECTIVELY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTAINMENT, FUEL REPROCESSING + FUEL HANDLING + SHIPPING CONTAINER + TRITIUM + OFF GAS + FUEL REPROCESSING + *R AND D PROGRAM + FUEL CYCLE + *FUEL RECYCLE

7-102335 ALSO IN CATEGORY 12 DATED 1975
ERDMAN CA + REYNOLDS AB
RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF LIQUID-METAL-COOLED FAST BREEDER REACTORS. PART 1: PRODUCTION
UNIVERISTY OF VIRGINIA
16 PAGES, 18 TABLES, 59 REFERENCES, NUCLEAR SAFETY, 16(1), PP. 43-59 (JAN.-FEB. 1975)

THIS ARTICLE, PRESENTED IN TWO PARTS, REVIEWS THE BEHAVIOR OF RADIONUCLIDES PRODUCED DURING THE NORMAL OPERATION OF A LIQUID-METAL-COOLED FAST BREEDER REACTOR (LMFBR). THE RESULTS GIVEN ARE PRIMARILY FROM THE LITERATURE, BUT SEVERAL INDEPENDENT CALCULATIONS ARE INCLUDED. NUMERICAL RESULTS ARE NORMALIZED TO A 1000-MW(E) LMFBR AND ARE COMPARED WITH A SIMILAR SIZE LIGHT-WATER REACTOR. SOURCES OF RADIOACTIVITY STUDIED INCLUDE PLUTONIUM AND OTHER TRANSURANIC ELEMENTS, FISSION PRODUCTS, TRITIUM, CORROSION PRODUCTS, ACTIVATION PRODUCTS, AND TRAMP FUEL.

EBR 1 AND 2 (RE) + PLUTONIUM + TRITIUM + FISSION PRODUCT TRANSPORT + CORROSION + SEFOR (RE) + TRANSURANIUM ELEMENT + OPERATING EXPERIENCE

7-102667 DATED 1975
GIESEKE JA + BEHN RC + CHACE AS
ANALYTIC STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY
BATTELLE COLUMBUS LABS., OHIO
BMI-1932 *. 235 PAGES, 10 TABLES, 42 FIGURES, MARCH 18, 1975

A CRITICAL STEP IN SAFETY ANALYSES FOR LIQUID METAL FAST BREEDER REACTORS IS THE PREDICTION OF CONCENTRATION FOR RADIOACTIVE MATERIALS AIRBORNE IN THE CONTAINMENT VESSELS AT VARIOUS TIMES AFTER POSTULATED ACCIDENTS. THE OBJECTIVE OF THIS STUDY WAS TO COMPILE, COMPARE AND EVALUATE AVAILABLE DATA APPLICABLE TO ANALYSIS OF AEROSOL BEHAVIOR FOR FAST REACTOR SAFETY; TO IMPROVE THE CURRENTLY AVAILABLE AEROSOL BEHAVIOR MODELS; TO ESTABLISH ASSUMPTIONS FOR USE WITH IMPROVED MODELS WHICH WILL GIVE CONSISTENTLY CONSERVATIVE PREDICTIONS OF AIRBORNE AEROSOL CONCENTRATIONS; AND TO RECOMMEND FUTURE RESEARCH NEEDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AEROSOL + COMPUTER PROGRAM + ANALYTICAL MODEL + FISSION PRODUCT TRANSPORT + AEROSOL PROPERTIES + AEROSOL, RADIOACTIVE + SAFETY ANALYSIS

7-102926 ALSO IN CATEGORY 12 DATED 1975
BAKER RD
QUARTERLY REPORT EXAMINATION OF FAST REACTOR FUELS, FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS, AND ANALYTICAL METHODS DEVELOPMENT - IRRADIATION TESTS, OCTOBER 1 THROUGH DECEMBER 31, 1974
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-102926 *CONTINUED*
LA-5881-PR +. 12 PAGES, MARCH 1975

THIS IS THE SECOND QUARTERLY REPORT ON THE EXAMINATION OF FAST REACTOR FUELS AND FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS AT THE LOS ALAMOS SCIENTIFIC LABORATORY. SINCE THE FIRST QUARTERLY REPORT (LA-5798-PR) THE ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS PROJECT HAS BEEN DIVIDED INTO THE FOLLOWING TWO PROJECTS. FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS AND ANALYTICAL METHODS DEVELOPMENT-IRRADIATION TESTS. MOST OF THE INVESTIGATIONS DISCUSSED HERE ARE OF THE CONTINUING TYPE. RESULTS AND CONCLUSIONS DESCRIBED MAY THEREFORE BY CHANGED OR AUGMENTED AS THE WORK CONTINUES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BORON + CARBIDE + CLADDING + HOT CELL + *ANALYTICAL TECHNIQUE + *IRRADIATION TESTING + *QUALITY ASSURANCE + CONTROL RODS + FUEL ELEMENTS

7-102927 ALSO IN CATEGORIES 12 AND 13 DATED 1975
BALLIF JL + BARTON GB + BORISCH RR + CAPLINGER WH + FUNK CW + LUTTON JM + MAFFEI MP
HEDL SODIUM REMOVAL PROGRAM ANNUAL REPORT FY-1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-63 +. 70 PAGES, 20 TABLES, 23 FIGURES, JAN. 1975

THE SODIUM REMOVAL PROGRAM AT HEDL HAS DEMONSTRATED THE ABILITY OF THE WATER-VAPOR/NITROGEN PROCESS TO CLEAN PUMPS, HEAT EXCHANGERS AND VALVES. THE FEASIBILITY OF THE PROCESS WAS DEMONSTRATED AND OPERATING CONDITIONS FOR REACTING BOTH BULK SODIUM AND SODIUM IN CREVICES WITHOUT DAMAGING THE COMPONENTS WERE IDENTIFIED. PROCESS DEVELOPMENT INCLUDED THE DEFINITION OF PROCESSING RATES FOR REMOVING BULK AND CREVICE SODIUM TO ESTABLISH PROCESSING CYCLES AND PROCESSING FACILITIES DESIGN. IT WAS CONCLUDED THAT THE WATER VAPOR IN NITROGEN REACTS WITH BULK SODIUM AT A RATE OF 0.02 IN.-NA/HR. ALSO CREVICES MUST BE LARGER THAN 0.001 IN. TO BE EFFECTIVELY AND REPRODUCIBLY PROCESSED TO REMOVE SODIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + *DECONTAMINATION + HEAT TRANSFER + HYDROGEN + *STEAM + CORROSION + *WATER VAPOR

7-102928 ALSO IN CATEGORY 12 DATED 1975
SHETH A
PARAMETRIC STUDY OF SODIUM AEROSOLS IN THE COVER-GAS SPACE OF SODIUM-COOLED REACTORS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-11 +. 55 PAGES, 15 FIGURES, 34 REFERENCES, MARCH 1975

A MATHEMATICAL BEHAVIOR OF SODIUM AEROSOL IN ARGON, BUT NOT IN HELIUM AEROSOLS IN THE COVER-GAS SPACE OF A SODIUM-COOLED REACTOR. A REVIEW OF THE LITERATURE WAS FIRST MADE TO EXAMINE METHODS OF AEROSOL GENERATION, MATHEMATICAL EXPRESSIONS REPRESENTING AEROSOL BEHAVIOR, AND PERTINENT EXPERIMENTAL INVESTIGATIONS OF SODIUM AEROSOLS. IN THE DEVELOPMENT OF THE MODEL, SOME TERMS WERE DERIVED FROM BASIC PRINCIPLES AND OTHER TERMS WERE ESTIMATED FROM AVAILABLE CORRELATIONS. THE MODEL WAS SIMULATED ON A COMPUTER, AND IMPORTANT PARAMETERS WERE STUDIED TO DETERMINE THEIR EFFECTS ON THE OVERALL BEHAVIOR OF SODIUM AEROSOLS. THE PARAMETERS STUDIED WERE SODIUM POOL TEMPERATURE, SOURCE AND INITIAL SIZE OF PARTICLES, FILM THICKNESS AT THE SODIUM POOL/COVER GAS INTERFACE, WALL PLATING PARAMETERS, COVER-GAS FLOW RATE, AND TYPE OF COVER GAS (ARGON AND HELIUM). THE MODEL SATISFACTORILY DESCRIBES THE BEHAVIOR OF SODIUM AEROSOL IN ARGON, BUT NOT IN HELIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + *BIBLIOGRAPHY + COMPUTER PROGRAM + *ANALYTICAL MODEL + *AEROSOL PROPERTIES + COVER GAS + FILTER, TRAP + *THEORETICAL INVESTIGATION

7-102985 ALSO IN CATEGORIES 12 AND 18 DATED 1973
SOVIET - SWEDISH SYMPOSIUM ON REACTOR SAFETY PROBLEMS, MARCH 5-7, 1973. PART 2
AB ATOMENERGI, SWEDEN
CONF-730363 +. 120 PAGES, MEETING HELD AT STUDSVIK, MARCH 5-7, 1973

THERE WERE 17 PAPERS PRESENTED AT THE SYMPOSIUM. PART 1 CONTAINS THE SWEDISH PAPERS (8) AND THIS PART (PART 2) CONTAINS THE SOVIET PAPERS (9). THE TOPICS PRESENTED HERE INCLUDE A SAFETY SYSTEM FOR A PWR WITH A CONTROLLED RELEASE OF LOW-ACTIVE COOLANT; PROCESSES OCCURRING IN A PWR DURING A PIPE RUPTURE; MAJOR ACCIDENTS; FISSION PRODUCT TRANSFER AND DEPOSITION; PROBABILITY METHODOLOGY FOR HAZARD ASSESSMENT; MECHANICAL ACTIONS DURING ACCIDENTS; HOT WATER FLOW THROUGH ORIFICES AND TUBES; SAFETY OF SODIUM COOLED FAST REACTORS; AND RADIATION SAFETY OF THE BOR-60.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION + ACCIDENT, LOSS OF COOLANT + REACTOR, PWR + *FISSION PRODUCT TRANSPORT + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SWEDEN + *REVIEW + FLOW DISTRIBUTION + ORIFICE + *ENGINEERED SAFETY FEATURE + FLOW + PROBABILITY

7-103024 ALSO IN CATEGORY 11 DATED 1975
BRAMMAN JI + POWELL HJ

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-103024 *CONTINUED*
REDISTRIBUTION OF FUEL AND FISSION PRODUCTS IN IRRADIATED OXIDE FUEL PINS
UKAEA, DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT
12 PAGES, 15 FIGURES, 41 REFERENCES, J. BRITISH NUCLEAR ENERGY SOCIETY, 14(1), PP. 63-75 (JAN. 1975)

A REVIEW IS PRESENTED BASED LARGELY ON HITHERTO UNPUBLISHED DOUNREAY DATA ON THE MOVEMENT OF FUEL AND FISSION PRODUCTS IN FAST REACTOR IRRADIATED OXIDE FUEL PINS. THE PROCESSES OF REDISTRIBUTION ARE DISCUSSED IN QUALITATIVE TERMS. ALTHOUGH EXTENSIVE REDISTRIBUTION IS COMMONLY OBSERVED, NONE OF THE PHENOMENA IS LIKELY TO LIMIT THE USE OF OXIDE FUELS IN COMMERCIAL FAST REACTOR CORES.

FISSION PRODUCT RELEASE + *FISSION PRODUCT TRANSPORT + FUEL ROD

7-103931 ALSO IN CATEGORIES 5 AND 18 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR OCTOBER-DECEMBER 1974. III. LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4805(VOL.3) +, 27 PAGES, 11 FIGURES, APRIL 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING FISSION PRODUCT TRANSIENT RELEASE FROM LMFBR FUEL, AND EFFECTS OF SODIUM SPILLS ON STEEL-LINED EQUIPMENT CELLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, CONSEQUENCES + FISSION PRODUCT RELEASE + AEROSOL PRODUCTION + *R AND D PROGRAM + CONTAINMENT LINER + FUEL ROD + *TRANSIENT

7-104419 ALSO IN CATEGORY 13 DATED 1973
TAYLOR GR + BISHOP EC + PERRONE P
THE STATUS OF SODIUM CLEANING PROCESSES IN THE LMFBR PROGRAM, USA
WESTINGHOUSE ELECTRIC CORPORATION
CONF-730326-1 +, 37 PAGES, FROM INTERNATIONAL WORKING GROUP ON SODIUM CLEANING, DOUNREAY, SCOTLAND, MARCH 26, 1973

INABILITY OR SLOWNESS OF EITHER ALCOHOL OR VACUUM DISTILLATION TO REMOVE SODIUM COMPOUNDS, SUCH AS SODIUM OXIDE OR SODIUM CARBONATE, IS A SIGNIFICANT ADVANTAGE FOR THE MOIST NITROGEN PROCESS. BOTH THE REACTANT COST, IN THE CASE OF ALCOHOL, AND THE ENGINEERING AND EQUIPMENT COST FOR VACUUM DISTILLATION ARE MORE SERIOUS DISADVANTAGES THEN THE FORMATION OF CAUSTIC SOLUTIONS IN THE MOIST GAS PROCESS. THE CATASTROPHIC EFFECTS OF CAUSTIC STRESS CORROSION CRACKING CAN BE AVOIDED IN THE MOIST NITROGEN PROCESS BY CAREFUL TEMPERATURE CONTROL. SUFFICIENT EXPERIMENTAL DATA ARE NOT AVAILABLE NOW TO JUDGE THE SUPERIORITY OF ANY PROCESS IN CLEANING CREVICES, HOWEVER, EFFECTIVE CREVICE CLEANING HAS BEEN REPORTED FOR ALL THREE PROCESSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + VACUUM RELIEF + STRESS CORROSION + DISTILLATION

7-104420 DATED 1972
VAN ERP JE + CHAWLA TC + WILSON RE
POTENTIAL FUEL FAILURE PROPAGATION DUE TO FISSION-GAS RELEASE IN LMFBR SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-721112-6 +, 16 PAGES, FROM AMERICAN SOCIETY OF MECHANICAL ENGINEERS WINTER MEETING, NEW YORK, N.Y., NOV. 26, 1972

THIS PAPER DEALS WITH POTENTIAL MECHANISMS FOR PIN-TO-PIN FAILURE PROPAGATION DUE TO FISSION GAS RELEASE IN FUEL SUBASSEMBLIES OF LIQUID METAL COOLED FAST BREEDER REACTORS, AS A CONSEQUENCE OF RANDOM FAILURE OF ONE OR MORE FUEL PINS. TWO DISTINCTLY DIFFERENT POTENTIAL FUEL FAILURE PROPAGATION MECHANISMS ASSOCIATED WITH FISSION GAS RELEASE ARE IDENTIFIED, VIZ, (A) TEMPERATURE TRANSIENTS INDUCED IN THE CLADDING OF ADJACENT FUEL PINS, AND (B) TRANSITORY MECHANICAL LOADS ON ADJACENT FUEL PINS. THIS PAPER DEALS SOLELY WITH THE FORMER FAILURE PROPOGATION MECHANISM, WHICH IS FOUND TO BE LINKED WITH A NUMBER OF DIFFERENT FISSION GAS RELEASE MODES. OUT-OF-PILE EXPERIMENTS USING BOTH METALLIC AND NONMETALIC FLUIDS ARE DESCRIBED AND RESULTS ARE GIVEN REGARDING THE VARIOUS FISSION GAS RELEASE MODES. IT IS CONCLUDED THAT EXTENSIVE AND RAPID PIN-TO-PIN FAILURE PROPAGATION IN CURRENT-DESIGN LMFBR FUEL SUBASSEMBLIES, DUE TO THERMAL TRANSIENTS INDUCED IN THE CLADDING OF ADJACENT FUEL PINS BY FISSION GAS RELEASE FROM ONE OR MORE RANDOMLY FAILED FUEL PINS, IS UNLIKELY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION GAS RELEASE + FUEL BURNUP + FAILURE, FUEL ELEMENT + XENON + THERMAL EXPERIMENT + FUEL ROD

7-104432 ALSO IN CATEGORY 18 DATED 1975
KIRBIYIK M + ERDMAN CA + REYNOLDS AB
FUEL VAPOR GENERATION IN LMFBR CORE DISRUPTIVE ACCIDENTS
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE
7 PAGES, 2 FIGS., 9 REFS., NUCLEAR TECHNOLOGY, 26(2), PP. 165-71 (JUNE 1975)

METHODS TO CALCULATE BOUNDING VALUES FOR THE GENERATION OF FUEL VAPOR DURING DISASSEMBLY AND DURING EXPANSION OF THE FUEL AFTER DISASSEMBLY IN A FAST-REACTOR CORE-DISRUPTIVE ACCIDENT WERE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-104432 *CONTINUED*
DEVELOPED. ISENTROPIC EXPANSION OF THE FUEL FOLLOWING DISASSEMBLY WITH NO FUEL MIXING BEFORE EXPANSION WAS ASSUMED. IT WAS NECESSARY TO DEVELOP CONSISTENT THERMODYNAMIC FUEL PROPERTIES FOR THE ANALYSIS. THE METHOD WAS APPLIED TO A LIQUID-METAL FAST BREEDER REACTOR DISASSEMBLY, FIRST WITH SODIUM IN THE CORE AND THEN WITH SODIUM REMOVED.

FUEL MELTDOWN + THERMODYNAMICS + CORE MELTDOWN + ACCIDENT, CORE DISRUPTIVE

7-104885 ALSO IN CATEGORY 12 DATED 1975
ERDMAN CA + KELLY JE + REYNOLDS AB
RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF LIQUID-METAL-COOLED FAST BREEDER REACTORS. PART 2: TRANSPORT
UNIVERSITY OF VIRGINIA
19 PPS, 9 TABS., 98 REFS., NUCLEAR SAFETY, 16(3), PP. 318-36 (MAY-JUNE 1975)

THIS IS THE SECOND PART OF A TWO-PART ARTICLE ON RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF A LIQUID-METAL-COOLED FAST BREEDER REACTOR (LMFBR). PART 1, INCLUDED IN NUCLEAR SAFETY 16(1), DISCUSSED THE PRODUCTION OF RADIOACTIVITY: PART 2 REVIEWS THE TRANSPORT OF THE VARIOUS RADIONUCLIDES. ALTHOUGH RELIANCE WAS PLACED ON PUBLISHED RESULTS FOR BOTH PARTS, SOME NEW CALCULATIONS WERE MADE WHERE NEEDED. RESULTS WERE NORMALIZED TO A 1000-MW(E) LMFBR AND COMPARED WITH VALUES FOR A LIGHT-WATER REACTOR (LWR). THIS REVIEW INCLUDES THE TRANSPORT OF TRITIUM AND CORROSION PRODUCTS, TRANSPORT OF FISSION PRODUCTS FROM FAILED FUEL, BEHAVIOR OF RADIOACTIVITY IN SODIUM AND COLD TRAPS, AND OPERATION OF GASEOUS RADWASTE SYSTEMS. OPERATING EXPERIENCES ARE REVIEWED FOR THE FAST REACTORS EBR-II, FERMI, SEFOR, DOUNREAY, RAPSODIE, AND BR-5; LIMITED DATA ATE GIVEN FOR THE THERMAL REACTORS SRE, SBER, AND HALLAM.

EBR 1 AND 2 (RE) + FISSION GAS RELEASE + HALLAM (LMR) + TRITIUM + FISSION PRODUCT TRANSPORT + FILTER, TRAP + CORROSION + OFF GAS + OPERATING EXPERIENCE + RAPSODIE (LMCR)

7-105106 ALSO IN CATEGORIES 11 AND 18 DATED 1974
BOHABOY PE + REGIMBAL JJ + CRAIG CN
EVALUATION OF CAPSULE B9D LOW BURNUP FAILED LMFBR FUEL PERFORMANCE
GENERAL ELECTRIC COMPANY
GEAP-13977 +, 96 PPS, 38 FIGS, NOV. 1974

TWO MIXED-OXIDE FUEL RODS WERE PURPOSELY DEFECTED WHILE OPERATING AT AN AVERAGE LINEAR POWER OF 15 KW/FT. THE TOP FUEL ROD CONTAINED A DEFECT IN THE GAS PLENUM; THE BOTTOM FUEL ROD WAS DEFECTED AT THE AXIAL MIDPOINT OF THE 4.25 INCH LONG FUEL COLUMN. IRRADIATION IN THE DEFECTED CONDITION CONTINUED TO AN AVERAGE FUEL BURNUP OF 6600 MWD/TE. RESULTS OF POST-IRRADIATION EXAMINATION OF THE FUEL, CAPSULE HARDWARE, AND SODIUM COOLANT ARE PRESENTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + *IRRADIATION TESTING + R AND D PROGRAM + FUEL ROD + RADIATION EFFECT + *MIXED OXIDE

7-105585 ALSO IN CATEGORY 18 DATED 1975
STATUS OF SAFETY TECHNOLOGY FOR RADIOLOGICAL CONSEQUENCE ASSESSMENT OF POSTULATED ACCIDENTS IN LIQUID METAL FAST BREEDER REACTORS
U.S. ERDA, WASHINGTON, D.C.
ERDA-56 +, 600 PPS, FIGS, REFS, JULY 1975

PRESENTS THE TEXT OF 26 PAPERS CONCERNED WITH PRESENTING THE CURRENT CAPABILITY TO PREDICT AND MITIGATE THE RADIOLOGICAL CONSEQUENCES OF POSTULATED ACCIDENTS IN LMFBR'S. THE MAIN TOPICS INCLUDE SOURCE TERMS, SODIUM REACTIONS, AEROSOL BEHAVIOR, RADIOLOGICAL DOSE ASSESSMENT, AND ENGINEERED SAFEGUARDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + AIR CLEANING + CODES AND STANDARDS + *ACCIDENT, CONSEQUENCES + FIRE + FISSION PRODUCT RELEASE + ANALYTICAL MODEL + FISSION PRODUCT TRANSPORT + DOSE CALCULATION, EXTERNAL + *REVIEW + ENGINEERED SAFETY FEATURE + *AGENCY, ERDA

7-105766 ALSO IN CATEGORIES 5 AND 18 DATED 1975
KERRISK JF
PINTEMP: A COMPUTER PROGRAM FOR FUEL ELEMENT DESIGN CALCULATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5868-MS +, 26 PPS, 2 TABS, 19 REFS, FEB. 1975

PINTEMP PERFORMS DESIGN CALCULATIONS FOR FUEL ELEMENTS IN THE EBR-II REACTOR. THE PROGRAM CALCULATES FUEL ELEMENT AND SODIUM COOLANT TEMPERATURES, THERMAL STRESSES IN THE CLAD AND FISSION GAS GENERATED IN THE FUEL DURING STEADY STATE IRRADIATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + EBR 1 AND 2 (RE) + FISSION GAS RELEASE + KRYPTON + STRESS + THERMAL MECHANICAL EFFECT + XENON + ARGON + TEMPERATURE + *FUEL ELEMENTS

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-105897 ALSO IN CATEGORY 12 DATED 1975
EPSTEIN ED
A REVIEW OF THE LITERATURE PERTINENT TO FISSION PRODUCT MIGRATION AND INTERACTION IN FUEL RODS
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A13423 +. 36 PPS. 4 FIGS. 33 REFS. JUNE 6. 1975

A SURVEY OF THE AVAILABLE LITERATURE PERTAINING TO THE VOLATILE FISSION-PRODUCT ACTIVITY IN FAST BREEDER REACTOR FUEL HAS BEEN CONDUCTED. THIS IS AN INITIAL EFFORT IN THE INVESTIGATION OF PLATEOUT (OR DEPOSITION) AND POTENTIAL PLUGGING IN THE GAS-COOLED FAST BREEDER REACTOR (GCFR) FUEL PRESSURE-EQUALIZATION SYSTEM (PES). A REVIEW OF THE MATERIAL SURVEYED AND THE RESULTS AND CONCLUSIONS REACHED WITH RESPECT TO PRESSURE-EQUALIZED AND VENTED GCFR FUEL RODS IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + DEPOSITION + DIFFUSION + CLADDING + FISSION PRODUCT, VOLATILE + IODINE + MOLYBDENUM + TELLURIUM + FISSION PRODUCT TRANSPORT + THERMAL EXPERIMENT + REACTOR, HTGR + FUEL ROD + REACTOR, GCFR

7-105995 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.212 - LIMITING THE POTENTIAL SOURCE OF GASEOUS ACTIVITY
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 4 PAGES, 3 TABLES, PP. Q001.212-1 THRU Q001.212-4 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES THE BASIS FOR LIMITING THE POTENTIAL SOURCE TO ISOTOPES OF KR, XE, I.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*FISSION GAS RELEASE + IODINE + KRYPTON + XENON + *CONTROL + COVER GAS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

7-105996 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.213 - DIFFUSION OF GASES THROUGH BUNA-N SEALS
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 3 PAGES, 1 FIGURE, PP. Q001.213-1 THRU Q001.213-3 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANALYSIS OF THE EVENT DESCRIBED IN SECTION 15.5.2.3 WAS BASED ON THE MAXIMUM MEASURED PERMEABILITIES FOR BUNA-N SEALS. TEST DATA FOR THIS TYPE OF SEALS ARE REPORTED IN REFERENCE 1. FIGURE 001.213-1 WHICH IS ATTACHED TO THIS RESPONSE. THE DIFFUSION RATE FOR EACH ELEMENT WAS CALCULATED FROM ITS PERMEABILITY AND THE PROPER SEAL DIMENSIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DIFFUSION + *FISSION GAS RELEASE + SEAL + RESPONSE TO NRC QUESTION + POLYMERIC + CLINCH RIVER (LMFBR)

7-106255 ALSO IN CATEGORY 12 DATED 1975
GIESEKE JA + BEHN RC + CHACE AS
ANALYTIC STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY. TOPICAL REPORT, TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-1932 +. 236 PPS, FIGS, REFS, MARCH 18, 1975

COMPARISON AMONG THE COMPILED EXPERIMENTAL DATA AND BETWEEN THE DATA AND THE PREDICTIVE MODELS INDICATED THAT THE EFFECTS OF CONTAINMENT SIZE AND SHAPE ARE LEAST ADEQUATELY KNOWN OR PREDICTED. IT IS BELIEVED THAT THE AEROSOL BEHAVIOR MODELS CAN BE FURTHER IMPROVED BY INCLUDING MORE REALISTIC REPRESENTATIONS OF PARTICLE COLLISIONS AND AGGLOMERATE PROPERTIES. HOWEVER, IT IS ALSO RECOMMENDED THAT EXPERIMENTS BE PERFORMED TO CLARIFY THE EFFECTS OF VESSEL SIZE AND SHAPE ON AIRBORNE PARTICLE CONCENTRATIONS. THE OBJECTIVE OF THIS STUDY WAS TO COMPILE, COMPARE AND EVALUATE AVAILABLE DATA APPLICABLE TO ANALYSIS OF AEROSOL BEHAVIOR FOR FAST REACTTOR SAFETY; TO IMPROVE THE CURRENTLY AVAILABLE AEROSOL BEHAVIOR MODELS; TO ESTABLISH ASSUMPTIONS FOR USE WITH IMPROVED MODELS WHICH WILL GIVE CONSISTENTLY CONSERVATIVE PREDICTIONS OF AIRBORNE AEROSOL CONCENTRATIONS; AND TO RECOMMEND FUTURE RESEARCH NEEDS

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + AIRBORNE RELEASE + BIBLIOGRAPHY + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES + PLUTONIUM DIOXIDE

7-106672 ALSO IN CATEGORIES 5 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., TENN.
400 PGS. LTR W/AMENDMENT 5 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, OCT. 6, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AMENDS THE PRELIMINARY SAR BY SUBMITTING TWO APPENDICES, (E) PRIMARY PIPE RUPTURE FALLBACK POSITION AND (F) CORE DISRUPTIVE ACCIDENT ACCOMMODATION. THESE INCLUDE DETAILS OF THE PARALLEL DESIGN IN WHICH A PRIMARY PIPE RUPTURE AND A CORE DISRUPTIVE ACCIDENT RESPECTIVELY ARE TREATED AS DESSIGN BASIS ACCIDENTS. INCLUDES DESCRIPTIONS OF THE INITIATING ACCIDENTS, EVALUATIONS, DESIGN REQUIREMENTS, ALTERNATIVE ADDITIONAL PARALLEL DESIGN FEATURES AND ASSESSMENT OF DESIGN

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-106672 *CONTINUED*
CAPABILITIES NECESSARY FOR TREATMENT OF THESE EXTREME AND LOW PROBABILITY ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + ACCIDENT + DESIGN CRITERIA + *REPORT, PSAR + MAIN COOLING SYSTEM + SYSTEM CAPABILITY + ACCIDENT, DESIGN BASIS + *CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS + ACCIDENT, CORE DISRUPTIVE

7-106716 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 010.3 (SECTION 3.5) - CHARCOAL DELAY BEDS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 3 FIGS, PP. A1-7 THRU A1-18 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENT DESIGN OF THE DELAY BEDS HAS EACH BED CONTAINING 625 POUNDS OF CHARCOAL. CURRENT DESIGN OF THE CAPS CHARCOAL BEDS INCLUDES AN OPERATING PRESSURE OF 35 PSIG AND AN OPERATING TEMPERATURE OF ABOUT -140 DEGREES F. DESIGN OF THE HAPS CHARCOAL BEDS INCLUDES AN OPERATING PRESSURE OF 30 PSIG AND AN OPERATING TEMPERATURE RANGE OF FROM -70 DEGREES F TO -210 DEGREES F.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

FILTER SYSTEM + CHARCOAL ADSORBER + CHARCOAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

7-106943 ALSO IN CATEGORIES 5 AND 18 DATED 1975
RADIOLOGICAL ASSESSMENT MODELS THIRD QUARTERLY REPORT, MARCH-MAY 1975
GENERAL ELECTRIC COMPANY
GEAP-14034-3 +. 60 PPS, 18 FIGS, 63 REFS, JUNE 1975

THE OBJECTIVES OF THIS PROGRAM ARE TO DEVELOP MODELS FOR ANALYZING AND EVALUATING POSTULATED RADIOLOGICAL SOURCES, AEROSOL DYNAMICS, SODIUM FIRES, AND RADIOLOGICAL DOSAGES ARISING IN THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT OF LIQUID METAL FAST BREEDER REACTOR. THE WORK PERFORMED DURING THIS REPORTING PERIOD CONTINUED THE REVIEW AND EVALUATING OF CURRENT TECHNOLOGY, EXPERIMENTS, ANALYTICAL MODELS, AND COMPUTER CODES USED IN RADIOLOGICAL MODELING AND ASSESSMENT. THE IMMEDIATE OBJECTIVE IS TO DEVELOP A PRELIMINARY, OVER-ALL RADIOLOGICAL ASSESSMENT MODEL FOR THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + AEROSOL + FIRE + *FISSION GAS RELEASE + FISSION PRODUCT RELEASE + SOURCE, RADIATION + ANALYTICAL MODEL + ACCIDENT MODEL + *ACCIDENT, CORE DISRUPTIVE

7-107337 DATED 1973
KOTRAPPA P
AEROSOL STUDIES RELATING TO FAST REACTOR SAFETY
BHABHA ATOMIC RESEARCH CENTRE, BOMBAY, INDIA
INIS-MF-665 +. 7 PPS, FROM SYMPOSIUM ON NUCLEAR SCIENCE ENGINEERING, BOMBAY, MARCH 13, 1973

CONCLUDES THAT RESEARCH IS PROGRESSING IN SEVERAL COUNTRIES. REDUCING MANY OF THE EXPERIMENTS WITH IMPROVED CHARACTERIZATION INSTRUMENTS WOULD BE OF GREAT USE IN NOT ONLY GETTING USEFUL PARAMETERS BUT FOR GAINING CONFIDENCE IN SOLVING NEW PROBLEMS THAT ALWAYS CROP UP DURING THE OPERATION OF A FAST REACTOR. RESEARCH PLANNED INCLUDES AERODYNAMIC AND SOLUBILITY CHARACTERIZATION OF AEROSOLS, HANDLING OF THE ACCIDENT SITUATIONS AND SPECIAL FILTRATION SYSTEMS FOR AIR CLEANING PURPOSES. PLANNING AND PRELIMINARY WORK IS PROGRESSING.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

*AEROSOL + TRANSPORT

7-107822 ALSO IN CATEGORY 18 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR APRIL-JUNE 1975. III. LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5021(VOL.3) +. 51 PPS, 22 FIGS, 5 REFS, OCT. 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING TRANSIENT RELEASE FROM LMFBR FUEL AND STRUCTURAL INTEGRITY OF EQUIPMENT CELL LINERS. A CAPACITOR DISCHARGE VAPORIZATION TECHNIQUE IS BEING DEVELOPED FOR GENERATING ELECTRICAL ENERGY DIRECTLY IN LMFBR FUEL THAT WILL PRODUCE HCDA-LIKE FUEL DISASSEMBLIES. THE SCOPING TESTS FOR THIS TECHNIQUE WERE CONTINUED. THE U(SUB 3) O(SUB 8) AEROSOL EXPERIMENTS HAVE SERVED TO CALIBRATE AND CHECK OUT THE SYSTEM AND INSTRUMENTATION AND HAVE PROVIDED USEFUL INFORMATION ON AEROSOL CHARACTERISTICS AND TRANSIENT BEHAVIOR. THE INDUCTION FURNACE USED FOR PRODUCING THE U(SUB 3) O(SUB 8) AEROSOL PROVED TO BE LIMITED IN CAPACITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + FISSION PRODUCT RELEASE + PLUTONIUM + FISSION PRODUCT TRANSPORT + ORNL + *R AND D PROGRAM +

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-107822 *CONTINUED*
ACCIDENT, CORE DISRUPTIVE

7-108193 ALSO IN CATEGORY 12 DATED 1975
REED LC + GIESEKE JA
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY: FY 1975 ANNUAL REPORT TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-662 +. 130 PPS, 11 TABS, 37 FIGS, REFS, OCT. 1975

WORK DURING THE PAST YEAR WAS DIRECTED TOWARD SIX MAJOR FRONTS. FIRST, PREPARATION OF THE FINAL REPORT CONCERNING THE STUDY ENTITLED 'ANALYTIC STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY', BMI-1932. SECOND, DEVELOPMENT OF THE MOST CURRENT AEROSOL MODEL, HAARM-1. THIRD, DEVELOPMENT OF A NEW AEROSOL BEHAVIOR MODEL. FOURTH, A LITERATURE REVIEW CONCERNING THE BEHAVIOR OF NONSPHERICAL AEROSOL AGGLOMERATES. FIFTH, SCOPING CALCULATIONS WERE COMPLETED CONCERNING THE EJECTION OF ALPHA-EMITTING PARTICLES DUE TO THEIR RADIOACTIVE DECAY. AND SIXTH, SENSITIVITY ANALYSES OF EVENTUAL MASS LEAKED TO THE ATMOSPHERE FROM DOUBLY CONTAINED AEROSOL RELEASES WERE PERFORMED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES

7-108194 ALSO IN CATEGORY 12 DATED 1975
HUANG TC + STITT RK
REVIEW AND EVALUATION OF CURRENT AEROSOL MODELS FOR LMFBR SAFETY ANALYSIS
GENERAL ELECTRIC COMPANY
GEAP-14054 +. 52 PPS, 9 TABS, 12 FIGS, 58 REFS, JUNE 1975

THIS STUDY CONCLUDES THAT THE AEROSOL BEHAVIOR MODELS PRESENTLY AVAILABLE CAN BE UTILIZED TO ADEQUATELY PREDICT AEROSOL BEHAVIOR IN THE REACTOR CONTAINMENT BUILDING, PROVIDING THE STOKES' CORRECTION FACTOR, THE GRAVITATIONAL COLLISION EFFICIENCY AND THE BOUNDARY LAYER THICKNESS AT THE WALL CAN BE DETERMINED FOR THE SIZE CONTAINMENT BEING ANALYZED. THE STATE-OF-KNOWLEDGE AS TO THE PROCESSES AND CONTROLLING PHENOMENA ASSOCIATED WITH THE FORMATION OF AEROSOLS FROM SODIUM FIRE, FUEL VAPOR CONDENSATION, AND FRAGMENTATION WERE STUDIED. A VARIETY OF ANALYTICAL AEROSOL SOURCE MODELS WERE ASSESSED AND THE IMPORTANT EXPERIMENTAL RESULTS WERE SUMMARIZED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

AEROSOL + COMPUTER PROGRAM + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES

7-108217 ALSO IN CATEGORY 18 DATED 1975
ATWOOD JM
SODIUM TECHNOLOGY - HEDL QUARTERLY TECHNICAL REPORT, JANUARY, FEBRUARY, MARCH, 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-3 +. 113 PPS, 11 TABS, 40 FIGS, MAY 1975

REPORTS PROGRESS IN THE FOLLOWING AREAS: SODIUM SYSTEMS DEVELOPMENT, SODIUM REMOVAL, FLOW IMPEDANCE PHENOMENA, RADIOACTIVITY CONTROL TECHNOLOGY, CORROSION PRODUCT RELEASE, RADIONUCLIDE FUEL FAILURE MONITORING, CELD TRAP TESTING, AND CRBRP SYSTEM 85.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*TRITIUM + INSTRUMENT, FAILED FUEL DETECTION + FISSION PRODUCT RETENTION + R AND D PROGRAM + FLOW + CLINCH RIVER (LMFBR)

7-108671 ALSO IN CATEGORIES 8 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 270 PGS, AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING THE QUALITY ASSURANCE PROGRAM, TEST GROUTING PROGRAM (NEW APPENDIX 2-C), COMPARISON WITH FFTF AND MONJU, CORE INTERNALS, SHUTDOWN COOLING SYSTEMS, DOSES FROM EXPOSURE TO LIQUID EFFLUENTS, LEAKAGE FROM SODIUM COLD TRAPS AND PUMP SEIZURE ANALYSIS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING DECAY HEAT REMOVAL, STRESS FROM CDA, PRIMARY PUMP SEAL FAILURES, FISSION PRODUCTS IN SODIUM AEROSOL, CELL TEMPERATURE AND PRESSURE DURING SODIUM FIRE, AND SURFACE AREA FOR CONDENSATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + CONCRETE + CONTAINMENT + FIRE + TESTING + RADIOACTIVITY RELEASE + SEAL + *REPORT, PSAR + QUALITY ASSURANCE + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *CLINCH RIVER (LMFBR) + PUMPS

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-108677 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.150 - RATE OF BACK DIFFUSION OF SODIUM-22
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.150-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RESULTS OF ANALYSIS OF BACK DIFFUSION SHOW THE FOLLOWING RELATIONSHIP: C(IHTS) = C(PHTS) EXP (-1.6 X 10(EXP +7)); C(PHTS) IS THE PRIMARY HEAT TRANSPORT SYSTEM VOLUMETRIC CONCENTRATION OF NA-22 AT THE DEFECT SOURCE; C(IHTS) IS THE RESULTANT NA-22 CONCENTRATION IN THE INTERMEDIATE HEAT TRANSPORT SYSTEM. AS CAN BE SEEN FROM THE ABOVE RELATIONSHIP, THE ACTIVITY THAT CAN DIFFUSE UPSTREAM INTO THE INTERMEDIATE SODIUM IS INSIGNIFICANT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DIFFUSION + *RADIOISOTOPE + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

7-108678 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.219 - FISSION PRODUCTS ASSOCIATED WITH AIRBORNE SODIUM
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS, PP. Q001.219-1 THRU Q001.219-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN THE SODIUM FIRE ANALYSES OF SECTION 15.6 OF THE PSAR, IT IS ASSUMED THAT THE CONCENTRATION OF FISSION PRODUCTS IN THE SODIUM AEROSOL IS THE SAME AS THAT IN THE SODIUM POOL. THE ASSUMPTION IS CONSERVATIVE WHEN APPLIED TO NON-VOLATILES. EXPERIMENTAL WORK AT ATOMICS INTERNATIONAL WAS CONDUCTED IN WHICH SAMPLES OF SODIUM CONTAINING URANIUM WERE BURNED IN A 7.4 LITER TEST CHAMBER CONTAINING AIR. THE RELEASE FRACTION OF SODIUM FROM THE SAMPLES WAS LESS THAN 5%, BUT THE RELEASE FRACTION OF URANIUM WAS 0.1% IN ONE CASE, AND IN THE OTHER CASE, WAS TOO SMALL TO BE DETECTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + AEROSOL + *FIRE + PLUTONIUM + *TESTING + URANIUM + *FISSION PRODUCT TRANSPORT + RESPONSE TO NRC QUESTION + TRANSPORT PROPERTY + CLINCH RIVER (LMFBR)

7-108748 ALSO IN CATEGORIES 8 AND 12 AND 18 DATED 1975
ANNUAL TECHNICAL PROGRESS REPORT - NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS - GOVERNMENT FISCAL YEAR 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13155 +, 53 PPS, 34 FIGS, 7 REFS, AUG. 15, 1975

PROJECT OBJECTIVES ARE TO (1) DEVELOP A COMPUTER PROGRAM FOR CALCULATING TWO-DIMENSIONAL, TRANSIENT NATURAL CONVECTION PHENOMENA, SUCH AS THOSE ARISING FROM VARIOUS POSTULATED SODIUM SPILL ACCIDENTS IN LMFBR HEAT TRANSFER VAULTS, HEAD COMPARTMENTS, CONTAINMENT BUILDINGS, AND SECONDARY HEAT TRANSFER SYSTEMS. (2) DEVELOP EXPERIMENT PROGRAMS AND CONDUCT TESTS THAT WILL CHARACTERIZE THE BEHAVIOR OF SODIUM, SODIUM OXIDE, FUEL, FISSION PRODUCT, AND OTHER AEROSOLS AS THEY MIGHT BE GENERATED BY VARIOUS POSTULATED LMFBR ACCIDENTS. (3) DETERMINE BY ANALYSIS AND EXPERIMENT THE GENERATION AND TRANSPORT OF THESE AERGSOLS WITH RESPECT TO SOURCE (LOCATION, TYPE, AND CONFIGURATION) RELEASE DISPERSAL, AGGLOMERATION ATTENUATION, AND REMOVAL FOR THE ENTIRE COURSE OF EVENTS ASSOCIATED WITH REAL AND HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + AEROSOL + COMPUTER PROGRAM + FIRE + FUEL MELTDOWN + SPRAY + HEAT TRANSFER, NATURAL CONVECTION + IGNITION + TRANSPORT PROPERTY + BUBBLE + *R AND D PROGRAM + LEAK + BEHAVIOR

7-108774 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.344 - AEROSOL DEPLETION FACTOR
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, PP. Q001.344-1 THRU Q001.344-2 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AEROSOL DEPLETION FACTORS DEFINED IN THE REFERENCED TABLES DESCRIBE THE RATE (FRACTION/SEC) AT WHICH THE SUSPENDED AEROSOL CONCENTRATION IS REDUCED VIA NATURAL AEROSOL DEPOSITION PROCESSES: PLATEOUT AND SETTLING. MATHEMATICALLY, THIS FACTOR IS ANALOGOUS TO A RADIOACTIVE DECAY CONSTANT, WHICH DESCRIBES THE RATE OF DECAY (REDUCTION) OF THE ACTIVITY OF A PARTICULAR ISOTOPE. HOWEVER, WHEREAS THE RATE OF RADIOACTIVE DECAY IS CONSTANT WITH TIME, AEROSOL DEPLETION IS TIME-DEPENDENT DUE TO THE CHANGING SUSPENDED AEROSOL CONCENTRATION, AND THE FACT THAT THE AEROSOL DEPOSITION PROCESSES ARE DEPENDENT ON THE CONCENTRATION OF THE SUSPENDED AEROSOL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AEROSOL + *DEPOSITION + AEROSOL PROPERTIES + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-109105 ALSO IN CATEGORY 1 DATED 1975
SAGAN LA
PLUTONIUM - SOME POLITICAL AND SOCIAL CONSIDERATIONS
PALO ALTO MEDICAL CLINIC
5 PPS, PRESENTED AT THE ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUSCON, ARIZON, OCT. 5-8, 1975

WE IN THE NUCLEAR COMMUNITY HAVE A SPECIFIC AND CRUCIAL ROLE TO PLAY IN CREATING THE POLITICAL AND LEGAL MACHINERY NECESSARY TO THE SAFE AND PEACEFUL USE OF NUCLEAR ENERGY. MY PLEA IS THAT YOU NOT DISSIPATE YOUR ENERGIES IN PAROCHIAL AND TECHNICAL DEBATES WHICH ONLY CONFUSE AND FRIGHTEN THE PUBLIC, BUT WILL DEDICATE YOURSELVES TO THOSE LARGER ISSUES WHERE YOUR KNOWLEDGE AND WISDOM CAN LEAD THE PUBLIC TO THE TRULY SAFE USE OF NUCLEAR ENERGY. THERE WILL BE SOME WHO WILL URGE YOU TO AVOID ANY DISCUSSION OF SAFEGUARDS OR DIVERSION OF NUCLEAR MATERIALS LEST THAT LEAD TO REACTION AGAINST ALL USES OF NUCLEAR ENERGY. THAT RISK EXISTS, BUT IF YOU BELIEVE, AS I DO, THAT THE PUBLIC CAN MAKE MATURE JUDGEMENTS, THEN THAT RISK IS VERY SMALL.

AVAILABILITY - L.A. SAGAN, M.D., PALO ALTO MEDICAL CLINIC, PALO ALTO, CALIF.

CHEMICAL TOXICITY + PLUTONIUM + HAZARD, RELATIVE + MILITARY CONSIDERATION + FUEL MANAGEMENT + SAFEGUARDS, NUCLEAR MATERIAL + TOXICITY + SOCIO/PHILOSOPHICAL CONSIDERATION + FUEL CYCLE

7-109506 ALSO IN CATEGORY 12 DATED 1975
REED LD + GIESEKE JA
SENSITIVITY ANALYSIS FOR POSTULATED LMFBR ACCIDENT CONDITIONS
BATTELLE COLUMBUS LABS., OHIO
BMI-X-664 +. 66 PPS, 39 FIGS, 4 REFS, OCT. 1975

THE AGGLOMERATION GROWTH, TRANSPORT, DEPOSITION, AND RELEASE FROM THE CONTAINMENT OF AEROSOLS ARE PREDICTED BY THE SEVERAL AVAILABLE AEROSOL BEHAVIOR MODELS. DISCUSSES THE COMPUTER-PREDICTED EFFECTS OF SUCH ASSUMED CONDITIONS ON AIRBORNE AEROSOL MASS CONCENTRATION OR MASS LEAKED. ALSO, THE EFFECTS OF USING DIFFERENT AVAILABLE COMPUTER CODES IS ILLUSTRATED IN TERMS OF THE DETAILS ASSUMED FOR AEROSOL BEHAVIOR MECHANISMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + DEPOSITION + PARTICLE SIZE + ANALYTICAL MODEL + AEROSOL PROPERTIES + AGGLOMERATE + ACCIDENT MODEL + SENSITIVITY ANALYSIS

7-109563 ALSO IN CATEGORIES 5 AND 18 DATED 1975
GIESEKE JA + REED LD
WORK PLAN: AEROSOL BEHAVIOR MODELLING FOR FAST REACTOR SAFETY. TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-663 +. 22 PPS, 1 FIG, AUG. 1975

A WORK PLAN FOR EFFORTS IN THE TIME PERIOD FROM JULY 1, 1974, THROUGH JUNE 31, 1977, (FY 75, 76, AND 77) IS DESCRIBED. THE OVERALL GOALS OF THIS STUDY ARE TO PROVIDE IMPROVEMENTS IN THE CAPABILITY TO PREDICT AEROSOL BEHAVIOR IN POSTULATED FAST REACTOR ACCIDENT SITUATIONS AND VERIFY THIS BEHAVIOR TO THE EXTENT POSSIBLE BY COMPARISON WITH AVAILABLE EXPERIMENTAL RESULTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *AEROSOL + ANALYTICAL MODEL + *AEROSOL PROPERTIES + *BEHAVIOR

7-109624 ALSO IN CATEGORY 12 DATED 1975
REED LD + GIESEKE JA
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY: QUARTERLY PROGRESS REPORT FOR JULY THROUGH SEPTEMBER, 1975. TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-666 +. 20 PPS, 3 FIGS, 8 REFS, OCT. 30, 1975

PROGRESS AT BATTELLE DURING THE PREVIOUS 3-MONTH PERIOD HAS BEEN MADE IN THREE GENERAL AREAS. A SODIUM OXIDE AEROSOL GENERATOR HAS BEEN DESIGNED AND CONSTRUCTED FOR USE WITH A MILLIKAN CELL APPARATUS IN STUDYING SODIUM OXIDE AGGLOMERATE CHARACTERISTICS. THE EXPERIMENTAL DESIGN, RATIONALE, AND PROCEDURE ARE DISCUSSED IN DETAIL IN A LATER SECTION OF THIS REPORT. ALSO, FURTHER IMPROVEMENTS HAVE BEEN MADE IN THE HARRM-1 AEROSOL BEHAVIOR CODE AND A SECOND GENERATION CODE, HAARM-2, HAS BEEN DEVELOPED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + OXIDE + ANALYTICAL MODEL + AGGLOMERATE + THEORETICAL INVESTIGATION

7-109900 DATED 1976
ZIMMERMANN H
FISSION GAS BEHAVIOR IN OXIDE FUEL ELEMENTS OF FAST BREEDER REACTORS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
7 PPS, 2 TABS, 7 FIGS, 16 REFS, NUCLEAR TECHNOLOGY, 28(1), PP. 127-33 (JAN. 1976)

UNDER THE CONDITIONS PREVAILING IN FAST BREEDER REACTORS, THE FRACTIONAL FISSION GAS RELEASE IS 90% OR MORE AFTER MEDIUM AND HIGH BURNUPS. THE RELEASE RATE IS NOT CONSTANT, BUT THERE ARE

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-109900 *CONTINUED*
PERIODS WITH PARTICULARLY HIGH RELEASE RATES (BREAKAWAY RELEASE). THE RETAINED FISSION GAS REACHES CONCENTRATIONS OF 1.5 X 10(EXP -2) GAS ATOMS PER URANIUM AND PLUTONIUM ATOMS IN FUEL REGIONS WITH TEMPERATURES BELOW 1100 DEG C. THE CONCENTRATION DECREASES WITH INCREASING TEMPERATURES. AT TEMPERATURES ABOVE 1500 DEG C THE CONCENTRATION OF THE RETAINED GAS IS 2 X 10(EXP -4) GAS ATOMS PER INITIAL METAL ATOM. UP TO FIVE TIMES MORE FISSION GAS IS RETAINED IN BUBBLES AND PORES THAN IN THE MATRIX. THERE IS A RELATION BETWEEN PLASTIC DEFORMATION OF THE CLADDING BY MECHANICAL INTERACTION WITH THE FUEL AND THE CONCENTRATION OF FISSION GAS IN BUBBLES.

CLADDING + FISSION GAS RELEASE + PLUTONIUM + THERMAL EXPERIMENT + FISSION PRODUCT RETENTION + BUBBLE + EXPANSION

7-109906 ALSO IN CATEGORIES 5 AND 11 DATED 1974
WEBER ET + SLAGLE OD + HINMAN CA
LABORATORY STUDIES ON MELTING AND GAS RELEASE BEHAVIOR OF IRRADIATED FUEL
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 22 PPS, PP, 641-63, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RESPONSE OF IRRADIATED FUELS TO RAPID HEATING IS A MAJOR FACTOR WHICH MUST BE CONSIDERED IN SAFETY ANALYSES FOR FAST REACTORS. A SERIES OF EXPERIMENTS AT HEDL PROVIDE OBSERVATIONS AND DATA ON THE RESPONSE OF FAST FLUX (EBR-II) IRRADIATED FUEL MATERIALS WHEN SUBJECTED TO RAPID HEATING IN THE LABORATORY. FUEL SAMPLES WITHIN A RESISTIVELY HEATED TUNGSTEN TUBE ARE SUBJECTED TO THERMAL TRANSIENTS IN A SYSTEM PROVIDING FOR TEMPERATURE AND PRESSURE MEASUREMENTS. IN ADDITION TO CONTINUOUS GAMMA RADIOGRAPHY OF THE SAMPLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

FAILURE + FAILURE, FUEL ELEMENT + THERMAL CONSIDERATION + *IRRADIATION TESTING + BEHAVIOR + *FUEL ELEMENTS

7-109944 ALSO IN CATEGORIES 5 AND 6 AND 18 DATED 1974
BUGENSBERGER HG + FISCHER EA + SCHMUCK P
ON THE EQUATION OF STATE OF MIXED OXIDE FUEL FOR THE ANALYSIS OF FAST REACTOR DISASSEMBLY ACCIDENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1333-48, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE VAPOR PRESSURE FOR MIXED OXIDE IS CALCULATED BY FOLLOWING THE METHOD USED BY RAND AND MARKIN. THE VAPOR PRESSURE OF THE FISSION PRODUCTS IS ALSO CALCULATED, AND FOUND TO BE MUCH LARGER THAN THAT OF MIXED OXIDE AT TEMPERATURES AROUND THE MELTING POINT. THE DISASSEMBLY PHASE OF AN UNPROTECTED REACTIVITY ACCIDENT IN A LMFBR IS ANALYZED USING THESE VAPOR PRESSURE DATA. THE ACCIDENT IS INITIATED BY A 5 $/SEC REACTIVITY RAMP; THE PREDISASSEMBLY PART WAS ANALYZED EARLIER WITH THE SAS-2A CODE. IT IS FOUND THAT THE VAPOR PRESSURE OF THE FISSION PRODUCTS HAS THE EFFECT OF GREATLY REDUCING THE ENERGY RELEASE IN THE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + VAPOR PRESSURE + MIXED OXIDE + *ACCIDENT, CORE DISRUPTIVE

7-109955 ALSO IN CATEGORY 18 DATED 1974
FULLWOOD RR + ERDMANN RC + IKAWO
ON THE USE OF LEAK PATH ANALYSIS IN FAULT TREE CONSTRUCTION FOR FAST REACTOR SAFETY
SAI SERVICES, MCLEAN, VA
CONF-740401-P3 +. 14 PPS, PP. 1492-1507, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DESCRIBES A METHOD FOR DETERMINING THE TOP OF A FAULT TREE FOR AN ACCIDENTAL RELEASE OF RADIOACTIVITY, WITH APPLICATION TO THE FFTF. THE ANALYSIS LEADS FROM DESIGN DRAWINGS AND RELATED INFORMATION TO A LOGICAL EXPRESSION FOR THE FAILURE PATHS. THIS ALGEBRAIC EXPRESSION, WHEN REDUCED, IS REPRESENTED BY A FAULT TREE. ADDITIONAL TREES ARE ALSO DRAWN FOR OTHER PARTS OF THE SYSTEM. THE RESULTS OF THE METHOD ARE COMPARED TO ALTERNATE SCHEMES AND THE CONCEPT OF FAULT TREE COMPLETENESS IS CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FFTF (TR) + *FAULT TREE ANALYSIS + PREDICTABILITY + FAILURE MODE ANALYSIS

7-109975 ALSO IN CATEGORIES 11 AND 18 DATED 1976
PARSLY LF
WORK PLAN: TRANSIENT RELEASE FROM LMFBR FUEL. ADDENDUM 1: INVESTIGATION OF LMFBR AEROSOL BEHAVIOR IN THE AEROSOL TEST FACILITY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4875 +. 17 PPS, 3 FIGS, 32 REFS, JAN. 1976

THE OBJECTIVES OF THIS TASK ARE TO CHARACTERIZE THE PROPERTIES AND TRANSIENT BEHAVIOR OF MIXED-OXIDE (SODIUM AND URANIUM) AEROSOLS IN A RELATIVELY LARGE CONTAINMENT VESSEL AND TO CORRELATE THEIR BEHAVIOR WITH ANALYTICAL MODELS. EXPERIMENTS ARE TO BE CONDUCTED UNDER CONDITIONS THAT CAN BE RELATED TO RELEASE INTO AN LMFBR CONTAINMENT BUILDING AS A RESULT OF A CDA. THE CONDITIONS WILL COVER THOSE RESULTING FROM A RANGE OF ACCIDENT SEVERITY UP TO AND INCLUDING LOSS OF FLOW AND

CATEGORY 7
FISSION PRODUCT RELEASE, TRANSPORT, AND REMOVAL

7-109979 *CONTINUED*
UNPROTECTED TRANSIENT OVERPOWER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AEROSOL + CONTAINMENT + FUEL MELTDOWN + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + AEROSOL PROPERTIES + SAMPLING + BEHAVIOR + TRANSIENT + MIXED OXIDE

7-110007 ALSO IN CATEGORIES 11 AND 18 DATED 1975
NISHIC G + KITANI S + TAKADA J
EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASE FROM AN LMFBR IN A HYPOTHETICAL ACCIDENT
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE, TOKAI-MURA
12 PPS, 6 TABS, 10 FIGS, 19 REFS, NUCLEAR ENGINEERING & DESIGN, 34(3), PP. 417-28 (NOV. 1975)

DESCRIBES THE WORK UNDERTAKEN TO PREPARE A COMPUTER CODE FOR THE HAZARD EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASED TO THE ATMOSPHERE IN THE EVENT OF A HYPOTHETICAL ACCIDENT IN A 50 MW(TH) SCALE LMFBR. THE REACTOR BUILDING STRUCTURE CONSISTS OF SEMI-DOUBLE CONTAINMENTS AS FOLLOWS: THE PRIMARY CONTAINMENT HAS A LARGE VOLUME IN COMPARISON WITH THE SECONDARY ANNULAR CONTAINMENT IN WHICH A PART IS CONNECTED TO THE ATMOSPHERE THROUGH AN EMERGENCY FILTER SYSTEM. SODIUM OXIDE AEROSOL CONTAINING PUO2-UO2 FUEL. FISSION PRODUCTS AND STRUCTURAL STEEL AGGLOMERATES QUICKLY BY COAGULATION DUE TO ITS HIGH CONCENTRATION. SIMULTANEOUSLY, THE AEROSOL CONCENTRATION DECREASES DUE TO SETTLING, PLATING AND THERMOPHORESIS. USING THE PRESENT CODE, THE AMOUNT OF PUO2 AEROSOL LEAKAGE TO THE ATMOSPHERE WAS EVALUATED.

AEROSOL + CONTAINMENT + FILTER SYSTEM + FISSION PRODUCT RELEASE + OXIDE + PLUTONIUM + URANIUM + AGGLOMERATE

7-110017 ALSO IN CATEGORIES 8 AND 18 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT, NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS: JULY - SEPTEMBER 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13161 +. 21 PPS, 2 TABS, 9 FIGS, NOV. 15, 1975

THE BURNING CHARACTERISTICS OF A SINGLE DROP OF SODIUM WERE DETERMINED UNDER VARIOUS TEST CONDITIONS IN THE LABORATORY DROP MODELING TEST APPARATUS (LDM). FROM THESE TESTS, IT WAS OBSERVED THAT THE BURNING RATE WAS RELATIVELY CONSISTENT FOR BOTH HIGH AND LOW HUMIDITY 21 VOL % O2 TESTS (0.008 GM/SEC) WITH A SLIGHT DEPENDENCY OF COMBUSTION PRODUCT RELEASE FRACTION AS A FUNCTION OF HUMIDITY (88.5% AT HUMIDITIES > 10,000 PPM, AND 76.1% AT HUMIDITIES < 1,000 PPM). AS THE AIR RECIRCULATION AROUND THE STATIONARY DROP WAS CHANGED FROM NATURAL TO FORCED, IT WAS OBSERVED THAT THE BURNING RATE INCREASED BY A FACTOR OF 40. THREE DROP BURNING TESTS CONDUCTED IN < 1,000 PPM HUMIDITY AIR ATMOSPHERE EXHIBITED LOW BURNING RATES WHICH WERE ATTRIBUTED TO INERT GAS BUILDUP WITHIN THE LDM COLUMN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FIRE + FISSION PRODUCT RELEASE + #R AND D PROGRAM

7-110134 ALSO IN CATEGORIES 5 AND 11 AND 18 DATED 1976
KAZIMI MS
ANALYSIS OF PRESSURE PULSE GENERATION DUE TO GAS RELEASE FROM FAILED FUEL PINS IN A LIQUID METAL FAST BREEDER REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY
11 PPS, 11 FIGS, NUCLEAR SCIENCE & ENGINEERING, 59(1), PP. 1-11 (JAN. 1976)

A MODEL FOR THE ANALYSIS OF PRESSURE PULSE GENERATION DUE TO SUDDEN GAS RELEASE FROM FAILED PINS IN A LIQUID-METAL FAST BREEDER REACTOR IS PRESENTED. THE PREDICTIONS OF THE MODEL ARE COMPARED TO EXPERIMENTAL DATA ON SUDDEN GAS RELEASE IN THE DUCTS OF THE EXPERIMENTAL BREEDER REACTOR II. THE PREDICTED MAGNITUDES OF PRESSURE PULSES ARE IN GOOD AGREEMENT WITH THE EXPERIMENTAL OBSERVATIONS. THE PREDICTED PRESSURE PULSE, HOWEVER, SEEMS TO DECAY AT A FASTER RATE THAN THE EXPERIMENTALLY OBSERVED RATE. THE EFFECTS OF THE PIN INTERNAL PRESSURE UPON RUPTURE, THE RUPTURE AREA, AND THE AMOUNT OF COMPRESSED GAS ARE STUDIED PARAMETRICALLY.

*EBR 1 AND 2 (RE) + FISSION GAS RELEASE + FAILURE, FUEL ELEMENT + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL MODEL + PRESSURE PULSE

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-093643 ALSO IN CATEGORIES 5 AND 6 AND 18 DATED 1974
NICHOLSON RB
DESIGN BASIS ACCIDENT STUDIES - FINAL REPORT
THE OHIO STATE UNIVERSITY
COO-2286-3 +. 260 PAGES, TABLES, REFERENCES, JUNE 22, 1974

AN EXTENSION OF THE ANL EQUATION OF STATE IN THE VENUS-II PROGRAM TO INCLUDE LOWER PRESSURE CONDITIONS AND AN ISENTROPIC EXPANSION CALCULATION SHOWS THAT THE ENERGY AVAILABLE FOR MECHANICAL DAMAGE IS STRONGLY DEPENDENT UPON HOW FAR THE EXPANSION CAN PROCEED. EXPANSION TO ONE ATMOSPHERE IN WEAK ACCIDENTS CAN LEAD TO ONE TO TWO ORDERS OF MAGNITUDE MORE ENERGY THAN R. W. STRATTON'S EIGHT-FOLD VOLUME EXPANSION. THE MODIFIED BETHE-TAIT METHOD OF EDWARDS AND MATHER IS APPROXIMATELY REPRODUCED AND VERIFIED BUT AT HIGH DOPPLER EFFECT, LOW EXCURSION ENERGY CONDITIONS, THE ANL EQUATION OF STATE IN VENUS LEADS TO SIGNIFICANTLY GREATER ENERGY RELEASE. A POTENTIALLY AUTOCATALYTIC EFFECT, ASSOCIATED WITH NEUTRON STREAMING THROUGH VOIDS, CANNOT BE DISREGARDED IN HCDA ANALYSIS. MORE WORK IS REQUIRED TO ESTABLISH ITS QUANTITATIVE SIGNIFICANCE. MOST OF THE SAS-2A COMPUTER PROGRAM MODELING IS FOUND TO BE BASED ON SOUND PRINCIPLES. WE ARE GENERALLY IN AGREEMENT WITH ANL ON THE FEW WEAKNESSES OF THE MODELING. THE DBA CONCEPT AS A BASIS FOR BREEDER CONTAINMENT DESIGN IS FOUND TO BE A SOUND CONCEPT WHEN ACCOMPANIED BY A COMMITMENT TO PROVIDE THE HIGHEST PRACTICABLE CONTAINMENT CAPACITY AND BY A COMMITMENT TO ASSURE RESPONSIBILITY AND VISABILITY IN CONTAINMENT DESIGN DECISIONS

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BETHE TAIT + COMPUTER PROGRAM + DOPPLER EFFECT + ENERGY SOURCE + EQUATION OF STATE + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + NEUTRON + ACCIDENT, DESIGN BASIS + VOID + ACCIDENT, CORE DISRUPTIVE

8-100282 ALSO IN CATEGORY 11 DATED 1974
CHO DH + CUNTHER WH + ARMSTRONG DR
FRAGMENTATION OF MOLTEN MATERIALS DROPPED INTO WATER
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8155 +. 22 PAGES, 16 FIGURES, 9 REFERENCES, DECEMBER 1974

A SERIES OF EXPERIMENTS WERE PERFORMED TO INVESTIGATE THE FRAGMENTATION OF A HOT MOLTEN MATERIAL IN A COLD QUENCH LIQUID. SMALL QUANTITIES OF VARIOUS MOLTEN MATERIALS (LESS THAN 1 G) WERE DROPPED INTO A POOL OF WATER AND THE PROJECTED AREAS OF THE RESULTING FRAGMENTS WERE MEASURED FOR THE EXTENT OF FRAGMENTATION. FIVE MATERIALS HAVING LOW MELTING POINTS WERE USED IN THIS INVESTIGATION: TIN, BISMUTH, SILVER CHLORIDE, ZINC AND LEAD. IN MOST CASES, THE DROPPING DISTANCE WAS KEPT CONSTANT AT 2 IN. FROM THE WATER SURFACE WHILE THE TEMPERATURE OF THE MOLTEN SAMPLES AND WATER WERE VARIED OVER A WIDE RANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL + METAL WATER REACTION + THERMAL MECHANICAL EFFECT + BISMUTH + LEAD + MOLTEN FUEL + SILVER + ZINC + R AND D PROGRAM + TIN + FUEL COOLANT INTERACTION

8-101619 ALSO IN CATEGORY 7 DATED 1970
AMBLARD M + SEMERIA R + VERNIER P + GOUZY A + NAJUC M
CONTACT BETWEEN LIQUID URANIUM DIOXIDE AND A SODIUM AND WATER COOLANT
GRENOBLE NUCLEAR RESEARCH CENTER
EURFNR-611 +. 70 PAGES, TRANSLATION OF REPORT TT 96, MARCH 3, 1970

DETERMINED EXPERIMENTALLY THAT MOLTEN UO2 DROPPED IN SODIUM AT 200 C AND 400 C IS HIGHLY DISPERSED AND CAUSES AN IMPORTANT DYNAMIC SUPPRESSION IN SODIUM. OBSERVED THE FORMATION OF LONG HOLLOW TUBES OF SODIUM WHEN MOLTEN UO2 AND WATER (20 C, ATMOSPHERIC PRESSURE) COME IN CONTACT. BOTH CASES INVOLVED THE FORMATION OF HOLLOW UO2 DROPS FILLED WITH A HERMETICALLY SEALED COLD LIQUID. THE DIFFERENT PROPERTIES OF THE TWO COLD LIQUIDS, ESPECIALLY THERMAL CONDUCTIVITY, SPECIFIC HEAT AND BOILING POINT, CAUSE VIOLENT FRAGMENTATION IN SODIUM AND PLASTIC DEFORMATION OF UO2 IN WATER. OBSERVED THAT WHEN A CYLINDER WAS MELTED BY THE JOULE EFFECT, ENCLOSED IN A STAINLESS-STEEL TUBE, THE LATTER WAS BURST BY THE MOLTEN UO2, WHICH COULD DISPERSE IN THE LOW-TEMPERATURE BATH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CHEMICAL REACTION + WATER + MOLTEN FUEL + URANIUM DIOXIDE + PROPERTY, PHYSICAL + BOILING + THERMAL CONDUCTIVITY

8-105757 ALSO IN CATEGORIES 5 AND 6 AND 11 A DATED 1975
A COMPENDIUM OF COMPUTER CODES FOR THE SAFETY ANALYSES OF LMFBR'S
U.S. ERDA, WASHINGTON
ERDA-31 +. 189 PPS, JUNE 1975

AN ALPHABETICAL LIST OF 55 COMPUTER CODES. GIVES A BRIEF STATEMENT OF THE PROBLEM SOLVED, THE STATUS OF THE CODE, THE MODEL DESCRIPTION, LIMITATIONS, FUTURE EFFORTS TO IMPROVE THE CODE, INTERFACES WITH OTHER CODES AND REFERENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CONTAINMENT + FISSION GAS RELEASE + FUEL MELTDOWN + ACCIDENT, LOSS OF COOLANT + *SAFETY ANALYSIS + PRESSURE PULSE + PRESSURE TRANSIENT + STRUCTURAL ANALYSIS, DYNAMIC + *THERMAL TRANSIENT + COMPARTMENT + FUEL SWELLING + THERMAL HYDRAULIC ANALYSIS + PIPES AND PIPE FITTINGS

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-106178 ALSO IN CATEGORY 18 DATED 1972
DUMM K + SAUERMANN F + SCHNITKER W
EXPERIMENTAL AND THEORETICAL INVESTIGATIONS ON SAFETY OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATOR WITH SODIUM-WATER REACTIONS
INTERATOM, BENSBERG/KOELN, F.R. GERMANY
ERDA-TR-27(VOL.1) +. 70 PPS. 15 REFS. APRIL 1972 (TRANSLATION)

A NUMBER OF LARGE SODIUM WATER REACTION TESTS HAS BEEN PERFORMED IN A STEAM GENERATOR MODEL IN ORDER TO VERIFY THE LAYOUT CRITERIA OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATORS UNDER ACCIDENT CONDITIONS. THE EXPERIMENTAL SETUP IS DESCRIBED. THE TEST RESULTS AND THEIR APPLICABILITY TO THE SNR STEAM GENERATORS ARE GIVEN AND DISCUSSED. (SEE ALSO VOL. 2)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL WATER REACTION + TESTING + GERMANY + R AND D PROGRAM + STEAM GENERATOR

8-106179 ALSO IN CATEGORY 18 DATED 1972
DUMM K + SAUERMANN F + SCHNITKER W
EXPERIMENTAL AND THEORETICAL INVESTIGATIONS ON SAFETY OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATOR WITH SODIUM-WATER REACTIONS
INTERATOM, BENSBERG/KOELN, F.R. GERMANY
ERDA-TR-27(VOL.2) +. 113 PPS. 107 FIGS. APRIL 1972 (TRANSLATION)

EXPERIMENTAL AND THEORETICAL INVESTIGATIONS WERE CARRIED OUT IN BEHALF OF THE NETHERLANDS CONSORTIUM PARTNER, N.V. NERATOOM, FOR BUILDING THE FAST SODIUM-COOLED BREEDER REACTOR SNR 300. THE TEST PLAN HAD A RUNNING TIME FROM THE BEGINNING OF 1968 TO THE BEGINNING OF 1972 WHICH INCLUDED THE MANUFACTURE AND INSTALLATION OF A LARGE STEAM GENERATOR MODEL AS WELL AS THE FINAL EVALUATION OF TESTING. THE TOTAL SCOPE OF WORK CARRIED ON IN ACCORDANCE WITH THE CONTRACT IS PRESENTED. (SEEL ALSO VOL. 1)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*METAL WATER REACTION + TESTING + GERMANY + R AND D PROGRAM + STEAM GENERATOR

8-108071 ALSO IN CATEGORIES 12 AND 18 DATED 1975
SARMA BLB + THOMPSON RC + STITT FK
REVIEW OF SODIUM FIRE ANALYTICAL MODELS
GENERAL ELECTRIC COMPANY
GEAP-14053 +. 100 PPS. 43 FIGS. 22 REFS. JUNE 1975

THE CODES SPRAY, SOFIRE II AND CACECO WERE UTILIZED FOR ANALYZING SODIUM FIRES AND MODELING SEVERAL SODIUM FIRE EXPERIMENTS CONDUCTED BY ATOMICS INTERNATIONAL. THE RESULTS ARE INTER-COMPARED TO EVALUATE THE CODE. WITHIN A LIMITED RANGE OF SPRAY FIRES IN LOW OXYGEN ENVIRONMENTS, THE SPRAY CODE APPEARS TO YIELD REASONABLE RESULTS. WITH CAREFUL APPLICATION AND USING SPRAY, SOFIRE II AND CACECO IN CONJUNCTION WITH EACH OTHER, PRIMARY SODIUM FIRES IN INERTED ENVIRONMENT (<- 2 VOL % OXYGEN) CAN BE ADEQUATELY ANALYZED. HOWEVER, THERE IS NO CODE AVAILABLE FOR ANALYZING SPRAY FIRES IN AIR ENVIRONMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + *FIRE + *ANALYTICAL MODEL + SPRAY

8-108671 ALSO IN CATEGORIES 7 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 270 PGS. AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING THE QUALITY ASSURANCE PROGRAM, TEST GROUTING PROGRAM (NEW APPENDIX 2-C), COMPARISON WITH FFTF AND MONJU, CORE INTERNALS, SHUTDOWN COOLING SYSTEMS, DOSES FROM EXPOSURE TO LIQUID EFFLUENTS, LEAKAGE FROM SODIUM COLD TRAPS AND PUMP SEIZURE ANALYSIS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING DECAY HEAT REMOVAL, STRESS FROM CDA, PRIMARY PUMP SEAL FAILURES, FISSION PRODUCTS IN SODIUM AEROSOL, CELL TEMPERATURE AND PRESSURE DURING SODIUM FIRE, AND SURFACE AREA FOR CONDENSATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + CONCRETE + CONTAINMENT + FIRE + TESTING + RADIOACTIVITY RELEASE + SEAL + *REPORT, PSAR + QUALITY ASSURANCE + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *CLINCH RIVER (LMFBR) + PUMPS

8-108679 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.232 - CELL TEMPERATURE AND PRESSURES FROM FIRE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS. 1 FIG. PP. Q001-232-1 THRU Q001.232-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-108079 *CONTINUED*
THE RELATIVELY HIGH BURNING RATE OF THE SPRAY PORTION OF THE FIRE RESULTS IN BOTH RAPID EXPANSION OF THE CELL ATMOSPHERE CAUSED BY HEATING, AND HIGH LOCAL GAS TEMPERATURES. WITH AN ASSUMED 700,000 CFM VENTING RATE, THE RATE OF PRESSURIZATION AND INCREASES IN OVERALL TEMPERATURE OF GAS IN THE CELL ARE MINIMAL DURING THE SPRAY PHASE OF THE FIRE. IN THE ABSENCE OF VENTING, THE MAXIMUM RATE OF PRESSURIZATION IN THE CELL DURING THE SPRAY PHASE WILL BE APPROXIMATELY 1.2 PSIG/SEC. THIS CORRESPONDS TO A LOCALIZED GAS HEAT UP RATE OF APPROXIMATELY 38 F/SEC IN THE CELL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + CONTAINMENT + *FIRE + RESPONSE TO NRC QUESTION + PRESSURE TRANSIENT + THERMAL TRANSIENT + COMPARTMENT + CLINCH RIVER (LMFBR)

8-108747 ALSO IN CATEGORY 12 DATED 1975
BOEHMER WC + HILLIARD BK
SODIUM FIRE PROTECTION BY SPACE ISOLATION, OPEN CATCH PAN AND NITROGEN FLOODING -- FFTF PROOF TEST F5
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-58 +. 76 PPS, 34 FIGS, 8 REFS, OCT. 1975

A LARGE-SCALE SODIUM FIRE EXTINGUISHMENT TEST WAS PERFORMED TO DEMONSTRATE THE ADEQUACY OF THE FFTF SECONDARY SODIUM FIRE PROTECTION SYSTEM. TWENTY-THREE HUNDRED POUNDS OF SODIUM AT 1100 DEG. F WERE SPILLED INTO AN AIR FILLED CELL WHICH HAD A STEEL CATCH PAN PROTECTING THE CONCRETE FLOOR AND WALLS. THE FIRE WAS SELF-EXTINGUISHED WHEN THE OXYGEN IN THE RELATIVELY LEAK TIGHT CELL WAS CONSUMED BY SODIUM-OXYGEN REACTION. NITROGEN FLOODING WAS STARTED AFTER 15 MINUTES TO MAINTAIN AN INERT ATMOSPHERE DURING COOLING. ONLY 5.7% OF THE SODIUM WAS REACTED DURING THE TEST. APPROXIMATELY 100 LB. OF WATER WERE RELEASED FROM THE CONCRETE, ONE TENTH OF WHICH REACTED TO FORM HYDROGEN. IT WAS CONCLUDED THAT ALL ASPECTS OF THE TEST RESULTS WERE PREDICTABLE AND THAT THE FFTF SECONDARY SODIUM FIRE PROTECTION SYSTEM WAS VERIFIED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

METAL WATER REACTION + TESTING + FFTF (TR) + SPRAY + IGNITION + CONTAINMENT ATMOSPHERE + FIRE PROTECTION

8-108748 ALSO IN CATEGORIES 7 AND 12 AND 18 DATED 1975
ANNUAL TECHNICAL PROGRESS REPORT - NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS - GOVERNMENT FISCAL YEAR 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13155 +. 53 PPS, 34 FIGS, 7 REFS, AUG. 15, 1975

PROJECT OBJECTIVES ARE TO (1) DEVELOP A COMPUTER PROGRAM FOR CALCULATING TWO-DIMENSIONAL, TRANSIENT NATURAL CONVECTION PHENOMENA, SUCH AS THOSE ARISING FROM VARIOUS POSTULATED SODIUM SPILL ACCIDENTS IN LMFBR HEAT TRANSFER VAULTS, HEAD COMPARTMENTS, CONTAINMENT BUILDINGS, AND SECONDARY HEAT TRANSFER SYSTEMS. (2) DEVELOP EXPERIMENT PROGRAMS AND CONDUCT TESTS THAT WILL CHARACTERIZE THE BEHAVIOR OF SODIUM, SODIUM OXIDE, FUEL, FISSION PRODUCT, AND OTHER AEROSOLS AS THEY MIGHT BE GENERATED BY VARIOUS POSTULATED LMFBR ACCIDENTS. (3) DETERMINE BY ANALYSIS AND EXPERIMENT THE GENERATION AND TRANSPORT OF THESE AEROSOLS WITH RESPECT TO SOURCE (LOCATION, TYPE, AND CONFIGURATION) RELEASE DISPERSAL, AGGLOMERATION ATTENUATION, AND REMOVAL FOR THE ENTIRE COURSE OF EVENTS ASSOCIATED WITH REAL AND HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + AEROSOL + COMPUTER PROGRAM + FIRE + FUEL MELTDOWN + SPRAY + HEAT TRANSFER, NATURAL CONVECTION + IGNITION + TRANSPORT PROPERTY + BUBBLE + *R AND D PROGRAM + LEAK + BEHAVIOR

8-108759 ALSO IN CATEGORIES 5 AND 6 AND 11 A DATED 19758
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

8-108763 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.226 - SODIUM FIRE ANALYSIS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. 0001.226 -1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537,

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-108763 *CONTINUED*
TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SPRAY FIRE COMPONENT ANALYZED (SPRAY-1) IN SECTION 15.6.1.4 WAS EVALUATED AS THE PRESSURIZED DISCHARGE OF 30 GPM (100% OF WHICH WAS ASSUMED TO REACT AS A SODIUM SPRAY) FOR A 10 MINUTE DURATION. THE POOL FIRE COMPONENT (SOFIRE-II) WAS EVALUATED BY CONSERVATIVELY ASSUMING THE INSTANTANEOUS FORMATION OF A LARGE SODIUM POOL (1500 GALLONS FOR THE PHTS CELLS AND 18,000 GALLONS FOR THE REACTOR CAVITY - THE RESPECTIVE MAXIMUM SODIUM DRAINAGES BASED ON SYSTEM EQUILIBRIUM CONDITIONS) IMMEDIATELY FOLLOWING THE 10 MINUTE SPRAY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPUTER PROGRAM + *FIRE + *SPRAY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

8-108765 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.240 - PRESSURE AND TEMPERATURE RESPONSES DURING SODIUM FIRE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.240-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PRESSURE AND TEMPERATURE RESPONSES OF A CELL/BUILDING TO A SODIUM SPILL AND ACCOMPANYING COMBUSTION ARE DEPENDENT UPON SEVERAL FACTORS, WHICH INCLUDE: SURFACE AREA OF THE SODIUM POOL, INITIAL SODIUM TEMPERATURE, SODIUM POOL DEPTH, INITIAL OXYGEN CONTENT OF THE CELL ATMOSPHERE, AND CELL VOLUME. A POOL WITH A SMALL SURFACE AREA WOULD GIVE OFF LESS HEAT PER UNIT TIME (FROM BOTH COMBUSTION AND SENSIBLE HEAT) THAN A POOL WITH LARGER SURFACE AREA, ALL OTHER FACTORS EQUAL. THE LOWER HEAT ADDITION RATE TO THE CELL ATMOSPHERE GIVES THE CELL ATMOSPHERE TIME TO TRANSFER HEAT TO THE CELL WALLS AND RESULTS IN LOWER TEMPERATURE/PRESSURE TRANSIENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FIRE + RESPONSE TO NRC QUESTION + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *COMPARTMENT + *TRANSIENT + CLINCH RIVER (LMFBR)

8-108766 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.243 - CONSERVATISM IN SPRAY-1 COMPUTER CODE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
3 PGS, PP. Q001.243-1 THRU Q001.243-3 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SPRAY-1 CODE WAS USED FOR THE ANALYSIS OF SODIUM SPRAY FIRES IN LOW OXYGEN CONCENTRATION (EQUAL TO OR LESS THAN 2%) GAS IN ORDER TO PREDICT THE RESULTANT TEMPERATURE AND PRESSURE TRANSIENTS IN A CELL. THE CODE WAS ALSO USED AS PART OF EXPERIMENTAL VERIFICATION TO SIMULATE AND ANALYZE SEVERAL EXPERIMENTAL SODIUM (SPRAY) JET TESTS CONDUCTED BY ATOMICS INTERNATIONAL (AI). THESE COMPARATIVE STUDIES HAVE SHOWN THAT THE CALCULATIONAL RESULTS OBTAINED BY USING THE SPRAY-1 CODE AGREE WITH THE EXPERIMENTALLY MEASURED RESULTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + FIRE + *COMPARISON, THEORY AND EXPERIENCE + TESTING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

8-109909 ALSO IN CATEGORY 11 DATED 1974
KRIEG R
NONSYMMETRIC TRANSIENT PRESSURE LOAD ON REACTOR VESSEL CAUSED BY POINT SOURCES SIMULATING FUEL-SODIUM INTERACTION
GESELLSCHAFT FUR KERNFORSCHUNG MBH, KARLSRUHE, F.R. GERMANY
CONF-740401-P2 *. 15 PPS, PP. 701-15, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE PROBLEM DEALT WITH HERE IS OF IMPORTANCE FOR STUDIES OF FAST REACTOR SAFETY, WHERE THE FUEL-SODIUM INTERACTION MAY GREATLY INFLUENCE THE EVALUATION OF STRUCTURAL INTEGRITY OF BOTH THE CORE AND CONTAINMENT. ASSUMING SMALL VARIATIONS IN FLUID VELOCITIES, THE FIELD EQUATIONS DESCRIBING THE TRANSIENT FLOW PROBLEM CAN BE LINEARIZED AND THE VISCOSITY TERM IS NEGLIGIBLE. UNDER THESE SIMPLIFICATIONS, USING THE METHOD OF SINGULARITIES, AN EXACT SOLUTION IS GIVEN SATISFYING BOUNDARY CONDITIONS WHICH, IN MANY CASES, APPROXIMATE THE REAL BOUNDARY CONDITIONS VERY WELL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CORE COMPONENTS + SUPPORT STRUCTURE + *STRUCTURAL ANALYSIS, DYNAMIC + *FUEL COOLANT INTERACTION + *PRESSURE VESSELS

8-109911 ALSO IN CATEGORY 11 DATED 1974
GAST K + LIEBE R + WILL H + REES NJM
SIMULATED VAPOR EXPLOSION EXPERIMENTS AND DYNAMIC ELASTO PLASTIC RESPONSE OF SNR CORE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ATOMIC WEAPONS RESEARCH ESTABLISHMENT, FOULNESS, ENGLAND
CONF-740401-P2 *. 15 PPS, PP. 732-47, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2,

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-109911 *CONTINUED*
1974

FAST REACTOR SAFETY REQUIRES CONSIDERATION OF THE CORE DEFORMATION PROBLEM EVENTUALLY ARISING FROM LOCAL COOLING DISTURBANCES OR FUEL FAILURES. A PROGRAM IS DESCRIBED WHICH COMBINES THEORETICAL AS WELL AS EXPERIMENTAL STUDIES OF THE TRANSIENT, NONLINEAR STRUCTURAL BEHAVIOR, SIMULATED VAPOR EXPLOSION TESTS ON FULL SIZE SNR CORE MODELS AND LARGE SCALE FCI EXPERIMENTS WITH UO2 INTERACTING WITH SODIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + TESTING + *DEFORMATION + VAPOR PRESSURE + SIMULATION + *STRUCTURAL ANALYSIS, DYNAMIC + VAPOR EXCHANGE

8-109912 ALSO IN CATEGORIES 5 AND 11 AND 18 DATED 1974
KRIEG R + CRAWFORD RM
DEFORMATION IN A 19-PIN BUNDLE DUE TO A SUDDEN FLUID EXPANSION
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 15 PPS, PP. 748-62, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE TRANSIENT FLOW AND PRESSURE FIELDS AS WELL AS THE PIN DEFORMATIONS ARE DETERMINED FOR A FLEXIBLE TWO-ROW PIN BUNDLE SURROUNDED BY AN INFINITE FLUID WITH A TRANSIENT FLUID SOURCE IN THE BUNDLE CENTER. BY NEGLECTING THE FLUID COMPRESSIBILITY AND VISCOSITY, THE SOLUTION FOR THE FLOW PROBLEM IS OBTAINED BY SUPERPOSITION OF SOLUTIONS FOR CERTAIN SINGULARITIES (SOURCES, DIPOLES, QUADRUPOLES). THE FLEXIBILITY OF THE PINS IS ESSENTIALLY APPROXIMATED BY ELASTIC PIN-BUNDLE DEFORMATIONS DUE TO A FUEL-COOLANT INTERACTION CAUSED BY A FAILED PIN IN A LIQUID-METAL-COOLED REACTOR. THE RESULTS MAY HELP TO ESTIMATE THE POTENTIAL FOR FAILURE PROPAGATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FLOW THEORY AND EXPERIMENTS + *DEFORMATION + EXPANSION + *FUEL ELEMENT CLUSTER + STRUCTURAL ANALYSIS, DYNAMIC

8-109919 DATED 1974
ZYSZKOWSKI W
ON THE INITIATION MECHANISM OF THE EXPLOSIVE INTERACTION OF MOLTEN REACTOR FUEL WITH COOLANT
INSTITUTE OF NUCLEAR RESEARCH, WARSAW, POLAND
CONF-740401-P2 +. 12 PPS, PP. 897-909, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

AN EXPLANATION OF THE THERMAL EXPLOSION IS GIVEN BASED ON EXPERIMENTAL OBSERVATION OF 'JETS' FROM MOLTEN 'HOT MATERIAL' INTO A SURROUNDING 'COLD LIQUID'. FAST LOCAL CHANGES OF THE THERMAL STRESS FIELD DURING SOLIDIFICATION ARE THE CAUSE OF THE 'HOT MATERIAL' FRAGMENTATION. COUPLING OF THE FRAGMENTATION PROCESS WITH VAPOR EXPLOSION PRODUCES THE FULL THERMAL EXPLOSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*EXPLOSION + *FUEL COOLANT INTERACTION

8-109920 DATED 1974
JOHNSON TR + BAKER L + PAVLIK JR
LARGE-SCALE MOLTEN FUEL-SODIUM INTERACTION EXPERIMENTS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 13 PPS, PP. 883-96, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

KILOGRAM-SCALE, MOLTEN-UO2-SODIUM INTERACTIONS WERE PERFORMED IN AN UNRESTRAINED GEOMETRY TO STUDY THE RESULTING ENERGETICS AND FRAGMENTATION. THE MOLTEN UO2 WAS PRODUCED BY THE EXOTHERMIC REACTION BETWEEN URANIUM AND MOO3 POWDERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MOLTEN FUEL + URANIUM DIOXIDE + *FUEL COOLANT INTERACTION

8-109921 DATED 1974
AMBLARD M + COSTA J + FABREGA S
OUT-OF-PILE STUDIES IN FRANCE ON SODIUM FUEL INTERACTION
CENTRE D'ETUDES NUCLEAIRES DE GRENOBLE, FRANCE
CONF-740401-P2 +. 11 PPS, PP. 910-21, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

PRESENTS THE EFFORT BEING MADE AT THE C.E.N.G., ON OUT-OF-PILE STUDIES ON SODIUM-FUEL INTERACTION. DETAILS ARE GIVEN FOR: (1) THE HIGH PERFORMANCE DEVICES DEVELOPED TO MELT UO2 AND USED TO REALIZE INTERACTIONS WITH SODIUM; (2) A PARAMETRIC MODEL OF SODIUM-FUEL INTERACTION; AND (3) LABORATORY EXPERIMENTS AND BASIC STUDIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + ANALYTICAL MODEL + *THERMAL EXPERIMENT + URANIUM DIOXIDE + *FUEL COOLANT INTERACTION

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-109922 ALSO IN CATEGORY 5 DATED 1974
HENRY RE + GABOR JD + WINSCH IO
LARGE SCALE VAPOR PROBLEMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 12 PPS, PP. 922-34, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

LARGE SCALE THERMAL INTERACTION STUDIES HAVE BEEN CARRIED OUT WITH BOTH SIMULANT FLUIDS AND REACTOR MATERIALS TO INVESTIGATE THE VALIDITY OF PROPOSED VAPOR EXPLOSION MODELS AND THE LIKELIHOOD OF SUCH EVENTS IN A LIQUID METAL FAST BREEDER REACTOR. EXPERIMENTAL RESULTS WITH FREON-22 AND WATER SHOW THAT THE INTERFACE TEMPERATURE, HOMOGENEOUS NUCLEATION MODEL ACCURATELY PREDICTS THE NECESSARY TEMPERATURE CONDITIONS FOR THE ONSET OF LARGE SCALE VAPOR EXPLOSIONS. LARGE SCALE THERMAL INTERACTION EXPERIMENTS WITH REACTOR MATERIALS, IN WHICH MOLTEN URANIUM DIOXIDE WAS INJECTED BELOW THE SURFACE OF A SODIUM POOL, DID NOT PRODUCE ANY MEASURABLE THERMALLY EXPLOSIVE EVENTS. THIS RESULT IS ALSO IN AGREEMENT WITH THE INTERFACE TEMPERATURE, HOMOGENEOUS NUCLEATION MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + *THERMAL EXPERIMENT + VAPOR PRESSURE + *FUEL COOLANT INTERACTION

8-109923 ALSO IN CATEGORY 5 DATED 1974
BOARD SJ + HALL RW + BROWN GE
THE ROLE OF SPONTANEOUS NUCLEATION IN THERMAL EXPLOSIONS-FREON/WATER EXPERIMENTS
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
CONF-740401-P2 +. 2 PPS, PP. 935-36, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE CASE OF SODIUM-UO2 EXPLOSIONS, ALTHOUGH STABLE FILM-BOILING IS UNLIKELY, EXPERIMENTS IN WHICH SODIUM IS INJECTED INTO UO2 PRODUCE VIGOROUS EXPLOSIONS. IT IS SUGGESTED THAT A STABILIZING SHELL OF FROZEN UO2 MAY DEVELOP AND THAT THIS COULD DELAY THE INTERACTION IN THE SAME WAY AS A VAPOUR FILM. MOREOVER, IN A PROMPT-CRITICALITY INCIDENT THE FUEL MAY BE ALREADY SURROUNDED BY COOLANT BEFORE THE EXCURSION SO THAT A DELAY IS NOT NECESSARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + URANIUM DIOXIDE + *FUEL COOLANT INTERACTION

8-109924 ALSO IN CATEGORY 5 DATED 1974
CALDAROLA L + KASTENBERG WE
ON THE MECHANISM OF FRAGMENTATION DURING MOLTEN FUEL/COOLANT THERMAL INTERACTIONS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 17 PPS, PP. 937-54, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A MATHEMATICAL MODEL FOR THE FRAGMENTATION OF UO2 DURING THE MOLTEN UO2/SODIUM THERMAL INTERACTION IS PRESENTED. THE MODEL IS BASED UPON RESULTS OF SIMULATION EXPERIMENTS WITH METAL/WATER INTERACTIONS IN WHICH BUBBLE VAPOR GROWTH AND COLLAPSE IS OBSERVED. PRELIMINARY NUMERICAL CALCULATIONS WITH THE MODEL YIELD QUALITATIVE AGREEMENT WITH MOLTEN STAINLESS STEEL/SODIUM EXPERIMENTS AND HAVE A SIMILARITY TO THE RECENTLY PUBLISHED PRESSURE/TEMPERATURE, UNSTABLE FILM BOILING CURVE OF FAKAHAT. AREAS OF NEEDED IMPROVEMENTS IN THE MODEL ARE ALSO PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANALYTICAL MODEL + URANIUM DIOXIDE + BOILING + *FUEL COOLANT INTERACTION

8-109925 ALSO IN CATEGORY 5 DATED 1974
ERDMAN CA + GARNER PL + HAAS PM
IMPROVEMENTS IN MODELING FUEL-COOLANT INTERACTIONS AND INTERPRETATION OF THE S-11 TREAT TEST
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE
CONF-740401-P2 +. 13 PPS, PP. 955-68, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THREE CONSTRAINT MODELS USED IN FUEL-COOLANT INTERACTION (FCI) CALCULATIONS AT THE UNIVERSITY OF VIRGINIA ARE COMPARED, INCLUDING A NEW TWO-DIMENSIONAL CONSTRAINT. THE NEW CONSTRAINT MODEL PROVIDES AN ESTIMATE OF ENERGY PARTITIONING NOT AVAILABLE FROM THE TWO OTHER CONSTRAINTS. A SIMPLE MODEL FOR REPRESENTING HEAT LOSSES FROM THE FCI ZONE IS DESCRIBED. VALIDITY OF THE MODEL FOR FCI CALCULATIONS IS DEMONSTRATED BY COMPARISON WITH A MORE COMPLEX MODEL. THE EFFECT OF ZONE HEAT LOSSES ON FCI CALCULATIONS IS SHOWN FOR THREE DIFFERENT SETS OF INITIAL FCI ZONE CONDITIONS. ADDITIONAL ANALYSIS OF THE S-11 TREAT TEST IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *ANALYTICAL MODEL + *COMPARISON + *FUEL COOLANT INTERACTION

8-109926 ALSO IN CATEGORY 5 DATED 1974
FAUSKE HK
SOME ASPECTS OF LIQUID-LIQUID HEAT TRANSFER AND EXPLOSIVE BOILING

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-109926 *CONTINUED*
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 16 PPS, PP. 992-1008, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

MOLTEN STEEL- AND FUEL-COOLANT INTERACTIONS BECOME OF INTEREST IF, DURING THE COURSE OF A POSTULATED ACCIDENT FUEL, CLADDING, OR STRUCTURAL MATERIALS BECOME MOLTEN AND CAN CONTACT SODIUM. THE POTENTIAL FOR EXPLOSIVE INTERACTIONS (VAPOR EXPLOSIONS) BETWEEN THESE MATERIALS HAS BEEN OF PRIMARY CONCERN FOR SOME TIME. THIS CONCERN IS SIMPLIFIED BY THE FACT THAT IT HAS BEEN KNOWN FOR YEARS THAT VIOLENT INTERACTIONS CAN OCCUR WHEN HOT LIQUIDS COME INTO CONTACT WITH COLD LIQUIDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EXPLOSION + *HEAT TRANSFER + LIQUID + BOILING + *FUEL COOLANT INTERACTION

8-109927 ALSO IN CATEGORY 5 DATED 1974
CALDAROLA L + KOUTSOUVELIS G
A THEORETICAL MODEL WITH VARIABLE MASSES FOR MOLTEN FUEL-SODIUM THERMAL INTERACTIONS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 22 PPS, PP. 969-91, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE MODEL PROPOSED IN THIS PAPER, THE REACTION HAS BEEN ASSUMED TO OCCUR IN TWO SUCCESSIVE PHASES. PHASE A - A GIVEN NUMBER (FUNCTION OF TIME) OF FUEL PARTICLES COMES IN INTIMATE CONTACT WITH A GIVEN MASS OF LIQUID SODIUM (FUNCTION OF TIME). THE HEAT TRANSFER PROCESS IS CHARACTERIZED BY VERY GOOD THERMAL CONTACT BETWEEN THE FUEL AND THE COOLANT, AND BY A LARGE CONTACT AREA DUE TO THE SMALL SIZE OF THE PARTICLES AND THE HEAT TRANSFER COEFFICIENT DECREASES WITH TIME. PHASE B - THE HEAT TRANSFER PROCESS IS CHARACTERIZED BY A VERY LARGE CONTACT AREA, AND BY A THERMAL CONTACT BETWEEN THE FUEL AND THE COOLANT WHICH BECOMES INCREASINGLY WORSE WITH TIME, DUE TO THE FORMATION OF A SODIUM VAPOUR LAYER AT THE EXTERNAL SURFACE OF THE FUEL FRAGMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANALYTICAL MODEL + THEORETICAL INVESTIGATION + *FUEL COOLANT INTERACTION

8-109936 ALSO IN CATEGORIES 5 AND 18 DATED 1974
HENRY RE + SINGER RM + LAMBERT GA
SODIUM EXPULSION TESTS FOR THE SEVEN-PIN GEOMETRY
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 13 PPS, PP. 1188-1201, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

SODIUM EXPULSION DATA ARE REPORTED FOR SINGLE- AND SEVEN-PIN GEOMETRIES WITH LMFBR HEAT FLUX CONDITIONS FOLLOWING PUMP COASTDOWN FLOW TRANSIENTS. ANALYSIS OF THE DATA SHOWS THAT IN BOTH CASES BOILING INCEPTION OCCURRED AT THE END OF THE HEATED ZONE WITH A SMALL SUPERHEAT. NET POSITIVE FLOW WAS OBSERVED DURING THE EARLY VOIDING STAGE AND THE GENERAL FLOW PATTERN APPEARS TO BE ANNULAR

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

*FLOW THEORY AND EXPERIMENTS + VOID FRACTION + BOILING + VOID

8-109958 ALSO IN CATEGORIES 6 AND 11 AND 18 DATED 1974
WIDER HU + JACKSON JF + SMITH LL
AN IMPROVED ANALYSIS OF FUEL MOTION DURING AN OVERPOWER EXCURSION
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 14 PPS, PP. 1541-55, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DURING AN OVERPOWER EXCURSION IN A LMFBR, IRRADIATED FUEL PINS ARE EXPECTED TO RUPTURE AND EJECT MOLTEN FUEL AND FISSION GAS INTO THE COOLANT CHANNELS. THE EJECTED FUEL IS SUBSEQUENTLY DISPLACED BY THE INITIAL SODIUM MOMENTUM, BY PRESSURES RESULTING FROM FUEL-COOLANT THERMAL INTERACTIONS, AND BY FISSION GAS RELEASED THROUGH THE CLAD RUPTURE. THIS FUEL AND SODIUM MOTION IN THE CORE REGION AFFECTS THE REACTIVITY OF THE REACTOR AND DETERMINES THE ULTIMATE COURSE OF THE NEUTRONICS TRANSIENT. IN THIS PAPER THE RESULTS OF PLUTO, A NEW MODEL FOR PREDICTING THIS FUEL AND SODIUM MOTION, ARE COMPARED WITH SAS/FCI, A CURRENT FUEL-COOLANT INTERACTION MODEL USED IN WHOLE-CORE ACCIDENT ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + *COMPARISON + *FUEL COOLANT INTERACTION + FUEL ELEMENTS

8-110017 ALSO IN CATEGORIES 7 AND 18 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT, NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS: JULY - SEPTEMBER 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13161 +. 21 PPS, 2 TABS, 9 FIGS, NOV. 15, 1975

CATEGORY 8
SOURCES OF ENERGY RELEASE UNDER ACCIDENT CONDITIONS

8-110017 *CONTINUED*
THE BURNING CHARACTERISTICS OF A SINGLE DROP OF SODIUM WERE DETERMINED UNDER VARIOUS TEST CONDITIONS IN THE LABORATORY DROP MODELING TEST APPARATUS (LDM). FROM THESE TESTS, IT WAS OBSERVED THAT THE BURNING RATE WAS RELATIVELY CONSISTENT FOR BOTH HIGH AND LOW HUMIDITY 21 VOL % O2 TESTS (0.008 GM/SEC) WITH A SLIGHT DEPENDENCY OF COMBUSTION PRODUCT RELEASE FRACTION AS A FUNCTION OF HUMIDITY (88.5% AT HUMIDITIES > 10,000 PPM, AND 76.1% AT HUMIDITIES < 1,000 PPM). AS THE AIR RECIRCULATION AROUND THE STATIONARY DROP WAS CHANGED FROM NATURAL TO FORCED, IT WAS OBSERVED THAT THE BURNING RATE INCREASED BY A FACTOR OF 40. THREE DROP BURNING TESTS CONDUCTED IN < 1,000 PPM HUMIDITY AIR ATMOSPHERE EXHIBITED LOW BURNING RATES WHICH WERE ATTRIBUTED TO INERT GAS BUILDUP WITHIN THE LDM COLUMN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FIRE + FISSION PRODUCT RELEASE + *R AND D PROGRAM

8-110051 ALSO IN CATEGORIES 1 AND 11 AND 12 DATED 1976
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 279 PGS, AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REVISES THE PRELIMINARY SAR BY SUBMITTING NEW APPENDICES 17D, AND LEAD REACTOR MANUFACTURER QA PROGRAM. INCLUDES THE REVISIONS TO THE QA SECTION. RESPONSES TO NRC QUESTIONS CONCERN ECCS, TRANSIENTS DURING SODIUM FIRES, CONTAINMENT LEAK RATE DURING ACCIDENT, SECURITY, AND TRAINING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + *NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT + FIRE + *REPORT, PSAR + QUALITY ASSURANCE + SYSTEM OPERABILITY IN ACCIDENT + LEAK RATE + EMERGENCY COOLING SYSTEM + TRANSIENT + *CLINCH RIVER (LMFBR)

8-110055 ALSO IN CATEGORIES 5 AND 11 AND 18 DATED 1976
RESPONSE TO QUESTION 001.179 - PASSIVE POST ACCIDENT HEAT REJECTION BY CONTAINMENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, 1 REF, PP. Q001.179-1 THRU Q001.179-2 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SOFIRE-II COMPUTER CODE IS USED TO DETERMINE THE RATE OF SODIUM COMBUSTION AND HEAT INPUT TO CONTAINMENT AND THE RESULTANT TEMPERATURE AND PRESSURE HISTORIES OF THE CONTAINMENT. THE PREDOMINANT MECHANISM FOR HEAT REJECTION FROM THE CONTAINMENT ATMOSPHERE IS NATURAL CONVECTION HEAT TRANSFER TO THE CONTAINMENT VESSEL STEEL SHELL. HEAT THEN CONDUCTS THROUGH THE STEEL SHELL AND INSULATION ON THE OUTER SURFACE OF THE STEEL SHELL TO THE ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT + FIRE + *HEAT TRANSFER + HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

8-110058 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.221 - USE OF SOFIRE-II IN LIEU OF SPRAY-I
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.221-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANALYSIS PRESENTED IN SECTION 15.6.1.2.2 CONSIDERS THE MAXIMUM SPILLAGE OF SODIUM FROM THE EVST AND REQUIRES A SIMULTANEOUS MAJOR PIPING FAILURE PLUS FAILURE OF THE AUTOMATIC ISOLATION VALVE. THIS EXTREMELY UNLIKELY EVENT WAS POSTULATED TO DEMONSTRATE THAT, EVEN FOR MAXIMUM SODIUM SPILLAGE FOR THE EVST, CONTINUED EVST COOLING WOULD BE MAINTAINED. THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF SUCH AN EVENT ARE CONTROLLED BY THE EXTENT OF RADIOACTIVE SODIUM AEROSOL FORMATION. THE AEROSOL FORMATION IS CONTROLLED BY THE LIMITED AMOUNT OF OXYGEN AVAILABLE IN THE INERTED (2% O2) EVST COOLING EQUIPMENT CELL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FIRE + RESPONSE TO NRC QUESTION + COMPARISON + CLINCH RIVER (LMFBR)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-093218 DATED 1974
FLANAGAN GF + ENGLE WW + WILLIAMS LR
ANALYSIS OF STORED FUEL, CONTROL ROD AND INHERENT SOURCE EFFECTS ON THE CRBR EX-VESSEL SOURCE RANGE MONITORING SYSTEM
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-740903-9 +. 6 PAGES, PRESENTED AT THE MEETING ON ADVANCED REACTORS, PHYSICS, DESIGN & ECONOMICS, HELD IN ATLANTA, GA., SEPT. 8, 1974

IN ORDER TO DETERMINE THE FEASIBILITY OF AN EX-VESSEL LOW-LEVEL FLUX MONITOR FOR USE IN THE CLINCH RIVER BREEDER REACTOR, SEVERAL POSSIBLE PROBLEM AREAS NEEDED TO BE ANALYZED. AMONG THESE WERE THE EFFECT OF STORED FUEL ON THE DETECTOR, AND THE EFFECT OF CONTROL ROD MOVEMENTS AND SOURCE CHANGES DURING REFUELING. THIS PAPER DESCRIBES THE TECHNIQUES USED AND THE RESULTS OF SUCH AN ANALYSIS WHICH WAS PERFORMED AT ORNL IN COOPERATION WITH THE AEC AND WARD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INSTRUMENT, NUCLEAR + TEST, INSTRUMENT RESPONSE + INSTRUMENT, ABNORMAL INDICATION + INSTRUMENT, STARTUP RANGE + RADIATION EFFECT + PERFORMANCE + CLINCH RIVER (LMFBR)

9-093227 DATED 1971
SPROLL F
MEASURING DEVICE FOR THE CONTROL OF THE COOLANT FLOWS IN NUCLEAR REACTOR FUEL ELEMENTS
GERMAN PATENT 1,951,918 +. MAY 6, 1971

A MEASURING DEVICE FOR THE CONTROL OF COOLANT FLOW IN SODIUM-COOLED FAST BREEDER REACTOR FUEL ELEMENTS IS DESCRIBED. THE DEVICE IS CHARACTERIZED BY THE FACT THAT THE ACCESS JUNCTIONS APPEARS AT THE LOWER END OF THE FUEL ELEMENTS FIXED TO THE CORE PLATE. IT CONTAINS A DEVICE FOR THE PRODUCTION AND ELIMINATION OF PRESSURE DIFFERENTIALS PROPORTIONAL TO THE FLOW, AND FROM THE FACT THAT THE MEASURING TUBINGS LEAD OUTSIDE THE REACTOR VESSEL.

AVAILABILITY - PHOTOCOPY - U.S. PAGENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

INSTRUMENT, CONTROL + INSTRUMENT, FLOW + FLOW

9-093613 ALSO IN CATEGORY 11 DATED 1974
QUARTERLY TECHNICAL PROGRESS REPORT FUELS, MATERIALS, AND CONTROL ROD DEVELOPMENT PROGRAMS, JULY-SEPTEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13137 +. 29 PAGES, 10 TABLES, 3 FIGURES, NOVEMBER 15, 1974

REPORTS ON THE FOLLOWING TOPICS: (1) IRRADIATION DAMAGE IN CLADDING AND CORE STRUCTURAL MATERIALS; (2) HELIUM GENERATION IN REACTOR MATERIALS; AND (3) ABSORBER STUDIES, HEATING EXPERIMENTS, AND DESIGN STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + RADIATION DAMAGE + STEEL, STAINLESS + R AND D PROGRAM + RADIATION EFFECT + EQUIPMENT DEVELOPMENT + FUEL, NUCLEAR + CONTROL RODS

9-099127 DATED 1973
BENTLEY PG + FIRTH D
SOME BACKGROUND STUDIES OF ACOUSTIC VIBRATION IN FAST REACTORS
UKAEA REACTOR GROUP, RISLEY
TRG-REPORT-2404 +. 19 PAGES, 6 FIGURES, 10 REFERENCES, MARCH 1973

CURRENT BRITISH DESIGNS FOR SODIUM COOLED FAST REACTORS HAVE THE NUCLEAR CORE, HEAT EXCHANGERS AND PUMP IMMERSED IN A POOL OF LIQUID SODIUM WHICH ALLOWS STRONG VIBRATION INTERACTION BETWEEN THE VARIOUS COMPONENTS AND THE ACOUSTIC EXCITATION PROVIDED BY THE PUMP. THIS PAPER CONSIDERS BROADLY THE EXCITATION OF VARIOUS COMPONENTS, PARTICULARLY THE POOL CONTAINMENT TANK AND THE IMMERSED PRIMARY COOLANT DUCTS BY THE PREDOMINANTLY SINUSOIDAL ACOUSTIC PRESSURE EXCITATION. BACKGROUND THEORETICAL AND LABORATORY INVESTIGATIONS ARE IN AGREEMENT FOR THE RESONANT FREQUENCIES OF SIMPLE LIQUID SYSTEMS, BOTH THOSE WHICH ARE PREDOMINANTLY ACOUSTIC AND THOSE WHICH ARE PREDOMINANTLY STRUCTURAL. AMPLITUDES OF VIBRATION ARE MOST DIFFICULT TO CALCULATE AND MAY BE UNDERESTIMATED BY A FACTOR OF UP TO 100 IF SIMPLE CLASSICAL LIQUID/STRUCTURE RELATIONSHIPS ARE USED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

UNITED KINGDOM + VIBRATION + COMPONENTS + ACOUSTICS + PUMPS + HEAT EXCHANGERS

9-099496 DATED 1900
INSTRUMENTATION DEVELOPMENT ELEVENTH QUARTERLY REPORT, JULY-SEPTEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-13825-11 +. 12 PAGES, 4 TABLES, 4 FIGURES, OCTOBER 1974

THIS IS THE ELEVENTH IN A SERIES OF REPORTS COVERING THE DEVELOPMENT OF INSTRUMENTATION FOR SURVEILLANCE OF THE CORE AND IN-VESSEL COMPONENTS OF LIQUID METAL FAST BREEDER REACTORS. CURRENT DEVELOPMENT EFFORTS ARE FOCUSED ON HIGH TEMPERATURE NEUTRON DETECTORS AND ADVANCED SIGNAL

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-099456 *CONTINUED*
TRANSMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, IN CORE + INSTRUMENT, SURVEILLANCE + MONITOR + NEUTRON + R AND D PROGRAM + ELECTRICAL CONDUCTION + EQUIPMENT DEVELOPMENT

9-099497 DATED 1900
INSTRUMENTATION DEVELOPMENT TENTH QUARTERLY REPORT, APRIL-JUNE 1974
GENERAL ELECTRIC COMPANY
GEAP-13825-10 +. 30 PAGES, 12 FIGURES, 6 REFERENCES, JULY 1974

THIS IS THE TENTH IN A SERIES OF REPORTS COVERING THE DEVELOPMENT OF INSTRUMENTATION FOR SURVEILLANCE OF THE CORE AND IN-VESSEL COMPONENTS OF LIQUID METAL FAST BREEDER REACTORS. CURRENT DEVELOPMENT EFFORTS ARE FOCUSED ON HIGH TEMPERATURE NEUTRON DETECTORS AND REACTIVITY MONITORING SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, IN CORE + INSTRUMENT, SURVEILLANCE + MONITOR + NEUTRON + INSTRUMENT, OPERATING REACTIVITY + R AND D PROGRAM + EQUIPMENT DEVELOPMENT

9-099499 DATED 1974
ALTERNATE SHUTDOWN SYSTEM - TENTH QUARTERLY REPORT, APRIL-JUNE 1974
GENERAL ELECTRIC COMPANY
GEAP-13824-10 +. 14 PAGES, 7 FIGURES, JULY 1974

THE ALTERNATE SHUTDOWN SYSTEM (ALSS) DESIGN CONTINUED. ATTENTION WAS FOCUSED UPON VARIOUS DETAILS WITHIN THE DRIVE MECHANISM IN PREPARATION FOR DETAIL DESIGN. THE DESIGN WAS UPDATED TO COMPLY WITH THE LATEST CLINCH RIVER BREEDER REACTOR PLANT CONFIGURATION. CHECK-OUT AND CALIBRATION OF THE PHASE II DAMPER TEST RIG WERE CARRIED OUT AND FABRICATION OF THE LATCH TEST RIG WAS CONTINUED. ANALYSIS EFFORTS WERE CONCENTRATED UPON FURTHER SCRAM DYNAMICS PREDICTIONS FOR ADDITIONAL TRANSIENT CONDITIONS AND UPON REFINEMENTS IN THE STRUCTURAL ANALYSIS OF THE DRIVELINE AND CONTROL ASSEMBLY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + TESTING + REACTOR CONTROL + SHUTDOWN SYSTEM, SECONDARY + DAMPING + ENGINEERED SAFETY FEATURE + SYSTEM ANALYSIS + CALIBRATION + CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

9-099642 ALSO IN CATEGORY 11 DATED 1974
WEBER SA + NOURDHOFF BH
HEDL QUARTERLY TECHNICAL REPORT JULY, AUGUST, SEPTEMBER 1974. VOLUME 4 - ENGINEERING AND DEVELOPMENT
HANFORD ENGINEERING DEVELOPMENT LABORATORY, RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL.4) +. 94 PAGES, 16 FIGURES, OCTOBER 1974

DISCUSSES PROGRESS ON THE FOLLOWING: SODIUM/NAK - MOBILTHERM REACTION TESTS, CLIRA MELTDOWN CUP INTEGRITY TEST, CLOSED LOOP EX-VESSEL MACHINE, SMALL SODIUM VALVE TESTING, MECHANICAL EQUIPMENT PROGRAMS, INLET PLENUM FEATURE MODEL TEST FOR THE CLINCH RIVER BREEDER REACTOR, INSTRUMENT TREE CHARACTERISTIC VIBRATION TEST, HYDRAULIC CORE MOCKUP SHAKER TEST, HYDRAULIC CORE MOCKUP - FLOW-INDUCED VIBRATION TESTS, NON-DESTRUCTIVE TEST (NDT) ENGINEERING, CONTROL AND DATA SYSTEMS, REACTOR INSTRUMENT DEVELOPMENT, AND FFTF DESIGN DATA.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTROL SYSTEM + DESIGN CRITERIA + TESTING + FFTF (TR) + DESIGN STUDY + INSTRUMENT, LIQUID LEVEL + RADIOGRAPHY + IN CORE MEASUREMENT + HANFORD SITE + CORE COMPONENTS + ORIFICE + R AND D PROGRAM + CABLES AND CONNECTIONS + EQUIPMENT DEVELOPMENT + INSTRUMENTS, MISC.

9-099946 DATED 1974
EATON TE + TODREAS NE
INSTRUMENTATION METHODS FOR INTERCHANNEL COOLANT MIXING STUDIES IN WIRE-WRAP SPACED NUCLEAR FUEL ASSEMBLIES
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-9-TR +. 558 PAGES, 19 TABLES, 10 FIGURES, JUNE 1974

A WIRE-WRAP SPACED, RHOMBUS SHAPED, 25-PIN EXPERIMENTAL ROD ARRAY WAS CONSTRUCTED WITH PARAMETERS TYPICAL OF LMFBR'S: D=0.25 IN., P/D=1.25, LEAD=12 IN. INSTRUMENTATION DESIGN FOR COOLANT MIXING EXPERIMENTS WAS DISCUSSED IN DETAIL. SALT (NACL) SOLUTION TRACERS OFFERED INHERENT ADVANTAGES IN INJECTION SOLUTION CONCENTRATION ON RESULTS. TRANSVERSE INJECTION CAUSED MORE FLOW PERTURBATION THAN A HYPODERMIC TUBE MOUNTED AT 20 DEG. FROM THE TUBE CENTERLINE. INJECTION VELOCITY INFLUENCED THE FLOW PERTURBATIONS; FOR THIS WORK, INJECTION AT THE AVERAGE SUBCHANNEL VELOCITY WAS USED WITH WATER FOR THE FLOW MEDIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-099946 *CONTINUED*
INSTRUMENT, FLOW

9-100130 ALSO IN CATEGORY 17 DATED 1974
MACRAE W
THE PROTOTYPE FAST REACTOR AT DOUNREAY
THE NUCLEAR POWER GROUP LTD., UK
4 PAGES, 7 FIGURES, ELECTRONICS & POWER, 20(14), PP. 581-584 (AUGUST 1974)

PRESENTS A DESCRIPTION OF THE PROTOTYPE FAST REACTOR INCLUDING THE PRIMARY CIRCUIT, SECONDARY CIRCUITS AND STEAM GENERATORS, AND THE FUEL AND FUEL HANDLING. THE FINAL TESTING OF THE REACTOR AND AUXILIARY PLANT IS CURRENTLY IN PROGRESS AND POWER OPERATION WILL COMMENCE THIS YEAR.

FUEL HANDLING + REACTOR DESCRIPTION + UNITED KINGDOM + DOUNREAY (LMFBR) + MAIN COOLING SYSTEM + STEAM GENERATOR

9-100404 DATED 1974
WRIGHT SA + ALBRECHT RW + EDELMANN MF
CROSS CORRELATION OF NEUTRONIC AND ACOUSTIC NOISE SIGNALS FROM LOCAL BOILING
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2069 +. 36 PAGES, 11 FIGURES, 9 REFERENCES, OCTOBER 1974

A BOILING SIMULATOR WAS CONSTRUCTED TO MODEL THE VOID AND PRESSURE EFFECTS OF LOCAL BOILING IN AN LMFBR. THE BOILING SIMULATOR WAS PLACED IN THE CORE OF A ZERO POWER REACTOR (GFK, ARK); AND THE NEUTRON AND PRESSURE SIGNALS WERE RECORDED AND CROSS CORRELATED. THE NEUTRON-PRESSURE CROSS CORRELATION EXHIBITED AN ALMOST PERFECT CORRELATION AT THE BUBBLE REPETITION FREQUENCY (7 HZ). THE NEUTRON-PRESSURE CROSS CORRELATION TECHNIQUE IS CONSIDERED A SERIOUS ALTERNATIVE FOR THE DETECTION OF LOCAL BOILING IN SODIUM COOLED REACTORS.

NOISE + COMPARISON, THEORY AND EXPERIENCE + NOISE ANALYSIS + CORRELATION + SIMULATION + BOILING + ACOUSTICS + VOID

9-101334 DATED 1974
MUHLESTEIN LD + PHILIPP LD + CANNEN CP
LONG-TERM TEST OF SILICA-INSULATED CABLE UNDER FFTF EX-VESSEL TEMPERATURE AND VOLTAGE CONDITIONS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-62 +. 36 PAGES, 13 TABLES, 5 FIGURES, OCTOBER 15, 1974

A METAL-SHEATHED, SILICA-INSULATED INSTRUMENT CABLE WAS LONG-TERM TESTED WITH BOTH POSITIVE AND NEGATIVE HIGH VOLTAGE. PERIODIC MEASUREMENTS OF RESISTANCE, CAPACITANCE, CHARACTERISTIC IMPEDANCE, AND BREAKDOWN PULSE NOISE WERE RECORDED. BASED ON THE TEST RESULTS, THIS TYPE OF CABLE, WITH MINOR MODIFICATION, WILL BE ACCEPTABLE FOR THE FFTF EX-VESSEL NEUTRON FLUX MONITORING SYSTEM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FLUX DISTRIBUTION + TESTING + SILICON + FFTF (TR) + MONITOR + NEUTRON + INSULATION + CABLES AND CONNECTORS

9-102254 DATED 1974
ALTERNATE SHUTDOWN SYSTEM ELEVENTH QUARTERLY REPORT, JULY-SEPTEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-13824-11 +. 20 PAGES, 8 FIGURES, 3 REFERENCES, OCT. 1974

THE DESIGN OF THE ALTERNATE SHUTDOWN SYSTEM (ALSS) CONTINUED. PERTINENT SECTIONS OF THE PRELIMINARY SAFETY ANALYSIS REPORT (PSAR) WERE PREPARED AND SUBMITTED TO WESTINGHOUSE. DRIVE MECHANISM AND DRIVELINE DESIGN EFFORTS WERE FOCUSED UPON REFINEMENTS IN PREPARATION FOR INITIATING DETAIL DRAWINGS. THE CONTROL ASSEMBLY DESIGN FOCUSED UPON THE EFFECT OF AN INCREASED B(EXP 10) LOADING AND THE EFFECT OF A STANDARD VERSUS A MODIFIED INLET MODULE. COMPONENT DEVELOPMENT TESTING CONTINUED AND PREPARATIONS WERE MADE FOR BEGINNING NEW TESTING. THE CRITICAL COMPONENT DEVELOPMENT PROGRAM (CCDP) WAS INITIATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

SHUTDOWN SYSTEM, SECONDARY + R AND D PROGRAM + EQUIPMENT DEVELOPMENT + CONTROL ROD DRIVES

9-102674 ALSO IN CATEGORIES 11 AND 17 DATED 1974
CAMBILLARD E + LACROIX A + VIALA J
PHENIX STEAM GENERATORS: MEASURING HYDROGEN CONCENTRATION OF SODIUM FOR TIGHTNESS INSPECTION OF WATER-STEAM TUBES
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE
ERDA-TR-6 + CONF-741085-3 +. 21 PAGES, PRESENTED AT SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

DISCUSSES THE SYSTEM FOR MEASURING HYDROGEN CONCENTRATION IN SODIUM TO DETECT POSSIBLE LEAKS IN STEAM GENERATORS. HYDROGEN DIFFUSION THROUGH THE TUBE WALLS HAS ALSO BEEN MEASURED AND DETERMINED TO BE 505 MG/HR.

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-102674 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + *HYDROGEN + *MEASUREMENT + STEAM GENERATOR + TUBING + TEST, LEAK

9-102759 ALSO IN CATEGORY 18 DATED 1974
MCCOWN JJ + BALLIF JL
REVIEW OF METHODS FOR MEASURING STAINLESS STEEL INTERSTITIAL ELEMENTS IN SODIUM-APPLICATION TO LMFBR'S
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-649 + CONF-740301-4 +. 30 PAGES, PRESENTED AT NACE MEETING-CORROSION/74, HELD IN CHICAGO, ILLINOIS, MARCH 4, 1974

THE TRACE IMPURITIES PRESENT IN SODIUM ARE OXYGEN, HYDROGEN, CARBON AND NITROGEN. THESE ELEMENETS AFFECT CORROSION AND MASS TRANSFER, INFLUENCE MECHANICAL PROPERTIES AND CONTRIBUTE TO SYSTEM PLUGGING PHENOMENA. NEW ANALYTICAL METHODS AND SAMPLING AND MONITURING HARDWARE DEVELOPED FOR DETERMINING STAINLESS STEEL INTERSTITIALS AT TRACE LEVELS IN SODIUM HAVE BEEN TESTED AT HEDL SINCE MARCH, 1972 IN THE PROTOTYPE APPLICATIONS LOOP (PAL). THE PURPOSE OF THIS PAPER IS TO DESCRIBE THE CURRENT STATUS OF ON-LINE MONITORS FOR MEASURING OXYGEN, HYDROGEN AND CARBON IN SODIUM AND TO PRESENT ANALYSIS DATA OBTAINED USING METAL EQUILIBRATION METHODS FOR MEASURING SPECIFIC CHEMICAL ACTIVITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + HYDROGEN + OXYGEN + *MONITOR, SAMPLING + NITROGEN + *STEEL, STAINLESS + *IMPURITY

9-102923 ALSO IN CATEGORY 11 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT FUELS, MATERIALS, AND CONTROL ROD DEVELOPMENT PROGRAMS OCT.-DEC. 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13142 +. 31 PAGES, 8 TABLES, 10 FIGURES, FEB. 15, 1975

REPORTS ON PROGRESS IN AEC TASKS ON IRRADIATION EFFECTS. (1) TASK 2A - IRRADIATION DAMAGE IN CLADDING AND CORE STRUCTURAL MATERIALS. (2) TASK 2B - HELIUM GENERATION IN REACTOR MATERIALS. (3) TASK 5 - ABSORBER STUDIES, HEATING EQUIPMENTS, AND DESIGN STUDIES - ALTERNATE CONTROL ASSEMBLIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

MATERIAL + IRRADIATION TESTING + *EQUIPMENT DEVELOPMENT + FUEL, NUCLEAR + CONTROL RODS

9-103518 DATED 1974
MATHIS MV + DE LORENZO JT + CHILES MM
NUCLEAR DETECTION INSTRUMENTATION FOR RSP MEASUREMENTS WITH THE FFTF ENGINEERING MOCKUP CORE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-741212-3 +. 20 PAGES, FROM 14TH SCINTILLATION & SEMICONDUCTOR SYMPOSIUM; WASHINGTON, D.C., DEC. 11, 1974

FOUR MULTICHANNEL DETECTION SYSTEMS OPERATING IN INTEGRATED CURRENT AND PULSE MODES WITHIN THE MOCKUP OF THE FAST FLUX TEST FACILITY (FFTF) REACTOR SUCCESSFULLY FURNISHED SIGNALS DURING A FIVE-MONTH REACTIVITY SURVEILLANCE PROCEDURES EXPERIMENT FOR EVALUATION OF REACTIVITY MEASUREMENT AND METHODS AND ASSOCIATED INSTRUMENTATION FOR LIQUID METAL FAST BREEDER REACTOR (LMFBR) APPLICATIONS AND SPECIFICALLY THE LOW LEVEL FLUX MONITOR DESIGNS FOR THE FFTF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INSTRUMENT, NUCLEAR + FFTF (TR) + MEASUREMENT, REACTIVITY + *INSTRUMENT, OPERATING REACTIVITY + INSTRUMENT, CURRENT + INSTRUMENT, PULSE

9-103936 DATED 1975
WHITE RG + SIMMONS MD
FFTF PROTOTYPE INSTRUMENT TREE SHAKER TESTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-6 +. 77 PAGES, 16 FIGURES, 1975

NATURAL FREQUENCIES, MODE SHAPES AND DAMPING VALUES WERE EXPERIMENTALLY DETERMINED ON AN FFTF PROTOTYPE INSTRUMENT TREE. INSTRUMENTATION GUIDE TUBES WERE SUBJECTED TO ADDITIONAL TESTING TO VERIFY CHARACTERISTIC RESPONSE FREQUENCIES. TESTING WAS PERFORMED AT AMBIENT TEMPERATURE IN THE HEDL CORE MECHANICAL MOCKUP IN THE HIGH TEMPERATURE SODIUM FACILITY. DATA ANALYSIS HAS ESTABLISHED THE POTENTIAL FEASIBILITY FOR MAIN-STRUCTURE MONITURING; HOWEVER, THE SUB-STRUCTURE MONITORING RESULTS WERE POOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*HYDRAULIC EFFECT + *TESTING + FFTF (TR) + MONITOR + VIBRATION + RESPONSE SPECTRUM + R AND D PROGRAM + INSTRUMENTS, MISC.

9-103966 ALSO IN CATEGORY 18 DATED 1975

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-103966 *CONTINUED*
A COMPILATION OF BORON CARBIDE DESIGN SUPPORT DATA FOR LMFBR CONTROL ELEMENTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-19 +. 55 PAGES, 19 FIGURES, 45 REFERENCES, 1975

DATA AND DESIGN CORRELATIONS ARE PRESENTED FOR BORON CARBIDE STRUCTURAL, MECHANICAL, AND PHYSICAL PROPERTIES, COMPATIBILITY WITH STAINLESS STEEL AND SODIUM, AND IRRADIATION BEHAVIOR PERTAINING TO HELIUM RELEASE, SWELLING, AND TRITIUM PRODUCTION AND RETENTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + CARBIDE + *CONTROL ROD BURNUP + FISSION PRODUCT RELEASE + TRITIUM + HELIUM + RADIATION EFFECT + SWELLING + CONTROL RODS

9-103982 DATED 1974
EDELMANN M
SOME CONSIDERATIONS ON NEUTRON INSTRUMENTATION REQUIREMENTS FOR MALFUNCTION DIAGNOSIS IN POWER REACTORS USING NOISE ANALYSIS TECHNIQUES
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE, GERMANY
EURFNR-1251 + KFK-2088 +. 26 PAGES, 9 FIGURES, 12 REFERENCES, SEPT. 1974

TO DETERMINE THE RESPONSE OF A NEUTRON DETECTOR TO LOCAL PERTURBATIONS IN A TYPICAL FAST BREEDER REACTOR DETAILED NUMERICAL CALCULATIONS OF SPACE-DEPENDENT SOURCE TRANSFER FUNCTIONS WERE PERFORMED FOR THE GERMAN PROTOTYPE REACTOR SNR 300. THE 26 GROUPS KFK-INR CROSS SECTION SET AND ONE-DIMENSIONAL CYLINDER GEOMETRY WERE USED FOR THE NUMERICAL SOLUTION OF THE DIFFUSION EQUATION IN THE FREQUENCY DOMAIN. IT WAS FOUND THAT IN THE PRESENT CLASS OF FAST BREEDER PROTOTYPE REACTORS NO IN-CORE NEUTRON DETECTORS WILL BE NEEDED FOR A CONTINUOUS INSPECTION USING NOISE ANALYSIS TECHNIQUES TO DETECT LOCAL PERTURBATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INSTRUMENT, IN CORE + REACTOR KINETICS + ANALYTICAL TECHNIQUE + NOISE ANALYSIS + GERMANY + PERTUREATION METHOD

9-104136 DATED 1975
WHEELOCK CW
REACTOR REACTIVITY CONTROL BY COOLANT PASSAGE COATING
U.S. PATENT 3,860,482 +. JANUARY 14, 1975

THIS PATENT RELATES TO A METHOD OF SUPPLEMENTARY CONTROL OF A LIQUID-COOLED NUCLEAR REACTOR COMPRISING PROVIDING A SOLUTION CONTAINING A NEUTRON-ABSORBING MATERIAL, INJECTING THE SOLUTION INTO THE COOLANT, AND DEPOSITING THE NEUTRON-ABSORBING MATERIAL ON THE INTERIOR SURFACE OF THE WALLS OF THE COOLANT CHANNELS.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

CONTROL SYSTEM + *REACTOR CONTROL + UNITED STATES + PATENT + INSTRUMENT, OPERATING REACTIVITY

9-104268 DATED 1975
ILLINCE VG
SOLUBILITY OF OXYGEN IN LIQUID SODIUM AND ITS CORROSION EFFECT
7 PAGES, 6 FIGURES, 29 REFERENCES, KERNENERGIE, 18(3), PP. 69-75 (MARCH 1975) (IN GERMAN)

DEALS WITH THE CONSTRUCTIVE SOLUTION OF A VACUUM DISTILLING APPARATUS PROVIDED FOR DETERMINING OXYGEN CONTENT IN SODIUM AND OPTIMIZATION OF THE DISTILLATION. CONSTRUCTION OF THE APPARATUS MAKES DETERMINATION OF THE OXYGEN CONTENT IN LIQUID SODIUM WITH COMPARATIVELY HIGH ACCURACY POSSIBLE. A MINIMUM AMOUNT OF ABOUT 1 TO 1.5 PPM O(SUB 2) CAN BE DETERMINED WHEN A NICKEL CRUCIBLE IS USED FOR DISTILLATION. THE CORROSION OF STRUCTURAL MATERIALS IS SHOWN TO BE DIRECTLY PROPORTIONAL TO OXYGEN ACTIVITY IN THE LIQUID SODIUM. FROM THE VIEWPOINT OF CORROSION OF MOST OF THE STRUCTURAL MATERIALS USED IN FAST REACTORS, AN OXYGEN CONCENTRATION OF LESS THAN 5 PPM IN LIQUID SODIUM IS CONSIDERED OPTIMAL, A CONCENTRATION UP TO 10 PPM UNDESIRED, AND A CONCENTRATION OF MORE THAN 10 PPM DANGEROUS IN MOST CASES.

*MEASUREMENT + *OXYGEN + CORROSION + EQUIPMENT + EFFECT

9-104270 DATED 1975
HESS B + KUPPERT E
INSTRUMENTATION FOR CORE AND COOLANT MONITORING IN LIQUID-METAL FAST BREEDER REACTORS (LMFBR)
64 PAGES, 27 FIGURES, 185 REFERENCES, 13(1), PP. 81-144 (MARCH 1975)

THIS REVIEW ON CORE AND COOLANT INSTRUMENTATION FOR LIQUID METAL FAST BREEDERS AIMS TO GIVE A SHORT SURVEY OF MEASUREMENT METHODS AND THE VARIETY OF APPROPRIATE INSTRUMENTATION DEVELOPED AND TESTED FOR REACTOR APPLICATION THROUGHOUT THE WORLD.

INSTRUMENT, IN CORE + *INSTRUMENT, NUCLEAR + *INSTRUMENT, PROCESS + MEASUREMENT + REACTOR PROTECTION SYSTEM + DATA PROCESSING + MEASUREMENT, TEMPERATURE + INSTRUMENT, FAILED FUEL DETECTION + INSTRUMENT, FLOW + INSTRUMENT, TEMPERATURE + IN CORE MEASUREMENT + *REVIEW + INSTRUMENT, COOLANT QUALITY + FLOW + ACOUSTICS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-105004 ALSO IN CATEGORY 17 DATED 1975
HANS R + MAUSBECK H
INSTRUMENTATION SPECIFIC TO THE SNR-350 LIQUID METAL FAST BREEDER REACTOR
INTERATOM, BENSBERG/KOLN, GERMANY
6 PPS, 15 FIGS, KERNTECHNIK, 17(3), PP. 113-18 (MARCH 1975)

IN THE PROCESS INSTRUMENTATION, LEVEL, FLOW, AND PRESSURE MEASURING TECHNIQUES ARE DESCRIBED. FOR THE ANALYZERS, PLUGGING METERS, HYDROGEN DETECTION AND SAMPLING ARE DISCUSSED. CORE INSTRUMENTATION DESCRIBED CONSISTS OF TEMPERATURE MONITORING PROBES, FUEL ELEMENT FLOWMETER, AND POSITION MEASURING DEVICES FOR FUEL ELEMENTS. MEASURING, CONTROL AND MONITORING DEVICES FOR THE ELECTRIC TRACE HEATING ARE DESCRIBED.

*INSTRUMENT, IN CORE + INSTRUMENT, PROCESS + GERMANY + INSTRUMENT, FLOW + INSTRUMENT, LIQUID LEVEL + INSTRUMENT, TEMPERATURE + INSTRUMENT, PRESSURE + *HEATERS

9-105493 ALSO IN CATEGORY 11 DATED 1974
GRANTZ AL
INSTRUMENTED SIMULATED FUEL ASSEMBLY DESIGN AND DEVELOPMENT
GENERAL ELECTRIC COMPANY
GEAP-14015 +, 56 PPS, 20 FIGS, NOV. 1974

TWO SIMULATED FUEL ASSEMBLIES WITH LOAD MEASUREMENT CAPABILITIES HAVE BEEN DESIGNED, DEVELOPED AND FABRICATED. THE INSTRUMENTED SIMULATED FUEL ASSEMBLIES (ISFA'S) HAVE BEEN DELIVERED TO WARD TO BE USED IN THE 3-D CORE RESTRAINT TEST RIG FOR THE PURPOSE OF MEASURING INTER-FUEL-ASSEMBLY LOADS UNDER SIMULATED REFUELING AND OPERATING CONDITIONS. THIS REPORT DOCUMENTS THE DESIGN BASIS OF THE ISFA'S INCLUDING REQUIREMENTS, COMPONENT DESIGN, COMPONENT DEVELOPMENT TESTS AND DESIGN (PERFORMANCE) VERIFICATION TESTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + DESIGN STUDY + CORE COMPONENTS + *STRUCTURAL INTEGRITY + COMPONENTS + *R AND D PROGRAM + *FUEL ROD + EQUIPMENT DEVELOPMENT

9-105678 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.6 - IRRADIATION TESTING OF BORON CARBIDE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENTLY COMMITTED B(SUB 4)C TESTS PROVIDING EBR-II RADIATION DATA IN SUPPORT OF CRBRP CONTROL ASSEMBLY DESIGN ARE GIVEN IN TABLE Q120.6-1. THIS TABLE SUMMARIZES EACH TEST USING THE HEDL NAME FOR THE TEST. TYPICAL TEST PARAMETERS FOR PELLET TEMPERATURE, PELLET DIAMETER AND B-10 CAPTURES ARE GIVEN. THE TESTS WILL EXTEND THE RADIATION DATA WELL ABOVE THE TEMPERATURES OF 2200 F AND PELLET SIZES OF 0.46 TO 0.47 INCH DIAMETER ANTICIPATED FOR THE PRIMARY CONTROL ASSEMBLY.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

BORON + IN PILE EXPERIMENT + *IRRADIATION TESTING + RESPONSE TO NRC QUESTION + *POISON, FIXED + CLINCH RIVER (LMFBR) + CONTROL RODS

9-105825 ALSO IN CATEGORIES 6 AND 18 DATED 1975
BAGSASAROV YE
SOVIET-FRENCH SEMINAR ON CORE DIAGNOSIS AND SAFETY OF FAST REACTORS-CADARACHE, JUNE 9-14, 1974
3 PPS, SOVIET ATOMIC ENERGY, 37(5), PP. 1213-15 (MAY 1975)

THE SEMINAR DISCUSSED PROBLEMS ASSOCIATED WITH THE GENERAL APPROACH TO THE SAFETY OF SODIUM-COOLED FAST REACTORS, DESIGN AND OPERATING METHODS OF CORE MONITORING, CONSEQUENCES OF FUEL ELEMENT LEAKS, METHODS OF LEAKAGE INDICATION AND ON-LINE DETERMINATION OF DEFECTIVE FUEL BUNDLES, SPECIFIC PROBLEMS ENCOUNTERED IN WORKING WITH LEAKY FUEL ELEMENTS, METHODS OF DETECTING DEFECTIVE FUEL ELEMENTS WITH THE AID OF LABELED GASES, SYSTEMS AND EQUIPMENT FOR FAST DATA ACQUISITION AND PROCESSING AND REACTOR CONTROL, AND MANY OTHERS.

*FRANCE + OPERATION + DATA PROCESSING + REACTOR CONTROL + *DESIGN STUDY + INSTRUMENT, FAILED FUEL DETECTION + INSTRUMENT, SURVEILLANCE + USSR + CORE COMPONENTS + SAFETY EVALUATION + REACTOR PHYSICS + OPERATING EXPERIENCE

9-105884 ALSO IN CATEGORIES 5 AND 18 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM, RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL, FIRST QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14045-1 +, 14 PPS, 5 FIGS, 3 REFS, MARCH 1975

THE OBJECTIVES OF THE LMFBR SHUTDOWN HEAT REMOVAL (SHR) RELIABILITY PROGRAM ARE TO ASSESS ANALYTICALLY AND EMPIRICALLY THE RELIABILITY OF HEAT REMOVAL SYSTEMS TO REMOVE HEAT FROM THE REACTOR AFTER SCRAM OR NORMAL SHUTDOWN AND TO PROVIDE TECHNOLOGY FOR ASSURING THAT RELIABILITY OBJECTIVES ARE ACHIEVED. THIS REPORT OUTLINES LMFBR SHR RELIABILITY PROGRAM ACTIVITIES AND RESULTS OF THOSE ACTIVITIES FROM JULY 1974 THROUGH FEBRUARY 1975. THE MAJORITY OF EFFORT TO DATE HAS BEEN CONCENTRATED ON INITIATING AND IMPLEMENTING RELIABILITY TASKS FOR THE CLINCH RIVER

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-105884 *CONTINUED*
BREEDER REACTOR PLANT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + RELIABILITY ANALYSIS + *RELIABILITY, SYSTEM + *SHUTDOWN COOLING SYSTEM + CLINCH RIVER (LMFBR)

9-105887 ALSO IN CATEGORIES 11 AND 12 AND 18 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. ADVANCED SAFETY ANALYSIS. FIRST QUARTERLY REPORT, JULY-NOVEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14038-1 +. 65 PPS, 20 TABS, 23 FIGS, NOV, 1974

REPORTS PROGRESS FOR THE PERIOD IN THE FOLLOWING AREAS: ESTABLISHMENT OF SHUTDOWN SYSTEM RELIABILITY GOALS AND SUCCESS CRITERIA; INHERENT SAFE CORE DESIGN; FUEL ROD FAILURE MECHANISMS; AND ENGINEERING ANALYSIS OF POST-ACCIDENT HEAT REMOVAL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FAILURE, FUEL ELEMENT + RELIABILITY, SYSTEM + *R AND D PROGRAM + *EMERGENCY COOLING CONSIDERATIONS

9-105980 ALSO IN CATEGORIES 1 AND 11 AND 12 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP, ILL.
DOCKET-50537-22 +. 179 PAGES, AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, AUG. 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING COMPONENTS NOT COVERED BY ASME CODE, CONTROL RODS, SOURCE RANGE FLUX MONITORING SYSTEM, SODIUM DUMP SYSTEM, SODIUM FIRE PROTECTION SYSTEM, AND CUMULATIVE MECHANICAL DAMAGE FUNCTION. INCLUDES RESPONSES TO NRC QUESTIONS CONERNING THE ABOVE MENTIONED SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*NRC QUESTION + CODES AND STANDARDS + CONTAINMENT DESIGN + DESIGN CRITERIA + STORAGE CONTAINER + EQUIPMENT + *REPORT, PSAR + INSTRUMENT, STARTUP RANGE + FIRE PROTECTION + *CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

9-106094 ALSO IN CATEGORY 5 DATED 1975
SHIGHT SA + ALBRECHT RW + EDELMANN MF
CROSS CORRELATION OF NEUTRONIC AND ACOUSTIC NOISE SIGNALS FROM LOCAL BOILING
GESELLSCHAFT FUR KERNFORSCHUNG MBH, F.R. GERMANY
12 PPS, 11 FIGS, 9 REFS, ANNALS OF NUCL. ENERGY, 2(2-5), PP. 367-78 (JUNE 1975)

A BOILING SIMULATOR WAS CONSTRUCTED TO MODEL THE VOID AND PRESSURE EFFECTS OF LOCAL BOILING IN AN LMFBR. BY FORCING SUPERHEATED STEAM INTO SUBCOOLED WATER THE BOILING SIMULATOR PRODUCED A SERIES OF SINGLE BUBBLES SEPARATED BY WAITING TIMES. THE BOILING SIMULATOR WAS PLACED IN THE CORE OF A ZERO POWER REACTOR (GFR, ARK), AND THE NEUTRON AND PRESSURE SIGNALS WERE RECORDED AND CROSS CORRELATED. THE NEUTRON-PRESSURE CROSS CORRELATION EXHIBITED AN ALMOST PERFECT CORRELATION AT THE BUBBLE REPETITION FREQUENCY (7 HZ).

*NOISE ANALYSIS + CORRELATION + NEUTRON + SIMULATION + *BOILING + ACOUSTICS + COMPARISON

9-106099 ALSO IN CATEGORY 5 DATED 1975
FRY DN
TEMPERATURE NOISE MEASUREMENTS IN BLOCKED AND UNBLOCKED 19-PIN ELECTRICALLY HEATED LMFBR FUEL SUBASSEMBLY MOCKUPS
OAK RIDGE NATIONAL LABORATORY, TENN.
2 PPS, 1 FIG, 3 REFS, ANNALS OF NUCL. ENERGY, 2(2-5), PP. 233-34 (JUNE 1975)

SODIUM TEMPERATURE NOISE WAS MEASURED AT THE EXIT OF A SIMULATED FAST REACTOR FUEL SUBASSEMBLY TO DETERMINE THE FEASIBILITY OF USING TEMPERATURE NOISE MONITORS TO DETECT FLOW BLOCKAGES IN FAST REACTORS, A MATTER OF EVER-INCREASING CONCERN IN THE LMFBR PROGRAM. NOISE FROM BOTH BLOCKED AND UNBLOCKED TEST BUNDLES WAS CHARACTERIZED USING VARIOUS NOISE SIGNAL DESCRIPTORS SUCH AS POWER SPECTRAL DENSITY, CROSS SPECTRAL DENSITY, AMPLITUDE PROBABILITY DISTRIBUTION, AND ROOT MEAN SQUARE (RMS).

NOISE + *MEASUREMENT, TEMPERATURE + NOISE ANALYSIS + *MEASUREMENT, NOISE + SIMULATION + FUEL ELEMENT CLUSTER

9-106102 DATED 1975
MIHALCZO JT + PARE VK + MATHIS MV
SPECTRAL DENSITY MEASUREMENTS WITH A MOCK-UP OF THE FAST FLUX TEST FACILITY REACTOR
OAK RIDGE NATIONAL LABORATORY, TENN.
14 PPS, 22 FIGS, 14 REFS, ANNALS OF NUCL. ENERGY, 2(2-5), PP. 177-91 (JUNE 1975)

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-106102 *CONTINUED*
TWO SERIES OF NOISE ANALYSIS MEASUREMENTS WERE MADE BY OAK RIDGE NATIONAL LABORATORY WITH THE ENGINEERING MOCK-UP CORE OF THE FAST FLUX TEST FACILITY (FFTF) REACTOR AT THE ZPR-9 FACILITY OF ARGONNE NATIONAL LABORATORY. THE PURPOSE OF THE FIRST SERIES, DESIGNATED THE REACTIVITY SURVEILLANCE PROCEDURES EXPERIMENT, WAS TO TEST ALL WORTHWHILE REACTIVITY METHODS FOR POSSIBLE APPLICATION TO THE FFTF, TO RESOLVE DISCREPANCIES OBSERVED IN PREVIOUS EXPERIMENTS, AND TO EVALUATE THE DESIGN OF THE LOW-LEVEL FLUX MONITORS IN THE RADIAL SHIELD TO DETERMINE THEIR ADEQUACY FOR FFTF APPLICATION. THE SECOND SERIES PURPOSE WAS TO TEST THE FEASIBILITY OF REACTIVITY DETERMINATION USING THE NOISE ANALYSIS METHOD WITH 252CF.

FFTF (TR) + *NOISE ANALYSIS + MEASUREMENT, NOISE + *MEASUREMENT, REACTIVITY + SIMULATION

9-106481 DATED 1974
KUWABARA J + KATO Y + FURUKAWA K
FINAL REPORT ON A DEVELOPMENT STUDY OF THE SHEATHED-THERMOCOUPLE-ELECTRODE FLOWMETER AS A PART OF STUDIES FOR THE FBR INSTRUMENTATION
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
JAPFNR-176 +. 90 PPS, 32 FIGS, JULY 1974

THE SHEATHED-THERMOCOUPLE-ELECTRODE FLOWMETER CONSISTS OF A MAGNET CIRCUIT MOUNTED INSIDE THE WALL OF THE SUBASSEMBLY AND A PAIR OF GROUNDED-TYPE SHEATHED CHROMEL-ALUMEL THERMOCOUPLES INSERTED INTO THE OUTLET OF THE SUBASSEMBLY WHERE THE MAGNETIC FIELD TRAVERSES. OUTLET TEMPERATURE, CHANNEL FLOW RATE, BOILING, PIN CLAD RUPTURE, FP GAS RELEASE AND GAS ENTRAINMENT ARE EXPECTED TO BE DETECTED FROM THE FOUR WIRES OF THE THERMOCOUPLES. FEASIBILITY OF THIS UNIQUE PROPOSAL HAS ALREADY BEEN PROVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*INSTRUMENT, TEMPERATURE + THERMOCOUPLE + *EQUIPMENT DEVELOPMENT + SENSORS, TEMPERATURE

9-106483 DATED 1974
LIONS N + PAGES JP + CHANTOT H
SPECIAL INSTRUMENTATION FOR PHENIX. PART III - HYDROGEN DETECTION
ELECTRICITE DE FRANCE, CHATOU
CEA-CONF-2663 + CONF-740318-8 +. 4PPS, FROM CONFERENCE ON FAST REACTOR POWER STATIONS, LONDON, UK, MARCH 11, 1974

THE SMALL WATER LEAKAGES INTO SODIUM IN THE STEAM GENERATORS OF PHENIX REACTOR ARE DETECTED BY MEASURING THE HYDROGEN CONCENTRATION IN THE LIQUID METAL. THE HYDROGEN IS PRODUCED BY THE SODIUM WATER REACTION. THE FAULTY MODULE CAN ALSO BE LOCATED BY THE HYDROGEN DETECTION SYSTEM. THERE IS NO DETECTION OF HYDROGEN IN THE ARGON COVER GAS, BECAUSE THE STEAM GENERATORS HAVE NO FREE SODIUM LEVEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + *HYDROGEN + DESIGN STUDY + INSTRUMENT, COMPONENT + *INSTRUMENT, SURVEILLANCE

9-106716 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 010.7 (SECTION 3.5) - RADIATION MONITORING INSTRUMENTATION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 3 PGS, 2 FIGS, 1 TAB, PP A1-38 THRU A1-44 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP DESIGN SYSTEMS FOR TREATING THE RADIOACTIVE LIQUID AND GASEOUS WASTES WERE SELECTED ON THE BASIS OF EQUIPMENT PERFORMANCE DATA AT OPERATING LIGHT WATER REACTORS AS WELL AS FROM FFTF DESIGN INFORMATION. EQUIPMENT SIZES, ARRANGEMENTS AND PROCESS REQUIREMENTS ARE BASED ON CONSERVATIVE ESTIMATES OF SYSTEM LEAKAGE, DECONTAMINATION REQUIREMENTS AND ACTIVITY CONCENTRATIONS. IN ADDITION, RADIATION MONITORING OF PROCESS SYSTEMS PROVIDES EARLY WARNING OF EQUIPMENT MALFUNCTION AND POTENTIAL RADIOLOGICAL HAZARDS AND PREVENTS RELEASE OF ACTIVITY TO THE ENVIRONMENT IN EXCESS OF 10 CFR 20 LIMITS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

RELEASE RATE + WASTE TREATMENT + RESPONSE TO NRC QUESTION + GAS + LIQUID + CLINCH RIVER (LMFBR) + RADIATION MONITORS

9-106736 ALSO IN CATEGORIES 16 AND 18 DATED 1975
RESPONSE TO QUESTION A6 - ON-SITE HUMIDITY DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-104 THRU A1-105 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICNESE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENTLY IN USE IS A BELFORT INSTRUMENT CO. MODEL 5-594 HYGROTHERMOGRAPH (4 FEET ABOVEGROUND, IN A STEVENSON SCREEN) WITH AN AMBIENT TEMPERATURE CHART RANGE OF -30 TO +110 DEGREES F AND RELATIVE HUMIDITY RANGE OF 0 TO 100 PERCENT. THE MAXIMUM POSSIBLE RELATIVE HUMIDITY ERROR IS + OR - 4 PERCENT. THE READING ACCURACY OF TEMPERATURE IS TO THE NEAREST WHOLE DEGREE. DATA IS RECORDED ON ANALOG STRIP-CHARTS AND MUST BE REDUCED MANUALLY. A MORE ELABORATE RELATIVE HUMIDITY SYSTEM, TO BE INSTALLED IN THE NEAR FUTURE, WILL ELECTRONICALLY RECORD THE AMOUNT OF AMBIENT WATER VAPOR IN THE AIR. A YEAR'S RECORD IS TO BE COLLECTED AND ANALYZED FOR FUTURE UTILIZATION.

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-106730 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*INSTRUMENT, METEOROLOGICAL + SITE CLIMATOLOGY + HUMIDITY, RELATIVE + RESPONSE TO NRC QUESTION + WEATHER DATA + CLINCH RIVER (LMFBR)

9-106731 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A6A - HYGROTHERMOGRAPH
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-105 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INITIAL HYGROTHERMOGRAPH WAS NOT INTENDED FOR USE IN HEAT DISSIPATION FOGGING ANALYSIS AND ADMITTEDLY DID NOT MEET THE REQUIREMENTS FOR HUMIDITY OR DEW POINT MONITORING SPECIFIED IN REGULATORY GUIDE 1.23. A NEW DEW POINT SYSTEM WAS INSTALLED AT THE ON-SITE METEOROLOGICAL FACILITY AND BEGAN OPERATION ON APRIL 3, 1975. THE NEW SYSTEM HAS A CAMBRIDGE MIRROR UNIT AND IS MONITORING THE DEW POINT TEMPERATURE AT 10 METERS ABOVE GROUND. THE INSTRUMENT ACCURACY MEETS THE REQUIREMENT OF + OR - 0.5 DEGREES CELSIUS SPECIFIED IN REGULATORY GUIDE 1.23.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

INSTRUMENT, METEOROLOGICAL + HUMIDITY, RELATIVE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

9-107073 ALSO IN CATEGORIES 2 AND 10 AND 11 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
127 PGS. AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS THE PROJECT'S SITE SUITABILITY SOURCE TERM FROM THE CRBRP PARALLEL DESIGN AND NEW AND REVISED PAGES TO THE PRELIMINARY SAR. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING RELIABILITY ANALYSIS, WEATHER DATA, SEISMIC RESPONSES DURING WASTE INJECTIONS, AND SODIUM FIRES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + DESIGN CRITERIA + RELIABILITY ANALYSIS + SEISMOLOGY + SITING, REACTOR + SOURCE, RADIATION + *REPORT, PSAR + ENGINEERED SAFETY FEATURE + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR)

9-107083 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.5 - SELF-WELDING PHENOMENA OF COUPLINGS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS. PP. 120.5-1 THRU 120.5-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY MATERIAL COUPLE INVOLVED IN THE OPERATING PARTS OF THE PRIMARY COUPLING IS INCONEL 718/INCONEL 718. THIS PARTICULAR MATERIALS COMBINATION HAS BEEN SUBJECTED TO EXTENSIVE TESTING IN SODIUM AND HAS PROVEN TO HAVE EXCELLENT RESISTANCE TO SELF-WELDING. TEST CONDITIONS HAVE INCLUDED TEMPERATURES OF 850 AND 1050 F, FOR CONTACT PRESSURES OF 16,000 AND 148,000 PSI, AND TIMES UP TO 6 MONTHS, WITH SEPARATIONS BEING PERFORMED AT THE EXPOSURE TEMPERATURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*WELDING + *MATERIAL + RESPONSE TO NRC QUESTION + INCONEL + CABLES AND CONNECTORS + CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

9-107084 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.14 - SODIUM-WATER REACTION PRESSURE RELIEF SYSTEM INSTRUMENTATION
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG. P. 222.14-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FUNCTIONS OF THE SWRPRS INSTRUMENTATION AND CONTROL SYSTEM THAT RESULT IN SCRAM OF THE REACTOR ARE SAFETY RELATED AND ARE PART OF THE PLANT PROTECTION SYSTEM. THE SODIUM-WATER REACTION DETECTION INSTRUMENTATION FOR MONITORING RUPTURE DISK FAILURE FALLS INTO THIS CATEGORY. UPON RECEIPT OF THESE SODIUM-WATER REACTION SIGNALS, INDICATING RUPTURE DISK FAILURE, THE SECONDARY PLANT PROTECTION SYSTEM INITIATES SCRAM AND TRIPS THE PHTS AND IHTS SODIUM PUMPS IN THE AFFECTED LOOP.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

METAL WATER REACTION + CONTROL + *PRESSURE RELIEF + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *INSTRUMENTS, MISC.

9-107192 ALSO IN CATEGORIES 12 AND 18 DATED 1975

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-107192 *CONTINUED*
BOURQUIN RD + BIRNEY KR
SCRAM - A COMPUTER PROGRAM FOR CALCULATING SCRAM TIMES FOR LMFBR CONTROL RODS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-83 +. 33 PPS, 5 FIGS, 5 REFS, AUG. 1975

THE ANALYTICAL TECHNIQUE INVOLVES THE DETERMINATION OF ALL THE FORCES ACTING ON THE CONTROL ROD SUB-SYSTEM DURING SCRAM. THE PROGRAM COMPLETES A FORCE BALANCE AS A FUNCTION OF THE DISTANCE TRAVELED DURING SCRAM AND DETERMINES THE TIME, PRESSURE DROP, BUNDLE VELOCITY, BUNDLE COOLANT VELOCITY, BYPASS COOLANT VELOCITY, AND BUNDLE ACCELERATION. THE PROGRAM IS SPECIFICALLY APPLICABLE FOR FFTF TYPE CONTROL RODS. RESULTS OBTAINED USING THE SCRAM MODEL ARE COMPARED WITH EXPERIMENTAL RESULTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL TECHNIQUE + FFTF (TR) + CONTROL ROD SCRAM MECHANISM + *CONTROL RODS

9-107470 DATED 1975
O'DELL LD + BAARS RE + WALTAR AE
USE OF FUEL FAILURE CORRELATIONS IN ACCIDENT ANALYSIS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-938 + CONF-750527-6 +. 21 PPS, FROM INTERNATIONAL WORKING GROUP ON FUEL FAILURE MECHANISMS, SEATTLE, WASHINGTON, MAY 11, 1975

THE MELT-III CODE FOR ANALYSIS OF A TRANSIENT OVERPOWER (TOP) ACCIDENT IN AN LMFBR IS BRIEFLY DESCRIBED, INCLUDING FAILURE CRITERIA CURRENTLY APPLIED IN THE CODE. PRELIMINARY RESULTS OF CALCULATIONS EXPLORING FAILURE PATTERNS IN TIME AND SPACE IN THE REACTOR CORE ARE REPORTED AND COMPARED FOR THE TWO EMPIRICAL FUEL FAILURE CORRELATIONS EMPLOYED IN THE CODE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + FAILURE + *FAILURE, FUEL ELEMENT + *COMPARISON, THEORY AND EXPERIENCE + FAILURE MODE ANALYSIS + FUEL ELEMENTS

9-107482 ALSO IN CATEGORY 17 DATED 1975
SCHATZ RA + DUETSCH KL
RELIABILITY MODELING OF CLINCH RIVER BREEDER REACTOR ELECTRICAL SHUTDOWN SYSTEMS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-750418-3 +. 28 PPS, FROM 6TH ANNUAL CONFERENCE ON MODELING & SIMULATION, PITTSBURGH, PA., APRIL 23-25, 1975

DESCRIBES THE INITIAL SIMULATION OF THE PROBABILISTIC PROPERTIES OF THE CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) ELECTRICAL SHUTDOWN SYSTEMS. A MODEL OF THE RELIABILITY (AND AVAILABILITY) OF THE SYSTEMS IS PRESENTED UTILIZING SUCCESS STATE AND CONTINUOUS-TIME, DISCRETE STATE MARKOV MODELING TECHNIQUES AS SIGNIFICANT ELEMENTS OF AN OVERALL RELIABILITY ASSESSMENT PROCESS CAPABLE OF DEMONSTRATING THE ACHIEVEMENT OF PROGRAM GOALS. THIS MODEL IS EXAMINED FOR: ITS SENSITIVITY TO SAFE/UNSAFE FAILURE RATES, SUBSYSTEM REDUNDANT CONFIGURATIONS, TEST AND REPAIR INTERVALS, MONITORING BY REACTOR OPERATORS; AND THE CONTROL EXERCISED OVER SYSTEM RELIABILITY BY DESIGN MODIFICATIONS AND THE SELECTION OF SYSTEM OPERATING CHARACTERISTICS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*RELIABILITY ANALYSIS + *REACTOR PROTECTION SYSTEM + ANALYTICAL MODEL + RELIABILITY, SYSTEM + CLINCH RIVER (LMFBR)

9-107620 ALSO IN CATEGORY 18 DATED 1975
ADVANCED SAFETY ANALYSIS SECOND QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1075
GENERAL ELECTRIC COMPANY
GEAP-14038-2 +. 23 PPS, 22 FIGS, MARCH 1975

LIGHT WATER REACTOR SCRAM SYSTEM DESIGN FEATURES AND FUNCTIONAL REQUIREMENTS WERE COMPILED TO PROVIDE A STARTING POINT FOR COMMERCIAL LMFBR RELIABILITY EVALUATIONS. A LITERATURE REVIEW AND INFORMAL DISCUSSION SESSIONS WERE CONDUCTED IN A CONTINUING EFFORT TO IDENTIFY AND QUALITATIVELY ASSESS INHERENT SAFETY DESIGN FEATURES. THE LIST OF INHERENT SAFETY DESIGN FEATURES WAS EXPANDED AND A BRIEF QUALITATIVE ASSESSMENT OF EACH ITEM ON THE LIST WAS PREPARED. COMPUTATIONAL TOOLS WERE READIED FOR STUDYING THE DYNAMIC BEHAVIOR OF THE REFERENCE COMMERCIAL LMFBR CORE SUBJECTED TO HYPOTHETICAL, UNPROTECTED ACCIDENT SEQUENCES. LOCALIZED, SYSTEMATIC INCOHERENCE EFFECTS IN ACCIDENT TRANSIENTS WERE IDENTIFIED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *REACTOR PROTECTION SYSTEM + INTRINSIC SAFETY + CONTROL ROD SCRAM MECHANISM + *RELIABILITY, SYSTEM + R AND D PROGRAM + TRANSIENT

9-107625 ALSO IN CATEGORY 18 DATED 1975
INSTRUMENTATION DEVELOPMENT TWELTH QUARTERLY REPORT OCTOBER-DECEMBER 1974

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-107625 *CONTINUED*
GENERAL ELECTRIC COMPANY
GEAP-13825-12 +, 30 PPS, 10 FIGS, JAN, 1975

REPORTS PROGRESS FOR THE PERIOD COVERING THE DEVELOPMENT OF INSTRUMENTATION FOR SURVEILLANCE OF THE CORE AND IN-VESSEL COMPONENTS OF LIQUID METAL FAST BREEDER REACTORS. CURRENT DEVELOPMENT EFFORTS ARE FOCUSED ON HIGH TEMPERATURE NEUTRON DETECTORS AND ADVANCED SIGNAL TRANSMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, NUCLEAR + HIGH TEMPERATURE + INSTRUMENT, SURVEILLANCE + MONITOR + CORE COMPONENTS + *R AND D PROGRAM + *INSTRUMENTS, MISC.

9-107626 DATED 1975
INSTRUMENTATION DEVELOPMENT THIRTEENTH QUARTERLY REPORT, JANUARY-MARCH 1975
GENERAL ELECTRIC COMPANY
GEAP-13825-13 +, 36 PPS, 23 FIGS, 7 REFS, MAY 1975

REPORTS PROGRESS FOR THE PERIOD COVERING THE DEVELOPMENT OF INSTRUMENTATION FOR SURVEILLANCE OF THE CORE AND IN-VESSEL COMPONENTS OF THE LIQUID METAL FAST BREEDER REACTOR. CURRENT DEVELOPMENT EFFORTS ARE FOCUSED ON HIGH TEMPERATURE NEUTRON DETECTORS AND ADVANCED SIGNAL TRANSMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, NUCLEAR + HIGH TEMPERATURE + INSTRUMENT, SURVEILLANCE + MONITOR + CORE COMPONENTS + *R AND D PROGRAM + *INSTRUMENTS, MISC.

9-107635 ALSO IN CATEGORY 18 DATED 1975
NOORDHOFF BH + WEBER SA + TREGO AL + YATABE JM
HEDL QUARTERLY TECHNICAL REPORT - JANUARY, FEBRUARY, MARCH 1975. ENGINEERING AND DEVELOPMENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-1 +, 120 PPS, 5 TABS, FIGS, MAY 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: TEST PROGRAM, REFUELING, MECHANICAL EQUIPMENT, HYDRAULICS AND MECHANICS, CONTROL AND DATA SYSTEMS, FFTF OPERATOR TRAINING SIMULATOR, REACTOR INSTRUMENT DEVELOPMENT, UNDER-SODIUM VIEWING, RADIOGRAPHY, EDDY CURRENT METHODS, ULTRASONIC TESTING, AND ACOUSTIC EMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + TRAINING + FFTF (TR) + INSTRUMENT, CONTROL + REFUELING + TEST, NONDESTRUCTIVE + REMOTE MANIPULATING AND VIEWING + SIMULATION + *R AND D PROGRAM

9-107636 ALSO IN CATEGORIES 6 AND 18 DATED 1975
BURGESS CA + SHEELY WF
LMFBR REFERENCE CONTROL MATERIALS SEMIANNUAL REPORT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-71 +, 40 PPS, 12 FIGS, JULY 1975

PROGRESS ON NEUTRON ABSORBER DEVELOPMENT ACTIVITIES FROM JANUARY, 1975 THROUGH JUNE, 1975 IS PRESENTED. INCLUDED IN THE REPORT ARE DESCRIPTIONS OF ACTIVITIES RELATED TO PERFORMANCE ANALYSIS, DEVELOPMENT TESTING, AND FABRICATION TECHNOLOGY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + TESTING + CONTROL ROD FABRICATION + FFTF (TR) + MATERIAL + R AND D PROGRAM + PERFORMANCE + *CONTROL RODS

9-107740 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.59 - STANDPIPE BUBBLER CONCEPT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. 0001.59-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

SINCE THE STANDPIPE BUBBLER IS PHYSICALLY JUST A PIPE CONNECTING THE PUMP TANK TO THE GAS EQUALIZATION LINE BETWEEN THE REACTOR AND THE OVERFLOW TANK, THERE ARE NO IDENTIFIABLE MALFUNCTIONS WHICH COULD RESULT IN OVERPRESSURING THE COVER GAS REGION OF THE PUMP SUCH THAT THE SODIUM LEVEL IN THE PUMP WOULD DROP TO A POINT WHICH WOULD PERMIT THIS GAS TO ENTER THE HYDRAULICS OF THE PUMP. THE VENT LINE FROM THE TOP OF THE IHX TO THE PUMP TANK ENTERS THE PUMP TANK AT AN ELEVATION BELOW THE MINIMUM SODIUM LEVEL IN THE TANK (WHICH IS 8IN BELOW THE MINIMUM SAFE LEVEL IN THE REACTOR).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-107740 *CONTINUED*
CHARGE $2.00)

RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR) + *PUMPS + *SENSORS, LEVEL

9-107767 DATED 1975
IVHM AT HEDL IS BEING TESTED ON HTSF FOR FFTF
1 PG, POWER ENGINEERING, 79(9), PG. 65 (SEPT. 1975)

A 48-TON BREEDER REACTOR REFUELING MACHINE IS BEING TESTED IN HOT ARGON GAS AND LIQUID SODIUM AT THE HANFORD ENGINEERING DEVELOPMENT LABORATORY OF THE WESTINGHOUSE HANFORD CO. THE IN-VESSEL HANDLING MACHINE UNDERWENT FINAL INSPECTION BY ENGINEERS AND TECHNICIANS AT THE HIGH TEMPERATURE SODIUM FACILITY BEFORE IT WAS ENCASED IN PROTECTIVE COVERINGS AND LOWERED INTO A SEALED VESSEL TO BEGIN THE TESTING. PRECAUTIONS WERE TAKEN TO PREVENT AIR FROM GETTING INTO THE SODIUM AND THE ARGON COVER GAS OF THE TEST VESSEL. HARDWARE MUST PERFORM PROPERLY IN AIR AND SODIUM BEFORE USE AT THE FFTF.

*FFTF (TH) + REFUELING + *FUEL HANDLING MACHINE + EQUIPMENT DEVELOPMENT

9-108005 DATED 1975
ROY P + RODGERS DN
HYDROGEN DETECTOR FOR SODIUM COOLED REACTORS
U.S. PATENT 3,886,444 +. MAY 27, 1975

THIS PATENT RELATES TO AN IMPROVED HYDROGEN DETECTOR FOR USE IN SODIUM COOLED REACTORS. THE IMPROVED DETECTOR BASICALLY COMPRISES A DIFFUSION TUBE OF EITHER PURE NICKEL OR STAINLESS STEEL HAVING A COATING ON THE VACUUM SIDE (INSIDE) OF A THIN LAYER OF REFRACTORY METAL, E.G., TUNGSTEN OR MOLYBDENUM. THE REFRACTORY METAL FUNCTIONS AS A DIFFUSION BARRIER IN THE PATH OF HYDROGEN DIFFUSING FROM THE SODIUM ON THE OUTSIDE OF THE DETECTOR INTO THE VACUUM ON THE INSIDE, THUS BY ADJUSTING THE THICKNESS OF THE COATING, IT IS POSSIBLE TO CONTROL THE RATE OF PERMEATION OF HYDROGEN THROUGH THE TUBE, THEREBY PROVIDING A MORE STABLE DETECTOR.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

*HYDROGEN + *MONITOR + UNITED STATES + PATENT

9-108012 DATED 1975
COHEN P
METHOD OF DETECTING A FUEL ELEMENT FAILURE
U.S. PATENT 3,881,989 +. MAY 6, 1975

THIS INVENTION RELATES TO A METHOD OF DETECTING A FUEL ELEMENT FAILURE IN A LIQUID-SODIUM-COOLED FAST BREEDER REACTOR COMPRISING EQUILIBRATING A SAMPLE OF THE SODIUM COOLANT WITH A MOLTEN MIXTURE OF BARIUM IODIDE AND STRONTIUM IODIDE WHEREBY ANY RADIOACTIVE IODINE IN THE SODIUM IS ACCUMULATED IN THE MOLTEN SALT BY ISOTOPIC EXCHANGE, PHYSICALLY SEPARATING THE SODIUM FROM THE MOLTEN SALT AND MONITORING THE MOLTEN SALT FOR THE PRESENCE OF RADIOACTIVE IODINE.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

ANALYTICAL TECHNIQUE + *INSTRUMENT, FAILED FUEL DETECTION + UNITED STATES + PATENT

9-108597 ALSO IN CATEGORY 17 DATED 1974
CAMBILLARD E + LACROIX A + LANGLOIS G
TESTS CARRIED OUT ON THE PHENIX STEAM GENERATOR LEAK DETECTION SYSTEMS (IN FRENCH)
CEA-CONF-2894 + CONF-741085-6 +. 21 PPS, FROM SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, EENSBERG, F.R. GERMANY, OCT. 14, 1974

THE PHENIX SECONDARY CIRCUITS ARE PROVIDED WITH MEASUREMENT SYSTEMS OF HYDROGEN CONCENTRATION IN SODIUM, THAT ALLOW FOR THE DETECTION OF POSSIBLE WATER LEAKS IN STEAM GENERATORS AND THE LOCATION OF A FAULTY MODULE. A MEASUREMENT DEVICE CONSISTS OF A DETECTOR WITH NICKEL MEMBRANES 0.3 MM WALL THICKNESS, AN ION PUMP WITH A 200 L/S FLOW RATE, A QUADRUPOLE MASS SPECTROMETER AND A CALIBRATED HYDROGEN LEAK. THE TEMPERATURE CORRECTION IS MADE AUTOMATICALLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + HYDROGEN + TESTING + MONITOR, GAS + MONITOR + STEAM GENERATOR + LEAK + TEST, LEAK + PHENIX (LMFBR)

9-108601 DATED 1974
SUBBOTIN VI + KOSLOV FA + KUNETSOV EK
LEAK DETECTION IN FAST NEUTRON REACTOR STEAM GENERATORS
ERDA-TR-26 + CONF-741236-1 +. 27 PPS, FROM PROCEEDINGS OF THE U.S./USSR ON THE DEVELOPMENT OF SODIUM COOLED FAST BREEDER REACTOR STEAM GENERATORS, LOS ANGELES, CALIF., DEC. 2, 1974

REQUIREMENTS FOR STEAM GENERATOR LEAK DIRECTION SYSTEMS IN FAST NEUTRON REACTOR INSTALLATIONS ARE DISCUSSED. EXAMPLES DISCUSSED ARE LEAK DETECTION IN BN-350 STEAM GENERATORS BY ANALYSIS OF HYDROGEN IN THE COVER GAS OF THE EVAPORATORS AND LEAK DETECTION SYSTEMS UTILIZING HYDROGEN

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-108601 *CONTINUED*
CONCENTRATION CONTROL IN SODIUM BY MEANS OF A DIFFUSION MEMBRANE WITH ARGON FLOW. ALSO PRESENTED ARE CALCULATIONAL EVALUATIONS OF THE EFFICIENCY OF SUCH SYSTEMS CONFORMING TO BN-350 SECONDARY SYSTEM PARAMETERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDROGEN + STEAM + TESTING + TEST, LEAK LOCATION + *STEAM GENERATOR + *TUBING + *TEST, LEAK

9-108745 DATED 1974
SWEET DW
THE CALIBRATION OF FISSION CHAMBERS FOR FAST REACTOR EXPERIMENTS
ATOMIC ENERGY ESTABLISHMENT, WINFRITH, ENGLAND
AEEW-R-936 +. 42 PPS, 18 TABS, 8 FIGS, 14 REFS, 1974

THE PREPARATION OF A SET OF ABSOLUTE FISSION CHAMBERS FOR THE MEASUREMENT OF REACTION RATES IN ZEERA IS DESCRIBED. THEIR CALIBRATION AND THE ASSOCIATED ERRORS ARE DISCUSSED AND AN ACCOUNT OF THE CHECKS MADE TO PROVIDE CONFIDENCE IN THEIR PERFORMANCE IS GIVEN.

AVAILABILITY - HER MAJESTY'S STATIONERY OFFICE, P.O. BOX 569, LONDON, S.E.1, ENGLAND

*CHAMBER, FISSION + ANALYTICAL TECHNIQUE + FAST NEUTRON + *INSTRUMENT CALIBRATION + CHAMBER, NEUTRON + CALIBRATION

9-108777 ALSO IN CATEGORY 1 DATED 1974
JACOBI SKW + SCHNEIDER RO + WEBER GG
RELIABILITY AND AVAILABILITY OF A SAFETY SHUTDOWN SYSTEM
KERNFORSCHUNGSZENTRUM KARLSRUHE, GERMANY
11 PPS, TABS, FIGS, PROCEEDINGS OF THE ANNUAL RELIABILITY & MAINTAINABILITY SYMPOSIUM, 7(2), SESSION 4C, PP. 186-96 (JAN. 29, 1974)

THIS PAPER IS AN EVALUATION OF RELIABILITY AND AVAILABILITY FOR THE SAFETY SHUTDOWN SYSTEM OF A FAST BREEDER REACTOR. A 'MULTI-INPUT-SAFETY-SHUTDOWN-SYSTEM' IS STUDIED FOR MONITORING EACH SUBASSEMBLY SEPARATELY TO MEET SPECIFIC SAFETY REQUIREMENTS FOR THE SODIUM COOLED FAST BREEDER. IN PART 1, A DESCRIPTION OF THE SYSTEM IS GIVEN. SOME PROPERTIES AND CONDITIONS LEADING TO SHUT DOWN ARE DISCUSSED. THIS IS BY NO MEANS INTENDED AS A COMPLETE LIST OF POSSIBLE EVENTS BUT SHOULD INDICATE THE NEED FOR SEPARATE SAFETY MONITORING OF EACH SUBASSEMBLY. IN PART 2, A NUMBER OF CONCEPTS USEFUL FOR A FAULT TREE EVALUATION ARE INTRODUCED. UNAVAILABILITY AND THE EXPECTED NUMBER OF FAILURES FOR THIS MODEL ARE EVALUATED.

RELIABILITY ANALYSIS + *REACTOR PROTECTION SYSTEM + DESIGN STUDY + *RELIABILITY, SYSTEM + SHUTDOWN SYSTEM, SECONDARY

9-109156 ALSO IN CATEGORY 12 DATED 1975
GOURDON J + GOURIOU A + JEANNOT A + JALLADE M
SYSTEM FOR INCIDENT DETECTION AND CORE SURVEILLANCE FOR A FAST REACTOR
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS
CONF-750411-40 +. 26 PPS. PRESENTED AT THE EUROPEAN NUCLEAR CONFERENCE, APRIL 21-25, 1975

PRESENTS A REVIEW OF AN INCIDENT DETECTION SYSTEM FOR A FAST REACTOR. THE AREAS COVERED INCLUDE: 1) NORMAL OPERATION, 2) THE INCIDENT SITUATION (WITH ALERT AND SCRAM), AND 3) THE INTERMEDIATE AREA WHEREIN A DEFECT ARISES. THE PRINCIPAL INCIDENTS THREATENING A CORE ARE REVIEWED, AS WELL AS ASPECTS ASSOCIATED WITH A LARGE PLANT MEETING ELECTRIC POWER DEMANDS. LASTLY, THE SURVEILLANCE AND PROTECTION SYSTEM OF THE SUPER PHENIX CORE IS DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FRANCE + INSTRUMENT, PROTECTIVE + *REACTOR PROTECTION SYSTEM + NOISE ANALYSIS + INSTRUMENT, SURVEILLANCE + SYSTEM DESCRIPTION + COMPUTER CONTROL

9-109165 ALSO IN CATEGORY 5 DATED 1975
PATTERSON JF
RADIAL BLANKET ASSEMBLY ORIFICING ARRANGEMENT
U.S. PATENT 3,892,625 +. JULY 1, 1975

THIS PATENT RELATES TO A NUCLEAR REACTOR CORE FOR A LIQUID METAL COOLED FAST BREEDER REACTOR IN WHICH MEANS ARE PROVIDED FOR INCREASING THE COOLANT FLOW THROUGH THE REACTOR FUEL ASSEMBLIES AS THE REACTOR AGES BY VARYING THE COOLANT FLOW RATE WITH THE CHANGING COOLANT REQUIREMENTS DURING THE CORE OPERATING LIFETIME.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

*CONTROL SYSTEM + *FLOW DISTRIBUTION + UNITED STATES + PATENT + MAIN COOLING SYSTEM + FLOW

9-109209 DATED 1975
ANDERSON TT + GAVIN AP + SPENCER EW
ACOUSTICALLY DETECTED EVENTS DURING TREAT TEST R7

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109209 *CONTINUED*
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-76-7 +. 26 PPS, 2 TABS, 8 FIGS, 11 REFS, JULY 1975

DEVELOPMENT OF ACOUSTIC PRESSURE TRANSDUCERS (MICROPHONES) AT ANL HAS SUCCESSFULLY PROCEEDED TO THE STAGE OF APPLICATION AND EVALUATION IN VARIOUS SODIUM SYSTEMS. THE ANL-DEVELOPED MICROPHONE HAS BEEN USED TO CHARACTERIZE SUPERHEAT AND SATURATION BOILING SODIUM IN THE LMFBR HEAT TRANSFER SIMULATION LOOP, AND TO MONITOR THE EBR-II PRIMARY SODIUM SYSTEM AS THE FIRST APPLICATION TO AN LMFBR IN THE U.S. THE TREAT R- SERIES EXPERIMENTS HAVE PROVIDED AN OPPORTUNITY TO EVALUATE THE MICROPHONE'S DETECTION CAPABILITY UNDER SIMULATED LMFBR ACCIDENT CONDITIONS. THE SUBJECT OF THIS REPORT. THIS CONSTITUTES THE FIRST IN-PILE APPLICATION OF THE HIGH-TEMPERATURE MICROPHONE TO A NUCLEAR-HEATED REACTOR SAFETY EXPERIMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

NOISE + INSTRUMENT, COMPONENT + MEASUREMENT, NOISE + R AND D PROGRAM + *ACOUSTICS + *EQUIPMENT DEVELOPMENT

9-109210 ALSO IN CATEGORY 12 DATED 1975
JOSEPHSON J + HUEBOTTER PR + SOWA ES
DEVELOPMENT OF SELF-ACTUATED SHUTDOWN SYSTEMS FOR LMFBR PLANTS. FINAL REPORT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/CT-76-2 +. 190 PPS, 16 TABS, 44 FIGS, 21 REFS, AUG. 1975

THE FURTHER DEVELOPMENT DURING FY 1975 OF THE SELF-ACTUATED SHUTDOWN SYSTEM (SASS) FOR LMFBR PLANTS CARRIED OUT AT ANL IS PRESENTED IN THIS REPORT. A FERROMAGNETIC CURIE TEMPERATURE PERMANENT MAGNET HOLDING DEVICE HAS BEEN SELECTED AS THE BASIS FOR THE DESIGN OF THE INHERENT SHUTDOWN ASSEMBLY OF THE SASS. THE SELF-ACTUATED SELF-CONTAINED DEVICE OPERATES SUCH THAT ACCIDENT CONDITIONS, RESULTING IN INCREASED COOLANT TEMPERATURE OR NEUTRON FLUX REDUCE THE MAGNETIC HOLDING FORCE BY RAISING THE TEMPERATURE OF THE TRIGGER MECHANISM ABOVE THE CURIE POINT. BORON CARBIDE ABSORBER IS THEN INSERTED INTO THE CORE, UNDER GRAVITY, TERMINATING THE ACCIDENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*SHUTDOWN MECHANISM, SELF + CONTROL ROD SCRAM MECHANISM + *SHUTDOWN SYSTEM, SECONDARY + R AND D PROGRAM + EQUIPMENT DEVELOPMENT

9-109211 DATED 1974
PROPOSAL FOR THE DEVELOPMENT OF SELF ACTUATED SHUTDOWN SYSTEMS FOR LMFBR PLANTS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/CT-74-10 +. 85 PPS, 6 TABS, 19 FIGS, 25 REFS, APRIL 1974

THIS PROPOSAL DEALS WITH A REACTOR COMPONENT WHICH WILL IMPROVE LMFBR SCRAM RELIABILITY TO THE LEVEL OF < 10(EXP -7) FAILURES/ DEMAND AS CURRENTLY REQUIRED BY THE REGULATORY BRANCHES OF THE AEC FOR WATER COOLED POWER REACTORS. A SYSTEM IS SUGGESTED WHICH IS ENTIRELY SELF-CONTAINED, REQUIRING NO EXTERNAL ELECTRICAL OR MECHANICAL CONNECTIONS, WHICH WILL ACT TO SHUT DOWN THE REACTOR SPONTANEOUSLY. THE SYSTEM IS ACTUATED BY THE ACCIDENT ITSELF, AND IS VIRTUALLY IMMUNE TO ELECTRO-MECHANICAL MALFUNCTION, HUMAN ERROR, OR DELIBERATE INTERVENTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*SHUTDOWN MECHANISM, SELF + DESIGN STUDY + *SHUTDOWN SYSTEM, SECONDARY + COMPONENTS + R AND D PROGRAM + POISON, FIXED + EQUIPMENT DEVELOPMENT

9-109218 ALSO IN CATEGORY 5 DATED 1975
LEAVELL WH + SIDES WH
EFFECTS OF ENTRAINED GAS ON THE ACOUSTIC DETECTION OF SODIUM BOILING IN A SIMULATED LMFBR FUEL BUNDLE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-751101-8 +. 6 PPS, FROM JOINT MEETING OF THE AMERICAN NUCLEAR SOCIETY & ATOMIC INDUSTRIAL FORUM, SAN FRANCISCO, CALIF, NOV. 16, 1975

THE ABILITY WITH WHICH AN ACOUSTIC MONITORING SYSTEM CAN DETECT LOCALIZED NUCLEATE BOILING OF A LMFBR'S SODIUM COOLANT IS DEPENDENT ON THE BACKGROUND NOISE INTENSITY FOUND IN THE REACTOR'S CORE ENVIRONMENT. BRET ET AL. MEASURED THE INTENSITY OF THE ACOUSTIC BACKGROUND NOISE IN RAPSODIE FOR VARIOUS COMBINATIONS OF PLANT PARAMETERS AND DETERMINED THAT THE INTENSITY OF THE NOISE IS DEPENDENT ON THE AMOUNT OF COVER GAS ENTRAINED IN THE COOLANT. IN EXPERIMENTS PERFORMED AT THE ORNL FUEL FAILURE MOCK-UP FACILITY, WE HAVE SOUGHT THE RELATIONSHIP BETWEEN ACOUSTIC INTENSITY OF NUCLEATE BOILING AND VOID FRACTION IN THE SODIUM COOLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR + *NUCLEATE BOILING + FUEL ELEMENT CLUSTER + VOID FRACTION + GAS + *ACOUSTICS + EFFECT

9-109220 DATED 1975
BULLOCK JB
NEEDS FOR REACTIVITY ANOMALY MONITORING IN CRBRP
OAK RIDGE NATIONAL LABORATORY, TENNESSEE

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109220 *CONTINUED*
CONF-751101-5 +. 5 PPS. FROM JOINT MEETING OF THE AMERICAN NUCLEAR SOCIETY & ATOMIC INDUSTRIAL FORUM. SAN FRANCISCO, CALIF., NOV. 16, 1975

THE SOUND APPLICATION OF REACTIVITY ANOMALY MONITORING REQUIRES A DEFINITIVE OPERATION PHILOSOPHY AND DESIGN BASIS. THIS STUDY FOR THE FIRST TIME DEFINES TWO GENERAL CLASSIFICATIONS OF REACTIVITY ANOMALIES AND IDENTIFIES EXPLICIT DESIGN CRITERIA AND OPERATIONAL PHILOSOPHY FOR AN ANOMALY MONITORING SYSTEM IN THE CLINCH RIVER BREEDER REACTOR PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *MEASUREMENT, REACTIVITY + MONITOR + REACTIVITY EFFECT, ANOMALOUS + CLINCH RIVER (LMFBR)

9-109556 ALSO IN CATEGORIES 11 AND 18 DATED 1975
MCCLUNG RW
NEEDS FOR DEVELOPMENT IN NONDESTRUCTIVE TESTING FOR LMFBR AND OTHER ADVANCED REACTOR SYSTEMS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5093 +. 75 PPS, NOV. 1975

THE NEEDS FOR DEVELOPMENT OF NONDESTRUCTIVE TESTING TECHNIQUES AND EQUIPMENT WERE SURVEYED AND ANALYZED TO RESOLVE PROBLEM AREAS FOR THE LIQUID-METAL FAST BREEDER REACTOR, THE MOLTEN-SALT BREEDER REACTOR AND THE ADVANCED GAS-COOLED REACTOR. THE REPORT DISCUSSES FIRST THE DEVELOPMENTAL NEEDS THAT ARE BROAD-BASED REQUIREMENTS IN NONDESTRUCTIVE TESTING AND THE RESPECTIVE METHODS AND APPLICABLE, IN GENERAL, TO ALL COMPONENTS AND REACTOR SYSTEMS. NEXT IN ORDER ARE THE REQUIREMENTS OF GENERIC MATERIALS AND COMPONENTS (E.G., STEAM GENERATORS) THAT ARE COMMON TO ALL REACTOR SYSTEMS. THESE ARE FOLLOWED BY SECTIONS SPECIFIC TO MATERIALS AND COMPONENTS PECULIAR TO EACH OF THE THREE CITED REACTOR SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR, GCR + *TEST, NONDESTRUCTIVE + REVIEW + MSBR (RE) + INSERVICE INSPECTION

9-109585 ALSO IN CATEGORY 18 DATED 1975
HILL MR
NONDESTRUCTIVE TESTING DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 30, 1975
OAK RIDGE NATIONAL LABORATORY
ORNL-5095 +. 55 PPS, 35 FIGS, 3 REFS, NOV. 1975

THE FABRICATION OF THE DRIVE SYSTEM FOR BORE-SIDE TUBE INSPECTION IS PROCEEDING ON SCHEDULE. AS A RESULT OF THE INITIAL INSPECTION TRIALS WITH A THREE-TRANSDUCER ULTRASONIC PROBE, MODIFICATIONS TO THE SYSTEM HAVE BEEN INITIATED. THE FAST BREEDER REACTOR DEPARTMENT'S EFFORTS ON THE CLINCH RIVER BREEDER REACTOR PROGRAM ARE DESCRIBED. STEAM GENERATORS - THE CURRENT EMPHASIS IN THIS PROGRAM IS THE DEVELOPMENT OF BORE-SIDE INSPECTION TECHNIQUES FOR THE TUBE-TO-TUBESHEET JOINTS AND TUBING. THE NEW MICROFOCUS ROD-ANODE X-RAY UNIT HAS ARRIVED FROM HOLLAND. BRIEF STUDIES WITH NONAQUEOUS ULTRASONIC COUPLANTS DEMONSTRATED FEASIBILITY. BOTH ULTRASONIC AND EDDY-CURRENT TECHNIQUES WERE USED TO DEMONSTRATE DETECTABILITY OF A SMALL LEAK IN A TUBE SECTION. BOTH THEORETICAL AND EXPERIMENTAL ULTRASONIC FREQUENCY ANALYSIS IS BEING FOLLOWED FOR QUANTITATIVE FLAW CHARACTERIZATION. CURRENT EFFORTS ARE BASED ON DIFFRACTION MODELS. SAMPLES ARE BEING PREPARED WITH KNOWN DISCONTINUITIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TEST, NONDESTRUCTIVE + R AND D PROGRAM + STEAM GENERATOR + TUBING + ULTRASONICS + CLINCH RIVER (LMFBR)

9-109592 ALSO IN CATEGORIES 6 AND 11 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1975
ARGONNE NATIONAL LABORATORY
ANL-RDP-44 +. 188 PPS, FIGS, OCT. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING EBR-2 OPERATIONS, LMFBR DESIGN SUPPORT, DEVELOPMENT OF LMFBR INSTRUMENTATION, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, ACCIDENT ANALYSIS, ENERGY AND ENVIRONMENTAL SYSTEMS, GCFR FUELS AND MATERIALS DEVELOPMENT, AND THE SAFETY RESEARCH EXPERIMENT FACILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + TESTING + DESIGN STUDY + SAFETY PROGRAM + REACTOR PHYSICS + R AND D PROGRAM + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

9-109928 ALSO IN CATEGORY 17 DATED 1974
CARLE R + MEGY J + ROBERT E + LABAT P
PHENIX STARTUP
ELECTRICITE DE FRANCE, PHENIX PROJECT
CONF-740401-P2 +. 11 PPS, PP. 1009-1020, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109928 *CONTINUED*
PHENIX 250 MW PROTOTYPE FAST REACTOR POWER STATION REACHED NOMINAL POWER ON MARCH 12, 1974. THIS PAPER DESCRIBES THE STARTUP TESTS WHICH BEGAN AT THE END OF 1972. BOTH ANTICIPATED SEQUENCING AND ACTUAL SEQUENCING ARE GIVEN FOR EACH PHASE OF THE TESTS. MAIN RESULTS AND ENCOUNTERED DIFFICULTIES ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + *REACTOR STARTUP EXPERIENCE + *REACTOR STARTUP

9-109929 ALSO IN CATEGORIES 12 AND 17 DATED 1974
PALAMIDESSI A
SAFETY DESIGN APPROACH TO THE PEC REACTOR
CNEN, BOLOGNA, ITALY
CONF-740401-P2 +. 20 PPS, PP. 1021-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN AND EVALUATION APPROACH USED TO ASSURE SAFETY IN THE PEC REACTOR IS DISCUSSED. SAFETY GOALS WERE ESTABLISHED TO GUIDE DESIGN AND TO PROVIDE ASSURANCE OF ADHERENCE WITH GENERAL SAFETY PRINCIPLES. SOME POSTULATED FAULTS ARE SURVEYED AND ENGINEERED SAFETY FEATURES AND PROTECTIVE SYSTEMS TO PREVENT THE ACCIDENTS OR MITIGATE THE CONSEQUENCES ARE DISCUSSED. THE EXTREMELY IMPROBABLE OR HYPOTHETICAL OCCURRENCES IN WHICH THE PROTECTIVE SYSTEMS ARE ASSUMED TO FAIL TO DERIVE DESIGN BASIS CONDITIONS ARE BRIEFLY DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + REACTOR PROTECTION SYSTEM + ACCIDENT, HYPOTHETICAL + DESIGN STUDY + *SAFETY EVALUATION + ENGINEERED SAFETY FEATURE + *ACCIDENT, ATWS

9-109931 ALSO IN CATEGORIES 12 AND 17 DATED 1974
YELLOWLEES JM + VIEIDER G + SACRISTE C
THE ENGINEERED SAFEGUARDS AND THEIR IMPLICATIONS FOR THE GBR-4 DESIGN
EUROPEAN ASSOCIATION FOR THE GAS BREEDER REACTOR, BRUSSELS
CONF-740401-P2 +. 13 PPS, PP. 1105-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DESCRIBES THE INHERENT SAFETY FEATURES AND ENGINEERED SAFEGUARDS OF A COMMERCIAL GAS-COOLED BREEDER REACTOR. THE RELIABILITY OF THE REACTOR, THE HEAT REMOVAL FROM THE CORE AND THE RADIOLOGICAL SAFEGUARDS ARE EMPHASIZED. THE CONCLUSION IS DRAWN THAT, USING CONVENTIONAL GAS-COOLED REACTOR ENGINEERING PRACTICE, THE GAS-COOLED BREEDER REACTOR CAN BE MADE AS SAFE AS ANY OTHER REACTOR SYSTEM WITHOUT LOSING ITS ECONOMIC COMPETITIVITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR, GCR + REACTOR PROTECTION SYSTEM + SAFETY EVALUATION + ENGINEERED SAFETY FEATURE

9-109934 ALSO IN CATEGORY 5 DATED 1974
CLARE AJ + EDARD SJ + HALL RS
STUDIES OF THE DEVELOPMENT OF COOLANT BOILING IN A FAST REACTOR
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, ENGLAND
CONF-740401-P3 +. 11 PPS, PP. 1161-72, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

INFORMATION OBTAINED ABOUT THE ONSET AND DEVELOPMENT OF COOLANT BOILING IN A FAST REACTOR IS OF CONSIDERABLE IMPORTANCE IN DETERMINING ITS ULTIMATE SAFETY CONSEQUENCES, AND IS ALSO ESSENTIAL AS AN AID TO QUANTIFYING THE DETECTABLE SIGNALS WHICH MAY BE GENERATED BY THE PROCESSES. EXPERIMENTS IN A WATER RIG ARE DESCRIBED WHICH AIM TO DEFINE THE TEMPERATURE DISTRIBUTION AROUND BLOCKAGES IN A PIN-CLUSTER, AND THE CONSEQUENT COOLANT BOILING PATTERNS. ANALYSIS OF THE DATA HAS SHOWN THE EFFECTS OF THE INTERACTION OF THE VAPOUR BUBBLES WITH THE FLOW AND TEMPERATURE FIELDS. THE REQUIREMENTS OF A COOLANT BOILING MODEL ARE DISCUSSED, INCLUDING THE EFFECT OF PERTURBATIONS SUCH AS THE RELEASE OF GAS FROM FAILED FUEL PINS. THE IMPLICATIONS OF THE PROGRAMME OF WORK ON REACTOR SAFETY, AND FAULT DETECTION, ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FLOW THEORY AND EXPERIMENTS + *NUCLEATE BOILING + *BOILING

9-109945 ALSO IN CATEGORY 12 DATED 1974
MORGENSTERN FH + BOCHHOLZ H + KRUGER H
DIVERSE SHUTDOWN SYSTEMS FOR THE KNK-1, KNK-2, AND SNR-300 REACTORS
INTERATOM, BENSBERG, WEST GERMANY
CONF-740401-P3 +. 20 PPS, PP. 1349-69, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE SITUATION OF KNK-1, IN WHICH A SECOND FAST ACTING SHUTDOWN SYSTEM WAS STRONGLY REQUIRED BY THE AUTHORITIES, WAS VERY UNFAVORABLE DUE TO THE ADVANCED STAGE OF CONSTRUCTION. THE AVAILABLE TIME COULD BE UTILIZED ONLY TO DEVELOP AND INSTALL A MECHANICAL SYSTEM. A SECOND SHUTDOWN SYSTEM WAS PREDETERMINED FOR KNK-2, WHICH HAS BEEN MODIFIED WITHIN THE MECHANICAL PART ONLY A LITTLE. THE AVAILABILITY OF A FUNCTIONING SYSTEM AND THE OPEN-ENDED DEVELOPMENT EXPENSES,

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109945 *CONTINUED*
OBVIOUS FROM STUDIES OF A LIQUID ABSORBER SYSTEM, RESULTED IN THE DECISION TO CONSIDER THE ALREADY DEVELOPED SYSTEM AS A BASIC DESIGN FOR THE SNR-300, TOO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN STUDY + GERMANY + *SHUTDOWN SYSTEM, SECONDARY + EQUIPMENT DEVELOPMENT

9-109946 ALSO IN CATEGORY 12 DATED 1974
CACHERA P + MARMONIER P + LADET J
CONSIDERATIONS RELATIVE TO A BACKUP SYSTEM
ELECTRICITY DE FRANCE
CONF-740401-P3 +. 8 PPS, PP. 1370-78, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE INTEREST OF A BACK-UP SYSTEM IS ANALYZED. A DESCRIPTION OF THE CLASSICAL SAFETY SYSTEM OF PHENIX IS GIVEN, AND THE SPECIFICATIONS OF A BACK-UP SYSTEM ARE LISTED. DIFFERENT POSSIBLE SOLUTIONS ARE EXAMINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + FRANCE + *DESIGN STUDY + *SHUTDOWN SYSTEM, SECONDARY

9-109947 ALSO IN CATEGORIES 12 AND 18 DATED 1974
NOYES RC + GILBERTSON JC
LMFBR ALTERNATE SHUTDOWN SYSTEMS - TEST EXPERIENCE AND GENERAL DESIGN CRITERIA
COMBUSTION ENGINEERING INC., WINDSOR, CONN.
CONF-740401-P3 +. 13 PPS, PP. 1379-92, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A BRIEF REVIEW OF THE HISTORY OF ALTERNATE SHUTDOWN SYSTEMS FOR LMFBR'S IS PRESENTED TOGETHER WITH A DISCUSSION OF THE RATIONALE USED IN DEVELOPING SIX PROPOSED GENERAL DESIGN CRITERIA FOR SUCH SYSTEMS. A REACTOR SHUTDOWN SYSTEM DEVELOPED AT COMBUSTION ENGINEERING, INC. IS DESCRIBED WHICH USES A MODIFIED EBR-II TYPE CONTROL ROD SYSTEM WITH A REDUNDANT SECOND SYSTEM SIMILAR TO FERMI SAFETY RODS EXCEPT THAT THE SCRAM MECHANISM IS PNEUMATICALLY ACTUATED. TEST RESULTS OF A MODEL OF THE PNEUMATIC SCRAM RELEASE MECHANISM OPERATED IN SODIUM AT 1100 F ARE GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + EBR 1 AND 2 (RE) + FERMI (LMFBR) + CONTROL ROD SCRAM MECHANISM + *SHUTDOWN SYSTEM, SECONDARY + REVIEW + EQUIPMENT DESIGN

9-109948 ALSO IN CATEGORIES 12 AND 18 DATED 1974
MCKEEHAN ER + SHAWVER BM
THE ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 7 PPS, PP. 1393-99, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

AN ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM IS DESCRIBED. THE SYSTEM BEING DEVELOPED IS FOR APPLICATION TO THE LIQUID METAL FAST BREEDER REACTOR (LMFBR) AND SERVES AS A BACKUP TO THE PRIMARY SHUTDOWN SYSTEM. THE SYSTEM IS DISCUSSED, AND COMPONENT DEVELOPMENT TESTS ARE OUTLINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SHUTDOWN SYSTEM, SECONDARY + *R AND D PROGRAM + EQUIPMENT DEVELOPMENT

9-109950 DATED 1974
SMIDT D + GAST K
SINGLE SUBASSEMBLY FAULT DETECTION SYSTEM-FUNCTIONAL REQUIREMENTS AND SHUT-OFF CRITERIA
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 14 PPS, PP. 1415-29, FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS, CALIF., APRIL 2, 1974

CONSIDERING POTENTIAL MODES OF SINGLE SUBASSEMBLY FAULT PROPAGATION, THE CRITICAL CHAIN OF EVENTS IS IDENTIFIED. SEVERAL STAGES OF FAULT DEVELOPMENT ARE DISTINGUISHED AND THE RELEVANT PHENOMENA ARE DISCUSSED WITH REGARD TO THEIR POTENTIAL OF CAUSING DAMAGE, THEIR TIME SCALE OF PROGRESSION AND METHODS OF DETECTION. PRELIMINARY FUNCTIONAL REQUIREMENTS ARE DERIVED FOR THE SUBASSEMBLY FAULT DETECTION SYSTEM. FINALLY, A SET OF ALARM AND SHUT-OFF CRITERIA IS PRESENTED AS AN EXAMPLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE, COMPONENT + DESIGN CRITERIA + FAILURE, FUEL ELEMENT + *INSTRUMENT, FAILED FUEL DETECTION + PROBABILITY

9-109951 ALSO IN CATEGORIES 12 AND 18 DATED 1974
VAN ERP JE + FAUSKE HK
ROLE AND DEVELOPMENT OF LMFBR PROTECTION SYSTEMS

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109951 *CONTINUED*
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 15 PPS. PP. 1430-45. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IT IS RECOMMENDED THAT A BALANCED APPROACH BE FOLLOWED WITH RESPECT TO RELIANCE ON (1) REACTOR SAFETY SHUTDOWN SYSTEMS (PLANT PROTECTION SYSTEMS), AND (2) ENGINEERED SAFEGUARDS, FOR PROTECTION OF PUBLIC HEALTH AND SAFETY: REACTOR SAFETY SHUTDOWN SYSTEMS, AS WELL AS ENGINEERED SAFEGUARDS (CONTAINMENT SYSTEMS, BLAST SHIELDS, POST-ACCIDENT-HEAT-REMOVAL SYSTEMS, ETC.) OF HIGH RELIABILITY AND PROVEN PERFORMANCE SHOULD BE PROVIDED FOR FAST BREEDER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR PROTECTION SYSTEM + RELIABILITY, SYSTEM + SHUTDOWN SYSTEM, SECONDARY + *ENGINEERED SAFETY FEATURE + PROBABILITY

9-109952 ALSO IN CATEGORY 18 DATED 1974
HIKIDO K + MEYER RA + REGIMBAL JJ
LMFBR SAFETY INSTRUMENTATION
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
CONF-740401-P3 +. 6 PPS. PP. 1446-51. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE STATUS OF LMFBR SAFETY INSTRUMENTATION IS REVIEWED WITH EMPHASIS ON IN-VESSEL SENSORS WHICH MAY BE EMPLOYED TO AVOID CONDITIONS LEADING TO POSSIBLE FUEL FAILURE PROPAGATION. FOCUS IS PLACED ON CORE-EXIT TEMPERATURE AND FLOW SENSORS, ACOUSTIC MONITORS, AND FEDAL EQUIPMENT PLANNED FOR FFTF AND THE CRBRP. SPECIAL EMPHASIS IS GIVEN TO POSSIBLE INSTRUMENTATION REQUIREMENTS BASED ON DATA FROM FAILED FUEL SWELLING MEASUREMENTS. ADDITIONAL DEVELOPMENT WORK RELATING TO INSTRUMENTATION REQUIRED FOR OPERATION WITH FAILED FUEL IS SUGGESTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*INSTRUMENT, IN CORE + *REACTOR PROTECTION SYSTEM + FFTF (TR) + INSTRUMENT, FAILED FUEL DETECTION + PROBABILITY + CLINCH RIVER (LMFBR)

9-109953 ALSO IN CATEGORIES 1 AND 18 DATED 1974
CAVE L
A COMPARATIVE STUDY OF THE SAFETY OF LIQUID METAL-COOLED AND GAS-COOLED FAST REACTORS
POLLUTION PREVENTION (CONSULTANTS) INC.
CONF-740401-P3 +. 28 PPS. PP. 1452-80. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE PRINCIPAL FEATURES OF THE METHOD USED IN THIS PAPER ARE AS FOLLOWS: (1) A QUANTITATIVE STANDARD OF SAFETY IS DEFINED WHICH IS COMMON TO BOTH SYSTEMS. (2) THE POSSIBILITY OF ATTAINING THIS STANDARD OF SAFETY IN EACH SYSTEM WITH FEASIBLE DESIGN FEATURES, LARGELY IRRESPECTIVE OF COST. (3) THE EFFECT OF SUBSTANTIAL CHANGES IN THE BASIC ASSUMPTIONS, INCLUDING THE STANDARD OF SAFETY REQUIRED ON DESIGN FEASIBILITY. (4) THE EFFECT ON SAFETY OF THE GENERATING COSTS AND DOUBLING TIMES PREDICTED FOR THE TWO SYSTEMS, TAKING INTO ACCOUNT FACTORS WHICH MAY LEAD TO DIFFERENCES IN AVAILABILITY. THE EFFECTS ON SAFETY OF THE DIFFERENCES BETWEEN THE MAIN VARIANTS OF EACH SYSTEM (I.E., 'POOL' AND 'LOOP' TYPE LMFBR; UPWARD AND DOWNWARD CORE FLOW GCFR) ARE EXAMINED BRIEFLY BUT THESE ARE FOUND TO BE UNIMPORTANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GCR + *COMPARISON, REACTOR CHARACTERISTICS + PROBABILITY

9-109954 ALSO IN CATEGORY 1 DATED 1974
CRAVERO M + LUCENET G
EVALUATION OF THE PROBABILITY OF AN AIRCRAFT CRASH ON A NUCLEAR POWER PLANT
ELECTRICITE DE FRANCE
CONF-740401-P3 +. 11 PPS. PP. 1481-92. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE LIQUID METAL FAST BREEDER REACTOR SUPER-PHENIX, (ELECTRICAL POWER 1200 MW) WHICH WILL BE BUILT AT CREYS-MALVILLE IN THE RHONE VALLEY MUST FOLLOW THE GUIDELINES GIVEN IN FRANCE FOR THE SAFETY OF THIS REACTOR. ONE OF THESE GUIDELINES IS TO EVALUATE THE RISKS IN RELATION WITH AIR TRAFFIC. CONSEQUENTLY, A STUDY OF THIS PROBLEM WAS BEGUN TO ESTIMATE THE PROBABILITY OF AN AIRCRAFT CRASH ON THE POWER PLANT SUPER-PHENIX, PARTICULARLY ON THE REACTOR BUILDING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + *ACCIDENT, HYPOTHETICAL + *AIRCRAFT + SAFETY EVALUATION + PROBABILITY

9-109962 ALSO IN CATEGORIES 6 AND 12 AND 18 DATED 1974
BURGSMULLER P + DEKAIS JJ + KRAHE A
GBR-4 PROTECTION SYSTEMS - FAILURES AND THEIR CONSEQUENCES
GAS-COOLED BREEDER REACTOR ASSOCIATION, BURSSELS, BELGIUM
CONF-740401-P3 +. 15 PPS. PP. 1603-18. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

CATEGORY 9
NUCLEAR INSTRUMENTATION, CONTROL, AND SAFETY SYSTEMS

9-109962 *CONTINUED*
IN THE GBR-4 DESIGN OF A GAS-COOLED FAST REACTOR, EMPHASIS IS PLACED ON USING TO ADVANTAGE THE SINGLE-PHASE CHARACTER OF THE COOLANT. SPECIFIC FEATURES OF THE PROTECTIVE SYSTEMS ARE FAIL-SAFE NEUTRON ABSORPTION, PERMANENTLY OPERATING AUXILIARY SUPPLIES AND ATMOSPHERIC PRESSURE COOLING. FOR TRANSIENT ANALYSIS A COMPUTER PROGRAM IS APPLIED USING A POINT REACTOR MODEL FOR HEAT TRANSFER AND NEUTRON KINETICS. A DYNAMIC STEAM GENERATOR CODE HAS BEEN EMPLOYED TO DESCRIBE SECONDARY SIDE EFFECTS. ANTICIPATED DISTURBANCES IN OPERATION ARE REACTIVITY INSERTION, LOSS OF SUPPLIES AND LOSS OF COOLANT PRESSURE. FOR THESE ACCIDENTS, FAILURES IN REACTOR PROTECTION ARE POSTULATED IN DECREASING ORDER OF PROBABILITY. THE CONSEQUENCES ARE ANALYSED AND DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR, GCR + *REACTOR KINETICS + REACTOR PROTECTION SYSTEM + STEAM GENERATOR + ENGINEERED SAFETY FEATURE

9-109998 ALSO IN CATEGORIES 11 AND 18 DATED 1975
MCELROY WN + BENNETT RA + JOHNSON DL
NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAM
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH. + ARGONNE NATIONAL LAB., ILLINOIS
HEDL-SA-911 + CONF-750935-7 +. 29 PPS, FROM 1ST ASTM-EURATOM SYMPOSIM ON REACTOR DOSIMETRY, DEVELOPMENTS AND STANDARDIZATION, PETTEN, THE NETHERLANDS, SEPT. 22, 1975

NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAMS ARE REVIEWED FOR THE U.S. LMFBR AND CTR PROGRAMS. PRESENTLY, THE MOST DEMANDING REQUIREMENTS ARE ASSOCIATED WITH THE DEVELOPMENT OF LMFBRS WHERE GOAL ACCURACIES IN THE RANGE OF 1 TO 3% HAVE BEEN REQUESTED FOR THE DETERMINATION OF NEUTRONICS PARAMETERS. CTR MATERIALS IRRADIATION STUDIES HAVE ONLY RECENTLY BEGUN IN EARNEST; CONSEQUENTLY, THE CURRENT DEMANDS UPON DOSIMETRY ARE MODEST, WITH PRECISION OF THE DATA TAKING PRECEDENCE OVER ACCURACY. IT IS EVIDENT THAT THE NEED FOR INTERNATIONAL STANDARDIZED AND WELL-DOCUMENTED PROCEDURES FOR NEUTRON ENVIRONMENTAL CHARACTERIZATION FOR LMRS, HTGRS, LMFBRS, AND CTRS WILL CONTINUE TO INCREASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MATERIAL + ENVIRONMENT + NEUTRON + PROPERTY, PHYSICAL + REVIEW + SURVEILLANCE PROGRAM + *REACTOR, THERMONUCLEAR

9-109999 ALSO IN CATEGORIES 5 AND 18 DATED 1976
FONTANA MH + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR APRIL-JUNE 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5076 +. 134 PPS, FIGS, REFS, JAN. 1976

A CODE WAS DEVELOPED FOR ANALYZING FLOW IN THE FFM LOOP DURING FLOW TRANSIENTS. AND ANALYSES ARE BEING MADE TO DETERMINE THE POWER TRANSIENTS THAT MUST BE PRODUCED IN THE ELECTRICAL HEATERS TO SIMULATE THE APPLICABLE NUCLEAR FLUX TRANSIENTS. AN EVALUATION WAS MADE OF ONE FLOW TRANSIENT TEST IN BUNDLE 3B (WITH A SIX-CHANNEL CENTRAL BLOCKAGE) IN WHICH SODIUM BOILING WAS INITIATED AND SUSTAINED IN THE BLOCKED CHANNELS DURING A 14-SEC PERIOD. THE ANALYSIS SHOWS THAT BOILING IN THE FIRST 6 IN. DOWNSTREAM OF THE BLOCKAGE APPEARS NEITHER TO HAVE SPREAD NOR TO HAVE INCREASED THE TEMPERATURES AT THE 2-IN AND 4-IN. LEVELS IN THE ADJACENT UNBLOCKED CHANNELS. THE EFFECTS OF ENTRAINED ARGON GAS ON ACOUSTIC INTENSITIES OF NUCLEATE SODIUM BOILING WERE INVESTIGATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + HEAT TRANSFER + ORNL + NOISE ANALYSIS + FLOW BLOCKAGE + *R AND D PROGRAM + FLOW + *BOILING + ACOUSTICS + TRANSIENT

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-105692 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.20 - POWER TRANSMISSION SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q222.20-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POWER TRANSMISSION SYSTEM IS DESIGNED AND ARRANGED TO MINIMIZE THE LIKELIHOOD OF A COMMON MODE FAILURE. THE PREFERRED AND THE RESERVE POWER SUPPLIES AS DESCRIBED IN SECTIONS 8.2.1.2 AND 8.2.1.3 ARE INDEPENDENT OF EACH OTHER IN THAT THEY TERMINATE IN DISTINCTLY SEPARATE SWITCHYARDS - THE GENERATING SWITCHYARD AND THE RESERVE SWITCHYARD. ELECTRICAL POWER FROM THE POWER GRID TO THE PLANT SITE IS SUPPLIED BY FOUR PHYSICALLY SEPARATE OFFSITE SOURCES DESIGNED AND LOCATED SO AS TO MINIMIZE THE LIKELIHOOD OF SIMULTANEOUS FAILURE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *REDUNDANCE + *INDEPENDENCE + *POWER TRANSMISSION + ON SITE + CLINCH RIVER (LMFBR)

10-105776 ALSO IN CATEGORY 18 DATED 1975
MARTIN MM + CLARK DL
ANALYSIS OF FAILED CATEGORY II ELECTRIC HEATERS THAT SIMULATE LMFBR FUEL PINS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4886 +. 54 PG., 4 TAB, 26 FIG, AUG. 1975

EXAMINATION OF PREMATURELY FAILED HIGH-PERFORMANCE ELECTRICAL HEATERS, WHICH SIMULATE LMFBR FUEL PINS, REVEALED THAT ALL HAD BEEN DAMAGED SIMILARLY DURING OPERATIONAL TESTING. FAILURE CULMINATED IN SEVERANCE OF THEIR HEATING ELEMENTS AND, IN MOST INSTANCES, PENETRATION OF THEIR TYPE 316 STAINLESS STEEL SHEATHS. THE PRINCIPAL REASON FOR INCIPIENT FAILURE WAS INADEQUATE TRANSFER OF HEAT FROM THE HEATING ELEMENT INTO THE SURROUNDING BORON NITRIDE INSULATION. ADVERSE PREFERRED ORIENTATION AND NUMEROUS LOW-DENSITY REGIONS REDUCED THE EFFECTIVE THERMAL PROPERTIES OF THE BORON NITRIDE INSULATION AND THEREBY CONTRIBUTED TO FAILURE OF THE HEATERS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE + HEAT TRANSFER + SIMULATION + FUEL ROD + *FAILURE, INCIPIENT + *HEATERS

10-105955 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.11 - POWER SOURCE OF THE AUXILIARY FEEDWATER SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q020.11-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BLENS & ROE

PROVIDES COMMENT ON THE REDUNDANCY AND DIVERSITY OF POWER SOURCE INCORPORATED INTO THE DESIGN OF THE AUXILIARY FEEDWATER SYSTEM (AFS) AS DESCRIBED IN BTP APCSB 10-1, 'DESIGN GUIDELINES FOR AUXILIARY FEEDWATER SYSTEM PUMP DRIVE AND POWER SUPPLY DIVERSITY FOR PRESSURIZED WATER REACTOR PLANTS'.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*STEAM + *ELECTRIC POWER + SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + REDUNDANCE + INDEPENDENCE + CLINCH RIVER (LMFBR) + *FEEDWATER

10-106794 ALSO IN CATEGORIES 1 AND 18 DATED 1[illegible]
RESPONSE TO QUESTION F9 - VALUE OF ELECTRICITY PRODUCED
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-282 OF AMENDMENT 1 TO CL[illegible]REEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE

A TOTAL GENERATION DURING THE DEMONSTRATION PERIOD OF APPROXIMATELY 9.5 BILLION KWH, BASED ON AN ASSUMED PLANT AVAILABILITY OF 55 PERCENT DURING THE DEMONSTRATION PERIOD, WHEN VALUED AT 4.9 MILLS/KWH, TOTALS NEARLY $47 MILLION OR AN AVERAGE OF $9.4 MILLION PER YEAR FOR A 5-YEAR PERIOD.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMICS + ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + COST BENEFIT + CLINCH RIVER (LMFBR)

10-106795 ALSO IN CATEGORIES 1 AND 18 DATED 1975
RESPONSE TO QUESTION F10 - VALUE OF ELECTRICITY PRODUCED ON TVA SYSTEM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-283 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AVERAGE COST OF ELECTRICITY PRODUCED ON THE TVA SYSTEM BY TVA GENERATING PLANTS IN FISCAL YEAR 1974 (JULY 1, 1973, THROUGH JUNE 30, 1974) WAS 4.929 MILLS/KWH INCLUDING DEPRECIATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-106795 *CONTINUED*
ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + TVA + CLINCH RIVER (LMFBR)

10-106801 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION G7 - TRANSMISSION LINE ROUTES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-303 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

IN GENERAL, AESTHETIC IMPACTS WERE MINIMIZED BY FOLLOWING APPLICABLE PORTIONS OF THE U.S. DEPARTMENT OF INTERIOR/AGRICULTURE PUBLICATION ENVIRONMENTAL CRITERIA FOR ELECTRIC TRANSMISSION SYSTEMS AND THE FEDERAL POWER COMMISSION PUBLICATION ELECTRIC POWER TRANSMISSION AND THE ENVIRONMENT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CABLES AND CONNECTORS + POWER TRANSMISSION + CLINCH RIVER (LMFBR)

10-106804 ALSO IN CATEGORIES 2 AND 18 DATED 1975
RESPONSE TO QUESTION G12 - MITIGATION OF CONSTRUCTION ACTIVITIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-305 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

DESCRIBES THE CONTROL PROGRAM INCLUDING PERIODIC REVIEW OF ALL CONSTRUCTION ACTIVITIES TO ASSURE THAT APPROPRIATE MITIGATING ACTIONS WILL BE TAKEN TO AVOID UNNECESSARY ADVERSE ENVIRONMENTAL IMPACTS DURING PLANT AND TRANSMISSION LINES CONSTRUCTION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ADMINISTRATIVE CONTROL + RESPONSE TO NRC QUESTION + EFFECT + CONSTRUCTION + CLINCH RIVER (LMFBR)

10-107073 ALSO IN CATEGORIES 2 AND 9 AND 11 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
127 PGS. AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

CONTAINS THE PROJECT'S SITE SUITABILITY SOURCE TERM FROM THE CRBRP PARALLEL DESIGN AND NEW AND REVISED PAGES TO THE PRELIMINARY SAR. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING RELIABILITY ANALYSIS, WEATHER DATA, SEISMIC RESPONSES DURING WASTE INJECTIONS, AND SODIUM FIRES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + DESIGN CRITERIA + RELIABILITY ANALYSIS + SEISMOLOGY + SITING, REACTOR + SOURCE, RADIATION + *REPORT, PSAR + ENGINEERED SAFETY FEATURE + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR)

10-107082 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 110.8 - SEISMIC QUALIFICATION OF ELECTRICAL EQUIPMENT
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS. PP. 110.8-1 THRU 110.8-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

IEEE 344-1975, 'IEEE RECOMMENDED PRACTICES FOR SEISMIC QUALIFICATION OF CLASS IE EQUIPMENT FOR NUCLEAR POWER GENERATING STATIONS' WILL BE USED AS DESCRIBED IN SECTION 3.10.1 FOR SEISMIC QUALIFICATION BY TESTING OF CLASS 1 ELECTRICAL EQUIPMENT. THE QUALIFICATION TESTS WILL BE BASED ON SINGLE FREQUENCY SINE BEAT TESTING AT RESONANCE. THIS CONSTITUTES SEVERE TESTING UNDER THE MOST UNFAVORABLE CONDITIONS WHERE A MEASURED EQUIPMENT NATURAL FREQUENCY HAS BEEN CONSERVATIVELY ASSUMED TO COINCIDE WITH A BUILDING OR SUPPORTING SYSTEM NATURAL FREQUENCY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CODES AND STANDARDS + *TESTING + ELECTRIC POWER + RESPONSE TO NRC QUESTION + *EQUIPMENT + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

10-107085 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.23 - DIESEL GENERATOR CAPABILITIES
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, 2 FIGS, PP. 222.23-1 THRU 222.23-4 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURVES INDICATING VARIATION OF LOAD AT DIFFERENT TIME PERIODS FOR EACH DIESEL GENERATOR ARE PROVIDED IN FIGURES Q222.23-1 AND Q222.23-2. SINCE THE DIESEL GENERATORS HAVE NOT BEEN PURCHASED, THE VARIATION OF VOLTAGE AND FREQUENCY VS. TIME CANNOT BE FURNISHED AT THIS TIME.

CATEGORY 10
ELECTRICAL POWER SYSTEMS

10-107085 *CONTINUED*
HOWEVER, THESE CURVES WILL BE FURNISHED SUBSEQUENT TO PURCHASE OF THE DIESELS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + ENGINES, INTERNAL COMBUSTION + *GENERATOR, DIESEL

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-093086 DATED 1974
JOHNSON RA + SCHROCK SL + WHITLOW GA
WEAR RESISTANT COATINGS FOR REACTOR COMPONENTS IN LIQUID SODIUM ENVIRONMENTS
WESTINGHOUSE ELECTRIC CORPORATION
HEDL-SA-651 + CONF-740103-3 +. 27 PAGES, PRESENTED AT CON. ON STRUCTURE-PROPERTY RELATIONSHIPS IN THICK FILM AND BULK COATINGS, HELD IN SAN FRANCISCO, CALIF., JAN. 28, 1974

RUBBING SURFACES OF CRITICAL COMPONENTS FOR THE LMFBR MUST WITHSTAND HIGH TEMPERATURE, LIQUID-METAL CORROSION, AND NUCLEAR IRRADIATION. FOR SOME COMPONENTS, THE BETTER KNOWN BEARING MATERIALS AND HARDFACINGS HAVE BEEN INADEQUATE OR IMPRACTICAL. FOR SEVERAL APPLICATIONS, BULK COATINGS HAVE PROVIDED THE ONLY SUCCESSFUL SOLUTION TO THE FRICTION PROBLEMS. COATING PROCESSES THAT HAVE BEEN OR ARE BEING EVALUATED INCLUDE PLASMA SPRAY, DETONATION GUN, SPARK-DISCHARGE, SPUTTERING, AND DIFFUSION COATING PROCESSES. FOR ONE SEVERE APPLICATION, A SPECIALLY MODIFIED COMMERCIAL COATING OF CHROMIUM CARBIDE IN A 15 VOLUME PERCENT NICHROME BINDER, APPLIED BY A COMMERCIAL DETONATION GUN PROCESS, HAS SO FAR BEEN FOUND MOST ACCEPTABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + RADIATION DAMAGE + CHROMIUM + CORROSION + HIGH TEMPERATURE + COATING + COMPONENTS + LIQUID + BEARING

11-093082 DATED 1974
SCOTT JH + CULLEY GE + HUNTER CW
MICROSTRUCTURAL DEPENDENCE OF FAILURE IN MIXED-OXIDE LMFBR FUEL PINS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-701 + CONF-740401-6 +. 29 PAGES, PRESENTED AT THE CONFERENCE ON FAST REACTOR SAFETY, HELD IN BEVERLY HILLS, CALIF., APRIL 2, 1974

ANALYSES OF MIXED OXIDE FUELED FAST REACTOR OVERPOWER TRANSIENTS HAVE SHOWN THAT TIME AND LOCATION OF INITIAL FUEL PIN FAILURE MAY HAVE AN IMPORTANT EFFECT ON THE ACCIDENT PROGRESSION. THE MORE RECENT TESTS AT ANL AND HEDL HAVE BEEN FOCUSED ON BEHAVIOR OF FTR PROTOTYPIC FUEL PINS IRRADIATED IN EBR-II. THIS PAPER REVIEWS EXPERIMENTAL DATA FROM THE TESTING OF FUEL PINS IN-REACTOR AND THE TESTING OF IRRADIATED CLADDING SPECIMENS EX-REACTOR AND PROPOSES AN EMPIRICAL CORRELATION CONSISTENT WITH EXPERIMENTAL EVIDENCE TO DATE. THIS CORRELATION RELATES FAILURE THRESHOLDS TO FUEL MICROSTRUCTURES AND LOCAL CLADDING CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OXIDE + IRRADIATION TESTING + FAILURE, CLADDING + FUEL ROD + FTR (TR)

11-093107 ALSO IN CATEGORY 18 DATED 1973
LACROIX R + MAGNAS JP
CIVIL ENGINEERING AND THE PHENIX POWER PLANT
SOCIETE GENERALE D'ENTREPRISES, PARIS
5 PAGES, TECH. MOD., 65(10), PP. 33-37 (OCTOBER 1973) (IN FRENCH)

THE PRINCIPAL CHARACTERISTICS OF THE CONSTRUCTION WORK UNDERTAKEN FOR THE PHENIX PLANT ARE LINKED TO THE TIME CONSTRAINTS IMPOSED (THE PRELIMINARY WORK WAS DRAWN UP AND OPTIONS TAKEN IN A VERY SHORT TIME DURATION), TO THE PROTOTYPE NATURE OF THE PLANT, TO THE VERY DIFFICULT ORGANIZATION PROBLEMS OCCURRING, AND TO THE NUCLEAR NATURE OF THE PLANT. PREFABRICATED CONSTRUCTIONS HAVING DIFFERENT CHARACTERISTICS AND LEAK TIGHTNESS PROPERTIES WERE USED FOR THE TWO PRINCIPAL BUILDINGS (REACTOR BUILDING AND EQUIPMENT HANDLING BUILDING). THE WAY IN WHICH LEAK TIGHTNESS PROBLEMS WERE OVERCOME AND THE PERFORMANCE OBTAINED ARE DISCUSSED.

FRANCE + BUILDING + CONSTRUCTION

11-093118 DATED 1973
CAVE L
FUTURE PROSPECTS FOR THE PRESTRESSED CONCRETE REACTOR VESSEL
POLLUTION PREVENTION LTD., CRAWLEY, ENGLAND
34 PAGES, AT. ENERGY REV., 11(2), PP. 305-339 (1973)

THE EMERGENCE OF THE HTR, EMBODYING THE PRESTRESSED CONCRETE PRESSURE VESSEL (CPV) CONCEPT, AS A COMPETITOR TO OTHER THERMAL REACTOR TYPES RAISES THE QUESTION WHETHER AN INCREASING PROPORTION OF REACTORS WILL USE CPVS. THE VARIOUS FACTORS THAT COULD LEAD TO THE USE OF CPVS FOR LWRS, THE FEASIBILITY OF STEEL VESSELS BEING USED FOR LARGE GCRS AND THE EFFECTS ON COST OF A CHANGE IN VESSEL MATERIAL IN EACH CASE ARE DISCUSSED. IT IS CONCLUDED THAT ALTHOUGH THESE CHANGES OF VESSEL MATERIAL ARE TECHNICALLY FEASIBLE, THEY ARE UNLIKELY TO OCCUR IN EITHER THE LWRS OR GCRS, ALTHOUGH CIRCUMSTANCES ARE IDENTIFIED IN WHICH SUCH CHANGES WOULD BECOME MORE LIKELY. CONSEQUENTLY THE FUTURE PROSPECTS OF THE CPV DEPEND MAINLY ON THE SUCCESS OF THE HTR IN COMPETITION WITH THE LWRS AND THE SUCCESS OF THE GCFR IN COMPETITION WITH THE LMFBR.

CONCRETE, PRESTRESSED + REACTOR, HTGR + FORECAST + PRESSURE VESSELS

11-093141 DATED 1973
MCLENNAN GA
PROPOSED METHOD FOR INCLUDING CREEP AND SWELLING IN THE ANALYSIS OF LMFBR DUCTS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-73-20 +. 54 PAGES, SEPTEMBER 1973

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-093141 *CONTINUED*
AT THE CORE RESTRAINT ANALYSIS MEETING AT WESTINGHOUSE IN AUG. 1973, ANL WAS DIRECTED TO PROCEED WITH DEVELOPMENT OF A 3-DIMENSIONAL NON-LINEAR ELASTIC CODE FOR ANALYSIS OF LMFBR CORE RESTRAINT SYSTEM. IN THIS PAPER ANL PROPOSES THE NUBOW CODE AND DESCRIBES ITS CHARACTERISTICS. FIRST, THERE IS A BRIEF DESCRIPTION OF THE CAPABILITIES OF THE CODE, FOLLOWED BY A DESCRIPTION OF THE THEORY AND METHODS TO PROVIDE A 2-DIMENSIONAL CREEP AND SWELLING CAPABILITY. NEXT EXTENDING THE CAPABILITY FOR 3-DIMENSIONAL EFFECTS IS DISCUSSED. THE LAST SECTION OF THE REPORT DESCRIBES UTILIZATION OF SUPERPOSITIONING THE COMPONENTS OF LOADS, DEFLECTIONS, STRESSES, ETC. FOR BEAMS IN 3-DIMENSIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + ANALYTICAL TECHNIQUE + CORE COMPONENTS + CREEP

11-093156 ALSO IN CATEGORY 18 DATED 1973
KOBAYASHI Y + KONDO S + TOGO Y
DESIGN AND OPTIMIZATION STUDY OF 10,000 MW(E) VERY LARGE FAST REACTOR CORE
12 PAGES, J. NUCL. SCI. TECHNOL. (TOKYO), 10(10), PP. 607-618 (OCT. 1973)

THE METHOD AND RESULTS OF A DESIGN STUDY ON A 10,000 MW(E) LIQUID METAL FAST BREEDER REACTOR ARE DESCRIBED. FIRST, A REFERENCE DESIGN WAS OBTAINED BY EXTRAPOLATING VARIOUS CHARACTERISTICS OF A 1,000 MW(E) LMFBR. IT WAS FOUND THAT REACTIVITY INCREASE COULD BE REDUCED TO ABOUT 6 CENTS WHEN SEVEN SUB-ASSEMBLIES WERE VOIDED IN THE CNETRAL PART OF THE CORE, AND THAT THE INCREASE OF REACTIVITY AND THE DECREASE OF BREEDING RATIO WITH TIME WERE LARGE FOR THE INITIAL LOADING CORE. A DESIGN OPTIMIZATION PROCEDURE WAS DEVELOPED BASED ON A COMPLEX METHOD OF NONLINEAR PROGRAMMING, AND THE METHOD WAS APPLIED TO THE VERY LARGE FAST REACTOR. THE PROOCESS RESULTED IN A RELATIVELY LARGE CORE HEIGHT AND FUEL PIN DIAMETER, WHILE POWER COST WAS IMPROVED DUE TO ENHANCED BREEDING GAIN. THE FUEL CENTER TEMPERATURE AND THE COOLANT VELOCITY WERE FOUND CLOSE TO THE UPPER BOUNDARIES OF THEIR PRESCRIBED RANGES.

COMPUTER PROGRAM + DESIGN CRITERIA + REACTOR, LARGE + DESIGN STUDY + CORE COMPONENTS + MATHEMATICAL TREATMENT + OPTIMIZATION + POWER PLANT, NUCLEAR

11-093613 ALSO IN CATEGORY 9 DATED 1974
QUARTERLY TECHNICAL PROGRESS REPORT FUELS, MATERIALS, AND CONTROL ROD DEVELOPMENT PROGRAMS, JULY-SEPTEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13137 +, 29 PAGES, 10 TABLES, 3 FIGURES, NOVEMBER 15, 1974

REPORTS ON THE FOLLOWING TOPICS: (1) IRRADIATION DAMAGE IN CLADDING AND CORE STRUCTURAL MATERIALS; (2) HELIUM GENERATION IN REACTOR MATERIALS; AND (3) ABSORBER STUDIES, HEATING EXPERIMENTS, AND DESIGN STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + RADIATION DAMAGE + STEEL, STAINLESS + R AND D PROGRAM + RADIATION EFFECT + EQUIPMENT DEVELOPMENT + FUEL, NUCLEAR + CONTROL RODS

11-093647 DATED 1974
HILL MR
MECHANICAL PROPERTIES TEST DATA FOR STRUCTURE MATERIALS QUARTERLY PROGRESS REPORT FOR PERIOD ENDING OCTOBER 31, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5103 +, 380 PAGES, FIGURES, REFERENCES, DECEMBER 1974

DISCUSSES THE FOLLOWING TOPICS: LOW CYCLE FATIGUE BEHAVIOR OF SMA TYPE 304/308 STAINLESS STEEL WELDMENTS, INCONEL 718 CODE CASE AND RELATED INVESTIGATIONS, FRACTURE AND FATIGUE STUDIES ON STAINLESS STEELS, IRRADIATION DAMAGE TO REACTOR METALS, MATERIALS PERFORMANCE AND SURVEILLANCE, FATIGUE CRACK GROWTH IN TYPE 316 STAINLESS STEEL, FRACTURE RESISTANCE OF TYPE 304 STAINLESS STEEL AND TYPE 308 WELD DEPOSIT, MECHANICAL PROPERTIES AND BEHAVIOR FOR STRUCTURAL MATERIALS, MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS FOR LMFBR, MECHANICAL PROPERTIES OF STEAM GENERATOR MATERIALS, BASIC SPECIMEN TESTING, AND TUBULAR SPECIMEN TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

WELDS + STEEL, STAINLESS + MATERIAL + IRRADIATION TESTING + FAILURE, FATIGUE + PROPERTY, PHYSICAL + REVIEW + SUPPORT STRUCTURE + R AND D PROGRAM + STEAM GENERATOR

11-093648 ALSO IN CATEGORY 18 DATED 1974
SODIUM TECHNOLOGY AND COVER GAS SEAL DEVELOPMENT PROGRAMS ANNUAL TECHNICAL PROGRESS REPORT, GOVERNMENT FISCAL YEAR 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13132 +, 296 PAGES, 127 FIGURES, AUGUST 15, 1974

PROJECT CONSISTS OF 3 TASKS. THE OBJECTIVE OF TASK 1 IS TO CONDUCT FRICTION SCREENING TESTS IN AN ENVIRONMENT OF HIGH-TEMPERATURE, HIGH-PURITY LIQUID SODIUM OR SODIUM VAPOR TO DEVELOP BACKUP MATERIALS, PROCESSES, AND VENDORS FOR CORE COMPONENT WEAR PADS. THE OBJECTIVES OF TASK 2 ARE TO

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-093648 *CONTINUED*
DEVISE, DEVELOP, TEST, AND EVALUATE TECHNIQUES FOR SODIUM REMOVAL AND STORAGE OF TEST SPECIMENS AND COMPONENTS, AND TO EXPAND AND REFINE, BY TEST AND ANALYSIS, THE SODIUM REMOVAL AND STORAGE TECHNIQUES AND PROCEDURES FOR USE IN PROCESSING TYPICAL LMFBR COMPONENTS. THE OBJECTIVES OF TASK 3 ARE TO (1) CONDUCT STATIC AND DYNAMIC TESTS TO DEMONSTRATE OR DETERMINE THE MECHANICAL PERFORMANCE OF FULL-SIZE (CROSS SECTION) FFTF FUEL TRANSFER MACHINE AND REACTOR VESSEL HEAD SEALS INTENDED FOR USE IN A SODIUM VAPOR - INERT GAS ENVIRONMENT, (2) DEMONSTRATE THAT THESE FFTF SEALS OR NEW SEAL CONFIGURATIONS PROVIDE ACCEPTABLE FISSION PRODUCT AND COVER GAS RETENTION CAPABILITIES AT CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) OPERATING ENVIRONMENTAL CONDITIONS OTHER THAN RADIATION, AND (3) DEVELOP IMPROVED SEALS AND SEAL TECHNOLOGY FOR THE CRBRP TO SUPPORT THE NATIONAL OBJECTIVE TO REDUCE ALL ATMOSPHERIC CONTAMINATIONS TO LOW LEVELS

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FFTF (TR) + FASTENER + MATERIAL + SEAL + COMPONENTS + R AND D PROGRAM + EQUIPMENT DEVELOPMENT + CLINCH RIVER (LMFBR)

11-093655 ALSO IN CATEGORIES 6 AND 18 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-33 +, 142 PAGES, FIGURES, DECEMBER 6, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

11-093656 ALSO IN CATEGORIES 6 AND 18 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, SEPTEMBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-32 +, 160 PAGES, FIGURES, NOVEMBER 1, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

11-093659 DATED 1974
BISHOP EC
VALIDATION OF HIGH TEMPERATURE DESIGN METHODS AND CRITERIA QUARTERLY PROGRESS REPORT FOR PERIOD ENDING AUGUST 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-HT-3045-7 +, 170 PAGES, 61 FIGURES, 21 TABLES, NOVEMBER 1974

BASIC SPECIMEN TESTING WAS CONTINUED. A LOADING SEQUENCE WAS DEFINED FOR A STEP-LOADING TEST IN THE TUBULAR SPECIMEN TASK AND CRITERIA WERE ESTABLISHED TO DEFINE THE TERTIARY CREEP STAGE. IT WAS DECIDED THAT FAILURE TESTS SHOULD BE INCLUDED IN THE 316 STAINLESS STEEL TEST PROGRAM TO FOLLOW CURRENT 304 STAINLESS STEEL TESTING. MLTF TEST STRAND FABRICATION IS 85% COMPLETE AND FINAL MACHINING OF THE FIRST ELBOW TEST SECTION COMPONENTS WAS INITIATED. TEST SECTION FABRICATION WAS CONTINUED AT FWC ALTHOUGH DELAYS WERE EXPERIENCED IN RECEIPT OF TEST NOZZLES FROM THE FWC SUBCONTRACTOR. A DETAILED PACKAGE HAS BEEN COMPILED OF BASIC SPECIMEN CREEP TEST MEASUREMENTS MADE ON FLAT UNIAXIALLY LOADED PLANE STRESS SPECIMENS, PLATES WITH END RESTRAINTS, AND PLANE STRAIN SPECIMENS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + TESTING + WELDS + STEEL, STAINLESS + CREEP BEHAVIOR + HIGH TEMPERATURE + PLASTICITY + STRESS STRAIN DATA + R AND D PROGRAM

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-094072 ALSO IN CATEGORY 18 DATED 1974
KUCZERA B
SIMULATION OF TRANSIENT LMFBR-FUEL PIN BEHAVIOUR UNDER CONSIDERATION OF CERTAIN BURNUP PHENOMENA
KERNFORSCHUNGSZENTRUM, INSTITUT FUR REAKTORENTWICKLUNG, KARLSRUHE, F.R. GERMANY
EURFNR-1184 + KFK-1964 *. 113 PAGES, 4 TABLES, 28 FIGURES, 98 REFERENCES, MARCH 1974

THE EFFECTS CONSIDERED ARE STEADY STATE FUEL SWELLING, CHANGE IN FUEL POROSITY, AND PRODUCTION AND PARTIAL RELEASE OF FISSION GASES. IRRADIATION DEPENDENT CHANGES OF THE CLADDING MATERIAL PROPERTIES ARE DISCUSSED TOGETHER WITH THE FUEL PIN FAILURE CRITERIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FISSION GAS RELEASE + FUEL BURNUP + GERMANY + PROPERTY, PHYSICAL + RADIATION EFFECT + FUEL SWELLING + FUEL ELEMENTS

11-097673 DATED 1974
STEICHEN JM
EFFECT OF THERMAL AGING ON THE HIGH STRAIN RATE TENSILE PROPERTIES OF TYPE 304 STAINLESS STEEL
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-38 *. 25 PAGES, 8 FIGURES, 12 REFERENCES, JULY 1974

THE INFLUENCE OF THERMAL AGING AT 800, 1000, AND 1200 F ON THE HIGH STRAIN RATE TENSILE PROPERTIES OF TYPE 304 STAINLESS STEEL HAS BEEN EXPERIMENTALLY DETERMINED. SPECIMENS WERE AGED IN STATIC SODIUM FOR EXPOSURES OF 1000, 3500 AND 10,000 HOURS. AGING AT TEMPERATURES TO 1000 F DID NOT ALTER THE ELEVATED TEMPERATURE STRENGTH, DUCTILITY, OR STRAIN RATE SENSITIVITY OF THE SUBJECT MATERIAL. AGING AT 1200 F DID NOT ALTER THE 1200 F STRENGTH PROPERTIES OF TYPE 304 STAINLESS STEEL; HOWEVER, DUCTILITY WAS INCREASED AT THE LOWEST STRAIN RATES AND SLIGHTLY REDUCED AT THE HIGHER TEST RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TENSILE PROPERTY + TESTING + STEEL, STAINLESS + THERMAL CONSIDERATION + THERMAL PROPERTY + STRESS STRAIN DATA + EXPERIMENT + R AND D PROGRAM

11-098944 ALSO IN CATEGORY 17 DATED 1973
KING GA
METALLURGICAL ANALYSIS OF FAILED SCTI THERMOWELL NO. TR-104-62E
LIQUID METAL ENGINEERING CENTER, CANOGA PARK, CALIF.
LMEC-TDR-73-2 *. 75 PAGES, 42 FIGURES, JANUARY 15, 1973

A SODIUM FIRE OCCURRED AT THE SCTI ON AUGUST 5, 1972 BECAUSE OF SODIUM LEAKAGE THROUGH A THERMOWELL LOCATED IN THE PRIMARY SODIUM INLET TO THE SCTI-IHX. THE THERMOWELL FAILED WITH THE SYSTEM OPERATING AT APPROXIMATELY 32% POWER LEVEL WITH SODIUM FLOWING AT APPROXIMATELY 1800 GPM AT A TEMPERATURE OF 850 F. THE FAILED THERMOWELL (TR-104-62E) WAS ONE OF TWO LOCATED ON AN 8-IN. BY 10-IN. STAINLESS STEEL PIPE REDUCER DOWNSTEAM OF, AND ADJACENT TO, AN 8-IN. BUTTERFLY VALVE (FRC-100V1) IN THE IHX PRIMARY SODIUM INLET. METALLURGICAL ANALYSIS REVEALED THAT THE FAILURE WAS A RESULT OF HIGH-CYCLE, LOW-AMPLITUDE FATIGUE AT THE TRANSITION RADIUS BETWEEN THE THERMOWELL STEM AND THE THERMOWELL SUPPORT. FAILURE WAS ATTRIBUTED TO VIBRATIONAL LOADING CONDITIONS WHICH WERE EXCESSIVE FOR THE PART CONFIGURATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE + FIRE + OUT OF PILE EXPERIMENT + EXPERIMENT + LEAK + HEAT EXCHANGERS

11-099299 ALSO IN CATEGORY 6 DATED 1974
HESS AL + THALGOTT FW
SPECIFICATIONS AND RESULTS OF A DESIGN-BASIS-ACCIDENT CALCULATION FOR ZPPR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7471(ADD. 1) *. 26 PAGES, 4 FIGURES 4 REFERENCES, SEPTEMBER 1974

THIS REPORT DOCUMENTS AN ANALYSIS CARRIED OUT FOR AN EXCURSION OF MORE SERIOUS CONSEQUENCES FOR A 6000-LITER, TWO-ZONE CORE, SIMULATING AN LMFBR FUELED WITH A UO(SUB 2)-PUO(SUB 2) MIXTURE AND USING A MORE TOXIC PLUTONIUM ISOTOPIC MIXTURE. POSTULATIONS AND PROCEDURES USED IN THE ANALYSIS WERE THE SAME AS PRESCRIBED FOR THE DBA IN THE FSAR. ALTHOUGH THE NEW OFF-STIE DOSE CALCULATED IS HIGHER BY A FACTOR OF SEVEN THAN THE DOSE IN THE FSAR DBA, IT IS STILL A FRACTION OF THE AEC-PERMITTED OCCUPATIONAL BURDEN. FURTHERMORE, THE ANALYSIS CONFIRMS THE CAPABILITY OF THE CONTAINMENT STRUCTURE FOR A MORE ENERGETIC EXCURSION THAN IN THE FSAR DBA, AND SHOWS AGAIN THAT OPERATION OF THE ZPPR POSES NO UNACCEPTABLE RISK.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + ACCIDENT, CONSEQUENCES + CRITICAL ASSEMBLY + PLUTONIUM + EXCURSION, LARGE + ZPPR (CAF)

11-099313 DATED 1973
FRENCH JW
CORE RESTRAINT DEVELOPMENT-QUARTERLY PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1973
WESTINGHOUSE ELECTRIC CORPORATION

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-099313 *CONTINUED*
WARD-CR-3045-2 +. 25 PAGES, 12 FIGURES, JULY 1973

THIS REPORT COVERS WORK ON DEVELOPMENT OF A CORE RESTRAINT SYSTEM FOR THE LMFBR PROGRESS IS REPORTED ON ALL FACETS OF THE JCE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CORE COMPONENTS + R AND D PROGRAM

11-099344 ALSO IN CATEGORY 18 DATED 1974
CHASTAIN SA + AREY TT + HENDERSON RG
FABRICATION, IRRADIATION, AND POSTIRRADIATION EXAMINATION OF MIXED OXIDE FUEL PIN PNL-3-8
HANFORD ENGINEERING DEVELOPMENT LABORATORY, RICHLAND, WASHINGTON
HEDL-TME 74-37 +. 55 PAGES, 16 TABLES, 20 FIGURES, JULY 1974

PRESENTS A COMPILATION OF DESIGN, SPECIFICATION AND FABRICATION DATA, ALONG WITH A DETAILED DESCRIPTION OF THE IRRADIATION AND RESULTS OF POST-IRRADIATION EXAMINATION OF FUEL PIN PNL-3-8. THE PIN OPERATED AT A PEAK LINEAR POWER OF 4.82 KW/FT AND THE PEAK CLADDING TEMPERATURE WAS 820 F. EXAMINATION REVEALED NO SIGNIFICANT DAMAGE OR DETERIORATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + IRRADIATION TESTING + R AND D PROGRAM + FUEL ROD + RADIATION EFFECT

11-099493 DATED 1975
BLUCM EE + LEITNAKER JM + STIEGLER JO
EFFECT OF NEUTRON IRRADIATION ON THE MICROSTRUCTURE AND PROPERTIES OF TITANIUM-STABILIZED TYPE 316 STAINLESS STEELS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4731 +. 20 PAGES, 7 TABLES, 23 REFERENCES, JANUARY 1975

THE EFFECTS OF TITANIUM ADDITIONS UP TO 0.6 WT % ON THE IRRADIATION-INDUCED SWELLING AND CHANGES IN CREEP-RUPTURE PROPERTIES WERE INVESTIGATED. SAMPLES WERE IRRADIATED IN THE EBR-II. IN ANNEALED MATERIAL, THE IRRADIATION-INDUCED SWELLING EXHIBITED A MINIMUM IN THE RANGE 0.2-0.4 WT % TI. THE MINIMUM IN SWELLING WAS DIRECTLY ATTRIBUTABLE TO A MINIMUM IN THE CONCENTRATION OF VOIDS. THE OBSERVED SWELLING BEHAVIOR IN THE ANNEALED MATERIAL IS THOUGHT TO BE ASSOCIATED WITH CHANGING AMOUNTS OF TITANIUM AND CARBON IN SOLUTION IN THE AUSTENITE AS THE TOTAL TITANIUM CONCENTRATION IS INCREASED. THE IMPROVED DUCTILITY IS ATTRIBUTABLE TO A DECREASED TENDENCY FOR GRAIN BOUNDARY CRACK FORMATION AND APPEARS TO BE ASSOCIATED WITH REMOVAL OF SULFUR AND POSSIBLY OTHER IMPURITIES FROM SOLUTION IN THE AUSTENITE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EBR 1 AND 2 (RE) + TITANIUM + STEEL, STAINLESS + SULFUR + CREEP PROPERTY + IRRADIATION TESTING + PROPERTY, PHYSICAL + STRESS RUPTURE + IMPURITY

11-099502 DATED 1974
BLEIBERG ML + ROWCLIFFE AF
BASIS FOR FE-CR-NI EXPERIMENTAL ALLOY DEVELOPMENT PROGRAM FOR LMFBR
WESTINGHOUSE ELECTRIC CORPORATION
WARD-AD-3045-1 +. 34 PAGES, 7 FIGURES, 30 REFERENCES, NOVEMBER 1974

A REVIEW WAS MADE OF THE PARAMETERS AND MECHANISMS WHICH HAVE BEEN EXPERIMENTALLY DEMONSTRATED OR THEORETICALLY PREDICTED TO INFLUENCE SWELLING. ALTHOUGH THE EXPERIMENTAL DATA ARE MINIMAL AND THE CURRENT THEORIES INADEQUATE, A BASIS FOR THE ALLOY COMPOSITIONS WAS DEVELOPED. THE SELECTED COMPOSITIONS WILL PROVIDE BASIC INFORMATION ON THE INFLUENCE OF COMPOSITION, MINOR ELEMENTS, SUBSTITUTIONAL SOLUTE ADDITIONS, AND PRECIPITATES ON SWELLING AND IRRADIATION CREEP IN FE-CR-NI ALLOYS. ALSO, THEY WILL ASSIST IN UNDERSTANDING THE IRRADIATION BEHAVIOR OF COMMERCIAL ALLOYS. THESE ALLOYS HAVE POTENTIAL FOR DEVELOPMENT AS SUITABLE ALLOYS, NOT ONLY IN REGARD TO SWELLING, BUT ALSO FOR OPTIMUM MECHANICAL PROPERTIES AND SODIUM COMPATIBILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ALLOY + CHROMIUM + NICKEL + STEEL, STAINLESS + IRON + CORRELATION + PROPERTY, PHYSICAL + INCONEL + R AND D PROGRAM + PROPERTY, MECHANICAL

11-099636 ALSO IN CATEGORY 18 DATED 1974
RAY WE
SODIUM TECHNOLOGY PROGRAM COMPONENT MATERIALS COMPATIBILITY - QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-15 +. 40 PAGES, 15 FIGURES, NOVEMBER 1974

ONE OF A SERIES. CARBON EQUILIBRIUM LOOPS 1 AND 2 (CEL-1 AND -2) CONTINUED TO RUN. WORK WAS RESUMED ON THE INTERMEDIATE HEAT TRANSPORT SYSTEM SIMULATION. RUN ITF-4 WAS TERMINATED AFTER

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-099636 *CONTINUED*
1500 HRS OF OPERATION. CORROSION AND CARBON LOSS DATA FOR THE SPECIMENS ARE TABULATED. INCONEL 718 WAS RECEIVED AND CUT INTO BARS FOR TENSILE TESTS. TYPE 316 STAINLESS STEEL WAS RECEIVED AND WILL BE CUT AND MACHINED FOR IN-SODIUM AND IN-AIR TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + CORROSION + MATERIAL + INCONEL + R AND D PROGRAM + PROPERTY, MECHANICAL

11-099641 DATED 1974
WILSON WL + MINUSHKIN B + CHELEN G
FRICTION AND WEAR TESTING IN SUPPORT OF FFTF COMPONENTS. INTERIM SUMMARY REPORT AUGUST 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-13 +. 112 PAGES. 61 FIGURES. NOVEMBER 1974

FRICTION AND WEAR TESTS IN FLOWING SODIUM WERE CONDUCTED AT WESTINGHOUSE IN SUPPORT OF SPECIFIC FFTF IN-VESSEL HANDLING MACHINE AND CORE COMPONENTS INTERFACES IN THREE SODIUM FRICTION AND WEAR TEST FACILITIES. TEST RESULTS FOR INCONEL 718 RUBBING AGAINST ITSELF IN 450 F SODIUM INDICATED THE FOLLOWING: (1) LUBRICATIVE SURFACE FILMS HAVE A SIGNIFICANT EFFECT ON FRICTION BEHAVIOR. (2) FRICTION COEFFICIENTS DECREASE SLIGHTLY WITH INCREASING CONTACT PRESSURE IN THE 500 TO 5000 PSI RANGE. (3) SHORT STROKE AMPLITUDES RESULT IN HIGHER FRICTION COEFFICIENTS THAN LONGER STROKES. (4) SODIUM OXYGEN CONTENTS OF UP TO THREE PPM HAVE NO SIGNIFICANT EFFECT ON FRICTION COEFFICIENTS. AT OXYGEN LEVELS OF EIGHT TO TEN PPM, HOWEVER, FRICTION COEFFICIENTS DECREASE BY A FACTOR OF APPROXIMATELY TEN PERCENT. TESTS WERE ALSO PERFORMED TO INVESTIGATE THE FRICTION AND WEAR BEHAVIOR OF SEVERAL CANDIDATE CARBIDE COATINGS FOR USE ON FAST TEST REACTOR FUEL ASSEMBLY DUCT LOAD PADS AND OTHER CRITICAL IN-CORE COMPONENT INTERFACES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

METAL + OXYGEN + TESTING + FFTF (TR) + MATERIAL + LUBRICATION + FRICTION

11-099642 ALSO IN CATEGORY 9 DATED 1974
WEBER SA + NOORDHOFF BH
HEDL QUARTERLY TECHNICAL REPORT JULY, AUGUST, SEPTEMBER 1974. VOLUME 4 - ENGINEERING AND DEVELOPMENT
HANFORD ENGINEERING DEVELOPMENT LABORATORY, RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL.4) +. 94 PAGES. 16 FIGURES. OCTOBER 1974

DISCUSSES PROGRESS ON THE FOLLOWING: SODIUM/NAK - MOBILTHERM REACTION TESTS. CLIRA MELTDOWN CUP INTEGRITY TEST. CLOSED LOOP EX-VESSEL MACHINE. SMALL SODIUM VALVE TESTING. MECHANICAL EQUIPMENT PROGRAMS. INLET PLENUM FEATURE MODEL TEST FOR THE CLINCH RIVER BREEDER REACTOR. INSTRUMENT TREE CHARACTERISTIC VIBRATION TEST. HYDRAULIC CORE MOCKUP SHAKER TEST. HYDRAULIC CORE MOCKUP - FLOW-INDUCED VIBRATION TESTS. NON-DESTRUCTIVE TEST (NDT) ENGINEERING. CONTROL AND DATA SYSTEMS. REACTOR INSTRUMENT DEVELOPMENT. AND FFTF DESIGN DATA.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTROL SYSTEM + DESIGN CRITERIA + TESTING + FFTF (TR) + DESIGN STUDY + INSTRUMENT, LIQUID LEVEL + RADIOGRAPHY + IN CORE MEASUREMENT + HANFORD SITE + CORE COMPONENTS + ORIFICE + R AND D PROGRAM + CABLES AND CONNECTORS + EQUIPMENT DEVELOPMENT + INSTRUMENTS, MISC.

11-099643 ALSO IN CATEGORIES 5 AND 18 DATED 1974
SCHENONE CE + BOLTAX A
ADDENDUM 3, REVISED DATA PACKAGE TO EXTEND GOAL BURNUP TO 12 PERCENT IN EBR-II GRID-TYPE SUBASSMBLY WSA-3
WESTINGHOUSE ELECTRIC CORPORATION
WARD-OX-3045-5(ADD.3) +. 39 PAGES. 11 FIGURES. 15 REFERENCES. NOVEMBER 1974

REVISED DESIGN AND SAFETY ANALYSES OF THE FUEL PINS AND SUBASSEMBLY HARDWARE PERTINENT TO CHANGES IN GOAL BURNUP, EBR-II ENVIRONMENT AND EXPERIMENTAL REQUIREMENTS ARE DESCRIBED IN THIS REPORT. THE ANALYSES WERE PERFORMED IN ACCORDANCE WITH THE 'GUIDE FOR IRRADIATION EXPERIMENTS IN EBR-II, REVISION 00', DATED SEPTEMBER 15, 1973. INFORMATION IS PRESENTED ONLY FOR (1) ITEMS DISCUSSED IN PREVIOUS DATA PACKAGES WHICH ARE AFFECTED BY THE CHANGE IN TARGET BURNUP, (2) NEW REQUIREMENTS OF REVISION 00 OF THE GUIDE, AND (3) SPECIFIC REQUESTS OF THE EBR-II PROJECT. THE CONCLUSION OF THE ANALYSES IS THAT CONTINUATION OF THE IRRADIATION OF WSA-3 TO 12% BURNUP DOES NOT POSE ANY UNUSUAL OR UNACCEPTABLE HAZARDS TO THE OPERATION OF EBR-II.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + FUEL BURNUP + THERMAL ANALYSIS + STRESS ANALYSIS + IRRADIATION TESTING + SAFETY ANALYSIS + R AND D PROGRAM + FUEL ELEMENTS

11-099646 DATED 1974
SAFETY ENGINEERING BASE DEVELOPMENT PROGRAM, EIGHTH QUARTERLY REPORT MAY-JULY 1974
GENERAL ELECTRIC COMPANY
GEAP-13923-8 +. 20 PAGES. 9 FIGURES. 5 REFERENCES. SEPTEMBER 1974

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-099646 *CONTINUED*
SIGNIFICANT CHANGES IN WORK SCOPE, SCHEDULE, PERSONNEL AND PRIORITIES WERE MADE IN THIS PERIOD. GOOD AGREEMENT BETWEEN THE CALCULATIONS AND THERMOCOUPLE MEASUREMENTS WAS OBTAINED FOR EXPERIMENT HOP3-3C. THE BEHAVE-3 PROGRAM WAS USED FOR MECHANICAL ANALYSIS OF THE C4A EXPERIMENT, AND GOOD AGREEMENT WAS OBTAINED BETWEEN FUEL MOTION MEASUREMENTS AND CALCULATED PREDICTIONS. A REPORT DESCRIBING THE COMPUTER CODE BEHAVE-3 WAS DRAFTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + THERMAL ANALYSIS + R AND D PROGRAM + THERMOCOUPLE

11-099760 DATED 1974
FOWLER FG + CROWELL JS + CLINARD JA
USER'S MANUAL FOR ORNL CREEP-PLAST GRAPHICS PACKAGE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4642 +. 47 PAGES, 26 FIGURES, SEPTEMBER 1974

THE ORNL CREEP-PLAST GRAPHIC PACKAGE COMPUTER PROGRAMS COMPLEMENTS THE COMPUTER PROGRAM CREEP-PLAST, A SPECIAL-PURPOSE FINITE ELEMENT PROGRAM FOR THERMAL AND ELASTIC-PLASTIC-CREEP ANALYSIS OF TWO DIMENSIONAL METAL STRUCTURES, BY ENHANCING THE OUTPUT FEATURES OF THE PROGRAM. THE BASIC FUNCTION OF THE PACKAGE IS TO DISPLAY THE ANALYTICAL SOLUTIONS OF STRUCTURAL PROBLEMS COMPUTED BY CREEP-PLAST IN A DESCRIPTIVE LOGICAL, AND USEFUL FASHION WHICH FACILITATES CRITICAL AND COMPARATIVE EVALUATION AND APPRAISAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + ELASTICITY + ORNL + PLASTICITY + STRESS STRAIN DATA + CREEP + TEMPERATURE

11-099763 DATED 1971
PENNELL WE
CORE RESTRAINT SYSTEM DESIGN AND ANALYSIS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-710122-1 +. 37 PAGES, FIGURES, 1971

NUCLEAR STABILITY CONSIDERATIONS DICTATE THAT GEOMETRY OF AN LMFBR CORE BE CLOSELY CONTROLLED AT ALL TIMES. CORE MOTIONS IN RESPONSE TO BOTH STEADY STATE AND TRANSIENT OPERATING CONDITIONS MUST BE PREDICTABLE. THE PRIMARY FUNCTION OF THE CORE RESTRAINT SYSTEM IS TO PROVIDE THIS CONTROL. REQUIREMENTS OF THE REFUELING SYSTEM, CONTROL SYSTEM AND THE CORE SUPPORT SYSTEM MUST BE CONSIDERED. DESIGN OF A CORE RESTRAINT SYSTEM IS DIVIDED INTO TWO PHASES. PHASE ONE DEFINES CORE RESPONSE TO THE FULL RANGE OF STEADY STATE AND TRANSIENT OPERATING CONDITIONS. PHASE TWO OF THE CORE RESTRAINT SYSTEM DESIGN INVOLVES THE DESIGN OF THE SYSTEM HARDWARE. THIS REPORT DISCUSSES THE 2 PHASES IN SOME DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + CORE COMPONENTS + SAFETY ANALYSIS

11-099928 DATED 1973
FRENCH JW
QUARTERLY PROGRESS REPORT PERIOD ENDING 8-31-73 CORE RESTRAINT DEVELOPMENT
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-3 +. 29 PAGES, NOVEMBER 1973

ANALYTICAL WORK WAS COMPLETED ON THE LMFBR CORE RESTRAINT CONCEPT STUDY, WHICH CONSIDERED EFFECTS OF IRRADIATION-INDUCED CREEP AND SWELLING ON THE PERFORMANCE OF SEVERAL CORE RESTRAINT SYSTEMS. ANALYSIS TO VERIFY BENDING PROPERTIES OF SIMULATED CORE ASSEMBLIES WAS CONDUCTED, AND TESTING OF ATTACHING THE CONTACT PADS TO THE CORE ASSEMBLY SPINES WAS INITIATED. RESULTS OF THE FRICTION MATERIALS SCREENING SURVEY WERE COMPILED. TECHNIQUES FOR ANALYSIS OF THE COMPLIANT LOAD PAD MODELS WERE SURVEYED AND COMPARED AGAINST TEST DATA.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

IRRADIATION TESTING + CORE COMPONENTS + CREEP + R AND D PROGRAM

11-099957 ALSO IN CATEGORY 18 DATED 1969
SCHUMAR JF + BARTS EW + CARTER JC
FUEL ELEMENT PROPAGATION PROGRAM PLAN
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/MET-01 +. 131 PAGES, AUGUST 1969

DESCRIBES A RESEARCH PROJECT AT ANL TO STUDY THE PROPAGATION OF FUEL-ELEMENT FAILURES, UNDER NORMAL AND NEAR-NORMAL OPERATING CONDITIONS, IN LIQUID METAL FAST BREEDER REACTORS. THE MAJOR OBJECTIVE OF THE PROGRAM IS TO DEVELOP A PREDICTIVE ANALYTICAL DESCRIPTION OF FUEL-ELEMENT FAILURE PROPAGATION AND ITS CONSEQUENCES ON THE REACTOR SYSTEM, SPECIFICALLY ON THE REACTOR CORE. BOTH EXPERIMENTAL AND ANALYTICAL STUDIES WILL BE MADE IN ORDER TO INVESTIGATE THE THRESHOLDS OF REACTOR OPERATION THAT CAUSE FAILURE TO PROPAGATE, THE MODES OF FAILURE TRANSPORT, AND THE CONSEQUENCES OF FAILURES PROPAGATING.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-099957 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE, FUEL ELEMENT + R AND D PROGRAM

11-100016 DATED 1973
GREENSTREET WL + CORUM JM + PUGH CE
HIGH-TEMPERATURE STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS PROG. REPORT OCT-72 THRU MARCH-73
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4085 +. 264 PAGES, REFERENCES, JULY 1973

SUMMARIZES ACCOMPLISHMENTS IN THE ORNL PROGRAM TO DEVELOP HIGH-TEMPERATURE STRUCTURAL DESIGN METHODS FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURES. THE PROGRAM GOAL IS THE DEVELOPMENT OF A VERIFIED HIGH-TEMPERATURE DESIGN TECHNOLOGY APPLICABLE TO LONG-TERM OPERATING CONDITIONS EXPECTED FOR LMFBR SYSTEMS. NEAR-TERM EFFORTS ARE CONCENTRATED ON ESTABLISHING AND VALIDATING METHODS AND CRITERIA TO BE USED, ON AN INTERIM BASIS, FOR FFTF AND LMFBR DEMONSTRATION PLANT DESIGNS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + HIGH TEMPERATURE + CORE COMPONENTS + STRUCTURAL INTEGRITY + COMPONENTS + PRESSURE VESSELS

11-100026 DATED 1973
POLLEY MV
BUBBLING FROM LMFBR FUEL FAILURES AND ITS RELEVANCE TO FAILED FUEL LOCATION
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, ENGLAND
RD/B/N-2837 +. 37 PAGES, FIGURES, NOVEMBER 1973

BUBBLING OF GAS FROM LMFBR FUEL FAILURES IS DISCUSSED FOR CASES WHERE THE INITIAL HIGH RELEASE HAS SUBSIDED AND IN WHICH THE FAILURE IS NOT LOGGED WITH SODIUM. THE DETACHMENT RADII OF BUBBLES EMANATING FROM SMALL CYLINDRICAL HOLES INTO FLOWING SODIUM HAVE BEEN CALCULATED. ESTIMATES WERE MADE OF THE IMPORTANCE OF DISSOLUTION IN THE SODIUM AS A MEANS OF TRANSPORTING NOBLE GASES, BR AND I INTO THE SODIUM. INFLUENCE OF HOLE SIZE AND EXCESS PRESSURE ON THE RATE OF GROWTH OF BUBBLES WAS INVESTIGATED WITH NUMERICAL SOLUTIONS TO THE BUBBLE GROWTH EQUATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION GAS RELEASE + IODINE + BROMINE + FAILURE, CLADDING + BUBBLE

11-100112 DATED 1973
EFFERDING LE + GRUNDY BR + IORIO NR
EBR-II TUBING EVALUATIONS - METALLURGICAL, HEAT TRANSFER AND LEAK DETECTION
WESTINGHOUSE ELECTRIC CORPORATION
WTD-LM-73-023 +. 84 PAGES, FIGURES, OCTOBER 1973

THIS REPORT DISCUSSES DUPLEX TUBES AND A THIRD FLUID LEAK DETECTION SYSTEM IN THE DEVELOPMENT OF AN LMFBR STEAM GENERATOR. EBR-II DUPLEX TUBES WERE EVALUATED METALLURGICALLY, FOR HEAT TRANSFER CHARACTERISTICS, AND FOR LEAK DETECTION CAPABILITY. EBR-II TUBING IS NOT SUITABLE FOR USE WITH A THIRD FLUID LEAK DETECTION SYSTEM. ANNEALED EBR-II DUPLEX TUBING IS ACCEPTABLE FOR ELEVATED TEMPERATURE SERVICE, BUT SLIDING OF THE INNER AND OUTER TUBE INTERFACE COULD CAUSE DAMAGE. LEAK DETECTION OF A FAULT AT THE DUPLEX TUBE INTERFACE MAY BE FEASIBLE USING SODIUM VAPOR SENSING TECHNIQUES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

EBR 1 AND 2 (RE) + HEAT TRANSFER + STEAM GENERATOR + TUBING + LEAK

11-100147 DATED 1973
BEMENT AL
VOID FORMATION IN IRRADIATED AUSTENITIC STAINLESS STEELS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
120 PAGES, ADVAN. NUCL. SCI. TECHNOL., VOL. 7, PP. 1-20 (1973)

LITERATURE ON IRRADIATION-INDUCED VOID SWELLING IN AUSTENITIC STAINLESS STEELS IS SUMMARIZED. CENTRAL FOCUS IS ON MATERIALS OF IMMEDIATE INTEREST TO LMFBR APPLICATION. NICKEL IS INCLUDED IN SOME SECTIONS, SINCE IT REPRESENTS A HIGH-PURITY HOMOLOG FOR AUSTENITE AND SINCE NICKEL-BASE ALLOYS ALSO HAVE IMMEDIATE AND FUTURE APPLICATION TO LMFBR'S. THIS ARTICLE IS DIVIDED INTO FIVE MAJOR PARTS: (1) INTRODUCTION AND BACKGROUND; (2) EXPERIMENTAL OBSERVATIONS, WHICH DESCRIBES VOIDS INDUCED BY NEUTRON AND CHARGED-PARTICLE IRRADIATION; (3) THEORY, WHICH DESCRIBES CURRENT THEORETICAL DESCRIPTIONS OF VOID NUCLEATION AND GROWTH; (4) PRACTICAL CONSEQUENCES OF VOID SWELLING, DEVOTED TO MECHANICAL BEHAVIOR AND DESIGN; AND (5) RECAPITULATION, WHICH SUMMARIZES SOME METALLURGICAL CORRECTIVE MEASURES AND IDENTIFIES SOME PROBLEM AREAS.

NICKEL + STEEL, STAINLESS + DEFORMATION + IRRADIATION TESTING

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-100154 DATED 1973
FRENCH JW
QUARTERLY PROGRESS REPORT FOR PERIOD ENDING NOVEMBER 30, 1973. CORE RESTRAINT DEVELOPMENT
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-4 +. 25 PAGES. 11 FIGURES. FEBRUARY 1974

PRELIMINARY CHARACTERIZATION TESTS WERE COMPLETED ON THE TEST FACILITY AND WORK WAS STARTED TO MOVE THE JAW ASSEMBLIES TO PROTOTYPICAL LMFBR ELEVATIONS. PROOF TESTS TO EVALUATE THE SET SCREW METHOD OF SECURING THE CORE LOAD PAD TO THE SIMULATED FUEL ASSEMBLY SPINE HAVE BEEN COMPLETED. DESIGN OF AN ENCLOSURE TO PROVIDE A CLEAN, TEMPERATURE CONTROLLED ENVIRONMENT FOR TESTING HAS BEEN COMPLETED. DESIGN OF A PLUG-IN FIXTURE FOR CORE RESTRAINT TESTS IS COMPLETED, AND PROCUREMENT WILL BE INITIATED DURING THE NEXT REPORT PERIOD.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR TEST FACILITY + CORE COMPONENTS + R AND D PROGRAM

11-100282 ALSO IN CATEGORY 8 DATED 1974
CHO DH + GUNTHER WH + ARMSTRONG DR
FRAGMENTATION OF MOLTEN MATERIALS DROPPED INTO WATER
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8155 +. 22 PAGES. 16 FIGURES. 9 REFERENCES. DECEMBER 1974

A SERIES OF EXPERIMENTS WERE PERFORMED TO INVESTIGATE THE FRAGMENTATION OF A HOT MOLTEN MATERIAL IN A COLD QUENCH LIQUID. SMALL QUANTITIES OF VARIOUS MOLTEN MATERIALS (LESS THAN 1 G) WERE DROPPED INTO A POOL OF WATER AND THE PROJECTED AREAS OF THE RESULTING FRAGMENTS WERE MEASURED FOR THE EXTENT OF FRAGMENTATION. FIVE MATERIALS HAVING LOW MELTING POINTS WERE USED IN THIS INVESTIGATION: TIN, BISMUTH, SILVER CHLORIDE, ZINC AND LEAD. IN MOST CASES, THE DROPPING DISTANCE WAS KEPT CONSTANT AT 2 IN. FROM THE WATER SURFACE WHILE THE TEMPERATURE OF THE MOLTEN SAMPLES AND WATER WERE VARIED OVER A WIDE RANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL + METAL WATER REACTION + THERMAL MECHANICAL EFFECT + BISMUTH + LEAD + MOLTEN FUEL + SILVER + ZINC + R AND D PROGRAM + TIN + FUEL COOLANT INTERACTION

11-101085 ALSO IN CATEGORY 18 DATED 1974
VITTI JA
PRELIMINARY ASSESSMENT OF PROOF TESTING LMFBR CARBIDE FUELED SUBASSEMBLIES IN FTR DRIVER POSITIONS
COMBUSTION ENGINEERING, INC., WINDSOR, CONNECTICUT
COO-2426-5 + CENO-370 +. 230 PAGES. FIGURES. DECEMBER 1974

PEAK LINEAR POWER AND PEAK DISCHARGE BURNUP SLIGHTLY EXCEED PRESENT COMMERCIAL DESIGN OBJECTIVES OF 30 KW/FT AND 73 MWD/KG. THE LOW OPERATING TEMPERATURE OF THE FTR LEADS TO NONPROTOTYPIC FUEL CLADDING TEMPERATURES. INDIVIDUAL ASSEMBLY POWER HISTORY, FLUX AND ENRICHMENTS CAN BE SIMULATED QUITE WELL IN THE FTR FOR COMMERCIAL OUTER ZONE FUEL ASSEMBLIES BUT INNER ZONE OPERATING CONDITIONS CANNOT BE DUPLICATED AS WELL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + TEST, PROOF + R AND D PROGRAM + FUEL ROD + FUEL ELEMENTS

11-101231 DATED 1974
CLAUDSON TT
IRRADIATION EFFECTS ON REACTOR STRUCTURAL MATERIALS SEMIANNUAL PROGRESS REPORT, FEBRUARY 1974 TO JULY 1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-51 +. 250 PAGES. FIGURES. REFERENCES. OCTOBER 1974

REPORTS PROGRESS ON ALL LMFBR STRUCTURAL MATERIAL PROGRAMS DURING THE PERIOD AT AEROJET, ANL, AI, GE, HEDL, NRL, ORNL, BMI-NW, AND UNIV. OF CINCINNATI.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + CARBIDE + CLADDING + STEEL + TENSILE PROPERTY + STEEL, STAINLESS + EMBRITTLEMENT + MATERIAL + IRRADIATION TESTING + STRUCTURAL INTEGRITY + CREEP + R AND D PROGRAM + FRACTURE TOUGHNESS + DUCTILITY + PROPERTY, MECHANICAL + RADIATION EFFECT

11-101235 DATED 1975
GREENSTREET WL + CORUM JM + PUGH CE
HIGH-TEMPERATURE STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5005 +. 147 PAGES. FIGURES. REFERENCES. JANUARY 1975

HIGHLIGHTS OF PROGRESS DURING THIS REPORTING PERIOD INCLUDE (1) THE FORMATION OF A CREEP-FATIGUE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-101235 *CONTINUED*
WORKING GROUP AS A JOINT EFFORT WITH ANL TO REVIEW INFORMATION ON FATIGUE, CREEP-FATIGUE INTERACTIONS, AND CUMULATIVE DAMAGE AND TO RECOMMEND FOLLOW-ON WORK; (2) COMPLETION, WITH ANL, OF A REVIEW OF ANL HIGH-TEMPERATURE FATIGUE PROGRAM RESULTS AND A DELINEATION OF SUGGESTED MODIFICATIONS TO TEST MATRICES AND PRIORITIES; (3) SUCCESSFUL COMPLETION OF 17 THERMAL RATCHETTING CYCLES FOR THE SECOND TYPE 304 STAINLESS STEEL PIPE SPECIMEN; AND (4) COMPLETION OF A NUMBER OF STUDIES ASSOCIATED WITH VARIOUS ASPECTS OF THE PROGRAM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CODES AND STANDARDS + COMPUTER PROGRAM + DESIGN CRITERIA + TENSILE PROPERTY + STEEL, STAINLESS + CREEP BEHAVIOR + MATERIAL + FAILURE, FATIGUE + CORE COMPONENTS + INELASTIC BEHAVIOR + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + BEHAVIOR + COMPONENT DESCRIPTION

11-101238 DATED 1974
EVANS EA
HEDL QUARTERLY TECHNICAL REPORT FOR JULY, AUGUST, SEPTEMBER 1974. VOLUME I - APPLIED RESEARCH AND MATERIALS ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL.1) +. 230 PAGES, FIGURES, REFERENCES, OCTOBER 1974

COVERS THE FOLLOWING TOPICS: CERAMIC FUELS PROPERTIES AND BEHAVIOR, FAST NEUTRON ABSORBER EXPERIMENTS, CONTROL ELEMENT COMPONENT TECHNOLOGY, MECHANICAL METALLURGY, IRRADIATION DAMAGE ANALYSIS, SODIUM TECHNOLOGY, FUEL PIN/CAPSULE FABRICATION FOR IRRADIATION TESTING, SUBASSEMBLY PROCESS DEVELOPMENT, INSTRUMENTATION OF TEST SPECIMENS, REPLACEABLE CORE COMPONENT PROCUREMENT, RADIOACTIVE FUEL MATERIALS PROCESSING, AND FUEL COMPONENTS TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + CERAMICS + FABRICATION + TESTING + CONTROL + FFTF (TR) + MATERIAL + IRRADIATION TESTING + DAMAGE + COMPONENTS + R AND D PROGRAM + ABSORPTION + BEHAVIOR + FUEL ELEMENTS

11-101241 DATED 1975
CWYNAR JC + FRANCE LL
FINAL STATUS REPORT ON MAJOR COMPONENTS TASK FORCE (MCTF) ON SENSITIZED TYPE 304 STAINLESS STEEL COMPONENTS FOR FFTF
WESTINGHOUSE ELECTRIC CORPORATION
WARD-2171-45 +. 90 PAGES, 27 FIGURES, REFERENCES, JANUARY 1975

TO BUILD ASSURANCE THAT INTERGRANULAR ATTACK OF COMPONENTS CAN BE AVOIDED DURING MANUFACTURE, STORAGE, SHIPPING, AND INSTALLATION, THE FOLLOWING PROGRAMS ARE RECOMMENDED; (1) EXPOSURE OF SENSITIZED TYPE 304 STAINLESS STEEL COUPONS IN THE STRESSED CONDITION WITH AND WITHOUT COLD WORK IN A VARIETY OF MANUFACTURING SHOP ENVIRONMENTS SHOULD BE CARRIED OUT OVER A PERIOD OF SEVERAL YEARS. (2) A PROGRAM OF ACCELERATED TESTING SHOULD BE INITIATED TO MORE RAPIDLY EXAMINE THE ROLES OF ATMOSPHERIC CORRODENTS. (3) INVESTIGATION OF LOW TEMPERATURE (1400 TO 1600 F) HEAT TREATMENT FOR THE DESENSITIZATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + FFTF (TR) + CORROSION + COMPONENTS + R AND D PROGRAM

11-101244 DATED 1973
PUNCHES JR
WIRE-WRAP FUEL ASSEMBLY TECHNOLOGY REQUIREMENTS
GENERAL ELECTRIC COMPANY
GEAP-13997 +. 81 PAGES, 16 TABLES, 4 FIGURES, NOVEMBER 1973

REQUIREMENTS FOR TECHNICAL ATTENTION TO WIRE-WRAPPED FUEL ASSEMBLIES IN ORDER TO MEET PRESENT SCHEDULE FOR THE FIRST LMFBR DEMONSTRATION PLANT HAVE BEEN STUDIED. THIS REPORT IS RESTRICTED TO THE TECHNOLOGY NEEDS FOR A 217-ROD WIRE-WRAPPED MIXED-OXIDE FUEL ASSEMBLY OPERATING AT A CORE MIXED MEAN OUTLET TEMPERATURE OF APPROXIMATELY 1000 F. IT IS ASSUMED THAT NEW MATERIALS ARE NOT REQUIRED FOR STRUCTURAL MEMBERS. EFFORT REQUIRED INVOLVES DEVELOPMENT OF ANALYTICAL TOOLS, PARTICULARLY COMPUTER CODES, AND PERFORMANCE OF MANY TESTS TO ESTABLISH CHARACTERISTICS OF MATERIALS INVOLVED AND DESIGN CONFIGURATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + TESTING + ANALYTICAL TECHNIQUE + FUEL ELEMENT CLUSTER + MIXED OXIDE

11-101268 DATED 1975
PATRIARCA P
FUELS AND MATERIALS DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 30, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4726 +. 190 PAGES, FIGURES, REFERENCES, JANUARY 1975

THE RADIAL HEAT FLOW APPARATUS HAS BEEN ASSEMBLED FOR MEASUREMENTS OF THERMAL CONDUCTIVITY OF

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-101266 *CONTINUED*
EU2O3 TO 1000 C. STUDIES IN THE FLORIDA LOOPS INDICATED THAT WELDED INCOLOY 800 FOR STEAM GENERATORS IS SUBJECT TO CRACKING UNDER WET-DRY CONDITIONS IN THE PRESENCE OF CACL2 AND O2, BUT IN THE SAME ENVIRONMENT 2 1/4 CR-1 MO STEEL IS NOT. ELEVATED-TEMPERATURE CREEP TESTING OF THE ORNL REFERENCE HEAT OF TYPE 304 STAINLESS STEEL IS CONTINUING. THE CONTINUING PROGRAM OF DEVELOPMENT OF TYPES 308, 316, AND 16-8-2 STAINLESS STEEL WELDS HAS BEEN REEVALUATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + NDT DATA + STEEL + URANIUM OXIDE + PLUTONIUM OXIDE + STEEL, STAINLESS + WELDING + MATERIAL + IRRADIATION TESTING + NEUTRON + STRESS CORROSION + CORE COMPONENTS + R AND D PROGRAM + STEAM GENERATOR + ULTRASONICS + ABSORPTION + PROPERTY, MECHANICAL + CONTROL RODS + FUEL ELEMENTS

11-101275 ALSO IN CATEGORIES 6 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT DEC. 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-35 +. 170 PAGES, FIGURES, JANUARY 31, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICS, AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

11-101330 DATED 1974
MAKIN MJ + WALTERS GP
THE SWELLING CHARACTERISTICS OF FE548 STEEL IN THE HVM AND DFR
UKAEA METALLURGY DIVISION, HARWELL, UK
AERE-R-7661 +. 31 PAGES, 13 FIGURES, 20 REFERENCES, FEBRUARY 1974

THE SWELLING OF FE548 AT 600 C DURING 1MV ELECTRON IRRADIATION HAS BEEN SHOWN TO BE SENSITIVE TO THE SOLUTION TREATMENT TEMPERATURE. THE SWELLING AT 40 DPA DECREASING STEADILY FROM APPROXIMATELY 20% IN MATERIAL SOLUTION TREATED AT 1075 OR 1150 C TO APPROXIMATELY 30% IN FV548 SOLUTION TREATED AT 1033 C. THE DECREASE IN SWELLING RATE AS THE S.T. TEMPERATURE IS RAISED OCCURS PRIMARILY BY A DECREASE IN VOID GROWTH RATE, THERE BEING LITTLE SYSTEMATIC VARIATION IN VOID DENSITY WITH S.T. TEMPERATURE. IT IS CONCLUDED THAT THE CONCENTRATION OF DISSOLVED CARBON AND SMALL CARBIDE PRECIPITATES IS AN IMPORTANT PARAMETER IN THE SWELLING OF AUSTENITIC STEELS DURING IRRADIATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + UNITED KINGDOM + STEEL, STAINLESS + IRRADIATION TESTING + R AND D PROGRAM + VOID FRACTION + ELECTRON + CONCENTRATION + FUEL SWELLING

11-101331 DATED 1974
STONEHAM AM
FORMATION OF CAVITIES IN STEELS EXPOSED TO LIQUID SODIUM
UKAEA THEORETICAL PHYSICS DIVISION, HARWELL UK
AERE-R-7734 +. 18 PAGES, 2 TABLES, MAY 1974

THE OBSERVATIONS OF CAVITIES IN STEELS EXPOSED TO LIQUID SODIUM ARE ANALYSED TO IDENTIFY THE MECHANISM OF FORMATION OF THE OBSERVED CAVITIES AND THE RELATION TO THE AUSTENITE-FERRITE TRANSITIONS SEEN AT THE SAME TIME. THE CAVITIES APPEAR TO RESULT FROM THE LEACHING OF NI, CR AND OTHER ELEMENTS FROM GRAIN BOUNDARIES AND OTHER FAST-DIFFUSION PATHS. NO SIGNIFICANT DIFFUSION WITHIN THE GRAINS, NOR SURFACE-LIMITED STEPS, APPEAR TO BE INVOLVED IN CAVITY FORMATION. THE AUSTENITE-FERRITE TRANSITION ALSO INVOLVE GRAIN-BOUNDARY DIFFUSION, BUT ALSO REQUIRES DIFFUSION WITHIN THE INDIVIDUAL GRAINS. THE LONG-TERM BEHAVIOR AND THE QUESTION OF POSSIBLE DELETERIOUS EFFECTS OF THE CAVITIES ON MECHANICAL PROPERTIES ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + STEEL + UNITED KINGDOM + CHROMIUM + NICKEL + STEEL, STAINLESS + VOID FRACTION + PROPERTY, MECHANICAL

11-101332 DATED 1975
DISTEFANO JR
COMPATIBILITY OF EU2O3 WITH TYPE 316 STAINLESS STEEL AND SODIUM
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4780 +. 31 PAGES, 10 TABLES, 14 FIGURES, JANUARY 1975

EUROPIUM OXIDE IS AN EXCELLENT CANDIDATE FOR A NEUTRON ABSORBER IN LIQUID-METAL-COOLED BREEDER REACTORS. IT HAS A HIGH NUCLEAR WORTH THAT IT RETAINS DURING BURNUP, AND IT CAN READILY BE FABRICATED INTO DENSE PELLETS. COMPATIBILITY TESTS SHOWED THAT TYPE 316 STAINLESS STEEL CAN BE

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11-101332 *CONTINUED*
USED AS A CLADDING FOR EUO3 AT TEMPERATURES UP TO 870 C. NO EVIDENCE OF ATTACK WAS OBSERVED WITH SINTERERED MONOCLINIC EU203, BUT UP TO 25 MICRO M GRAIN-BOUNDARY ATTACK WAS FOUND WHEN TYPE 316 STAINLESS STEEL WAS EXPOSED TO HOT-PRESSED MONOCLINIC EU203 AT 870 C. TESTS WITH SODIUM AT 650 AND 760 C SHOWED THAT EU203 IS PENETRATED BY SODIUM, BUT THERE WAS NO ATTACK OF THE STAINLESS STEEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + OXIDE + STEEL, STAINLESS + NEUTRON + EUROPIUM + R AND D PROGRAM + ABSORPTION + CONTROL RODS

11-101335 DATED 1975
RAY WE
SODIUM TECHNOLOGY PROGRAM: FRICTION, WEAR AND SELF-WELDING QUARTERLY PROGRESS REPORT FOR PERIOD ENDING OCTOBER 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-19 +. 50 PAGES, 14 TABLES, 15 FIGURES, FEBRUARY 1975

THERE ARE CURRENTLY FOUR MATERIALS COUPLES BEING INVESTIGATED IN SUPPORT OF THE INSTRUMENT TREE LOWER RADIAL BEARING INTERFACE. THESE TESTS INVOLVE HAYNES 273 AND TRIBALOY 700 MATERIALS, BOTH AGAINST THEMSELVES AND ALUMINIZED INCONEL 718. INITIAL 450 F TESTING INDICATES THAT THE TRIBALOY 700 MATERIAL COUPLES ARE SUPERIOR TO THE HAYNES 273 COUPLES. SELF-WELDING EVALUATION IN SODIUM FOR FFTF COMPONENT MATERIALS IS CONTINUING. THE CURRENT REFERENCE DUCT LOAD PAD COATING, CHROMIUM CARBIDE/NICHROME ON TYPE 316 STAINLESS STEEL, HAD AN AVERAGE CORROSION RATE OF 0.11 MPY AFTER 8023 HOURS EXPOSURE TO 1160 F SODIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + WELDING + FFTF (TR) + CORROSION + HIGH TEMPERATURE + MATERIAL + INCONEL + R AND D PROGRAM + FRICTION

11-101337 DATED 1974
GARR KR + STANLEY JT
FERRITE FORMATION IN NEUTRON-IRRADIATED TYPE 316 STAINLESS STEEL
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13140 +. 22 PAGES, 5 FIGURES, 16 REFERENCES, OCTOBER 31, 1974

MAGNETIC MEASUREMENTS WERE MADE ON TYPE 316 STAINLESS STEEL SPECIMENS THAT HAD BEEN NEUTRON IRRADIATED. A SIGNIFICANT INCREASE OF MAGNETIZATION WAS OBSERVED FOR THE IRRADIATED SPECIMENS COMPARED TO THE UNIRRADIATED SPECIMENS. THE SHAPE OF THE MAGNETIZATION VERSUS FIELD CURVES SHOWED THAT THE IRRADIATION SPECIMENS CONTAINED MANY SMALL SUPERPARAMAGNETIC PARTICLES. THE MAGNETIC PARTICLES ARE ASSUMED TO BE THE FERRITE PHASE ALTHOUGH OTHER POSSIBILITIES CANNOT BE EXCLUDED. THE AMOUNT AND DISTRIBUTION OF THE MAGNETIC PHASE VARIED WITH PRE-IRRADIATION AND POST-IRRADIATION HEAT TREATMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STEEL, STAINLESS + IRRADIATION TESTING + NEUTRON + STEEL, FERRITIC + R AND D PROGRAM

11-101339 DATED 1974
ROBERTS JTA + WEINS JJ + YOUNGDAHL CA + YAGGEE FL + MAIYA PS + SPRUIELL JE
FUEL-ASSEMBLY MATERIALS SIMULATION PROGRAM: STATUS REPORT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8125 +. 30 PAGES, 12 FIGURES, 14 REFERENCES, OCTOBER 1974

PRESENTS THE RESULTS AND PRELIMINARY RECOMMENDATIONS FROM THE FIRST YEAR OF EFFORT TO SIMULATE THE EFFECTS OF IRRADIATION IN FUEL-ASSEMBLY MATERIALS. THE OBJECTIVE WAS TO DEVELOP THERMOMECHANICAL AND THERMOCHEMICAL TREATMENTS OF TYPE 316 STAINLESS STEEL THAT WILL REDUCE METAL DUCTILITY TO THE LESS THAN APPROXIMATELY 1% STRAIN LEVEL DURING HEATING RAMPS. A 50% COLD-WORKED, OR 50% COLD-WORKED AND AGED, TYPE 316 STAINLESS STEEL CLADDING TUBE FAILS AFTER <1% STABLE STRAIN AT 2100-2300 F, WHEN SUBJECTED TO A 200 F/SEC HEATING RAMP, BUT UNDERGOES SOME RECOVERY AT THE LOWER HEATING RATES. THE STUDY ALSO INCLUDED THE EFFECTS OF FISSION PRODUCTS AND SODIUM ON TYPE 316 STAINLESS STEEL AND THE EFFECTS OF IRRADIATION ON THE OXIDE FUEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + CLADDING + THERMAL MECHANICAL EFFECT + STEEL, STAINLESS + MATERIAL + IRRADIATION TESTING + STRESS STRAIN DATA + R AND D PROGRAM + PROPERTY, MECHANICAL

11-101827 DATED 1974
CLAUSS J
FUEL ELEMENTS FOR LIGHT-WATER REACTORS, HIGH-TEMPERATURE REACTORS, FAST SODIUM BREEDER AND GASCOOLED FAST BREEDERS
3 PAGES, ATOM UND STROM, 20(11-12), PP. 127-129 (NOV. 1974)

THE TECHNICAL COMMITTEE ON FUEL ELEMENTS IN THE KTG HELD ITS TECHNICAL CONFERENCE FOR THIS YEAR

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-101827 *CONTINUED*
ON THE 12TH TO 13TH, NOVEMBER 1974. HERE A SHORT OUTLINE IS GIVEN FROM THE POINT OF VIEW OF AN ELECTRICITY SUPPLY OBSERVER OF THE SERIES OF LECTURES AND DISCUSSIONS, AS ADVANCE INFORMATION.

REACTOR, GCR + REACTOR, LWR + REVIEW + REACTOR, HTGR + OPERATING EXPERIENCE + FUEL ELEMENTS

11-101867 ALSO IN CATEGORY 5 DATED 1975
BRATIS JC + MARCINIAK TJ + GVILDYS J
REXCO-HT: A HYDRODYNAMIC CONTAINMENT CODE INCLUDING MOLTEN-FUEL-COOLANT INTERACTIONS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-15 +, 69 PAGES, 17 FIGURES, 13 REFERENCES, FEB. 1975

IN THE PRESENT WORK, SOPHISTICATED FUEL-COOLANT INTERACTION MODELS AND A THERMODYNAMICALLY CONSISTENT EQUATION OF STATE FOR SODIUM ARE INTRODUCED INTO THE REXCO-H CODE. THESE ARE FIRST PRESENTED, FOLLOWED BY DETAILED INFORMATION OF THE REQUIRED INPUT. NEXT, A DESCRIPTION OF THE OUTPUT FORMATS AND THE LIMITATIONS OF THE CODE ARE GIVEN. FINALLY, RESULTS OBTAINED THROUGH APPLICATION OF THE CODE TO THREE DIFFERENT CONFIGURATIONS ARE PRESENTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CONTAINMENT + EQUATION OF STATE + THERMODYNAMICS + MOLTEN FUEL + ACCIDENT, HYPOTHETICAL + HYDRODYNAMIC ANALYSIS + FUEL COOLANT INTERACTION

11-102024 DATED 1975
HILL MR
MECHANICAL PROPERTIES TEST DATA FOR STRUCTURAL MATERIALS QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JANUARY 31, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5104 +, 346 PAGES, FIGURES, MARCH 1975

DISCUSSES THE FOLLOWING TOPICS: LCW CYCLE FATIGUE BEHAVIOR OF SMA TYPE 304/308 STAINLESS STEEL WELDMENTS, INCONEL 718 CODE CASE AND RELATED INVESTIGATIONS, FRACTURE AND FATIGUE STUDIES ON STAINLESS STEELS, IRRADIATION DAMAGE TO REACTOR METALS, MATERIALS PERFORMANCE AND SURVEILLANCE, FATIGUE CRACK GROWTH IN TYPE 316 STAINLESS STEEL, FRACTURE RESISTANCE OF TYPE 304 STAINLESS STEEL AND TYPE 308 WELD DEPOSIT, MECHANICAL PROPERTIES AND BEHAVIOR FOR STRUCTURAL MATERIALS, MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS FOR LMFBR, MECHANICAL PROPERTIES OF STEAM GENERATOR MATERIALS, BASIC SPECIMEN TESTING, AND TUBULAR SPECIMEN TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

WELDS + STEEL, STAINLESS + MATERIAL + IRRADIATION TESTING + FAILURE, FATIGUE + PROPERTY, PHYSICAL + REVIEW + SUPPORT STRUCTURE + R AND D PROGRAM + STEAM GENERATOR

11-102044 ALSO IN CATEGORIES 6 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGESS REPORT, JANUARY 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-36 +, 148 PAGES, FIGURES, FEB. 27, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICAL, AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

11-102045 DATED 1974
CORE RESTRAINT ENGINEERING FIRST QUARTERLY REPORT, AUGUST-OCTOBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14031-1 +, 12 PAGES, 2 FIGURES, 2 REFERENCES, NOV. 1974

THIS REPORT IS THE FIRST IN A SERIES TO PROVIDE CORE RESTRAINT SYSTEM DESIGN REQUIREMENTS, SUBCOMPONENTS, AND ANALYTICAL METHODS. MODIFICATIONS OF THE WITHDRAWAL FORCE TESTING HAVE BEEN COMPLETED. ALL OF THE TEST ASSEMBLY HARDWARE HAS BEEN FABRICATED AND THE CHANNELS HAVE BEEN PREBOWED. FINAL MODIFICATIONS TO THE TEST RIG SUPPORT PLATES AND ACCESSORIES ARE CONTINUING. TEST PROCEDURES ARE BEING FINALIZED FOR THE FIRST SERIES OF TESTS. THE NUBOW COMPUTER CODE MODIFICATIONS REQUIRED TO INCLUDE EXTERNAL LATERAL LOADS AND/OR MOMENTS WERE RECEIVED FROM ANL. THESE MODIFICATIONS AND A ROUTINE TO CALCULATE WITHDRAWAL FORCES UNDER CONDITIONS OF REFUELING MACHINE MISALIGNMENT ARE IN THE DEBUGGING PROCESS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-102045 *CONTINUED*
COMPUTER PROGRAM + DESIGN CRITERIA + EXPERIMENT + CORE COMPONENTS + R AND D PROGRAM + CORE RESTRAINT

11-102049 DATED 1975
CHAPMAN RH
A STATE-OF-THE-ART REVIEW OF EQUIPMENT CELL LINERS FOR LMFBR
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4714 +. 88 PAGES, FEB. 1975

CELL LINER DESIGN CONCEPTS AND PRACTICES USED IN LMFBR SYSTEMS WERE SURVEYED TO LEARN HOW FUNCTIONAL REQUIREMENTS WERE SATISFIED, THE SEVERITY OF SODIUM SPILLS THE LINERS WERE DESIGNED FOR, AND PROBLEMS ENCOUNTERED IN DESIGN AND CONSTRUCTION. SURVEY WAS LIMITED TO 'LOOP-TYPE' LMFBRS. THIS REPORT DISCUSSES STEEL-LINED CONCRETE STRUCTURES AND IDENTIFIES RESEARCH AND DEVELOPMENT NEEDED FOR A RATIONAL AND THOROUGH ASSESSMENT OF CELL LINER DESIGN CONCEPTS. PRACTICALLY ALL LMFBR CELL LINERS HAVE BEEN FIRMLY ATTACHED TO THE BACKUP CONCRETE STRUCTURE. AN EXCEPTION IS THE 'FREE-FLOATING' LINER CONCEPT EMPLOYED IN THE FFTF. OTHER THAN THIS EXAMPLE, THE CONCEPTS HAVE CHANGED VERY LITTLE FROM THOSE USED IN THE FIRST PLANTS CONSTRUCTED. THE MOST PRESSING RESEARCH NEED IS AN EXPERIMENTAL PROGRAM TO IDENTIFY FAILURE MODES, TO PROVIDE DESIGN DATA, TO PROVIDE EXPERIMENTAL DATA FOR VALIDATION OF ANALYTICAL MODELS, AND TO PROVIDE PROOF-OF-CONCEPT EVIDENCE UNDER POSTULATED ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + CONTAINMENT DESIGN + STEEL LINER

11-102052 DATED 1974
LICINA GJ + COPELAND JF
A REVIEW OF 2-14CR-1MO STEEL FOR STEAM GENERATOR APPLICATIONS IN THE CLINCH RIVER BREEDER REACTOR
GENERAL ELECTRIC COMPANY
GEAP-20589 +. 38 PAGES, 17 FIGURES, 76 REFERENCES, OCT. 1974

THE JUSTIFICATION FOR THE SELECTION OF 2-1/4CR-1MO FERRITIC STEEL AS THE MATERIAL FOR USE IN THE STEAM GENERATORS OF THE CLINCH RIVER BREEDER REACTOR PROJECT IS PRESENTED. THE REFERENCES MATERIAL EXHIBITS PROVEN FABRICABILITY TO THE REQUIREMENTS OF ASME SECTION III, CLASS 1 AND A VIRTUAL IMMUNITY TO STRESS CORROSION CRACKING UNDER POSSIBLE OFF-CHEMISTRY CONDITIONS - THE PRIMARY SELECTION CRITERIA. THE MATERIAL EXHIBITS SATISFACTORY, WELL-CHARACTERIZED COMPATIBILITY WITH SODIUM AND WATER ENVIRONMENTS AND PROVIDES ADEQUATE MECHANICAL PROPERTIES FOR THE 210,000 HOUR DESIGN LIFE. A DISCUSSION OF THE EFFECTS OF HEAT TREATMENT WITH RESPECT TO MICROSTRUCTURE, MECHANICAL PROPERTIES, AND POSSIBLE EMBRITTLEMENT TENDENCIES IS ALSO GIVEN TO PROVIDE A BASIS FOR THE SELECTION OF THE HEAT TREATMENT FOR CRBRP COMPONENTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

STEEL + WATER + DESIGN STUDY + STRESS CORROSION + HEAT TREATMENT + STEAM GENERATOR + MICROSTRUCTURE + CRACK + CLINCH RIVER (LMFBR)

11-102053 DATED 1974
INDIG ME
STRESS CORROSION STUDIES OF LMFBR STEAM GENERATOR MATERIALS
GENERAL ELECTRIC COMPANY
GEAP-12536 +. 18 PAGES, 5 TABLES, 19 FIGURES, AUG. 1974

BECAUSE OF THE PROXIMITY OF SODIUM AND WATER IN THE STEAM GENERATOR OF THE LIQUID METAL FAST BREEDER REACTOR, THE POSSIBILITY OF CAUSTIC CRACKING EXISTS. THUS A PROGRAM OF CAUSTIC CRACKING OF VARIOUS FERRITIC AND AUSTENITIC ALLOYS WAS INITIATED IN ORDER TO HELP DETERMINE THE MATERIAL OF CONSTRUCTION OF THE STEAM GENERATOR. THE TESTING ENVIRONMENT SIMULATED FAULTED CONDITIONS IN THE EVAPORATOR AND THE SUPERHEATED STEAM SECTIONS OF THE STEAM GENERATOR. MANY OF THE AUSTENITIC ALLOYS WERE FOUND TO BE SUSCEPTIBLE TO CAUSTIC CRACKING. AT 600 F (EVAPORATOR TEMPERATURE) CRACKING WAS FOUND IN SAMPLES OF CARPENTER 20 CB 3, ARMCO 22-13-5, TYPE 304 STAINLESS STEEL AND INCOLOY-800 IN 3% CAUSTIC. INCONEL-600 FAILED WHEN STRESSED BELOW YIELD IN CAUSTIC CONTAMINATED STEAM AT 900 F (SUPERHEATER TEMPERATURE). THE 2-1/4 CR-1 MO STEEL WAS FOUND EXTREMELY RESISTANT TO CAUSTIC CRACKING AND HAS BEEN CHOSEN AS THE MATERIAL OF CONSTRUCTION FOR THE STEAM GENERATOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

STEEL + WATER + STEEL, STAINLESS + MATERIAL + STRESS CORROSION + STEAM GENERATOR + CRACK

11-102055 DATED 1974
STEAM GENERATOR MATERIALS ENGINEERING FIRST QUARTERLY REPORT, JULY-SEPTEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14029-1 +. 24 PAGES, 9 TABLES, 23 REFERENCES, OCT. 1974

THIS IS THE FIRST QUARTERLY PROGRESS REPORT FOR THE PROJECT THE OBJECTIVE OF WHICH IS CHARACTERIZATION OF MATERIAL, MAINLY 2-1/4CR-1MO AND AUSTENITIC STAINLESS STEELS, TO ASSURE THAT SATISFACTORY MATERIALS COMPATIBILITY IS ACHIEVED WITH LMFBR STEAM GENERATOR ENVIRONMENTS. SUBTASK A IS ASSOCIATED WITH THE KINETICS AND MAGNITUDE OF DECARBURIZATION OF 2-1/4CR-1MO IN HIGH TEMPERATURE LIQUID SODIUM. SUBTASK B IS AN ASSESSMENT OF STRESS CORROSION SUSCEPTIBILITY

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-102059 *CONTINUED*
OF 2-1/4CR-1MO IN WATER/STEAM-SIDE ENVIRONMENTS OF LMFBR STEAM GENERATORS. SUBTASKS C AND D DEFINE, RESPECTIVELY, THE EFFECT OF CARBURIZATION ON MECHANICAL PROPERTIES AND THE MAGNITUDE OF CARBURIZATION. UNDER SUBTASK E, GENERAL ELECTRIC HEADS THE WORKING COMMITTEE ON STEAM GENERATOR MATERIALS FOR THE NUCLEAR SYSTEMS MATERIALS HANDBOOK. SUBTASK F, AN EXPERIMENTAL EFFORT, IS INVESTIGATING THERMAL DEGRADATION EFFECTS PRODUCED BY PARTICULATE DEPOSITION (IN SODIUM) ON HEAT TRANSFER SURFACES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CARBON + STEEL, STAINLESS + MATERIAL + MASS TRANSFER + STRESS CORROSION + STEAM GENERATOR + PROPERTY, MECHANICAL

11-102060 DATED 1975
RAY WE
SODIUM TECHNOLOGY PROGRAM COMPONENT MATERIALS COMPATIBILITY QUARTERLY PROGRESS REPORT FOR PERIOD ENDING OCTOBER 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-18 +. 22 PAGES, 8 FIGURES, MARCH 1975

RUN ITF-5 WAS COMPLETED FOR THE INTERSTITIAL TRANSFER LOOP. CORROSION DATA FROM THE 2000-HOUR EXPOSURE WERE IN GOOD AGREEMENT WITH RESULTS FROM RUN ITF-4. NITROGEN LOSS WAS INSIGNIFICANT. A COLD-WORKED FOIL SAMPLE FROM UKAEA COMPLETELY RECRYSTALLIZED AFTER 1500 HOURS AT 1360 F WITH NO CHANGE IN CARBON CONTENT. CARBON EQUILIBRIUM LOOP RUNS CEL-58 AND CEL-2-32 ACHIEVED 3000 AND 1000 HOURS RESPECTIVELY. SIX INCONEL 718 MECHANICAL PROPERTY SAMPLES WERE EXPOSED TO 1000 F SODIUM WITH FLOW OF 6.5 FPS; THIS TEST IS FOR 2000 HOURS. SOLUTION-ANNEALED 316 STAINLESS STEEL PLATE IS BEING FABRICATED INTO MECHANICAL PROPERTY TEST SAMPLES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CARBON + CUT OF PILE EXPERIMENT + STEEL, STAINLESS + MATERIAL + MASS TRANSFER + INCONEL + R AND D PROGRAM + TECHNOLOGY

11-102064 DATED 1974
CONTROL ASSEMBLY ENGINEERING FIRST QUARTERLY REPORT, AUGUST-OCTOBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14030-1 +. 8 PAGES, 2 TABLES, 5 REFERENCES, NOV. 1974

THIS IS THE FIRST QUARTERLY PROGRESS REPORT FOR A PROGRAM THE OBJECTIVE OF WHICH IS TO DEVELOP A NON-BORON-CARBIDE ABSORBER ASSEMELY WHICH IS RELIABLE, ECONOMIC, AND LONG-LIVED FOR USE IN LMFBR REACTOR CORE SYSTEMS. AT THIS TIME THE TASK IS TO DESIGN AND QUALIFY LMFBR PROTOTYPICAL EUROPIUM OXIDE TEST ASSEMBLIES. MAJOR ACTIVITIES WITHIN THE PROGRAM INCLUDE MECHANICAL DESIGN, DESIGN SUPPORT ANALYSES, DESIGN TESTING, ECONOMIC STUDIES, AND THE PREPARATION OF THE DOCUMENTATION REQUIRED TO QUALIFY TWO EUROPIUM OXIDE TEST ASSEMBLIES FOR INSERTION INTO THE FIRST CORE OF FTR. A DESIGN TRADE-OFF STUDY IS BEING PERFORMED FOR EUROPIUM CARBIDE, NITRIDE, BORIDE, AND EUROPIUM OXIDE/RHENIUM CERMETS.

CONTROL SYSTEM + OXIDE + EUROPIUM + EQUIPMENT DESIGN + EQUIPMENT DEVELOPMENT + FTR (TR)

11-102095 ALSO IN CATEGORY 18 DATED 1974
COCKE RL + TRENT DS + POSTMA AK
A PARAMETRIC STUDY OF TEMPERATURE, PRESSURE, AND BURNING RESULTING FROM LARGE SODIUM FIRES IN THE CSE CONTAINMENT VESSEL
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASHINGTON
BNWL-B-391 +. 40 PAGES, 23 FIGURES, DEC. 1974

A PARAMETRIC STUDY WAS CONDUCTED TO DETERMINE THE EFFECT OF SODIUM BURNING CONDITIONS ON THE TEMPERATURE, PRESSURE, AND SODIUM BURNING RATE IN THE CSE CONTAINMENT VESSEL. FOR THE EXPECTED VALUES OF EXPERIMENTAL PARAMETERS, AVERAGE GAS TEMPERATURE AS HIGH AS 360 F, AND PRESSURES AS HIGH AS 4.5 PSIG WERE PREDICTED. DURING THE BURN PERIOD, CONSIDERABLE HIGHER TEMPERATURES WERE REACHED IN THE FIRE PLUME. THE DOMINANT HEAT INPUT COMES FROM THE HEATED BURN PAN RATHER THAN THE FIRE ITSELF. THE PREDICTED TEMPERATURES AND PRESSURES WERE FOUND TO BE WELL WITHIN THE DESIGN RATINGS OF THE VESSEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT + FIRE + R AND D PROGRAM

11-102216 ALSO IN CATEGORY 5 DATED 1974
CARAJILESCOV P + TODREAS NE
EXPANSION OF THE METHOD OF CORRELATED TEMPERATURES TO CLAD AND FUEL DESIGN ANALYSES
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
16 PAGES, 15 FIGURES, 8 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 30(1), PP. 3-19 (JULY 1974)

IN THE THERMAL DESIGN OF NUCLEAR REACTOR CORES, SPECIFIED DESIGN LIMITS (TEMPERATURES AND LINEAR POWER RATING) SHOULD NOT BE EXCEEDED BY THE OPERATING VALUES OF CERTAIN ELEMENTS (COOLANT, CLAD AND FUEL). AN EXPANSION OF THE METHOD OF CORRELATED TEMPERATURES, DEVELOPED FOR COOLANT

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-102216 *CONTINUED*
TEMPERATURE ANALYSIS, WAS PERFORMED TO ENABLE CLAD TEMPERATURE AND FUEL CENTERLINE MELTING ANALYSES FOR REACTOR CORE RELIABILITY STUDIES. SINCE GENERATION OF RANDOM NUMBERS IS INVOLVED, CALCULATIONAL PROCEDURES, TAILORED TO DESIGNER NEEDS, WERE DEVELOPED IN ORDER TO REDUCE COMPUTATIONAL TIME. THE METHOD IS APPLIED TO A TYPICAL LMFBR CORE AND RESULTS ARE PRESENTED FOR VARIOUS ASSUMED CLAD AND FUEL DESIGN LIMITS.

CLADDING + MEASUREMENT + ANALYTICAL TECHNIQUE + MEASUREMENT, TEMPERATURE + DESIGN STUDY + COMPARISON + TEMPERATURE

11-102229 DATED 1974
CHELLEW NR + MILLER WE + KESSIE RW
A METHOD FOR DETECTING FUEL CLADDING PENETRATION IN LMFBR'S BY MONITORING THE SODIUM COOLANT FOR IODINE-135
ARGONNE NATIONAL LABORATORY, ILLINOIS
8 PAGES, 3 FIGURES, 11 REFERENCES, NUCLEAR TECHNOLOGY, 21(2), PP. 125-32 (FEB. 1974)

WORK COMPLETED DEMONSTRATES FEASIBILITY OF A CLADDING-FAILURE MONITORING TECHNIQUE BASED ON 135I CONTENT OF THE PRIMARY SODIUM COOLANT. METHOD CONSISTS OF ISOLATING A SMALL VOLUME OF PRIMARY SODIUM, SPARGING IT WITH AN INERT GAS TO STRIP OUT DISSOLVED GASES, FURTHER SPARGING TO STRIP 135M XE PRODUCED BY 135I DECAY, CALCULATING THE 135I CONTENT OF THE SODIUM FROM THE 135M XE CONTENT OF THE SECOND SPARGE. A SYSTEM WITH AUTOMATIC CONTROLS WAS DESIGNED FOR MONITORING 135I IN THE PRIMARY SODIUM.

IODINE + XENON + MONITOR + FAILURE, CLADDING

11-102458 ALSO IN CATEGORY 5 DATED 1975
KUCZERA B
SIMULATION OF THE TRANSIENT BEHAVIOR OF LMFBR FUEL PINS UNDER CONSIDERATION OF SPECIAL BURNUP PHENOMENA USING THE BREDA-II MODEL
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
14 PAGES, 9 FIGURES, 28 REFERENCES, NUCLEAR ENGINEERING & DESIGN, 31, (2), PP. 294-307 (JAN. 1975)

A NEW FUEL PIN MODEL HAS BEEN USED FOR TRANSIENT FUEL PIN DEFORMATION ANALYSIS DURING HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS (HCDA) AND FOR THE PURPOSE OF INTERPRETING FUEL PIN FAILURE TESTS. THE FUEL PIN MODEL IS BASED ON THE EQUATIONS OF THE QUASI-STATIC THEORY OF THERMAL ELASTICITY. THE FUEL IS REGARDED AS ELASTIC AND THE CLADDING AS ELASTO-PLASTIC MATERIAL. THE EQUATIONS FOR THE STRESS-STRAIN ANALYSIS ARE BASED ON THE PLANE STRAIN APPROXIMATION. A MULTIREGION FUEL PIN MODEL ALLOWS TO SIMULATE LONG-TIME AND TRANSIENT BURNUP PHENOMENA. THE LONG-TIME EFFECTS TAKEN INTO ACCOUNT ARE THE STEADY STATE SWELLING OF FUEL, THE CHANGE IN FUEL POROSITY AND THE PRODUCTION AND PARTIAL RELEASE OF FISSION GASES.

FUEL BURNUP + FAILURE, FUEL ELEMENT + *ANALYTICAL MODEL + STRESS ANALYSIS + DEFORMATION + *SIMULATION + FUEL SWELLING + *FUEL ELEMENTS

11-102674 ALSO IN CATEGORIES 9 AND 17 DATED 1974
CAMBILLARD E + LACROIX A + VIALA J
PHENIX STEAM GENERATORS: MEASURING HYDROGEN CONCENTRATION OF SODIUM FOR TIGHTNESS INSPECTION OF WATER-STEAM TUBES
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE
ERDA-TR-6 + CONF-741085-3 +. 21 PAGES, PRESENTED AT SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

DISCUSSES THE SYSTEM FOR MEASURING HYDROGEN CONCENTRATION IN SODIUM TO DETECT POSSIBLE LEAKS IN STEAM GENERATORS. HYDROGEN DIFFUSION THROUGH THE TUBE WALLS HAS ALSO BEEN MEASURED AND DETERMINED TO BE 505 MG/HR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + *HYDROGEN + *MEASUREMENT + STEAM GENERATOR + TUBING + TEST, LEAK

11-102683 ALSO IN CATEGORY 17 DATED 1974
BISCAREL J + LAFON A + LIONS N
EFFECT OF SMALL WATER LEAKAGE INTO SODIUM IN TUBES OF THE PHENIX STEAM GENERATOR GROUP
CEA CENTRE D'ETUDES NUCLEAIRES DE CADARACHE, FRANCE
ERDA-TR-5 + CONF-741085-2 +. 18 PAGES, PRESENTED AT THE SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

THE EFFECTS OF WASTAGE CAUSED BY SMALL WATER OR STEAM LEAKAGE INTO THE SODIUM WAS STUDIED IN THE PHENIX STEAM GENERATOR GEOMETRY. THE RATE OF LOSS OF THICKNESS OF MATERIALS IS STUDIED AS A FUNCTION OF VARIOUS CHARACTERISTC PARAMETERS. THE METALLURGICAL ANALYSIS OF THE CRATERS ONLY SHOWED A SLIGHT SURFACE MODIFICATION OF THE STRUCTURE IN THE CASE OF TWO UNSTABILIZED FERRITIC STEELS AND AN AUSTENITIC STEEL. THE COMPARISON BETWEEN THE FERRITIC AND AUSTENITIC STEELS POINTED UP THE FACT THAT, IN THEIR RATED OPERATING CONDITIONS, THESE MATERIALS HAVE ESSENTIALLY THE SAME BEHAVIOR WITH RESPECT TO THE WASTAGE PHENOMENON.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CHEMICAL REACTION + FRANCE + STEEL + WATER + *CORROSION + *STEAM GENERATOR + *TUBING

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-102758 DATED 1974
LAMKIN DE
ANALYTICAL STRESS ANALYSIS SOLUTION FOR A SIMPLIFIED MODEL OF A REACTOR FUEL ELEMENT
ARIZONA UNIVERSITY, TUCSON
COO-2109-8 +. 110 PAGES, FIGURES, MAY 1974

ASSUMPTIONS ARE FUEL ELEMENT IS REPRESENTED BY ONE FUEL REGION SURROUNDED BY A CLADDING REGION. MECHANICAL PROPERTIES ARE SPACE INDEPENDENT WITHIN EACH OF THE TWO REGIONS. CREEP RATES ARE RELATED LINEARLY TO THE DEVIATORIC STRESS. A STATE OF PLANE STRAIN WITH AZIMUTHAL SYMMETRY IS ASSUMED. USING VISCOELASTIC-ELASTIC ANALOGY, CLOSED-FORM ANALYTICAL SOLUTIONS GIVE STRESSES IN THE FUEL ELEMENT. SEVERAL 'DRIVING FORCES,' NAMELY FISSION GAS PRESSURE, COOLANT PRESSURE, THERMAL EXPANSION, AND IRRADIATION INDUCED SWELLING, ARE VISIBLE AND EASILY COMPARED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + *ANALYTICAL MODEL + STEEL, STAINLESS + *STRESS ANALYSIS + SWELLING + *FUEL ELEMENTS

11-102764 DATED 1974
LAIDLER JJ + MASTEL B + GARNER FA
SWELLING IN ELECTRON-IRRADIATED 316 STAINLESS STEEL
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-656(REV.1) + CONF-740651-4 +. 24 PAGES, PRESENTED AT SYMPOSIUM ON THE EFFECTS OF RADIATION ON STRUCTURAL MATERIALS, GATLINBURG, TENN., JUNE 11, 1974

MATERIAL OPERATES AT TEMPERATURES AS GREAT AS 750 C. CORE DESIGN IS BASED ON EXTRAPOLATIVE EQUATIONS FIT TO LOW-FLUENCE NEUTRON IRRADIATION SWELLING DATA FOR SOLUTION-TREATED AND COLD WORKED 316 STAINLESS STEEL, WITH DATA EXTENDING TO FLUENCES OF 5-7 X 10(EXP 22)N/CM SQUARED (E >0.1 MEV). THE SAME ALLOY IS THE DESIGN MATERIAL FOR THE LMFBR DEMONSTRATION REACTOR. TECHNIQUE INVOLVES IRRADIATION OF CLADDING SPECIMENS WITH 1 MEV ELECTRONS IN A HIGH VOLTAGE ELECTRON MICROSCOPE (HVEM). THE RESULTS REPORTED HERE HAVE LEAD TO A NUMBER OF IMPORTANT CONCLUSIONS REGARDING EXPECTED BEHAVIOR OF FTR AND DEMO-1 FUEL CLADDING AND DUCTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*STEEL, STAINLESS + IRRADIATION TESTING + *ELECTRON MICROSCOPY + ELECTRON + *SWELLING + FTR (TR)

11-102791 DATED 1974
JAMES LA
ESTIMATION OF CRACK EXTENSION IN A PIPING ELBOW USING FRACTURE MECHANICS TECHNIQUES
*WESTINGHOUSE HANFORD CO., RICHLAND, WASHINGTON
*HEDL-SA-663 + CONF-740606-8 +. 26 PAGES, PRESENTED AT PRESSURE VESSELS AND PIPING-MATERIALS-NUCLEAR CONFERENCE, HELD IN MIAMI BEACH, FLA., JUNE 24, 1974

THE EXTENSION OF A HYPOTHETICAL CRACK IN A PIPING ELBOW UNDER FATIGUE LOADINGS AT ELEVATED TEMPERATURE IS ESTIMATED USING THE ANALYSIS TECHNIQUES OF LINEAR-ELASTIC FRACTURE MECHANICS. THE IN-SERVICE BEHAVIOR OF A HYPOTHETICAL FLAW, LOCATED IN THE DOWNCOMER ELBOW OF THE INLET TO AN LMFBR NUCLEAR REACTOR, IS ANALYZED USING ANTICIPATED SERVICE LOADINGS. THE OBJECTIVE IS TO ILLUSTRATE THE ANALYSIS TECHNIQUES AND ASSUMPTIONS REGARDING LOADINGS, OPERATIONAL ENVIRONMENT AND MATERIAL BEHAVIOR THAT MUST BE MADE IN ORDER TO COMPLETE THE ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STEEL, STAINLESS + *ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + *FRACTURE TOUGHNESS + GROWTH/DEVELOPMENT + FATIGUE + CRACK + *PIPES AND PIPE FITTINGS

11-102923 ALSO IN CATEGORY 9 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT FUELS, MATERIALS, AND CONTROL ROD DEVELOPMENT PROGRAMS OCT.-DEC. 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13142 +. 31 PAGES, 8 TABLES, 10 FIGURES, FEB. 15, 1975

REPORTS ON PROGRESS IN AEC TASKS ON IRRADIATION EFFECTS. (1) TASK 2A - IRRADIATION DAMAGE IN CLADDING AND CORE STRUCTURAL MATERIALS. (2) TASK 2B - HELIUM GENERATION IN REACTOR MATERIALS. (3) TASK 5 - ABSORBER STUDIES, HEATING EQUIPMENTS, AND DESIGN STUDIES - ALTERNATE CONTROL ASSEMBLIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

MATERIAL + IRRADIATION TESTING + *EQUIPMENT DEVELOPMENT + FUEL, NUCLEAR + CONTROL RODS

11-102935 ALSO IN CATEGORIES 6 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT FEB. 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-37 +. 151 PAGES, FIGURES, MARCH 31, 1975

DISCUSSES THE (1) R&D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICS.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-102935 *CONTINUED*
AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + *TREAT (PRR) + *CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + *IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + *MODEL + *VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

11-102939 DATED 1975
EVANS EA
HEDL QUARTERLY TECHNICAL REPORT OCTOBER, NOVEMBER, DECEMBER 1974, VOLUME 1, APPLIED RESEARCH AND MATERIALS ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-4(VOL.1) +. 325 PAGES, FIGURES, JAN. 1975

SUBJECTS COVERED ARE I. APPLIED RESEARCH, A. CERAMIC FUELS PROPERTIES AND BEHAVIOR, B. NEUTRON ABSORBER TECHNOLOGY; II. MATERIALS ENGINEERING, A. MECHANICAL METALLURGY, B. MATERIALS ANALYSIS AND APPLICATION, C. MATERIALS DEVELOPMENT, AND D. SODIUM TECHNOLOGY. MUCH OF THE WORK DESCRIBED FOR APPLIED RESEARCH USES THE EBR-II FOR IRRADIATION TESTING OF FUELS. MUCH OF THE WORK UNDER MATERIALS ENGINEERING INVESTIGATES STAINLESS STEEL BEHAVIOR AND PROPERTIES. MUCH OF THE WORK IN SODIUM TECHNOLOGY IS RELATIVE TO CORROSION AND SODIUM HANDLING. THE REPORT SUMMARIZES ALL WORK IN THE FIRST TWO CHAPTERS WHICH ARE SHORT AND THEN PRESENTS DETAILED INFORMATION IN INDIVIDUAL REPORTS OR EXHIBITS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CERAMICS + CONTROL ROD PROGRAM + EBR 1 AND 2 (RE) + CLADDING + STEEL, STAINLESS + WELDING + CORROSION + *MATERIAL + IRRADIATION TESTING + CREEP + *R AND D PROGRAM + *FUEL, NUCLEAR + METALLURGY + CRACK + MIXED OXIDE

11-102950 DATED 1974
DORAN DG + BURNETT RA
SIMULATED ANNEALING OF DISPLACEMENT CASCADES IN FCC METALS, I: BEELER CASCADES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-56 +. 22 PAGES, 5 TABLES, 4 FIGURES, 9 REFERENCES, SEPT. 1974

LOW TEMPERATURE ANNEALS, CHARACTERIZED BY NO VACANCY MIGRATION AND A 104 SITE ANNIHILATION REGION (AR), RESULTED IN 49 DEFECT PAIRS AT 20 KEV AND 11 PAIRS AT 5 KEV. HIGH TEMPERATURE ANNEALS, CHARACTERIZED BY BOTH INTERSTITIAL AND VACANCY MIGRATION AND A 32 SITE AR, RESULTED IN 68 PAIRS AT 20 KEV AND 18 PAIRS AT 5 KEV WHEN NO CLUSTER DISSOCIATION WAS PERMITTED; MOST OF THE VACANCIES WERE IN IMMOBILE CLUSTERS. THESE HIGH TEMPERATURE VALUES DROPPED TO 40 AND 14 UPON DISSOLUTION OF THE VACANCY CLUSTERS. PARAMETER STUDIES SHOWED THAT, AT A GIVEN TEMPERATURE, THE LARGE AR RESULTED IN ABOUT ONE-HALF AS MANY DEFECTS AS THE SMALL AR. CLUSTER SIZE DISTRIBUTIONS AND EXAMPLES OF SPATIAL CONFIGURATIONS ARE INCLUDED IN THE PAPER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *RADIATION DAMAGE + ANALYTICAL MODEL + IRRADIATION TESTING + *THERMAL PROPERTY + *FACE CENTERED CUBIC CRYSTAL + *THEORETICAL INVESTIGATION

11-103024 ALSO IN CATEGORY 7 DATED 1975
BRAMMAN JI + POWELL HJ
REDISTRIBUTION OF FUEL AND FISSION PRODUCTS IN IRRADIATED OXIDE FUEL PINS
UKAEA, DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT
12 PAGES, 15 FIGURES, 41 REFERENCES, J. BRITISH NUCLEAR ENERGY SOCIETY, 14(1), PP. 63-75 (JAN. 1975)

A REVIEW IS PRESENTED BASED LARGELY ON HITHERTO UNPUBLISHED DOUNREAY DATA ON THE MOVEMENT OF FUEL AND FISSION PRODUCTS IN FAST REACTOR IRRADIATED OXIDE FUEL PINS. THE PROCESSES OF REDISTRIBUTION ARE DISCUSSED IN QUALITATIVE TERMS. ALTHOUGH EXTENSIVE REDISTRIBUTION IS COMMONLY OBSERVED, NONE OF THE PHENOMENA IS LIKELY TO LIMIT THE USE OF OXIDE FUELS IN COMMERCIAL FAST REACTOR CORES.

FISSION PRODUCT RELEASE + *FISSION PRODUCT TRANSPORT + FUEL ROD

11-103330 DATED 1974
SHIELS SA + EAGNALL C + SCHROCK SL
CARBON EQUILIBRIUM RELATIONSHIPS FOR AUSTENITIC STAINLESS STEELS IN A SODIUM ENVIRONMENT
WESTINGHOUSE ELECTRIC CORPORATION
11 PAGES, 9 FIGURES, 18 REFERENCES, NUCLEAR TECHNOLOGY, 23(3), PP. 273-83 (SEPT. 1974)

A TECHNIQUE TO MEASURE THE 'CARBON POTENTIAL' OF HEAT TRANSPORT SYSTEM SODIUM INVOLVES THE EQUILIBRATIONS OF LOW-CARBON TYPE 304 STAINLESS-STEEL FOILS AT A STANDARD TEMPERATURE OF 704 C (1300 F). THE EQUILIBRIUM CARBON CONCENTRATION OF THE FOIL IS USED AS THE MEASUREMENT OF THE CARBON POTENTIAL OF THE SODIUM. RELATIONSHIPS BETWEEN THE CARBON POTENTIAL, AND CARBON EQUILIBRIUM VALUES IN TYPES 304 AND 316 STAINLESS STEEL HAVE BEEN DEVELOPED BY EXPERIMENTATION. THESE CORRELATIONS ALLOW THE SURFACE CARBON LEVELS IN SYSTEM COMPONENTS TO BE PREDICTED.

*CARBON + DIFFUSION + NITROGEN + *STEEL, STAINLESS + CORROSION + *EQUILIBRIUM

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-103349 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR APRIL AND MAY 1971
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4685 +. 50 PAGES, 13 REFERENCES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF PROGRESS REPORTS DESCRIBING WORK UNDER THE LMFBR PROGRAM TASK ON STRUCTURAL DESIGN METHODS FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURES. SUBCONTRACT WITH TELEDYNE MATERIALS RESEARCH CO. TO PERFORM AN ANALYTICAL PARAMETRIC STUDY OF RATCHETTING IN REPRESENTATIVE STRUCTURAL COMPONENTS WAS SIGNED AND WORK WAS INITIATED. CONTINUING TO DEVELOP AND REFINE A NONLINEAR KINEMATIC HARDENING MODEL FOR DESCRIBING ELASTIC-PLASTIC BEHAVIOR, INCLUDING HARDENING, UNDER CYCLIC LOADING. HIGH-TEMPERATURE BEAM TEST FACILITY IS PRESENTLY BEING FITTED WITH AN APPARATUS FOR APPLYING CONSTANT LOADS FOR RELATIVELY LONG PERIODS. AND IN THE AREA OF CREEP-FATIGUE, CREEP AND CREEP-RUPTURE DATA HAVE BEEN GENERATED BY PROFESSOR S. Y. ZAMRIK AT PENNSYLVANIA STATE UNIVERITY FOR BOTH PLATE AND BAR STOCK FROM THE ORNL REFERENCE HEAT OF 304 STAINLESS STEEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103350 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR FEBRUARY AND MARCH 1971
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4684 +. 64 PAGES, 7 REFERENCES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF PROGRESS REPORTS DESCRIBING WORK UNDER THE LMFBR PROGRAM TASK ON STRUCTURAL DESIGN METHODS FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURES. ORNL MADE AN ANALYSIS OF A PRELIMINARY CREEP EQUATION AND CHECKED IT WITH EXPERIMENTAL RESULTS ON 304 STAINLESS STEEL. SUBCONTRACTS ARE BEING REVIEWED AND ADDITIONAL ONES INITIATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + STEEL, STAINLESS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103351 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR DECEMBER 1970 AND JANUARY 1971
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4683 +. 66 PAGES, 22 REFERENCES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF MONTHLY PROGRESS REPORTS ON WORK UNDER THE LMFBR PROGRAM TASK TO DEVELOP A HIGH-TEMPERATURE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS. PROGRESS ON THE THREE INTERPRETIVE REPORTS WAS MADE. THESE REPORTS - ON INELASTIC ANALYSIS METHODS, CREEP BEHAVIOR REPRESENTATION, AND THE BEHAVIOR OF WELDMENTS - WILL BE FINISHED BY JUNE 30, 1971. SEVERAL SUBCONTRACTS ARE BEING INITIATED FOR THE STUDY OF ELASTIC-PLASTIC-CREEP FINITE-ELEMENT WORK.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103352 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR OCTOBER AND NOVEMBER 1970
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4682 +. 41 PAGES, 28 REFERENCES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF MONTHLY PROGRESS REPORTS ON WORK UNDER THE LMFBR PROGRAM TASK TO DEVELOP A HIGH-TEMPERAUTRE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103353 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMATION PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR PERIOD ENDING SEPTEMBER 1970

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-103353 *CONTINUED*
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4681 +. 39 PAGES, FIGURES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF MONTHLY PROGRESS REPORTS ON WORK UNDER THE LMFBR PROGRAM TASK TO DEVELOP HIGH-TEMPERATURE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS. CREEP-FATIGUE CUMULATIVE DAMAGE CRITERIA, THE BEHAVIOR OF WELDMENTS IN CRITICAL STRUCTURAL AREAS, AND INELASTIC BUCKLING OF COMMON CONFIGURATIONS SUCH AS PIPING COMPONENTS ARE BEIGN STUDIED. FIRST, ON THE BASIS OF THE INFORMATION THAT IS LIKELY TO BE AVAILABLE IN THE IMMEDIATE FUTURE, A BILINEAR STRESS-STRAIN RELATICN WOULD BE USED WITH THE KINEMATIC HARDENING RULE. SECOND, EXISTING COMPUTATIONAL CAPABILITY LEADS TO THE PRCEAELE SELECTION OF AN EQUATION-OF-STATE REPRESENTATION OF CREEP BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTICN; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE + *PIPES AND PIPE FITTINGS

11-103354 DATED 1974
GREENSTREET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR PERIOD ENDING AUGUST 31, 1970
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4680 +. 28 PAGES, FIGURES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF MONTHLY PROGRESS REPORTS ON WORK UNDER THE LMFBR PROGRAM TASK TO DEVELOP A HIGH-TEMPERATURE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS. WHEN THE PROGRAM PLANNING PHASE IS COMPLETED AND THE INITIAL PHASES OF THE PROGRAM ARE IMPLEMENTED, THIS SERIES OF MONTHLY PROGRESS REPORTS WILL BE SUSPENDED, AND FORMAL SEMIANNUAL PROGRESS REPORTS WILL BE ISSUED. THE LONG-RANGE PROGRAM DRAFT WAS EDITED AND FINALIZED AND COPIES WERE PREPARED FOR SUBMISSION TO THE COMMISSION FOR COMMENTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTICN; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + *STEEL, STAINLESS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103355 DATED 1974
GREENSTREEET WL + CORUM JM + PUGH CE
INFORMAL PROGRESS RERPOTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR PERIOD ENDING JULY 31, 1970
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4679 +. 30 PAGES, 15 REFERENCES, SEPT. 1974

THIS IS THE FIRST IN A SERIES OF MONTHLY PROGRESS REPORTS WITH AN EXPANDED DISTRIBUTION AND COVERING THE LMFBR PROGRAM TASK TO DEVELOP A HIGH-TEMPERATURE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS. THE CENTRAL THRUST OF THE TASK IS DIRECTED TOWARD DEVELOPING PROVEN METHODS FOR PREDICTING STRUCTURAL BEHAVIOR UNDER ARBITRARY TIME-VARYING LOADS AND TEMPERATURES. THE PROGRAM IS PRESENTLY IN THE PLANNING AND EARLY IMPLEMENTATION STAGES, AND THE PROGRESS REPORTS HEREIN REFLECT THIS. IN ADDITION TO SECTIONS ON PROGRAM PLANNING AND COORDINATION, INTERIM DESIGN CRITERIA STUDIES, AND DESIGN METHODS FOR CORE STRUCTURALS, THE CATEGORIES OF THIS REPORT CORRESPOND TO THE AREAS ASSOCIATED WITH THE MAIN THRUST OF THE PROGRAM PLUS SUPPORTING MATERIALS INVESTIGATIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTICN; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + *CORE COMPONENTS + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103356 DATED 1974
GREENSTREET WL + PUGH CE + CORUM JM
INFORMAL PROGRESS REPORTS ON STRUCTURAL DESIGN METHODS FOR LMFBR COMPONENTS FOR PERIOD ENDING JUNE 30, 1970
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4678 +. 24 PAGES, 4 FIGURES, 3 REFERENCES, SEPT. 1974

THIS IS ONE OF A CONTINUING SERIES OF MONTHLY PROGRESS REPORTS ON WORK UNDER THE LMFBR PROGRAM TASK TO DEVELOP A HIGH-TEMPERATURE STRUCTURAL DESIGN TECHNOLOGY AND ASSOCIATED DESIGN CRITERIA FOR LMFBR VESSELS, COMPONENTS, AND CORE STRUCTURALS. THE CENTRAL THRUST OF THE TASK IS DIRECTED TOWARD DEVELOPING PROVEN METHODS FOR PREDICTING STRUCTURAL BEHAVIOR UNDER ARBITRARY TIME-VARYING LOADS AND TEMPERATURES, AND CONSISTS OF (1) STUDIES OF ANALYTICAL DESCRIPTION OF ELASTIC-PLASTIC AND TIME-DEPENDENT MATERIAL BEHAVIORS, (2) IDENTIFICATION OF DEVELOPMENT OF STRUCTURAL ANALYSIS TECHNIQUES INCORPORATING THESE DESCRIPTIONS, AND (3) SIMPLE STRUCTURE TESTS UNDER ELASTIC, ELASTIC-PLASTIC, AND CREEP CONDITIONS FOR ASSESSING THE ANALYTICAL METHODS. RELATED AREAS OF STUDY INCLUDE CREEP-FATIGUE CUMULATIVE DAMAGE, WELDMENT BEHAVIOR IN CRITICAL STRUCTURAL AREAS, AND BUCKLING. THE PROGRAM IS PRESENTLY IN THE PLANNING AND EARLY IMPLEMENTATION STAGES, AND THE PROGRESS REPORTS HEREIN REFLECT THIS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62,

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-103356 *CONTINUED*
OAK RIDGE, TENN. 37830

BUCKLING + DESIGN CRITERIA + WELDS + ANALYTICAL TECHNIQUE + HIGH TEMPERATURE + DAMAGE + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *FATIGUE

11-103376 ALSO IN CATEGORY 18 DATED 1975
KONDO S
CONTAINABILITY OF EFFECT OF MOLTEN FUEL RELEASE IN FAST REACTOR FUEL-SUBASSEMBLY
UNIVERSITY OF TOKYO, JAPAN
12 PAGES, 5 FIGURES, 36 REFERENCES, J. NUCLEAR SCIENCE & TECHNOLOGY, 12(1), PP. 12-23 (JAN. 1975)

DISCUSSES VARIOUS ALTERNATIVE SAFETY IMPLICATIONS RELEVANT TO LOCAL FAULTS IN LMFBR, AND EVALUATES THE BASIC FACTORS AFFECTING THE ABILITY OF THE SUBASSEMBLY WRAPPER WALL TO CONTAIN THE VARIOUS EFFECTS OF MOLTEN FUEL RELEASE. THE RESPONSE OF THE WRAPPER TUBE IS EVALUATED BY THE METHOD PROPOSED BY YOUNGDAHL. FIRSTLY, AN EQUATION IS DERIVED FOR CALCULATING THE ENERGY REPARTITION BETWEEN THE PORTIONS CONSUMED IN WALL DEFORMATION AND SODIUM SLUG ACCELERATION. THEN, USING THIS EQUATION, ANALYSES ARE PERFORMED COVERING VARIOUS SITUATIONS WHERE MOLTEN FUEL COOLANT INTERACTION SIGNIFICANTLY AFFECTS THE SURROUNDING MATTER.

*CLADDING + FUEL MELTDOWN + ANALYTICAL TECHNIQUE + *PERFORMANCE

11-103933 ALSO IN CATEGORY 18 DATED 1975
BOLTAX A + SALING JH
OXIDE FUEL ELEMENT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-OX-3045-16 +. 60 PAGES, 14 FIGURES, APRIL 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING IRRADIATION TESTING OF MIXED OXIDES; POST-IRRADIATION EXAMINATION OF FAST REACTOR EXPERIMENTS; GRID-TYPE FUEL ASSEMBLIES; FABRICATION, DEVELOPMENT, AND TESTING OF LMFBR FUEL ASSEMBLIES; ANALYSIS OF FUEL AND CLADDING IRRADIATION BEHAVIOR; AND IMPROVEMENT OF ANALYTICAL METHODS AND LIFETIME CODES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CLADDING + ANALYTICAL TECHNIQUE + *IRRADIATION TESTING + EXAMINATION + R AND D PROGRAM + FUEL, NUCLEAR + *MIXED OXIDE + FUEL ELEMENTS

11-103976 ALSO IN CATEGORY 18 DATED 1975
LORENZ RA
EVALUATION OF THE REXCO-H AND REXCO-HEP REACTOR EXCURSION CONTAINMENT CODES
NAVAL ORDNANCE LAB., SILVER SPRING, MARYLAND
NOLTR 74-63 +. 46 PAGES, 5 FIGURES, 7 REFERENCES, MARCH 1975

CODES WERE DEVELOPED BY ARGONNE NATIONAL LABORATORY TO ANALYZE RESPONSE TO THE PRIMARY CONTAINMENT SYSTEM OF A LIQUID METAL FAST BREEDER REACTOR TO A CORE DISASSEMBLY ACCIDENT (CDA). REXCO-H ANALYZES THE HYDRODYNAMIC RESPONSE, AND REXCO-HEP ANALYZES THE HYDRODYNAMIC AND ELASTIC-PLASTIC RESPONSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *CONTAINMENT ANALYSIS + EXCURSION, LARGE + MATHEMATICAL TREATMENT + *ACCIDENT, CORE DISRUPTIVE

11-103983 ALSO IN CATEGORY 18 DATED 1975
CRAWFORD RM + MARR WW + PADILLA A + WANG PY
STUDIES ON LMFBR SUBASSEMBLY BOUNDARY INTEGRITY
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-27 +. 55 PAGES, 37 FIGURES, 28 REFERENCES, MAY 1975

INITIAL FAULTS AND THEIR ASSOCIATED FAILURE-PROPAGATION MODES ARE IDENTIFIED WITH THE USE OF SAFETY-ASSURANCE DIAGRAMS. TO PUT THESE INITIAL FAULTS INTO PERSPECTIVE, REACTOR OPERATING EXPERIENCE IS REVIEWED WITH PARTICULAR EMPHASIS ON THE FUEL-MELTING INCIDENT IN THE FERMI REACTOR. THE ABILITY OF THE SUBASSEMBLY DUCT TO WITHSTAND A PRESSURE-PULSE LOADING IS REVIEWED, INCLUDING RECENT ANALYSES OF LOCAL MELTS AND SUBASSEMBLY-DUCT MECHANICAL RESPONSE. THE CONSEQUENCES OF A LOCALIZED FAILURE OF THE SUBASSEMBLY DUCT IS ALSO ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL MELTDOWN + *STRUCTURAL INTEGRITY + PRESSURE PULSE + OPERATING EXPERIENCE + FAILURE MODE ANALYSIS

11-104002 DATED 1974
MOJIMA M + IHARA S + AKIMOTO Y
OUT-OF-PILE PERFORMANCE TEST OF BORON CARBIDE. III. COMPATIBILITY BETWEEN BORON CARBIDE AND SODIUM
MITSUBISHI METAL CORP., JAPAN
JAPENR-184 +. 47 PAGES, 9 FIGURES, NOV. 1974

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-104002 *CONTINUED*
EFFECTS OF HEATING TEMPERATURE HEATING PERIOD DENSITY AND B/C RATIO OF B4C PELLET, AND OXYGEN CONTENT IN SODIUM WERE EXAMINED. THE RESULTS FROM MICROSCOPIC ANALYSIS, X-RAY DIFFRACTION AND ELECTRON PROBE MICROANALYSIS REVEALED THAT THERE EEXISTS AN EXCELLENT COMPATIBILITY BETWEEN B4C AND SODIUM UNDER THE EXPERIMENTAL CONDITION. STAINLESS STEEL USED AS CAPSULE MATERIAL IN THE EXAMINATION SHOWED THE FORMATION OF ONLY A FEW MICRONS OF INTERACTION ZONE UNDER THE COEXISTENCE OF B4C AND SODIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

OUT OF PILE EXPERIMENT + STEEL, STAINLESS + JAPAN + MATERIAL + PROPERTY, PHYSICAL + PROPERTY, CHEMICAL

11-104090 DATED 1975
JAMES LA
FATIGUE-CRACK PROPAGATION IN A CAST STAINLESS STEEL
WESTINGHOUSE HANFORD CO., RICHLAND, WASHINGTON
8 PAGES, 8 FIGURES, 21 REFERENCES, NUCLEAR TECHNOLOGY, 26(1), PP. 46-53

LINEAR-ELASTIC FRACTURE MECHANICS TECHNIQUES WERE EMPLOYED TO CHARACTERIZE CRACK GROWTH BEHAVIOR OF SA-351 GRADE CF8 CAST STAINLESS STEEL FOR TEMPERATURE 75 TO 1200 F (24 TO 649 C). IN GENERAL, CRACK GROWTH RATES INCREASED WITH INCREASING TEST TEMPERATURE. GROWTH RATES IN AND CAST MATERIAL GENERALLY FELL WITHIN OR BELOW THE SCATTER BANDS FOR WROUGHT TYPES 304 AND 316 MATERIAL TESTED UNDER SIMILAR CONDITIONS, IMPLYING THAT DATA OBTAINED ON WROUGHT MATERIAL WOULD LIKELY YIELD CONSERVATIVE RESULTS FOR CRACK GROWTH ANALYSES ON CAST STRUCTURES.

TESTING + *STEEL, STAINLESS + ANALYTICAL TECHNIQUE + FRACTURE TOUGHNESS + TEMPERATURE + GROWTH/DEVELOPMENT + MATHEMATICS, LINEAR EQUATION + FATIGUE + *CRACK

11-104125 DATED 1974
SCHROCK SL + WHITLOW GA
CORROSION STUDIES FOR THE SODIUM COOLED FAST BREEDER REACTOR PROGRAM
WESTINGHOUSE ELECTRIC CORPORATION
CONF-741013-3 +. 16 PAGES, FROM MEETING OF THE ELECTROCHEMICAL SOCIETY, NEW YORK, N.Y., OCT. 13, 1974

INCLUDED HERE ARE CONSIDERATIONS OF WALL THINNING RATES, FOR THIN WALLED STRUCTURES SUCH AS FUEL CLADDING OR HEAT TRANSFER TUBING, CHANGES IN INTERSTITIAL ELEMENT CONTENTS FOR IRON BASE ALLOYS, CHANGES IN SURFACE COMPOSITION OR MICROSTRUCTURE WHICH COULD LEAD TO HIGH WEAR RATES OR FRICTION COEFFICIENTS BETWEEN CONTACTING INTERFACES, AND DEPOSITION OF CORROSION PRODUCTS IN COLD LEG REGIONS OF THE SODIUM SYSTEM WITH RESULTING EFFECTS ON RADIOACTIVE MAINTENANCE, FLOW BLOCKAGE, AND HEAT TRANSFER. IN THIS PAPER THE STATE-OF-THE-ART POSITION FOR EACH OF THE ABOVE SODIUM CORROSION CONSIDERATIONS IS DESCRIBED. DATA ARE GIVEN IN GRAPHICAL FORM WHICH ILLUSTRATE THE EXTENT OF THE SURFACE COMPOSITIONAL ALTERATIONS AS A FUNCTION OF THE CONDITIONS OF SODIUM EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + HEAT TRANSFER + STEEL, STAINLESS + *CORROSION + SURFACE + FLOW BLOCKAGE + R AND D PROGRAM + TUBING + FRICTION + *MICROSTRUCTURE

11-104127 DATED 1975
PITNER AL
IRRADIATION OF BORON CARBIDE AND TANTALUM IN A SPECTRUM-HARDENED ETR FLUX
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 72-34 +. 38 PAGES, FIGURES, FEB. 1972

BORON CARBIDE PELLETS WERE IRRADIATED AT 1300 TO 1900 F TO A MAXIMUM BURNUP OF 9 X 10(EXP 20) CAPTURES/CC IN A SPECTRUM-HARDENED ETR FLUX TO SIMULATE LMFBR CONDITIONS. ALTHOUGH OVERHEATING CONDITIONS IN THE CAPSULE CAUSED EXTENSIVE INSTRUMENTATION FAILURE AND RESULTED IN EARLY DISCHARGE OF THE TEST, THE EXPERIMENTAL DESIGN WAS BASICALLY SOUND AND HAS BEEN USED SUCCESSFULLY IN A FOLLOW-ON EXPERIMENT. IN GENERAL, SAMPLES RETRIEVED FROM THE TEST WERE IN GOOD PHYSICAL CONDITION AND SHOWED LITTLE MICROSTRUCTURAL DAMAGE. DATA ARE REPORTED FOR GAS RELEASE, SWELLING, INTERACTION WITH TYPE 316 STAINLESS STEEL, AND THERMAL CONDUCTIVITY CHANGE. SEVERAL SPECIMENS OF TANTALUM WERE ALSO IRRADIATED TO INVESTIGATE SWELLING BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*BORON + *CARBIDE + ETR (TR) + *TANTALUM + HIGH TEMPERATURE + *IRRADIATION TESTING + SIMULATION + SWELLING

11-104282 ALSO IN CATEGORY 18 DATED 1975
FAST REACTOR SAFETY - IV: CLADDING FAILURE AND FUEL BEHAVIOR
7 PAGES, TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 302-8, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 6 PAPERS PRESENTED AT THE MEETING ON CLAD FAILURE AND FUEL BEHAVIOR. THE TOPICS INCLUDE: LMFBR CLADDING FAILURE PREDICTION IN TRANSIENT OVERPOWER EXPERIMENTS; FAILURE OF IRRADIATED LMFBR FUEL PINS IN A TRANSIENT OVERPOWER ACCIDENT; FAILURE THRESHOLD CORRELATION FOR FAST REACTOR TRANSIENT OVERPOWER ACCIDENT ANALYSIS; THERMAL

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-104282 *CONTINUED*
INTERACTION OF MOLTEN CAREIDE FUEL WITH STAINLESS-STEEL CLADDING; FUEL BEHAVIOR SLIGHTLY ABOVE OR BELOW THE FAILURE THRESHOLD; AND OUT-OF-REACTOR FUEL-MOTION STUDIES UTILIZING DIRECT ELECTRICAL HEATING.

FUEL MELTDOWN + *REACTOR TRANSIENT + FAILURE, CLADDING

11-104413 ALSO IN CATEGORIES 13 AND 18 DATED 1972
TVERBERG JC
STAINLESS STEEL FUEL CLADDING FOR FAST BREEDER REACTORS
CARPENTER TECHNOLOGY CORP.
3 PAGES, 4 FIGS., NUCLEAR ENGINEERING INTERNATIONAL, 17(199), PP. 1001-1003 (DEC. 1972)

THE METHODS DESCRIBED IN THIS PAPER REPRESENT THOSE PROCESSES EMPLOYED BY CARPENTER TECHNOLOGY CORPORATION, SPECIAL PRODUCTS DIVISION, SAN DIEGO, CALIFORNIA, IN ITS PRODUCTION OF DEFECT FREE FAST BREEDER FUEL CLADDING TUBES. THE CONCEPTS INCLUDE SPECIAL HANDLING TO PREVENT TUBE-TO-TUBE CONTACT, VERTICAL DEGREASING TO PREVENT SLUDGE FROM ACCUMULATING IN THE TUBES DURING CLEANING, BRIGHT ANNEALING USING PURE HYDROGEN TO YIELD A SCALE FREE SURFACE THUS ELIMINATING ACID PICKLING, AND STATISTICAL CONTROL OF ALL MANUFACTURING VARIABLES.

*FABRICATION + CLADDING + STEEL, STAINLESS + FFTF (TR) + QUALITY ASSURANCE

11-104418 ALSO IN CATEGORY 12 DATED 1972
SENS PF
EXAMINATION OF FAST REACTOR FUEL PINS IRRADIATED IN A SODIUM ENVIRONMENT IN THE HFR SWING-IN FACILITY
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
RCN-167 +, 38 PAGES, FIGURES, MARCH 1972

TWO FAST REACTOR FUEL PINS HAVE BEEN IRRADIATED IN A NA ENVIRONMENT IN THE H.F.R. AT PETTEN FOR A SHORT DURATION AND AT A LINEAR POWER LEVEL OF 110 W/CM. THE POST-IRRADIATION EXAMINATION OF THESE PINS IS DESCRIBED. ACCIDENTAL INTERACTION BETWEEN UO2 AND AN AI203 ISOLATION PELLET OCCURED, PRESUMABLY DUE TO FLUX PEAKING AT THE END OF THE 50% ENRICHED FUEL COLUMN. SOLIDIFICATION OF THE MOLTEN FUEL IN THE CENTRE OF THE PIN CAUSED THE FORMATION OF A UO2 - A1203 EUTECTIC NETWORK BETWEEN THE PRIMARY UO2 DENDRIDES. THE ABSENCE OF A1203 IN THE COLUMNAR GRAIN REGION, EXCEPT AT THE OUTER BOUNDARY, CAN QUALITATIVELY BE EXPLAINED BY A MIGRATION MECHANISM WITH THE STEEP TEMPERATURE GRADIENT AS DRIVING FORCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALUMINUM + CHEMICAL REACTION + FAILURE, FUEL ELEMENT + FUEL MELTDOWN + OXIDE + URANIUM + HIGH TEMPERATURE + IRRADIATION TESTING + FUEL ROD

11-104425 ALSO IN CATEGORIES 5 AND 18 DATED 1973
CLAXTON KT + COLLIER JG
MASS TRANSPORT OF STAINLESS STEEL CORROSION PRODUCTS IN FLOWING LIQUID SODIUM
UKAEA RESEARCH GROUP, HARWELL
13 PAGES, 8 TABS., 13 FIGS., J. BRITISH NUCLEAR ENERGY SOCIETY, 12(1), PP. 63-75 (JAN. 1973)

THE MASS TRANSPORT OF CORROSION PRODUCTS LIKELY TO BE ENCOUNTERED IN A FAST REACTOR THROUGH EXPOSURE OF STAINLESS STEEL TO FLOWING LIQUID SODIUM IS DISCUSSED. A PUMPED SODIUM LOOP CAPABLE OF FLOW RATES OF 1100 KG/H AT A TEMPERATURE OF 600 C HAS BEEN COMMISSIONED. THIS RIG INCORPORATES AN INDIRECTLY HEATED ACTIVE CYLINDRICAL TEST SECTION AND COLD TRAPPING AND FILTERING FACILITIES. IT HAS BEEN OPERATED UNDER CONDITIONS WHICH SIMULATE THOSE OBTAINING IN A SINGLE TUBE OF THE INTERMEDIATE HEAT EXCHANGER OF PFR. THE INITIAL EXPERIMENTS HAVE INVESTIGATED THE TRANSPORT AND DEPOSITION CHARACTERISTICS OF FE, MN AND CO. MANGANESE-54 BEHAVIOUR IS CHARACTERIZED BY ITS RAPID AND HIGHLY PREFERENTIAL MIGRATION TO THE DIFFUSION COLD TRAP, THE COLDEST PART OF THE CIRCUIT. EXPERIMENTS WITH 60-CO HAVE INDICATED THAT ITS TRANSPORT IS MORE LIMITED THAN 59-FE AND THAT THE DEPOSIT IS LESS STRONGLY ATTACHED BEING EASILY DISLODGED THROUGH VELOCITY CHANGES IN THE CIRCUIT.

COBALT + MANGANESE + STEEL, STAINLESS + IRON + CORROSION + IN PILE EXPERIMENT + MASS TRANSFER

11-104429 DATED 1973
ROY P + SCHAD MK
AN ANALYSIS OF CORROSION OF STEELS BY LIQUID SODIUM
GENERAL ELECTRIC COMPANY
3 PAGES, 3 FIGS., 7 REFS., J. NUCLEAR MATERIALS, 47(1), PP. 129-31 (MAY 1973)

THE SODIUM VELOCITY IS USED AS ONE OF THE PARAMETERS IN ALL THE DESIGN ALLOWANCES FOR CORROSION IN LMFBR SYSTEMS. THE PRESENT ANALYSIS INDICATES THAT THE BOUNDARY LAYER THICKNESS SHOULD BE DETERMINED FROM THE VELOCITY AND GEOMETRY AND THEN USED IN ESTABLISHING THE CORROSION DESIGN ALLOWANCES RATHER THAN THE SODIUM VELOCITY ITSELF.

DESIGN CRITERIA + STEEL, STAINLESS + CORROSION + HIGH TEMPERATURE

11-104523 DATED 1974
CORUM JM + GREENSTREET WL + LIU KC

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-104523 *CONTINUED*
INTERIM GUIDELINES FOR DETAILED INELASTIC ANALYSIS OF HIGH-TEMPERATURE REACTOR SYSTEM COMPONENTS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5014 +. 128 PAGES, DEC. 1974

EQUATIONS ARE PRESENTED IN MULTIAXIAL FORMS FOR DESCRIBING TIME-INDEPENDENT ELASTIC-PLASTIC BEHAVIOR AND TIME-DEPENDENT CREEP BEHAVIOR OF TYPES 304 AND 316 STAINLESS STEEL. RECOMMENDED PROCEDURES ARE SIMILAR TO THOSE IN ORNL-TM-3602, BUT THEY ARE MORE GENERAL TO ALLOW LEEWAY IN TREATING PARTICULAR SITUATIONS. ALSO THIS REPORT DESCRIBES HIGH-TEMPERATURE DEFORMATION BEHAVIOR, AND INCLUDES GUIDELINES FOR VERIFICATION AND QUALIFICATION OF INELASTIC ANALYSIS COMPUTER PROGRAMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + *STEEL, STAINLESS + *HIGH TEMPERATURE + PLASTICITY + CREEP + *INELASTIC BEHAVIOR + *MATHEMATICAL TREATMENT + STRUCTURAL ANALYSIS, DYNAMIC + PROPERTY, MECHANICAL + HARDENING

11-104524 DATED 1974
CHIANG T + FRANCE DM + BUMP TR
DNB INDUCED THERMAL STRESS AND FATIGUE IN LMFBR EVAPORATOR TUBES WITH OXIDE SCALE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-24 +. 79 PAGES, 28 FIGS., DEC. 1974

TRANSIENT TEMPERATURE DISTRIBUTIONS AND THERMAL STRESSES WERE CALCULATED FOR A SODIUM HEATED STEAM GENERATOR EVAPORATOR TUBE AND WATER SIDE OXIDE LAYER IN THE REGION OF DEPARTURE FROM NUCLEATE BOILING. PERTINENT PARAMETER RANGES AND GEOMETRY WERE ADOPTED FROM THE CLINCH RIVER BREEDER REACTOR PLANT. THE TUBE WALL AND THE OXIDE SCALE LAYER ON THE WATER SIDE OF THE TUBE WERE SUBJECTED TO PERIODIC WATER HEAT TRANSFER COEFFICIENT FLUCTUATIONS SIMULATING THE EFFECT OF DNB IN THAT AREA OF THE TUBE. THE STRESSES OBTAINED WERE EMPLOYED IN ESTIMATING LIFE EXPECTANCY OF THE STEAM GENERATOR TUBE BASED ON FATIGUE OF THE TUBE WALL AND REPEATED EXFOLIATION OF THE OXIDE LAYERS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*STRESS + EVAPORATION + DNB + HEAT TRANSFER ANALYSIS + *STEAM GENERATOR + *TUBING + *FATIGUE + CLINCH RIVER (LMFBR)

11-104525 DATED 1974
CHOW JGY
HIGH CYCLE FATIGUE PROPERTIES OF LMFBR MATERIALS
BROOKHAVEN NATIONAL LAB., UPTON, N.Y.
BNL-16574 + CONF-720622-4 +. 21 PAGES, FROM SYMPOSIUM ON FATIGUE AT ELEVATED TEMPERATURES, STORRS, CONN., JUNE 18, 1972

PROPERTIES AT ELEVATED TEMPERATURE ARE PRESENTED. MATERIALS TESTED WERE 304 STAINLESS STEEL, INCOLOY 800, AND 2 1/4CR-1MO FERRITIC STEEL. MTS SYSTEMS MACHINE OPERATING AT 40 CPS WAS USED FOR TESTS UP TO 10(EXP 8) CYCLES AND ULTRASONIC VIBRATION TEST OPERATING AT 20,000 CPS WAS USED FOR HIGHER CYCLE RANGE TO FAILURE. FAILURE PROCESSES FOR THE TWO METHODS OF TESTING ARE NOT IDENTICAL. IN THE 10(EXP 7) TO 10(EXP 8) CYCLE RANGE, THE STRESSES FOR THE ULTRASONIC TEST TO PRODUCE FAILURE IS APPROXIMATELY 50% LOWER THAN IN THE MTS TEST METHOD. THESE RESULTS DEMONSTRATE THE NECESSITY OF FAILURE MECHANISM STUDIES IN CONJUNCTION WITH FATIGUE TESTING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + STEEL + TESTING + STEEL, STAINLESS + HIGH TEMPERATURE + *MATERIAL + VIBRATION + INCOLOY + *ULTRASONICS + *PROPERTY, MECHANICAL + *CYCLING + FATIGUE

11-104535 DATED 1974
HUET JJ + LEROY V
DISPERSION-STRENGTHENED FERRITIC STEELS AS FAST-REACTOR STRUCTURAL MATERIALS
9 PAGES, 6 FIGS., 14 REFS., NUCLEAR TECHNOLOGY, 24(2), PP. 216-24 (NOV. 1974)

DISPERSION STRENGTHENED FERRITIC STEELS ARE BEING STUDIED FOR POSSIBLE USE AS CANNING MATERIAL FOR SODIUM-COOLED FAST REACTORS. BASIC ALLOY CONTAINS FE-13% CR-1.5% MO-3.5% TI TO WHICH 2% TIO2 OR 1% Y2O3 IS ADDED BY A POWDER METTALURGY TECHNIQUE. AT 700 C, THE ALLOYS COMPARED FAVORABLY IN STRESS RUPTURE TESTS WITH THE BEST AUSTENITIC STEELS. CORROSION TESTS IN DYNAMIC SODIUM AT 700 C SHOWED THAT AFFECTED ZONES REMAINED NARROW WITH NO INFLUENCE ON MECHANICAL RESISTANCE. NEUTRON IRRADIATION DEMONSTRATED THEIR RESISTANCE TO EMBRITTLEMENT AND HAD THE HIGHEST ELONGATION TO RUPTURE AFTER IRRADIATION. SIMULATION TESTS BY 1-MEV ELECTRONS GAVE ALMOST ZERO SWELLING IN THE TEMPERATURE RANGE OF 475 TO 700 C.

ALLOY + *STEEL + EMBRITTLEMENT + CORROSION + HIGH TEMPERATURE + IRRADIATION TESTING + CREEP + DUCTILITY + HARDENING + SWELLING

11-104565 DATED 1975
MA BM
IRRADIATION SWELLING, CREEP AND THERMAL FATIGUE BEHAVIORS OF LMFBR PRESSURE VESSELS

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-104565 *CONTINUED*
IOWA STATE UNIVERSITY, AMES
20 PAGES, 16 FIGS., 23 REFS., J. FRANKLIN INSTITUTE, 299(2), PP. 127-46 (FEB. 1975)

THE BEHAVIORS OF IRRADIATION SWELLING, IRRADIATION CREEP AND THERMAL-CYCLING FATIGUE INDUCED BY FAST NEUTRON FLUENCE AND DEVELOPED IN THE LMFBR PRESSURE VESSELS ARE ANALYZED ON THE BASIS OF EXPERIMENTAL DATA. FROM THE INTERACTIONS OF THE VARIOUS PHENOMENON, THE FAILURE CRITERION FOR THE DESIGN AND SAFETY SURVEILLANCE OF THE PRESSURE VESSELS IS EXPRESSED AS AN EQUATION. THE TANGENTIAL TENSILE STRAIN PRODUCED BY IRRADIATION CREEP, THERMAL-CYCLING FATIGUE AND HYDROSTATIC PRESSURE OF THE LIQUID SODIUM COOLANT MAY BE COMBINED TOGETHER WITH THE IRRADIATION SWELLING STRAIN AS A WHOLE.

*THERMAL MECHANICAL EFFECT + FAST NEUTRON + IRRADIATION TESTING + SAFE FAILURE CRITERION + CREEP + *CYCLING + SWELLING + FATIGUE + *PRESSURE VESSELS + FLUENCE

11-104664 DATED 1974
DONATI JR + GRAND M + SPITERI P
CORROSION PHENOMENA FOLLOWING SODIUM/WATER MICROREACTION IN FISSURE ACROSS RAPID REACTOR STEAM GENERATOR PIPE
7 PAGES, J. NUCLEAR MATERALS, 54(2), PP. 217-23 (DEC. 1974) (IN FRENCH)

CAUSTIC CORROSION OF LMFBR STEAM-GENERATOR TUBES, OCCURRING DURING SODIUM-WATER REACTIONS INSIDE THIN CRACKS THROUGH THE TUBE WALLS, HAVE BEEN STUDIED. TESTS ON 2.25 CR-1 MO EVAPORATOR TUBES AND 321 H SUPERHEATER TUBES SHOW THAT FERRITIC MATERIAL ENDURES GENERAL CORROSION RESULTING IN WIDENING OF THE INITIAL CRACK. ON THE CONTRARY, CRACKING OF AUSTENITIC MATERIAL IS INTERGRANULAR. AMONG THE CORROSION PRODUCTS, MAINLY CONSISTING OF SODIUM CHROMITE, DEPOSITS OF PURE IRON HAVE BEEN NOTICED.

*METAL WATER REACTION + WATER + STEEL, STAINLESS + *CORROSION + STEEL, FERRITIC + *STEAM GENERATOR + TUBING + CRACK

11-104846 ALSO IN CATEGORY 18 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR JANUARY-MARCH 1975. III - LIQUID METAL COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4914, VOL. 3 +. 49 PP, TABS., REFS., JULY 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: RELEASE AND BEHAVIOR OF FUEL, FISSION PRODUCTS, AND TRANSURANIC ELEMENTS IN AEROSOLS RESULTING FROM THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT OF A LIQUID METAL FAST BREEDER REACTOR; AND STRUCTURAL INTEGRITY OF LMFBR EQUIPMENT CELL LINERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + FISSION PRODUCT RELEASE + STRUCTURAL INTEGRITY + *R AND D PROGRAM + CONTAINMENT LINER + *ACCIDENT, CORE DISRUPTIVE

11-104849 ALSO IN CATEGORY 18 DATED 1975
PATRIARCA P
STEAM GENERATOR MATERIALS TECHNOLOGY PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING MARCH 31, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4969 +. 195 PP, FIGS., 54 REFS., JULY 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING STEAM GENERATOR MATERIALS DEVELOPMENT FOR THE CLINCH RIVER BREEDER REACTOR, ADVANCED FERRITIC ALLOYS DEVELOPMENT FOR LMFBR STEAM GENERATORS, AND ALLOY 800 DEVELOPMENT FOR ADVANCED LMFBR STEAM GENERATORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ALLOY + *MATERIAL + STEEL, FERRITIC + *R AND D PROGRAM + *STEAM GENERATOR + CLINCH RIVER (LMFBR)

11-105105 ALSO IN CATEGORY 18 DATED 1974
STEAM GENERATOR MATERIALS ENGINEERING (LMFBR PROGRAM) FIRST QUARTERLY REPORT, JULY-SEPT. 1974
GENERAL ELECTRIC COMPANY
GEAP-14,029-1 +. 24 PPS, 11 TABS, 23 REFS, OCT. 1974

THE MAJOR ACCOMPLISHMENTS FOR THE QUARTER INCLUDE: (1) PRELIMINARY CHARACTERIZATION OF THE BASE METAL AND ALL-WELD-METAL TUBES (2-1/4 CR-1MO) WAS COMPLETED; (2) INITIAL TESTING SHOWED THAT 2-1/4 CR-1MO WELDS ARE AS FULLY RESISTANT TO STRESS CORROSION AS THE BASE METAL; (3) FABRICATION OF THE IHTS SIMULATION COMPONENTS IS PROCEEDING; AND (4) LOOP 1R HAS BEEN MODIFIED FOR PARTICULATE THERMAL DEGRADATION STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + WELDS + STEEL, STAINLESS + *MATERIAL + STRESS CORROSION + R AND D PROGRAM + *STEAM GENERATOR

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105106 ALSO IN CATEGORIES 7 AND 18 DATED 1974
BOHABOY PE + REGIMBAL JJ + CRAIG CN
EVALUATION OF CAPSULE B9D LOW BURNUP FAILED LMFBR FUEL PERFORMANCE
GENERAL ELECTRIC COMPANY
GEAP-13977 +. 96 PPS. 38 FIGS. NOV. 1974

TWO MIXED-OXIDE FUEL RODS WERE PURPOSELY DEFECTED WHILE OPERATING AT AN AVERAGE LINEAR POWER OF 15 KW/FT. THE TOP FUEL ROD CONTAINED A DEFECT IN THE GAS PLENUM; THE BOTTOM FUEL ROD WAS DEFECTED AT THE AXIAL MIDPOINT OF THE 4.25 INCH LONG FUEL COLUMN. IRRADIATION IN THE DEFECTED CONDITION CONTINUED TO AN AVERAGE FUEL BURNUP OF 6600 MWD/TE. RESULTS OF POST-IRRADIATION EXAMINATION OF THE FUEL, CAPSULE HARDWARE, AND SODIUM COOLANT ARE PRESENTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + *IRRADIATION TESTING + R AND D PROGRAM + FUEL ROD + RADIATION EFFECT + *MIXED OXIDE

11-105116 ALSO IN CATEGORY 5 DATED 1975
CHANG YW + GVILDYS J
REXCO-HEP: A TWO DIMENSIONAL COMPUTER CODE FOR CALCULATING THE PRIMARY SYSTEM RESPONSE IN FAST REACTORS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-19 +. 120 PPS, 2 TABS, 57 FIGS, 24 REFS, JUNE 1975

THIS REPORT DESCRIBES THE HYDRODYNAMIC-ELASTIC-PLASTIC VERSION OF THE REXCO CODE (REXCO-HEP, RELEASE 2), WHICH TREATS NOT ONLY THE HYDRODYNAMICS, BUT ALSO THE ELASTIC AND PLASTIC DEFORMATION OF THE REACTOR MATERIALS. THE BASIC EQUATIONS AND NUMERICAL TECHNIQUES USED IN THE REXCO-HEP CODE ARE DESCRIBED IN DETAIL, TOGETHER WITH THE ASSUMPTIONS AND LIMITATIONS OF THE MATHEMATICAL MODEL USED IN THE ANALYSIS. THE RESULTS OF COMPARISON OF THE CODE PREDICTIONS WITH ANALYTICAL SOLUTIONS AND EXISTING EXPERIMENTAL EXCURSION DATA ARE ALSO GIVEN. INPUT INSTRUCTIONS AND OUTPUT OPTIONS OF THE COMPUTER PROGRAM ARE INCLUDED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + *ANALYTICAL MODEL + ELASTICITY + HYDRODYNAMIC ANALYSIS + PLASTICITY + PRESSURE PULSE + STRUCTURAL ANALYSIS, DYNAMIC

11-105118 DATED 1975
BUSH SH
THE CHIMERA OF NEW NUCLEAR MATERIALS
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASHINGTON
66 PPS, PRESENTED AT AMERICAN SOC. FOR ENGINEERING EDUCATION ANNUAL CONFERENCE, COLORADO STATE UNIV., JUNE 16-19, 1975

DISCUSSES MATERIALS PROBLEMS FOR FWR, BWR, AND LMFBR NUCLEAR PLANTS SUCH AS STRESS CORROSION, RADIATION DAMAGE, CRACKING, FATIGUE, CREEP, SWELLING AND VOIDS. DISCUSSION LISTS VARIABLES INFLUENCING MECHANICAL BEHAVIOR SUCH AS TEMPERATURE, FLUENCE, CHEMICAL COMPOSITION, ENVIRONMENTAL CONTAMINANTS AND CYCLING STRESSES. THE AUTHOR SUGGESTS THAT MUCH OF THE RESEARCH NEEDED IS INTERDISCIPLINARY AND COULD BE DONE IN UNIVERSITIES. HIS ENTIRE DISCUSSION IS A SORT OF STATE-OF-THE-ART APPROACH.

AVAILABILITY - SPENCER H. BUSH, SENIOR STAFF CONSULTANT, BATTELLE PACIFIC NORTHWEST LABS., P.O. BOX 999, RICHLAND, WASHINGTON 99352

*REACTOR, BWR + OXYGEN + *REACTOR, PWR + RADIATION DAMAGE + STEEL + STEEL, STAINLESS + CORROSION + *MATERIAL + STRESS CORROSION + CREEP + *PROPERTY, MECHANICAL + TEMPERATURE + GROWTH/DEVELOPMENT + SWELLING + FATIGUE + CRACK + FLUENCE

11-105493 ALSO IN CATEGORY 9 DATED 1974
GRANTZ AL
INSTRUMENTED SIMULATED FUEL ASSEMBLY DESIGN AND DEVELOPMENT
GENERAL ELECTRIC COMPANY
GEAP-14015 +. 56 PPS, 20 FIGS, NOV. 1974

TWO SIMULATED FUEL ASSEMBLIES WITH LOAD MEASUREMENT CAPABILITIES HAVE BEEN DESIGNED, DEVELOPED AND FABRICATED. THE INSTRUMENTED SIMULATED FUEL ASSEMBLIES (ISFA'S) HAVE BEEN DELIVERED TO W-ARD TO BE USED IN THE 3-D CORE RESTRAINT TEST RIG FOR THE PURPOSE OF MEASURING INTER-FUEL-ASSEMBLY LOADS UNDER SIMULATED REFUELING AND OPERATING CONDITIONS. THIS REPORT DOCUMENTS THE DESIGN BASIS OF THE ISFA'S INCLUDING REQUIREMENTS, COMPONENT DESIGN, COMPONENT DEVELOPMENT TESTS AND DESIGN (PERFORMANCE) VERIFICATION TESTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + DESIGN STUDY + CORE COMPONENTS + *STRUCTURAL INTEGRITY + COMPONENTS + *R AND D PROGRAM + *FUEL ROD + EQUIPMENT DEVELOPMENT

11-105563 ALSO IN CATEGORY 18 DATED 1975

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105563 *CONTINUED*
JAMES LA + BORISCH RR
EXPOSURE OF PRECRACKED AND PRELOADED FRACTURE MECHANICS SPECIMENS IN LIQUID SODIUM, WITH AN INTERMEDIATE MOIST NITROGEN CLEANING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME-75-51 +. 16 PPS, 5 FIGS, MAY 1975

THIS STUDY WAS UNDERTAKEN IN ORDER TO SURVEY THE APPLICABILITY OF FRACTURE MECHANICS TECHNIQUES IN CHARACTERIZING THE POTENTIAL FOR CRACK EXTENSION WHEN REACTOR COMPONENTS ARE REMOVED FROM SERVICE IN A SODIUM ENVIRONMENT, CLEANED, AND SUBSEQUENTLY RETURNED TO SERVICE. PRECRACKED AND PRELOADED FRACTURE MECHANICS SPECIMENS WERE EXPOSED TO SODIUM, CLEANED, RETURNED TO A SODIUM ENVIRONMENT, AND FINALLY EXAMINED. NO CRACK EXTENSION OCCURRED IN ANY OF THE STATICALLY LOADED SPECIMENS DURING THE TEST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BRITTLE FRACTURE + *CORE COMPONENTS + R AND D PROGRAM + FRACTURE TOUGHNESS + CRACK

11-105580 DATED 1975
HILL MR
MECHANICAL PROPERTIES TEST DATA FOR STRUCTURAL MATERIALS QUARTERLY PROGRESS REPORT FOR PERIOD ENDING APRIL 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5105 +. 396 PPS, TABS, FIGS, JULY 1975

THIS IS THE 7TH REPORT IN THIS SERIES WHICH DESCRIBES WORK BEING DONE AT AEROJET NUCLEAR, ARGONNE, ORNL, NAVAL RESEARCH LAB, HANFORD, WESTINGHOUSE, U OF CINCINNATI, U OF CALIFORNIA, AND GENERAL ELECTRIC. THE WORK REPORTED COVERS FATIGUE, FRACTURE, CREEP, RUPTURE, TENSILE PROPERTIES, ELASTIC PROPERTIES, THERMAL AGING, AND CRACK GROWTH FOR STAINLESS STEELS, INCONEL, AND CHROM-MOLY STEELS IN MISC ENVIRONMENT, SODIUM INCLUDED. EACH RESEARCHER HAS A SEPARATE SECTION IN THE REPORT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STEEL + TENSILE PROPERTY + TESTING + STEEL, STAINLESS + ELASTICITY + STRESS RUPTURE + INCONEL + STRUCTURAL INTEGRITY + CREEP + *R AND D PROGRAM + *PROPERTY, MECHANICAL + GROWTH/DEVELOPMENT + FATIGUE + CRACK

11-105631 ALSO IN CATEGORIES 5 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 916 PAGES, AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING NEW FLOW DIAGRAMS, INDUSTRIAL SECURITY, MISSILE PROTECTION, REACTOR VESSEL DESIGN,, TRANSIENT EFFECTS, RADWASTE SYSTEMS, AND AIRBORNE RADIOACTIVITY MONITORING. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING THE SAME SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + MISSILE GENERATION AND PROTECTION + WASTE TREATMENT + MONITORING SYSTEM, RADIATION + *REPORT, PSAR + TRANSIENT + SECURITY + *CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-105633 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.8 - NOZZLES BEING THE REACTOR COOLANT BOUNDARY
PROJECT MANAGEMENT CORP.
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE JUSTIFICATION FOR IDENTIFYING THE NOZZLES CONNECTING THE SYSTEM TO THE PRIMARY HEAT TRANSPORT SYSTEM AS BEING THE REACTOR COOLANT BOUNDARY FOR THOSE SYSTEMS WHOSE FAILURE COULD NOT RESULT IN THE FUEL DESIGN LIMITS IS AS FOLLOWS: THE ONLY SYSTEMS WHICH FALL INTO THIS CATEGORY ARE THE ARGON COVER GAS PRESSURIZATION AND EQUALIZATION SYSTEMS AND THE PRIMARY SODIUM MAKEUP AND OVERFLOW SYSTEMS. THESE LOW PRESSURE SYSTEMS ARE CONNECTED TO THE PRIMARY COOLING SYSTEM AND ARE LOCATED IN INERTED INNER CELLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT INTEGRITY + *NOZZLE + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

11-105634 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.11 - NOZZLES THAT ARE INTERMEDIATE COOLING BOUNDARY
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.11-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE JUSTIFICATION FOR IDENTIFYING THE NOZZLES CONNECTING THE SYSTEM TO THE INTERMEDIATE HEAT TRANSPORT SYSTEM AS BEING THE INTERMEDIATE COOLANT BOUNDARY FOR THOSE SYSTEMS WHOSE FAILURE COULD

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105634 *CONTINUED*
NOT IMPAIR THE CAPABILITY OF THE INTERMEDIATE COOLANT SYSTEM TO PERFORM ITS SAFETY FUNCTION IS AS FOLLOWS: THE ONLY SYSTEM WHICH FALL INTO THIS CATEGORY ARE THE COVER GAS PRESSURIZATION AND EQUALIZATION SYSTEM AND THE SODIUM FILL AND DRAIN SYSTEM. FAILURE OF THESE LOW PRESSURE SYSTEMS WOULD ONLY RESULT IN MINOR CONSEQUENCES SUCH AS LOSS OF COVER GAS AND MINOR SODIUM SPILLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CONTAINMENT INTEGRITY + *NOZZLE + RESPONSE TO NRC QUESTION + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

11-105635 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.12 - FUEL DESIGN LIMITS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.12-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

FUEL DESIGN LIMITS MEANS THOSE LIMITS SUCH AS TEMPERATURE, BURNUP, FLUENCE, AND CLADDING STRAIN WHICH ARE SPECIFIED BY THE DESIGNER FOR NORMAL OPERATION AND OFF-NORMAL CONDITIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*DESIGN CRITERIA + CLADDING + FUEL BURNUP + STRESS + RESPONSE TO NRC QUESTION + TEMPERATURE + CLINCH RIVER (LMFBR) + *FUEL ELEMENTS

11-105639 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.21 (3A.1.2) - RAPS SURGE AND DELAY TANK CELL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.21-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE ONLY INNER CELL SPECIFICALLY DESIGNED TO ACT AS A CONTAINMENT BARRIER AGAINST THE ACCIDENTAL RELEASE OF RADIOACTIVITY IS THE RAPS SURGE AND DELAY TANK CELL LOCATED IN THE REACTOR SERVICE BUILDING. NO CREDIT FOR RETENTION, HOLDUP, PLATE-OUT, OR SETTLING OF ACCIDENTALLY RELEASED RADIOACTIVE MATERIAL IS TAKEN FOR ANY OTHER INNER CELL IN THE REFERENCE DESIGN EVALUATIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CONTAINMENT INTEGRITY + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + COMPARTMENT + CLINCH RIVER (LMFBR)

11-105640 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.25 - PERIODIC TESTING OF CELLS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.25-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE INNER CELLS SYSTEM IS NOT AN ENGINEERED SAFETY FEATURE, AND NO CREDIT IS TAKEN FOR CELL LEAKTIGHTNESS IN THE SAFETY ANALYSIS FOR ANY ACCIDENT CONDITION, THUS PERIODIC TESTING OF THE CELLS IS NOT A SAFETY REQUIREMENT. FOR INERTED CELLS, THE ATMOSPHERE CONTROL SYSTEM WILL ENSURE DETECTION OF ANY EXCESSIVE LEAKAGE DURING PLANT OPERATION WHETHER LEAKAGE IS CELL-TO-CELL OR CELL-TO-UPPER-CONTAINMENT. THE INERTED CELLS ARE DESIGNED TO OPERATE AT SLIGHTLY NEGATIVE PRESSURE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *TEST, LEAK RATE + CONTAINMENT INTEGRITY + RESPONSE TO NRC QUESTION + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-105641 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.26 - IDENTIFICATION OF CELL MATERIALS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.26-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

LOWER PORTIONS OF THE CELL INCLUDING FLOORS AND LOWER AREAS OF CELL WALLS WHERE SODIUM SPILL IS A POSTULATED DBA, ARE PROVIDED WITH CARBON STEEL LINERS. INERTED CELLS ARE ALSO PROVIDED WITH CARBON STEEL LINERS. IN SODIUM AREAS WHERE CELLS ARE NOT LINED, CARBON STEEL CATCH PANS ARE PROVIDED TO CONTAIN THE POSTULATED SODIUM SPILL. GRATED FLOORS WILL BE PROVIDED ABOVE ALL CATCH PAN AREAS FOR ACCESSIBILITY. EXPOSED CONCRETE WITHIN UNLINED SODIUM AREAS WILL BE SUBJECT TO LOCALIZED SPILL OR SPRAY EFFECTS FROM HOT SODIUM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT INTEGRITY + *STEEL LINER + RESPONSE TO NRC QUESTION + LEAK + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-105642 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.60 - ACCESS TO INDIVIDUAL CELLS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.60-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28,

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105642 *CONTINUED*
1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

EACH OF THE THREE PHTS CELLS AND THE REACTOR CAVITY HAS ITS OWN RECIRCULATING GAS COOLING SYSTEM. THE PHTS CELLS AND THE REACTOR CAVITY ARE SEPARATED FROM EACH OTHER BY CONCRETE WALLS AND THE PIPING PENETRATIONS. THIS ARRANGEMENT PROVIDES THE CAPABILITY TO INDIVIDUALLY INERT OR DEINERT A PHTS CELL OR THE REACTOR CAVITY. EACH LOOP CAN BE IDLED AND VENTED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + CONTAINMENT ATMOSPHERE + *SYSTEM CAPABILITY + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-105644 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.66 - ADHERENCE TO CODES AND STANDARDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.66-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

WHERE GENERALLY RECOGNIZED CODES AND STANDARDS DO NOT COVER CONDITIONS THAT WILL BE IMPOSED ON THE EQUIPMENT, THEY WILL BE SUPPLEMENTED AS NEEDED. EXAMPLES ARE THE EFFECTS OF SODIUM AND COVER GAS ON THE STRUCTURAL PROPERTIES OF THE MATERIALS USED, AND SPECIAL REQUIREMENTS FOR PROTECTION OF THE EQUIPMENT FROM CONTAMINATION DURING FABRICATION, SHIPMENT, AND STORAGE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CODES AND STANDARDS + DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *EQUIPMENT + CLINCH RIVER (LMFBR)

11-105646 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.145 - DUTY CYCLE EVENTS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.145-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DUTY CYCLE EVENTS RESULTING IN SIMILAR TRANSIENTS ON A PARTICULAR COMPONENT WERE GROUPED TOGETHER WITH THE MOST SEVERE TRANSIENT IN EACH GROUP SELECTED AS THE UMBRELLA TRANSIENT FOR THAT GROUP. THE FREQUENCY SPECIFIED FOR EACH TRANSIENT IS THE SUM OF ALL DUTY CYCLE EVENTS ASSIGNED TO THAT GROUP. SINCE INDIVIDUAL DUTY CYCLE EVENTS HAVE DIFFERENT EFFECTS ON DIFFERENT COMPONENTS, THE GROUPING OF DUTY CYCLE EVENTS RESULTS IN DIFFERING UMBRELLA TRANSIENTS AND FREQUENCIES FOR EACH COMPONENT.

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ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + *EQUIPMENT + *FREQUENCY ANALYSIS + *TRANSIENT + CLINCH RIVER (LMFBR)

11-105651 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.83 - FAILURE DETECTION OF OMEGA SEAL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.83-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN OF THE REACTOR VESSEL, CLOSURE HEAD, AND SUPPORT SYSTEM HAS BEEN REVISED TO ELIMINATE THE OMEGA SEAL.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*MODIFICATION + *SEAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + LEAK + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-105656 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.71 - ACCESS FOR REFUELING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.71-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO STRUCTURAL COMPONENTS OF THE REACTOR ENCLOSURE OR INTERNALS MUST BE MODIFIED OR REMOVED TO ACCOMPLISH REFUELING.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*MODIFICATION + *REFUELING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR)

11-105658 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.178 - CONTAINMENT RESPONSE TO SODIUM FIRE
PROJECT MANAGEMENT CORP

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-10565E *CONTINUED*
DOCKET-50537-23 +. 2 PAGES, PP. Q001.178-1 THRU Q001.178-2 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28, 1975. DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONTAINMENT TEMPERATURES (ATMOSPHERE AND WALL) WILL CONTINUE TO SLOWLY DECREASE AS INDICATED IN FIGURES 6.2-3 AND 6.2-4 OF THE PSAR AND ASYMPTOTICALLY APPROACH AMBIENT CONDITIONS. THE CONTAINMENT PRESSURE WILL ALSO CONTINUE TO DECREASE SLOWLY (LESS THAN 0.5 PSIG PER DAY) AND MAY DECREASE TO SUBATMOSPHERIC PRESSURE BECAUSE OF THE OXYGEN DEPLETION WHICH OCCURS DURING SODIUM COMBUSTION. PROVISIONS TO INCLUDE VACUUM RELIEF CAPABILITY FOR THE CONTAINMENT HAVE BEEN MADE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT + *FIRE + *RESPONSE TIME + *CONTAINMENT STRUCTURE + PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + TEMPERATURE + *TRANSIENT + CLINCH RIVER (LMFBR)

11-105659 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.180 - NON-SEISMIC CATEGORY 1 STRUCTURE WITHIN CONTAINMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.180-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL INTERIOR STRUCTURES WITHIN CONTAINMENT SUCH AS WALLS, SLABS, STEEL FRAMING AND SUPPORT FRAMES OVER THE EI&C CUBICLES ABOVE THE OPERATING FLOOR WILL BE DESIGNED AS SEISMIC CATEGORY I STRUCTURES. THEREFORE, NO FAILURE OF STRUCTURES WITHIN THE CONTAINMENT WILL RESULT FROM A SSE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + CONTAINMENT + RESPONSE TO NRC QUESTION + *SEISMIC DESIGN + *STRUCTURE + CLINCH RIVER (LMFBR)

11-105661 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.229 - PHTS CELL CAPACITY TO WITHSTAND 24 PSIG
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.229-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRELIMINARY CALCULATIONS HAVE BEEN DEVELOPED TO ESTABLISH PHTS CELL CAPACITY TO WITHSTAND 24 PSIG. THE WALLS AND SLABS ARE ASSUMED AS PLATES SUPPORTED AND RESTRAINED AT ALL EDGES. A LINEAR TEMPERATURE GRADIENT OF 250 F WAS ASSUMED TO ESTABLISH THERMAL MOMENTS. THIS APPROACH IS CONSIDERED CONSERVATIVE SINCE SIGNIFICANT TIME WILL BE NECESSARY TO REACH A STEADY STATE GRADIENT AND THE PEAK PRESSURE MAY NOT BE APPLICABLE DURING THE STEADY STATE CONDITION. DURING TRANSIENT STATE, THE THERMAL STRESSES WILL BE LIMITED TO A FEW INCHES OF DEPTH ON THE BACK SIDE OF THE LINER.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*DESIGN CRITERIA + ANALYTICAL MODEL + *PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-105662 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.231 - CELL LEAK RATE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.231-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE CALCULATION OF BOTH THE PRIMARY HEAT TRANSPORT SYSTEM AND REACTOR CAVITY CELL PRESSURE TRANSIENTS, THE CELLS WERE ASSUMED LEAK TIGHT; I.E., NO ESCAPE OF CELL ATMOSPHERE OR COMBUSTION PRODUCE HEAT AS A RESULT OF LEAKAGE. THIS ASSUMPTION IS CONSERVATIVE AND MAXIMIZES THE PRESSURE TRANSIENTS IN THE CELLS. FOR RADIOLOGICAL CONSIDERATIONS, THE CELLS WERE ASSUMED TO HAVE AN INFINITE LEAK RATE; I.E., ALL SODIUM AEROSOL WAS RELEASED INSTANTLY FROM THE CELLS TO THE UPPER RCB VOLUME.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *LEAK RATE + *COMPARTMENT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-105674 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 110.13 - PREOPERATIONAL VIBRATIONAL AND DYNAMIC EFFECTS TESTING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q110.23-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PREOPERATIONAL VIBRATIONAL AND DYNAMIC EFFECTS TESTING PROGRAM THAT IS TO BE CONDUCTED DURING STARTUP FUNCTIONAL TESTING FOR SAFETY-RELATED PIPING CLASSIFIED AS CODE CLASS 1, 2 AND 3 AND FOR PIPING AND COMPONENT SUPPORTS WILL BE DESCRIBED FULLY IN THE FSAR. THE PURPOSE OF THESE TESTS WILL BE TO CONFIRM THAT THE PIPING, COMPONENTS, AND SUPPORTS HAVE BEEN DESIGNED TO WITHSTAND THE DYNAMIC LOADINGS FROM OPERATIONAL TRANSIENT CONDITIONS THAT WILL BE ENCOUNTERED DURING SERVICE, AS REQUIRED BY THE ASME CODE.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105674 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

HYDRAULIC EFFECT + *TEST, PREOPERATIONAL + RESPONSE TO NRC QUESTION + *VIBRATION + *STABILITY + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

11-105676 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 110.15 - DYNAMIC SYSTEM ANALYSIS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q110.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DYNAMIC SYSTEM ANALYSIS METHODS AND PROCEDURES (I.E., RESPONSE SPECTRUM AND/OR TIME-HISTROY ANALYSIS METHODS) WHICH WILL BE USED TO DETERMINE THE DYNAMIC RESPONSES OF REACTOR INTERNALS AND THE HEAT TRANSPORT COOLANT LOOPS AND CONNECTING EQUIPMENT UNDER SEISMIC LOADINGS ARE DEFINED IN DETAIL IN SECTION 3.7 OF THE PSAR. THESE ANALYSIS METHODS WITH PROPER APPLICATION WILL ALSO BE USED TO CONFIRM THE STRUCTURAL DESIGN ADEQUACY OF THE REACTOR INTERNALS AND THE HEAT TRANSPORT COOLANT PIPING TO WITHSTAND THE DYNAMIC LOADINGS OF THE MOST SEVERE THIRD LEVEL DESIGN MARGIN LOADINGS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + MAIN COOLING SYSTEM + *STRUCTURAL ANALYSIS, DYNAMIC + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

11-105677 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.3 - ROTATING OR MOVING PARTS OF REACTOR INTERNALS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.3-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES THE WELDING AND SEIZING OF ROTATING OR MOVING PARTS OF THE REACTOR INTERNALS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + WELDING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + CLINCH RIVER (LMFBR)

11-105681 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.11 - SPECIAL WELDING TECHNIQUES FOR REACTOR VESSEL AND CORE SUPPORT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.11-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRIOR TO ANY WELDING, THEORETICAL CENTERLINES WERE ESTABLISHED, USING REFERENCE SURFACES ON THE VESSEL FLANGE AND THE CORE SUPPORT STRUCTURE. DURING WELDING, THE POSITION OF THE CORE SUPPORT STRUCTURE IN RELATIONSHIP TO THE VESSEL WAS MONITORED USING OPTICAL INSTRUMENTS. THE WELD CIRCUMFERENCE WAS DIVIDED INTO FOUR QUADRANTS, EACH OF WHICH WAS DIVIDED FURTHER INTO 12-INCH INCREMENTS. THE FIRST WELD PASS WAS MADE USING FOUR WELDERS WORKING SIMULTANEOUSLY, ONE WELDER PER QUADRANT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

PROCEDURES AND MANUALS + *WELDING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-105684 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 120.22 - AVOIDANCE OF SENSITIZATION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.22-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AT THIS POINT IT IS NOT POSSIBLE TO SPECIFY DETAILED HEAT TREATMENT SCHEDULES. EACH COMPONENT WILL BE EVALUATED INDEPENDENTLY TO DETERMINE WHETHER HEAT TREATMENT IS NECESSARY. IF IT IS REQUIRED, THE HEAT TREATMENT WILL BE OPTIMIZED TO GIVE THE MAXIMUM DEGREE OF STRESS RELIEF TOGETHER WITH THE MINIMUM DEGREE OF SENSITIZATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *STEEL, STAINLESS + RESPONSE TO NRC QUESTION + *DAMAGE + *HEAT TREATMENT + RATE + COOLING + THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

11-105685 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.1 - EFFECTIVE LOADINGS ON STRUCTURE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q130.1-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105685 *CONTINUED*
PROVIDES A DESCRIPTION OF THE METHOD USED TO COMBINE TORNADO MISSILE, WIND AND VACUUM PRESSURE STRUCTURAL EFFECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ANALYTICAL MODEL + STRESS ANALYSIS + PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + DESTRUCTIVE WIND + *STRUCTURAL ANALYSIS, DYNAMIC + STRUCTURE + CLINCH RIVER (LMFBR)

11-105686 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.14 - VENTING TO REDUCE TORNADO LOADING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q130.14-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN THE DESIGN OF ALL SEISMIC CATEGORY I STRUCTURES, VENTING IS NOT CONSIDERED. THEREFORE, THE FULL EFFECT OF TORNADO DIFFERENTIAL PRESSURE OF 3 PSI WILL BE TAKEN INTO ACCOUNT IN THE STRUCTURAL DESIGN IN ACCORDANCE WITH REGULATORY GUIDE 1.76.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT + DESIGN CRITERIA + STRESS + PRESSURE RELIEF + *PRESSURE DROP + RESPONSE TO NRC QUESTION + DESTRUCTIVE WIND + *STRUCTURE + CLINCH RIVER (LMFBR) + VALVES

11-105687 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.16 - MULTIPLE BARRIER MISSILE SHIELDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q130.16-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

MULTIPLE BARRIER MISSILE SHIELDS ARE NOT UTILIZED IN THE DESIGN OF SEISMIC CATEGORY I STRUCTURES. WHENEVER MISSILE BARRIERS ARE REQUIRED FOR PROTECTING SAFETY RELATED EQUIPMENT OR COMPONENTS WHICH ARE VULNERABLE TO DAMAGE, PROTECTIVE MEASURES WILL BE INCLUDED IN THE DESIGN. COMPOSITE SECTIONS, UTILIZED FOR THE ECONOMIC DESIGN OF STRUCTURAL STEEL BEAMS FOR SUPPORTING CONCRETE FLOOR OR ROOF SLABS IN SOME OF THE SEISMIC CATEGORY I BUILDINGS, ARE NOT CONSIDERED IN THE ASSESSMENT OF LOCAL DAMAGE DUE TO EITHER EXTERNAL OR INTERNAL MISSILES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + MISSILE GENERATION AND PROTECTION + RESPONSE TO NRC QUESTION + STRUCTURE + CLINCH RIVER (LMFBR)

11-105688 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.21 - CELL LINER DESIGN
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q130.21-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE LINER DESIGN FOR THE REACTOR CAVITY AND OTHER CELLS CAN BE DIVIDED INTO TWO BROAD CATEGORIES, VIZ (A) LINERS DESIGNED TO WITHSTAND HOT SODIUM SPILLS AND (B) LINERS DESIGNED TO REMAIN GAS-TIGHT IN ORDER TO CONSERVE INERT GAS IN INERTED CELLS. THE FORMER WILL BE DESIGNED TO WITHSTAND HIGH TEMPERATURE SODIUM SPILLS WITHOUT RUPTURE WHEREAS THE LATTER WILL BE REQUIRED TO REMAIN GAS-TIGHT DURING NORMAL PLANT OPERATION TO CONSERVE INERT GAS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *STEEL LINER + RESPONSE TO NRC QUESTION + *COMPARTMENT + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR)

11-105708 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 331.6 - FIELD RUN PIPING CARRYING RADIOACTIVE MATERIAL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q331.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PIPING CARRYING RADIOACTIVE MATERIALS WILL NOT BE FIELD RUN. A FULLY STAFFED FIELD QA PROGRAM AT BOTH THE CONTRACTOR LEVEL AND OWNER LEVEL WILL ENSURE THAT THE PIPING IS RUN ACCORDING TO THE HOME OFFICE DRAWINGS. ENGINEERING SITE PERSONNEL ARE LIMITED, IN WRITING, IN THE TYPE OF CHANGES THEY ARE PERMITTED TO APPROVE IN THE FIELD. ALL OTHER CHANGES, WHICH INCLUDE PIPING CARRYING RADIOACTIVE MATERIALS, MUST BE APPROVED IN THE HOME OFFICE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RADIOISOTOPE + RESPONSE TO NRC QUESTION + INSTALLATION + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

11-105741 ALSO IN CATEGORIES 5 AND 6 AND 18 DATED 1974
KASTENBERG WE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105741 *CONTINUED*
TRANSIENT ANALYSIS OF LMFBR OXIDE FUEL ELEMENTS DURING ACCIDENTS. FINAL REPORT FOR THE PERIOD 1 JULY 1973-30 JUNE 1974
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7468 +. 136 PPS, 68 FIGS, 137 REFS, AUG. 1974

REPORTS ON A STUDY OF THE MODE OF FAILURE FOR LMFBR OXIDE FUEL PINS DURING AN OVERPOWER TRANSIENT AND THE IMPLICATIONS ON THE COURSE OF AN UNPROTECTED OVERPOWER TRANSIENT ACCIDENT. SECTION 2 IS DEVOTED TO FAILURE MECHANISM; SECTION 3 ADDRESSES LOCATION AND MODE OF FAILURE; AND SECTION 4 CONTAINS A SUMMARY AND THE MAJOR CONCLUSIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + FUEL ROD + FAILURE MODE ANALYSIS + *TRANSIENT

11-105745 ALSO IN CATEGORY 18 DATED 1975
MATHEYS WL
SODIUM LEAK CHARACTERIZATION TESTS
WESTINGHOUSE ELECTRIC CORPORATION
WARD-LT-3045-1 +. 31 PPS, 3 TABS, 18 FIGS, JUNE 1975

A SERIES OF LEAK CHARACTERIZATION TESTS WAS CONDUCTED TO STUDY SODIUM FLOW THROUGH PIPE CRACKS AND DETERMINE THE MINIMUM CRACK SIZE FOR CONTINUOUS LEAKAGE. RESULTS OF THESE TESTS SHOW THAT SMALL CRACKS DO PLUG IN TIME, AND A CONTINUOUS LEAKAGE CRACK SIZE WAS NOT ESTABLISHED IN THIS SERIES. IT WAS SHOWN, HOWEVER, THAT PRIOR TO PLUGGING, LEAKAGE WAS OF SUCH MAGNITUDE AS TO ASSURE DETECTION BY THE MORE SENSITIVE LEAK DEVICES AVAILABLE OR IN ADVANCED STAGES OF DEVELOPMENT TODAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + R AND D PROGRAM + LEAK RATE + LEAK + *TEST, LEAK + CRACK + *PIPES AND PIPE FITTINGS

11-105757 ALSO IN CATEGORIES 5 AND 6 AND 8 AN DATED 1975
A COMPENDIUM OF COMPUTER CODES FOR THE SAFETY ANALYSES OF LMFBR'S
U.S. ERDA, WASHINGTON
ERDA-31 +. 189 PPS, JUNE 1975

AN ALPHABETICAL LIST OF 55 COMPUTER CODES. GIVES A BRIEF STATEMENT OF THE PROBLEM SOLVED, THE STATUS OF THE CODE, THE MODEL DESCRIPTION, LIMITATIONS, FUTURE EFFORTS TO IMPROVE THE CODE, INTERFACES WITH OTHER CODES AND REFERENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CONTAINMENT + FISSION GAS RELEASE + FUEL MELTDOWN + ACCIDENT, LOSS OF COOLANT + *SAFETY ANALYSIS + PRESSURE PULSE + PRESSURE TRANSIENT + STRUCTURAL ANALYSIS, DYNAMIC + *THERMAL TRANSIENT + COMPARTMENT + FUEL SWELLING + THERMAL HYDRAULIC ANALYSIS + PIPES AND PIPE FITTINGS

11-105761 ALSO IN CATEGORY 18 DATED 1975
KURZEKA WJ + WLECH FH
PERMEATION, LEAKAGE, AND COMPRESSION SET TESTING OF ELASTOMERIC SEALS FOR LMFBR USE
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13146 +. 91 PPS, 43 FIGS, 24 REFS, APRIL 2, 1975

ELASTOMER SEALS WERE EVALUATED TO FFTF/LMFBR CONDITIONS. BASIC PERMEATION MEASUREMENTS OF THE ELASTOMERS WERE CONDUCTED AND COMPRESSION SET MEASUREMENTS OF O-RINGS WERE MADE. PERMEATION MEASUREMENTS ON STATIC O-RINGS WERE MADE AT VARIOUS COMPRESSIONS AND FINISHES. DYNAMIC QUAD-, O-, AND T-SEAL LEAKAGE, PERMEATION, AND WEAR AT VARIOUS COMPRESSIONS AND FINISHES WERE EVALUATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + FFTF (TR) + *SEAL + LEAK + POLYMERIC

11-105826 DATED 1974
FINDLEY WN + MARK R
MULTIAXIAL CREEP BEHAVIOR OF 304 STAINLESS STEEL
BROWN UNIV., PROVIDENCE, R.I. + OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-SUB-3599-3 +. 45 PPS, 10 TABS, 18 FIGS, NOV. 1974

HIGHER TEMPERATURE AND LONG LIFE EXPECTED FOR LIQUID-METAL FAST-BREEDER REACTORS COMBINED TO CAUSE CREEP BEHAVIOR TO BE A LIMITING FEATURE IN THE DESIGN. ONE OF THE PRINCIPAL STRUCTURAL MATERIALS IS 304 STAINLESS STEEL. INFORMATION AVAILABLE ON CREEP BEHAVIOR OF THIS MATERIAL IS LIMITED LARGELY TO UNIAXIAL TENSION STRESSES. SINCE DESIGN OF THE MOST CRITICAL PARTS INVOLVES BIAXIAL STRESS STATES, VARYING STRESS AND STRESS GRADIENTS, MUCH MORE INFORMATION IS NEEDED FOR DESIGN. TESTS IN COMBINED TENSION AND TORSION, PURE TENSION AND PURE TORSION WERE CONDUCTED AT 1100 F FOR 2.0 HOURS TO 1008.7 HOURS. ATTEMPTS TO MEASURE CIRCUMFERENTIAL STRAINS WERE CONTINUED. OTHER TESTS SHOW STRAIN RATE VECTORS WHICH ARE CONSISTENT WITH A MISES EQUIVALENT FOR A CREEP SURFACE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105826 *CONTINUED*
DESIGN CRITERIA + STRESS + TENSILE PROPERTY + TESTING + *STEEL, STAINLESS + HIGH TEMPERATURE + *CREEP

11-105850 ALSO IN CATEGORY 18 DATED 1974
PROCEEDINGS OF THE US-USSR SEMINAR ON THE DEVELOPMENT OF SODIUM-COOLED FAST BREEDER REACTOR STEAM GENERATORS. VOLUME 2 - DISCUSSION
U.S. ERDA, WASHINGTON
ERDA-32 +, 126 PPS, DEC. 1974

THIS DOCUMENT CONTAINS THE OPENING REMARKS AND THE DISCUSSION FOLLOWING PRESENTATION OF PAPERS AT THE SEMINAR IN LOS ANGELES, DEC. 2-4, 1974. THE LAST DAY OF THE SEMINAR, PROBLEMS, ETC. WERE DISCUSSED BY PANEL MEMBERS. ALL COMMENTS ARE DOCUMENTED. SUBJECTS COVERED WERE HEAT TRANSFER AND HYDRODYNAMICS, CORROSION AND STRENGTH IN MATERIALS, STEAM GENERATOR LEAKS, STEAM GENERATOR MODEL TESTING, FABRICATION, QUALITY CONTROL AND MAINTENANCE, AND FUTURE STEAM GENERATOR CONCEPTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FABRICATION + FAILURE + CORROSION + WATER TREATMENT + QUALITY ASSURANCE + HEAT TREATMENT + *STEAM GENERATOR + TUBING + LEAK

11-105851 ALSO IN CATEGORY 18 DATED 1974
TRIP REPORT - UNITED STATES LMFBR STEAM GENERATOR TEAM, IAEA SYMPOSIUM, BENSBERG, GERMANY, OCT. 14-17, 1974
U.S. ERDA, WASHINGTON
ERDA-36 +, 71 PPS, 5 TABS, OCT. 1974

PURPOSE OF THIS TEAM VISIT WAS TWOFOLD; FIRST, FOR THE US TO HAVE A STRONG PARTICIPATION IN THE TECHNICAL INFORMATION EXCHANGE. SECONDLY, THE TEAM DESIRED TO MEET SEPARATELY WITH DIFFERENT EUROPEAN ORGANIZATIONS TO EXPLORE DETAILS OF ITEMS PRESENTED AT THE SYMPOSIUM. IT IS THE TEAM'S OPINION THAT SEVERAL VIABLE PROGRAMS ARE UNDERWAY, AND THAT DEVELOPMENT OF SEVERAL CONCEPTS HAS ADVANCED TO THE DEMONSTRATION STAGE. ALSO NO FOREIGN ORGANIZATION IS CLEARLY LEADING IN DEVELOPMENT OF LMFBR STEAM GENERATORS. THERE ARE MANY SIMILARITIES AND OVERLAPS BETWEEN THE SEVERAL COUNTRY'S PROGRAMS. THE NOTABLE EXCEPTION IS THE FRENCH EFFORT EPITOMIZED BY THE PHENIX PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + FABRICATION + FAILURE + MAINTENANCE AND REPAIR + MATERIAL + WATER TREATMENT + SAFETY EVALUATION + *STEAM GENERATOR + TUBING + LEAK + OPERATING EXPERIENCE

11-105883 ALSO IN CATEGORY 18 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. SAFETY ASSESSMENT. SECOND QUARTERLY REPORT, SEPT.-NOV. 1974
GENERAL ELECTRIC COMPANY
GEAP-14023-2 +, 50 PPS, 12 TABS, 28 FIGS, NOV. 1974

THIS REPORT IS THE SECOND IN A SERIES OF QUARTERLY REPORTS PUBLISHED UNDER THE SAFETY ASSESSMENT PROGRAM. THE OBJECTIVE OF THE WORK REPORTED HERE IS TO ESTABLISH PROCEDURE AND TECHNIQUES, SUCH AS PROBABILISTIC METHODOLOGY, FOR QUANTITATIVE ASSESSMENTS OF LMFBR SAFETY. PROGRESS DURING SEPTEMBER, OCTOBER AND NOVEMBER 1974 IS DESCRIBED FOR TASKS RELATED TO LMFBR RISK ASSESSMENT METHODS AND PROBABILISTIC PIPEBREAK.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + FAILURE, PIPE + *ACCIDENT, PROBABILITY OF + R AND D PROGRAM + *PROBABILITY

11-105885 ALSO IN CATEGORY 18 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM. REFERENCE FUEL STUDIES. SECOND QUARTERLY REPORT, NOVEMBER-DECEMBER 1974 AND JANUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14032-2 +, 60 PPS, 13 TABS, 22 FIGS, FEB. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING THE THERMODYNAMIC DATA PROGRAM ON PUO2-UO2 AT HIGH TEMPERATURES, FUEL ROD ENGINEERING, AND THE FUEL ROD TEST PROGRAM AIMED AT PROVIDING VIABLE FUEL RODS FOR THE FTR, CRBR, AND COMMERCIAL LMFBR'S.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + THERMODYNAMICS + HIGH TEMPERATURE + R AND D PROGRAM + FUEL ROD + CLINCH RIVER (LMFBR) + FTR (TR)

11-105867 ALSO IN CATEGORIES 9 AND 12 AND 18 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. ADVANCED SAFETY ANALYSIS. FIRST QUARTERLY REPORT, JULY-NOVEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14038-1 +, 65 PPS, 20 TABS, 23 FIGS, NOV. 1974

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105887 *CONTINUED*
REPORTS PROGRESS FOR THE PERIOD IN THE FOLLOWING AREAS: ESTABLISHMENT OF SHUTDOWN SYSTEM RELIABILITY GOALS AND SUCCESS CRITERIA; INHERENT SAFE CORE DESIGN; FUEL ROD FAILURE MECHANISMS; AND ENGINEERING ANALYSIS OF POST-ACCIDENT HEAT REMOVAL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FAILURE, FUEL ELEMENT + RELIABILITY, SYSTEM + *R AND D PROGRAM + *EMERGENCY COOLING CONSIDERATIONS

11-105891 DATED 1974
SCOTT JH + BAARS RE + CULLEY GE + HUNTER CW
MICROSTRUCTURAL DEPENDENCE OF FAILURE THRESHOLD IN MIXED OXIDE LMFBR FUEL PINS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-9 +. 93 PPS, 34 FIGS, OCT. 1974

TRANSIENT OVERPOWER TESTS HAVE BEEN CONDUCTED ON OXIDE FUEL PINS IN CONJUNCTION WITH SUPPORT OF THE FFTF. RESULTS INDICATE (1) THERE IS A MARKED DEPENDENCE OF FUEL PIN FAILURE THRESHOLD ON PRIOR IRRADIATION HISTORY OF THE FUEL PIN. THE FIRST-ORDER EFFECT IN RADIATION IS LINEAR HEAT RATES, WHICH DETERMINES FUEL MICROSTRUCTURE. (2) FOR THE LIKELY RANGE OF OVERPOWER CONDITIONS, THE PREDOMINATE FAILURE MECHANISMS WILL BE DIFFERENTIAL THERMAL EXPANSION, TRANSIENT INDUCED RELEASE OF FISSION PRODUCT GASES AND MELTING OF THE CLADDING. (3) LOCATION OF FUEL PIN FAILURE IS WHERE THE PRODUCT OF FUEL PIN ENTHALPY AND CLADDING TEMPERATURE IS MAXIMIZED. (4) FRESH FUEL PINS ARE VERY LIKELY TO SURVIVE SIGNIFICANTLY LONGER THAN OTHER PIN TYPES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*FAILURE + *FUEL ROD + *MICROSTRUCTURE + MIXED OXIDE

11-105892 ALSO IN CATEGORY 18 DATED 1975
CORE RESTRAINT ENGINEERING SECOND QUARTERLY REPORT, NOVEMBER-DECEMBER 1974 AND JANUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14031-2 +. 10 PPS, 5 FIGS, FEB. 1975

THE OVERALL OBJECTIVE IS TO PROVIDE HIGH PRIORITY NEEDS ASSOCIATED WITH LMFBR CORE RESTRAINT SYSTEM AND DESIGN REQUIREMENTS, SUB-COMPONENTS, AND ANALYTICAL METHODS. FIRST PHASE OF WITHDRAWAL FORCE TESTS WERE COMPLETED AT HEDL. IN GENERAL, THE ANALYTICAL PREDICTIONS COMPARE WITH THE TEST RESULTS. THE UPDATED VERSION OF CORTAC, PROGRAMMED BY ANL, HAS BEEN SUCCESSFULLY RUN AT GE-FBRD. A MODIFIED CALCULATIONAL PROCEDURE HAS BEEN DEVELOPED FOR CORTAC TO HANDLE STEP CHANGES IN FLOW AND POWER AND IS BEING DEBUGGED. THE CONCEPTUAL LAYOUT OF THE COMPRESSION FIXTURE FOR THE LOAD PAD AND CHANNEL WALL LATERAL LOAD LIMITS HAS BEEN COMPLETED. TWO-DIMENSIONAL LOAD PAD MODELING USING THE ANSYS COMPUTER CODE IS IN PROCESS. A PRELIMINARY CONCEPT OF THE LEAD-IN SYSTEM OF THE IN-REACTOR LOAD PAD SURVEILLANCE SYSTEM FROM THE SIGNAL CONDITIONING EQUIPMENT TO THE INSTRUMENTED LOAD PADS HAS BEEN COMPLETED. CONCEPTUAL LAYOUTS OF THE IVTM (IN-VESSEL TRANSFER MACHINE) AND PERIPHERAL WITHDRAWAL FORCE MINIMIZER SYSTEMS HAVE BEEN COMPLETED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + EQUIPMENT DESIGN + CORE COMPONENTS + *CORE RESTRAINT

11-105899 ALSO IN CATEGORY 18 DATED 1975
THOMPSON DC
CORE RESTRAINT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1975
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-8 +. 25 PPS, 9 FIGS, MAY 1975

THE LMFBR (LIQUID METAL FAST BREEDER REACTOR) REQUIRES A CORE RESTRAINT SYSTEM TO PROVIDE BOTH AXIAL AND RADIAL SUPPORT FOR THE REACTOR ASSEMBLIES. THE PRIMARY REQUIREMENTS OF THE CORE RESTRAINT SYSTEM ARE: (1) LOCATION OF FUEL, CONTROL BLANKET, AND REMOVABLE SHIELD ASSEMBLIES IN PREDICTABLE AND REPRODUCIBLE POSITIONS; (2) REFUELING SHOULD BE ACCOMPLISHED WITHOUT DAMAGE TO THE ASSEMBLIES; AND (3) OPERATING LOADS MUST NOT BE EXCESSIVE. VARIABLES AFFECTING THE CORE RESTRAINT SYSTEM ARE PRIMARILY THE RADIATION-INDUCED MATERIALS EFFECTS OF SWELLING CREEP AND LOAD PAD FRICTION CHARACTERISTICS. THESE CAUSE BOWING DEFORMATIONS OF THE CORE ASSEMBLIES DURING LIFE. THE OBJECTIVE OF THIS DEVELOPMENT PROGRAM IS TO EVALUATE POTENTIAL RESTRAINT CONCEPTS BOTH ANALYTICALLY AND EMPIRICALLY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FUEL ELEMENT BOWING + CORE COMPONENTS + *CORE RESTRAINT

11-105916 DATED 1975
CLAUDSON TT
SEMI-ANNUAL PROGRESS REPORT: IRRADIATION EFFECTS ON REACTOR STRUCTURAL MATERIALS AUGUST 1974 TO FEBRUARY 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105916 *CONTINUED*
HEDL-TME-75-23 +. 155 PPS. FIGS. REFS. MARCH 1975

THIS DOCUMENT REPORTS PROGRESS OF SEVERAL ORGANIZATIONS DOING RESEARCH IN CREEP, CREEP-FATIGUE, SWELLING, CRACK PROPAGATION, RADIATION DAMAGE MECHANISMS, HELIUM VOID NUCLEATION, AND OTHER IRRADIATION DAMAGE STUDIES. MATERIALS INVESTIGATED WERE STAINLESS STEEL, INCONEL, STEEL, INCOLOY, NICKEL, VANADIUM, AND BCC METALS AND ALLOYS. ORGANIZATIONS REPORTING ARE AEROJET, AI, G.E., NAVAL RESEARCH LAB, ORNL, PACIFIC NORTHWEST LAB, UNIVERSITY OF CINCINNATI, AND HANFORD ENG. DEVELOPMENT LAB.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EBR 1 AND 2 (RE) + *RADIATION DAMAGE + STEEL + STEEL, STAINLESS + *IRRADIATION TESTING + INCONEL + CREEP + INCOLOY + VOID + GROWTH/DEVELOPMENT + SWELLING + FATIGUE + CRACK

11-105980 ALSO IN CATEGORIES 1 AND 9 AND 12 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP, ILL.
DOCKET-50537-22 +. 179 PAGES, AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, AUG. 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING COMPONENTS NOT COVERED BY ASME CODE, CONTROL RODS, SOURCE RANGE FLUX MONITORING SYSTEM, SODIUM DUMP SYSTEM, SODIUM FIRE PROTECTION SYSTEM, AND CUMULATIVE MECHANICAL DAMAGE FUNCTION. INCLUDES RESPONSES TO NRC QUESTIONS CONERNING THE ABOVE MENTIONED SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*NRC QUESTION + CODES AND STANDARDS + CONTAINMENT DESIGN + DESIGN CRITERIA + STORAGE CONTAINER + EQUIPMENT + *REPORT, PSAR + INSTRUMENT, STARTUP RANGE + FIRE PROTECTION + *CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

11-105981 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.19 - GENERAL CRITERIA FOR SYSTEM HANDLING IRRADIATED FUEL
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.19-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SYSTEMS WHICH HANDLE OR CONTAIN IRRADIATED FUEL ASSEMBLIES WILL CONFORM SPECIFICALLY TO THE FOLLOWING CRBRP GENERAL DESIGN CRITERIA: 61, 62 AND 63 WHICH ARE ESSENTIALLY IDENTICAL TO THE RELATED CRITERIA IN 10CFR50. THE DESIGN FEATURES NECESSARY TO MEET THE CRITERIA 61, 62 AND 63 ARE ADDRESSED IN DETAIL IN SECTION 9.1.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*FUEL HANDLING + *NRC DESIGN CRITERIA + *FUEL STORAGE + RADIATION SAFETY AND CONTROL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

11-105983 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.58 - VISUAL INSERVICE INSPECTION
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.58-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

VISUAL INSPECTION OF THE EXTERIOR SURFACE OF ALL SODIUM-RETAINING BOUNDARIES IS THE ONLY TYPE OF IN-SERVICE INSPECTION WHICH IS PRACTICAL AND WITHIN THE STATE-OF-THE-ART TODAY. VISUAL INSPECTION CAPABILITY IS BEING PROVIDED THROUGHOUT THE PRIMARY SYSTEM OF CRBRP VIA TELEVISION CAMERAS, PERISCOPES, AND/OR CONTACT MEANS. HOWEVER, THE NEED FOR ADDITIONAL ASSURANCE OF VIABLE HARDWARE IS RECOGNIZED. FOR THIS PUPOSE, MULTIPLE, REDUNDANT, LEAK DETECTION SYSTEMS (SECTION 7.5.5 OF THE PSAR) ARE PROVIDED TO DETECT VERY SMALL LEAKS, IF ANY SHOULD DEVELOP, AND PERMIT PLANT SHUTDOWN BEFORE ANY SIGNIFICANT LOSS OF SODIUM CAN OCCUR.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

STORAGE CONTAINER + NOZZLE + *REMOTE MANIPULATING AND VIEWING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + PRESSURE VESSELS + PIPES AND PIPE FITTINGS + *INSERVICE INSPECTION

11-105987 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.87 - BACKUP SEALS FOR CDA
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q001.82-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CURRENT DESIGN OF THE RISER ASSEMBLIES INCORPORATES A BACKUP SEAL FOR THIRD LEVEL DESIGN MARGIN ON THE ASSUMPTION THAT THE INFLATED ELASTOMER DYNAMIC SEALS MAY NOT HAVE THE CAPABILITY OF CONTAINING THE MASS OF LIQUID SODIUM PROPELLED UPWARD UNDER SOME HYPOTHESIZED MARGIN LOADING INCIDENT. THE BACKUP SEAL IS DESIGNED TO STOP SODIUM FLOW THROUGH THE BEARING RACES, WHICH WOULD SEPARATE UNDER THE RELATIVE MOTION OF THE ROTATING PLUGS RESULTING FROM A THIRD LEVEL DESIGN MARGIN.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-105987 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT + DESIGN CRITERIA + CONTAINMENT INTEGRITY + *SEAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + ACCIDENT, CORE DISRUPTIVE + *CONTROL ROD DRIVES

11-105990 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.108 - STRUCTURAL EVALUATION PLAN (SEP)
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.108-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

SEPS ARE INVOKED BY RDT F9-4 WHICH IS A MANDATORY RDT STANDARD FOR ALL DESIGNS TO THE ASME CODE FOR TEMPERATURES ABOVE 800 F. WHEN A SINGLE SEP INVOLVES TWO OR MORE REACTOR MANUFACTURERS (RMS), THE LEAD REACTOR MANUFACTURER (LRM) SHALL REVIEW AND APPROVE. WHEN A SINGLE SEP INVOLVES AN RM AND IS PREPARED BY THEM FOR THEIR DESIGN, IT SHALL BE REVIEWED AND APPROVED BY THE LRM. WHEN A SINGLE SEP IS CREATED FOR AN RM BY ONE OF ITS SUPPLIERS, THE RM SHALL REVIEW AND APPROVE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *REVIEW + RESPONSE TO NRC QUESTION + *STRUCTURAL INTEGRITY + CLINCH RIVER (LMFBR)

11-105991 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.110 - DYNAMIC LOAD ON IHX FROM STEAM GENERATOR FAILURE
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.110-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN EVALUATING THE STRUCTURAL ADEQUACY OF THE IHX WITH RESPECT TO THE SODIUM WATER REACTION, THE DYNAMIC NATURE OF THE INTERMEDIATE SODIUM PRESSURE HISTORY IS BEING ACCOUNTED FOR BY USING DYNAMIC LOAD FACTORS. THE FACTOR WILL BE APPLIED TO THE MAXIMUM INTERMEDIATE PRESSURE WHICH IN TURN IS USED TO DETERMINE THE PRESSSURE-INDUCED PRIMARY STRESSES. THESE PRIMARY STRESSES ARE LIMITED BY THE EMERGENCY CONDITION ALLOWABLES OF CODE CASE 1592, PARAGRAPH 3224, AS MODIFIED BY RDT F9-4T.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + METAL WATER REACTION + *STRESS + RESPONSE TO NRC QUESTION + STEAM GENERATOR + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

11-106159 ALSO IN CATEGORY 1 DATED 1974
THIRD QUARTERLY REPORT, 1974 FAST BREEDER PROJECT
KERNFORSCHUNGSZENTRUM, PROJEKT SCHNELLER BRUTER, KARLSRUHE, F.R. GERMANY
EURFNR-1229 + KFK-1274/3 + EUR-5199 +. 150 PPS, FIGS, DEC. 1974

FUEL SWELLING IS THOUGHT TO BE THE CAUSE OF HIGH PLASTIC STRAINS MEASURED DURING IN-PILE EXPERIMENTS. CORROSION ON THE INSIDE OF THE TUBE WALL INCREASES WITH INCREASING BURNUP. RESULTS ON SWELLING BEHAVIOR OF AUSTENITIC STEELS AFTER VARIOUS KINDS OF PRELIMINARY TREATMENT INDICATE A CONSIDERABLE REDUCTION OF SWELLING IN THE COLD-WORKED CONDITION AND A PARTICULARLY ADVANTAGEOUS BEHAVIOR OF 1.4970 TYPE STEEL. NEW EVALUATIONS OF CROSS-SECTIONS OF U-238 AND PU-239 FOR KEDAK-3 NUCLEAR DATA FILE HAVE RESULTED IN A NUMBER OF CHANGES RELATIVE TO THE VALUES USED SO FAR. THE MECHANICAL EFFECTS OF A FUEL-SODIUM INTERACTION ARE STUDIED BY THEORETICAL CALCULATIONS AND BY EXPLOSION TESTS ON REACTOR CORE MODELS. IN THE EXPLOSION TEST PEAK PRESSURES UP TO 100 ATM. WERE ACCOMMODATED BY FUEL WITHOUT ANY MAJOR PLASTIC STRAINS.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

EXPLOSION + CLADDING + TESTING + STEEL, STAINLESS + CORROSION + GERMANY + IRRADIATION TESTING + STRESS STRAIN DATA + CROSS SECTION + FUEL ROD + SWELLING

11-106672 ALSO IN CATEGORIES 5 AND 7 AND 12 A DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., TENN.
400 PGS, LTR W/AMENDMENT 5 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, OCT. 6, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AMENDS THE PRELIMINARY SAR BY SUBMITTING TWO APPENDICES, (E) PRIMARY PIPE RUPTURE FALLBACK POSITION AND (F) CORE DISRUPTIVE ACCIDENT ACCOMMODATION. THESE INCLUDE DETAILS OF THE PARALLEL DESIGN IN WHICH A PRIMARY PIPE RUPTURE AND A CORE DISRUPTIVE ACCIDENT RESPECTIVELY ARE TREATED AS DESSIGN BASIS ACCIDENTS. INCLUDES DESCRIPTIONS OF THE INITIATING ACCIDENTS, EVALUATIONS, DESIGN REQUIREMENTS, ALTERNATIVE ADDITIONAL PARALLEL DESIGN FEATURES AND ASSESSMENT OF DESIGN CAPABILITIES NECESSARY FOR TREATMENT OF THESE EXTREME AND LOW PROBABILITY ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + ACCIDENT + DESIGN CRITERIA + *REPORT, PSAR + MAIN COOLING SYSTEM + SYSTEM CAPABILITY + ACCIDENT, DESIGN BASIS + *CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS + ACCIDENT, CORE DISRUPTIVE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-106834 ALSO IN CATEGORY 18 DATED 1975
ZIMMERMANN W
TRANSFERCELL AND CORE-ELEMENT STORAGE-FACILITY FOR THE SNR 2 (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2132 +, 55 PPS, 6 TABS, 12 FIGS, MAY 1975

PRESENTS A SHORT SURVEY OF THE DEVELOPMENT AND STATE OF THE ART, FOLLOWED BY THE CONCEPT OF THE FUEL ELEMENT HANDLING CHOSEN FOR SNR-2. THE TRANSFER CELL CONNECTING THE REACTOR WITH THE FUEL STORAGE IS DESCRIBED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FUEL STORAGE + DESIGN STUDY + GERMANY + STORAGE CONTAINER + SYSTEM DESCRIPTION

11-107073 ALSO IN CATEGORIES 2 AND 9 AND 10 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
127 PGS, AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS THE PROJECT'S SITE SUITABILITY SOURCE TERM FROM THE CRBRP PARALLEL DESIGN AND NEW AND REVISED PAGES TO THE PRELIMINARY SAR. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING RELIABILITY ANALYSIS, WEATHER DATA, SEISMIC RESPONSES DURING WASTE INJECTIONS, AND SODIUM FIRES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + DESIGN CRITERIA + RELIABILITY ANALYSIS + SEISMOLOGY + SITING, REACTOR + SOURCE, RADIATION + *REPORT, PSAR + ENGINEERED SAFETY FEATURE + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR)

11-107075 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.15 - LEAK IDENTIFICATION
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.15-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DETECTION AND CONFIRMATION OF A LEAK IN THE PRIMARY SYSTEM LEADS TO SHUTDOWN OF THE PLANT REGARDLESS OF THE PRECISE LOCATION. THEREFORE, LOCATION OF THE LEAK IS AN ECONOMIC CONSIDERATION AND A MANDATORY REQUIREMENT IN THE CRITERION IS NOT WARRANTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

TEST, LEAK LOCATION + RESPONSE TO NRC QUESTION + *CONTAINMENT LEAK MONITOR + CLINCH RIVER (LMFBR)

11-107076 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.24 - DESIGN BASIS OF INNER CELLS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.24-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INNER CELLS WITHIN THE CONTAINMENT ARE DESIGNED AND REQUIRED ONLY TO HAVE A NOMINAL LEAKTIGHTNESS FOR THE PURPOSE OF MAINTAINING THE PURITY OF THE INERTED ATMOSPHERE IN THESE CELLS DURING NORMAL PLANT OPERATION. NOTE THAT THE INERTED CELLS ARE OPERATED AT A SLIGHT NEGATIVE PRESSURE TO PROVIDE THE DESIRED NORMAL OPERATING LEAKAGE PATH. THE INNER CELLS ARE NOT ENGINEERED SAFETY FEATURES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + CONTAINMENT + *DESIGN CRITERIA + ACCIDENT, LOSS OF COOLANT + RESPONSE TO NRC QUESTION + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-107078 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.126 - EFFECT OF INERT ATMOSPHERE ON LEAK MONITOR
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.126-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

OF THE TYPES OF LEAK DETECTION DEVICES PROPOSED FOR THE LEAK DETECTION SYSTEM, ONLY SODIUM VAPOR/AEROSOL LEAK DETECTION DEVICES WOULD SHOW A DIFFERENCE IN THEIR RESPONSE WHEN OPERATED IN AN AIR ATMOSPHERE AS OPPOSED TO AN INERT ATMOSPHERE. THE ELECTRICAL SENSING TYPES SUCH AS CABLE AND CONTACT DETECTORS WOULD SHOW NO DIFFERENCE IN RESPONSE DUE TO OPERATING ATMOSPHERES. HOWEVER, THE POTENTIAL FOR HIGHER MOISTURE CONTENT IN AIR COULD RESULT IN GREATER INHIBITION TO SODIUM FLOW GIVEN A SMALL LEAK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107078 *CONTINUED*
CHARGE $2.00)

RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + *CONTAINMENT LEAK MONITOR + EFFECT + CLINCH RIVER (LMFBR)

11-107081 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.248 - ELASTOMER SEAL SYSTEM LEAKAGE
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.248 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG.--WEST., AE--BURNS & ROE

THE ELASTOMER SEAL SYSTEM IN THE UPPER SECTION OF THE RISER ASSEMBLY IS MADE UP OF 2 SETS OF 'O' RINGS AND ONE SET OF INFLATABLE SEALS. DOUBLE-BUFFERING AND PURGING BETWEEN THE 'O' RINGS MINIMIZE THE AMOUNT OF NOBLE GAS LEAKAGE. THE CALCULATED INFLATABLE SEAL LEAKAGE RATE DUE TO DIFFUSION IS 2.6 X 10 (EXP -5) SCC/SEC CM OVER THE RANGE 5 TO 15.0 PSID BETWEEN THE PRESSURIZED SEAL AND ATMOSPHERE. A BUFFER GAS FLOW OF APPROXIMATELY 2 SCFM IN COMBINATION WITH THIS LEAK RATE LIMITS RADIATION IN THE HEAD ACCESS AREA FROM THE SEALS TO LESS THAN 0.2 MR/HR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DIFFUSION + *SEAL + RESPONSE TO NRC QUESTION + *LEAK RATE + CLINCH RIVER (LMFBR)

11-107340 DATED 1974
HOBDELL MR
ELECTROCHEMICAL MEASUREMENTS OF CARBON POTENTIAL
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
RD/B/N-3157 +. 14 PPS, 10 REFS, SEPT. 1974

AN ELECTROCHEMICAL CARBON CELL HAS BEEN USED TO MONITOR CHANGES IN CARBON CHEMICAL POTENTIAL (ACTIVITY) ACCOMPANYING CARBON TRANSFER FROM 2 1/4 CR-1MO FERRITIC STEEL TO AISI 316 STAINLESS STEEL IN LIQUID SODIUM AT 910K. THE VARIATIONS OF CARBON ACTIVITY WITH TIME IN THE SEPARATE 2 1/4 CR-1MO STEEL/SODIUM AND 316 STEEL/SODIUM SYSTEMS HAVE ALSO BEEN INVESTIGATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + CHEMICAL REACTION + STEEL, STAINLESS + CORROSION + MONITOR + METAL, LIQUID + *MASS TRANSFER + STEEL, FERRITIC + METALLURGY

11-107456 ALSO IN CATEGORY 18 DATED 1975
CARLSON EA
FFTF/IVHM LIQUID METAL MAINTENANCE SEAL TEST
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-58 +. 31 PPS, 17 FIGS, 2 REFS, JULY 1975

THIS REPORT DESCRIBES THE OPERATION AND EFFECTIVENESS OF THE IN-VESSEL HANDLING MACHINE (IVHM) LIQUID METAL MAINTENANCE SEAL WHICH WAS TESTED AT HANFORD ENGINEERING DEVELOPMENT LABORATORY (HEDL) IN OCTOBER 1974. OPERATION IN THE FAST FLUX TEST FACILITY (FFTF) OF THE IVHM MAINTENANCE SEAL IS EXPECTED FOR ONLY SHORT PERIODS OF TIME DURING MAINTENANCE ON THE MAIN IVHM ELASTOMER SEALS. SUCCESSFUL OPERATION OF ONE COMPLETE MAINTENANCE SEAL CYCLE WAS DEMONSTRATED DURING THE TEST. THIS CYCLE INCLUDED (1) INSTALLATION OF MAINTENANCE SEAL HARDWARE ON THE IVHM, (2) ANNULUS HEAT UP AND FILL WITH ALLOY, (3) ANNULUS COOL DOWN AND CHECK OF SEAL EFFECTIVENESS, AND (4) HEAT UP AND DRAIN.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

MAINTENANCE AND REPAIR + OPERATION + TESTING + FFTF (TR) + METAL, LIQUID + *SEAL + EQUIPMENT DESIGN + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT + CORE COMPONENTS + POLYMERIC

11-107627 ALSO IN CATEGORY 18 DATED 1975
STEAM GENERATOR MATERIALS ENGINEERING THIRD QUARTERLY REPORT, JANUARY-MARCH 1975
GENERAL ELECTRIC COMPANY
GEAP-14029-3 +. 22 PPS, 7 FIGS, 34 REFS, APRIL 1975

MAJOR ACCOMPLISHMENTS FOR THIS QUARTER WERE AS FOLLOWS: (1) DECARBURIZATION POT NO. 1 WAS RE-STARTED AND EXPOSURE OF 2-1/4 CR-1MO BASE METAL TO 10,000 HOURS, AND WELD METAL TO 7000 HOURS, IS UNDER WAY. (2) HIGH TEMPERATURE ELECTROCHEMICAL EXPERIMENTS HAVE BEEN INITIATED IN 5% CAUSTIC SOLUTIONS AT 600 F WITH 2-1/4 CR-1MO STEEL. POLARIZATION CURVES WERE DEVELOPED. (3) A REPORT ON THE SECOND PHASE OF TESTING OF 2-1/4CR-1MO AND INCOLOY 800 TUBING IN SUPERHEATED STEAM HAS BEEN COMPLETED AND ISSUED - CAUSTIC-SUPERHEAT STRESS CORROSION TESTING, FEBRUARY 1975 (NEDM-14007). (4) CREEP-FATIGUE TESTS OF TYPE-316 STAINLESS STEEL HAVE BEEN INITIATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + *MATERIAL + ENVIRONMENT + CREEP + R AND D PROGRAM + *STEAM GENERATOR + PERFORMANCE + FATIGUE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107628 ALSO IN CATEGORY 18 DATED 1975
CORE RESTRAINT ENGINEERING THIRD QUARTERLY REPORT, FEBRUARY-APRIL 1975
GENERAL ELECTRIC COMPANY
GEAP-14031-3 +, 22 PPS, 11 FIGS, 2 REFS, JUNE 1975

THIS REPORT IS THE THIRD IN A SERIES. THE OBJECTIVE OF THE WORK REPORTED HERE IS TO PROVIDE CORE RESTRAINT SYSTEM DESIGN REQUIREMENTS, SUBCOMPONENTS, AND ANALYTICAL METHODS IN ACCORDANCE WITH LMFBR PROGRAM PLANT TASKS. PROGRESS IS DESCRIBED FOR SUBTASKS RELATED TO WITHDRAWAL FORCE TESTING, TRANSIENT ANALYSIS, LOAD PAD AND CHANNEL WALL LATERAL LIMITS, IN-REACTOR LOAD PAD SURVEILLANCE, AND WITHDRAWAL FORCE MINIMIZER.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FASTENER + DESIGN STUDY + CORE COMPONENTS + SUPPORT STRUCTURE + *R AND D PROGRAM

11-107633 ALSO IN CATEGORY 18 DATED 1975
CORUM JM + PUGH CE
HIGH-TEMPERATURE STRUCTURAL DESIGN PROGRAM PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5048 +, 326 PPS, TABS, FIGS, OCT, 1975

KEY ACCOMPLISHMENTS DURING THIS REPORTING PERIOD INCLUDE (1) THE FORMULATION OF RECOMMENDED INTERIM CONSTITUTIVE EQUATION GUIDELINES FOR INELASTIC DESIGN ANALYSIS OF 2 1/4 CR-1 MO STEEL REACTOR SYSTEM COMPONENTS; (2) COMPLETION OF PIRAX 2, A SIMPLIFIED INELASTIC PIPING SYSTEM FLEXIBILITY ANALYSIS COMPUTER PROGRAM; (3) COMPLETION OF A BASIC SET OF HIGH-TEMPERATURE STRUCTURAL TESTS, INCLUDING TWO PIPE RATCHETTING TEST SERIES, FOR VERIFICATION AND QUALIFICATION OF INELASTIC DESIGN ANALYSIS PROCEDURES THROUGH BENCHMARK CALCULATIONS; AND (4) COMPLETION OF AN ANALYTICAL STUDY OF ELASTIC CREEP-FATIGUE DESIGN PROCEDURES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + TESTING + ORNL + *HIGH TEMPERATURE + *DESIGN STUDY + CREEP + FATIGUE + *STRUCTURE

11-107645 ALSO IN CATEGORY 18 DATED 1975
SHIELS SA + BAGNALL C + ORBON SJ + SCHRECK SL + RAY WE
INTERSTITIAL TRANSFER PROGRAM ITF RUNS 2 AND 3
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-22 +, 60 PPS, 23 FIGS, 25 REFS, JULY 1975

THE EFFECT OF SODIUM EXPOSURE UPON THE MECHANICAL PROPERTIES OF STAINLESS STEEL IS EXPECTED TO INVOLVE THE CHANGE OF THE CONCENTRATION AND DISTRIBUTION OF THE INTERSTITIAL ALLOYING ELEMENTS, CARBON AND NITROGEN. RECENT OBSERVATIONS SUGGEST THAT BOTH LONG-TERM PROPERTIES, SUCH AS CREEP RUPTURE STRENGTH, AND SHORT-TERM TENSILE PROPERTIES ARE THUS ALTERED. THE ITF IS A UNIQUE SODIUM TEST FACILITY WHICH WAS DESIGNED PRIMARILY TO REPRODUCE THE INTERSTITIAL TRANSFER BEHAVIOR OF THE FFTF PRIMARY SYSTEM. AS THIS TOPICAL REPORT IS THE FIRST COMPILATION OF ITF INFORMATION, THE DESIGN OF THE FACILITY IS DISCUSSED AND THE BACKGROUND TO THE TEST PROGRAM IS GIVEN. THE REPORTED RESULTS ARE FROM THE FIRST TWO TEST RUNS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ALLOY + DIFFUSION + *TENSILE PROPERTY + *STEEL, STAINLESS + STRUCTURAL INTEGRITY + CREEP + *PROPERTY, MECHANICAL + METALLURGY

11-107683 ALSO IN CATEGORY 18 DATED 1975
MCGREGOR BJ + CLIFFORD CE + MUCKENTHALER FJ + MYNATT FR
ORNL TSF PIPE CHASE NEUTRON STREAMING EXPERIMENT - PHASE TWO
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4283 +, 53 PPS, 11 TABS, 19 FIGS, AUG, 1975

A SECOND ORNL TOWER SHIELDING FACILITY EXPERIMENT HAS BEEN PERFORMED AND ANALYZED IN THE INVESTIGATION OF TECHNIQUES FOR PREDICTING THE EXTENT OF NEUTRON STREAMING THROUGH THE SODIUM COOLANT PIPES OF THE FAST FLUX TEST FACILITY. THE ANALYSIS CONSISTED OF CALCULATIONS OF THE BONNER BALL AND SPECTROMETER RESPONSES WITH THE TWO-DIMENSIONAL DISCRETE ORDINATES CODE DOT-III USING 50-GROUP AND 14-GROUP CROSS-SECTION SETS AND ASSUMPTIONS OF BOTH ISOTROPIC AND ANISOTROPIC BOUNDARY SOURCES AT THE PIPE-CHASE ENTRANCE. IT IS CONCLUDED THAT THE SAME CALCULATIONAL APPROACH WOULD ACCURATELY PREDICT, OR POSSIBLY SLIGHTLY OVERPREDICT, THE NEUTRON FLUX LEVELS THAT WILL EXIST IN THE HEAT EXCHANGER VAULTS OF THE FFTF.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ANALYTICAL TECHNIQUE + FFTF (TR) + ORNL + SHIELDING + NEUTRON + RADIATION MODEL + HEAT EXCHANGERS

11-107711 ALSO IN CATEGORIES 2 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107711 *CONTINUED*
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 359 PGS, AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING AN UPDATED SEISMIC MODEL, FLOOD DESIGN, WEATHER STATISTICS, LOGS OF BORINGS, AND FUEL ASSEMBLY DESIGN. RESPONSES TO NRC QUESTIONS ARE GENERALLY GIVEN AS REFERENCES TO REVISED SECTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + GEOLOGY + RIVER + SITING, REACTOR + SITE CLIMATOLOGY + SOIL PROPERTY + *REPORT, PSAR + WEATHER, SEVERE + FLOOD + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR) + FUEL ELEMENTS

11-107715 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.225 - ESTIMATES OF VOLUME OF A SODIUM SPILL
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q001.225-1 THRU Q001.225-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IF A PHTS LEAK OCCURS IN PIPING OUTSIDE THE GUARD VESSEL, THE AMOUNT OF SODIUM WHICH COULD DRAIN FROM THE LOOP DEPENDS ON THE LOCATION OF THE LEAK RELATIVE TO THE HIGH POINT OF THE PRIMARY PIPING. THE HIGH POINT OF THE PRIMARY PIPING IS LOCATED IN THE HTS EQUIPMENT CELL. IF A LEAK WERE TO OCCUR, VENTING AT THE HIGH POINT WOULD BREAK THE SYPHON ACTION AND LIMIT THE DRAINAGE QUANTITY TO THAT VOLUME OF SODIUM WHICH IS ON THE LEAK SIDE OF THE VENT AND WHOSE ELEVATION IS ABOVE THE ELEVATION OF THE LEAK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + LEAK + *SYSTEM CAPACITY + CLINCH RIVER (LMFBR)

11-107719 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.5 - ESTIMATE OF LIGHTNING STRIKES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, 1 FIG, PP. Q322.5-1 THRU Q322.5-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A FORMULA HAS BEEN DEVELOPED FOR ESTIMATING THE FREQUENCY OF LIGHTNING FLASHES TO THE EARTH PER THUNDERSTORM DAY PER SQUARE KILOMETER FOR A PARTICULAR REGION. THE RESULTS SHOW AN ESTIMATED 6.47 FLASHES PER YEAR PER SQUARE KILOMETER. IT HAS BEEN DETERMINED THAT A STRUCTURE ATTRACTS LIGHTNING OF AVERAGE INTENSITY UP TO A DISTANCE EQUAL TO TWICE ITS HEIGHT. THE PROBABILITY OF A LIGHTNING DISCHARGE STRIKING THE REACTOR CONTAINMENT BUILDING CAN BE DERIVED USING THE PREVIOUSLY CALCULATED FREQUENCIES OF DISCHARGES EXPECTED IN THE SITE VICINITY AND THE ATTRACTION AREA OF THE STRUCTURE. THESE RESULTS SHOW THAT THE STRUCTURE IS LIKELY TO BE STRUCK BY LIGHTNING ONCE IN EVERY 2.5 YEARS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT, PROBABILITY OF + CONTAINMENT STRUCTURE + RESPONSE TO NRC QUESTION + ELECTRIC ARC + WEATHER, SEVERE + FREQUENCY ANALYSIS + STRUCTURE + CLINCH RIVER (LMFBR)

11-107737 ALSO IN CATEGORIES 2 AND 18 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
271 PGS, AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING CHAPTER AND APPENDIX SUMMARIES, GENERAL DESCRIPTION OF THE PLANT, RELIABILITY PROGRAM, EQUIPMENT ARRANGEMENT DIAGRAMS, ORGANIZATION, TORNADO LOADINGS, MISSILE PROTECTION, RADIOLOGICAL MONITORING SYSTEM, MANUFACTURER'S QUALITY ASSURANCE PROGRAM, AND COMPUTER CODES. RESPONSES TO NRC QUESTIONS CONCERN THESE SAME TOPICS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT DESIGN + MISSILE GENERATION AND PROTECTION + REACTOR DESCRIPTION + SITING, REACTOR + RELIABILITY, SYSTEM + MONITORING SYSTEM, RADIATION + DESTRUCTIVE WIND + *REPORT, PSAR + QUALITY ASSURANCE + *CLINCH RIVER (LMFBR)

11-107738 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.56 - SELECTION OF SODIUM VELOCITY LIMIT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.56-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107738 *CONTINUED*
THE HEAT TRANSPORT SYSTEM SODIUM VELOCITY LIMIT OF 30 FEET PER SECOND WAS SELECTED BASED ON OPTIMIZATION OF PIPE SIZE, REQUIRED INSULATION, PREHEAT, SODIUM INVENTORY AND PIPE CORROSION. THIS OPTIMIZATION IS BASED ON CONSIDERATION THAT THE HIGHER THE ALLOWABLE SODIUM VELOCITY THE SMALLER IS THE DIAMETER OF THE HTS PIPING, WHICH RESULTS IN SHORTER PIPE RUNS. THE CORROSION RATE REMAINS NEARLY CONSTANT OVER A RANGE OF SODIUM VELOCITIES FROM 10 TO 40 FPS, THEREBY VERIFYING THE ACCEPTABILITY OF THE HIGHER SODIUM VELOCITY ALLOWANCE OF 30 FPS. THE 30 FPS WAS CHOSEN TO ENSURE MINIMUM EROSION/CORROSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + CORROSION + EROSION + RESPONSE TO NRC QUESTION + *FLOW + *RATE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

11-107739 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.57 - USE OF WELDED PIPE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.57-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE SELECTION OF WELDED PIPE WAS BASED ON A DETAILED EVALUATION OF STRESS CRITERIA, AVAILABLE ANALYTICAL RESULTS AND PIPE FABRICATION VARIABLES REPORTED IN REFERENCE Q001.57. THE CRITERIA FOR STRESS CONDITIONS IS THAT SHOWN IN CODE CASE 1592. THE IN-SERVICE INSPECTION REQUIREMENTS FOR LIQUID METAL PIPING AND SYSTEMS IS UNDER DEVELOPMENT BY AN ASME CODE COMMITTEE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *WELDS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS + INSERVICE INSPECTION

11-107742 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.69 - METHOD OF COMBINING LOADS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.69-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE METHOD OF COMBINING LOADS IS DIRECTED BY THE ACCEPTANCE CRITERIA OF THE DESIGN SECTIONS OF THE ASME CODE. IN THE DESIGN EVALUATION, THE COMBINING AND ORDERING OF THE DUTY CYCLE EVENTS WITHIN THE LOADING HISTOGRAMS TO BE USED IS FIRST CHECKED TO VERIFY THE PROPOSED HISTOGRAM WILL PRODUCE A CONSERVATIVE CUMULATIVE DAMAGE ASSESSMENT. IN ADDITION, HISTOGRAMS FOR THE REACTOR VESSEL, GUARD VESSEL, AND CLOSURE HEAD WHICH DEFINE THE NORMAL, UPSET AND EMERGENCY OPERATING HISTORY FOR THOSE COMPONENTS FOR THEIR DESIGN OF TIME FROM INITIAL START-UP ARE PROVIDED IN THE EQUIPMENT SPECIFICATIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + THERMAL MECHANICAL EFFECT + *STRESS ANALYSIS + RESPONSE TO NRC QUESTION + STRUCTURAL INTEGRITY + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

11-107743 ALSO IN CATEGORIES 1 AND 18 DATED 1975
RESPONSE TO QUESTION 001.84 - COMPLIANCE WITH APPENDIX H, 10CFR50
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.84-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

APPENDIX H IS DIRECTED SPECIFICALLY TOWARD REACTOR VESSELS FABRICATED FROM FERRITIC STEELS. AS THE CRBR VESSEL IS TO BE MADE FROM AN AUSTENITIC STAINLESS STEEL, CERTAIN SECTIONS OF APPENDIX H (IN PARTICULAR, THOSE RELATED TO FRACTURE TOUGHNESS TESTING) ARE NOT CONSIDERED APPLICABLE. ALTHOUGH BOTH TYPES OF MATERIAL SUFFER A LOSS OF IMPACT RESISTANCE AS A CONSEQUENCE OF NEUTRON IRRADIATION, THAT UNDERGONE BY THE FERRITIC STEELS IS ACCOMPANIED BY A SIGNIFICANT UPWARD CHANGE IN THE DUCTILE-TO-BRITTLE TRANSITION TEMPERATURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BRITTLE FRACTURE + CODES AND STANDARDS + THERMAL MECHANICAL EFFECT + *MATERIAL + NEUTRON + RESPONSE TO NRC QUESTION + DAMAGE + FRACTURE TOUGHNESS + *RADIATION EFFECT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-107745 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.88 - HOT STANDBY CONDITION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.88-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE HOT STANDBY CONDITION IS A TEMPERATURE CONDITION THAT WILL USUALLY EXIST FOLLOWING A NORMAL SHUTDOWN OR A PLANT TRIP. THERE ARE TIMES SUCH AS A SHUTDOWN FOR THE PURPOSE OF REFUELING OR

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107745 *CONTINUED*
WHEN HTS OR STEAM GENERATOR SYSTEM MAINTENANCE IS INDICATED WHEN THE SODIUM TEMPERATURE WILL BE BROUGHT DOWN TO 400 F. ORDINARILY, HOWEVER, THE SODIUM TEMPERATURES WILL BE BROUGHT TO THE HOT STANDBY TEMPERATURE OF APPROXIMATELY 600 F.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *REACTOR SHUTDOWN + *TEMPERATURE + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

11-107746 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.90 - STRESS FROM PIPE DIAMETRAL TEMPERATURE GRADIENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.90-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE PHTS PIPING, THE PRESENT TRACE HEATING DESIGN LOCATES THE HEATERS AT THE BOTTOM OF THE PIPING. THE HEATER POWER IS SELECTED SO AS TO PRODUCE A SPECIFIC HEATUP RATE FOR THE PIPING AND TO LIMIT THE DIAMETRAL TEMPERATURE GRADIENT ACROSS THE PIPE. THE STRESSES THAT RESULT FROM THE DIAMETRAL TEMPERATURE GRADIENT ON THE PIPING WILL BE COMBINED WITH OTHER STRESSES IN THE PIPING DURING THE FILLING CONDITION TO ENSURE THAT CODE STRESS LIMITS ARE NOT EXCEEDED. PRELIMINARY EVALUATIONS OF THIS CONDITION HAVE SHOWN THAT THE STRESSES RESULTING FROM THE TEMPERATURE GRADIENTS ARE WELL WITHIN CODE ALLOWABLES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*STRESS + THERMAL MECHANICAL EFFECT + *TEMPERATURE GRADIENT + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

11-107749 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.102 - LOCATING AND PLUGGING LEAKING TUBES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.102-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AT PRESENT, THE DETAILS FOR LOCATING AND PLUGGING A LEAKING TUBE HAVE NOT BEEN DEVELOPED. HOWEVER, PLANS ARE UNDERWAY TO DEVELOP DETAILS FOR BOTH OF THESE. CONCEPTUALLY, IT IS PLANNED TO DO BOTH THE LEAK DETECTION AND THE TUBE PLUGGING WITH THE IHX AT THE REFUELING TEMPERATURE, NAMELY, 400 F, WITH THE REACTOR SHUT DOWN AND THE AFFECTED PRIMARY LOOP DRAINED. IT IS PLANNED TO LOCATE LEAKS IN TWO OR MORE STEPS, NAMELY, GROSS DETECTION OF THE AREA OF THE HEAT EXCHANGER BUNDLE IN WHICH THE LEAK IS LOCATED AND SECONDLY, BY TUBE-TO-TUBE ISOLATION OF THE FINAL LEAKING TUBE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + FAILURE, TUBING + *TUBING + *LEAK + CLINCH RIVER (LMFBR) + HEAT EXCHANGERS

11-107752 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.115 - LONGITUDINAL AND CIRCUMFERENTIAL CRACK GROWTH
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.115-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRITERIA FOR JUDGING ACCEPTABILITY IS THAT NO FAILURES DUE TO CRACK GROWTH LEAD TO LOSS OF CORE COOLABLE GEOMETRY. LOSS OF CORE COOLABLE GEOMETRY IS CONSERVATIVELY DEFINED AS SODIUM BOILING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTAINMENT INTEGRITY + RESPONSE TO NRC QUESTION + CORE COMPONENTS + COOLING + *CRACK + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

11-107753 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.117 - TRIAXIAL LOADING RELATION TO UNIAXIAL LOADING
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. A001.117-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NORMAL PRACTICE IS TO RESOLVE THE STRESS FIELD INTO AN EQUIVALENT STRESS FOR COMPARISON WITH THE UNIAXIAL BASED MATERIAL DATA. THIS APPROACH IS BEING USED IN LMFBR COMPONENT STRUCTURAL ANALYSIS. THIS APPROACH IS CONSISTENT WITH MULTI-AXIAL STRESS EVALUATION METHODS IN THE ASME CODE SECTION III.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107753 *CONTINUED*
TESTING + ANALYTICAL MODEL + *STRESS ANALYSIS + RESPONSE TO NRC QUESTION + *CREEP + CLINCH RIVER (LMFBR)

11-107754 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.118 - CREEP-FATIGUE DAMAGE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.118-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE CREEP STRENGTH OF THE MATERIAL WILL BE DEGRADED TO ACCOUNT FOR THE EFFECT OF THE SODIUM ENVIRONMENT. BY ALSO IGNORING THE FATIGUE STRENGTH IMPROVEMENT DUE TO THE SODIUM ENVIRONMENT, THE NET RESULT IS A CONSERVATIVE ESTIMATE OF THE CUMULATIVE CREEP-FATIGUE DAMAGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CREEP PROPERTY + MATERIAL + RESPONSE TO NRC QUESTION + *CREEP + EFFECT + PROPERTY, MECHANICAL + *FATIGUE + CLINCH RIVER (LMFBR)

11-107757 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.122 - EFFECT OF ACCIDENT LOADS ON CRACK GROWTH
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.122-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

IT IS ANTICIPATED THAT THE ADDITON OF OBE, SSE AND THIRD LEVEL DESIGN MARGIN LOADINGS WILL NOT CHANGE SIGNIFICANTLY THE CRACK GROWTH AS DETERMINED USING THE LOAD CYCLE GIVEN IN FIG. 5.3-29. HOWEVER, ALL OF THE LOADING CYCLES ON THE PIPING WILL BE USED IN THE DETAILED ASSESSMENT OF CRACK GROWTH.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + *STRESS + RESPONSE TO NRC QUESTION + EFFECT + ACCIDENT, DESIGN BASIS + *CRACK + CLINCH RIVER (LMFBR)

11-107761 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.247 - EFFECT OF PRESSURE CHANGE OF SODIUM LEVEL IN REACTOR VESSEL
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.247-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE REACTOR VESSEL, PUMP TANK AND REACTOR OVERFLOW TANK ARE ALL CONNECTED WITH A GAS EQUALIZATION LINE WHICH WILL MAINTAIN THE PRESSURES EQUAL DURING THIS PRESSURE TRANSIENT. LEVELS, THEREFORE, WILL NOT CHANGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + *PRESSURE TRANSIENT + *SYSTEM CAPACITY + EFFECT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

11-107838 ALSO IN CATEGORY 18 DATED 1975
PATRIARCA P
FUELS AND MATERIAL DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5029 +. 40 PPS, FIGS, REFS, SEPT. 1975

THERMAL EXPANSION DATA ON EU2O3 WAS EXTENDED TO 1500 C. THE FIRST-STAGE IRRADIATION OF THE EU2O3 FTR DESIGN-ORIENTED TEST IN EBR-II HAS BEEN COMPLETED. POSTIRRADIATION EXAMINATION OF EU2O3 PELLETS FROM EXPERIMENT BICM-1 CONTINUED. STRAIN GAGE ROSETTE DATA FROM A ROOM-TEMPERATURE TENSILE TEST PERFORMED ON A WHOLE WELD CROSS SECTION OF AN FFTF VESSEL TEST WELD HAVE BEEN ANALYZED. PRELIMINARY REPORTS SUMMARIZING THE FINDINGS OF THE TASK FORCE ON ALTERNATE STRUCTURAL MATERIALS FOR LIQUID METAL FAST BREEDER REACTORS HAVE BEEN COMPLETED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + WELDS + WELDING + FFTF (TR) + THERMAL PROPERTY + EUROPIUM + R AND D PROGRAM + METALLURGY + CONTROL RODS

11-107856 ALSO IN CATEGORY 18 DATED 1975
BRAGER HR
THE EFFECTS OF COLD WORKING AND PRE-IRRADIATION HEAT TREATMENT ON VOID FORMATION IN NEUTRON-IRRADIATED TYPE 316 STAINLESS STEEL
WESTINGHOUSE HANFORD CO., RICHLAND, WASHINGTON
15 PPS, 12 FIGS, 25 REFS, J. NUCLEAR MATERIALS, 57(1), PP. 103-18 (JULY 1975)

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-107858 *CONTINUED*
THE EFFECT OF FAST-NEUTRON IRRADIATION ON VOID FORMATION IN TYPE 316 STAINLESS STEEL HAVING UNDERGONE SPECIFIC THERMAL-MECHANICAL TREATMENTS WAS INVESTIGATED BY TRANSMISSION ELECTRON MICROSCOPY. THE STUDY SHOWED THAT, FOR IRRADIATION AT THE THREE LOWER TEMPERATURES (420, 475 AND 580 C): (1) THE VOID VOLUME DECREASED WITH INCREASING COLD WORK; (2) THE REDUCTION IN SWELLING WAS DUE TO A DECREASE IN BOTH VOID-NUMBER DENSITY AND VOID SIZE; (3) THE DECREASE IN VOID SIZE WITH INCREASING COLD-WORK LEVEL WAS ENHANCED AT HIGHER IRRADIATION TEMPERATURES; (4) COLD WORKING FROM 0 TO 10% DECREASED THE VOID-NUMBER DENSITY, AND VOID VOLUME, MORE THAN IN THE RANGE FROM 10 TO 20%; (5) VOID FORMATION IN THE 20% CW STEEL WHICH HAD BEEN HEAT TREATED 100 H AT 650 C BEFORE IRRADIATION WAS SIMILAR TO THAT OF THE SOLUTION-TREATED STEEL.

*STEEL, STAINLESS + FAST NEUTRON + R AND D PROGRAM + VOID + *RADIATION EFFECT + METALLURGY

11-108025 DATED 1975
HILL MR
MECHANICAL PROPERTIES TEST DATA FOR STRUCTURAL MATERIALS QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5106 +. 330 PPS, FIGS, SEPT, 1975

EIGHT RESEARCH ORGANIZATIONS REPORT PROGRESS ON MECHANICAL PROPERTIES INVESTIGATIONS FOR MOSTLY STAINLESS STEEL MATERIALS. THE KEY WORDS SHOW THE SUBJECTS COVERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + TENSILE PROPERTY + IMPACT SHOCK + *STEEL, STAINLESS + WELDING + MATERIAL + STRESS STRAIN DATA + HEAT TREATMENT + CREEP + R AND D PROGRAM + *PROPERTY, MECHANICAL + GROWTH/DEVELOPMENT + CYCLING + FATIGUE + CRACK

11-108127 ALSO IN CATEGORIES 5 AND 6 AND 18 DATED 1975
NICKERSON G + KASTENBERG WE
PRELIMINARY ASSESSMENTS OF CARBIDE FUEL PINS DURING MILD OVERPOWER TRANSIENTS
UNIVERISTY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7582 +. 72 PPS, 16 TABS, 64 REFS, OCT, 1975

SEVERAL ASPECTS OF CARBIDE FUELED LMFBR'S ARE STUDIED. DISCUSSES THE STATE OF DEVELOPMENT OF CARBIDE FUEL AND CURRENT INFORMATION ABOUT AVAILABLE THERMOPHYSICAL PROPERTIES OF THIS MATERIAL IS PRESENTED. DESCRIBES THE CONCEPTUAL CARBIDE CORE DESIGN THAT IS STUDIED BY HOPE AND COMPARES IT WITH CRBRP DESIGN DATA. THE SCOPE OF THE BULK BOILING STUDY UNDERTAKEN WITH HOPE AND THE RESULTS OF THIS STUDY ARE ALSO PRESENTED IN THIS CHAPTER. A SUMMARY OF THE THESIS, CONCLUSIONS DRAWN FROM THE WORK COMPLETED, AND SOME RECOMMENDATIONS FOR FUTURE RESEARCH NEEDS ARE PRESENTED.

AVAILABILITY - ENERGY & KINETICS DEPARTMENT, SCHOOL OF ENGINEERING AND APPLIED SCIENCE, UNIV. OF CALIFORNIA, LOS ANGELES, CALIF.

*CARBIDE + COMPUTER PROGRAM + REACTOR TRANSIENT + DESIGN STUDY + *FUEL ROD + BOILING

11-108198 ALSO IN CATEGORY 18 DATED 1975
RAY WE
SODIUM TECHNOLOGY PROGRAM - FRICTION, WEAR, AND SELF-WELDING - QUARTERLY PROGRESS REPORT FOR PERIOD ENDING APRIL 30, 1975
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-27 +. 85 PPS, 30 FIGS, OCT, 1975

POST-TEST SPECIMEN EXAMINATIONS INDICATED THE USE OF PLASMA-SPRAYED TRIBALOY TO BE UNACCEPTABLE FROM A WEAR AND COMPATABILITY STANDPOINT. THE TESTS ALSO SHOWED THAT THE REFERENCE MATERIALS COMBINATION (HAYNES 273/HAYNES 273) EXHIBITS THE WORST OVERALL FRICTION BEHAVIOR OF THE FOUR MATERIALS COMBINATIONS EVALUATED. SEPARATION FORCE MEASUREMENTS FOR THE FFTF PRIMARY HOT LEG ISOLATION VALVE MATERIALS WERE COMPLETED AFTER EIGHT-MONTH EXPOSURE. WITH THE FIRST FOUR MONTHS AT 850 F, THE NEXT TWO MONTHS AT 1000 F, AND THEN A TWO-MONTH EXPOSURE AT 1115 F.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

WELDING + MATERIAL + PRESSURE DROP + R AND D PROGRAM + *FRICTION

11-108216 ALSO IN CATEGORY 18 DATED 1975
DILLON RL + LEVY IS + BRIMHALL PD + PAVLOV C + SCHWENK EB
A STATE OF THE ART REVIEW OF DEGRADATION PROCESSES IN LMFBR MATERIALS. VOLUME 1 - MECHANICAL PROPERTIES
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-1901 (VOL.1) +. APPROX. 160 PPS, FIGS, REFS, MARCH 7, 1975

REVIEWS THE DEGRADATION PROCESSES TO METALS IN SODIUM REACTOR SERVICE. THE PROCESSES DISCUSSED INCLUDE THOSE AFFECTING MECHANICAL PROPERTIES - NEUTRON IRRADIATION, THERMAL EXPOSURE AND SODIUM - AND FUEL-CLAD INTERACTION. THE CHAPTERS DEAL WITH SWELLING, TENSILE PROPERTIES, HIGH STRAIN RATE PROPERTIES, CREEP-RUPTURE PROPERTIES, FATIGUE, WELD PERFORMANCE, AND MECHANICAL PROPERTIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-108216 *CONTINUED*
METAL + STEEL + TENSILE PROPERTY + THERMAL MECHANICAL EFFECT + STEEL, STAINLESS + WELDING + *MATERIAL + PROPERTY, PHYSICAL + REVIEW + STRESS RUPTURE + STRESS STRAIN DATA + CREEP + *DATA COLLECTION + PROPERTY, MECHANICAL + RADIATION EFFECT + SWELLING + METALLURGY + FATIGUE

11-108219 ALSO IN CATEGORY 18 DATED 1975
DILLON RL + LEVY IS + DIVINE JR + GRIGGS B + WESTERMAN RE + ZIMA GE
A STATE OF THE ART REVIEW OF DEGRADIATION PROCESSES IN LMFBR MATERIALS. VOLUME 2 - CORROSION BEHAVIOR
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-1901(VOL.2) +. APPROX. 250 PPS, FICS, MARCH 7, 1975

REVIEWS THE DEGRADATION PROCESSES TO METALS IN SODIUM REACTOR SERVICE. THE PROCESSES DISCUSSED CONCERN ENVIRONMENTAL EFFECTS SPECIFIC TO SODIUM COOLANTS - CORROSION AND MASS TRANSFER, EROSION, WEAR AND SELF WELDING, SODIUM-WATER REACTIONS, AND EXTERNAL CORROSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL + METAL WATER REACTION + WELDING + *CORROSION + *MATERIAL + EROSION + REVIEW + FRICTION + DATA COLLECTION + PROPERTY, MECHANICAL + METALLURGY

11-108590 ALSO IN CATEGORY 18 DATED 1969
LMFBR LARGE VALVE TECHNOLOGY DEVELOPMENT
CRANE U.S.A., CHICAGO
COO-2004-1 +. 74 PPS, JUNE 1969

DESCRIBES THE PRIMARY DESIGN CONSIDERATIONS PERTINENT TO LMFBR LARGE VALVE DEVELOPMENT. THE EFFECTS OF HIGH-TEMPERATURE SODIUM SERVICE ARE DETAILED AS WELL AS THE PRIMARY FUNCTIONAL REQUIREMENTS FOR ISOLATION, FLOW CONTROL, AND CHECK VALVES. UPON THE STATED CRITERIA, EIGHTEEN DESIGN CONCEPTS, THREE FOR EACH FUNCTIONAL VALVE TYPE FOR EACH OF TWO EXTERNAL ENVIRONMENTS, HAVE BEEN DEVELOPED. EACH OF THE DESIGN CONCEPTS WILL BE EXPANDED INTO PRELIMINARY DESIGNS AND ANALYZED IN DEPTH UNDER LATER PROGRAM TASKS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + HIGH TEMPERATURE + *DESIGN STUDY + FLOW + *VALVE, CHECK + *VALVES

11-108592 DATED 1975
DEITRICH LW
EXPERIMENTS ON TRANSIENT FUEL FAILURE MECHANISMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-750527-3 +. 51 PPS, FROM INTERNATIONAL WORKING GROUP ON FUEL FAILURE MECHANISMS, SEATTLE, WASH., MAY 11, 1975

SOME OF THE EXPERIMENTAL WORK RELATED TO UNDERSTANDING FUEL FAILURE MECHANISMS UNDER TRANSIENT CONDITIONS IS REVIEWED. BOTH IN-REACTOR AND LABORATORY TESTS ARE CONSIDERED. THE RANGE OF TESTS DISCUSSED INCLUDE MEASUREMENTS OF FUEL PROPERTIES NEEDED IN ANALYTICAL WORK, LABORATORY STUDIES OF THE RESPONSE OF FUEL SUBJECTED TO TEMPERATURE TRANSIENTS BY DIRECT-ELECTRICAL-HEATING (DEH) TECHNIQUES, AND LABORATORY EXPERIMENTS ON CLADDING FAILURE UNDER TRANSIENT HEATING CONDITIONS. IN-REACTOR TESTS CONDUCTED IN TREAT ARE ALSO DISCUSSED, INCLUDING THE E- AND H-SERIES TRANSIENT OVERPOWER ACCIDENT SIMULATIONS, THE L- AND R-SERIES LOSS-OF-FLOW ACCIDENT SIMULATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + *FAILURE, FUEL ELEMENT + FAILURE, CLADDING + PROPERTY, PHYSICAL + SIMULATION + SYSTEM ANALYSIS + TRANSIENT + PERFORMANCE + METALLURGY

11-108593 DATED 1975
DEITRICH LW
ANALYSIS OF TRANSIENT FUEL FAILURE MECHANISMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-750527-2 +. 28 PPS, FROM INTERNATIONAL WORKING GROUP ON FUEL FAILURE MECHANISMS, SEATTLE, WASH., MAY 11, 1975

SELECTED ANALYTICAL PROGRAMS AT ARGONNE NATIONAL LABORATORY RELATED TO FUEL PIN FAILURE MECHANISMS IN ACCIDENT TRANSIENTS ARE DISCUSSED. FOR THE PRESENT PURPOSES, FUEL PIN FAILURE MECHANISMS ARE TAKEN TO BE THOSE PHENOMENA GOVERNING LOSS OF STRUCTURAL INTEGRITY OF THE CLADDING OR LOSS OF PIN-LIKE GEOMETRY IN CASES WHERE CLADDING MELTS BEFORE FUEL. ANALYSIS OF FUEL-COOLANT INTERACTIONS, POST-FAILURE FUEL TRANSPORT, CHANNEL PLUGGING, CLAD MOTION, AND THE LIKE, WHILE IMPORTANT TO THE COMPLETE ACCIDENT ANALYSIS, ARE NOT DEALT WITH HERE. OVERALL, THE ANALYTICAL INVESTIGATIONS OF FUEL PIN BEHAVIOR INCLUDE BOTH FUEL PERFORMANCE AND RESPONSE TO OFF-NORMAL AND ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FAILURE, FUEL ELEMENT + ANALYTICAL TECHNIQUE + FAILURE, CLADDING + PERFORMANCE LIMIT + SYSTEM ANALYSIS + TRANSIENT + PERFORMANCE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-108556 DATED 1974
BOLTAX A + NAYAK UP + SKALKA RJ
MIXED CARBIDE FUEL PIN PERFORMANCE ANALYSIS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-741017-29 +. 8 PPS, FROM MEETING OF THE AMERICAN NUCLEAR SOCIETY, WASHINGTON, D.C., OCT. 27, 1974

ANALYTICAL STUDIES OF BOTH MIXED OXIDE AND MIXED CARBIDE FUEL PIN PERFORMANCE ARE IN PROGRESS. THIS PAPER WILL SUMMARIZE THE STATUS OF RECENT STUDIES ON CARBIDE FUEL AND WILL INCLUDE SOME COMPARISONS OF THE TWO FUEL TYPES. THE FUEL PERFORMANCE CALCULATIONS WERE MADE WITH AN UPDATED VERSION OF THE CYGRO-F COMPUTER CODE. THIS CODE PROVIDES DETAILED MULTIRING MECHANICAL AND THERMAL ANALYSES WHICH HAVE BEEN CALIBRATED WITH THE AVAILABLE HELIUM-BONDED MIXED CARBIDE FAST REACTOR DATA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + OXIDE + TESTING + THERMAL ANALYSIS + ANALYTICAL MODEL + *DESIGN STUDY + PROPERTY, PHYSICAL + *FUEL ROD + PROPERTY, MECHANICAL + MIXED OXIDE

11-108671 ALSO IN CATEGORIES 7 AND 8 AND 12 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 270 PGS, AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING THE QUALITY ASSURANCE PROGRAM, TEST GROUTING PROGRAM (NEW APPENDIX 2-C), COMPARISON WITH FFTF AND MONJU, CORE INTERNALS, SHUTDOWN COOLING SYSTEMS, DOSES FROM EXPOSURE TO LIQUID EFFLUENTS, LEAKAGE FROM SODIUM COLD TRAPS AND PUMP SEIZURE ANALYSIS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING DECAY HEAT REMOVAL, STRESS FROM CDA, PRIMARY PUMP SEAL FAILURES, FISSION PRODUCTS IN SODIUM AEROSOL, CELL TEMPERATURE AND PRESSURE DURING SODIUM FIRE, AND SURFACE AREA FOR CONDENSATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + CONCRETE + CONTAINMENT + FIRE + TESTING + RADIOACTIVITY RELEASE + SEAL + *REPORT, PSAR + QUALITY ASSURANCE + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *CLINCH RIVER (LMFBR) + PUMPS

11-108674 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.111 - OVERPRESSURE LOADS FROM CORE DISRUPTIVE ACCIDENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.111-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HCDA IS NOT PART OF THE DESIGN BASIS FOR THE CRBRP REFERENCE DESIGN AS EXPLAINED IN SECTION 1.1 AND 15.1. THE THIRD LEVEL DESIGN LOADINGS ON THE PRIMARY PUMP OF 550-575 NSI WILL RESULT IN HIGH PRIMARY PRESSURE LOADS AT THE PUMP TANK NOZZLES--THE MOST CRITICAL AREA IN THE PUMP IN TERMS OF STRESS. THESE PRESSURE LOADINGS IN THE PRIMARY PUMP WILL CAUSE STRESSES IN THE DISCHARGE NOZZLE TO APPROACH THE YIELD POINT. IN THE PUMP TANK SUCTION NOZZLE, THE YIELD STRESS MAY BE EXCEEDED, BUT THE RESULTING STRESS WILL BE WITHIN THE ALLOWABLE STRESS FOR ASME SECTION III FAULTED CONDITIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *STRESS + NOZZLE + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PUMPS + *ACCIDENT, CORE DISRUPTIVE

11-108675 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.112 - PRIMARY SODIUM PUMP SEAL FAILURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.112-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DETAILED DESIGN OF THE SHAFT SEAL SYSTEM FOR THE PRIMARY SODIUM PUMP HAS NOT BEEN COMPLETED, THEREFORE, THE MAXIMUM RELEASE TO THE CONTAINMENT BUILDING RESULTING FROM DESIGN BASIS FAULTS IN THE SHAFT SEAL SYSTEM CANNOT BE PRECISELY QUANTIFIED NOW. HOWEVER, THE CONSEQUENCES OF PUMP SHAFT SEAL FAILURES ARE BOUNDED BY THE HYPOTHETICAL EVENT ANALYZED IN CHAPTER 15 AND ARE THEREFORE ORDERS OF MAGNITUDE LESS THAN THE GUIDELINES VALVES OF 10CFR100.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + RADIOACTIVITY RELEASE + *SEAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PUMPS

11-108676 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.146 - INGRESS OF CELL ATMOSPHERE INTO COOLANT SYSTEM

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-108676 *CONTINUED*
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS, 0001-146-1 THRU 0001-146-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POTENTIAL FOR LEAKS IN THE PIPING IS EXTREMELY REMOTE. THE POTENTIAL FOR CELL ATMOSPHERE INGRESS INTO THE COOLANT SYSTEM IN THE EVENT OF A LEAK EXISTS AT ANY POINT IN THE SYSTEM THAT OPERATES UNDER A NEGATIVE PRESSURE RELATIVE TO ATMOSPHERIC. THEREFORE, THE POTENTIAL FOR CELL ATMOSPHERE INGRESS INTO THE COOLANT SYSTEM DEPENDS ON WHETHER THE LOOP IS SHUT DOWN, THE PUMP IN ON PONY MOTOR OPERATION, OR THE PUMP IS ON MAIN MOTOR OPERATION. EACH OF THESE THREE LOOP CONDITIONS PRODUCE A UNIQUE PRESSURE PROFILE AROUND THE LOOP, AND THEREFORE, MUST BE ADDRESSED SEPARATELY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + *MAIN COOLING SYSTEM + LEAK + CLINCH RIVER (LMFBR)

11-108759 ALSO IN CATEGORIES 5 AND 6 AND 8 AN DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

11-108760 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.38 - FUEL PIN TRANSIENTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
3 PGS, 3 TABS, PP. 0001.38-1 THRU 0001.38-5 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THERE ARE BASICALLY THREE TYPES OF FUEL PIN TRANSIENTS: OVERPOWER, UNDERCOOLING AND OVERCOOLING. THE LOADING MECHANISMS ON THE CLADDING ARE BASICALLY DIFFERENT FOR THE FIRST TWO TRANSIENT TYPES. THEY WILL BE DESCRIBED FOR FRESH FUEL AND FOR HIGH BURNUP FUEL WHICH HAS BEEN SUBJECTED TO EITHER LOW AND HIGH POWER STEADY STATE OPERATION. THE CHARACTERIZATION OF THE RELEVANT PARAMETERS OF THESE THREE FUEL TYPES IS GIVEN IN TABLE 0001.38-1. THE CLADDING CAN BE LOADED BY TWO MECHANISMS, GAS PRESSURE IF THERE IS A GAP BETWEEN THE FUEL AND CLADDING AND DIRECT MECHANICAL LOADING OF THE CLADDING BY THE FUEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FUEL BURNUP + FUEL INTEGRITY + STRESS + RESPONSE TO NRC QUESTION + *FUEL ROD + THERMAL TRANSIENT + *TRANSIENT + CLINCH RIVER (LMFBR)

11-108764 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.228 - SYSTEM PRESSURE DURING LEAKS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. 0001.228-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANALYSES REFERENCED ON PAGE 15.6-23 OF THE PSAR WERE BASED ON PRELIMINARY ASSESSMENTS OF 1) PHTS CELL MAXIMUM PRESSURES VERSUS SODIUM LEAK RATE AND 2) REACTOR VESSEL INLET PLENUM MINIMUM PRESSURES VERSUS SODIUM LEAK RATE. THE CELL PRESSURES WERE COMPUTED WITH THE SPRAY-1 COMPUTER CODE AND THE PLENUM PRESSURES WITH THE DFMO COMPUTER CODE. NEW FIGURE 15.6.1.4-10 PRESENTS THE RESULTS OF THESE ANALYSES. THE TWO CELL PRESSURE CURVES WHICH ARE INCLUDED IN THE FIGURE ARE ONE FOR HOT LEG (1015 F) LEAKS AND ANOTHER FOR COLD LEG (730 F) LEAKS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPUTER PROGRAM + *PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + LEAK + *COMPARTMENT + CLINCH RIVER (LMFBR)

11-108771 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.319 - CLAD DETERIORATION DUE TO IRRADIATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-108771 *CONTINUED*
1 PG. P. Q001.319-1 OF AMENDMENT 5 TO CLINCH RIVER BREEDER LICENSE APPLICATION. DEC. 17. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & RCE

THE INCREASES IN FUEL ROD CLADDING TEMPERATURE DUE TO THE UMBRELLA TRANSIENTS ARE THE GREATEST AT BEGINNING-OF-LIFE. THUS. THE CLADDING TEMPERATURE VERSUS TIME RELATIONSHIPS DUE TO THESE TRANSIENTS WERE ANALYZED AT BEGINNING-OF-LIFE. THE PROCEDURES USED IN ASSESSING THE EFFECTS OF THESE TRANSIENTS IS DISCUSSED FULLY IN SECTION 4.2.1.3.1.1. BRIEFLY. THE CLADDING DUCTILITY LIMITED STRAIN WAS CALCULATED WITH THE REQUIRED NUMBER OF UMBRELLA TRANSIENTS APPLIED SIMULTANEOUSLY AT END-OF-LIFE. FOR CONSERVATISM. THE CLADDING TEMPERATURE INCREASES DURING THESE END-OF-LIFE TRANSIENTS WERE ASSUMED TO EQUAL THE MORE SEVERE BEGINNING-OF-LIFE VALUES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM. 1717 H STREET. WASHINGTON. D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CLADDING + *RADIATION DAMAGE + RESPONSE TO NRC QUESTION + CREEP + TEMPERATURE + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

11-108775 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 130.35 - HEAVY AGGREGATE CONCRETE
PROJECT MANAGEMENT CORP.. OAK RIDGE. TN
1 PG. P. Q130.35-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION. DEC. 17. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & RCE

A VERY LIMITED AMOUNT OF HEAVY-AGGREGATE CONCRETE WILL BE USED FOR MAINLY SHIELDING PURPOSES ON A SIDE WALL OF THE FUEL HANDLING CELL. THIS SIDE WALL IS LOCATED BELOW THE OPERATING FLOOR AND FACING THE OPERATING GALLERY. INFORMATION PERTAINING TO THE CHARACTERISTICS AND PHYSICAL CONSTANTS OF SUCH HIGH-DENSITY CONCRETE WILL BE PROVIDED WHEN THEY ARE AVAILABLE IN THE FUTURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM. 1717 H STREET. WASHINGTON. D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONCRETE + *SHIELDING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

11-109162 ALSO IN CATEGORY 18 DATED 1975
KEAIRNS DL + NEWBY RA + COOPER MH + EISENBACH G
CONCEPTUAL DESIGN OF A FLUIDIZED BED STEAM GENERATOR FOR THE LMFBR
WESTINGHOUSE ELECTRIC CORPORATION
4 PPS. PP. 338-41. FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE. NEWARK. DELAWARE. AUG. 18-22. 1975

A FLUIDIZED BED STEAM GENERATION SYSTEM. FBSG. IS BEING DEVELOPED. THE FBSG ELIMINATES NEED FOR AN INTERMEDIATE SODIUM LOOP AND HEAT EXCHANGER UTILIZED IN CURRENT DESIGN AND ISOLATES THE SODIUM AND WATER THUS REDUCING THE POSSIBILITY OF A SODIUM-WATER REACTION. A CONCEPTUAL DESIGN FOR A STACKED SODIUM AND WATER TUBE BUNDLE FLUIDIZED BED STEAM GENERATOR IS PRESENTED AND THE CIRCULATING FLUIDIZING GAS SYSTEM IS DESCRIBED. AN EXPERIMENTAL PROGRAM IS UNDERWAY TO DEVELOP DESIGN DATA AND DEMONSTRATE CONCEPT FEASIBILITY. THE DEVELOPMENT PROGRAM IS DISCUSSED AND OBJECTIVES OUTLINED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS. INC.. 345 EAST 47 ST.. NEW YORK. N.Y. 10017

DESIGN CRITERIA + REACTOR. RESEARCH + DESIGN STUDY + *FLUIDIZED BED + *STEAM GENERATOR

11-109164 ALSO IN CATEGORIES 1 AND 18 DATED 1975
IACOBELLIS SF
DEVELOPMENT AND TESTING REQUIREMENTS FOR MAJOR LMFBR COMPONENTS
ATOMICS INTERNATIONAL. CANOGA PARK. CALIF.
8 PPS. PP. 70-77. FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE. NEWARK. DELAWARE. AUG. 18-22. 1975

THE MOST SIGNIFICANT DEVELOPMENT REQUIRED TO MOVE FROM CRBRP COMMERCIAL PLANTS IS A SCALEUP IN THE SIZE OF HEAT TRANSFER COMPONENTS. TO ACHIEVE THIS SCALEUP WITH ADEQUATE ASSURANCE OF SUCCESSFUL RELIABLE PERFORMANCE. SIGNIFICANT TESTING OF THESE COMPONENTS WILL BE REQUIRED. THIS PAPER WILL FOCUS ON THAT ASPECT OF THE LMFBR PROGRAM. IN THE CURRENT LMFBR PROGRAM NO INTERMEDIATE-SIZED PLANTS ARE PLANNED. INSTEAD. THE CURRENT PROGRAM PLACES A MUCH GREATER EMPHASIS ON NEED FOR A COMPREHENSIVE COMPONENT TESTING PROGRAM. THIS PAPER WILL REVIEW DEVELOPMENT STATUS OF MAJOR LMFBR COMPONENTS. EXPLORE TECHNICAL UNCERTAINTIES. AND DISCUSS BOTH THE CURRENT MAJOR COMPONENT TESTING CAPABILITIES AND PLANNED FUTURE EXPANSIONS OF THESE FACILITIES.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS. INC.. 345 EAST 47 ST.. NEW YORK. N.Y. 10017

*RELIABILITY ANALYSIS + *TEST. COMPONENT + *COMPONENTS + STEAM GENERATOR + *COMPONENT DESCRIPTION + PUMPS + PIPES AND PIPE FITTINGS + HEAT EXCHANGERS

11-109343 ALSO IN CATEGORIES 5 AND 18 DATED 1975
KERRISK JF

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109343 *CONTINUED*
THE CONSEQUENCES OF SODIUM BOND LOSS FROM AN LMFBR CARBIDE FUEL ELEMENT
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6095-MS +. 20 PPS, 7 FIGS, 36 REFS, OCT, 1975

THE CONSEQUENCES OF SODIUM BOND LOSS FROM A URANIUM-PLUTONIUM CARBIDE FUEL ELEMENT DURING NORMAL STEADY STATE OPERATION HAVE BEEN ASSESSED. THE ELEMENTS CONSIDERED ARE TYPICAL OF THOSE CURRENTLY BEING IRRADIATED IN EBR-II, AND INCLUDE ELEMENTS WITH AND WITHOUT SHROUD TUBES. THE ANALYSIS PRESENTED IS VERY CONSERVATIVE IN THAT THE MANY SIMPLIFYING ASSUMPTIONS REQUIRED WERE MADE TO PREDICT WORSE CONSEQUENCES THAN WOULD BE FOUND IN A REALISTIC ANALYSIS. FOLLOWING SODIUM BOND LOSS, FUEL MELTING OCCURS, BUT THE FUEL RAPIDLY RESOLIDIFIES AFTER SLUMPING OUT TO CONTACT THE CLAD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + CLADDING + FUEL MELTDOWN + FAILURE, CLADDING + *HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ELEMENTS

11-109344 ALSO IN CATEGORY 18 DATED 1975
HALL J
FFTF PUMP SEAL TEST FINAL REPORT
LIQUID METAL ENGINEERING CENTER, CANOGA PARK, CALIF.
LMEC-75-11 +. 200 PPS, 19 TABS, 32 FIGS, SEPT. 15, 1975

THE TEST PROGRAM CONFIRMED THAT THE BASIC SEAL DESIGN WAS SATISFACTORY. TESTING OF AN ALTERNATE DESIGN WAS INCLUDED, ALTHOUGH TESTING OF THE PROTOTYPE DESIGN OCCUPIED MOST OF THE PROGRAM. RESULTS OBTAINED IN THIS TEST PROGRAM REVEALED THE NEED FOR CERTAIN MODIFICATIONS TO THE PROTOTYPE PUMP. A SIGNIFICANT RESULT OF CHECKOUT TESTING REVEALED THE NEED FOR HYDROSTATIC LIFT-OFF CAPABILITY IN THE KINGSBURY THRUST BEARING. THIS REPORT CONTAINS A DESCRIPTION AND DISCUSSION OF TEST FACILITIES, TEST HARDWARE, AND THE TEST PROGRAM, WITH APPENDIXES DESCRIBING LABYRINTH SEAL OPERATION (APPENDIX A), SIGNIFICANT PROBLEMS (APPENDIX B), SUMMARIES OF TEST DATA (APPENDIX C), AND PRE- AND POST-TEST INSPECTION RESULTS AND MEASUREMENTS (APPENDIX D).

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

OPERATION + TESTING + FFTF (TR) + DESIGN STUDY + *SEAL + LMEC + *PUMPS

11-109394 DATED 1975
BUSBOOM HJ + APPLEBY WK + CHALLENGER KD
CHARACTERIZATION OF TYPE 321 H TUBING FOR LMFBR FUEL CLADDING
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
GEAP-14050 +. 42 PPS, 15 TABS, 13 FIGS, 12 REFS, JULY 1975

TYPE-321 H STAINLESS STEEL FROM AIR-MELTED AND VACUUM-MELTED INGOTS WAS FABRICATED INTO THIN WALL SMALL DIAMETER TUBING AND CHARACTERIZED FOR USE IN LMFBR DEVELOPMENT PROGRAMS. VARIOUS FABRICATION ROUTES WERE EMPLOYED TO PROVIDE ANNEALED TUBES WITH DIFFERENT SOLUTION HEAT TREATMENTS AND GRAIN SIZES AS WELL AS TUBES CONTAINING 10 AND 20% COLD WORK. CHARACTERIZATION OF THE TUBING DEMONSTRATED THAT TYPE 321 IS MORE COMPLEX THAN TYPE 304 OR 316 AND GREAT CARE MUST BE TAKEN TO SELECT THERMAL-MECHANICAL TREATMENTS TO OPTIMIZE GRAIN SIZE AND STRESS-RUPTURE STRENGTH. AS FAR AS PHYSICAL AND MECHANICAL PROPERTIES ARE CONCERNED, IT APPEARS PROBABLE THAT TYPE 321H CAN BE SUBSTITUTED FOR TYPE 316 FOR CLADDING IF ADEQUATE ATTENTION IS PAID TO HEAT TREATMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FABRICATION + *CLADDING + *STEEL, STAINLESS + STRESS RUPTURE + HEAT TREATMENT + TUBING

11-109398 ALSO IN CATEGORY 18 DATED 1975
PATRIARCA P
FUELS AND MATERIALS DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5029 +. 40 PPS, 13 FIGS, 14 REFS, SEPT. 1975

THIS REPORT COVERS WORK IN THE ORNL METALS AND CERAMICS DIVISION ON ADVANCED ABSORBER MATERIALS AND THE MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS FOR THE LMFBR. WORK ON EUZO3 IS DESCRIBED; AND STUDIES OF STAINLESS STEEL PIPING AND PRESSURE VESSEL WELDING MATERIALS ARE REPORTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*WELDS + STEEL, STAINLESS + R AND D PROGRAM

11-109404 ALSO IN CATEGORY 18 DATED 1975
PATRIARCA P
QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975. STEAM GENERATOR MATERIALS TECHNOLOGY PROGRAM
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5027 +. 292 PPS, TABS, FIGS, OCT. 1975

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109404 *CONTINUED*
THIS IS THE SECOND REPORT CONTAINING COLLECTED RESULTS OF ALL R AND D PROGRAMS ON MATERIALS FOR STEAM GENERATORS. TOPICS INCLUDE SG MATERIALS DEVELOPMENT FOR THE CLINCH RIVER BREEDER; ADVANCED FERRITIC ALLOYS DEVELOPMENT; ALLOY 800 DEVELOPMENT FOR ADVANCED SG'S; LARGE INGOT/FORGING TECHNOLOGY DEVELOPMENT; AND ALTERNATE STRUCTURAL MATERIALS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALLOY + MATERIAL + STEEL, FERRITIC + R AND D PROGRAM + STEAM GENERATOR + METALLURGY + STRUCTURE

11-109411 ALSO IN CATEGORY 18 DATED 1974
EVANS EA
HEDL QUARTERLY TECHNICAL REPORT FOR JULY, AUGUST, SEPTEMBER 1974. VOL. 2 - FUELS AND SAFETY ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 74-3(VOL. 2) +. 60 PPS, 12 TABS, 30 FIGS, OCT. 1974

PRESENTS A TABLE INDICATING THE STATUS OF FUELS TESTING AND BRIEFLY DISCUSSES FFTF COMPONENT FABRICATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FABRICATION + TESTING + CORE COMPONENTS + *R AND D PROGRAM + *FUEL ELEMENTS

11-109474 ALSO IN CATEGORY 18 DATED 1975
CLEMENT CF
THEORY OF MASS TRANSPORT IN LIQUID CIRCUITS
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, UK
AERE-TP-606 +. 38 PPS, 3 FIGS, 10 REFS, 1975

THE ISOTHERMAL SOLUBILITY EXPERIMENTS WHICH COULD BE USED TO OBTAIN THE SURFACE REACTION RATE AND DIFFUSIVITY PARAMETERS ARE DESCRIBED. MOLECULAR MASS TRANSPORT IN LOOPS IS THEN TREATED WITH A COLLECTION OF MASS TRANSFER COEFFICIENTS TO BE USED WHEN DIFFUSIVITIES ARE SMALL. TYPES OF CIRCUIT BEHAVIOUR DESCRIBED INCLUDE THE APPROACH TO SATURATION IN ISOTHERMAL LEGS, THE CHARACTERISTICS OF RISING TEMPERATURE REGIONS AND THE DEPENDENCE ON GEOMETRICAL PROPERTIES IN SIMPLE CIRCUITS. A SURFACE TEMPERATURE EFFECT IS SHOWN TO PRODUCE A POSSIBLE CORROSION PEAK AT THE ENTRANCE TO AN ISOTHERMAL HOT LEG. A COUPLED MODEL FOR THE TRANSPORT OF SMALL PARTICLES AND MOLECULAR SPECIES IS FORMULATED IN WHICH PARTICLE GROWTH AND DISSOLUTION IS ALLOWED, AND THE EXPECTED SIZE OF PERSISTENT PARTICLES IN CIRCUITS IS DISCUSSED. SOME PROBLEMS ASSOCIATED WITH EXTENSION OF THE THEORY TO MULTICOMPONENT SYSTEMS ARE BRIEFLY DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + *CORROSION + TRANSPORT THEORY + METAL, LIQUID + *MASS TRANSFER + TRANSPORT + SOLUBILITY + MASS

11-109481 DATED 1975
FOSTER BE + COOK KV + DODD CV + SIMPSON WA + MCCLUNG RW
FEASIBILITY STUDIES FOR NONDESTRUCTIVE TESTING OF DUPLEX TUBE-TO-TUBESHEET JOINTS AND TUBES FOR AN LMFBR STEAM GENERATOR
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5094 +. 33 PPS, 19 FIGS, DEC. 1975

STUDIES WERE CONDUCTED FOR DEVELOPMENT OF NONDESTRUCTIVE TESTING TECHNIQUES IN SUPPORT OF A DESIGN CONCEPT. A RADIOGRAPHIC TECHNIQUE USING 192 IR AS THE RADIATION SOURCE WAS DEVELOPED FOR THE BORE-SIDE INSPECTION OF DUPLEX TUBE-TO-TUBESHEET WELD JOINTS. BORE-SIDE ULTRASONIC INSPECTIONS OF THE INNER MEMBER OF THE DUPLEX TUBE MAY BE PERFORMED AT SENSITIVITIES COMPARABLE WITH THOSE REQUIRED FOR NUCLEAR GRADE TUBING. LONGITUDINALLY ORIENTED SIMULATED FLAWS SMALLER THAN 7% OF THE WALL OF THE INNER MEMBER CAN BE DETECTED WITH MODIFIED COMMERCIAL TRANSDUCERS. AN EDDY-CURRENT TECHNIQUE WITH MAGNETIC SATURATION, DEVELOPED WITH THE AID OF MATHEMATICAL MODELS, WAS INVESTIGATED FOR BORE-SIDE INSPECTION. PIT-TYPE DEFECTS AS SMALL AS 25% OF THE DUPLEX WALL WERE DETECTABLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FLAW + *TEST, NONDESTRUCTIVE + RADIOGRAPHY + *STEAM GENERATOR + *TUBING + ULTRASONICS

11-109485 ALSO IN CATEGORY 18 DATED 1974
U.S./U.S.S.R. SEMINAR ON THE DEVELOPMENT OF SODIUM-COOLED FAST BREEDER REACTOR STEAM GENERATORS
U.S. ERDA, WASHINGTON
ERDA-32(ADD.) +. 246 PPS, MEETING HELD IN LOS ANGELES, CALIF., DEC. 2-4, 1974

PRESENTS THE TEXT OF 10 PAPERS CONCERNING BASIC PRINCIPLES IN THE DEVELOPMENT OF SODIUM-COOLED STEAM GENERATORS, PREOP TESTS AND STARTUP OF THE BN-350 STEAM GENERATORS, HEAT TRANSFER IN ONCE THROUGH STEAM GENERATORS, DNB, FAILURE OF STEELS CAUSED BY A SODIUM-STEAM REACTION JET, AND LEAK DETECTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109485 *CONTINUED*
FABRICATION + FAILURE + HEAT TRANSFER + JET + TESTING + REACTOR COOLANT + *STEAM GENERATOR + LEAK + *TEST, LEAK

11-109488 DATED 1975
VALIDATION OF HIGH TEMPERATURE DESIGN METHODS AND CRITERIA. QUARTERLY PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1975
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA.
WARD-HT-3045-12 +. 115 PPS, 37 FIGS, OCT. 1975

OBJECTIVES ARE TO DESIGN, TEST, AND ANALYZE SPECIMENS AND COMPONENTS TO: 1) DETERMINE INELASTIC (ELASTIC PLUS PLASTIC PLUS CREEP) BEHAVIOR AND STRAIN TOLERANCES OF 304 AND 316 STAINLESS STEEL BASE MATERIALS UNDER COMPLEX STRESS DISTRIBUTION, AND 2) VALIDATE METHODS OF INELASTIC ANALYSIS AND DESIGN CRITERIA FOR COMPLEX STRUCTURES USING TECHNIQUES DEVELOPED BY ORNL AND OTHERS TO PROVIDE THE LMFBR DESIGNER WITH STANDARDS AND GUIDELINES FOR STRUCTURE DESIGN ANALYSIS. WORK DURING THE REPORT PERIOD INCLUDED CORE DESIGN METHODS, TESTING OF SPECIMENS AND STRUCTURES, ANALYSIS METHODS, ELEVATED TEMPERATURE DESIGN, AND CRACK PROPAGATION TESTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*DESIGN CRITERIA + STEEL, STAINLESS + *STRESS ANALYSIS + *HIGH TEMPERATURE + CREEP + GROWTH/DEVELOPMENT + CRACK

11-109491 DATED 1975
SODIUM TECHNOLOGY PROGRAM COMPONENT MATERIALS COMPATABILITY QUARTERLY PROGRESS REPORT FOR PERIOD ENDING APRIL 30, 1975
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA.
WARD-NA-3045-26 +. 65 PPS, 29 FIGS, NOV. 1975

DESCRIBES WORK ON INTERSTITIAL TRANSFER AND PROGRESS IN STUDIES ON SODIUM EFFECTS ON MECHANICAL PROPERTIES. EXPERIMENTS SHOW THAT ANNEALED 2-1/4CR-1MO ALLOY HAS A STABLE STRUCTURE AND WILL NOT LOSE CARBON IN SODIUM AT 950 F. ALSO, THE SAME MATERIAL NORMALIZED, OR NORMALIZED AND TEMPERED, WHEN EXPERIENCING AN INITIAL RAPID COOLING ARE UNSTABLE AT STEAM GENERATOR TEMPERATURES. INCONEL 718 SPECIMENS WERE TESTED IN THE MTS FATIGUE MACHINE AT 1000 F AND 316 STAINLESS STEEL WAS TESTED FOR LOW CYCLE FATIGUE DATA AT 1100 F.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

MOLYBDENUM + *STEEL + CHROMIUM + STEEL, STAINLESS + INCONEL + CREEP + *PROPERTY, MECHANICAL + *FATIGUE

11-109495 DATED 1975
ADKINS CR + MANGUS JC + GROSS MC
ALTERNATE STEAM GENERATOR DEVELOPMENT PROGRAM PHASE I SUMMARY REPORT, SEPTEMBER 1974 THROUGH DECEMBER 1974. VOLUME 1: DEVELOPMENT OF ALTERNATE STEAM GENERATORS FOR LMFBR PLANTS
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA
WARD-SG-3045-1(VOL.1) +. 205 PPS, 26 TABS, 46 FIGS, OCT. 1975

IF A SODIUM-WATER STEAM GENERATOR OF HIGH RELIABILITY IS DEVELOPED, IT WILL ALLOW THE ELIMINATION OF THE INTERMEDIATE SODIUM LOOPS, AND THEIR AUXILIARIES, WHICH WILL REDUCE THE COST OF THE PLANT, AND WILL ALSO REDUCE CONSTRUCTION TIME, SIMPLIFY OPERATIONS AND MAINTENANCE, AND IMPROVE AVAILABILITY. BASED ON PREVIOUS WORK PERFORMED BY WESTINGHOUSE AND THE WORK PERFORMED DURING THIS STUDY, IT IS BELIEVED THAT A HIGH RELIABILITY SODIUM-WATER STEAM GENERATOR CAN BE DEVELOPED. FURTHERMORE, EVEN IF A TUBE LEAK OCCURS IN SUCH A STEAM GENERATOR, THE CONSEQUENCES WOULD BE MINIMAL AND THE UNIT WOULD BE EASILY REPAIRED AND RETURNED TO SERVICE WITHIN A SHORT TIME.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + MAINTENANCE AND REPAIR + RELIABILITY, COMPONENT + *STEAM GENERATOR + LEAK

11-109496 DATED 1975
COOPER MH + LEE PK
ALTERNATE STEAM GENERATOR DEVELOPMENT PROGRAM PHASE I SUMMARY REPORT, SEPTEMBER 1974 THROUGH DECEMBER 1974. VOLUME 2: EVALUATION OF ALTERNATE SECONDARY SYSTEM FLUIDS FOR LMFBR PLANTS
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA.
WARD-SG-3045-1(VOL.2) +. 80 PPS, 15 TABS, 1 FIG, OCT. 1975

FEASIBILITY OF MITIGATING POTENTIAL SODIUM-WATER REACTIONS IN THE STEAM GENERATOR OF THE LMFBR BY SUBSTITUTING A LESS REACTIVE FLUID IN THE SECONDARY LOOP WAS INVESTIGATED. PHYSICAL PROPERTIES OF CANDIDATE FLUIDS, INCLUDING LIQUID ELEMENTS, MOLTEN SALTS, SIMPLE GASES, DISSOCIATING GASES, ORGANICS, AND FLUID-SOLID SUSPENSIONS WERE TABULATED. PERFORMANCE OF THESE FLUIDS WAS EVALUATED ON THE BASIS OF REQUIRED HEAT TRANSFER AREA AND PUMPING POWER FOR A TYPICAL STEAM GENERATOR DESIGN, CHEMICAL REACTIVITY WITH SODIUM AND WATER, MATERIALS COMPATIBILITY, THERMAL STABILITY, AND IRRADIATION STABILITY. NO SUITABLE FLUID SUPERIOR TO SODIUM WAS IDENTIFIED FOR USE AT THE REFERENCE PLANT CONDITIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109496 *CONTINUED*
*BISMUTH + LEAD + *REACTOR COOLANT + *STEAM GENERATOR

11-109512 DATED 1975
FEE DC + JOHNSON I + JOHNSON CE
CHEMICAL INTERACTION BETWEEN FUEL AND CLADDING IN STAINLESS STEEL-CLAD FAST REACTOR FUELS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-53 +. 41 PPS, 11 FIGS, 108 REFS, OCT, 1975

CHEMICAL INTERACTION BETWEEN MIXED OXIDE FUEL AND THE CLADDING OF FAST REACTOR FUEL PINS IS REVIEWED. IRRADIATION OF A FUEL PIN IS DISCUSSED IN TERMS OF FOUR PROCESSES. PROCESSES THAT OCCUR EARLY IN THE LIFE ARE DEVELOPMENT OF A TEMPERATURE GRADIENT AND THE RESTRUCTURING OF THE FUEL. PROCESSES THAT OCCUR LATER IN THE LIFE ARE THE BUILDUP OF FISSION PRODUCTS, WHICH AFFECTS THE OXYGEN POTENTIAL, AND MIGRATION OF FISSION PRODUCTS. CHEMISTRY OF CORROSIVE ATTACK PROCESSES IS DISCUSSED. CURRENT MODELS OF CLADDING ATTACK ARE EVALUATED. ELIMINATION OF CLADDING ATTACK THROUGH THE USE OF GETTERS TO CONTROL THE OXYGEN POTENTIAL IS DISCUSSED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*CHEMICAL REACTION + *CLADDING + FUEL BURNUP + OXYGEN + FISSION PRODUCT TRANSPORT + STEEL, STAINLESS + CORROSION + MATERIAL + FUEL, LIQUID METAL + RADIATION EFFECT + FUEL CLAD INTERACTION + *MIXED OXIDE

11-109556 ALSO IN CATEGORIES 9 AND 18 DATED 1975
MCCLUNG RW
NEEDS FOR DEVELOPMENT IN NONDESTRUCTIVE TESTING FOR LMFBR AND OTHER ADVANCED REACTOR SYSTEMS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5093 +. 75 PPS, NOV. 1975

THE NEEDS FOR DEVELOPMENT OF NONDESTRUCTIVE TESTING TECHNIQUES AND EQUIPMENT WERE SURVEYED AND ANALYZED TO RESOLVE PROBLEM AREAS FOR THE LIQUID-METAL FAST BREEDER REACTOR, THE MOLTEN-SALT BREEDER REACTOR AND THE ADVANCED GAS-COOLED REACTOR. THE REPORT DISCUSSES FIRST THE DEVELOPMENTAL NEEDS THAT ARE ERDAC-BASED REQUIREMENTS IN NONDESTRUCTIVE TESTING AND THE RESPECTIVE METHODS AND APPLICABLE, IN GENERAL, TO ALL COMPONENTS AND REACTOR SYSTEMS. NEXT IN ORDER ARE THE REQUIREMENTS OF GENERIC MATERIALS AND COMPONENTS (E.G., STEAM GENERATORS) THAT ARE COMMON TO ALL REACTOR SYSTEMS. THESE ARE FOLLOWED BY SECTIONS SPECIFIC TO MATERIALS AND COMPONENTS PECULIAR TO EACH OF THE THREE CITED REACTOR SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR, GCR + *TEST, NONDESTRUCTIVE + REVIEW + MSBR (RE) + INSERVICE INSPECTION

11-109571 ALSO IN CATEGORIES 5 AND 18 DATED 1975
KLIMA BB
LMFBR SPENT FUEL TRANSPORT: SINGLE ASSEMBLY HEAT TRANSPORT TEST
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4936 +. 100 PPS, 8 TABS, 20 FIGS, OCT. 1975

THE SINGLE ASSEMBLY HEAT TRANSPORT TEST FACILITY OPERATING EXPERIENCE AND TEST DATA ARE PRESENTED. THIS FACILITY WAS SET UP TO TEST THE HEAT TRANSPORT OF A SIMULATED LMFBR SINGLE FUEL ASSEMBLY CONSISTING OF 217 STAINLESS STEEL TUBES EACH OF WHICH WAS INDIVIDUALLY WRAPPED WITH 0.091-IN.-DIAM WIRE. THIS ASSEMBLY FAILED AND WAS REPLACED BY AN ASSEMBLY WIHT 0.060-IN.-WIRE WRAPPING. HEAT TRANSPORT WAS TESTED USING SODIUM, HELIUM AND ARGON GASES, DOWTHERM A, AND A VACUUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + FUEL BURNUP + *HEAT TRANSFER + TESTING + TRANSPORT PROPERTY + *FUEL ELEMENTS

11-109576 ALSO IN CATEGORIES 5 AND 18 DATED 1975
SHIN YS + WAMBSGANSS MW
FLOW-INDUCED VIBRATION IN LMFBR STEAM GENERATORS: A STATE-OF-THE-ART REVIEW
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-16 +. 76 PPS, 38 FIGS, 119 REFS, MAY 1975

IDENTIFIES AND DISCUSSES EXISTING METHODS OF FLOW-INDUCED VIERATION ANALYSIS APPLICABLE TO STEAM GENERATORS, THEIR LIMITATIONS, AND BASE-TECHNOLOGY NEEDS. ALSO INCLUDED ARE DISCUSSIONS OF FIVE DIFFERENT LMFBR STEAM-GENERATOR CONFIGURATIONS AND IMPORTANT DESIGN CONSIDERATIONS, FAILURE EXPERIENCES, POSSIBLE FLOW-INDUCED EXCITATION MECHANISMS, VIBRATION TESTING, AND AVAILABLE METHODS OF VIBRATION ANALYSIS. THE OBJECTIVES ARE TO AID LMFBR STEAM-GENERATOR DESIGNERS IN MAKING THE BEST POSSIBLE EVALUATION OF POTENTIAL VIBRATION IN STEAM-GENERATOR INTERNALS AND TO PROVIDE THE BASIS FOR DEVELOPMENT OF DESIGN GUIDELINES TO AVOID DETRIMENTAL FLOW-INDUCED VIBRATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDRAULIC EFFECT + DESIGN STUDY + *VIBRATION + *STEAM GENERATOR + FLOW + EFFECT

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109592 ALSO IN CATEGORIES 6 AND 9 AND 18 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1975
ARGONNE NATIONAL LABORATORY
ANL-RDP-44 +. 168 PPS. FIGS. OCT. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING EBR-2 OPERATIONS, LMFBR DESIGN SUPPORT, DEVELOPMENT OF LMFBR INSTRUMENTATION, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, ACCIDENT ANALYSIS, ENERGY AND ENVIRONMENTAL SYSTEMS, GCFR FUELS AND MATERIALS DEVELOPMENT, AND THE SAFETY RESEARCH EXPERIMENT FACILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + TESTING + DESIGN STUDY + SAFETY PROGRAM + REACTOR PHYSICS + R AND D PROGRAM + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

11-109834 ALSO IN CATEGORY 5 DATED 1975
PECHERSKY MJ + MARKELY RA + CHUANG MC + KOTHMANN RE
CLADDING CIRCUMFERENTIAL HOT SPOT FACTORS FOR FUEL AND BLANKET RODS
WESTINGHOUSE ELECTRIC CORP., MADISON AND PITTSBURGH, PA.
8 PPS, 14 FIGS, 5 REFS, NUCLEAR ENGINEERING & DESIGN, 35(1), PP. 21-28 (DEC. 1975)

TO EVALUATE THE PERFORMANCE OF A WIRE-WRAPPED LMFBR FUEL OR BLANKET ASSEMBLY, THE EFFECT OF THE WIRE WRAP ON THE LOCAL CLADDING TEMPERATURE PROFILE MUST BE ASCERTAINED. THERE IS AN INCREASE IN THE LOCAL CLADDING TEMPERATURE IN THE VICINITY OF THE CONTACT POINT BETWEEN THE ROD AND THE WIRE. RESULTS OF A STUDY TO DETERMINE CLADDING CIRCUMFERENTIAL TEMPERATURE PROFILES IN FUEL AND BLANKET RODS ARE PRESENTED. CALCULATIONS WERE ALSO PERFORMED FOR 'BARE' RODS TO DETERMINE THE NET EFFECT OF THE WIRE WRAP. CALCULATIONS WERE PERFORMED WITH THE FATHOM-II COMPUTER PROGRAM, WHICH SOLVES THE MOMENTUM AND ENERGY EQUATIONS IN THE COOLANT SURROUNDING THE FUEL ROD AND THE CONDUCTION EQUATIONS IN THE CLADDING AND WIRE WRAP. THIS PAPER STUDIES THE MOST SEVERE CONDITION OF THE HOT SPOT TEMPERATURE.

COMPUTER PROGRAM + *CLADDING + *HOT SPOT + FUEL ROD + TEMPERATURE + BLANKET

11-109901 ALSO IN CATEGORY 5 DATED 1974
ALEXAS A + LINDNER W + SCHIKARSKI W
OUT-OF-PILE SIMULATION OF FUEL PIN BEHAVIOR IN SODIUM-COOLED FAST BREEDER REACTORS BY UO2 RODS HEATED BY ELECTRICAL CURRENT
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 14 PPS, PP. 535-49, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

FUEL PIN BEHAVIOR IN ALL TYPES OF NUCLEAR REACTORS UNDER BOTH STEADY STATE AND TRANSIENT OVERPOWER CONDITIONS IS STILL ONE OF THE MAJOR PROBLEMS IN REACTOR SAFETY. PIN BEHAVIOR IN FAST BREEDER REACTORS (OF BOTH SODIUM AND GAS COOLED TYPE) IS OF PARTICULAR INTEREST SINCE IN THE PRESENT STATE OF THE SAFETY ANALYSIS POWER EXCURSION INCIDENTS IN FAST REACTOR CORES ARE CONSIDERED CREDIBLE AT LEAST IN UNPROTECTED HYPOTHETICAL ACCIDENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *TESTING + SIMULATION + *BEHAVIOR + *FUEL ELEMENTS

11-109902 ALSO IN CATEGORY 5 DATED 1974
KWAST H
THE BEHAVIOR OF FAST REACTOR FUEL PINS UNDER LOSS OF COOLANT FLOW CONDITIONS
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
CONF-740401-P2 +. 14 PPS, PP. 550-64, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE EXPERIMENTAL PROGRAM ON FAST REACTOR SAFETY, IN PROGRESS AT RCN, INCLUDES IRRADIATIONS OF SINGLE FUEL PINS UNDER LOSS OF COOLANT FLOW CONDITIONS. TWO TYPES OF EXPERIMENTS ARE PERFORMED: CLAD FAILURE EXPERIMENTS, DESIGNATED AS SHOT AND LOSS OF COOLING EXPERIMENTS, DESIGNATED AS LOC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *ACCIDENT, LOSS OF COOLANT + FAILURE, CLADDING + *BEHAVIOR + *FUEL ELEMENTS

11-109903 ALSO IN CATEGORY 5 DATED 1974
HUNTER CW + FISH RL
DEFORMATION AND FAILURE OF FAST REACTOR CLADDING DURING SIMULATED LOSS-OF-FLOW TYPE TRANSIENTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 15 PPS, PP. 565-79, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DEFORMATION AND FAILURE BEHAVIOR OF 20% COLD WORKED TYPE 316 STAINLESS STEEL FUEL CLADDING WAS EXPERIMENTALLY DETERMINED UNDER THERMAL TRANSIENTS AND INTERNAL GAS PRESSURES, WHICH SIMULATED HYPOTHETICAL LOSS-OF-FLOW ACCIDENT CONDITIONS. BOTH UNIRRADIATED AND EBR-II IRRADIATED TUBULAR

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109903 *CONTINUED*
CLADDING SPECIMENS (7.4-9.0 X 10 (EXP 21) N/CM SQUARED, EN > 0.1 MEV) WERE SUBJECTED TO HEATING RATES OF 10 AND 200 DEG F/SEC, WITH HOOP STRESS LOADINGS OF 1300 TO 6480 PSI. THESE TEST CONDITIONS PRODUCED CLADDING FAILURE AT TEMPERATURES FROM 2000 TO 2400 DEG F.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + FAILURE + FAILURE, FUEL ELEMENT + *DEFORMATION + *FAILURE, CLADDING + BEHAVIOR + FUEL ELEMENTS

11-109904 ALSO IN CATEGORY 5 DATED 1974
MARR WW + WANG PY + MISKA B
SUBASSEMBLY-TO-SUBASSEMBLY FAILURE PROPAGATION: THERMAL LOADING OF ADJACENT SUBASSEMBLY
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2. 16 PPS, PP. 598-614, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

PRESENTS THE RESULTS OF SOME ANALYTICAL STUDIES ON SUBASSEMBLY FAILURE PROPAGATION. THIS IS BEING DONE TO PROVIDE A VISIBLE DEMONSTRATION OF LMFBR SAFETY FOR SEVERAL POSTULATED INITIATING ACCIDENTS EVEN THOUGH THEY ARE CONSIDERED TO BE VERY UNLIKELY. IT IS WORTH NOTING THAT THERE HAS BEEN NO EVIDENCE OF SUBASSEMBLY FAILURE PROPAGATION IN CURRENT OPERATING NUCLEAR REACTORS, EVEN THOUGH FUEL FAILURES AND, IN SOME CASES, EXTENSIVE FUEL MELTING HAVE OCCURRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *FUEL ELEMENT CLUSTER + *FAILURE MODE ANALYSIS + BEHAVIOR + FUEL ELEMENTS

11-109905 ALSO IN CATEGORY 5 DATED 1974
VAN ERP JB + CHAWLA TC + FAUSKE HK
AN EVALUATION OF PIN-TO-PIN FAILURE PROPAGATION IN LMFBR FUEL SUBASSEMBLIES
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 40 PPS, PP. 615-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A SURVEY IS PRESENTED CONCERNING EXPERIMENTAL AND ANALYTICAL WORK PERFORMED WITH THE AIM OF EVALUATING THE POTENTIAL FOR PIN-TO-PIN FAILURE PROPAGATION WITHIN FUEL SUBASSEMBLIES OF LIQUID METAL COOLED FAST BREEDER REACTORS (LMFBRS) OF CURRENT DESIGN (MIXED U-PU OXIDE PELLETS, STAINLESS STEEL CLADDING). IT IS CONCLUDED THAT (1) THE OCCURRENCE OF PIN-TO-PIN FUEL FAILURE PROPAGATION FOR CURRENT LMFBR FUEL DESIGNS IS IMPROBABLE FOR ANY OF THE POSTULATED PROPAGATION MECHANISMS, AND (2) IF FAILURE PROPAGATION WERE TO OCCUR AT ALL, THEN EITHER IT WILL BE SELF-LIMITING OR ITS PROGRESSION WILL BE SLOW, ALLOWING AMPLE TIME FOR DETECTION (E.G., BY MEANS OF MONITORING SYSTEMS FOR FISSION PRODUCTS IN COVER GAS AND REACTOR COOLANT), AND FOR CORRECTIVE ACTION, IF NECESSARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + *FAILURE, FUEL ELEMENT + *FUEL ELEMENT CLUSTER + FAILURE MODE ANALYSIS + BEHAVIOR + FUEL ELEMENTS

11-109906 ALSO IN CATEGORIES 5 AND 7 DATED 1974
WEBER ET + SLAGLE OD + HINMAN CA
LABORATORY STUDIES ON MELTING AND GAS RELEASE BEHAVIOR OF IRRADIATED FUEL
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 22 PPS, PP. 641-63, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RESPONSE OF IRRADIATED FUELS TO RAPID HEATING IS A MAJOR FACTOR WHICH MUST BE CONSIDERED IN SAFETY ANALYSES FOR FAST REACTORS. A SERIES OF EXPERIMENTS AT HEDL PROVIDE OBSERVATIONS AND DATA ON THE RESPONSE OF FAST FLUX (EBR-II) IRRADIATED FUEL MATERIALS WHEN SUBJECTED TO RAPID HEATING IN THE LABORATORY. FUEL SAMPLES WITHIN A RESISTIVELY HEATED TUNGSTEN TUBE ARE SUBJECTED TO THERMAL TRANSIENTS IN A SYSTEM PROVIDING FOR TEMPERATURE AND PRESSURE MEASUREMENTS, IN ADDITION TO CONTINUOUS GAMMA RADIOGRAPHY OF THE SAMPLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

FAILURE + FAILURE, FUEL ELEMENT + THERMAL CONSIDERATION + *IRRADIATION TESTING + BEHAVIOR + *FUEL ELEMENTS

11-109907 ALSO IN CATEGORY 5 DATED 1974
VONKA V + BOSWINKEL HH + HEIL JA
A FUEL PIN BOWING UNDER LMFBR CONDITIONS
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
CONF-740401-P2 +. 15 PPS, PP. 664-78, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE RESULTS AND CONCLUSIONS OF A THEORETICAL AND EXPERIMENTAL INVESTIGATION ON ROD BOWING, UNDER LIQUID METAL FAST BREEDER REACTOR CONDITIONS. IN 4, 7 AND 12 ROD ELECTRICALLY HEATED MOCK UPS OF FUEL ELEMENTS IS REPORTED. SEVERE ROD BOWING WAS OBSERVED, UPON VISUAL AND RADIO-NEUTROGRAPHIC INSPECTION AFTER OPERATION OF ABOVE-MENTIONED CLUSTERS, CAUSED BY RADIAL TEMPERATURE GRADIENTS. THIS KIND OF BOWING WAS OF A PROGRESSIVE NATURE, AS THE BOWING CAUSES A CHANGING SUBCHANNEL GEOMETRY AND THEREBY A CHANGE OF THE INITIATING TEMPERATURE GRADIENTS.

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109907 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + FAILURE, FUEL ELEMENT + *COMPARISON, THEORY AND EXPERIENCE + *DEFORMATION + BEHAVIOR + FUEL ELEMENTS

11-109908 ALSO IN CATEGORY 18 DATED 1974
STEPNEWSKI DO + FOX GL + SIMPSON DE + PEAK RD
FFTF SCALE MODEL STRUCTURAL DYNAMICS TESTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 21 PPS, PP. 679-700, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

ANALYZES THE STRUCTURAL DYNAMIC RESPONSE OF A REACTOR SYSTEM PRIMARY COOLANT BOUNDARY TO A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT (HCDA) BASED ON SCALE MODEL EXPERIMENTS. THE BUCKINGHAM PI THEOREM IS USED TO IDENTIFY MATERIAL AND PROCESS PARAMETER RELATIONSHIPS BETWEEN MODEL AND PROTOTYPE REQUIRED FOR EXACT SIMILITUDE. DEPARTURES FROM SIMILITUDE REQUIREMENTS IN THE SCALE MODEL TESTS ARE IDENTIFIED, AND THE EFFECTS OF THESE DEPARTURES ON FULL-SCALE VESSEL RESPONSE ARE ASSESSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FFTF (TR) + MAIN COOLING SYSTEM + *STRUCTURAL ANALYSIS, DYNAMIC

11-109909 ALSO IN CATEGORY 8 DATED 1974
KRIEG R
NONSYMMETRIC TRANSIENT PRESSURE LOAD ON REACTOR VESSEL CAUSED BY POINT SOURCES SIMULATING FUEL-SODIUM INTERACTION
GESELLSCHAFT FUR KERNFORSCHUNG MBH, KARLSRUHE, F.R. GERMANY
CONF-740401-P2 +. 15 PPS, PP. 701-15, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE PROBLEM DEALT WITH HERE IS OF IMPORTANCE FOR STUDIES OF FAST REACTOR SAFETY, WHERE THE FUEL-SODIUM INTERACTION MAY GREATLY INFLUENCE THE EVALUATION OF STRUCTURAL INTEGRITY OF BOTH THE CORE AND CONTAINMENT. ASSUMING SMALL VARIATIONS IN FLUID VELOCITIES, THE FIELD EQUATIONS DESCRIBING THE TRANSIENT FLOW PROBLEM CAN BE LINEARIZED AND THE VISCOSITY TERM IS NEGLIGIBLE. UNDER THESE SIMPLIFICATIONS, USING THE METHOD OF SINGULARITIES, AN EXACT SOLUTION IS GIVEN SATISFYING BOUNDARY CONDITIONS WHICH, IN MANY CASES, APPROXIMATE THE REAL BOUNDARY CONDITIONS VERY WELL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CORE COMPONENTS + SUPPORT STRUCTURE + *STRUCTURAL ANALYSIS, DYNAMIC + *FUEL COOLANT INTERACTION + *PRESSURE VESSELS

11-109910 ALSO IN CATEGORY 18 DATED 1974
HOLTBECKER H + STIEVENART M + EGLEME M
STUDY OF NUCLEAR ACCIDENTS BY CHEMICAL SIMULATION EXPERIMENTS
EURATOM, ISPRA, ITALY + BELGONUCLEAIRE, BRUSSELS, BELGIUM
CONF-740401-P2 +. 15 PPS, PP. 716-31, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DESCRIBES THE EXPERIMENTAL AND THEORETICAL PROGRAMME CARRIED OUT BY BELGONUCLEAIRE IN CLOSE COOPERATION WITH THE ISPRA RESEARCH CENTRE AND INTERATOM AND AIMING AT THE SIMULATION OF THE SNR HYPOTHETICAL CORE DISRUPTIVE ACCIDENT IN A VESSEL MODE. THIS PROGRAMME INCLUDES SIX PHASES: (1) THE DEFINITION OF THE ACCIDENT TO BE SIMULATED AND THE CHOICE OF THE SCALING FACTOR AND OF THE EXPLOSIVE POWDER; (2) A SERIES OF EXPLOSION TESTS IN AN OLD FLOODED QUARRY TO DETERMINE THE POWDER CHARACTERISTICS; (3) A SERIES OF EXPLOSION TESTS IN THREE TYPES OF 1/12 SCALED DOWN AND SIMPLIFIED VESSELS; (4) A SERIES OF EXPLOSION TESTS IN A 1/6 SCALED DOWN VESSEL; (5) A SERIES OF DYNAMIC TESTS ON MATERIALS, AND (6) A FINAL EXPLOSION TEST IN A 1/6 SNR VESSEL MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + EXPLOSION + TESTING + ACCIDENT, HYPOTHETICAL + SIMULATION + *STRUCTURAL ANALYSIS, DYNAMIC + ACCIDENT, CORE DISRUPTIVE

11-109911 ALSO IN CATEGORY 8 DATED 1974
GAST K + LIEBE R + WILL H + REES NJM
SIMULATED VAPOR EXPLOSION EXPERIMENTS AND DYNAMIC ELASTO PLASTIC RESPONSE OF SNR CORE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ATOMIC WEAPONS RESEARCH ESTABLISHMENT, FOULNESS, ENGLAND
CONF-740401-P2 +. 15 PPS, PP. 732-47, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

FAST REACTOR SAFETY REQUIRES CONSIDERATION OF THE CORE DEFORMATION PROBLEM EVENTUALLY ARISING FROM LOCAL COOLING DISTURBANCES OR FUEL FAILURES. A PROGRAM IS DESCRIBED WHICH COMBINES THEORETICAL AS WELL AS EXPERIMENTAL STUDIES OF THE TRANSIENT, NONLINEAR STRUCTURAL BEHAVIOR, SIMULATED VAPOR EXPLOSION TESTS ON FULL SIZE SNR CORE MODELS AND LARGE SCALE FCI EXPERIMENTS WITH UO2 INTERACTING WITH SODIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109911 *CONTINUED*
EXPLOSION + TESTING + *DEFORMATION + VAPOR PRESSURE + SIMULATION + *STRUCTURAL ANALYSIS, DYNAMIC + VAPOR EXCHANGE

11-109912 ALSO IN CATEGORIES 5 AND 8 AND 18 DATED 1974
KRIEG R + CRAWFORD RM
DEFORMATION IN A 19-PIN BUNDLE DUE TO A SUDDEN FLUID EXPANSION
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 15 PPS, PP. 746-62, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE TRANSIENT FLOW AND PRESSURE FIELDS AS WELL AS THE PIN DEFORMATIONS ARE DETERMINED FOR A FLEXIBLE TWO-ROW PIN BUNDLE SURROUNDED BY AN INFINITE FLUID WITH A TRANSIENT FLUID SOURCE IN THE BUNDLE CENTER. BY NEGLECTING THE FLUID COMPRESSIBILITY AND VISCOSITY, THE SOLUTION FOR THE FLOW PROBLEM IS OBTAINED BY SUPERPOSITION OF SOLUTIONS FOR CERTAIN SINGULARITIES (SOURCES, DIPOLES, QUADRUPOLES). THE FLEXIBILITY OF THE PINS IS ESSENTIALLY APPROXIMATED BY ELASTIC PIN-BUNDLE DEFORMATIONS DUE TO A FUEL-COOLANT INTERACTION CAUSED BY A FAILED PIN IN A LIQUID-METAL-COOLED REACTOR. THE RESULTS MAY HELP TO ESTIMATE THE POTENTIAL FOR FAILURE PROPAGATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FLOW THEORY AND EXPERIMENTS + *DEFORMATION + EXPANSION + *FUEL ELEMENT CLUSTER + STRUCTURAL ANALYSIS, DYNAMIC

11-109913 ALSO IN CATEGORY 18 DATED 1974
FISTEDIS SH + CHANG YW + MARCINIAK TJ
FAST REACTOR CONTAINMENT ANALYSIS, RECENT IMPROVEMENTS, APPLICATIONS, AND FUTURE DEVELOPMENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 21 PPS, PP. 763-84, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

GIVES A BRIEF DESCRIPTION OF (1) THE PROBLEMS INVOLVED IN THE EVALUATION OF THE RESPONSE OF THE LIQUID METAL-COOLED FAST BREEDER REACTOR (LMFBR) TO HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS (HCDA), (2) THE CURRENT CAPABILITY OF THE PROGRAM AT ARGONNE NATIONAL LABORATORY TO PROVIDE ANSWERS TO THESE PROBLEMS, AND (3) THE ULTIMATE OBJECTIVES OF THE PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, HYPOTHETICAL + *STRUCTURAL ANALYSIS, DYNAMIC + *ACCIDENT, CORE DISRUPTIVE

11-109915 ALSO IN CATEGORIES 5 AND 18 DATED 1974
PECKOVER RS
THE THERMAL CONTAINMENT OF REACTOR CORE MATERIAL AFTER SHUTDOWN
UKAEA CULHAM LABORATORY, UK
CONF-740401-P2 +. 20 PPS, PP. 802-22, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A TEMPERATURE EXCURSION ARISING THROUGH SOME HYPOTHETICAL BLOCKAGE OF THE COOLING SYSTEM IN A LIQUID COOLED REACTOR SYSTEM COULD LEAD TO THE MELT-OUT OF THE CORE OR PART OF THE CORE. ONE WAY OF CONTAINING THE CORE DEBRIS MAY BE TO ALLOW IT TO FALL INTO SUITABLY DESIGNED CORE CATCHERS PLACED BELOW THE CORE SUBASSEMBLIES. AN ALTERNATIVE APPROACH WOULD BE TO ALLOW THE CORE MATERIAL TO SETTLE ON THE BOTTOM OF THE REACTOR POT WHICH IS COOLED FROM BELOW BY FORCED CONVECTION. A THIRD POSSIBILITY IS TO ALLOW THE CORE TO FALL INTO A SUBTERRANEAN CAVITY BUILT ESPECIALLY FOR THE PURPOSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + EMERGENCY COOLING + COOLING + *CORE CATCHER

11-109949 ALSO IN CATEGORIES 12 AND 18 DATED 1974
HOPKINS HC + SNYDER HJ
GCFR'S SOLUTION TO RADIATION AND THERMAL DISTORTION
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 15 PPS, PP. 1400-14, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN FEATURES OF THE GAS-COOLED FAST BREEDER REACTOR (GCFR) THAT ALLOW ACCOMMODATION OF RADIATION AND THERMAL DISTORTION WITHOUT RESORTING TO A COMPLEX CORE-RESTRAINT MECHANISM ARE DISCUSSED. A COMPARISON OF RADIATION SWELLING AND GEOMETRIC PARAMETERS FOR THE GCFR AND LMFBR ARE PRESENTED TO ILLUSTRATE WHY A RESTRAINT SYSTEM IS UNNECESSARY. THE ANALYSIS OF GCFR CORE BEHAVIOR IS DESCRIBED BRIEFLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GCR + SHUTDOWN SYSTEM, SECONDARY + *EQUIPMENT DESIGN + *CORE COMPONENTS + BEHAVIOR + *SWELLING

11-109956 ALSO IN CATEGORIES 1 AND 18 DATED 1974
BROWN NW + STITT RK + WILSON RJ

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109956 *CONTINUED*
AN ESTIMATE OF LMFBR STEAM GENERATOR SYSTEM RELIABILITY AND AVAILABILITY
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
CONF-740401-P3 +. 16 PPS. PP. 1508-24. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF., APRIL 2, 1974

A PROBABILISTIC EVALUATION OF A REFERENCE STEAM GENERATOR SYSTEM IS DISCUSSED. THE STUDY WAS CONDUCTED IN SUPPORT OF THE AEC LMFBR STEAM GENERATOR SYSTEMS DEVELOPMENT PROGRAM. THE OBJECTIVE OF THE STUDY WAS TO HELP IN IDENTIFYING THE RELATIVE IMPORTANCE OF CRITICAL DEVELOPMENT AREAS. THE STUDY ESTIMATES THE PROBABILITY OF STRUCTURAL DAMAGE TO THE SECONDARY SODIUM SYSTEM BOUNDARY AND THE AVAILABILITY OF A SINGLE LOOP OF A THREE LOOP REFERENCE PLANT. CRITICAL DEVELOPMENT NEEDS AND THEIR RELATIVE IMPORTANCE TO RELIABILITY AND AVAILABILITY GOALS ARE IDENTIFIED BASED ON THE PROBABILISTIC EVALUATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*RELIABILITY. COMPONENT + *STEAM GENERATOR + PROBABILITY + EQUIPMENT DEVELOPMENT

11-109958 ALSO IN CATEGORIES 6 AND 8 AND 18 DATED 1974
WIDER HU + JACKSON JF + SMITH LL
AN IMPROVED ANALYSIS OF FUEL MOTION DURING AN OVERPOWER EXCURSION
ARGONNE NATIONAL LABORATORY. ILLINOIS
CONF-740401-P3 +. 14 PPS. PP. 1541-55. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF., APRIL 2, 1974

DURING AN OVERPOWER EXCURSION IN A LMFBR, IRRADIATED FUEL PINS ARE EXPECTED TO RUPTURE AND EJECT MOLTEN FUEL AND FISSION GAS INTO THE COOLANT CHANNELS. THE EJECTED FUEL IS SUBSEQUENTLY DISPLACED BY THE INITIAL SODIUM MOMENTUM, BY PRESSURES RESULTING FROM FUEL-COOLANT THERMAL INTERACTIONS, AND BY FISSION GAS RELEASED THROUGH THE CLAD RUPTURE. THIS FUEL AND SODIUM MOTION IN THE CORE REGION AFFECTS THE REACTIVITY OF THE REACTOR AND DETERMINES THE ULTIMATE COURSE OF THE NEUTRONICS TRANSIENT. IN THIS PAPER THE RESULTS OF PLUTO, A NEW MODEL FOR PREDICTING THIS FUEL AND SODIUM MOTION, ARE COMPARED WITH SAS/FCI, A CURRENT FUEL-COOLANT INTERACTION MODEL USED IN WHOLE-CORE ACCIDENT ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + *COMPARISON + *FUEL COOLANT INTERACTION + FUEL ELEMENTS

11-109966 ALSO IN CATEGORY 18 DATED 1974
NICHOLSON RB
THE ROLE OF HYPOTHETICAL ACCIDENT ANALYSIS IN FAST BREEDER DESIGN AND LICENSING
THE OHIO STATE UNIVERSITY
CONF-740401-P3 +. 8 PPS. PP. 1660-68. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF., APRIL 2, 1974

THE STUDY OF HYPOTHETICAL CORE DISASSEMBLY ACCIDENTS IS AN ESSENTIAL PROCESS IN THE DESIGN AND LICENSING OF FAST BREEDER REACTORS. THE DESIGNER FROM THE BEGINNING OF THE DESIGN PROCESS MUST WORK TOWARD A CONTAINMENT SYSTEM THAT HAS MINIMUM PRACTICABLE FAILURE PROBABILITY FOR A CORE DISASSEMBLY ACCIDENT IN THE GENERIC SENSE, WITH THE SPECIFIC INITIATING CIRCUMSTANCES UNSPECIFIED. THE ROLE OF ENGINEERING JUDGMENT IN SETTING SAFETY DESIGN CRITERIA AND THE INDIVIDUALS MAKING THE JUDGMENTS SHOULD BE GIVEN GREATER VISIBILITY. THE EXPERIMENTAL PROGRAM ON FAST REACTOR MELTDOWN ACCIDENTS MUST BE PURSUED VIGOROUSLY WITH NEW EXPERIMENTAL FACILITIES IN ORDER TO REDUCE THE EXTENT OF THE JUDGMENT FACTOR IN THE CONTAINMENT DESIGN BASIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*DESIGN CRITERIA + *ACCIDENT, HYPOTHETICAL + ACCIDENT, DESIGN BASIS + *LICENSING PROCESS + ACCIDENT, CORE DISRUPTIVE

11-109979 ALSO IN CATEGORIES 7 AND 18 DATED 1976
PARSLY LF
WORK PLAN: TRANSIENT RELEASE FROM LMFBR FUEL. ADDENDUM 1: INVESTIGATION OF LMFBR AEROSOL BEHAVIOR IN THE AEROSOL TEST FACILITY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4675 +. 17 PPS, 3 FIGS, 32 REFS, JAN. 1976

THE OBJECTIVES OF THIS TASK ARE TO CHARACTERIZE THE PROPERTIES AND TRANSIENT BEHAVIOR OF MIXED-OXIDE (SODIUM AND URANIUM) AEROSOLS IN A RELATIVELY LARGE CONTAINMENT VESSEL AND TO CORRELATE THEIR BEHAVIOR WITH ANALYTICAL MODELS. EXPERIMENTS ARE TO BE CONDUCTED UNDER CONDITIONS THAT CAN BE RELATED TO RELEASE INTO AN LMFBR CONTAINMENT BUILDING AS A RESULT OF A COA. THE CONDITIONS WILL COVER THOSE RESULTING FROM A RANGE OF ACCIDENT SEVERITY UP TO AND INCLUDING LOSS OF FLOW AND UNPROTECTED TRANSIENT OVERPOWER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*AEROSOL + CONTAINMENT + FUEL MELTDOWN + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + AEROSOL PROPERTIES + SAMPLING + BEHAVIOR + TRANSIENT + MIXED OXIDE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-109998 ALSO IN CATEGORIES 9 AND 18 DATED 1975
MCELROY WN + BENNETT RA + JOHNSON DL
NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAM
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH. + ARGONNE NATIONAL LAB., ILLINOIS
HEDL-SA-911 + CONF-750935-7 +. 29 PPS. FROM 1ST ASTM-EURATOM SYMPOSIM ON REACTOR DOSIMETRY, DEVELOPMENTS AND STANDARDIZATION, PETTEN, THE NETHERLANDS, SEPT. 22, 1975

NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAMS ARE REVIEWED FOR THE U.S. LMFBR AND CTR PROGRAMS. PRESENTLY, THE MOST DEMANDING REQUIREMENTS ARE ASSOCIATED WITH THE DEVELOPMENT OF LMFBRS WHERE GOAL ACCURACIES IN THE RANGE OF 1 TO 3% HAVE BEEN REQUESTED FOR THE DETERMINATION OF NEUTRONICS PARAMETERS. CTR MATERIALS IRRADIATION STUDIES HAVE ONLY RECENTLY BEGUN IN EARNEST; CONSEQUENTLY, THE CURRENT DEMANDS UPON DOSIMETRY ARE MODEST, WITH PRECISION OF THE DATA TAKING PRECEDENCE OVER ACCURACY. IT IS EVIDENT THAT THE NEED FOR INTERNATIONAL STANDARDIZED AND WELL-DOCUMENTED PROCEDURES FOR NEUTRON ENVIRONMENTAL CHARACTERIZATION FOR LWRS, HTGRS, LMFBRS, AND CTRS WILL CONTINUE TO INCREASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MATERIAL + ENVIRONMENT + NEUTRON + PROPERTY, PHYSICAL + REVIEW + SURVEILLANCE PROGRAM + *REACTOR, THERMONUCLEAR

11-110000 ALSO IN CATEGORY 18 DATED 1975
HUEBOTTER PR + FULFORD PJ + MCLENNAN GA
ADVANCED LMFBR CORE RESTRAINT SYSTEM AND INTERFACING SYSTEMS: TENTATIVE DESIGN CONCEPT AND EVALUATION WORK PLAN
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-44 +. 26 PPS. 5 FIGS. 12 REFS, JULY 1975

A STUDY EFFORT TO EVOLVE AN ADVANCED LMFBR CORE RESTRAINT SYSTEM HAS BEEN RECOMMENDED. THE PROPOSED DESIGN ELIMINATES THE TOP LOAD PADS (TLPS), CONVERTS THE ABOVE CORE LOAD PADS (ACLPS) TO STAMPED BUTTONS ON THE DUCTS, AND ELIMINATES THE TLP AND ACLP CORE FORMER RINGS. IT USES A LONG BENDING-BAR-TYPE NOZZLE WITH AN UPPER PIVOT POINT TAKING THE VERTICAL LOAD AND A SMALL DIAMETRAL CLEARANCE AT THE BOTTOM END. THE DESIGN ANTICIPATES THE USE OF A BOTTOM FISSION GAS PLENUM WITH THE FUEL AND BLANKET DUCTS ABOVE THE PIN BUNDLE EITHER REDUCED IN DIAMETER OR ARTICULATED TO AVOID STRONG MECHANICAL INTERACTIONS AT THE FREE ENDS. CONTROL ASSEMBLIES HAVE CONVENTIONAL DUCTS (FULL DIAMETER AND NONARTICULATED) WHOSE TOP-END POSITIONS ARE GOVERNED BY NOZZLE SUPPORT AND THEIR OWN FREE-BOWING BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*FASTENER + *DESIGN STUDY + *CORE COMPONENTS + SUPPORT STRUCTURE

11-110007 ALSO IN CATEGORIES 7 AND 18 DATED 1975
NISHIO G + KITANI S + TAKADA J
EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASE FROM AN LMFBR IN A HYPOTHETICAL ACCIDENT
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE, TOKAI-MURA
12 PPS. 6 TABS, 10 FIGS. 19 REFS, NUCLEAR ENGINEERING & DESIGN, 34(3), PP. 417-28 (NOV. 1975)

DESCRIBES THE WORK UNDERTAKEN TO PREPARE A COMPUTER CODE FOR THE HAZARD EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASED TO THE ATMOSPHERE IN THE EVENT OF A HYPOTHETICAL ACCIDENT IN A 50 MW(TH) SCALE LMFBR. THE REACTOR BUILDING STRUCTURE CONSISTS OF SEMI-DOUBLE CONTAINMENTS AS FOLLOWS: THE PRIMARY CONTAINMENT HAS A LARGE VOLUME IN COMPARISON WITH THE SECONDARY ANNULAR CONTAINMENT IN WHICH A PART IS CONNECTED TO THE ATMOSPHERE THROUGH AN EMERGENCY FILTER SYSTEM. SODIUM OXIDE AEROSOL CONTAINING PUO2-UO2 FUEL. FISSION PRODUCTS AND STRUCTURAL STEEL AGGGLOMERATES QUICKLY BY COAGULATION DUE TO ITS HIGH CONCENTRATION. SIMULTANEOUSLY, THE AEROSOL CONCENTRATION DECREASES DUE TO SETTLING, PLATING AND THERMOPHORESIS. USING THE PRESENT CODE, THE AMOUNT OF PUO2 AEROSOL LEAKAGE TO THE ATMOSPHERE WAS EVALUATED.

AEROSOL + CONTAINMENT + FILTER SYSTEM + FISSION PRODUCT RELEASE + OXIDE + PLUTONIUM + URANIUM + AGGLOMERATE

11-110051 ALSO IN CATEGORIES 1 AND 8 AND 12 A DATED 1976
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 279 PGS, AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

REVISES THE PRELIMINARY SAR BY SUBMITTING NEW APPENDICES 17D, AND LEAD REACTOR MANUFACTURER QA PROGRAM. INCLUDES THE REVISIONS TO THE QA SECTION. RESPONSES TO NRC QUESTIONS CONCERN ECCS, TRANSIENTS DURING SODIUM FIRES, CONTAINMENT LEAK RATE DURING ACCIDENT, SECURITY, AND TRAINING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT + FIRE + *REPORT, PSAR + QUALITY ASSURANCE + SYSTEM OPERABILITY IN ACCIDENT + LEAK RATE + EMERGENCY COOLING SYSTEM + TRANSIENT + *CLINCH RIVER (LMFBR)

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-110052 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.103 - IHX TUBE BUNDLE HANDLING
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.103-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE-LMFBR, MFG--WEST., AE--BURNS & ROE

THE IHX TUBE BUNDLE WILL NOT BE REMOVED SEPARTATELY. THE ENTIRE IHX WOULD BE REMOVED IF NECESSARY. TUBE LEAK DETECTION AND TUBE PLUGGING WILL BE HANDLED IN SITU. ALSO, BELLOWS REPLACEMENT WILL BE HANDLED IN SITU.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*MAINTENANCE AND REPAIR + CONTAMINATION + RESPONSE TO NRC QUESTION + TUBING + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

11-110055 ALSO IN CATEGORIES 5 AND 8 AND 18 DATED 1976
RESPONSE TO QUESTION 001.179 - PASSIVE POST ACCIDENT HEAT REJECTION BY CONTAINMENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, 1 REF, PP. Q001.179-1 THRU Q001.179-2 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SOFIRE-II COMPUTER CODE IS USED TO DETERMINE THE RATE OF SODIUM COMBUSTION AND HEAT INPUT TO CONTAINMENT AND THE RESULTANT TEMPERATURE AND PRESSURE HISTORIES OF THE CONTAINMENT. THE PREDOMINANT MECHANISM FOR HEAT REJECTION FROM THE CONTAINMENT ATMOSPHERE IS NATURAL CONVECTION HEAT TRANSFER TO THE CONTAINMENT VESSEL STEEL SHELL. HEAT THEN CONDUCTS THROUGH THE STEEL SHELL AND INSULATION ON THE OUTER SURFACE OF THE STEEL SHELL TO THE ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT + FIRE + *HEAT TRANSFER + HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

11-110056 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.218 - JUSTIFICATION FOR USE OF SOFIRE-II
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.218-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POSTULATED EVENT EVALUATED IS THE EXTREMELY UNLIKELY FAILURE OF THE PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK DURING MAINTENANCE. BECAUSE OF THE DESIGN, LOCATION, AND OPERATING PRESSURE OF THE TANK, NO MECHANISM RESULTING IN THE PRESSURIZED DISCHARGE OF SODIUM, IN THE EVENT OF POSTULATED TANK FAILURE, EXISTS. THE EXPECTED RELEASE MODE, IN THE EVENT OF TANK FAILURE, IS A SLOW GRAVITY DRAIN OF THE CONTAINED SODIUM TO THE CELL FLOOR, APPROXIMATELY 2 FEET BENEATH THE TANK.

AVAILABILITY - ERDA PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D.C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + ACCIDENT + *COMPUTER PROGRAM + FIRE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

11-110057 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.220 - JUSTIFICATION FOR LEAK RATE USED
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.220-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP REACTOR CONTAINMENT BUILDING IS DESIGNED TO LIMIT LEAKAGE TO 0.1% VOL/DAY AT A CONTAINMENT OVERPRESSURE OF 10 PSIG. TO ASSUME CONTAINMENT LEAKAGE AT THE DESIGN RATE IMPLIES A CONSTANT CONTAINMENT OVERPRESSURE OF 10 PSIG. HOWEVER, FOR THE REFERENCED ACCIDENT (PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK FAILURE DURING MAINTENANCE) THE MAXIMUM RCB OVERPRESSURE IS 1.8 PSIG, MORE THAN A FACTOR OF 5 LESS THAN THE CONTAINMENT DESIGN PRESSURE. BECAUSE THIS PEAK ACCIDENT PRESSURE IS CONSIDERABLY LESS THAN THE CONTAINMENT DESIGN PRESSURE, LEAKAGE AT THE CONTAINMENT DESIGN RATE, 0.1% VOL/DAY @ 10 PSIG, WOULD NOT OCCUR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *CONTAINMENT + NRC DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *LEAK RATE + COMPARISON + CLINCH RIVER (LMFBR)

11-110059 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.222 - USE OF SOFIRE-II FOR 90,000 GALLON SPILL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.222-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-110059 *CONTINUED*
THE POSTULATED EVENT EVALUATED IN SECTION 15.6.1.3 IS THE EXTREMELY UNLIKELY FAILURE OF THE PRIMARY SODIUM EX-CONTAINMENT STORAGE TANK. THE TANK IS USED TO STORE PRIMARY SODIUM COOLANT ONLY IN THE EVENT MAJOR MAINTENANCE REQUIRES COMPLETE DRAINAGE OF THE REACTOR VESSEL OR EVST. THE SODIUM STORED IN THE TANK WILL BE ESSENTIALLY A STAGNANT POOL UNDER VERY LOW GAS PRESSURE AND THUS ANY FORSEEABLE FAILURE, SUCH AS THE CRACKING OF A FILL OR DRAIN LINE, WOULD RESULT IN ONLY A SLOW LEAKAGE OF SODIUM AND A SPILL ORDERS OF MAGNITUDE LESS THAN THE ASSUMED 90,000 GALLONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FIRE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

11-110060 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.242- COMPUTING THE LEAK VS TIME CURVE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.242-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LEAKAGE FROM THE CONTAINMENT IS COMPUTED BASED ON THE DESIGN LEAKAGE SPECIFICATION OF THE RCB, 0.1% VOL/DAY AT A CONTAINMENT OVERPRESSURE OF 10 PSIG, AND THE RELATIONSHIP THAT LEAKAGE IS PROPORTIONAL TO THE SQUARE ROOT OF DELTA P WHERE DELTA P IS DEFINED AS THE PRESSURE DIFFERENTIAL ACROSS THE CONTAINMENT VESSEL SHELL, BETWEEN THE RCB ATMOSPHERE AND THE OUTSIDE ENVIRONMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTAINMENT + RESPONSE TO NRC QUESTION + *MATHEMATICAL TREATMENT + *LEAK RATE + CLINCH RIVER (LMFBR)

11-110062 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 120.36 - CRITICAL STRESS LOCATION IN PRIMARY AND SECONDARY PIPING
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q120.36-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MOST HIGHLY STRESSED SECTION OF THE PRIMARY LOOP IS THE CROSS OVER PIPING FROM THE PUMP DISCHARGE TO THE IHX PRIMARY INLET. THIS IS THE ONLY SECTION OF PRIMARY PIPING WHICH HAS BOTH HIGH TEMPERATURE AND FULL PRESSURE DURING NORMAL CONDITIONS. THE HIGHEST STRESSED PIPING COMPONENTS OF THE INTERMEDIATE SYSTEM ARE IN LOOP 1. THE LOOP 1 HOT LEG (REACTOR CONTAINMENT PENETRATION TO SUPERHEATER INLET) HAS THE HIGHEST THERMAL EXPANSION STRESSES. THE ELBOWS, THE SWRPRS TEE AND THE 2 1/4 CR-1 MO STAINLESS STEEL TRANSITION PIECE ARE THE CRITICAL ITEMS IN THE PIPE LINE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*STRESS ANALYSIS + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

11-110063 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 120.48 - EFFECT OF CARBIDE PHASE ON FATIGUE LIFE OF STAINLESS STEEL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
7 PGS, 4 FIGS, 10 REFS, PP. Q120.48-1 THRU Q120.48-7 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO REDUCTION OF FATIGUE PROPERTIES DUE TO CARBIDE PRECIPITATION IS EXPECTED IN EITHER TYPE 304 OR TYPE 316 AUSTENITIC STAINLESS STEEL AT THE OPERATING TEMPERATURES OF THE CRBR. VARIOUS INVESTIGATORS HAVE SHOWN THAT AT TEMPERATURES ABOVE 750 DEG F THERE IS EITHER NO EFFECT OR A BENEFICIAL EFFECT DUE TO THE PRECIPITATION OF CARBIDES ON THE FATIGUE PROPERTIES OF EITHER TYPE 304 AUSTENTIC STAINLESS STEEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CARBIDE + *STEEL, STAINLESS + PRECIPITATION + RESPONSE TO NRC QUESTION + EFFECT + *FATIGUE + CLINCH RIVER (LMFBR)

11-110064 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 310.25 - USE OF CONTINUOUS CONTAINMENT PURGE
PROJECT MANAGMENT CORP., OAK RIDGE, TN
1 PG, PP. Q310.25-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INTEGRATED SYSTEM DESIGN (AIR TRANSPORT TIME, ISOLATION VALVE CLOSURE TIME, AND SENSOR LOCATION) OF THE REACTOR CONTAINMENT BUILDING ISOLATION SYSTEM INSURES CONTAINMENT ISOLATION PRIOR TO ACTIVITY RELEASES APPROACHING 10CFR20 GUIDELINES. PSAR ACCIDENT ANALYSES HAVE TAKEN CREDIT FOR CONTAINMENT ISOLATION. USE OF A CONTINUOUS CONTAINMENT PURGE, DURING NORMAL REACTOR OPERATION, DOES NOT LEAD TO UNACCEPTABLE CONSEQUENCES TO THE HEALTH AND SAFETY OF THE PUBLIC EVEN

CATEGORY 11
CONTAINMENT OF NUCLEAR FACILITIES

11-110064 *CONTINUED*
IN THE EVENT OF DESIGN BASIS SODIUM FIRE ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *ACCIDENT + *CONTAINMENT PURGE + RESPONSE TIME + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

11-110096 ALSO IN CATEGORY 18 DATED 1975
KAPLAN S + FEERICK BT + MARRON JV
FTR GRID-SPACED ASSEMBLY DESIGN BASIS REPORT
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
GEAP-14002 +, 150 PPS, 35 TABS, FIGS, MAY 1975

DEVELOPED FOR USE AT LMFBR CORE DESIGN AND OPERATING CONDITIONS AS AN ALTERNATE FUEL ROD SUPPORT SYSTEM TO THE WIRE-WRAP DESIGN. PROJECTED BENEFITS INCLUDE A DESIGN ALTERNATIVE FOR EXTENDED LIFE, GREATER TOLERANCE TO DIFFERENTIAL PLANAR SWELLING, AND AN LMFBR DRIVER ASSEMBLY THAT IS RELIABLE, SAFE, AND ECONOMICAL. THREE GRID SPACER DRIVER ASSEMBLIES ARE BEING FABRICATED FOR IRRADIATION IN FTR. THE DESIGN IS BASED ON EXPERIENCE GAINED FROM CONDUCTING THE F9E AND F9F GRID SPACED ASSEMBLIES IN EBR-II AND A PROGRAM OF OUT-OF-PILE TESTING AND DEVELOPMENT. DESIGN AND THE ASSOCIATED DESIGN METHODS WILL BE EVALUATED AND IMPROVED BASED ON A COMPARISON OF THE PREDICTED PERFORMANCE SUMMARIZED IN THIS REPORT WITH THE ACTUAL PERFORMANCE OBSERVED DURING THE INTERIM AND POST-IRRADIATION EXAMINATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + CORE COMPONENTS + *SUPPORT STRUCTURE + R AND D PROGRAM + *FUEL ROD + *FTR (TR)

11-110134 ALSO IN CATEGORIES 5 AND 7 AND 18 DATED 1976
KAZIMI MS
ANALYSIS OF PRESSURE PULSE GENERATION DUE TO GAS RELEASE FROM FAILED FUEL PINS IN A LIQUID METAL FAST BREEDER REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY
11 PPS, 11 FIGS, NUCLEAR SCIENCE & ENGINEERING, 59(1), PP. 1-11 (JAN. 1976)

A MODEL FOR THE ANALYSIS OF PRESSURE PULSE GENERATION DUE TO SUDDEN GAS RELEASE FROM FAILED PINS IN A LIQUID-METAL FAST BREEDER REACTOR IS PRESENTED. THE PREDICTIONS OF THE MODEL ARE COMPARED TO EXPERIMENTAL DATA ON SUDDEN GAS RELEASE IN THE DUCTS OF THE EXPERIMENTAL BREEDER REACTOR II. THE PREDICTED MAGNITUDES OF PRESSURE PULSES ARE IN GOOD AGREEMENT WITH THE EXPERIMENTAL OBSERVATIONS. THE PREDICTED PRESSURE PULSE, HOWEVER, SEEMS TO DECAY AT A FASTER RATE THAN THE EXPERIMENTALLY OBSERVED RATE. THE EFFECTS OF THE PIN INTERNAL PRESSURE UPON RUPTURE, THE RUPTURE AREA, AND THE AMOUNT OF COMPRESSED GAS ARE STUDIED PARAMETRICALLY.

EBR 1 AND 2 (RE) + FISSION GAS RELEASE + FAILURE, FUEL ELEMENT + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL MODEL + PRESSURE PULSE

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-093196 DATED 1973
OGUSHI K + HAYAKAWA S + HANAMIYA I
RESEARCH AND DEVELOPMENT OF A SMALL EDDY-CURRENT PROBE-TYPE FLOWMETER FOR FUEL FAILURE DETECTION AND LOCATION SYSTEM FOR LMFBR
FUJI ELECTRIC CO. LTD., TOKYO
5 PAGES, FUJI JIHO, 46(6), PP. 541-546 (JUNE 1973) (IN JAPANESE)

THE DEVELOPMENT OF AN IN-CORE PROBE-TYPE EDDY-CURRENT FLOWMETER FOR THE PROTOTYPE FAST BREEDER REACTOR MONJU IS DESCRIBED. THE FLOWMTER CONSISTS OF MULTIPLE PRIMARY COILS AND DIFFERENTIAL TYPE SECONDARY COILS. EDDY-CURRENTS FLUX DENSITY PRODUCED BY THE PRIMARY COILS. THE DIFFERENTIAL OUTPUT OF THE TWO VOLTAGES WHICH ARE INDUCED IN THE SECONDARY COILS BY THE EDDY-CURRENT IS PROPORTIONAL TO THE SODIUM FLOW VELOCITY. FLOWMETERS WITH OUTER SPOOL DIAMETERS OF 7.6 PHI, 10.2 PHI, 10.5 PHI, 13.5 PHI, AND 14 PHI CM WERE CONSTRUCTED. USING A SODIUM TEST LOOP, THE CHARACTERISTIC TEST AND THE MOCK-UP TEST OF THE EDDY-CURRENT TYPE FLOWMETERS WERE PERFORMED. AS A RESULT OF THE CHARACTERISTIC TEST, IT WAS FOUND THAT THE SENSITIVITY AND LINEARITY OF THE FLOWMETEER WERE EXCELLENT. THE OPTIMUM EXCITING FREQUENCY WAS DETERMINED. SINCE THE OUTPUT SIGNAL WAS AFFECTED SO STRONGLY BY THE VOID SODIUM FLOW, THE FLOWMETER MIGHT HAVE APPLICATION AS A VOID DETECTOR. NO INTERFERENCE AMONG ADJACENT FLOWMETERS WAS OBSERVED

FAILURE, FUEL ELEMENT + INSTRUMENT, FAILED FUEL DETECTION + FAILURE, CLADDING

12-093198 DATED 1973
NIEMARK LA
FUEL PIN FOR A LIQUID METAL COOLED FAST BREEDER REACTOR
GERMAN PATENT 2,303,992 +. 9 PAGES, AUGUST 2, 1973

THE DESCRIBED FUEL ROD CONTAINS NUMEROUS CERAMIC FUEL PELLETS OF UO2-PUO2, WHICH FORM THE FUEL ZONE WITHIN THE CLADDING TUBE AND NUMEROUS RING-SHAPED CERAMIC JACKET PELLETS OF DEPLETED UO2, WHICH FORM AN UPPER JACKET ARRANGED IN THE CLADDING TUBE ABOVE THE FUEL ZONE. A GRID SUPPORT PLATE FOR THE UPPER JACKET CONTAINS A CONICAL JET WHICH INCREASES THE AXIAL MOVEMENT OF THE FUEL AND PREVENTS THE RETURNING MOVEMENT OF THE FUEL SHOULD THE FUEL MELT AS A RESULT OF THE REACTIVITY INSERTION OR POWER INCREASE. THE EXACT MEASURES OF THE JET ARE GIVEN.

AVAILABILITY - PHOTOCOPY - U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

CORE COMPONENTS + SUPPORT STRUCTURE + PATENT + FUEL ROD

12-095165 ALSO IN CATEGORY 7 DATED 1973
ALLAN CG
SOLUBILITIES OF SODIUM BROMIDE AND SODIUM IODIDE IN SODIUM
UKAEA REACTOR GROUP, DOUNREAY
TRG-REPORT-2458 +. 26 PAGES, 6 FIGURES, 6 TABLES, 42 REFERENCES, NOVEMBER 1973

THE SOLUBILITIES OF SODIUM BROMIDE AND SODIUM IODIDE IN REACTOR GRADE SODIUM AT 150 - 450 C ARE REPORTED. THE HALIDES DISSOLVE AS THE DISSOCIATED IONS, SOLVATED BY THE LIQUID METAL, AND THE SOLUTIONS SHOW LARGE DEVIATIONS FROM THE IDEAL AND SMALL DEVIATIONS FROM REGULARITY. THIS IS INTERPRETED IN TERMS OF SHORT-RANGE ORDER IN THE SOLUTION. FISSION PRODUCT HALIDES WILL COLLECT IN THE COOLER PARTS OF FAST REACTOR CIRCUITS, ESPECIALLY FILTRATION COLD TRAPS, AND THE RADIATION LEVELS FROM THESE COMPONENTS WILL BE HIGH. THE ADDITION OF STABLE HALIDE FOLLOWED BY COLD TRAPPING MAY BE AN EFFICIENT METHOD OF REMOVING HALIDE ACTIVITY FROM FAST REACTOR PRIMARY CIRCUITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FILTER, TRAP + COOLANT CHEMISTRY + PROPERTY, PHYSICAL + BROMIDE + IODIDE + SOLUBILITY + SOLUTION

12-098141 DATED 1974
CRONENBERG AW + FAUSKE HK
UO2 SOLIDIFICATION PHENOMENA ASSOCIATED WITH RAPID COOLING IN LIQUID SODIUM
ARGONNE NATIONAL LABORATORY, ILLINOIS
9 PAGES, 6 FIGURES, 32 REFERENCES, J. NUCLEAR MATERIALS, 52(1), PP. 24-32 (AUGUST 1974)

AN IMPORTANT SAFETY ASPECT OF FUEL MELTDOWN IN A LIQUID-METAL FAST BREEDER REACTOR (LMFBR) IS THE FRAGMENTATION OF MOLTEN UO2 INTO FINELY DIVIDED PARTICLES WHEN QUENCHED IN SODIUM COOLANT, WITH SUBSEQUENT COOLANT VAPORIZATION. IN ORDER TO ANALYZE THE MECHANICS OF SUCH FRAGMENTATION, A KNOWLEDGE OF THE PHYSICAL STATE OF THE UO2 SURFACE WITHIN THE BREAKUP PERIOD MUST BE KNOWN. TO ACCOMPLISH THIS, THE KINETICS OF CRYSTAL FORMATION AND GROWTH ARE INVESTIGATED AND COMPARED WITH THE HEAT TRANSFER CONTROLLED SOLIDIFICATION RATE TO DETERMINE WHETHER OR NOT THE SURFACE OF A UO2 DROPLET CAN REMAIN MOLTEN IF CONTACT IS ESTABLISHED DURING QUENCHING IN SODIUM COOLANT. RESULTS INDICATE THAT ALTHOUGH THE INITIAL HEAT TRANSFER RATE FOR PERFECTLY WETTED UO2 IS QUITE RAPID, THE CRYSTALLIZATION PROCESS IS APPROXIMATELY AN ORDER OF MAGNITUDE GREATER, WITH THE UO2-NA CONTACT TEMPERATURE WELL BELOW THE TEMPERATURE FOR HOMOGENEOUS SOLIDIFICATION. THUS, IT CAN BE CONCLUDED THAT THE FREEZING OF UO2 IN SODIUM IS HEAT TRANSFER LIMITED SUCH THAT ANY FRAGMENTATION ANALYSIS SHOULD ACCOUNT FOR SURFACE SOLIDIFICATION.

FUEL MELTDOWN + CHEMICAL KINETICS + URANIUM DIOXIDE

12-099318 DATED 1974

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-099318 *CONTINUED*
TREVORROW LE + KULLEN BJ + JARRY RL
TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8102 +, 79 PAGES, 25 TABLES, 24 FIGURES, OCTOBER 1974

A REVIEW OF THE BEHAVIOR OF TRITIUM AND NOBLE-GAS FISSION PRODUCTS IN NUCLEAR REACTORS IS PRESENTED. THE SOURCES OF TRITIUM CONSIDERED INCLUDE FISSION AND ACTIVATION OF POISONS AND IMPURITIES IN COOLANTS. THE NOBLE GASES INCLUDED IN THIS REVIEW ARE LIMITED TO FISSION PRODUCTS, WITH EMPHASIS ON THE LONG-LIVED SPECIES. REACTOR TYPES SURVEYED INCLUDE LIGHT WATER REACTORS, HIGH-TEMPERATURE GAS-COOLED REACTORS, AND LIQUID-METAL-COOLED FAST BREEDER REACTORS. DATA INDICATIVE OF THE NORMAL OPERATING PROCEDURES HAVE BEEN EXPANDED TO PROVIDE ESTIMATES OF THE QUANTITIES OF TRITIUM AND NOBLE GASES AND THEIR DILUENTS EXPECTED AT VARIOUS POINTS ALONG THE FLOW PATH FOR BOTH GASEOUS AND LIQUID WASTE STREAMS. DATA ARE NORMALIZED TO AN ENERGY OF 1000 MWE-YR TO PERMIT COMPARISON WITH PRESENT-GENERATION REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + FISSION PRODUCT RELEASE + KRYPTON + REACTOR, PWR + TRITIUM + XENON + REACTOR, HTGR + FUEL CYCLE

12-099349 DATED 1974
GILMORE RF
TEST REPORT OF THE EVALUATION OF FLOW DIVIDER BELLOWS FOR CLOSED LOOP IN-REACTOR ASSEMBLY
HANFORD ENGINEERING DEVELOPMENT LABORATORY, RICHLAND, WASHINGTON
HEDL-TME 74-29 +, 17 PAGES, 10 FIGURES, JUNE 1974

THIS REPORT CONTAINS THE RESULTS OF TESTS PERFORMED ON THE CLOSED LOOP IN-REACTOR ASSEMBLY FLOW DIVIDER TUBE BELLOWS. TWO TEST BELLOWS WERE LIFE TESTED IN SODIUM ENVIRONMENTS TO VERIFY THEIR ABILITY TO WITHSTAND CLIRA THERMAL CYCLES AT NORMAL SYSTEM TEMPERATURE AND PRESSURE OPERATING CONDITIONS. THE TEST ENVIRONMENTS DID NOT AFFECT THE INTEGRITY OF EITHER BELLOWS. IT IS RECOMMENDED THAT THE FLOW DIVIDER TUBE BELLOWS BE ACCEPTED FOR FFTF APPLICATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + THERMAL EXPERIMENT + TEST, COMPONENT + IN PILE EXPERIMENT + FAILURE, FATIGUE + THERMAL PROPERTY

12-099479 ALSO IN CATEGORY 7 DATED 1974
NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS QUARTERLY TECHNICAL PROGRESS REPORT, JULY-SEPT. 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13139 +, 16 PAGES, 5 FIGURES, NOVEMBER 15, 1974

THE LARGE TEST VESSEL (LTV) FOR CONDUCTING SODIUM AND WATER JET TESTS WAS DISMANTLED, CLEANED, AND REASSEMBLED, AND ASSOCIATED INSTRUMENTATION CALIBRATED. THE BURNING CHARACTERISTICS OF STATIONARY AND FALLING DROPS OF SODIUM WERE DETERMINED. COMPUTER COMPARISONS BETWEEN SOMIX-1 AND TORRANCIS CYLINDRICAL GEOMETRY CODE FOR THE HIGH GRASHOF NUMBER CASE SHOWED GOOD AGREEMENT. A PARAMETRIC STUDY WAS MADE TO DETERMINE THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF AN FFTF HYPOTHETICAL CORE DISASSEMBLY ACCIDENT. FROM ZERO TO 10,000 LB SODIUM, FROM 1-50% OF THE CORE FUEL AND SOLID FISSION PRODUCTS AND 100% OF THE NOBLE GAS FISSION PRODUCTS WERE CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + ACCIDENT, CONSEQUENCES + FIRE + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + JET + ACCIDENT, HYPOTHETICAL

12-100243 ALSO IN CATEGORY 7 DATED 1974
JORDAN H + SCHIKARSKI W + WILD H
NUCLEAR AEROSOLS IN A CLOSED SYSTEM
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1227 + KFK-1989 +, 115 PAGES, 37 FIGURES, OCTOBER 1974

THE AV PROGRAM WAS SET UP TO INVESTIGATE THE BEHAVIOR OF UO2 AEROSOLS IN A DRY, INERT AND ENCLOSED ATMOSPHERE. SUCH A SYSTEM IS BROUGHT INTO THE CONTEXT OF FAST BREEDER REACTOR SAFETY IN THE INTRODUCTION AND CONCLUSION OF THIS REPORT WHERE THE PRIMARY ROLE OF THE FUEL AEROSOL IN THE EVENT OF A HYPOTHETICAL LMFBR ACCIDENT IS EMPHASIZED. THE RESULT OF THE PROGRAM IS A BASIC UNDERSTANDING OF THE AEROSOL-MECHANICAL PROCESSES THAT DETERMINE THE DYNAMICS OF AN AEROSOL SYSTEM. THESE ARE INCORPORATED IN A COMPUTER CODE THAT SATISFACTORALLY DUPLICATES EXPERIMENTAL FINDINGS AND THAT CAN BE USED TO EXTRAPOLATE THESE TO ACTUAL REACTOR CONTAINMENT SITUATIONS. PARAMETERS OF MAJOR INFLUENCE ON THE HALF-LIFE OF SUSPENDED FUEL MASS HAVE BEEN IDENTIFIED. THESE ARE THE PHYSICAL DIMENSIONS OF THE SYSTEM, ITS TEMPERATURE AND RATE OF HEAT LOSS AND THE TYPE AND INITIAL SIZE DISTRIBUTION OF THE AEROSOL PARTICLES. THE REMAINING UNCERTAINTIES IN THE INFLUENCE OF TYPE AND SIZE DISTRIBUTION OF THE AEROSOL PARTICLES ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + DEPOSITION + PARTICLE SIZE + ANALYTICAL MODEL + AEROSOL PROPERTIES

12-100390 ALSO IN CATEGORY 7 DATED 1974

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-100390 *CONTINUED*
ZIMMERMANN H
FISSION GAS BEHAVIOR IN OXIDE FUEL ELEMENTS OF FAST BREEDER REACTORS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1228 + KFK-2057 +. 80 PAGES, 30 FIGURES, OCT. 1974 (IN GERMAN)

FUEL ELEMENTS WERE IRRADIATED AND THE AMOUNT OF FISSION GAS WAS MEASURED IN 3 STEPS AS RELEASED FISSION GAS, FISSION GAS RETAINED IN BUBBLES AND PORES, AND FISSION GAS RETAINED IN VERY SMALL INTRAGRANULAR BUBBLES AND CRYSTAL LATTICE SITES. UNDER THE CONDITION PREVAILING IN FAST BREEDER REACTORS THE FRACTIONAL FISSION GAS RELEASE IS ABOUT 90% OR MORE AFTER MEDIUM AND HIGH BURNUPS. THE RELEASE RATE IS NOT CONSTANT, BUT THERE ARE PERIODS WITH HIGH RELEASE RATES (BREAK AWAY RELEASES). A SIMPLE FORMULA DESCRIBING FISSION GAS RELEASE RATES IN 3 TEMPERATURE REGIONS WAS OBTAINED ON THE BASIS OF MEASURED RELEASE RATES AND CONCENTRATIONS OF THE RETAINED FISSION GAS.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

*FISSION GAS RELEASE + FUEL BURNUP + OXIDE + URANIUM + *THERMAL EXPERIMENT + FUEL ROD + FUEL ELEMENTS

12-100541 ALSO IN CATEGORY 7 DATED 1974
FUJII I + OHNO M + TAKEHARA K
DEVELOPMENT OF A SODIUM INPILE LOOP
TOKYO SHIBAURA ELECTRIC CO. LTD., KAWASAKI, JAPAN
4 PAGES, 3 FIGURES, J. BRITISH NUCLEAR ENERGY SOCIETY, 13(4), PP. 403-406 (OCTOBER 1974)

A SODIUM FACILITY HAS BEEN INSTALLED IN THE TOSHIBA TRAINING REACTOR FOR THE PURPOSES OF DEVELOPMENT OF A FAILED FUEL DETECTION SYSTEM, AND THE STUDY OF RADIONUCLIDES DISTRIBUTION AND THEIR CLEAN-UP. THE FACILITY COMPRISES AN INPILE PLUG AND ASSOCIATED SODIUM LOOP. SOME COMMISSIONING TESTS HAVE BEEN CARRIED OUT.

DEPOSITION + FAILURE, FUEL ELEMENT + FISSION PRODUCT TRANSPORT + IN PILE EXPERIMENT

12-100548 ALSO IN CATEGORY 7 DATED 1974
KABELE TJ + BOHRINGER AP
ENGINEERING SCALE TESTS OF AN FFTF FISSION GAS DELAY BED
*WESTINGHOUSE HANFORD COMPANY, RICHLAND, WASHINGTON
HEDL-SA-691 + CONF-740807-20 +. 12 PAGES, PRESENTED AT THE 13TH AIR CLEANING CONFERENCE, HELD IN SAN FRANCISCO, CALIF., AUG. 12, 1974

THE DYNAMIC ADSORPTION COEFFICIENT OF 85KR ON ACTIVATED CHARCOAL FROM A NITROGEN CARRIER GAS WAS MEASURED AT -80 AND -120 C AT PRESSURES OF ZERO AND 30 PSIG. THE EFFECTS OF THE PRESENCE OF IMPURITIES IN THE NITROGEN CARRIER GAS (1% OXYGEN, AND 100 VPPM CARBON DIOXIDE) ON THE ADSORPTION COEFFICIENT OF 85 KR WERE ALSO MEASURED. THE 85KR ADSORPTION COEFFICIENT INCREASED WITH DECREASING TEMPERATURE, AND INCREASED WITH INCREASING PRESSURE. THE PRESENCE OF OXYGEN AND CARBON DIOXIDE IMPURITIES IN THE NITROGEN CARRIER GAS HAD NO DISCERNIBLE EFFECT UPON THE ADSORPTION COEFFICIENT. THE ADSORPTION COEFFICIENT FOR 85KR FROM NITROGEN GAS WAS LOWER THAN FOR ADSORPTION OF 85KR FROM AN ARGON GAS STREAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

KRYPTON + NITROGEN + CHARCOAL + COOLANT PURIFICATION SYSTEM

12-100559 ALSO IN CATEGORY 18 DATED 1972
BREWER ST + MASON EA + DRISCOLL MJ
THE ECONOMICS OF FUEL DEPLETION IN FAST BREEDER REACTOR BLANKETS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-3060-4 + MITNE-123 +. 342 PAGES, 48 TABLES, 71 FIGURES, NOVEMBER 1972

A FAST BREEDER REACTOR FUEL DEPLETION-ECONOMICS MODEL WAS DEVELOPED AND APPLIED TO A NUMBER OF 1000 MWE LMFBR CASE STUDIES, INVOLVING RADIAL BLANKET-RADIAL REFLECTOR DESIGN, RADIAL BLANKET FUEL MANAGEMENT AND SENSITIVITY OF ENERGY COSTS TO CHANGES IN THE ECONOMIC ENVIRONMENT. CHOICE OF FUEL COST ACCOUNTING PHILOSOPHY, E.G. WHETHER OR NOT TO TAX PLUTONIUM REVENUE, WAS FOUND TO HAVE SIGNIFICANT EFFECT ON ABSOLUTE VALUES OF ENERGY COSTS, WITHOUT, HOWEVER, DISTORTING DESIGN RANKINGS, COMPARATIVE RESULTS, AND IRRADIATION TIME OPTIMIZATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + ECONOMIC STUDY + FUEL MANAGEMENT + BLANKET

12-100560 DATED 1972
MOSEDALE D + LEWTHWAITE GW + RAMSAY I
FURTHER CREEP EXPERIMENTS ON THE DOUNREAY FAST REACTOR
UKAEA REACTOR GROUP, DOUNREAY, SCOTLAND
TRG-REPORT-2385 + CONF-721115-5 +. 14 PAGES, PRESENTED AT THE EUROPEAN CONFERENCE ON IRRADIATION EMBRITTLEMENT AND CREEP IN FUEL CLADDING AND CORE COMPONENTS, HELD IN LONDON, ENGLAND, 1972

THE FINDINGS FROM FURTHER IRRADIATION OF HELICES, LOADED IN TENSION AND IMMERSED IN SODIUM AT TEMPERATURES OF ABOUT 280 C, IN THE INNER BREEDER OF THE DOUNREAY FAST REACTOR ARE PRESENTED AND DISCUSSED IN THE CONTEXT OF PREVIOUS EXPERIMENTS OF THIS TYPE. SPECIMEN MATERIALS COMPRISED EIGHT AUSTENITIC STAINLESS STEELS, NIMONIC PE16 ALLOY AND NICKEL. SEVEN OF THE STEELS WERE

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-100560 *CONTINUED*
STUDIED IN BOTH COLD-WORKED AND SOLUTION-TREATED CONDITIONS, ONE IN ONLY THE FORMER. THE NIMONIC ALLOY WAS EXPOSED IN SOLUTION AND FULLY HEAT-TREATED CONDITIONS AND THE NICKEL WAS ANNEALED. THE DOUNREAY FAST REACTOR SPRING RESULTS ARE DISCUSSED IN RELATION TO OTHER EXPERIMENTAL FINDINGS AND PREDICTIONS FROM THEORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TESTING + CREEP BEHAVIOR + EMBRITTLEMENT + IRRADIATION TESTING + DOUNREAY (LMFBR) + CREEP + PROPERTY, MECHANICAL

12-101858 DATED 1973
FORSTER S
THE COOLING OF NUCLEAR POWER STATIONS FITTED WITH HIGH-TEMPERATURE REACTOR AND HELIUM-TURBINE CYCLE
7 PAGES, 13 FIGURES, BRENNST.-WARME-KRAFT, 25(11), PP. 426-32 (NOV. 1973) (IN GERMAN)

THE TYPICAL CHARACTERISTICS OF THE COLD END OF NUCLEAR POWER STATIONS WITH HIGH-TEMPERATURE REACTOR AND HELIUM TURBINE CYCLE ARE EXPLAINED. THE ARRANGEMENT IS DESCRIBED OF THE 3 COOLING SYSTEMS (RIVER WATER, WET COOLING, DRY COOLING), AS WELL AS THE INFLUENCE OF THE LOWER PROCESS TEMPERATURE ON CYCLE DESIGN AND NET EFFICIENCY. FOR INSTALLATIONS WITH DRY-AIR COOLING, CONSIDERATIONS FOR OPTIMISING THE WHOLE PLANT ARE SHOWN, IN RESPECT OF LOWER CURRENT PRODUCTION COST, AND DECISIVE DESIGN FEATURES OF THE COLD END ARE GIVEN. IN A COMPARISON WITH OTHER NUCLEAR POWER SYSTEMS (LIGHT-WATER REACTOR AND HIGH-TEMPERATURE REACTOR WITH STEAM POWER PLANT), ESPECIALLY WITH DRY-AIR COOLING, A COMPARISON IS MADE WITH THE NET EFFICIENCY, THE THERMAL LOADING, AND THE COOLING REQUIREMENTS OF THE DRY-AIR COOLER.

THERMAL ANALYSIS + HIGH TEMPERATURE + HELIUM + TURBINE + COOLING TOWER

12-101906 DATED 1975
MAECK WJ
FAST REACTOR FISSION YIELDS FOR U-233, U-235, U-238, PU-239 AND RECOMMENDATIONS FOR THE DETERMINATION OF BURNUP ON FBR MIXED OXIDE FUELS: AN INTERIM PROJECT REPORT
IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS
ICP-1050-1 +. 19 PAGES, 10 TABLES, JAN. 1975

FAST FISSION YIELD DATA ARE PRESENTED FOR OVER 40 STABLE AND LONG-LIVED NUCLIDES FOR 233U, 235U, AND 238U IRRADIATED IN EBR-II. ALSO REPORTED ARE PRELIMINARY FAST FISSION YIELD DATA FOR 239PU, CAPTURE-TO-FISSION RATIO MEASUREMENTS ARE REPORTED FOR 233U, 235U, 238U, 237NP, 239PU, 240PU, 241PU, AND 242PU IRRADIATED IN THE SAME ASSEMBLY. THE NEUTRON ENVIRONMENT FOR THE IRRADIATION IS DESCRIBED. MONITORS AND THEIR FAST FISSION YIELD VALUES ARE RECOMMENDED FOR THE DETERMINATION OF BURNUP ON URANIUM-PLUTONIUM MIXED-OXIDE FBR FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL BURNUP + OXIDE + PLUTONIUM + URANIUM + IRRADIATION TESTING + FUEL CONVERSION

12-102015 ALSO IN CATEGORY 7 DATED 1975
JOHNSON CE + DUDEY ND + HEINRICH RR + BLACKBURN PE + FLUSS MJ + MALEWOCKI RL + TETENBAUM M + BURRIS L
FUELS AND MATERIALS CHEMISTRY ANNUAL REPORT JULY 1973-JUNE 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8122 +. 97 PAGES, 34 FIGURES, JAN. 1975

TO AID IN EVALUATING THE PERFORMANCE OF FAST-BREEDER REACTOR FUELS, HIGH-TEMPERATURE TRANSPIRATION STUDIES HAVE BEEN MADE OF OXYGEN POTENTIALS OVER THE U-PU-O SYSTEM AT 2150-2550 K AND WHERE PU/(U+PU) = 0.2. A COMPUTER MODEL HAS BEEN WRITTEN TO DETERMINE THE REDISTRIBUTION OF OXYGEN, URANIUM, AND PLUTONIUM IN IRRADIATED FUELS AS A FUNCTION OF TIME AND AT STEADY STATE. OXYGEN MOVEMENT IS CONTROLLED BY IONIC DIFFUSION. STUDIES OF THE VAPORIZATION BEHAVIOR OF SOLID AND LIQUID CESIUM MOLYBDATE HAVE BEEN CARRIED OUT. THE EXISTENCE OF GASEOUS CESIUM MOLYBDATE MOLECULES AS THE PRINCIPAL SPECIES IN THE VAPOR HAS BEEN ESTABLISHED. PERCOLATION THEORY HAS BEEN APPLIED TO THE STUDY OF OXYGEN DIFFUSION IN POROUS HYPERSTOICHIOMETRIC URANIA PELLETS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CESIUM + COMPUTER PROGRAM + DIFFUSION + FUEL BURNUP + MOLYBDENUM + OXYGEN + ANALYTICAL MODEL + POROUS MEDIA + TRANSPIRATION

12-102030 ALSO IN CATEGORY 7 DATED 1974
BOBER M + SCHUMACHER G
INCREASES IN THE CENTERLINE TEMPERATURE OF MIXED OXIDE FAST REACTOR FUEL PINS AS A RESULT OF URANIUM/PLUTONIUM REDISTRIBUTION
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1190 + KFK-1904 +. 43 PAGES, 12 FIGURES, 31 REFERENCES, APRIL 1974

RESULTS OF POST IRRADIATION EXAMINATIONS OF REDISTRIBUTION OF URANIUM AND PLUTONIUM IN FAST REACTOR MIXED OXIDE FUEL PINS ARE REVIEWED. REDISTRIBUTION BY EVAPORATION-CONDENSATION PROCESSES CLEARLY DEPENDS ON STOICHIOMETRY AND ONLY TO A LESS DEGREE ON POWER RATING AND BURNUP. IT MAINLY DEVELOPS IN THE FIRST STAGE OF FUEL RESTRUCTURING. AT THE CENTRAL VOID THE PLUTONIUM ENRICHMENT YIELDS UP TO 170% OF THE AVERAGE CONCENTRATION. THIS CAUSES AN INCREASE IN CENTRAL TEMPERATURE

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-102030 *CONTINUED*
UP TO 150 C.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL BURNUP + PLUTONIUM + THERMAL EXPERIMENT + IRRADIATION TESTING + VOID FRACTION + FUEL ELEMENTS

12-102056 ALSO IN CATEGORY 18 DATED 1975
THOMPSON DC
CORE RESTRAINT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING NOVEMBER 30, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-7 +. 35 PAGES, 15 FIGURES, FEB. 1975

THE 121-ASSEMBLY CORE RESTRAINT DEVELOPMENT TESTS WERE STARTED DURING THIS REPORTING PERIOD. PHASES I AND II HAVE BEEN COMPLETED. DATA ARE BEING ANALYZED AND PHASE I DATA HAVE BEEN ISSUED TO PARTICIPANTS OF THE NATIONAL PROGRAM. THE FACILITY WAS CHARACTERIZED BEFORE TESTING WAS STARTED. THIS CHARACTERIZATION DETERMINES FACILITY DEFLECTIONS UNDER DIFFERENT LOADING CONDITIONS. THIS INFORMATION REDUCES THE ERROR IN RECORDING PERIPHERAL JAW POSITION. THE NEW TARGETS USED IN DUCT BOW MEASUREMENT HAVE BEEN PROCURED AND INSTALLED IN THE SIMULATED ASSEMBLIES. FULL CORE SIMULATED FUEL ASSEMBLIES (FSA) ARE BEING DESIGNED AND RAW MATERIAL PROCURED. CHANGES IN THE CRBRP CONCEPTUAL DESIGN TERMINATED THE WORK OF THE UPPER INTERNALS PLUG-IN DESIGN CONCEPT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, IN CORE + FASTENER + CORE COMPONENTS + SUPPORT STRUCTURE + SIMULATION + R AND D PROGRAM

12-102335 ALSO IN CATEGORY 7 DATED 1975
ERDMAN CA + REYNOLDS AB
RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF LIQUID-METAL-COOLED FAST BREEDER REACTORS. PART 1: PRODUCTION
UNIVERISTY OF VIRGINIA
16 PAGES, 18 TABLES, 59 REFERENCES, NUCLEAR SAFETY, 16(1), PP. 43-59 (JAN.-FEB. 1975)

THIS ARTICLE, PRESENTED IN TWO PARTS, REVIEWS THE BEHAVIOR OF RADIONUCLIDES PRODUCED DURING THE NORMAL OPERATION OF A LIQUID-METAL-COOLED FAST BREEDER REACTOR (LMFBR). THE RESULTS GIVEN ARE PRIMARILY FROM THE LITERATURE, BUT SEVERAL INDEPENDENT CALCULATIONS ARE INCLUDED. NUMERICAL RESULTS ARE NORMALIZED TO A 1000-MW(E) LMFBR AND ARE COMPARED WITH A SIMILAR SIZE LIGHT-WATER REACTOR. SOURCES OF RADIOACTIVITY STUDIED INCLUDE PLUTONIUM AND OTHER TRANSURANIC ELEMENTS, FISSION PRODUCTS, TRITIUM, CORROSION PRODUCTS, ACTIVATION PRODUCTS, AND TRAMP FUEL.

EBR 1 AND 2 (RE) + PLUTONIUM + TRITIUM + FISSION PRODUCT TRANSPORT + CORROSION + SEFOR (RE) + TRANSURANIUM ELEMENT + OPERATING EXPERIENCE

12-102926 ALSO IN CATEGORY 7 DATED 1975
BAKER RD
QUARTERLY REPORT EXAMINATION OF FAST REACTOR FUELS, FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS, AND ANALYTICAL METHODS DEVELOPMENT - IRRADIATION TESTS, OCTOBER 1 THROUGH DECEMBER 31, 1974
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5681-PR +. 12 PAGES, MARCH 1975

THIS IS THE SECOND QUARTERLY REPORT ON THE EXAMINATION OF FAST REACTOR FUELS AND FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS AT THE LOS ALAMOS SCIENTIFIC LABORATORY. SINCE THE FIRST QUARTERLY REPORT (LA-5798-PR) THE ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS PROJECT HAS BEEN DIVIDED INTO THE FOLLOWING TWO PROJECTS. FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS AND ANALYTICAL METHODS DEVELOPMENT-IRRADIATION TESTS. MOST OF THE INVESTIGATIONS DISCUSSED HERE ARE OF THE CONTINUING TYPE. RESULTS AND CONCLUSIONS DESCRIBED MAY THEREFORE BY CHANGED OR AUGMENTED AS THE WORK CONTINUES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BORON + CARBIDE + CLADDING + HOT CELL + *ANALYTICAL TECHNIQUE + *IRRADIATION TESTING + *QUALITY ASSURANCE + CONTROL RODS + FUEL ELEMENTS

12-102927 ALSO IN CATEGORIES 7 AND 13 DATED 1975
BALLIF JL + BARTON GB + BORISCH RR + CAPLINGER WH + FUNK CW + LUTTON JM + MAFFEI MP
HEDL SODIUM REMOVAL PROGRAM ANNUAL REPORT FY-1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-63 +. 70 PAGES, 20 TABLES, 23 FIGURES, JAN. 1975

THE SODIUM REMOVAL PROGRAM AT HEDL HAS DEMONSTRATED THE ABILITY OF THE WATER-VAPOR/NITROGEN PROCESS TO CLEAN PUMPS, HEAT EXCHANGERS AND VALVES. THE FEASIBILITY OF THE PROCESS WAS DEMONSTRATED AND OPERATING CONDITIONS FOR REACTING BOTH BULK SODIUM AND SODIUM IN CREVICES WITHOUT DAMAGING THE COMPONENTS WERE IDENTIFIED. PROCESS DEVELOPMENT INCLUDED THE DEFINITION OF PROCESSING RATES FOR REMOVING BULK AND CREVICE SODIUM TO ESTABLISH PROCESSING CYCLES AND PROCESSING FACILITIES DESIGN. IT WAS CONCLUDED THAT THE WATER VAPOR IN NITROGEN REACTS WITH BULK SODIUM AT A RATE OF 0.02 IN.-NA/HR. ALSO CREVICES MUST BE LARGER THAN 0.001 IN. TO BE EFFECTIVELY AND REPRODUCIBLY PROCESSED TO REMOVE SODIUM.

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-102927 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + *DECONTAMINATION + HEAT TRANSFER + HYDROGEN + *STEAM + CORROSION + *WATER VAPOR

12-102928 ALSO IN CATEGORY 7 DATED 1975
SHETH A
PARAMETRIC STUDY OF SODIUM AEROSOLS IN THE COVER-GAS SPACE OF SODIUM-COOLED REACTORS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-11 +. 55 PAGES, 15 FIGURES, 34 REFERENCES, MARCH 1975

A MATHEMATICAL BEHAVIOR OF SODIUM AEROSOL IN ARGON, BUT NOT IN HELIUM AEROSOLS IN THE COVER-GAS SPACE OF A SODIUM-COOLED REACTOR. A REVIEW OF THE LITERATURE WAS FIRST MADE TO EXAMINE METHODS OF AEROSOL GENERATION. MATHEMATICAL EXPRESSIONS REPRESENTING AEROSOL BEHAVIOR, AND PERTINENT *EXPERIMENTAL INVESTIGATIONS OF SODIUM AEROSOLS. IN THE DEVELOPMENT OF THE MODEL, SOME TERMS* WERE DERIVED FROM BASIC PRINCIPLES AND OTHER TERMS WERE ESTIMATED FROM AVAILABLE CORRELATIONS. THE MODEL WAS SIMULATED ON A COMPUTER, AND IMPORTANT PARAMETERS WERE STUDIED TO DETERMINE THEIR EFFECTS ON THE OVERALL BEHAVIOR OF SODIUM AEROSOLS. THE PARAMETERS STUDIED WERE SODIUM POOL TEMPERATURE, SOURCE AND INITIAL SIZE OF PARTICLES, FILM THICKNESS AT THE SODIUM POOL/COVER GAS INTERFACE, WALL PLATING PARAMETERS, COVER-GAS FLOW RATE, AND TYPE OF COVER GAS (ARGON AND HELIUM). THE MODEL SATISFACTORILY DESCRIBES THE BEHAVIOR OF SODIUM AEROSOL IN ARGON, BUT NOT IN HELIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + *BIBLIOGRAPHY + COMPUTER PROGRAM + *ANALYTICAL MODEL + *AEROSOL PROPERTIES + COVER GAS + FILTER, TRAP + *THEORETICAL INVESTIGATION

12-102985 ALSO IN CATEGORIES 7 AND 18 DATED 1973
SOVIET - SWEDISH SYMPOSIUM ON REACTOR SAFETY PROBLEMS, MARCH 5-7, 1973. PART 2
AB ATOMENERGI, SWEDEN
CONF-730363 +. 120 PAGES, MEETING HELD AT STUDSVIK, MARCH 5-7, 1973

THERE WERE 17 PAPERS PRESENTED AT THE SYMPOSIUM. PART 1 CONTAINS THE SWEDISH PAPERS (8) AND THIS PART (PART 2) CONTAINS THE SOVIET PAPERS (9). THE TOPICS PRESENTED HERE INCLUDE A SAFETY SYSTEM FOR A PWR WITH A CONTROLLED RELEASE OF LOW-ACTIVE COOLANT; PROCESSES OCCURRING IN A PWR DURING A PIPE RUPTURE; MAJOR ACCIDENTS; FISSION PRODUCT TRANSFER AND DEPOSITION; PROBABILITY METHODOLOGY FOR HAZARD ASSESSMENT; MECHANICAL ACTIONS DURING ACCIDENTS; HOT WATER FLOW THROUGH ORIFICES AND TUBES; SAFETY OF SODIUM COOLED FAST REACTORS; AND RADIATION SAFETY OF THE BOR-60.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION + ACCIDENT, LOSS OF COOLANT + REACTOR, PWR + *FISSION PRODUCT TRANSPORT + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SWEDEN + *REVIEW + FLOW DISTRIBUTION + ORIFICE + *ENGINEERED SAFETY FEATURE + FLOW + PROBABILITY

12-104117 DATED 1900
ROBIN MG
STEAM GENERATORS DEVELOPED IN FRANCE FOR THE SUPER PHENIX
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE
ERDA-TR-3 + CONF-741065-4 +. 21 PAGES, FROM SYMPOSIUM ON STEAM GENERATORS FOR LMFBR'S, BENSBERG, F.R. GERMANY, OCT. 14, 1974

THE DEVELOPMENT PROGRAM OF STEAM GENERATORS STUDIED BY FIVES-CAIL BABCOCK AND STEIN INDUSTRY COMPANIES, JOINTLY WITH CEA AND EDF, FOR THE SUPER PHENIX 1200 MWE FAST BREEDER POWER PLANT, IS PRESENTED. THE MAIN CHARACTERISTICS OF BOTH SODIUM HEATED STEAM GENERATORS ARE EMPHASIZED AND EXPERIMENTAL STUDIES RELATED TO THEIR KEY FEATURES ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STEAM + COMPONENTS + STEAM GENERATOR + TUBING + GENERATORS

12-104276 ALSO IN CATEGORY 18 DATED 1975
SAFETY FEATURE ANALYSIS AND LICENSING
8 PAGES, TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 271-78, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON THE SUBJECT OF SAFETY FEATURE ANALYSIS AND LICENSING. THE TOPICS INCLUDE: A RATIONAL APPROACH TO ACCIDENT DOSE ASSESSMENT; REACTOR CAVITY PRESSURE RESPONSE TO A PIPE BREAK; A GENERALIZED COORDINATE TREATMENT OF THE VENT-CLEARING TRANSIENT FOR HORIZONTAL-VENT PRESSURE-SUPPRESSION CONTAINMENT SYSTEM; COMPUTATIONAL FEATURES OF THE CACECO CONTAINMENT ANALYSIS CODE; SELF-ACTUATED SHUTDOWN FOR LMFBR PLANTS; LMFBR LICENSING-COMPARISON WITH OTHER REACTOR DESIGNS; AND EVOLUTIONARY SAFETY DEVELOPMENTS FOR NUCLEAR POWER PLANTS.

COMPUTER PROGRAM + CONTAINMENT + CONTAINMENT, PRESSURE SUPPRESSION + *SAFETY ANALYSIS + *ENGINEERED SAFETY FEATURE + LICENSING PROCESS

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-10441E ALSO IN CATEGORY 11 DATED 1972
SENS PF
EXAMINATION OF FAST REACTOR FUEL PINS IRRADIATED IN A SODIUM ENVIRONMENT IN THE HFR SWING-IN FACILITY
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
RCN-167 +, 38 PAGES, FIGURES, MARCH 1972

TWO FAST REACTOR FUEL PINS HAVE BEEN IRRADIATED IN A NA ENVIRONMENT IN THE H.F.R. AT PETTEN FOR A SHORT DURATION AND AT A LINEAR POWER LEVEL OF 110 W/CM. THE POST-IRRADIATION EXAMINATION OF THESE PINS IS DESCRIBED. ACCIDENTAL INTERACTION BETWEEN UO2 AND AN A1203 ISOLATION PELLET OCCURED, PRESUMABLY DUE TO FLUX PEAKING AT THE END OF THE 50% ENRICHED FUEL COLUMN. SOLIDIFICATION OF THE MOLTEN FUEL IN THE CENTRE OF THE PIN CAUSED THE FORMATION OF A UO2 - A1203 EUTECTIC NETWORK BETWEEN THE PRIMARY UO2 DENDRIDES. THE ABSENCE OF A1203 IN THE COLUMNAR GRAIN REGION, EXCEPT AT THE OUTER BOUNDARY, CAN QUALITATIVELY BE EXPLAINED BY A MIGRATION MECHANISM WITH THE STEEP TEMPERATURE GRADIENT AS DRIVING FORCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALUMINUM + CHEMICAL REACTION + FAILURE, FUEL ELEMENT + FUEL MELTDOWN + OXIDE + URANIUM + HIGH TEMPERATURE + IRRADIATION TESTING + FUEL ROD

12-10442I DATED 1972
FISHER SE + HOOPER AJ
STUDY OF CORROSION AND DEPOSITION IN LIQUID METALS. PART I. OBSERVATIONS ON WEDGING CORROSION AND MASS TRANSPORT IN THE SYSTEM ZIRCONIUM/SODIUM/STAINLESS STEEL AT 650 C
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY, UK
RD/B/N-2521 +, 17 PAGES, DEC. 1972

THE USE OF ZIRCONIUM METAL AT HIGH TEMPERATURES IN THE PURIFICATION OF SODIUM HAS BEEN WIDELY REPORTED. A STUDY IS DESCRIBED OF THE INTERACTION BETWEEN ZIRCONIUM METAL SAMPLES AND SODIUM CONTAINING AN INITIALLY HIGH CONCENTRATION OF DISSOLVED OXYGEN, IN WHICH X-RAY DIFFRACTION, EDAX AND E.P.M.A. WERE USED TO EXAMINE ZIRCONIUM SAMPLES FOLLOWING SODIUM EXPOSURE. THE OBSERVED MASS TRANSFER OF CONSTITUENT ELEMENTS OF STAINLESS STEEL TO THE ZIRCONIUM IS ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CHEMICAL REACTION + DEPOSITION + ZIRCONIUM + STEEL, STAINLESS + CORROSION

12-10442J DATED 1973
ARKHIPOV VM + IVANENKO VN + TYMOSH BS
PROBLEMS OF SODIUM REMOVAL AND DEACTIVATION OF FAST REACTOR CIRCUITS AND COMPONENTS
AEC-TR-7431 +, 10 PAGES, 1973 (TRANSLATED FROM RUSSIAN)

A STUDY WAS MADE OF SOME PROBLEMS OF THE TECHNOLOGICAL PROCESS OF NONRADIOACTIVE AND RADIOACTIVE SODIUM REMOVAL AND THE DEACTIVATION OF THE COMPONENTS OF LIQUID METAL SYSTEMS WITH FAST REACTORS. IN THE INVESTIGAGION, PRIMARILY THE EXPERIENCE IN OPERATING THE BR-5 REACTOR AND THE SODIUM TEST UNITS OF THE FEI (PHYSICS AND POWER ENGINEERING INSTITUTE) IS USED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + OPERATING EXPERIENCE

12-10488G ALSO IN CATEGORY 7 DATED 1975
ERDMAN CA + KELLY JL + REYNOLDS AE
RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF LIQUID-METAL-COOLED FAST BREEDER REACTORS. PART 2: TRANSPORT
UNIVERSITY OF VIRGINIA
19 PPS, 9 TABS., 98 REFS., NUCLEAR SAFETY, 16(3), PP. 318-36 (MAY-JUNE 1975)

THIS IS THE SECOND PART OF A TWO-PART ARTICLE ON RADIONUCLIDE BEHAVIOR DURING NORMAL OPERATION OF A LIQUID-METAL-COOLED FAST BREEDER REACTOR (LMFBR). PART I, INCLUDED IN NUCLEAR SAFETY 16(1), DISCUSSED THE PRODUCTION OF RADIOACTIVITY: PART 2 REVIEWS THE TRANSPORT OF THE VARIOUS RADIONUCLIDES. ALTHOUGH RELIANCE WAS PLACED ON PUBLISHED RESULTS FOR BOTH PARTS, SOME NEW CALCULATIONS WERE MADE WHERE NEEDED. RESULTS WERE NORMALIZED TO A 1000-MW(E) LMFBR AND COMPARED WITH VALUES FOR A LIGHT-WATER REACTOR (LWR). THIS REVIEW INCLUDES THE TRANSPORT OF TRITIUM AND CORROSION PRODUCTS, TRANSPORT OF FISSION PRODUCTS FROM FAILED FUEL, BEHAVIOR OF RADIOACTIVITY IN SODIUM AND COLD TRAPS, AND OPERATION OF GASEOUS RADWASTE SYSTEMS. OPERATING EXPERINECES ARE REVIEWED FOR THE FAST REACTORS EBR-II, FERMI, SEFOR, DOUNREAY, RAPSODIE, AND BR-5; LIMITED DATA ATE GIVEN FOR THE THERMAL REACTORS SRE, S8ER, AND HALLAM.

EBR 1 AND 2 (RE) + FISSION GAS RELEASE + HALLAM (LMR) + TRITIUM + FISSION PRODUCT TRANSPORT + FILTER, TRAP + CORROSION + OFF GAS + OPERATING EXPERIENCE + RAPSODIE (LMCR)

12-10565A ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.123 - REQUIREMENTS FOR INTERMEDIATE HEAT TRANSPORT SYSTEM PUMP
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q001.123-1 OF AMENDMENT 1 TC CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE IHTS COOLANT PUMPS ARE REQUIRED TO REMAIN OPERABLE ONLY AT PONY MOTOR SPEED FOLLOWING ALL

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-105654 *CONTINUED*
SYSTEM RELATED EMERGENCY CONDITIONS AND THE FAULTED CONDITIONS. THE DECAY HEAT REMOVAL FUNCTION CAN BE ACCOMPLISHED WITH AS FEW AS ONE OF THE THREE IHTS LOOPS OPERATING.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *PUMPS

12-105666 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.1 - PROTECTION OF SAFETY RELATED EQUIPMENT FROM FLOODING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.1-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SAFETY-RELATED EQUIPMENT, LOCATED IN ALL AREAS BELOW GRADE, WILL BE PROTECTED AGAINST HIGH GROUNDWATER LEVEL OR MAXIMUM FLOOD. BY DESIGN CONSIDERATION, THERE WILL BE NO EXTERIOR ACCESSES OR ENTRANCES BELOW THE PLANT GRADE AT El.815, TO ALL SEISMIC CATEGORY I STRUCTURES, THEREBY COMPLETELY ELIMINATING THE POTENTIAL INGRESS OF GROUNDWATER OR FLOOD WATER. THERE ARE NO EXTERIOR PENETRATIONS INTO REACTOR CONTAINMENT STRUCTURE BELOW GRADE LEVEL.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + RESPONSE TO NRC QUESTION + *ENGINEERED SAFETY FEATURE + WEATHER, SEVERE + *FLOOD + CLINCH RIVER (LMFBR)

12-105667 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.2 - PROTECTION OF SAFETY RELATED EQUIPMENT LOCATED OUTDOORS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.2-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY SAFETY-RELATED COMPONENTS THAT WILL BE LOCATED OUTDOORS ARE: DIESEL FUEL OIL STORAGE TANKS, CATEGORY I ELECTRIC MANHOLES AND THE EMERGENCY COOLING TOWER BASIN. THE PROTECTION PROVIDED FOR POTENTIAL DAMAGE AGAINST TORNADO GENERATED MISSILES IS DESCRIBED. ALL VENTILATION SYSTEM AIR INTAKES AND EXHAUSTS WHICH ARE SAFETY RELATED, INCLUDING THOSE FOR EMERGENCY DIESEL GENERATOR UNITS, WILL BE PROTECTED AGAINST THE TORNADO-GENERATED MISSILES BY REINFORCED CONCRETE ENCLOSURES OR HEAVY METAL GRILLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*MISSILE GENERATION AND PROTECTION + VENTILATION SYSTEM + RESPONSE TO NRC QUESTION + *DESTRUCTIVE WIND + ENGINEERED SAFETY FEATURE + CLINCH RIVER (LMFBR)

12-105668 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.5 - PRELIMINARY LAYOUT DRAWING OF SAFETY RELATED AREAS OUTSIDE CONTAINMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.5-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DRAWINGS ARE NOT YET AVAILABLE BECAUSE SYSTEM ROUTING DESIGN IS NOT COMPLETE. HOWEVER, THE EFFECTS OF PIPE RUPTURE ARE BEING CONSIDERED IN THE DESIGN PROCESS USING SEPARATION OF RUPTURE SOURCES AND SAFETY RELATED EQUIPMENT AS THE PRINCIPAL MEANS OF PROTECTION FROM PIPING RUPTURE. THE ATTACHED TABLE LISTS BY BUILDING ALL SAFETY RELATED EQUIPMENT AND THE PIPING SYSTEMS WHICH THREATEN THEIR FUNCTION IN THE EVENT OF POSTULATED PIPING FAILURES DURING NORMAL PLANT OPERATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ACCIDENT + HYDRAULIC EFFECT + RESPONSE TO NRC QUESTION + DAMAGE + *ENGINEERED SAFETY FEATURE + DATA COLLECTION + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

12-105669 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.6 - PROTECTION OF SAFETY RELATED SYSTEMS FROM FREEZING
PROJECT MANAGEMENT CORP.
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY COMPONENT NOT HOUSED WITHIN TEMPERATURE CONTROLLED AREAS AND ESSENTIAL IN ATTAINING AND MAINTAINING A SAFE REACTOR SHUTDOWN ARE THE EMERGENCY COOLING TOWERS. PIPING TO THE EMERGENCY COOLING TOWERS WILL BE ROUTED UNDERGOUND BELOW THE FROST LEVEL TO PREVENT FREEZING. THE PIPING AT THE EMERGENCY COOLING TOWER IS DRAINED BY A 3/4 INCH PERMANENT BLEED LINE TO THE BASIN TO PREVENT FREEZING OF THE PIPES WHEN THE EMERGENCY COOLING TOWER IS NOT OPERATING.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

THERMAL INSULATION + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + ENGINEERED SAFETY FEATURE + *WEATHER, SEVERE + CLINCH RIVER (LMFBR)

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-105670 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 20.17 - AUXILIARY COOLANT FLUID SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q020.17-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE SAFETY RELATED PORTION OF THE ACFS PROVIDES HEAT REMOVAL SERVICE TO THE EX-VESSEL STORAGE TANK COMPONENT CELLS. TO THE FUEL HANDLING CELL AND TO THE OVERFLOW HEAT REMOVAL SYSTEM COMPONENT CELLS VIA THE RECIRCULATING GAS COOLING SYSTEM. THE ACFS IN CONJUNCTION WITH THE RGCS AND AUXILIARY LIQUID METAL SYSTEM IS DESIGNED TO PREVENT FUEL DAMAGE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *EMERGENCY COOLING + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR)

12-105671 ALSO IN CATEGORIES 5 AND 18 DATED 1975
RESPONSE TO QUESTION 20.19 - DECAY HEAT REMOVAL SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q020.19-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE STEAM GENERATOR AUXILIARY HEAT REMOVAL SYSTEM PROVIDES PRIMARY HEAT REMOVAL FOR THE REACTOR DECAY HEAT. THE OVERFLOW HEAT REMOVAL SYSTEM PROVIDES BACKUP FOR THE SGAHRS AS A SECONDARY MEANS FOR THE REACTOR DECAY HEAT REMOVAL. THE 100% REDUNDANT EX-VESSEL STORAGE TANK COOLING SYSTEM (EVS) PROVIDES SPENT FUEL DECAY HEAT REMOVAL SERVICE. ALL THREE SYSTEMS USE THE ATMOSPHERE AS AN ULTIMATE HEAT SINK. THE EMERGENCY PLANT SERVICE WATER SYSTEM WITH THE EMERGENCY COOLING TOWERS PROVIDES AUXILIARY HEAT REMOVAL TO SUPPORT THE OPERATION OF THE ABOVE SYSTEMS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DECAY HEAT + FUEL STORAGE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + COOLING + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

12-105673 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 110.4 - STRAIN FOR PIPE WHIP RESTRAINTS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q110.4-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

FOR METALLIC DUCTILE MATERIALS. THE PERMANENT STRAIN FOR PIPE WHIP RESTRAINTS WILL BE LIMITED TO 50% OF THE ULTIMATE UNIFORM STRAIN OF THE MATERIALS OF THE RESTRAINTS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DESIGN CRITERIA + *SHOCK ABSORBER + *STRESS STRAIN DATA + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

12-105691 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.13 - PRIMARY SHUTDOWN SYSTEM CAPABILITY
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE SECONDARY SHUTDOWN SYSTEM. ACTING ALONE. CAN TERMINATE ALL ANTICIPATED AND UNLIKELY EVENTS WITHOUT EXCEEDING THE SPECIFIED LIMITS EVEN IF THE MOST REACTIVE CONTROL ROD IN THE SECONDARY SYSTEM CANNOT BE INSERTED. THE OBJECTIVE OF PROVIDING SEPARATE PRIMARY AND SECONDARY SHUTDOWN SYSTEMS IS PROTECTION AGAINST COMMON MODE FAILURE DEGRADATION OF THE REACTOR TRIP FUNCTION. NOT REDUNDANCY.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

REACTOR TRANSIENT + CONTROL + *SHUTDOWN SYSTEM. SECONDARY + RESPONSE TO NRC QUESTION + REACTIVITY. NEGATIVE + REACTOR SHUTDOWN + CLINCH RIVER (LMFBR)

12-105693 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.22 - VENTILATION IN ELECTRICAL EQUIPMENT ROOM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.22-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

ROOM VENTILATION IS NOT REQUIRED FOR INITIAL OPERATION OF CLASS 1E CIRCUIT BREAKERS LOCATED IN THE ELECTRICAL EQUIPMENT ROOM. DURING CONTINUED OPERATION UNDER LOAD. THE ELECTRICAL EQUIPMENT ROOM VENTILATION FANS ARE REQUIRED TO OPERATE FOR PROPER FUNCTIONING OF LOCAL INSTRUMENTATION. PROTECTIVE RELAYS. AND CONTROL DEVICES INSTALLED ON THE CIRCUIT BREAKERS. EACH ELECTRICAL EQUIPMENT ROOM IS VENTILATED BY 2-100% CAPACITY HVAC SYSTEMS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-105693 *CONTINUED*
*VENTILATION SYSTEM + *ELECTRIC POWER + SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *EQUIPMENT + COMPARTMENT + BREAKER + CLINCH RIVER (LMFBR)

12-105694 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 310.4 - CONTROL ROOM VENTILATION SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 3 PAGES, 1 TABLE, PP. Q310.4-1 THRU Q310.4-3 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONTROL ROOM IS CLASSIFIED AS TYPE B CONSTRUCTION IN ACCORDANCE WITH REGULATORY GUIDE 1.78 AND IS CONSTRUCTED SUCH THAT THE LEAKAGE RATE IS ABOUT 0.06 AIR CHANGES PER HOUR. THE CONTROL ROOM IS PRESSURIZED TO MAINTAIN A MINIMUM OF 1/4 INCH WATER POSITIVE PRESSURE. THE CONTROL ROOM HVAC SYSTEM AIR INTAKES WILL BE PROVIDED WITH REDUNDANT, SEISMIC CATEGORY I DETECTORS FOR THOSE TOXIC MATERIALS WHICH CAN ENTER THE CONTROL ROOM AIR INTAKE IN UNACCEPTABLE CONCENTRATIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

VENTILATION SYSTEM + CONTROL + CHLORINE + RESPONSE TO NRC QUESTION + *CONTROL PANEL/ROOM + *TOXICITY + CLINCH RIVER (LMFBR)

12-105697 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 310.10 - EFFECTIVENESS OF CONTROL ROOM HABITABILITY SYSTEM FOR SODIUM FIRE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q310.10-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RELEASE OF SODIUM AND SUBSEQUENT SODIUM FIRES RESULTING IN THE RELEASE OF NA(SUB 2)O, NA(SUB 2)O(SUB 2), NAOH, NAH AND NA(SUB 2)CO(SUB 3) TO THE ATMOSPHERE IS DESCRIBED IN SECTION 7.2.1.1 OF THE ENVIRONMENTAL REPORT. THE EFFECT OF THE RELEASE OF SODIUM COMBUSTION PRODUCTS TO THE ATMOSPHERE ON THE HABITABILITY OF THE CONTROL ROOM WILL BE ANALYZED IN ACCORDANCE WITH REGULATORY GUIDE 1.78. THE RESULTS OF THIS ANALYSIS WILL BE PRESENTED IN THE FSAR.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*FIRE + *VENTILATION SYSTEM + COMBUSTION + RESPONSE TO NRC QUESTION + CONTROL PANEL/ROOM + TOXICITY + CLINCH RIVER (LMFBR)

12-105702 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 310.26 - CONTAINMENT PURGE ISOLATION VALVES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q310.26-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO EVENT RESULTING IN POSTULATED EJECTION OF BURNING SODIUM ONTO THE OPERATING FLOOR HAS BEEN IDENTIFIED. HOWEVER, EVEN IF THIS WERE TO BE POSTULATED, IT COULD NOT REACH THE ISOLATION VALVES BECAUSE OF THEIR LOCATION. THE CONTAINMENT ISOLATION VALVES GASKETING MATERIAL WILL BE BASED ON AN ASSUMED CONSERVATIVE TEMPERATURE OF 400 F AND ON ITS ABILITY TO WITHSTAND ANY CHEMICAL REACTION WITH THE COMBUSTION PRODUCTS OF BURNING SODIUM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + FIRE + CONTAINMENT PURGE + *CONTAINMENT ISOLATION + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + *VALVES

12-105703 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 310.30 - CONTAINMENT ATMOSPHERE CLEANUP SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE 310.30-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MOST LIMITING IN-CONTAINMENT RADIOACTIVE SODIUM FIRES RESULT FROM (1) THE POSTULATED FAILURE OF THE PRIMARY SODIUM STORAGE TANK DURING MAINTENANCE, AND (2) A POSTULATED PRIMARY HEAT TRANSPORT SYSTEM PIPING LEAK DURING OPERATION. A CONTAINMENT ATMOSPHERE CLEANUP SYSTEM, OR SOME OTHER ACCIDENT MITIGATING DEVICE, WOULD BE NECESSARY IF LEAKAGE OF RADIOACTIVE SODIUM AEROSOL TO THE ENVIRONMENT, RESULTING FROM EITHER OF THESE POSTULATED FIRES, RESULTED IN UNACCEPTABLE OFF-SITE EXPOSURES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + *AIR CLEANING + AIRBORNE RELEASE + *CONTAINMENT + FIRE + CONTAINMENT PURGE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + FILTERS

12-105709 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 331.9 - MAKE-UP RATE FOR PLANT HVAC SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q331.9-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28,

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-105709 *CONTINUED*
1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE FRESH AIR MAKE-UP RATE FOR THE PLANT HVAC SYSTEMS IS BASED ON THE FREQUENCY OF OCCUPATION OF THE VARIOUS AREAS. THE OCCUPATION FREQUENCY WAS DETERMINED IN A CONSERVATIVE MANNER. ON THE BASIS OF THE FRESH AIR MAKE-UP RATE, THE PLANT HVAC SYSTEM IS CAPABLE OF DILUTING THE AIRBORNE CONTAMINATION CONCENTRATION IN ALL OCCUPIED AREAS WELL BELOW THE PERMISSIBLE LIMITS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *VENTILATION SYSTEM + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + *INTAKE + CLINCH RIVER (LMFBR)

12-105887 ALSO IN CATEGORIES 9 AND 11 AND 18 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. ADVANCED SAFETY ANALYSIS. FIRST QUARTERLY REPORT, JULY-NOVEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14038-1 +. 65 PPS, 20 TABS, 23 FIGS, NOV. 1974

REPORTS PROGRESS FOR THE PERIOD IN THE FOLLOWING AREAS: ESTABLISHMENT OF SHUTDOWN SYSTEM RELIABILITY GOALS AND SUCCESS CRITERIA; INHERENT SAFE CORE DESIGN; FUEL ROD FAILURE MECHANISMS; AND ENGINEERING ANALYSIS OF POST-ACCIDENT HEAT REMOVAL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FAILURE, FUEL ELEMENT + RELIABILITY, SYSTEM + *R AND D PROGRAM + *EMERGENCY COOLING CONSIDERATIONS

12-105897 ALSO IN CATEGORY 7 DATED 1975
EPSTEIN ED
A REVIEW OF THE LITERATURE PERTINENT TO FISSION PRODUCT MIGRATION AND INTERACTION IN FUEL RODS
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A13423 +. 36 PPS, 4 FIGS, 33 REFS, JUNE 6, 1975

A SURVEY OF THE AVAILABLE LITERATURE PERTAINING TO THE VOLATILE FISSION-PRODUCT ACTIVITY IN FAST BREEDER REACTOR FUEL HAS BEEN CONDUCTED. THIS IS AN INITIAL EFFORT IN THE INVESTIGATION OF PLATEOUT (OR DEPOSITION) AND POTENTIAL PLUGGING IN THE GAS-COOLED FAST BREEDER REACTOR (GCFR) FUEL PRESSURE-EQUALIZATION SYSTEM (PES). A REVIEW OF THE MATERIAL SURVEYED AND THE RESULTS AND CONCLUSIONS REACHED WITH RESPECT TO PRESSURE-EQUALIZED AND VENTED GCFR FUEL RODS IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + DEPOSITION + DIFFUSION + CLADDING + FISSION PRODUCTS, VOLATILE + IODINE + MOLYBDENUM + TELLURIUM + FISSION PRODUCT TRANSPORT + THERMAL EXPERIMENT + REACTOR, HTGR + FUEL ROD + REACTOR, GCFR

12-105980 ALSO IN CATEGORIES 1 AND 9 AND 11 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP, ILL.
DOCKET-50537-22 +. 179 PAGES, AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, AUG. 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING COMPONENTS NOT COVERED BY ASME CODE, CONTROL RODS, SOURCE RANGE FLUX MONITORING SYSTEM, SODIUM DUMP SYSTEM, SODIUM FIRE PROTECTION SYSTEM, AND CUMULATIVE MECHANICAL DAMAGE FUNCTION. INCLUDES RESPONSES TO NRC QUESTIONS CONERNING THE ABOVE MENTIONED SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*NRC QUESTION + CODES AND STANDARDS + CONTAINMENT DESIGN + DESIGN CRITERIA + STORAGE CONTAINER + EQUIPMENT + *REPORT, PSAR + INSTRUMENT, STARTUP RANGE + FIRE PROTECTION + *CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

12-106295 ALSO IN CATEGORY 7 DATED 1975
GIESEKE JA + BEHN RC + CHACE AS
ANALYTIC STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY, TOPICAL REPORT, TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-1932 +. 236 PPS, FIGS, REFS, MARCH 18, 1975

COMPARISON AMONG THE COMPILED EXPERIMENTAL DATA AND BETWEEN THE DATA AND THE PREDICTIVE MODELS INDICATED THAT THE EFFECTS OF CONTAINMENT SIZE AND SHAPE ARE LEAST ADEQUATELY KNOWN OR PREDICTED. IT IS BELIEVED THAT THE AEROSOL BEHAVIOR MODELS CAN BE FURTHER IMPROVED BY INCLUDING MORE REALISTIC REPRESENTATIONS OF PARTICLE COLLISIONS AND AGGLOMERATE PROPERTIES. HOWEVER, IT IS ALSO RECOMMENDED THAT EXPERIMENTS BE PERFORMED TO CLARIFY THE EFFECTS OF VESSEL SIZE AND SHAPE ON AIRBORNE PARTICLE CONCENTRATIONS. THE OBJECTIVE OF THIS STUDY WAS TO COMPILE, COMPARE AND EVALUATE AVAILABLE DATA APPLICABLE TO ANALYSIS OF AEROSOL BEHAVIOR FOR FAST REACTOR SAFETY; TO IMPROVE THE CURRENTLY AVAILABLE AEROSOL BEHAVIOR MODELS; TO ESTABLISH ASSUMPTIONS FOR USE WITH IMPROVED MODELS WHICH WILL GIVE CONSISTENTLY CONSERVATIVE PREDICTIONS OF AIRBORNE AEROSOL CONCENTRATIONS; AND TO RECOMMEND FUTURE RESEARCH NEEDS

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-106295 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + AIRBORNE RELEASE + BIBLIOGRAPHY + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES + PLUTONIUM DIOXIDE

12-106672 ALSO IN CATEGORIES 5 AND 7 AND 11 A DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., TENN.
400 PGS, LTR W/AMENDMENT 5 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, OCT. 6, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AMENDS THE PRELIMINARY SAR BY SUBMITTING TWO APPENDICES, (E) PRIMARY PIPE RUPTURE FALLBACK POSITION AND (F) CORE DISRUPTIVE ACCIDENT ACCOMMODATION. THESE INCLUDE DETAILS OF THE PARALLEL DESIGN IN WHICH A PRIMARY PIPE RUPTURE AND A CORE DISRUPTIVE ACCIDENT RESPECTIVELY ARE TREATED AS DESSIGN BASIS ACCIDENTS. INCLUDES DESCRIPTIONS OF THE INITIATING ACCIDENTS, EVALUATIONS, DESIGN REQUIREMENTS, ALTERNATIVE ADDITIONAL PARALLEL DESIGN FEATURES AND ASSESSMENT OF DESIGN CAPABILITIES NECESSARY FOR TREATMENT OF THESE EXTREME AND LOW PROBABILITY ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + ACCIDENT + DESIGN CRITERIA + *REPORT, PSAR + MAIN COOLING SYSTEM + SYSTEM CAPABILITY + ACCIDENT, DESIGN BASIS + *CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS + ACCIDENT, CORE DISRUPTIVE

12-106780 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION E7 - ION EXCHANGE RESINS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +, 1 PG, P. A1-263 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THREE TO FIVE HOURS PER UNIT IS THE EXPECTED TIME REQUIRED FOR REGENERATION OF ION EXCHANGE RESINS, DEPENDING ON UNIT BEING REGENERATED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ION EXCHANGE + RESIN + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

12-107074 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 1.1 - RELIABILITY ALLOCATIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
3 PGS, PP. 1.1-1 THRU 1.1-3 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DISTINCTION BETWEEN 8 X 10(-7TH) AND 1 X 10(-6TH) IS MEANINGFUL IN PROVIDING GUIDELINES, AS ARE CUSTOMARILY ESTABLISHED IN THE RELIABILITY ALLOCATION PROCESS. THE SAFETY RELIABILITY APPORTIONMENT AS PRESENTED FOR THE CLINCH RIVER PLANT IS CONSISTENT WITH ACCEPTED APPORTIONMENT PRINCIPLES, AND DOES INDEED INCLUDE MEANINGFUL DISTINCTION AMONG ITS COMPONENTS. SPECIFICALLY, THE 8 TO 1 DIFFERENCE IN UNRELIABILITY ALLOCATION BETWEEN THE SHUTDOWN HEAT REMOVAL SYSTEM AND THE SHUTDOWN SYSTEM IS CONSIDERED TO BE CLEARLY MEANINGFUL AND REFLECTS THE RELATIVE CONTRIBUTIONS OF THE TWO SYSTEMS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*RELIABILITY ANALYSIS + ACCIDENT, PROBABILITY OF + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

12-107087 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 222.31 - RELIABILITY ALLOCATION FOR SUBSYSTEMS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, 1 TAB, PP. 222.31-1 THRU 222.31-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ALLOCATIONS FOR THE MAJOR SUBSYSTEMS OF THE SHUTDOWN SYSTEMS AND SHUTDOWN HEAT REMOVAL SYSTEMS ARE THE BASIS FOR DESIGN REQUIREMENTS RELATED TO RELIABILITY. THE ALLOCATION AT THIS LEVEL FOR THE SHUTDOWN SYSTEM IS INCLUDED IN APPENDIX C, SECTION C.14.1. ALLOCATION OF THE SUBSYSTEM TO THE LOWER LEVEL IS GENERATED BY THE DESIGN ORGANIZATION FOR TEST PLANNING AND COMPONENT SPECIFICATIONS. THE INITIAL REPORT SHOWING THE LOWER LEVEL ALLOCATIONS USED FOR TEST PLANNING PURPOSES IS CURRENTLY BEING PREPARED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

12-107192 ALSO IN CATEGORIES 9 AND 18 DATED 1975

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-107192 *CONTINUED*
BOURQUIN RD + BIRNEY KR
SCRAM - A COMPUTER PROGRAM FOR CALCULATING SCRAM TIMES FOR LMFBR CONTROL RODS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-83 +. 33 PPS, 5 FIGS, 5 REFS, AUG. 1975

THE ANALYTICAL TECHNIQUE INVOLVES THE DETERMINATION OF ALL THE FORCES ACTING ON THE CONTROL ROD SUB-SYSTEM DURING SCRAM. THE PROGRAM COMPLETES A FORCE BALANCE AS A FUNCTION OF THE DISTANCE TRAVELED DURING SCRAM AND DETERMINES THE TIME, PRESSURE DROP, BUNDLE VELOCITY, BUNDLE COOLANT VELOCITY, BYPASS COOLANT VELOCITY, AND BUNDLE ACCELERATION. THE PROGRAM IS SPECIFICALLY APPLICABLE FOR FFTF TYPE CONTROL RODS. RESULTS OBTAINED USING THE SCRAM MODEL ARE COMPARED WITH EXPERIMENTAL RESULTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL TECHNIQUE + FFTF (TR) + CONTROL ROD SCRAM MECHANISM + *CONTROL RODS

12-107712 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.136 - REACTION FORCES FROM RELIEF/SAFETY VALVES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.136-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RELIEF/SAFETY VALVE REACTION FORCES, DUE TO DEAD WEIGHT, SEISMIC EVENTS, DISCHARGING FLUID, THERMAL EXPANSION, AND THE DYNAMIC EFFECTS OF VALVE OPENING OR CLOSURE, WILL BE ACCOMMODATED WITH THE USE OF SUPPORTS ON THE VALVE DISCHARGE PIPING AND PROPER SIZING OF THE INLET NOZZLE TO LIMIT THE STRESS IN THE VALVE AND NOZZLE WITHIN CODE ALLOWABLES. MAGNITUDES OF THESE REACTION FORCES WILL BE DETERMINED AFTER FINALIZATION OF THE DISCHARGE PIPING CONFIGURATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

STRESS + *PRESSURE RELIEF + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR) + *VALVES + PIPES AND PIPE FITTINGS

12-107713 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.165 - DECAY HEAT REMOVAL SYSTEMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q001.165-1 THRU Q001.165-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN RATIONALE FOR THE REMOVAL OF DECAY HEAT IS TO USE THE MAIN CONDENSER FOR SHORT TERM HEAT REMOVAL WHENEVER IT IS AVAILABLE. THE PLANT OPERATOR MAY INITIATE HEAT REMOVAL VIA THE PROTECTED AIR COOLED CONDENSERS (PACC) FOR LONG TERM HEAT REMOVAL AT ANY TIME, HOWEVER, DUE TO THE LIMITED HEAT REMOVAL ABILITY OF THE PACC'S (45 MWT TOTAL FOR THREE UNITS) EITHER THE MAIN TURBINE GENERATOR CONDENSER OR THE SHORT TERM STEAM VENTING AND AUXILIARY FEEDWATER WHICH MAKE-UP A SGAHRS SUBSYSTEM MUST FUNCTION UNTIL THE STEAM GENERATOR HEAT LOAD DROPS BELOW THE CAPABILITY OF THE PACCS (APPROX. 4 1/2% OF RATED).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DECAY HEAT + OPERATION + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

12-107714 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.199 - INTERMEDIATE SODIUM REMOVAL SYSTEM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.199-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE FUNCTION OF THE INTERMEDIATE SODIUM REMOVAL SYSTEM, LOCATED IN THE STEAM GENERATOR BUILDING, IS TO REMOVE THE RESIDUAL SODIUM, WHICH IS CONTAMINATED WITH TRITIUM, FROM THE COMPONENTS OF THE INTERMEDIATE HEAT TRANSPORT SYSTEM. THE MAJOR COMPONENTS TO BE CLEANED IN THE INTERMEDIATE SYSTEM ARE THE STEAM GENERATOR MODULE AND THE IHTS PUMP ASSEMBLY. THE ISRS PROVIDES THE CAPABILITY TO CLEAN THESE COMPONENTS 12 AND 6 TIMES IN 30 YEARS, RESPECTIVELY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

12-107747 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.91 - FAULTED CONDITION IN HEAT TRANSPORT SYSTEM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.91-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-107747 *CONTINUED*
LOADINGS AND STRESSES ON THE HEAT TRANSPORT SYSTEM RESULTING FROM FAULTED CONDITIONS SHALL BE EVALUATED AGAINST THE CRITERIA AND LIMITS GIVEN IN THE ASME CODE, SECTION III, FOR FAULTED CONDITIONS. THIS WILL ASSURE THAT THE INTEGRITY OF PRESSURE BOUNDARY WILL NOT BE BREACHED. ANY FUNCTIONAL DEMANDS FOR ACTIVE COMPONENTS NEEDED TO PROVIDE DECAY HEAT REMOVAL DURING FAULTED CONDITIONS SHALL BE PROVIDED IN THE RESPECTIVE EQUIPMENT SPECIFICATION OF THE COMPONENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT + DESIGN CRITERIA + RESPONSE TO NRC QUESTION + SHUTDOWN COOLING SYSTEM + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

12-107760 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.183 - INITIATION SIGNALS FOR CONTAINMENT ISOLATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.183-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

EARLIER IN THE DESIGN BOTH TEMPERATURE AND PRESSURE WERE CONSIDERED FOR INITIATION OF THE CIS; HOWEVER, BOTH WERE ELIMINATED. CALCULATIONS SHOW THAT SUBSTANTIAL (FOR DETECTION PURPOSES) PRESSURE AND/OR TEMPERATURE RISES ARE DELAYED MANY HOURS AFTER THE INITIATION OF ACCIDENTS. FURTHER, THE MAXIMUM PRESSURE IS IN THE RANGE OF 2 PSIG AND THE MAXIMUM TEMPERATURE IS 250 F. IN ADDITION THE DIRECT MEASUREMENT OF THE LIMITING PARAMETER, WHICH IS RADIOACTIVITY IN THIS CASE, IS THE MOST DESIRABLE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTROL SYSTEM + *CONTAINMENT ISOLATION + RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + PRESSURE TRANSIENT + THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

12-108071 ALSO IN CATEGORIES 8 AND 18 DATED 1975
SARMA BUE + THOMPSON RC + STITT RK
REVIEW OF SODIUM FIRE ANALYTICAL MODELS
GENERAL ELECTRIC COMPANY
GEAP-14053 +, 100 PPS, 43 FIGS, 22 REFS, JUNE 1975

THE CODES SPRAY, SOFIRE II AND CACECC WERE UTILIZED FOR ANALYZING SODIUM FIRES AND MODELING SEVERAL SODIUM FIRE EXPERIMENTS CONDUCTED BY ATOMICS INTERNATIONAL. THE RESULTS ARE INTER-COMPARED TO EVALUATE THE CODE. WITHIN A LIMITED RANGE OF SPRAY FIRES IN LOW OXYGEN ENVIRONMENTS, THE SPRAY CODE APPEARS TO YIELD REASONABLE RESULTS. WITH CAREFUL APPLICATION AND USING SPRAY, SOFIRE II AND CACECC IN CONJUNCTION WITH EACH OTHER, PRIMARY SODIUM FIRES IN INERTED ENVIRONMENT (<~ 2 VOL % OXYGEN) CAN BE ADEQUATELY ANALYZED. HOWEVER, THERE IS NO CODE AVAILABLE FOR ANALYZING SPRAY FIRES IN AIR ENVIRONMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + *FIRE + *ANALYTICAL MODEL + SPRAY

12-108175 ALSO IN CATEGORY 18 DATED 1975
RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL SECOND QUARTERLY REPORT, MARCH-MAY 1975
GENERAL ELECTRIC CO.
GEAP-14045-2 +, 50 PPS, 4 TABS, 9 FIGS, JUNE 1975

THE LMFBR SHUTDOWN HEAT REMOVAL AND STRUCTURAL RELIABILITY PROGRAM PLAN 2 WAS COMPLETED IN APRIL 1975. THE PLAN HAS BEEN STRUCTURED TO INCLUDE THE APPLICABLE PORTIONS OF RELIABILITY ASSURANCE STANDARD RDT F2-9T AND RELIABILITY ENGINEERING DISCIPLINES DEVELOPED FOR THE DEFENSE AND SPACE INDUSTRY. THE PROGRAM PLAN EMPHASIZES THE ANALYSES NEEDED TO CONFIRM STRUCTURAL INTEGRITY OF THE CORE SUPPORT STRUCTURE AND COOLANT BOUNDARIES AS WELL AS SHUTDOWN HEAT TRANSFER SYSTEMS OPERATIONAL RELIABILITY. A PRELIMINARY ASSESSMENT OF LMFBR HEAT REMOVAL SYSTEMS WAS COMPLETED. THE NUMERICAL RELIABILITY ANALYSIS IS PRIMARILY A PREDICTION OF THE PROBABILITY THAT THE CRBRP SHUTDOWWN HEAT REMOVAL SYSTEMS (SHRS) WILL BE UNABLE TO REMOVE REACTOR HEAT WHEN REQUIRED TO PREVENT LOSS OF CORE COOLABLE GEOMETRY. THE CURRENT ESTIMATE OF THIS PREDICTION IS 3.5 X 10(EXP -7)/YEAR, AND IT HAS BEEN INCORPORATED INTO APPENDIX C OF THE CRBRP PSAR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + *RELIABILITY ANALYSIS + RELIABILITY, SYSTEM + SHUTDOWN COOLING SYSTEM + R AND D PROGRAM + PROBABILITY + CLINCH RIVER (LMFBR)

12-108193 ALSO IN CATEGORY 7 DATED 1975
REED LD + GIESEKE JA
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY: FY 1975 ANNUAL REPORT TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-662 +, 130 PPS, 11 TABS, 37 FIGS, REFS, OCT. 1975

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-108193 *CONTINUED*
WORK DURING THE PAST YEAR WAS DIRECTED TOWARD SIX MAJOR FRONTS. FIRST, PREPARATION OF THE FINAL REPORT CONCERNING THE STUDY ENTITLED 'ANALYTIC STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY', BMI-1932. SECOND, DEVELOPMENT OF THE MOST CURRENT AEROSOL MODEL, HAARM-1. THIRD, DEVELOPMENT OF A NEW AEROSOL BEHAVIOR MODEL. FOURTH, A LITERATURE REVIEW CONCERNING THE BEHAVIOR OF NONSPHERICAL AEROSOL AGGLOMERATES. FIFTH, SCOPING CALCULATIONS WERE COMPLETED CONCERNING THE EJECTION OF ALPHA-EMITTING PARTICLES DUE TO THEIR RADIOACTIVE DECAY. AND SIXTH, SENSITIVITY ANALYSES OF EVENTUAL MASS LEAKED TO THE ATMOSPHERE FROM DOUBLY CONTAINED AEROSOL RELEASES WERE PERFORMED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES

12-108194 ALSO IN CATEGORY 7 DATED 1975
HUANG TC + STITT RK
REVIEW AND EVALUATION OF CURRENT AEROSOL MODELS FOR LMFBR SAFETY ANALYSIS
GENERAL ELECTRIC COMPANY
GEAP-14054 +. 52 PPS, 9 TABS, 12 FIGS, 58 REFS, JUNE 1975

THIS STUDY CONCLUDES THAT THE AEROSOL BEHAVIOR MODELS PRESENTLY AVAILABLE CAN BE UTILIZED TO ADEQUATELY PREDICT AEROSOL BEHAVIOR IN THE REACTOR CONTAINMENT BUILDING, PROVIDING THE STOKES' CORRECTION FACTOR, THE GRAVITATIONAL COLLISION EFFICIENCY AND THE BOUNDARY LAYER THICKNESS AT THE WALL CAN BE DETERMINED FOR THE SIZE CONTAINMENT BEING ANALYZED. THE STATE-OF-KNOWLEDGE AS TO THE PROCESSES AND CONTROLLING PHENOMENA ASSOCIATED WITH THE FORMATION OF AEROSOLS FROM SODIUM FIRE, FUEL VAPOR CONDENSATION, AND FRAGMENTATION WERE STUDIED. A VARIETY OF ANALYTICAL AEROSOL SOURCE MODELS WERE ASSESSED AND THE IMPORTANT EXPERIMENTAL RESULTS WERE SUMMARIZED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

AEROSOL + COMPUTER PROGRAM + PLUTONIUM + ANALYTICAL MODEL + AEROSOL PROPERTIES

12-108671 ALSO IN CATEGORIES 7 AND 8 AND 11 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 270 PGS, AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING THE QUALITY ASSURANCE PROGRAM, TEST GROUTING PROGRAM (NEW APPENDIX 2-C), COMPARISON WITH FFTF AND MONJU, CORE INTERNALS, SHUTDOWN COOLING SYSTEMS, DOSES FROM EXPOSURE TO LIQUID EFFLUENTS, LEAKAGE FROM SODIUM COLD TRAPS AND PUMP SEIZURE ANALYSIS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING DECAY HEAT REMOVAL, STRESS FROM CDA, PRIMARY PUMP SEAL FAILURES, FISSION PRODUCTS IN SODIUM AEROSOL, CELL TEMPERATURE AND PRESSURE DURING SODIUM FIRE, AND SURFACE AREA FOR CONDENSATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + CONCRETE + CONTAINMENT + FIRE + TESTING + RADIOACTIVITY RELEASE + SEAL + *REPORT, PSAR + QUALITY ASSURANCE + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *CLINCH RIVER (LMFBR) + PUMPS

12-108672 ALSO IN CATEGORIES 5 AND 18 DATED 1975
RESPONSE TO QUESTION 001.61 - DECAY HEAT REMOVAL CAPABILITY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.61-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE VERIFICATION OF NATURAL CIRCULATION DECAY HEAT REMOVAL CAPABILITY OF CRBRP WILL BE BASED ON ANALYSIS USING DATA FROM COMPONENT TESTS. THE SYSTEM RESISTANCE FLOW TESTS ON KEY COMPONENTS, THAT IS, THE SPECIFIED REQUIREMENTS FOR DELTA P AS A FUNCTION OF FLOW WILL BE VERIFIED BY TESTS ON AN INDIVIDUAL COMPONENT BASIS. THE REACTOR PRESSURE DROPS WILL BE DETERMINED BY OUT-OF-REACTOR TESTS ON INDIVIDUAL COMPONENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DECAY HEAT + TESTING + RESPONSE TO NRC QUESTION + COMPONENTS + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + CLINCH RIVER (LMFBR)

12-108747 ALSO IN CATEGORY 8 DATED 1975
BOEHMER WD + HILLIARD BK
SODIUM FIRE PROTECTION BY SPACE ISOLATION, OPEN CATCH PAN AND NITROGEN FLOODING -- FFTF PROOF TEST F5
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-98 +. 76 PPS, 34 FIGS, 8 REFS, OCT. 1975

A LARGE-SCALE SODIUM FIRE EXTINGUISHMENT TEST WAS PERFORMED TO DEMONSTRATE THE ADEQUACY OF THE FFTF SECONDARY SODIUM FIRE PROTECTION SYSTEM. TWENTY-THREE HUNDRED POUNDS OF SODIUM AT 1100

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-108747 *CONTINUED*
DEG. F WERE SPILLED INTO AN AIR FILLED CELL WHICH HAD A STEEL CATCH PAN PROTECTING THE CONCRETE FLOOR AND WALLS. THE FIRE WAS SELF-EXTINGUISHED WHEN THE OXYGEN IN THE RELATIVELY LEAK TIGHT CELL WAS CONSUMED BY SODIUM-OXYGEN REACTION. NITROGEN FLOODING WAS STARTED AFTER 15 MINUTES TO MAINTAIN AN INERT ATMOSPHERE DURING COOLING. ONLY 5.7% OF THE SODIUM WAS REACTED DURING THE TEST. APPROXIMATELY 100 LB. OF WATER WERE RELEASED FROM THE CONCRETE, ONE TENTH OF WHICH REACTED TO FORM HYDROGEN. IT WAS CONCLUDED THAT ALL ASPECTS OF THE TEST RESULTS WERE PREDICTABLE AND THAT THE FFTF SECONDARY SODIUM FIRE PROTECTION SYSTEM WAS VERIFIED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

METAL WATER REACTION + TESTING + FFTF (TR) + SPRAY + IGNITION + CONTAINMENT ATMOSPHERE + FIRE PROTECTION

12-108748 ALSO IN CATEGORIES 7 AND 8 AND 18 DATED 1975
ANNUAL TECHNICAL PROGRESS REPORT - NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS - GOVERNMENT FISCAL YEAR 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13155 +. 53 PPS, 34 FIGS, 7 REFS, AUG. 15, 1975

PROJECT OBJECTIVES ARE TO (1) DEVELOP A COMPUTER PROGRAM FOR CALCULATING TWO-DIMENSIONAL, TRANSIENT NATURAL CONVECTION PHENOMENA, SUCH AS THOSE ARISING FROM VARIOUS POSTULATED SODIUM SPILL ACCIDENTS IN LMFBR HEAT TRANSFER VAULTS, HEAD COMPARTMENTS, CONTAINMENT BUILDINGS, AND SECONDARY HEAT TRANSFER SYSTEMS. (2) DEVELOP EXPERIMENT PROGRAMS AND CONDUCT TESTS THAT WILL CHARACTERIZE THE BEHAVIOR OF SODIUM, SODIUM OXIDE, FUEL, FISSION PRODUCT, AND OTHER AEROSOLS AS THEY MIGHT BE GENERATED BY VARIOUS POSTULATED LMFBR ACCIDENTS. (3) DETERMINE BY ANALYSIS AND EXPERIMENT THE GENERATION AND TRANSPORT OF THESE AEROSOLS WITH RESPECT TO SOURCE (LOCATION, TYPE, AND CONFIGURATION) RELEASE DISPERSAL, AGGLOMERATION ATTENUATION, AND REMOVAL FOR THE ENTIRE COURSE OF EVENTS ASSOCIATED WITH REAL AND HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + AEROSOL + COMPUTER PROGRAM + FIRE + FUEL MELTDOWN + SPRAY + HEAT TRANSFER, NATURAL CONVECTION + IGNITION + TRANSPORT PROPERTY + BUBBLE + *R AND D PROGRAM + LEAK + BEHAVIOR

12-108759 ALSO IN CATEGORIES 5 AND 6 AND 8 AN DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

12-108762 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 001.144 - AUXILIARY FEEDPUMP TURBINE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. G001.144-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AUXILIARY FEEDPUMP TURBINE IS NOT KEPT HOT FOR QUICK START OPERATION. THE DRIVE TURBINE CONCEPT SELECTED FOR THE AUXILIARY FEED PUMP IS BASED ON THE CAPABILITY OF THIS TURBINE TO WITHSTAND SEVERE SERVICE CONDITIONS. THIS IS ACCOMPLISHED BY CONSTRUCTING THE TURBINE WHEEL FROM A SINGLE FORGING WITH BUCKETS MILLED INTO THE FORGING. THE START-UP PROCEDURE IS SIMILAR TO THAT FOR THE RCIC TURBINE IN A BWR IN THAT IT WILL OCCUR WITHOUT PRE-WARMING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + RESPONSE TO NRC QUESTION + TURBINE + THERMAL TRANSIENT + *AUXILIARY + CLINCH RIVER (LMFBR) + *FEEDWATER

12-109156 ALSO IN CATEGORY 9 DATED 1975
GOURDON J + GOURIOU A + JEANNOT A + JALLADE M
SYSTEM FOR INCIDENT DETECTION AND CORE SURVEILLANCE FOR A FAST REACTOR
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS
CONF-750411-40 +. 26 PPS, PRESENTED AT THE EUROPEAN NUCLEAR CONFERENCE, APRIL 21-25, 1975

PRESENTS A REVIEW OF AN INCIDENT DETECTION SYSTEM FOR A FAST REACTOR. THE AREAS COVERED INCLUDE:

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-109156 *CONTINUED*
1) NORMAL OPERATION, 2) THE INCIDENT SITUATION (WITH ALERT AND SCRAM), AND 3) THE INTERMEDIATE AREA WHEREIN A DEFECT ARISES. THE PRINCIPAL INCIDENTS THREATENING A CORE ARE REVIEWED, AS WELL AS ASPECTS ASSOCIATED WITH A LARGE PLANT MEETING ELECTRIC POWER DEMANDS. LASTLY, THE SURVEILLANCE AND PROTECTION SYSTEM OF THE SUPER PHENIX CORE IS DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + INSTRUMENT, PROTECTIVE + *REACTOR PROTECTION SYSTEM + NOISE ANALYSIS + INSTRUMENT, SURVEILLANCE + SYSTEM DESCRIPTION + COMPUTER CONTROL

12-109210 ALSO IN CATEGORY 9 DATED 1975
JOSEPHSON J + HUEBOTTER PR + SOWA ES
DEVELOPMENT OF SELF-ACTUATED SHUTDOWN SYSTEMS FOR LMFBR PLANTS. FINAL REPORT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/CT-76-2 +. 190 PPS, 16 TABS, 44 FIGS, 21 REFS, AUG. 1975

THE FURTHER DEVELOPMENT DURING FY 1975 OF THE SELF-ACTUATED SHUTDOWN SYSTEM (SASS) FOR LMFBR PLANTS CARRIED OUT AT ANL IS PRESENTED IN THIS REPORT. A FERROMAGNETIC CURIE TEMPERATURE PERMANENT MAGNET HOLDING DEVICE HAS BEEN SELECTED AS THE BASIS FOR THE DESIGN OF THE INHERENT SHUTDOWN ASSEMBLY OF THE SASS. THE SELF-ACTUATED SELF-CONTAINED DEVICE OPERATES SUCH THAT ACCIDENT CONDITIONS, RESULTING IN INCREASED COOLANT TEMPERATURE OR NEUTRON FLUX REDUCE THE MAGNETIC HOLDING FORCE BY RAISING THE TEMPERATURE OF THE TRIGGER MECHANISM ABOVE THE CURIE POINT. BORON CARBIDE ABSORBER IS THEN INSERTED INTO THE CORE, UNDER GRAVITY, TERMINATING THE ACCIDENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*SHUTDOWN MECHANISM, SELF + CONTROL ROD SCRAM MECHANISM + *SHUTDOWN SYSTEM, SECONDARY + R AND D PROGRAM + EQUIPMENT DEVELOPMENT

12-109479 ALSO IN CATEGORIES 5 AND 18 DATED 1975
CATTON I
POST-ACCIDENT HEAT REMOVAL FOR LMFBR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7593 +. 54 PPS, 4 FIGS, 29 REFS, NOV. 1975

PREDICTIONS OF DRYOUT CONDITIONS FOR FFTF ARE MADE AND FOUND TO DIFFER FROM THOSE PREVIOSULY REPORTED. AN APPROXIMATE CRITERION FOR CORE DISPERSAL IS PRESENTED WHICH INDICATES THAT MUCH HIGHER DECAY HEAT LEVELS MAY BE REQUIRED FOR CORE DISPERSAL THAN PREDICTED. APPLICATION OF RECENT WORK ON PREDICTION OF HEAT TRANSFER FROM DOWNWARD FACING SURFACES INDICATES THAT NON-UNIFORM HEAT FLUX HAS A SIGNIFICANT EFFECT ON THE FFTF LOWER DOME THICKNESS.

AVAILABILITY - UNIVERSITY OF CALIFORNIA, SCHOOL OF ENGINEERING & APPLIED SCIENCE, ENERGY AND KINETICS DEPARTMENT, LOS ANGELES, CALIFORNIA

DECAY HEAT + *FFTF (TR) + CORE MELTDOWN + HEAT TRANSFER ANALYSIS + HEAT FLUX, DRYOUT + EMERGENCY COOLING + *ACCIDENT, CORE DISRUPTIVE

12-109503 ALSO IN CATEGORY 18 DATED 1975
CARVER JR + TEAL GR + WALDO JB
INSTALLATION OF THE FFTF IN-VESSEL HANDLING MACHINE INTO A SODIUM ENVIRONMENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-93 +. 36 PPS, 26 FIGS, NOV. 1975

THE FFTF IN-VESSEL HANDLING MACHINE ENGINEERING MODEL WAS SUCCESSFULLY INSTALLED IN THE SODIUM/ARGON ENVIRONMENT OF THE COMPOSITE REACTOR COMPONENT TEST ACTIVITY. SINCE ALL OF THE COMPONENTS OF THE FFTF LARGE COMPONENT HANDLING SYSTEM WERE NOT AVAILABLE, SPECIAL EQUIPMENT AND PROCEDURES WERE REQUIRED TO ACCOMPLISH THE INSTALLATION. HIGHLIGHTING THE TRANSFER WAS THE SUCCESSFUL USE OF A CYLINDRICAL PLASTIC SHROUD, 42 FEET LONG AND 8.5 FEET IN DIAMETER, TO EXCLUDE AIR FROM THE CRDTA VESSEL WHILE THE IVHM WAS LOWERED INTO POSITION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL HANDLING + ARGON + COVER GAS + FFTF (TR) + TEST, COMPONENT + FUEL HANDLING MACHINE + COMPONENTS + OPERATING EXPERIENCE

12-109506 ALSO IN CATEGORY 7 DATED 1975
REED LD + GIESEKE JA
SENSITIVITY ANALYSIS FOR POSTULATED LMFBR ACCIDENT CONDITIONS
BATTELLE COLUMBUS LABS., OHIO
BMI-X-664 +. 66 PPS, 39 FIGS, 4 REFS, OCT. 1975

THE AGGLOMERATION GROWTH, TRANSPORT, DEPOSITION, AND RELEASE FROM THE CONTAINMENT OF AEROSOLS ARE PREDICTED BY THE SEVERAL AVAILABLE AEROSOL BEHAVIOR MODELS. DISCUSSES THE COMPUTER-PREDICTED EFFECTS OF SUCH ASSUMED CONDITIONS ON AIRBORNE AEROSOL MASS CONCENTRATION OR MASS LEAKED. ALSO, THE EFFECTS OF USING DIFFERENT AVAILABLE COMPUTER CODES IS ILLUSTRATED IN TERMS OF THE DETAILS ASSUMED FOR AEROSOL BEHAVIOR MECHANISMS.

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-109506 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + DEPOSITION + PARTICLE SIZE + ANALYTICAL MODEL + AEROSOL PROPERTIES + AGGLOMERATE + ACCIDENT MODEL + SENSITIVITY ANALYSIS

12-109624 ALSO IN CATEGORY 7 DATED 1975
REED LD + GIESEKE JA
AEROSOL BEHAVIOR MODELING FOR FAST REACTOR SAFETY: QUARTERLY PROGRESS REPORT FOR JULY THROUGH SEPTEMBER, 1975, TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-666 +. 20 PPS, 3 FIGS, 8 REFS, OCT. 30, 1975

PROGRESS AT BATTELLE DURING THE PREVIOUS 3-MONTH PERIOD HAS BEEN MADE IN THREE GENERAL AREAS. A SODIUM OXIDE AEROSOL GENERATOR HAS BEEN DESIGNED AND CONSTRUCTED FOR USE WITH A MILLIKAN CELL APPARATUS IN STUDYING SODIUM OXIDE AGGLOMERATE CHARACTERISTICS. THE EXPERIMENTAL DESIGN, RATIONALE, AND PROCEDURE ARE DISCUSSED IN DETAIL IN A LATER SECTION OF THIS REPORT. ALSO, FURTHER IMPROVEMENTS HAVE BEEN MADE IN THE HARRM-1 AEROSOL BEHAVIOR CODE AND A SECOND GENERATION CODE, HAARM-2, HAS BEEN DEVELOPED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + COMPUTER PROGRAM + OXIDE + ANALYTICAL MODEL + AGGLOMERATE + THEORETICAL INVESTIGATION

12-109914 ALSO IN CATEGORY 5 DATED 1974
ANTONAKAS D + ZALESKI CP + MALAVAL M + CHALOT A
DECAY HEAT REMOVAL IN AN LMFBR
COMMISSARIAT A L'ENERGIE ATOMIQUE + ELECTRICITE DE FRANCE
CONF 740401-P2 +. 16 PPS, PP. 785-801, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THIS PAPER DISCUSSES CRITERIA PERTINENT TO DECAY HEAT REMOVAL PRESENTLY UNDER CONSIDERATION FOR LMFBR'S IN FRANCE; AND DESCRIBES THE SOLUTIONS RETAINED IN SUPER PHENIX PROJECT, NOW IN THE DETAILED DESIGN PHASE, AND IN PHENIX DEMONSTRATION PLANT, NOW IN OPERATION. SOME THOUGHTS ABOUT DECAY HEAT REMOVAL AFTER AN EVENTUAL CORE MELT DOWN ACCIDENT ARE PRESENTED AND AN EVALUATION OF DIFFERENT DECAY HEAT REMOVAL SYSTEMS BY PROBABILISTIC METHODS IS GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + FRANCE + *EMERGENCY COOLING + COOLING

12-109929 ALSO IN CATEGORIES 9 AND 17 DATED 1974
PALAMIDESSI A
SAFETY DESIGN APPROACH TO THE PEC REACTOR
CNEN, BOLOGNA, ITALY
CONF-740401-P2 +. 20 PPS, PP. 1021-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN AND EVALUATION APPROACH USED TO ASSURE SAFETY IN THE PEC REACTOR IS DISCUSSED. SAFETY GOALS WERE ESTABLISHED TO GUIDE DESIGN AND TO PROVIDE ASSURANCE OF ADHERENCE WITH GENERAL SAFETY PRINCIPLES. SOME POSTULATED FAULTS ARE SURVEYED AND ENGINEERED SAFETY FEATURES AND PROTECTIVE SYSTEMS TO PREVENT THE ACCIDENTS OR MITIGATE THE CONSEQUENCES ARE DISCUSSED. THE EXTREMELY IMPROBABLE OR HYPOTHETICAL OCCURRENCES IN WHICH THE PROTECTIVE SYSTEMS ARE ASSUMED TO FAIL TO DERIVE DESIGN BASIS CONDITIONS ARE BRIEFLY DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + REACTOR PROTECTION SYSTEM + ACCIDENT, HYPOTHETICAL + DESIGN STUDY + *SAFETY EVALUATION + ENGINEERED SAFETY FEATURE + *ACCIDENT, ATWS

12-109931 ALSO IN CATEGORIES 9 AND 17 DATED 1974
YELLOWLEES JM + VIELDER G + SACRISTE C
THE ENGINEERED SAFEGUARDS AND THEIR IMPLICATIONS FOR THE GBR-4 DESIGN
EUROPEAN ASSOCIATION FOR THE GAS BREEDER REACTOR, BRUSSELS
CONF-740401-P2 +. 13 PPS, PP. 1105-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DESCRIBES THE INHERENT SAFETY FEATURES AND ENGINEERED SAFEGUARDS OF A COMMERCIAL GAS-COOLED BREEDER REACTOR. THE RELIABILITY OF THE REACTOR, THE HEAT REMOVAL FROM THE CORE AND THE RADIOLOGICAL SAFEGUARDS ARE EMPHASIZED. THE CONCLUSION IS DRAWN THAT, USING CONVENTIONAL GAS-COOLED REACTOR ENGINEERING PRACTICE, THE GAS-COOLED BREEDER REACTOR CAN BE MADE AS SAFE AS ANY OTHER REACTOR SYSTEM WITHOUT LOSING ITS ECONOMIC COMPETITIVITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR, GCR + REACTOR PROTECTION SYSTEM + SAFETY EVALUATION + ENGINEERED SAFETY FEATURE

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-109945 ALSO IN CATEGORY 9 DATED 1974
MORGENSTERN FH + BOCHHOLZ H + KRUGER H
DIVERSE SHUTDOWN SYSTEMS FOR THE KNK-1, KNK-2, AND SNR-300 REACTORS
INTERATOM, BENSBERG, WEST GERMANY
CONF-740401-P3 +. 20 PPS, PP. 1349-69, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE SITUATION OF KNK-1, IN WHICH A SECOND FAST ACTING SHUTDOWN SYSTEM WAS STRONGLY REQUIRED BY THE AUTHORITIES, WAS VERY UNFAVORABLE DUE TO THE ADVANCED STAGE OF CONSTRUCTION. THE AVAILABLE TIME COULD BE UTILIZED ONLY TO DEVELOP AND INSTALL A MECHANICAL SYSTEM. A SECOND SHUTDOWN SYSTEM WAS PREDETERMINED FOR KNK-2, WHICH HAS BEEN MODIFIED WITHIN THE MECHANICAL PART ONLY A LITTLE. THE AVAILABILITY OF A FUNCTIONING SYSTEM AND THE OPEN-ENDED DEVELOPMENT EXPENSES, OBVIOUS FROM STUDIES OF A LIQUID ABSORBER SYSTEM, RESULTED IN THE DECISION TO CONSIDER THE ALREADY DEVELOPED SYSTEM AS A BASIC DESIGN FOR THE SNR-300, TOO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN STUDY + GERMANY + *SHUTDOWN SYSTEM, SECONDARY + EQUIPMENT DEVELOPMENT

12-109946 ALSO IN CATEGORY 9 DATED 1974
CACHERA F + MARMONIER P + LADET J
CONSIDERATIONS RELATIVE TO A BACKUP SYSTEM
ELECTRICITY DE FRANCE
CONF-740401-P3 +. 8 PPS, PP. 1370-78, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE INTEREST OF A BACK-UP SYSTEM IS ANALYZED. A DESCRIPTION OF THE CLASSICAL SAFETY SYSTEM OF PHENIX IS GIVEN, AND THE SPECIFICATIONS OF A BACK-UP SYSTEM ARE LISTED. DIFFERENT POSSIBLE SOLUTIONS ARE EXAMINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + FRANCE + *DESIGN STUDY + *SHUTDOWN SYSTEM, SECONDARY

12-109947 ALSO IN CATEGORIES 9 AND 18 DATED 1974
NOYES RC + GILBERTSON JC
LMFBR ALTERNATE SHUTDOWN SYSTEMS - TEST EXPERIENCE AND GENERAL DESIGN CRITERIA
COMBUSTION ENGINEERING INC., WINDSOR, CONN.
CONF-740401-P3 +. 13 PPS, PP. 1379-92, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A BRIEF REVIEW OF THE HISTORY OF ALTERNATE SHUTDOWN SYSTEMS FOR LMFBR'S IS PRESENTED TOGETHER WITH A DISCUSSION OF THE RATIONALE USED IN DEVELOPING SIX PROPOSED GENERAL DESIGN CRITERIA FOR SUCH SYSTEMS. A REACTOR SHUTDOWN SYSTEM DEVELOPED AT COMBUSTION ENGINEERING, INC. IS DESCRIBED WHICH USES A MODIFIED EBR-II TYPE CONTROL ROD SYSTEM WITH A REDUNDANT SECOND SYSTEM SIMILAR TO FERMI SAFETY RODS EXCEPT THAT THE SCRAM MECHANISM IS PNEUMATICALLY ACTUATED. TEST RESULTS OF A MODEL OF THE PNEUMATIC SCRAM RELEASE MECHANISM OPERATED IN SODIUM AT 1100 F ARE GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + EBR 1 AND 2 (RE) + FERMI (LMFBR) + CONTROL ROD SCRAM MECHANISM + *SHUTDOWN SYSTEM, SECONDARY + REVIEW + EQUIPMENT DESIGN

12-109948 ALSO IN CATEGORIES 9 AND 18 DATED 1974
MCKEEHAN ER + SHAWVER BM
THE ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 7 PPS, PP. 1393-99, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

AN ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM IS DESCRIBED. THE SYSTEM BEING DEVELOPED IS FOR APPLICATION TO THE LIQUID METAL FAST BREEDER REACTOR (LMFBR) AND SERVES AS A BACKUP TO THE PRIMARY SHUTDOWN SYSTEM. THE SYSTEM IS DISCUSSED, AND COMPONENT DEVELOPMENT TESTS ARE OUTLINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SHUTDOWN SYSTEM, SECONDARY + *R AND D PROGRAM + EQUIPMENT DEVELOPMENT

12-109949 ALSO IN CATEGORIES 11 AND 18 DATED 1974
HOPKINS RC + SNYDER HJ
GCFR'S SOLUTION TO RADIATION AND THERMAL DISTORTION
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 15 PPS, PP. 1400-14, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN FEATURES OF THE GAS-COOLED FAST BREEDER REACTOR (GCFR) THAT ALLOW ACCOMMODATION OF RADIATION AND THERMAL DISTORTION WITHOUT RESORTING TO A COMPLEX CORE-RESTRAINT MECHANISM ARE DISCUSSED. A COMPARISON OF RADIATION SWELLING AND GEOMETRIC PARAMETERS FOR THE GCFR AND LMFBR

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PLANT SAFETY FEATURES - REACTOR

12-109949 *CONTINUED*
ARE PRESENTED TO ILLUSTRATE WHY A RESTRAINT SYSTEM IS UNNECESSARY. THE ANALYSIS OF GCFR CORE BEHAVIOR IS DESCRIBED BRIEFLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GCR + SHUTDOWN SYSTEM, SECONDARY + *EQUIPMENT DESIGN + *CORE COMPONENTS + BEHAVIOR + *SWELLING

12-109951 ALSO IN CATEGORIES 9 AND 18 DATED 1974
VAN ERP JB + FAUSKE HK
ROLE AND DEVELOPMENT OF LMFBR PROTECTION SYSTEMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 15 PPS, PP. 1430-45, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IT IS RECOMMENDED THAT A BALANCED APPROACH BE FOLLOWED WITH RESPECT TO RELIANCE ON (1) REACTOR SAFETY SHUTDOWN SYSTEMS (PLANT PROTECTION SYSTEMS), AND (2) ENGINEERED SAFEGUARDS, FOR PROTECTION OF PUBLIC HEALTH AND SAFETY: REACTOR SAFETY SHUTDOWN SYSTEMS, AS WELL AS ENGINEERED SAFEGUARDS (CONTAINMENT SYSTEMS, BLAST SHIELDS, POST-ACCIDENT-HEAT-REMOVAL SYSTEMS, ETC.) OF HIGH RELIABILITY AND PROVEN PERFORMANCE SHOULD BE PROVIDED FOR FAST BREEDER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR PROTECTION SYSTEM + RELIABILITY, SYSTEM + SHUTDOWN SYSTEM, SECONDARY + *ENGINEERED SAFETY FEATURE + PROBABILITY

12-109962 ALSO IN CATEGORIES 6 AND 9 AND 18 DATED 1974
BURGSMULLER P + DEKAIS JJ + KRAHE A
GBR-4 PROTECTION SYSTEMS - FAILURES AND THEIR CONSEQUENCES
GAS-COOLED BREEDER REACTOR ASSOCIATION, EURSSELS, BELGIUM
CONF-740401-P3 +. 15 PPS, PP. 1603-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE GBR-4 DESIGN OF A GAS-CCOLED FAST REACTOR, EMPHASIS IS PLACED ON USING TO ADVANTAGE THE SINGLE-PHASE CHARACTER OF THE COOLANT. SPECIFIC FEATURES OF THE PROTECTIVE SYSTEMS ARE FAIL-SAFE NEUTRON ABSORPTION, PERMANENTLY OPERATING AUXILIARY SUPPLIES AND ATMOSPHERIC PRESSURE COOLING. FOR TRANSIENT ANALYSIS A COMPUTER PROGRAM IS APPLIED USING A POINT REACTOR MODEL FOR HEAT TRANSFER AND NEUTRON KINETICS. A DYNAMIC STEAM GENERATOR CODE HAS BEEN EMPLOYED TO DESCRIBE SECONDARY SIDE EFFECTS. ANTICIPATED DISTURBANCES IN OPERATION ARE REACTIVITY INSERTION, LOSS OF SUPPLIES AND LOSS OF COOLANT PRESSURE. FOR THESE ACCIDENTS, FAILURES IN REACTOR PROTECTION ARE POSTULATED IN DECREASING ORDER OF PROBABILITY. THE CONSEQUENCES ARE ANALYSED AND DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR, GCR + *REACTOR KINETICS + REACTOR PROTECTION SYSTEM + STEAM GENERATOR + ENGINEERED SAFETY FEATURE

12-110051 ALSO IN CATEGORIES 1 AND 8 AND 11 A DATED 1976
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 279 PGS, AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REVISES THE PRELIMINARY SAR BY SUBMITTING NEW APPENDICES 17D, AND LEAD REACTOR MANUFACTURER QA PROGRAM. INCLUDES THE REVISIONS TO THE QA SECTION. RESPONSES TO NRC QUESTIONS CONCERN ECCS, TRANSIENTS DURING SODIUM FIRES, CONTAINMENT LEAK RATE DURING ACCIDENT, SECURITY, AND TRAINING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT + FIRE + *REPORT, PSAR + QUALITY ASSURANCE + SYSTEM OPERABILITY IN ACCIDENT + LEAK RATE + EMERGENCY COOLING SYSTEM + TRANSIENT + *CLINCH RIVER (LMFBR)

12-110053 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.160 - ADEQUACY OF NATURAL CIRCULATION FOR THE PACC
PROJECT MANAGMENT CORP., OAK RIDGE, TN
4 PGS, 1 TAB, 1 FIG, PP. Q001.160-1 THRU Q001.160-4 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TUBE BUNDLES DURING NORMAL PLANT OPERATION ARE FILLED WITH SATURATED STEAM. THE CONDENSATE OUTFLOW FROM THE BUNDLE DURING THIS PERIOD IS PRIMARILY DUE TO GRAVITY. UPON SGAHRS INITIATION SIGNAL, THE ISOLATION DOORS ARE OPENED, THE FAN IS TURNED ON, AND STEAM CONDENSATION INCREASES. CONDENSATION CAUSES A VOLUME COLLAPSE INSIDE THE FINNED TUBE BUNDLE. THIS VOLUME COLLAPSE CAUSES THE BUNDLE PRESSURE TO DROP BELOW THE STEAM DRUM PRESSURE AS MAKEUP FLOW FROM THE DRUM IS ESTABLISHED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CATEGORY 12
PLANT SAFETY FEATURES - REACTOR

12-110053 *CONTINUED*
*CIRCULATION, NATURAL + RESPONSE TO NRC QUESTION + EMERGENCY COOLING + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

12-110084 ALSO IN CATEGORY 18 DATED 1976
RESPONSE TO QUESTION 001.168 - OVERCOOLING DURING SGAHRS OPERATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.168-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE SGAHRS TRANSIENT HAS BEEN ACCOUNTED FOR IN THE EVALUATION OF THE PLANT DUTY CYCLE EVENTS SINCE THOSE THERMAL TRANSIENT EVENTS ARE INCLUDED IN THE DESIGN DUTY CYCLE FOR THE HTS COMPONENTS. IN THE TIME PERIOD FOLLOWING THE INITIAL THERMAL TRANSIENTS, THE SGAHRS CONTROL SYSTEM WILL MAINTAIN SYSTEM TEMPERATURE WITHIN THEIR ACCEPTABLE RANGES SUCH THAT NO COOLING WILL RESULT. IF THE MAIN CONDENSER AND NORMAL FEEDWATER ARE AVAILABLE, SHORT TERM HEAT REMOVAL WILL BE ACCOMPLISHED VIA THE TURBINE BYPASS SYSTEM. SGAHRS WILL NOT BE INVOLVED UNTIL THE OPERATOR ACTIVATES THE PROTECTED AIR COOLED CONDENSERS (PACC) FOR LONG TERM HEAT REMOVAL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + *EMERGENCY COOLING + *THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

12-110077 ALSO IN CATEGORIES 1 AND 5 AND 18 DATED 1975
ZEMANICK PP + BROWN NW
DECAY HEAT REMOVAL FOR THE LIQUID METAL FAST BREEDER REACTOR
*WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
CONF-750468-1 +, 62 PGS., FROM SPECIALIST MEETING ON RELIABILITY OF DECAY HEAT REMOVAL SYSTEMS PROPOSED FOR FAST REACTORS, HARWELL, UK, APRIL 28, 1975

THE FUNCTIONAL AND RELIABILITY REQUIREMENTS OF THE DECAY HEAT REMOVAL SYSTEMS ARE DESCRIBED. THE RELIABILITY REQUIREMENT AND ITS RATIONALE AS ADEQUATE ASSURANCE THAT PUBLIC HEALTH AND SAFETY ARE SAFEGUARDED ARE PRESENTED. THE MEANS BY WHICH THE RELIABILITY OF THE DECAY HEAT REMOVAL SYSTEMS ARE ESTABLISHED TO MEET THEIR REQUIREMENT ARE IDENTIFIED. THE HEAT REMOVAL SYSTEMS AND THEIR OPERATING CHARACTERISTICS ARE DESCRIBED. THE DISCUSSION INCLUDES THE OVERFLOW HEAT REMOVAL SERVICE AND ITS ROLE IN DECAY HEAT REMOVAL IF NEEDED. THE DETAILS OF THE SYSTEMS ARE DESCRIBED TO DEMONSTRATE THE ELEMENTS OF REDUNDANCY AND DIVERSITY IN THE SYSTEMS DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + RELIABILITY, SYSTEM + EMERGENCY COOLING + *SHUTDOWN COOLING SYSTEM + R AND D PROGRAM

CATEGORY 13
PLANT SAFETY FEATURES - NONREACTOR

13-098139 DATED 1974
GROENIER WS + JENKINS HJ
THE EVAPORATION OF SODIUM INTO AN INERT SWEEP GAS--AN EVALUATION OF THE PROCESS HAVING APPLICATION TO THE DEACTIVATION OF INTERNAL SODIUM IN LMFBR FUEL ASSEMBLIES
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4598 +. 28 PAGES, 6 FIGURES, 8 REFERENCES, OCTOBER 1974

THE FEASIBILITY OF REMOVING METALLIC SODIUM FROM LIQUID METAL FAST BREEDER REACTOR FUEL ASSEMBLIES BY EVAPORATION IS BEING INVESTIGATED. NUMEROUS EXPERIMENTS WERE RECENTLY PERFORMED TO DETERMINE THE RATE OF EVAPORATION OF MOLTEN SODIUM AS A FUNCTION OF TEMPERATURE, PRESSURE, AND SWEEP GAS VELOCITY. IN THESE EXPERIMENTS, A SMALL AMOUNT OF SODIUM WAS EVAPORATED INTO A FLOWING STREAM OF ARGON GAS FROM A CRUCIBLE CONTAINING A SODIUM POOL WITH A KNOWN SURFACE AREA. OTHER EXPERIMENTS INCLUDE EVAPORATION FROM A WIRE MESH COATED WITH SODIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECONTAMINATION + OXIDE + THERMAL EXPERIMENT

13-100134 DATED 1971
BARR MR
EVALUATION OF MIXED U, PU OXIDE SINTERING VARIABLES AND PUO2 POWDER SOURCE
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 72-140 +. 56 PAGES, FIGURES, JAN. 1971

A FRACTIONAL EXPERIMENT WAS DESIGNED TO EVALUATE THE EFFECTS ON DENSITY AND MICROSTRUCTURE OF VARIATIONS IN PUO2 SOURCE, WEIGHT PERCENT ADDITION OF PUO2, PRESSING PRESSURE, SINTERING TEMPERATURE, SINTERING TIME, AND RATE OF TEMPERATURE RISE. THE THREE PUO2 SOURCES CONSIDERED WERE CALCINED PU NITRATE, CALCINED PU OXALATE, AND BURNED PU METAL. STATISTICAL ANALYSIS OF RESULTS PRODUCED EQUATIONS WHICH SHOW THE RELATIVE IMPORTANCE OF EACH VARIABLE CONSIDERED. RELATIONSHIPS BETWEEN THE VARIABLES CONSIDERED AND DENSITY ARE EXPRESSED THROUGH A SERIES OF CURVES PRODUCED FROM THE EQUATIONS. EFFECTS OF SINTERING VARIABLES ON SINTERED PELLET MICROSTRUCTURE WERE ALSO OBSERVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL HANDLING + OXIDE + PLUTONIUM + URANIUM + SINTERING + STATISTICAL ANALYSIS + PLUTONIUM DIOXIDE + FUEL REPROCESSING + FUEL, POWDER TYPE

13-100651 DATED 1972
BORISCH RR
THEORETICAL ANALYSIS OF SODIUM REMOVAL FROM FAST FLUX TEST FACILITY FUEL SUBASSEMBLIES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-399 + CONF-721065 +. 12 PAGES, MAY 31, 1972

THE ARGON-MOIST ARGON-WATER RINSE PROCESS IS THE ONE METHOD OF REMOVING SODIUM FROM FFTF TEST SUBASSEMBLIES WHICH WILL MEET ALL THE IMPOSED REQUIREMENTS. CALCULATIONS NECESSARY FOR SIZING ARGON BLOWERS AND WATER RINSE TANKS ARE PRESENTED. THE ABILITY TO MAINTAIN COOLING AT ALL TIMES GREATLY INCREASES THE SODIUM REMOVAL DIFFICULTIES. HOWEVER, IT IS POSSIBLE TO PERFORM ALL STAGES OF THE CLEANING PROCESS WITHOUT OVERHEATING A SUBASSEMBLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + ARGON + FUEL REPROCESSING + FUEL ELEMENTS

13-101336 DATED 1974
WINSCH IC + JOHNSON TR + PIERCE RC + MILLER WE
MELT DECLADDING OF FAST REACTOR FUEL
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8142 +. 38 PAGES, 8 TABLES, 18 FIGURES, 13 REFERENCES, NOVEMBER 1974

ONE STEP IN PROCESSING HIGHLY RADIOACTIVE FAST REACTOR FUELS IS REMOVAL OF THE CLADDING FROM THE OXIDE FUEL. A PROPOSED METHOD FOR ACCOMPLISHING THIS STEP IN A REMOTELY OPERATED FACILITY IS TO MELT THE STAINLESS STEEL AT 1450-1650 C AND TO SEPARATE THE MOLTEN LIQUID METAL PHASE FROM THE OXIDE SOLID. FIVE TECHNIQUES FOR PHASE SEPARATION HAVE BEEN STUDIED IN SMALL-SCALE EXPERIMENTS IN WHICH THE STAINLESS STEEL COMPONENTS OF 3-IN.-LONG SECTIONS OF MOCKED-UP UNIRRADIATED FUEL ASSEMBLIES WERE MELTED. EXPERIMENTAL RESULTS INDICATE THAT THE BULK OF THE MOLTEN STAINLESS STEEL CAN BE SEPARATED FROM THE OXIDE SOLIDS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + STEEL, STAINLESS + FUEL REPROCESSING + R AND D PROGRAM + FUEL ELEMENTS

13-102036 ALSO IN CATEGORY 7 DATED 1975
LEARY JA
LASL ADVANCED PLUTONIUM LMFBR FUEL PROGRAM PUBLICATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO

CATEGORY 13
PLANT SAFETY FEATURES - NONREACTOR

13-102026 *CONTINUED*
LA-5697-MS +. 55 PAGES, FIGURES, JAN. 1975

FORTY ARTICLES PUBLISHED BY LASL AUTHORS ARE SUMMARIZED. SUBJECTS INCLUDE SYNTHESIS, FABRICATION, PROPERTIES, AND IRRADIATION TESTING OF PLUTONIUM ADVANCED FUELS FOR FAST BREEDER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY + CARBIDE + CERAMICS + GLOVE BOX + OXIDE + PLUTONIUM + THERMAL ANALYSIS + THERMODYNAMICS + HIGH TEMPERATURE + NITRIDE + IRRADIATION TESTING + PROPERTY, PHYSICAL + ACTINIDE

13-102320 ALSO IN CATEGORY 7 DATED 1975
BURCH WD
LMFBR FUEL RECYCLE DRAGON PROGRESS REPORT FOR PERIOD APRIL TO DEC. 31, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4836 +. 92 PAGES, FIGURES, APRIL 1975

THE LMFBR FUEL RECYCLE DEVELOPMENT PROGRAM IS AIMED AT PROVIDING THE TECHNOLOGY ON WHICH TO BASE THE DESIGN OF COMMERCIAL REPROCESSING FACILITIES THAT WILL BE REQUIRED BY ABOUT 1997. THE PROCESS AND EQUIPMENT DEVELOPMENT PHASE OF THE PROGRAM WILL CULMINATE IN A HOT PILOT-PLANT PROCESS DEMONSTRATION TENTATIVELY SCHEDULED FOR THE 1986 TO 1987 PERIOD, ALLOWING THE REQUISITE LEAD TIME OF ABOUT TEN YEARS FOR THE DESIGN, CONSTRUCTION, AND STARTUP OF COMMERCIAL FACILITIES. FEED FOR THE HOT PILOT PLANT WILL BE AVAILABLE FROM THE FAST-FLUX TEST FACILITY (FFTF) AND THE CLINCH RIVER BREEDER REACTOR (CRBR), WHICH ARE SCHEDULED TO BEGIN DISCHARGING CORE ELEMENTS IN 1980 AND 1983 RESPECTIVELY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTAINMENT, FUEL REPROCESSING + FUEL HANDLING + SHIPPING CONTAINER + TRITIUM + OFF GAS + FUEL REPROCESSING + *R AND D PROGRAM + FUEL CYCLE + *FUEL RECYCLE

13-102927 ALSO IN CATEGORIES 7 AND 12 DATED 1975
BALLIF JL + BARTON GB + BORISCH RR + CAPLINGER WH + FUNK CW + LUTTON JM + MAFFEI MP
HEDL SODIUM REMOVAL PROGRAM ANNUAL REPORT FY-1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-63 +. 70 PAGES, 20 TABLES, 23 FIGURES, JAN. 1975

THE SODIUM REMOVAL PROGRAM AT HEDL HAS DEMONSTRATED THE ABILITY OF THE WATER-VAPOR/NITROGEN PROCESS TO CLEAN PUMPS, HEAT EXCHANGERS AND VALVES. THE FEASIBILITY OF THE PROCESS WAS DEMONSTRATED AND OPERATING CONDITIONS FOR REACTING BOTH BULK SODIUM AND SODIUM IN CREVICES WITHOUT DAMAGING THE COMPONENTS WERE IDENTIFIED. PROCESS DEVELOPMENT INCLUDED THE DEFINITION OF PROCESSING RATES FOR REMOVING BULK AND CREVICE SODIUM TO ESTABLISH PROCESSING CYCLES AND PROCESSING FACILITIES DESIGN. IT WAS CONCLUDED THAT THE WATER VAPOR IN NITROGEN REACTS WITH BULK SODIUM AT A RATE OF 0.02 IN.-NA/HR. ALSO CREVICES MUST BE LARGER THAN 0.001 IN. TO BE EFFECTIVELY AND REPRODUCIBLY PROCESSED TO REMOVE SODIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + *DECONTAMINATION + HEAT TRANSFER + HYDROGEN + *STEAM + CORROSION + *WATER VAPOR

13-103436 ALSO IN CATEGORIES 1 AND 18 DATED 1975
COCHRAN TB
THE LIQUID METAL FAST BREEDER REACTOR - AN ENVIRONMENTAL AND ECONOMIC CRITIQUE
271 PAGES, PUBL. BY RESOURCES FOR THE FUTURE INC., 1974 (BUCK)

COCHRAN TAKES A CRITICAL LOOK AT THE ECONOMIC AND ENVIRONMENTAL ARGUMENTS WHICH HAVE BEEN MADE IN FAVOR OF AN EARLY INTRODUCTION OF THE LMFBR AS CENTRAL COMPONENT OF THE UNITED STATES ELECTRICAL ENERGY SYSTEM. IN GENERAL HE FEELS THAT THE ECONOMIC ARGUMENTS PUT FORTH ARE OPEN TO ANY SERIOUS QUESTIONS. HE ALSO SUGGESTS THAT THE LMFBR APPEARS TO HAVE NO ENVIRONMENTAL ADVANTAGE OVER THE PRESENTLY OPERATING LIGHT WATER REACTORS AND ESPECIALLY NOT OVER THE HIGH TEMPERATURE GAS REACTOR.

AVAILABILITY - THE JOHNS HOPSKINS UNIVERSITY PRESS, BALTIMORE, MARYLAND 21218

ECONOMICS + PLUTONIUM + ENVIRONMENT + *SAFEGUARDS, NUCLEAR MATERIAL + COST, CAPITAL + *N-POWER, SAFETY OF + OPPONENT + FUEL CYCLE

13-104413 ALSO IN CATEGORIES 11 AND 18 DATED 1972
TVERBERG JC
STAINLESS STEEL FUEL CLADDING FOR FAST BREEDER REACTORS
CARPENTER TECHNOLOGY CORP.
3 PAGES, 4 FIGS., NUCLEAR ENGINEERING INTERNATIONAL, 17(199), PP. 1001-1003 (DEC. 1972)

THE METHODS DESCRIBED IN THIS PAPER REPRESENT THOSE PROCESSES EMPLOYED BY CARPENTER TECHNOLOGY CORPORATION, SPECIAL PRODUCTS DIVISION, SAN DIEGO, CALIFORNIA, IN ITS PRODUCTION OF DEFECT FREE FAST BREEDER FUEL CLADDING TUBES. THE CONCEPTS INCLUDE SPECIAL HANDLING TO PREVENT TUBE-TO-TUBE CONTACT, VERTICAL DEGREASING TO PREVENT SLUDGE FROM ACCUMULATING IN THE TUBES DURING CLEANING, BRIGHT ANNEALING USING PURE HYDROGEN TO YIELD A SCALE FREE SURFACE THUS ELIMINATING

CATEGORY 13
PLANT SAFETY FEATURES - NONREACTOR

13-104413 *CONTINUED*
ACID PICKLING, AND STATISTICAL CONTROL OF ALL MANUFACTURING VARIABLES.

*FABRICATION + CLADDING + STEEL, STAINLESS + FFTF (TR) + QUALITY ASSURANCE

13-104419 ALSO IN CATEGORY 7 DATED 1973
TAYLOR GF + BISHOP EC + PERRONE P
THE STATUS OF SODIUM CLEANING PROCESSES IN THE LMFBR PROGRAM, USA
WESTINGHOUSE ELECTRIC CORPORATION
CONF-730326-1 +. 37 PAGES, FROM INTERNATIONAL WORKING GROUP ON SODIUM CLEANING, DOUNREAY, SCOTLAND, MARCH 26, 1973

INABILITY OR SLOWNESS OF EITHER ALCOHOL OR VACUUM DISTILLATION TO REMOVE SODIUM COMPOUNDS, SUCH AS SODIUM OXIDE OR SODIUM CARBONATE, IS A SIGNIFICANT ADVANTAGE FOR THE MOIST NITROGEN PROCESS. BOTH THE REACTANT COST, IN THE CASE OF ALCOHOL, AND THE ENGINEERING AND EQUIPMENT COST FOR VACUUM DISTILLATION ARE MORE SERIOUS DISADVANTAGES THEN THE FORMATION OF CAUSTIC SOLUTIONS IN THE MOIST GAS PROCESS. THE CATASTROPHIC EFFECTS OF CAUSTIC STRESS CORROSION CRACKING CAN BE AVOIDED IN THE MOIST NITROGEN PROCESS BY CAREFUL TEMPERATURE CONTROL. SUFFICIENT EXPERIMENTAL DATA ARE NOT AVAILABLE NOW TO JUDGE THE SUPERIORITY OF ANY PROCESS IN CLEANING CREVICES; HOWEVER, EFFECTIVE CREVICE CLEANING HAS BEEN REPORTED FOR ALL THREE PROCESSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + VACUUM RELIEF + STRESS CORROSION + DISTILLATION

13-104424 ALSO IN CATEGORIES 1 AND 18 DATED 1973
ZEIGLER RK
QUALITY ASSURANCE PLAN FOR MIXED OXIDE FUEL FOR LMFBR
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-UR-73-740 + CONF-730911-1 +. 7 PAGES, FROM WESTERN REGIONAL CONFERENCE OF AMERICAN SOCIETY FOR QUALITY CONTROL, PORTLAND, OREGON, SEPT. 27, 1973

AN EVALUATION OF THE ADEQUACY OF THE METHODS OF ANALYSIS IS PRESENTED FOR CHEMICAL SPECIFICATIONS OF LMFBR/FFTF MIXED URANIUM-PLUTONIUM OXIDE FUEL. THIS EVALUATION IS BASED ON STATISTICAL ANALYSES OF THE RESULTS OBTAINED BY SEVEN LABORATORIES ON A DISTRIBUTED BATCH OF FFTF FUEL PELLETS AND DISTRIBUTED SPECIAL BLENDS OF CERTAIN IMPURITIES AND A HIGH PURITY URANIUM-PLUTONIUM OXIDE MATRIX. BASED UPON THE RESULTS OF THIS EVALUATION A QUALITY ASSURANCE PROGRAM WILL BE DISCUSSED WHICH WILL ENSURE THE CONTINUING EXISTENCE OF QUALITY DATA FOR THE CHEMICAL CHARACTERIZATION OF LMFBR/FFTF MIXED OXIDE FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + URANIUM + FUEL, PELLET TYPE + ANALYTICAL TECHNIQUE + *QUALITY ASSURANCE + MIXED OXIDE

13-106800 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION G6 - NATURAL URANIUM REQUIREMENTS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-301 THRU A1-302 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE PLANT'S 30-YEAR LIFE, ESTIMATES IN METRIC TONS THE NATURAL URANIUM REQUIREMENT, THE PU-239 REQUIREMENT, THE U-235 AND U-238 CONSUMPTION, AND THE PU-239 PRODUCTION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FUEL BURNUP + PLUTONIUM + URANIUM + RESPONSE TO NRC QUESTION + FUEL, NUCLEAR + CLINCH RIVER (LMFBR)

13-106726 DATED 1975
WATSON SB + RAINEY RH
MODIFICATIONS OF THE SEPHIS COMPUTER CODE FOR CALCULATING THE PUREX SOLVENT EXTRACTION SYSTEM
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5123 +. 59 PPS, 3 TABS, 5 REFS, DEC. 1975

THE SEPHIS COMPUTER PROGRAM WAS DEVELOPED TO SIMULATE THE COUNTERCURRENT SOLVENT EXTRACTION. THIS REPORT GIVES MODIFICATIONS IN THE PROGRAM WHICH RESULT IN IMPROVED FIT TO EXPERIMENTAL DATA, A DECREASE IN COMPUTER STORAGE REQUIREMENTS, AND A DECREASE IN EXECUTION TIME. METHODS FOR APPLYING THE COMPUTER PROGRAM TO PRACTICAL SOLVENT EXTRACTION PROBLEMS ARE EXPLAINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + *SOLVENT EXTRACTION PROCESS + OPTIMIZATION

13-110005 DATED 1975
COOK JH + VILLARREAL R + NELSON CE
PLUTONIUM CONTAMINATION MONITORING IN THE HFEF HOT CELLS DURING SECTIONING OF MARK-IIA SODIUM LOOPS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/HFEF/006 +. 48 PPS, 11 TABS, 10 FIGS, 11 REFS, MAY 1975

CATEGORY 13
PLANT SAFETY FEATURES - NONREACTOR

13-110005 *CONTINUED*
AN EXTENSIVE PROGRAM FOR MONITORING ALPHA CONTAMINATION WAS CONDUCTED IN-CELL AND OUT-OF-CELL IN HFEF/S TO ESTABLISH THE CONTAMINATION SPREAD FROM SECTIONING SODIUM LOOPS THAT CONTAINED FAILED MIXED-OXIDE FUEL ELEMENTS. THE MONITORING PROGRAM WAS MAINTAINED DURING THE SECTIONING OF SIX RAS-TREAT MARK-IIA LOOPS IN THE ARGON CELL. THE MONITORING PROGRAM PROVIDED CONCLUSIVE EVIDENCE THAT NO CONTAMINATION SPREAD RESULTED FROM SECTIONING THE LOOPS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HOT CELL + PLUTONIUM + SAMPLING + CONTAMINATION + IN PILE EXPERIMENT + MONITORING SYSTEM, RADIATION + RADIATION MONITORS

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-105704 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.13 - JOINT FREQUENCY DISTRIBUTION DATA
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q322.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PROVIDES THE TWO SETS OF JOINT FREQUENCY DISTRIBUTION USED TO OBTAIN THE INFORMATION IN THE SECTION WIND AND STABILITY DATA AND IN TABLE 2.38-20 OF SUPPLEMENT 1 TO CHAPTER TWO - REVISED ON-SITE METEOROLOGY OF THE PSAR. THE FIRST SET BASED ON WIND SPEED AND DIRECTION MEASURED AT THE 75-FT LEVEL AND VERTICAL TEMPERATURE DIFFERENCE BETWEEN THE 33- AND 200-FT LEVELS. THE SECOND SET IS BASED ON THE WINDS MEASURED AT THE 75-FT LEVEL BUT WITH THE VERTICAL TEMPERATURE DIFFERENCE MEASURED BETWEEN THE 75- AND 200-FT LEVELS.

AVAILABILITY - NICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

SITING. REACTOR + WIND PROFILE + METEOROLOGY + *WIND STATISTICS + RESPONSE TO NRC QUESTION + DATA COLLECTION + WEATHER DATA + CLINCH RIVER (LMFBR)

16-105705 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.15 - DISTRIBUTION OF PERCENTAGE OF CALMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q322.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE TOTAL PERCENTAGE OF CALMS LISTED AT THE BOTTOM OF TABLES 2.38-21 THROUGH 2.38-36 ARE EVENLY DISTRIBUTED THROUGHOUT THE VARIOUS DIRECTION GROUPS IN THE FIRST WIND SPEED CATEGORY. THE DISTRIBUTION IS DONE BY USING THE TOTAL PERCENTAGE OF CALMS FOR EACH STABILITY AND DIVIDING BY THE NUMBER OF WIND DIRECTION GROUPS. THIS ONE-SIXTEENTH OF THE CALM PERCENTAGE IS THEN ADDED TO EACH DIRECTION'S CLASSIFICATION OF 0.0-1.3 KNOTS.

AVAILABILITY - NICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

SITING. REACTOR + WIND PROFILE + METEOROLOGY + *WIND STATISTICS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

16-106717 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.4 (SECTION 2.6.2.3) - HUMIDITY DATA AT CRBRP SITE
PROJECT MANAGEMENT CORP.. ILL.
DOCKET 50537-9 +. 1 PG. 1 TAB. PP. A1-64 THRU A1-65 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

ON-SITE HUMIDITY DATA IS NOT AVAILABLE AT THIS TIME. EVIDENCE OF THE REPRESENTATIVENESS CANNOT BE PROVIDED ON A QUANTITATIVE BASIS. BUT ON A QUALITATIVE BASIS. THE BULL RUN DATA IS INFLUENCED BY THE RIDGES RUNNING NORTHEAST AND SOUTHWEST AS WELL AS BY THE CLINCH RIVER PROVIDING AN ABUNDANT SOURCE OF ATMOSPHERIC MOISTURE. THIS IS SIMILAR TO THE SITUATION AT THE CRBRP SITE. HOWEVER. A COMPARISON CAN BE MADE BETWEEN BULL RUN STEAM PLANT DATA AND KNOXVILLE DATA. THIS COMPARISON IS FOR THE MOST ADVERSE CONDITIONS, LOW TEMPERATURE AND HIGH HUMIDITY AND IS PRESENTED.

AVAILABILITY - NICROSURANCE. INC.. P.O. BOX 3522. OAK RIDGE. TENN. 37830

SITE CLIMATOLOGY + HUMIDITY. RELATIVE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

16-106718 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.13 - METEOROLOGICAL DATA
PROJECT MANAGEMENT CORP.. ILL.
DOCKET 50537-9 +. 1 PG. P. A1-71 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE WIND SPEED USED IN THE EVALUATION WAS A MEAN SPEED FROM THE 75-FOOT AND 200-FOOT WIND LEVELS OF THE CRBRP METEOROLOGICAL TOWER. THE FREQUENCY OF WIND DIRECTION WAS BASED UPON THE DIRECTION DISTRIBUTION OF DATA FROM THE 75-FOOT LEVEL AT THE SAME LOCATION. THE TEMPERATURE AND RELATIVE *HUMIDITY DATA WAS OBTAINED FROM THE TVA BULL RUN STEAM PLANT WHERE THE HEIGHT OF THE SENSORS* ABOVEGROUND WAS FOUR FEET.

AVAILABILITY - NICROSURANCE. INC.. P.O. BOX 3522. OAK RIDGE. TENN. 37830

SAFETY ANALYSIS REPORT. METEOROLOGY + SITE CLIMATOLOGY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

16-106725 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A1 - OTHER PLUME SOURCES
PROJECT MANAGEMENT CORP.. ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-94 THRU A1-95 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUEN 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

CONTACT WAS MADE WITH THE ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION LOCATED AT OAK RIDGE, TENNESSEE, TO OBTAIN INFORMATION ABOUT OTHER POSSIBLE PLUME SOURCES IN THE AREA OF THE SITE. DRS. GARRY BRIGGS, STEVE HANNA AND RAY HAWSKER

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-106725 *CONTINUED*
HAVE STUDIED MANY PLUME SOURCES IN THE OAK RIDGE AREA AND HAVE INDICATED THAT THERE ARE ONLY FIVE POSSIBLE PLUME SOURCES WITHIN A 15-MILE RADIUS OF THE CRBRP SITE. THESE FIVE POSSIBLE PLUME SOURCES ARE IDENTIFIED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

16-106726 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A2 - COOLING TOWER PLUME LENGTHS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-96 THRU A1-97 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY DISTRIBUTION TABLE (IN PERCENT) OF DIRECTION AND INCREMENTAL DISTANCES FROM THE COOLING TOWERS OF PLUME LENGTHS ON AN ANNUAL BASIS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + COOLING TOWER + CLINCH RIVER (LMFBR)

16-106727 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A3 - FOG AND ICE OBSERVATION PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-98 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PLANS FOR THE FOG AND ICE OBSERVATION PROGRAM HAVE NOT BEEN FORMALIZED. IT IS ANTICIPATED THAT THIS PROGRAM WILL BE LIMITED TO ROUTINE VISUAL INSPECTION BY PLANT PERSONNEL OF THE COOLING TOWER PLUME AND THE PLUME'S RELATION TO FOG AND ICE OCCURRENCE AT THE SITE. THE DEGREE OF PROGRAM SOPHISTICATION AND OTHER OPTIONS WILL BE INVESTIGATED AND DETAILS OF THE PROGRAM DEFINED APPROXIMATELY TWO YEARS PRIOR TO PLANT OPERATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FOG + SITE CLIMATOLOGY + RESPONSE TO NRC QUESTION + WEATHER, SEVERE + CLINCH RIVER (LMFBR)

16-106728 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A4 - COOLING TOWER PLUME
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-99 THRU A1-100 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY TABLE (IN PERCENT) OF DIRECTION AND INCREMENTAL DISTANCE FROM THE COOLING TOWERS FOR FOGGING AND ICING DUE TO COOLING TOWER PLUME.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FOG + PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + COOLING TOWER + EFFECT + CLINCH RIVER (LMFBR)

16-106729 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION A5 - COOLING TOWER DRIFT DEPOSITION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 1 TAB, PP. A1-101 THRU A1-103 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY TABLE OF DIRECTION AND INCREMENTAL DISTANCE FROM THE COOLING TOWERS FOR DRIFT DEPOSITION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DEPOSITION + RESPONSE TO NRC QUESTION + COOLING TOWER + EFFECT + CLINCH RIVER (LMFBR)

16-106730 ALSO IN CATEGORIES 9 AND 18 DATED 1975
RESPONSE TO QUESTION A6 - ON-SITE HUMIDITY DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-104 THRU A1-105 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICNESE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENTLY IN USE IS A BELFORT INSTRUMENT CO. MODEL 5-594 HYGROTHERMOGRAPH (4 FEET ABOVEGROUND, IN A STEVENSON SCREEN) WITH AN AMBIENT TEMPERATURE CHART RANGE OF -30 TO +110 DEGREES F AND RELATIVE HUMICITY RANGE OF 0 TO 100 PERCENT. THE MAXIMUM POSSIBLE RELATIVE HUMIDITY ERROR IS + OR - 4 PERCENT. THE READING ACCURACY OF TEMPERATURE IS TO THE NEAREST WHOLE DEGREE. DATA IS RECORDED ON ANALOG STRIP-CHARTS AND MUST BE REDUCED MANUALLY. A MORE ELABORATE RELATIVE HUMIDITY SYSTEM, TO BE INSTALLED IN THE NEAR FUTURE, WILL ELECTRONICALLY RECORD THE AMOUNT OF AMBIENT WATER VAPOR IN THE AIR. A YEAR'S RECORD IS TO BE COLLECTED AND ANALYZED FOR FUTURE UTILIZATION.

CATEGORY 16
METEOROLOGICAL CONSIDERATIONS

16-106730 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*INSTRUMENT, METEOROLOGICAL + SITE CLIMATOLOGY + HUMIDITY, RELATIVE + RESPONSE TO NRC QUESTION + WEATHER DATA + CLINCH RIVER (LMFBR)

16-106773 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION D27 - DAILY TEMPERATURE DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-244 THRU A1-250 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES THE DAILY TEMPERATURES UPON WHICH THE MONTHLY TEMPERATURES ARE BASED, INCLUDES THE TEMPERATURES FOR BOTH THE RIVER WATER AND THE COOLING TOWER BLOWDOWN.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITE CLIMATOLOGY + TEMPERATURE + CLINCH RIVER (LMFBR)

16-107091 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.14 - WIND AND STABILITY DATA
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, 23 TABS, PP. 322.14-1 THRU 322.14-25 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A TEMPERATURE SENSOR WAS INSTALLED ON THE METEOROLOGICAL TOWER AT THE 33-FT. LEVEL ON APRIL 3, 1974. HOWEVER, DATA AT THIS SENSOR WAS FOUND TO BE IN ERROR FOR A SIX WEEK PERIOD OCCURRING IN OCTOBER - NOVEMBER, 1974. THEREFORE, THE REQUESTED ONE FULL YEAR OF JOINT FREQUENCY DISTRIBUTIONS OF WIND SPEED AND DIRECTION MEASURED AT THE 75-FT. LEVEL AND ATMOSPHERIC STABILITY DETERMINED BY THE VERTICAL TEMPERATURE DIFFERENCE BETWEEN THE 33- AND 200-FT. LEVELS IS NOT AVAILABLE WITH A DATA RECOVERY RATE EQUAL OR EXCEEDING 90%.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INSTRUMENT, METEOROLOGICAL + METEOROLOGICAL SUPPORT + WIND STATISTICS + RESPONSE TO NRC QUESTION + *TEMPERATURE + *STABILITY + WEATHER DATA + CLINCH RIVER (LMFBR) + SENSORS, TEMPERATURE

16-107092 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 322.16 - METEOROLOGICAL CONDITIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 322.16-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL PLANT STRUCTURES ARE DESIGNED ACCORDING TO THE SOUTHERN STANDARD BUILDING CODE AND ANSI A58.1-1972, 'BUILDING CODE REQUIREMENTS FOR MINIMUM DESIGN LOADS IN BUILDINGS AND OTHER STRUCTURES'. THE APPLICATION OF THESE STANDARDS TO THE CRBRP LEADS TO A (FASTEST MILE) WIND SPEED OF 90 MILES PER HOUR. ROOFS ARE DESIGNED TO WITHSTAND THE LOAD CAUSED BY THE ONE IN 100 YEAR STORM (3.5 INCHES PER HOUR). SAFETY-RELATED HVAC SYSTEMS ARE DESIGN TO MAINTAIN THE BUILDING ATMOSPHERE TEMPERATURE WITHIN THE LIMITS IDENTIFIED IN SECTION 9.6 UP TO A MAXIMUM OUTSIDE TEMPERATURE OF 105 F AND A MINIMUM OUTSIDE TEMPERATURE OF -16 F.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + *METEOROLOGY + RESPONSE TO NRC QUESTION + *STRUCTURE + CLINCH RIVER (LMFBR)

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-093106 DATED 1973
PHENIX PLANT: FAST NEUTRON PROTOTYPE
10 PAGES, TECH.MOD., 65(10), PP. 23-32 (OCT. 1973) (IN FRENCH)

THE GENERAL LAYOUT OF THE PHENIX REACTOR IS PRESENTED. THE CORE, VESSELS, CIRCUITS, ENERGY RECOVERY EQUIPMENT (SODIUM CIRCUITS, EXCHANGERS, AND STEAM GENERATORS), TURBO-ALTERNATOR AND CONDENSER ASSEMBLY, WATER SUPPLY CIRCUIT, AUXILIARY BOILER, APPARATUS FOR HANDLING THE FUEL ASSEMBLIES, AND THE COMPONENTS OF THE REACTOR BLOCK AND THE INSTALLATION CONTROLLING THE REACTOR AND THE PLANT ARE BRIEFLY DESCRIBED.

FRANCE + REACTOR DESCRIPTION

17-093641 ALSO IN CATEGORIES 1 AND 18 DATED 1975
PROCEEDINGS OF THE SCIENTIFIC-TECHNICAL CONFERENCE "ATOMIC POWER, FUEL CYCLES, RADIATION STUDY OF MATERIALS", HELD IN ULYANOVSK, 5-10 OCTOBER 1970 (VOL.1)
CONF-701074-P1 +. 725 PAGES, JANUARY 1975 (TRANSLATED FROM RUSSIAN)

CONTAINS ARTICLES DISCUSSING NUCLEAR ENERGY DEVELOPMENT IN THE VARIOUS SOVIET BLOC NATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + REACTOR, BWR + COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + REACTOR, PWR + ACCIDENT, HYPOTHETICAL + CZECHOSLOVAKIA + GERMANY + HUNGARY + USSR + BULGARIA + OPERATING EXPERIENCE + GROWTH/DEVELOPMENT + INDUSTRY, NUCLEAR + REACTOR STARTUP

17-098944 ALSO IN CATEGORY 11 DATED 1973
KING GA
METALLURGICAL ANALYSIS OF FAILED SCTI THERMOWELL NO. TR-104-62E
LIQUID METAL ENGINEERING CENTER, CANOGA PARK, CALIF.
LMEC-TDR-73-2 +. 75 PAGES, 42 FIGURES, JANUARY 15, 1973

A SODIUM FIRE OCCURRED AT THE SCTI ON AUGUST 5, 1972 BECAUSE OF SODIUM LEAKAGE THROUGH A THERMOWELL LOCATED IN THE PRIMARY SODIUM INLET TO THE SCTI-IHX. THE THERMOWELL FAILED WITH THE SYSTEM OPERATING AT APPROXIMATELY 32% POWER LEVEL WITH SODIUM FLOWING AT APPROXIMATELY 1800 GPM AT A TEMPERATURE OF 850 F. THE FAILED THERMOWELL (TR-104-62E) WAS ONE OF TWO LOCATED ON AN 8-IN. BY 10-IN. STAINLESS STEEL PIPE REDUCER DOWNSTEAM OF, AND ADJACENT TO, AN 8-IN. BUTTERFLY VALVE (FRC-100V1) IN THE IHX PRIMARY SODIUM INLET. METALLURGICAL ANALYSIS REVEALED THAT THE FAILURE WAS A RESULT OF HIGH-CYCLE, LOW-AMPLITUDE FATIGUE AT THE TRANSITION RADIUS BETWEEN THE THERMOWELL STEM AND THE THERMOWELL SUPPORT. FAILURE WAS ATTRIBUTED TO VIBRATIONAL LOADING CONDITIONS WHICH WERE EXCESSIVE FOR THE PART CONFIGURATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE + FIRE + OUT OF PILE EXPERIMENT + EXPERIMENT + LEAK + HEAT EXCHANGERS

17-099932 DATED 1974
OLDS FC
PHENIX FAST REACTOR: BIG BOOST FOR THE BREEDERS
5 PAGES, 2 TABLES, 2 FIGURES, POWER ENGINEERING, 78(9), PP. 66-70 (SEPTEMBER 1974)

FRANCE'S NEW 250-MWE FAST BREEDER REACTOR POWER STATION WAS TIED INTO THE NATIONAL GRID AND TAKEN TO FULL POWER JUST 66 MONTHS AFTER SITE WORK BEGAN. THE PLANT HAS PERFORMED VERY WELL FOR THE FIRST 50 FULL POWER DAYS (TO THE DATE OF THIS WRITING). LOW CAPITAL COST OF THE PLANT IS AS IMPRESSIVE AS ITS CONSTRUCTION SCHEDULE, START-UP, AND OPERATION.

FRANCE + REACTOR DESCRIPTION + DESIGN STUDY + OPERATING EXPERIENCE + REACTOR STARTUP

17-100130 ALSO IN CATEGORY 9 DATED 1974
MACRAE N
THE PROTOTYPE FAST REACTOR AT DOUNREAY
THE NUCLEAR POWER GROUP LTD., UK
4 PAGES, 7 FIGURES, ELECTRONICS & POWER, 20(14), PP. 581-584 (AUGUST 1974)

PRESENTS A DESCRIPTION OF THE PROTOTYPE FAST REACTOR INCLUDING THE PRIMARY CIRCUIT, SECONDARY CIRCUITS AND STEAM GENERATORS, AND THE FUEL AND FUEL HANDLING. THE FINAL TESTING OF THE REACTOR AND AUXILIARY PLANT IS CURRENTLY IN PROGRESS AND POWER OPERATION WILL COMMENCE THIS YEAR.

FUEL HANDLING + REACTOR DESCRIPTION + UNITED KINGDOM + DOUNREAY (LMFBR) + MAIN COOLING SYSTEM + STEAM GENERATOR

17-101914 ALSO IN CATEGORY 18 DATED 1974
ZEMANICK PP + HORNING J + NULTON JD
IAEA INTERNATIONAL WORKING GROUP ON FAST REACTORS SPECIALISTS MEETING ON OPERATING EXPERIENCE AND DESIGN CRITERIA OF SODIUM VALVES
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-740964 +. 600 PAGES, MEETING HELD IN RICHLAND, WASHINGTON, SEPT. 23-27, 1974

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-101914 *CONTINUED*
THE SPECIALISTS PRESENTED POSITION PAPERS ON BEHALF OF THEIR COUNTRIES ON THE SUBJECTS OF LARGE SODIUM VALVE DESIGN AND OPERATING EXPERIENCE, SMALL SODIUM VALVE DESIGN AND OPERATING EXPERIENCE, SODIUM VALVE TEST RESULTS AND FACILITY DESCRIPTIONS, SODIUM VALVE ANALYSIS CRITERIA AND METHODS, AND SODIUM VALVE MANUFACTURING DEVELOPMENT. ALL PAPERS ARE REPRODUCED IN THEIR ENTIRETY IN THIS DOCUMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + FRANCE + IAEA + UNITED KINGDOM + GERMANY + ITALY + JAPAN + NETHERLANDS + UNITED STATES + OPERATING EXPERIENCE + VALVES

17-102043 DATED 1975
REIMANN KJ + SATHER A
INITIAL IN-SERVICE INSPECTION OF DUPLEX TUBES IN EBR-II EVAPORATOR EV-702
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8146 +. 14 PAGES, 10 FIGURES, FEB. 1975

AN INITIAL IN-SERVICE INSPECTION OF EVAPORATOR TUBES FROM THE INSIDE (WATER SIDE) WAS CONDUCTED TO ESTABLISH THE FEASIBILITY OF USING ULTRASONIC SHEAR WAVES AS A NONDESTRUCTIVE TECHNIQUE. A SPECIAL TRANSDUCER MANIPULATOR WAS DESIGNED SO THAT THE SAME TRANSDUCER COULD BE USED TO GENERATE SHEAR WAVES FOR DEFECT DETECTION AND LONGITUDINAL WAVES FOR WALL-THICKNESS MEASUREMENTS. THE EXPERIMENTAL TEST ARRANGEMENT WAS USED TO EXAMINE 19 TUBES IN EVAPORATOR EV-702 TO A DEPTH OF APPROXIMATELY 14 FT. IN FIVE OF THE INSPECTED TUBES, ULTRASONIC REFLECTIONS FROM OUTSIDE-SURFACE ABNORMALITIES WERE OBTAINED. THE INITIAL INSPECTION DEMONSTRATED THE FEASIBILITY OF THE EXAMINATION METHOD AND PINPOINTED THE WEAKNESSES OF THE EXPERIMENTAL PROCEDURE AND EQUIPMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + EVAPORATION + TEST, NONDESTRUCTIVE + COMPONENTS + TUBING + ULTRASONICS + HEAT EXCHANGERS + INSERVICE INSPECTION

17-102674 ALSO IN CATEGORIES 9 AND 11 DATED 1974
CAMBILLARD E + LACROIX A + VIALA J
PHENIX STEAM GENERATORS: MEASURING HYDROGEN CONCENTRATION OF SODIUM FOR TIGHTNESS INSPECTION OF WATER-STEAM TUBES
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE
ERDA-TR-6 + CONF-741085-3 +. 21 PAGES, PRESENTED AT SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

DISCUSSES THE SYSTEM FOR MEASURING HYDROGEN CONCENTRATION IN SODIUM TO DETECT POSSIBLE LEAKS IN STEAM GENERATORS. HYDROGEN DIFFUSION THROUGH THE TUBE WALLS HAS ALSO BEEN MEASURED AND DETERMINED TO BE 505 MG/HR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + *HYDROGEN + *MEASUREMENT + STEAM GENERATOR + TUBING + TEST, LEAK

17-102683 ALSO IN CATEGORY 11 DATED 1974
BISCAREL J + LAFON A + LIONS N
EFFECT OF SMALL WATER LEAKAGE INTO SODIUM IN TUBES OF THE PHENIX STEAM GENERATOR GROUP
CEA CENTRE D'ETUDES NUCLEAIRES DE CADARACHE, FRANCE
ERDA-TR-5 + CONF-741085-2 +. 18 PAGES, PRESENTED AT THE SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

THE EFFECTS OF WASTAGE CAUSED BY SMALL WATER OR STEAM LEAKAGE INTO THE SODIUM WAS STUDIED IN THE PHENIX STEAM GENERATOR GEOMETRY. THE RATE OF LOSS OF THICKNESS OF MATERIALS IS STUDIED AS A FUNCTION OF VARIOUS CHARACTERISTC PARAMETERS. THE METALLURGICAL ANALYSIS OF THE CRATERS ONLY SHOWED A SLIGHT SURFACE MODIFICATION OF THE STRUCTURE IN THE CASE OF TWO UNSTABILIZED FERRITIC STEELS AND AN AUSTENITIC STEEL. THE COMPARISON BETWEEN THE FERRITIC AND AUSTENITIC STEELS POINTED UP THE FACT THAT, IN THEIR RATED OPERATING CONDITIONS, THESE MATERIALS HAVE ESSENTIALLY THE SAME BEHAVIOR WITH RESPECT TO THE WASTAGE PHENOMENON.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CHEMICAL REACTION + FRANCE + STEEL + WATER + *CORROSION + *STEAM GENERATOR + *TUBING

17-103965 ALSO IN CATEGORY 18 DATED 1975
US/USSR SEMINAR ON FAST BREEDER REACTOR CONSTRUCTION AND OPERATING EXPERIENCE
U.S. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
ERDA-42(ENG) +. 262 PAGES, FIGURES, JUNE 5, 1975

PRESENTS THE TEXT OF 11 PAPERS ON THE FOLLOWING SUBJECTS: STATUS OF LMFBR'S IN THE U.S.; EBR-2 CONSTRUCTION EXPERIENCE AND INITIAL PERFORMANCE; EBR-2 OPERATING EXPERIENCE; ENRICO FERMI CONSTRUCTION EXPERIENCE; DECOMMISSIONING OF ENRICO FERMI; SEFOR CONSTRUCTION AND OPERATING EXPERIENCE; FFTF; AND CONSTRUCTIBILITY OF THE CLINCH RIVER BREEDER REACTOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62,

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-103965 *CONTINUED*
OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + FERMI (LMFBR) + *OPERATION + FFTF (TR) + USSR + SEFOR (RE) + DECOMMISSIONING + REVIEW + UNITED STATES + *CONSTRUCTION + CLINCH RIVER (LMFBR)

17-104329 DATED 1975
DUTRAM WJ
THE PROTOTYPE FAST REACTOR DOUNREAY - SOME INTERESTING ASPECTS OF ITS DESIGN AND CONSTRUCTION
6 PAGES, PROCEEDINGS IEE, 122(1), PP. 49-54 (JAN. 1975)

ASPECTS COVERED INCLUDE THE BRINGING TOGETHER OF THE PRIMARY-VESSEL COMPONENTS ALL OF WHICH ARE SUPPORTED FROM THE REACTOR ROOF, THE CONSTRUCTION OF WHICH INVOLVED THE USE OF FLOTATION. A DESCRIPTION IS INCLUDED OF THE ROTATING SHIELD AND ITS FUNCTION RELATED TO THE CHARGE PROCEDURES OF THE REACTOR. THE USE OF THE IRRADIATED-CAVE FACILITIES IS DESCRIBED AND SOME DETAIL IS GIVEN OF SOME OF THE SPECIAL MACHINES WITHIN THIS COMPLEX.

REACTOR DESCRIPTION + UNITED KINGDOM + *DOUNREAY (LMFBR) + CONSTRUCTION

17-104344 DATED 1972
KIRK J
EXPERIENCE AND TECHNIQUES IN MAINTENANCE AND REPAIR OF REACTOR COMPONENTS ON THE DOUNREAY FAST REACTOR
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-PL-504-1 +, 14 PAGES, 1972

SINCE THE DFR FIRST WENT CRITICAL IN 1959, A CONSIDERABLE AMOUNT OF RADIOACTIVE MAINTENANCE HAS BEEN CARRIED OUT. THE WORK HAS RANGED FROM RELATIVELY MINOR TASKS SUCH AS CONTROL ROD MAINTENANCE TO MAJOR UNDERTAKINGS LIKE THE CHANGING OF THE COMPLETE CORE TUBE NEST, DEALING WITH 600 SWOLLEN BREEDER ELEMENTS AND REPAIR OF A PRIMARY CIRCUIT LEAK. THE TECHNIQUES EMPLOYED IN CARRYING OUT THE MAINTENANCE ARE DESCRIBED.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

MAINTENANCE AND REPAIR + UNITED KINGDOM + DOUNREAY (LMFBR) + COMPONENTS + *OPERATING EXPERIENCE

17-104920 DATED 1974
AUBERT M
THE PHENIX 4 FAST BREEDER POWER PLANT
4 PPS, NUCLEAR ENGINEERING INTERNATIONAL, 19(218), PP. 563-66 (JULY 1974)

AFTER THE PHENIX 250 MW(E) DEMONSTRATION PLANT START-UP AND OPERATION IT IS POSSIBLE TO CONSIDER FAST BREEDER SODIUM-COOLED PLANTS FROM 250 TO 500 MW(E) BASED ON THE PHENIX CONCEPT. THE 450 MW(E) PLANT IS THUS A DIRECT EXTRAPOLATION FORM PHENIX WITHOUT ANY NEW TECHNOLOGICAL RISK. THIS PLANT ALLOWS ACCESS TO THE SODIUM FAST NEUTRON REACTOR FIELD AND IS COMPETITIVE WITH CONVENTIONAL STATIONS WITH REGARD TO GENERATION COSTS.

*FRANCE + COMPARISON, REACTOR CHARACTERISTICS

17-105003 ALSO IN CATEGORY 5 DATED 1975
ZWAHR H
STEAM TURBINES FOR NUCLEAR POWER PLANTS
TECHNISCHE UNIVERSITAT HANNOVER, GERMANY
9 PPS, 11 FIGS, 14 REFS, KERNTECHNIK, 17(3), PP. 119-27 (MARCH 1975)

THE BASIC THERMODYNAMIC SCHEMATA OF THE STEAM CYCLE OF VARIOUS NUCLEAR POWER PLANT TYPES ARE GIVEN AND DISCUSSED. THE SATURATED OR WET STEAM TURBINES USED WITH LIGHT WATER REACTORS ARE DISCUSSED IN DETAIL. IN PROSPECT, UNIT RATINGS OF THE ORDER OF 2000 MW MAY BE EXPECTED IN ABOUT 1985. A PROBABLE DEVELOPMENT IN THE FIELD OF GAS-COOLED HIGH TEMP. REACTORS IS THE TRANSITION FROM THE INDIRECT TO THE DIRECT CYCLE IN WHICH THE FUNCTION OF THE STEAM TURBINES WILL BE TAKEN OVER BY GAS TURBINES.

*REACTOR, BWR + REACTOR, PWR + *STEAM + THERMODYNAMICS + GERMANY + REACTOR, LWR + REACTOR, HTGR + *TURBINE + POWER PLANT, NUCLEAR

17-105004 ALSO IN CATEGORY 9 DATED 1975
HANS R + MAUSBECK H
INSTRUMENTATION SPECIFIC TO THE SNR-350 LIQUID METAL FAST BREEDER REACTOR
INTERATOM, BENSBERG/KOLN, GERMANY
6 PPS, 15 FIGS, KERNTECHNIK, 17(3), PP. 113-18 (MARCH 1975)

IN THE PROCESS INSTRUMENTATION, LEVEL, FLOW, AND PRESSURE MEASURING TECHNIQUES ARE DESCRIBED. FOR THE ANALYZERS, PLUGGING METERS, HYDROGEN DETECTION AND SAMPLING ARE DISCUSSED. CORE INSTRUMENTATION DESCRIBED CONSISTS OF TEMPERATURE MONITORING PROBES, FUEL ELEMENT FLOWMETER, AND POSITION MEASURING DEVICES FOR FUEL ELEMENTS. MEASURING, CONTROL AND MONITORING DEVICES FOR THE ELECTRIC TRACE HEATING ARE DESCRIBED.

*INSTRUMENT, IN CORE + INSTRUMENT, PROCESS + GERMANY + INSTRUMENT, FLOW + INSTRUMENT, LIQUID LEVEL +

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-105004 *CONTINUED*
INSTRUMENT, TEMPERATURE + INSTRUMENT, PRESSURE + *HEATERS

17-106806 ALSO IN CATEGORY 18 DATED 1975
RESPONSE TO QUESTION 5 - PLANTS DEMONSTRATION OBJECTIVES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-317 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE STATED OBJECTIVES OF THE CRBRP WILL BE FULFILLED WITHIN THE FIVE-YEAR DEMONSTRATION PERIOD. AT THIS TIME, THE PRECISE ROLE OF THE CRBRP IN THE LMFBR PROGRAM DURING THE POST-DEMONSTRATION PERIOD CANNOT BE PRECISELY DETERMINED. IT IS PRESENTLY ANTICIPATED HOWEVER THAT DURING THE POST-DEMONSTRATION PERIOD, THE CRBRP WILL BE USED FOR A NUMBER OF SPECIFIC EXPERIMENTAL AND OPERATIONAL TESTS, SUCH AS TESTING VARIATIONS IN FUEL ASSEMBLY DESIGNS, NATURAL CIRCULATION PERFORMANCE, ETC.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

OPERATION + RESPONSE TO NRC QUESTION + OPERATING EXPERIENCE + CLINCH RIVER (LMFBR)

17-106808 ALSO IN CATEGORIES 1 AND 18 DATED 1975
RESPONSE TO QUESTION 7 - LMFBR PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-324 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES THE RELATIONSHIP OF THE CRBRP TO SUBSEQUENT PHASES OF THE LMFBR PROGRAM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + R AND D PROGRAM + COMPARISON + CLINCH RIVER (LMFBR)

17-107482 ALSO IN CATEGORY 9 DATED 1975
SCHATZ RA + DUETSCH KL
RELIABILITY MODELING OF CLINCH RIVER BREEDER REACTOR ELECTRICAL SHUTDOWN SYSTEMS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-750418-3 +. 28 PPS, FROM 6TH ANNUAL CONFERENCE ON MODELING & SIMULATION, PITTSBURGH, PA., APRIL 23-25, 1975

DESCRIBES THE INITIAL SIMULATION OF THE PROBABILISTIC PROPERTIES OF THE CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) ELECTRICAL SHUTDOWN SYSTEMS. A MODEL OF THE RELIABILITY (AND AVAILABILITY) OF THE SYSTEMS IS PRESENTED UTILIZING SUCCESS STATE AND CONTINUOUS-TIME, DISCRETE STATE MARKOV MODELING TECHNIQUES AS SIGNIFICANT ELEMENTS OF AN OVERALL RELIABILITY ASSESSMENT PROCESS CAPABLE OF DEMONSTRATING THE ACHIEVEMENT OF PROGRAM GOALS. THIS MODEL IS EXAMINED FOR; ITS SENSITIVITY TO SAFE/UNSAFE FAILURE RATES, SUBSYSTEM REDUNDANT CONFIGURATIONS, TEST AND REPAIR INTERVALS, MONITORING BY REACTOR OPERATORS; AND THE CONTROL EXERCISED OVER SYSTEM RELIABILITY BY DESIGN MODIFICATIONS AND THE SELECTION OF SYSTEM OPERATING CHARACTERISTICS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*RELIABILITY ANALYSIS + *REACTOR PROTECTION SYSTEM + ANALYTICAL MODEL + RELIABILITY, SYSTEM + CLINCH RIVER (LMFBR)

17-107736 DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
36 PGS, AMENDMENT 4 TO CLINCH RIVER BREEDER LICENSE APPLICATION, SEPT. 12, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THIS AMENDMENT TO THE PRELIMINARY SAR CONSISTS OF THE PROJECT'S SITE SUITABILITY SOURCE TERM FOR THE CRBRP REFERENCE DESIGN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + FISSION PRODUCT RELEASE + ACCIDENT, REFUELING + SITING, REACTOR + SOURCE, RADIATION + POPULATION EXPOSURE + RADIOACTIVITY RELEASE + *REPORT, PSAR + *CLINCH RIVER (LMFBR)

17-108111 DATED 1975
TESTING OF THE PHENIX NUCLEAR STATION
U.S. ERDA, WASHINGTON
ERDA-TR-56 +. 105 PPS, FIGS, OCT. 1975 (TRANSLATED FROM FRENCH)

PRESENTS DETAILS OF THE TESTING OF THE CIRCUIT, REACTOR, CORE, FUEL HANDLING AND SPECIAL HANDLING SYSTEMS, CONTROL SYSTEMS, AND ELECTRICITY PRODUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-108111 *CONTINUED*
FRANCE + FUEL HANDLING + TESTING + REACTOR STARTUP TESTING + TEST, SYSTEM OPERABILITY + PHENIX (LMFBR)

17-108213 ALSO IN CATEGORY 18 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT JULY-AUGUST 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-7 +. 18 PPS, AUG. 1974

REPORTS ON OPERATION OF THE TEST LOOP AND INCLUDES COOLANT CHEMISTRY, THE FEEDWATER/STEAM SYSTEM, THE SODIUM SYSTEM, AND MAINTENANCE AND REPAIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COOLANT CHEMISTRY + *NETHERLANDS + R AND D PROGRAM

17-108214 ALSO IN CATEGORY 18 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT, JUNE 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-6 +. 11 PPS, JUNE 1974

REPORTS ON THE OPERATION OF THE TEST LOOP INCLUDING COOLANT CHEMISTRY, THE CHEMISTRY OF THE COVER GAS, AND FAILURES AND MAINTENANCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COVER GAS + COOLANT CHEMISTRY + NETHERLANDS + R AND D PROGRAM

17-108215 ALSO IN CATEGORY 18 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT, SEPTEMBER 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-8 +. 15 PPS, 3 FIGS, SEPT. 1974

REPORTS ON THE OPERATION OF THE TEST LOOP INCLUDING COOLANT CHEMISTRY, CHEMISTRY OF THE COVER GAS, AND FAILURES AND MAINTENANCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COVER GAS + COOLANT CHEMISTRY + NETHERLANDS + R AND D PROGRAM

17-108596 DATED 1975
CASE JC + LARSON WJ
LOADING DIAGRAMS OF EXPERIMENTAL SUBASSEMBLIES STARTING IRRADIATION IN EBR-II RUNS 63-76
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/EBR-090 +. 111 PPS, FIGS, FEB. 1975

THIS REPORT CONTAINS THE LOADING DIAGRAMS FOR ALL EXPERIMENTAL SUBASSEMBLIES AS THEY WERE FABRICATED FOR IRRADIATION STARTING IN EBR-II RUNS 63 THROUGH 76. IT SUPPLEMENTS THREE SIMILAR REPORTS: ANL/EBR-015, FOR RUNS 5 THROUGH 42; ANL/EBR-043, FOR RUNS 43 THROUGH 50; AND ANL/EBR-074, FOR RUNS 51 THROUGH 62. EACH DIAGRAM, WITH ITS ACCOMPANYING TABLE, GIVES THE LOCATION, IDENTIFICATION NUMBER, AND CONTENT OF EACH CAPSULE (OR ELEMENT) IN THE SUBASSEMBLY. INFORMATION WITH EACH DIAGRAM GIVES THE TYPE OF HARDWARE, ORIFICE SIZE, RESULTS OF FLOW-TESTING OF THE FABRICATED ASSEMBLY (WHERE APPLICABLE), DATE AND PLACE OF ASSEMBLY, AND DATE PLACED INTO THE REACTOR. (ALL DIMENSIONS ARE IN INCHES.)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EBR I AND 2 (RE) + SYSTEM DESCRIPTION + FUEL MANAGEMENT + FUEL ELEMENTS

17-108597 ALSO IN CATEGORY 9 DATED 1974
CAMBILLARD E + LACROIX A + LANGLOIS G
TESTS CARRIED OUT ON THE PHENIX STEAM GENERATOR LEAK DETECTION SYSTEMS (IN FRENCH)
CEA-CONF-2894 + CONF-741085-6 +. 21 PPS, FROM SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST BREEDER REACTORS, EENSBERG, F.R. GERMANY, OCT. 14, 1974

THE PHENIX SECONDARY CIRCUITS ARE PROVIDED WITH MEASUREMENT SYSTEMS OF HYDROGEN CONCENTRATION IN SODIUM, THAT ALLOW FOR THE DETECTION OF POSSIBLE WATER LEAKS IN STEAM GENERATORS AND THE LOCATION OF A FAULTY MODULE. A MEASUREMENT DEVICE CONSISTS OF A DETECTOR WITH NICKEL MEMBRANES 0.3 MM WALL THICKNESS, AN ION PUMP WITH A 200 1/S FLOW RATE, A QUADRUPOLE MASS SPECTROMETER AND A CALIBRATED HYDROGEN LEAK. THE TEMPERATURE CORRECTION IS MADE AUTOMATICALLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + HYDROGEN + TESTING + MONITOR, GAS + MONITOR + STEAM GENERATOR + LEAK + TEST, LEAK + PHENIX (LMFBR)

17-109204 ALSO IN CATEGORY 18 DATED 1975

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-109204 *CONTINUED*
SICARD E + COULON P + MOUGIOT JC
FUEL MANAGEMENT CODES FOR FAST REACTORS
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
CONF-750411-41 +. 30 PPS, FROM EUROPEAN NUCLEAR CONFERENCE, APRIL 21-25, 1975

THE CAPHE CODE CARRIES OUT ALL THE NEUTRONIC, THERMAL AND HYDRAULIC CALCULATIONS FOR A CORE LOAD (AT THE BEGINNING AND AT THE END OF THE WORKING CYCLE) AND MAKES IT POSSIBLE TO FORCE THE CHARACTERISTICS OF A SUBSEQUENT LOAD PLAN. AMONG THE CHARACTERISTICS CALCULATED FOR EACH SUBASSEMBLY ARE: TOTAL POWER, SODIUM FLOW, SODIUM TEMPERATURE INCREASE, MAXIMUM NOMINAL CLAD TEMPERATURE, MAXIMUM HOT POINT TEMPERATURE OF A CLAD, MAXIMUM FISSION BURNUP ATTAINED BY THE FUEL, NUMBER OF DISPLACEMENTS ATTAINED PER ATOM OF STEEL AND THE BALANCE IN HEAVY ATOMS FOR THE FUEL AND THE LOWER AND UPPER AXIAL BLANKETS. CODE WAS APPLIED TO FUEL MANAGEMENT OF PHENIX.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CLADDING + *FRANCE + FUEL BURNUP + *FUEL MANAGEMENT + TEMPERATURE + PHENIX (LMFBR) + BLANKET

17-109347 ALSO IN CATEGORY 18 DATED 1975
CURRIE AJ
SODIUM FROST OBSERVATIONS IN CRCTA: IVHM PENETRATION PLUG
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-92 +. 22 PPS, 11 FIGS, 2 REFS, AUG. 1975

SODIUM FROST FORMATIONS ON THE IN-VESSEL HANDLING MACHINE (IVHM) PENETRATION PLUG ARE DESCRIBED. THIS PLUG, INSTALLED IN THE COMPOSITE REACTOR COMPONENTS TEST ACTIVITY (CRCTA) TO CLOSE AND INSULATE THE IVHM PENETRATION IN THE ABSENCE OF THE IVHM COMPONENT, WAS EXPOSED TO SODIUM VAPOR FOR 210 DAYS. DURING PLUG RESIDENCE, THE CRCTA SODIUM POOL TEMPERATURES RANGED BETWEEN 350 DEG. F AND 1100 DEG. F. A DETAILED COMPARISON OF THE ANNULAR PROFILES OF THE CRCTA/IVHM PLUG AND CRCTA/IVHM TEST COMPONENT IS MADE, FOLLOWED BY PREDICTED PATTERNS OF SODIUM FROST FORMATION ON THE IVHM TEST COMPONENT. IMPLICATIONS FOR FFTF OPERATIONS ARE DISCUSSED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DEPOSITION + OPERATION + FFTF (TR) + COOLANT CHEMISTRY + *FUEL HANDLING MACHINE + *SURFACE FILM DEPOSIT + CORE COMPONENTS + *EFFECT

17-109508 ALSO IN CATEGORY 18 DATED 1975
KERRISK JF
EXPERIENCE RELATED TO THE SAFETY OF ADVANCED LMFBR FUEL ELEMENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6028 +. 29 PPS, 16 TABS, 78 REFS, NOV. 1975

EXPERIMENTS AND EXPERIENCE RELATIVE TO THE SAFETY OF ADVANCED FUEL ELEMENTS FOR THE LIQUID METAL FAST BREEDER REACTOR ARE REVIEWED. THE DESIGN AND OPERATING PARAMETERS AND SOME OF THE UNIQUE FEATURES OF ADVANCED FUEL ELEMENTS ARE DISCUSSED BRIEFLY. TRANSIENT AND STEADY STATE OVERPOWER OPERATION AND LOSS OF SODIUM BOND TESTS AND EXPERIENCE ARE DISCUSSED IN DETAIL. AREAS WHERE INFORMATION IS LACKING ARE ALSO MENTIONED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + REVIEW + HEAT CONDUCTANCE, FUEL TO CLAD + *OPERATING EXPERIENCE + *FUEL ELEMENTS

17-109928 ALSO IN CATEGORY 9 DATED 1974
CARLE R + MEGY J + ROBERT E + LAFAT P
PHENIX STARTUP
ELECTRICITE DE FRANCE, PHENIX PROJECT
CONF-740401-P2 +. 11 PPS, PP. 1009-1020, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

PHENIX 250 MW PROTOTYPE FAST REACTOR POWER STATION REACHED NOMINAL POWER ON MARCH 12, 1974. THIS PAPER DESCRIBES THE STARTUP TESTS WHICH BEGAN AT THE END OF 1972. BOTH ANTICIPATED SEQUENCING AND ACTUAL SEQUENCING ARE GIVEN FOR EACH PHASE OF THE TESTS. MAIN RESULTS AND ENCOUNTERED DIFFICULTIES ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + *REACTOR STARTUP EXPERIENCE + *REACTOR STARTUP

17-109929 ALSO IN CATEGORIES 9 AND 12 DATED 1974
PALAMIDESSI A
SAFETY DESIGN APPROACH TO THE PEC REACTOR
CNEN, BOLOGNA, ITALY
CONF-740401-P2 +. 20 PPS, PP. 1021-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN AND EVALUATION APPROACH USED TO ASSURE SAFETY IN THE PEC REACTOR IS DISCUSSED. SAFETY

CATEGORY 17
OPERATIONAL SAFETY AND EXPERIENCE

17-109925 *CONTINUED*
GOALS WERE ESTABLISHED TO GUIDE DESIGN AND TO PROVIDE ASSURANCE OF ADHERENCE WITH GENERAL SAFETY PRINCIPLES. SOME POSTULATED FAULTS ARE SURVEYED AND ENGINEERED SAFETY FEATURES AND PROTECTIVE SYSTEMS TO PREVENT THE ACCIDENTS OR MITIGATE THE CONSEQUENCES ARE DISCUSSED. THE EXTREMELY IMPROBABLE OR HYPOTHETICAL OCCURRENCES IN WHICH THE PROTECTIVE SYSTEMS ARE ASSUMED TO FAIL TO DERIVE DESIGN BASIS CONDITIONS ARE BRIEFLY DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + REACTOR PROTECTION SYSTEM + ACCIDENT, HYPOTHETICAL + DESIGN STUDY + *SAFETY EVALUATION + ENGINEERED SAFETY FEATURE + *ACCIDENT, ATWS

17-109931 ALSO IN CATEGORIES 9 AND 12 DATED 1974
YELLOWLEES JM + VIEIDER G + SACRISTE C
THE ENGINEERED SAFEGUARDS AND THEIR IMPLICATIONS FOR THE GBR-4 DESIGN
EUROPEAN ASSOCIATION FOR THE GAS BREEDER REACTOR, BRUSSELS
CONF-740401-P2 +. 13 PPS, PP. 1105-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DESCRIBES THE INHERENT SAFETY FEATURES AND ENGINEERED SAFEGUARDS OF A COMMERCIAL GAS-COOLED BREEDER REACTOR. THE RELIABILITY OF THE REACTOR, THE HEAT REMOVAL FROM THE CORE AND THE RADIOLOGICAL SAFEGUARDS ARE EMPHASIZED. THE CONCLUSION IS DRAWN THAT, USING CONVENTIONAL GAS-COOLED REACTOR ENGINEERING PRACTICE, THE GAS-CUCLED BREEDER REACTOR CAN BE MADE AS SAFE AS ANY OTHER REACTOR SYSTEM WITHOUT LOSING ITS ECONOMIC COMPETITIVITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR, GCR + REACTOR PROTECTION SYSTEM + SAFETY EVALUATION + ENGINEERED SAFETY FEATURE

17-110050 ALSO IN CATEGORY 18 DATED 1975
NOORDHOFF BH + MCGOUGH CB + NOLAN JE
TESTING EXPERIENCE WITH FAST FLUX TEST FACILITY
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-SA-916 + CONF-750604-3 +. 21 PPS, FROM U.S./USSR SEMINAR ON FAST BREEDER REACTOR CONSTRUCTION AND EXPERIENCE, OBINSK, USSR, JUNE 2, 1975

SEVERAL NEW SODIUM FACILITIES WERE CONSTRUCTED AND CONFIRMATION TESTS ON THE PROTOTYPE COMPONENTS ARE NOW IN PROGRESS. TEST CONDITIONS AND RESULTS TO DATE ARE REPORTED FOR THE PRIMARY PUMP, INTERMEDIATE HEAT EXCHANGER, SODIUM-TO-AIR DUMP HEAT EXCHANGER, LARGE AND SMALL SODIUM VALVES, PURIFICATION COLD TRAP, IN-VESSEL HANDLING MACHINE, INSTRUMENT TREE, CORE RESTRAINT, CONTROL ROD SYSTEM, SELECTED MAINTENANCE EQUIPMENT. THE SIGNIFICANCE AND CONTRIBUTION OF THESE TESTS TO THE FFTF AND LMFBR PROGRAM ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TESTING + FFTF (TR) + FUEL HANDLING MACHINE + CORE COMPONENTS + CONTROL RODS + PUMPS + VALVES + HEAT EXCHANGERS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-093068 DATED 1974
DUCAT GA + CRISCOLL MJ + TODREAS NE
EVALUATION OF THE PARFAIT BLANKET CONCEPT FOR FAST BREEDER REACTORS
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
COO-2250-5 +, 265 PAGES, FIGURES, JANUARY 1974

AN EVALUATION OF THE NEUTRONIC, THERMAL-HYDRAULIC, MECHANICAL AND ECONOMIC CHARACTERISTICS OF FAST BREEDER REACTOR CONFIGURATIONS CONTAINING AN INTERNAL BLANKET HAS BEEN PERFORMED. THIS DESIGN CALLED THE PARFAIT BLANKET CONCEPT, EMPLOYS A LAYER OF AXIAL ENRICHMENT ZONE; OTHERWISE, THE DESIGN IS THE SAME AS THAT OF THE CONVENTIONAL LMFBR'S TO WHICH THE PARFAIT CONFIGURATION WAS COMPARED. TWO SIGNIFICANT ADVANTAGES WERE IDENTIFIED FOR THE PARFAIT BLANKET CONCEPT RELATIVE TO THE CONVENTIONAL DESIGN. FIRST, THE PARFAIT CONFIGURATION HAS A 25% SMALLER PEAK FAST FLUX WHICH REDUCES WRAPPER TUBE DILATION BY 37% AND FUEL ELEMENT ELONGATION BY 29%; AND SECOND, AXIAL AND RADIAL FLUX FLATTENING CONTRIBUTE TO A 7.6% REDUCTION IN THE PEAK FUEL BURNUP. BOTH CHARACTERISTICS SIGNIFICANTLY DIMINISH THE PROBLEMS OF FUEL AND METAL SWELLING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN STUDY + THERMAL HYDRAULIC ANALYSIS + BLANKET

18-093107 ALSO IN CATEGORY 11 DATED 1973
LACROIX R + MAGNAS JP
CIVIL ENGINEERING AND THE PHENIX POWER PLANT
SOCIETE GENERALE D'ENTREPRISES, PARIS
5 PAGES, TECH. MOD., 65(10), PP. 33-37 (OCTOBER 1973) (IN FRENCH)

THE PRINCIPAL CHARACTERISTICS OF THE CONSTRUCTION WORK UNDERTAKEN FOR THE PHENIX PLANT ARE LINKED TO THE TIME CONSTRAINTS IMPOSED (THE PRELIMINARY WORK WAS DRAWN UP AND OPTIONS TAKEN IN A VERY SHORT TIME DURATION), TO THE PROTOTYPE NATURE OF THE PLANT, TO THE VERY DIFFICULT ORGANIZATION PROBLEMS OCCURRING, AND TO THE NUCLEAR NATURE OF THE PLANT. PREFABRICATED CONSTRUCTIONS HAVING DIFFERENT CHARACTERISTICS AND LEAK TIGHTNESS PROPERTIES WERE USED FOR THE TWO PRINCIPAL BUILDINGS (REACTOR BUILDING AND EQUIPMENT HANDLING BUILDING). THE WAY IN WHICH LEAK TIGHTNESS PROBLEMS WERE OVERCOME AND THE PERFORMANCE OBTAINED ARE DISCUSSED.

FRANCE + BUILDING + CONSTRUCTION

18-093125 ALSO IN CATEGORY 5 DATED 1974
STEAM GENERATOR TEST LOOP FOR SODIUM COOLED FAST BREEDER REACTOR
11 PAGES, ISHIKAWAHIMA-HARIMA GIHO, 14(1), PP. 66-77 (JAN. 1974) (IN JAPANESE)

IN THE DEVELOPMENT OF THE LIQUID METAL FAST BREEDER REACTOR (LMFBR), THE STEAM GENERATOR (SG) IS CONSIDERED A COMPONENT WHICH REQUIRES PREFERENTIAL DEVELOPMENT. IN JAPAN, THE HELICAL COILED HEAT TRANSFER TUBE TYPE SG WAS CHOSEN AS ONE OF THE SG TYPES FOR THE LMFBR, AND RESEARCH AND DEVELOPMENT WILL PROCEED. HOWEVER, THIS TYPE POSSESSES SOME PROBLEMS TO BE SOLVED, SUCH AS BOILING IN THE DOWNCOMER AND MULTI-CHANNEL FLOW INSTABILITY DURING LOW LOAD OPERATION. A TEST LOOP WAS DESIGNED AND MANUFACTURED FOR THE PURPOSE OF PROVING THERMAL AND HYDRODYNAMIC PERFORMANCE AND OBTAINING BASIC EXPERIMENTAL DATA FOR THE PROBLEMS MENTIONED.

JAPAN + SYSTEM DESCRIPTION + R AND D PROGRAM + STEAM GENERATOR

18-093128 DATED 1973
NAKAGAWA H
DESIGN STUDIES OF LARGE FAST BREEDER REACTORS
TOKYO ELECTRIC POWER CO., INC., JAPAN
10 PAGE, NIPPN GENSHIR, GAKKAISH, 15(7), PP. 469-478 (JULY 1973) (IN JAPANESE)

THE CORE DESIGN FOR A LARGE FAST BREEDER REACTOR WAS STUDIED. THE OUTLINE OF THE 1000 MW(E) CLASS CORE DESIGN IS INTRODUCED, AND SOME PROBLEMS PECULIAR TO LARGE REACTOR CORES ARE CLARIFIED ON THE COLUMNAR FORM OF THE CORE, PLUTONIUM ENRICHMENT RATE OF TWO REGION CORE STRUCTURE, POWER DENSITY OF FUEL PINS AND THE HOT SPOT FACTOR, DESIGN OF CONTROL RODS, OPTIMUM DESIGN OF A REACTOR CORE ,BENCH MARK TESTS AND NUCLEAR CHARACTERISTICS OF BURN-UP. THE MOST IMPORTANT PROBLEM OF LARGE REACTORS IS THE COUNTER-MEASURE TO THE POSITIVE VOID COEFFICIENT OF REACTIVITY.

DESIGN STUDY + JAPAN + R AND D PROGRAM

18-093129 DATED 1973
YAMADA T
SOME PROBLEMS ON DEVELOPMENT OF FAST BREEDER REACTOR
ATOMIC ENERGY COMMISSION, TOKYO
5 PAGES, GENSHIR. KOGYO, 19(6), PP. 9-13 (JUNE 1973) (IN JAPANESE)

DESPITE THE PAST 20 ODD YEARS EFFORTS BY SCIENTISTS AND TECHNOLOGISTS OVER THE WORLD, FAST BREEDER REACTORS ARE NOT YET IN PRACTICAL USE, ALTHOUGH THE PRESENT STATE SEEMS TO BE ONLY A STEP AWAY FROM IT. THE CURRENT STATE OF FBR DEVELOPMENT IS DESCRIBED INCLUDING: SIGNIFICANCE OF THE DEVELOPMENT OF FBRS, TECHNOLOGICAL ASPECTS IN THE DEVELOPMENT, WORLD TRENDS IN FBR DEVELOPMENT, OPTIMIZATION OF BLANKETS, AND UNCERTAIN FACTORS IN THE FUEL CYCLE. THE FBRS ARE ADVANTAGEOUS NOT ONLY IN FUEL EFFICIENCY AND ECONOMY, BUT ALSO IN ENVIRONMENTAL ASPECTS. CONTROVERSIAL ASPECTS ARE SAFETY, SWELLING, POT OR LOOP TYPE, ETC. BREEDING CHARACTERISTICS OF THE FBRS ARE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-093129 *CONTINUED*
CLOSELY RELATED TO THE OPTIMUM DESIGN OF BLANKETS.

JAPAN + REVIEW + R AND D PROGRAM

18-093137 DATED 1973
SAMEITH M + SCHULTHEISS GF + SMIDT D
RESEARCH WORK CONCERNING THE SAFETY OF NUCLEAR POWER PLANTS
UNIV., KARLSRUHE, GERMANY
8 PAGES, FRIDERICIANA, NO. 13, PP. 41-48 (NOV. 1973) (IN GERMAN)

THREE FIELDS OF REACTOR SAFETY RESEARCH, NAMELY INVESTIGATIONS OF LOCAL COOLANT FLOW DISTURBANCES IN A SODIUM-COOLED FAST BREEDER REACTOR, BASIC EXPERIMENTS CONCERNING THE BEHAVIOR OF TWO-PHASE MIXTURES IN COMPRESSION AND EXPANSION WAVES (LWR-ACCIDENT WITH FAST PRESSURE DROP), AND DEVELOPMENT OF AN INFORMATION SYSTEM FOR REACTOR SAFETY ARE DESCRIBED.

ACCIDENT, LOSS OF FLOW + REACTOR, POWER + GERMANY + FLOW, TWO PHASE + SAFETY PROGRAM + R AND D PROGRAM

18-093156 ALSO IN CATEGORY 11 DATED 1973
KOBAYASHI Y + KONDO S + TOGO Y
DESIGN AND OPTIMIZATION STUDY OF 10,000 MW(E) VERY LARGE FAST REACTOR CORE
12 PAGES, J. NUCL. SCI. TECHNOL. (TOKYO), 10(10), PP. 607-618 (OCT. 1973)

THE METHOD AND RESULTS OF A DESIGN STUDY ON A 10,000 MW(E) LIQUID METAL FAST BREEDER REACTOR ARE DESCRIBED. FIRST, A REFERENCE DESIGN WAS OBTAINED BY EXTRAPOLATING VARIOUS CHARACTERISTICS OF A 1,000 MW(E) LMFBR. IT WAS FOUND THAT REACTIVITY INCREASE COULD BE REDUCED TO ABOUT 6 CENTS WHEN SEVEN SUB-ASSEMBLIES WERE VOIDED IN THE CNETRAL PART OF THE CORE, AND THAT THE INCREASE OF REACTIVITY AND THE DECREASE OF BREEDING RATIO WITH TIME WERE LARGE FOR THE INITIAL LOADING CORE. A DESIGN OPTIMIZATION PROCEDURE WAS DEVELOPED BASED ON A COMPLEX METHOD OF NONLINEAR PROGRAMMING, AND THE METHOD WAS APPLIED TO THE VERY LARGE FAST REACTOR. THE PROCESS RESULTED IN A RELATIVELY LARGE CORE HEIGHT AND FUEL PIN DIAMETER, WHILE POWER COST WAS IMPROVED DUE TO ENHANCED BREEDING GAIN. THE FUEL CENTER TEMPERATURE AND THE COOLANT VELOCITY WERE FOUND CLOSE TO THE UPPER BOUNDARIES OF THEIR PRESCRIBED RANGES.

COMPUTER PROGRAM + DESIGN CRITERIA + REACTOR, LARGE + DESIGN STUDY + CORE COMPONENTS + MATHEMATICAL TREATMENT + OPTIMIZATION + POWER PLANT, NUCLEAR

18-093611 ALSO IN CATEGORY 1 DATED 1974
DEVELOPMENT FACILITIES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 72-145(REV.1) +. 265 PAGES, FIGURES, NOVEMBER 1974

THIS DOCUMENT PROVIDES A DESCRIPTION OF THE VARIOUS DEVELOPMENT FACILITIES AVAILABLE AT HEDL FOR USE IN THE FFTF/LMFBR PROGRAM. THE FACILITIES DESCRIBED ENCOMPASS: THE FAST FLUX TEST FACILITY (FFTF) REACTOR PLANT AS A TEST BED; THE HIGH TEMPERATURE SODIUM FACILITY (HTSF), A NONRADIOACTIVE LARGE COMPONENT TEST FACILITY; GENERAL SODIUM FACILITIES; HYDRAULICS LABORATORY; FUEL FABRICATION FACILITIES, FUEL EXAMINATION FACILITIES, CHEMICAL AND MICROSTRUCTURAL ANALYSIS LABORATORIES, AND SUPPORT LABORATORY CAPABILITIES. FACILITIES UTILIZATION IS BASED ON PRIORITIES OF THE VARIOUS PROGRAMS WITH THE FFTF HAVING THE HIGHEST PRIORITY. THE FACILITIES ARE CAPABLE OF MODIFICATION TO SUIT THE SPECIFIC TEST REQUIREMENTS. SUFFICIENT DETAIL IS PROVIDED IN THIS REPORT TO PERMIT ASSESSMENT OF USE FOR PARTICIPANTS IN THE LMFBR PROGRAM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR DESCRIPTION + THERMAL MECHANICAL EFFECT + FFTF (TR) + TEST, COMPONENT + IRRADIATION TESTING + SYSTEM DESCRIPTION + COMPONENT DESCRIPTION

18-093641 ALSO IN CATEGORIES 1 AND 17 DATED 1975
PROCEEDINGS OF THE SCIENTIFIC-TECHNICAL CONFERENCE "ATOMIC POWER, FUEL CYCLES, RADIATION STUDY OF MATERIALS", HELD IN ULYANOVSK, 5-10 OCTOBER 1970 (VOL.1)
CONF-701074-P1 +. 725 PAGES, JANUARY 1975 (TRANSLATED FROM RUSSIAN)

CONTAINS ARTICLES DISCUSSING NUCLEAR ENERGY DEVELOPMENT IN THE VARIOUS SOVIET BLOC NATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + REACTOR, BWR + COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + REACTOR, PWR + ACCIDENT, HYPOTHETICAL + CZECHOSLOVAKIA + GERMANY + HUNGARY + USSR + BULGARIA + OPERATING EXPERIENCE + GROWTH/DEVELOPMENT + INDUSTRY, NUCLEAR + REACTOR STARTUP

18-093643 ALSO IN CATEGORIES 5 AND 6 AND 8 DATED 1974
NICHOLSON RB
DESIGN BASIS ACCIDENT STUDIES - FINAL REPORT
THE OHIO STATE UNIVERSITY
COO-2286-3 +. 260 PAGES, TABLES, REFERENCES, JUNE 22, 1974

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-093643 *CONTINUED*
AN EXTENSION OF THE ANL EQUATION OF STATE IN THE VENUS-II PROGRAM TO INCLUDE LOWER PRESSURE CONDITIONS AND AN ISENTROPIC EXPANSION CALCULATION SHOWS THAT THE ENERGY AVAILABLE FOR MECHANICAL DAMAGE IS STRONGLY DEPENDENT UPON HOW FAR THE EXPANSION CAN PROCEED. EXPANSION TO ONE ATMOSPHERE IN WEAK ACCIDENTS CAN LEAD TO ONE TO TWO ORDERS OF MAGNITUDE MORE ENERGY THAN R. W. STRATTON'S EIGHT-FOLD VOLUME EXPANSION. THE MODIFIED BETHE-TAIT METHOD OF EDWARDS AND MATHER IS APPROXIMATELY REPRODUCED AND VERIFIED BUT AT HIGH DOPPLER EFFECT, LOW EXCURSION ENERGY CONDITIONS. THE ANL EQUATION OF STATE IN VENUS LEADS TO SIGNIFICANTLY GREATER ENERGY RELEASE. A POTENTIALLY AUTOCATALYTIC EFFECT, ASSOCIATED WITH NEUTRON STREAMING THROUGH VOIDS, CANNOT BE DISREGARDED IN HCDA ANALYSIS. MORE WORK IS REQUIRED TO ESTABLISH ITS QUANTITATIVE SIGNIFICANCE. MOST OF THE SAS-2A COMPUTER PROGRAM MODELING IS FOUND TO BE BASED ON SOUND PRINCIPLES. WE ARE GENERALLY IN AGREEMENT WITH ANL ON THE FEW WEAKNESSES OF THE MODELING. THE DBA CONCEPT AS A BASIS FOR BREEDER CONTAINMENT DESIGN IS FOUND TO BE A SOUND CONCEPT WHEN ACCOMPANIED BY A COMMITMENT TO PROVIDE THE HIGHEST PRACTICABLE CONTAINMENT CAPACITY AND BY A COMMITMENT TO ASSURE RESPONSIBILITY AND VISABILITY IN CONTAINMENT DESIGN DECISIONS

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BETHE TAIT + COMPUTER PROGRAM + DOPPLER EFFECT + ENERGY SOURCE + EQUATION OF STATE + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + NEUTRON + ACCIDENT, DESIGN BASIS + VOID + ACCIDENT, CORE DISRUPTIVE

18-093648 ALSO IN CATEGORY 11 DATED 1974
SODIUM TECHNOLOGY AND COVER GAS SEAL DEVELOPMENT PROGRAMS ANNUAL TECHNICAL PROGRESS REPORT, GOVERNMENT FISCAL YEAR 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13132 +. 296 PAGES, 127 FIGURES, AUGUST 15, 1974

PROJECT CONSISTS OF 3 TASKS. THE OBJECTIVE OF TASK 1 IS TO CONDUCT FRICTION SCREENING TESTS IN AN ENVIRONMENT OF HIGH-TEMPERATURE, HIGH-PURITY LIQUID SODIUM OR SODIUM VAPOR TO DEVELOP BACKUP MATERIALS, PROCESSES, AND VENDORS FOR CORE COMPONENT WEAR PADS. THE OBJECTIVES OF TASK 2 ARE TO DEVISE, DEVELOP, TEST, AND EVALUATE TECHNIQUES FOR SODIUM REMOVAL AND STORAGE OF TEST SPECIMENS AND COMPONENTS, AND TO EXPAND AND REFINE, BY TEST AND ANALYSIS, THE SODIUM REMOVAL AND STORAGE TECHNIQUES AND PROCEDURES FOR USE IN PROCESSING TYPICAL LMFBR COMPONENTS. THE OBJECTIVES OF TASK 3 ARE TO (1) CONDUCT STATIC AND DYNAMIC TESTS TO DEMONSTRATE OR DETERMINE THE MECHANICAL PERFORMANCE OF FULL-SIZE (CROSS SECTION) FFTF FUEL TRANSFER MACHINE AND REACTOR VESSEL HEAD SEALS INTENDED FOR USE IN A SODIUM VAPOR - INERT GAS ENVIRONMENT, (2) DEMONSTRATE THAT THESE FFTF SEALS OR NEW SEAL CONFIGURATIONS PROVIDE ACCEPTABLE FISSION PRODUCT AND COVER GAS RETENTION CAPABILITIES AT CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) OPERATING ENVIRONMENTAL CONDITIONS OTHER THAN RADIATION, AND (3) DEVELOP IMPROVED SEALS AND SEAL TECHNOLOGY FOR THE CRBRP TO SUPPORT THE NATIONAL OBJECTIVE TO REDUCE ALL ATMOSPHERIC CONTAMINATIONS TO LOW LEVELS

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FFTF (TR) + FASTENER + MATERIAL + SEAL + COMPONENTS + R AND D PROGRAM + EQUIPMENT DEVELOPMENT + CLINCH RIVER (LMFBR)

18-093655 ALSO IN CATEGORIES 6 AND 11 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-33 +. 142 PAGES, FIGURES, DECEMBER 6, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

18-093656 ALSO IN CATEGORIES 6 AND 11 DATED 1974
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, SEPTEMBER 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-32 +. 160 PAGES, FIGURES, NOVEMBER 1, 1974

REPORTS PROGRESS ON THE FOLLOWING PROJECTS: (1) EXPERIMENTAL BREEDER REACTOR NO. II; (2) HOT FUEL EXAMINATION FACILITY; (3) LMFBR DESIGN SUPPORT; (4) INSTRUMENTATION AND CONTROL; (5) FUELS AND MATERIALS DEVELOPMENT; (6) REACTOR PHYSICS; (7) REACTOR SAFETY; (8) ENERGY AND ENVIRONMENTAL SYSTEMS; AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + DESIGN

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-093656 *CONTINUED*
STUDY + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + REACTOR PHYSICS + R AND D PROGRAM + STEAM GENERATOR + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

18-094072 ALSO IN CATEGORY 11 DATED 1974
KUCZERA B
SIMULATION OF TRANSIENT LMFBR-FUEL PIN BEHAVIOUR UNDER CONSIDERATION OF CERTAIN BURNUP PHENOMENA
KERNFORSCHUNGSZENTRUM, INSTITUT FUR REAKTORENTWICKLUNG, KARLSRUHE, F.R. GERMANY
EURFNR-1184 + KFK-1964 +. 113 PAGES, 4 TABLES, 28 FIGURES, 98 REFERENCES, MARCH 1974

THE EFFECTS CONSIDERED ARE STEADY STATE FUEL SWELLING, CHANGE IN FUEL POROSITY, AND PRODUCTION AND PARTIAL RELEASE OF FISSION GASES. IRRADIATION DEPENDENT CHANGES OF THE CLADDING MATERIAL PROPERTIES ARE DISCUSSED TOGETHER WITH THE FUEL PIN FAILURE CRITERIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FISSION GAS RELEASE + FUEL BURNUP + GERMANY + PROPERTY, PHYSICAL + RADIATION EFFECT + FUEL SWELLING + FUEL ELEMENTS

18-098353 ALSO IN CATEGORY 7 DATED 1974
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE DIVISION OF REACTOR SAFETY RESEARCH FOR JULY - SEPTEMBER 1974, LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4729(VOL.3) +. 25 PAGES, 8 FIGURES, DECEMBER 1974

REPORTS PROGRESS ON THE INVESTIGATION OF THE RELEASE AND BEHAVIOR OF TRANSURANIC ELEMENTS AND FISSION PRODUCTS RESULTING FROM A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT. A SECOND TALK WAS COMPLETED WITH THE ISSUANCE OF THE REPORT ORNL-TM-4714, A STATE-OF-THE-ART REVIEW OF EQUIPMENT CELL LINERS FOR LMFBRS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FISSION PRODUCT RELEASE + R AND D PROGRAM + CONTAINMENT LINER + ACCIDENT, CORE DISRUPTIVE

18-098354 ALSO IN CATEGORY 7 DATED 1974
FONTANA MH
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE DIVISION OF REACTOR SAFETY RESEARCH FOR APRIL - JUNE 1974, LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4655(VOL 3) +. 39 PAGES, 11 FIGURES, AUGUST 1974

REPORTS PROGRESS ON THE INVESTIGATION OF THE RELEASE AND BEHAVIOR OF TRANSURANIC ELEMENTS AND FISSION PRODUCTS RESULTING FROM THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION PRODUCT RELEASE + R AND D PROGRAM + ACCIDENT, CORE DISRUPTIVE

18-098359 DATED 1974
FAST BREEDER PROJECT STATUS REPORT 1974
KERNFORSCHUNGSZENTRUM, PROJEKT SCHNELLER BRUTER, KARLSRUHE
EURFNR-1182 + KFK-2003 +. 187 PAGES, FIGURES, MARCH 1974

PRESENTS 13 PAPERS WHICH SURVEYS THE STATE OF RESEARCH AND DEVELOPMENT WORK PERFORMED BY THE GERMAN, BELGIUM, AND NETHERLANDS RESEARCH CENTERS ON THE SWR 300 PROTOTYPE FAST BREEDER REACTOR, ON THE SNR FOLLOW-ON PROGRAM, ALTERNATIVE FUELS AND COOLANTS. THE DETAILED PAPERS DEAL WITH RESULTS AND CONCENTRATE ON FUEL PIN AND MATERIALS DEVELOPMENT, PHYSICS, AND SAFETY OF FAST REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GERMANY + SAFETY PROGRAM + REACTOR PHYSICS + *R AND D PROGRAM

18-099071 DATED 1971
BILLIAU R + BUYSE L + DE COSTER M + FREDRIX H
ANNUAL SCIENTIFIC REPORT, 1970
BLG 460/71 +. 180 PAGES, FIGURES, 1971

DURING 1970 R AND D WORK ON SODIUM-COOLED FAST BREEDERS WAS CONTINUED ALONG THE LINES OF THE FIVE-YEAR PROGRAMME 1968-1972, AND IN THE FRAMEWORK OF THE 'PROJECT SCHNELLER BRUTER' CARRIED OUT JOINTLY BY THE FEDERAL REPUBLIC OF GERMANY AND THE BENELUX COUNTRIES. S.C.K./C.E.N.'S CONTRIBUTION WAS STILL PREDOMINANTLY CENTRED ON LONG-TERM R AND D, AS OUTLINED. HOWEVER, IN VIEW OF THE FORTHCOMING CONSTRUCTION OF THE PROTOTYPE REACTOR SNR-300, RELATIVELY MORE WORK WAS DEVOTED TO SHORT-TERM PROBLEMS IN FUEL FABRICATION TECHNOLOGY, SELECTION OF STRUCTURAL MATERIALS AND IN AND OUT OF PILE TESTING. AS IN THE PAST, CLOSE CO-OPERATION WAS MAINTAINED WITH

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-099071 *CONTINUED*
INDUSTRY; IN PARTICULAR RESEARCH IN FUEL FABRICATION AND REPROCESSING WAS CARRIED OUT IN ASSOCIATION WITH BELGONUCLEAIRE. THE MAJOR RESULTS AND TRENDS OF EACH PROGRAMME ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, TEST + WASTE DISPOSAL + BELGIUM + REACTOR, THERMAL + RADIOISOTOPE + SAFETY PROGRAM + R AND D PROGRAM + ACTINIUM + SAFEGUARDS, NUCLEAR MATERIAL + PRODUCTION

18-099344 ALSO IN CATEGORY 11 DATED 1974
CHASTAIN SA + AREY TT + HENDERSON RG
FABRICATION, IRRADIATION, AND POSTIRRADIATION EXAMINATION OF MIXED OXIDE FUEL PIN PNL-3-8
HANFORD ENGINEERING DEVELOPMENT LABORATORY, RICHLAND, WASHINGTON
HEDL-TME 74-37 +. 55 PAGES, 16 TABLES, 20 FIGURES, JULY 1974

PRESENTS A COMPILATION OF DESIGN, SPECIFICATION AND FABRICATION DATA, ALONG WITH A DETAILED DESCRIPTION OF THE IRRADIATION AND RESULTS OF POST-IRRADIATION EXAMINATION OF FUEL PIN PNL-3-8. THE PIN OPERATED AT A PEAK LINEAR POWER OF 4.82 KW/FT AND THE PEAK CLADDING TEMPERATURE WAS 820 F. EXAMINATION REVEALED NO SIGNIFICANT DAMAGE OR DETERIORATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + IRRADIATION TESTING + R AND D PROGRAM + FUEL ROD + RADIATION EFFECT

18-099360 DATED 1974
DRISCOLL MJ
MIT LMFBR BLANKET RESEARCH PROJECT. QUARTERLY PROGRESS REPORT, APRIL 1, 1974 - JUNE 30, 1974
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2250-9 +. 17 PAGES, 4 FIGURES, 1974

THE MIT REACTOR HAS BEEN SHUTDOWN TO PERMIT RENOVATION STARTING MAY 24. RESUMPTION OF OPERATION IS SCHEDULED FOR OCTOBER 1. DURING THE PAST FISCAL YEAR WORK WAS CARRIED OUT ON (1) ACQUISITION OF BENCHMARK DATA ON BLANKET MOCKUP NO. 4; (2) ACQUISITION, EVALUATION AND APPLICATION OF GAMMA HEATING METHODS; AND (3) INVESTIGATION OF ADVANCED BLANKET CONFIGURATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + MITR (RR) + BLANKET

18-099485 ALSO IN CATEGORY 5 DATED 1974
WILLIAMS LS
FINAL RADIAL SHIELD ORIFICE TESTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 73-87 +. 24 PAGES, 12 FIGURES, OCTOBER 1974

THIS REPORT DESCRIBES THE FINAL HYDRAULIC TESTING PERFORMED IN SUPPORT OF THE ENGINEERING DESIGN OF THE ORIFICES FOR THE FFTF RADIAL SHIELDS. THE END USE OF ALL THE TEST DATA WAS THE ENGINEERING DESIGN PREDICTION OF THE FINAL ORIFICE SIZE WHICH WOULD DELIVER THE DESIRED FLOWRATES TO THE RADIAL SHIELD IN THE FFTF.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

HYDRAULIC EXPERIMENT + REACTOR, TEST + TESTING + FFTF (TR) + CORE COMPONENTS + ORIFICE + R AND D PROGRAM + FLOW

18-099501 ALSO IN CATEGORIES 5 AND 6 DATED 1974
SLEMBER RJ
HEDL QUARTERLY TECHNICAL REPORT JULY, AUGUST, SEPTEMBER, 1974. VOLUME 3 - REACTOR AND SAFETY ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-3(VOL. 3) +. 34 PAGES, 6 FIGURES, OCTOBER 1974

REPORTS ACTIVITIES ON (1) LMFBR DOUBLING TIME, (2) CLOSED LOOP IN-REACTOR SAFETY ANALYSIS, (3) REACTOR VESSEL AND HEAT RESPONSE TO A LOSS OF FLOW HYPOTHETICAL CORE DISRUPTIVE ACCIDENT, (4) INTERNAL FLUID HYDRODYNAMICS, AND (5) CORE ENGINEERING AND PHYSICS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + FFTF (TR) + R AND D PROGRAM + PRESSURE TRANSIENT + ACCIDENT, CORE DISRUPTIVE

18-099636 ALSO IN CATEGORY 11 DATED 1974
RAY WE
SODIUM TECHNOLOGY PROGRAM COMPONENT MATERIALS COMPATIBILITY - QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-15 +. 40 PAGES, 15 FIGURES, NOVEMBER 1974

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-099636 *CONTINUED*
ONE OF A SERIES. CARBON EQUILIBRIUM LOOPS 1 AND 2 (CEL-1 AND -2) CONTINUED TO RUN. WORK WAS RESUMED ON THE INTERMEDIATE HEAT TRANSPORT SYSTEM SIMULATION. RUN ITF-4 WAS TERMINATED AFTER 1500 HRS OF OPERATION. CORROSION AND CARBON LOSS DATA FOR THE SPECIMENS ARE TABULATED. INCONEL 718 WAS RECEIVED AND CUT INTO BARS FOR TENSILE TESTS. TYPE 316 STAINLESS STEEL WAS RECEIVED AND WILL BE CUT AND MACHINED FOR IN-SODIUM AND IN-AIR TESTING.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + CORROSION + MATERIAL + INCONEL + R AND D PROGRAM + PROPERTY, MECHANICAL

18-099643 ALSO IN CATEGORIES 5 AND 11 DATED 1974
SCHENONE CE + BOLTAX A
ADDENDUM 3, REVISED DATA PACKAGE TO EXTEND GOAL BURNUP TO 12 PERCENT IN EBR-II GRID-TYPE SUBASSMBLY WSA-3
WESTINGHOUSE ELECTRIC CORPORATION
WARD-OX-3045-5(ADD.3) +. 39 PAGES, 11 FIGURES, 15 REFERENCES, NOVEMBER 1974

REVISED DESIGN AND SAFETY ANALYSES OF THE FUEL PINS AND SUBASSEMBLY HARDWARE PERTINENT TO CHANGES IN GOAL BURNUP, EBR-II ENVIRONMENT AND EXPERIMENTAL REQUIREMENTS ARE DESCRIBED IN THIS REPORT. THE ANALYSES WERE PERFORMED IN ACCORDANCE WITH THE 'GUIDE FOR IRRADIATION EXPERIMENTS IN EBR-II, REVISION 00', DATED SEPTEMBER 15, 1973. INFORMATION IS PRESENTED ONLY FOR (1) ITEMS DISCUSSED IN PREVIOUS DATA PACKAGES WHICH ARE AFFECTED BY THE CHANGE IN TARGET BURNUP, (2) NEW REQUIREMENTS OF REVISION 00 OF THE GUIDE, AND (3) SPECIFIC REQUESTS OF THE EBR-II PROJECT. THE CONCLUSION OF THE ANALYSES IS THAT CONTINUATION OF THE IRRADIATION OF WSA-3 TO 12% BURNUP DOES NOT POSE ANY UNUSUAL OR UNACCEPTABLE HAZARDS TO THE OPERATION OF EBR-II.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + FUEL BURNUP + THERMAL ANALYSIS + STRESS ANALYSIS + IRRADIATION TESTING + SAFETY ANALYSIS + R AND D PROGRAM + FUEL ELEMENTS

18-099644 DATED 1974
SODIUM TECHNOLOGY AND COVER GAS SEAL DEVELOPMENT PROGRAMS QUARTERLY TECHNICAL PROGRESS REPORT, JULY-SEPTEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13138 +. 69 PAGES, 11 TABLES, 34 FIGURES, NOVEMBER 15, 1974

TWELVE LONG-TERM STORAGE BOLTS WHICH HAD BEEN WET WITH SODIUM CLEANER AND STORED FOR 1 YEAR WERE EXAMINED. NONE EXHIBITED RESIDUES OF SODIUM PRODUCTS. SODIUM-DENATURED ALCOHOL AND SODIUM DOWNOL PM REACTION RATE STUDIES WERE CONTINUED. A SODIUM FROST-GENERATING APPARATUS WAS DESIGNED AND FABRICATED. IT WILL BE USED TO PRODUCE SODIUM FROST ON STAINLESS STEEL DISKS WHICH WILL BE IMMERSED IN DENATURED ETHANOL OR DOWNOL PM TO ESTABLISH THE REACTION CHARACTERISTICS. RADIATION STABILITY OF CLEANING METHODS WAS STUDIED. INFLATABLE SEALS AND ROTATING PLUG SEALS ARE BEING TESTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + TESTING + COVER GAS + FFTF (TR) + MATERIAL + SEAL + EQUIPMENT DESIGN + R AND D PROGRAM + FRICTION + ORGANIC

18-099957 ALSO IN CATEGORY 11 DATED 1969
SCHUMAR JF + BARTS EW + CARTER JC
FUEL ELEMENT PROPAGATION PROGRAM PLAN
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL/MET-C1 +. 131 PAGES, AUGUST 1969

DESCRIBES A RESEARCH PROJECT AT ANL TO STUDY THE PROPAGATION OF FUEL-ELEMENT FAILURES, UNDER NORMAL AND NEAR-NORMAL OPERATING CONDITIONS, IN LIQUID METAL FAST BREEDER REACTORS. THE MAJOR OBJECTIVE OF THE PROGRAM IS TO DEVELOP A PREDICTIVE ANALYTICAL DESCRIPTION OF FUEL-ELEMENT FAILURE PROPAGATION AND ITS CONSEQUENCES ON THE REACTOR SYSTEM, SPECIFICALLY ON THE REACTOR CORE. BOTH EXPERIMENTAL AND ANALYTICAL STUDIES WILL BE MADE IN ORDER TO INVESTIGATE THE THRESHOLDS OF REACTOR OPERATION THAT CAUSE FAILURE TO PROPAGATE. THE MODES OF FAILURE TRANSPORT, AND THE CONSEQUENCES OF FAILURES PROPAGATING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE, FUEL ELEMENT + R AND D PROGRAM

18-100022 DATED 1974
GRAHAM J
LIQUID METAL FAST BREEDER REACTOR SAFETY
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740609-5 +. 14 PAGES, PRESENTED AT THE 77TH NATIONAL MEETING OF THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, PITTSBURGH, PA., JUNE 2, 1974

THE LMFBR HAS SPECIAL CONSIDERATIONS PERTAINING TO SAFETY WHICH ARE UNIQUE AMONG REACTORS. THESE

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18-100022 *CONTINUED*
INCLUDE THE CHEMICAL ACTIVITY OF THE SODIUM, THE CONSEQUENCES OF POTENTIAL VOIDING WHILE IN USE AS A COOLANT, THE POSSIBILITY OF LOCAL FUEL FAILURE EFFECTS, AND THE POTENTIAL OF CRITICALITY ACCIDENTS. EACH OF THESE ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, CRITICALITY + COOLANT CHEMISTRY + REACTIVITY EFFECT, VOID

18-100038 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM, VOLUME 7
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL. 7) +. 350 PAGES, FIGURES, DECEMBER 1974

THIS VOLUME (AND VOLUMES 5 AND 6) CONTAINS COPIES OF LETTERS COMMENTING ON THE DRAFT STATEMENT AND THE AEC'S REPLY TO EACH. TWENTY-EIGHT LETTERS WITH REPLYS ARE INCLUDED IN THIS VOLUME.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

AGENCY, AEC + STATEMENT, ENVIRONMENTAL

18-100055 DATED 1975
FONTANA MH
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR JULY-SEPTEMBER 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4776 +. 61 PAGES, FIGURES, JANUARY 1975

DESCRIBES THE PROGRESS DURING THE PERIOD CONCERNING WATER SYSTEM MOCKUP OF THE FFM, DETECTION METHODS DEVELOPMENT, FFM FACILITY OPERATIONS, AND HEATER DEVELOPMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

NOISE ANALYSIS + DESIGN STUDY + R AND D PROGRAM + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

18-100062 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOL. 6
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.6) +. 650 PAGES, FIGURES, DECEMBER 1974

THIS VOLUME (AND VOLUMES 5 AND 7) CONTAIN COPIES OF LETTERS COMMENTING ON THE DRAFT STATEMENT AND THE AEC'S REPLY TO EACH. THIRTEEN LETTERS WITH REPLIES ARE INCLUDED IN THIS VOLUME.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

AGENCY, AEC + STATEMENT, ENVIRONMENTAL

18-100063 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOL. 1
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.1) +. 132 PAGES, FIGURES, REFERENCES, DECEMBER 1974

VOL. 1 (OF 7) PRESENTS THE SUMMARY, BACKGROUND, AND THE LMFBR PROGRAM. THIS VOLUME INCLUDES A DISCUSSION OF THE PAST, CURRENT AND PROJECTED USES OF ENERGY AND ITS IMPORTANCE TO SOCIETY. INCLUDED IS A SUMMARY OF THE ORIGINS AND HISTORY OF THE LMFBR PROGRAM AND A DISCUSSION OF THE SEVERAL EXPERIMENTAL AND SPECIAL PURPOSE FAST REACTORS THAT HAVE BEEN BUILT IN THE U.S. SINCE THE LATE 1940'S. THE FAST REACTOR PROGRAMS IN OTHER INDUSTRIALIZED NATIONS ARE ALSO REVIEWED.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

REVIEW + R AND D PROGRAM + AGENCY, AEC + N-POWER FORECAST + STATEMENT, ENVIRONMENTAL

18-100064 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOL. 4
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.4) +. 541 PAGES, FIGURES, REFERENCES, DECEMBER 1974

THE SUBJECTS COVERED IN THIS VOLUME ARE (1) MITIGATION OF ADVERSE ENVIRONMENTAL IMPACTS, (2) UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS, (3) SHORT TERM BENEFITS AND LONG TERM LOSSES, (4) IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES, AND (5) COST-BENEFIT ANALYSIS. INCLUDES THE CUMULATIVE ENVIRONMENTAL EFFECTS TO THE YEAR 2020, AND THE DECOMMISSIONING OF LMFBR'S AND FUEL CYCLE FACILITIES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

DECOMMISSIONING + AGENCY, AEC + BENEFIT VS RISK + COST BENEFIT + STATEMENT, ENVIRONMENTAL

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-100065 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOL. 5
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.5) +. 615 PAGES, FIGURES, REFERENCES, DECEMBER 1974

THIS VOLUME (AND VOLUMES 6 AND 7) CONTAINS COPIES OF LETTERS COMMENTING ON THE DRAFT STATEMENT AND THE AEC'S REPLY TO EACH. TWENTY FIVE LETTERS WITH REPLIES ARE INCLUDED IN THIS VOLUME.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

AGENCY, AEC + STATEMENT, ENVIRONMENTAL

18-100066 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOLUME 2
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.2) +. 914 PAGES, FIGURES, REFERENCES, DECEMBER 1974

DESCRIBES THE ENVIRONMENTAL IMPACT OF LOCAL ELEMENTS OF THE LMFBR FUEL CYCLE. INCLUDES AN EVALUATION OF THE IMPACTS OF VARIOUS ACCIDENTS IN THE FACILITIES COMPRISING THE FUEL CYCLE. THIS VOLUME ALSO EXAMINES THE TRANSPORTATION OF RADIOACTIVE MATERIALS AND THE MANAGEMENT OF WASTES. THE VOLUME CONCLUDES WITH AN EXAMINATION OF THE RELATED SOCIOPOLITICAL IMPACTS OF THE LMFBR.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

ACCIDENT, CONSEQUENCES + ECONOMICS + FABRICATION + PLUTONIUM + TRANSPORTATION AND HANDLING + ACCIDENT, PROBABILITY OF + WASTE MANAGEMENT + FUEL REPROCESSING + TOXICITY + AGENCY, AEC + BENEFIT VS RISK + FUEL CYCLE + STATEMENT, ENVIRONMENTAL

18-100067 DATED 1974
PROPOSED FINAL ENVIRONMENTAL STATEMENT, LIQUID METAL FAST BREEDER REACTOR PROGRAM - VOL. 3
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1535(VOL.3) +. 620 PAGES, FIGURES, REFERENCES, DECEMBER 1974

THIS VOLUME EXAMINES THE VARIOUS ALTERNATIVE TECHNOLOGIES, NUCLEAR AS WELL AS NONNUCLEAR, THAT MIGHT BE UTILIZED TO SATISFY THE NATIONS POWER REQUIREMENTS. THE OPTIONS CONSIDERED INCLUDE LIGHT WATER REACTORS, HTGR'S, GAS-COOLED FAST REACTORS, LIGHT WATER BREEDER REACTORS, MOLTEN SALT BREEDER REACTOR, AND FUSION. INCLUDES AN EXAMINATION OF THE NATIONAL EFFORT IN ENERGY CONSERVATION TO ASSESS THE CAPABILITY FOR REDUCING PROJECTED ENERGY DEMANDS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

REACTOR, LWR + REACTOR, HTGR + MSER (RE) + ELECTRIC POWER, ALTERNATE + REACTOR, THERMONUCLEAR + AGENCY, AEC + REACTOR, GCFR + STATEMENT, ENVIRONMENTAL

18-100302 DATED 1974
BOHM H + DIENST W + KUMMERER K
CONTRIBUTION TO THE FUEL ELEMENT DEVELOPMENT FOR THE FAST BREEDER REACTOR SNR-300
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1224 + KFK-1999 +. 345 PAGES, FIGURES, SEPTEMBER 1974

PRESENTS THE TEXT OF 19 PAPERS CONCERNING FUEL DESIGN CRITERIA, MIXED OXIDE FUEL, BEHAVIOR OF SS CLADDING UNDER SNR-300 CONDITIONS, NEUTRON INDUCED SWELLING, CORROSION, FABRICATION, AND IRRADIATION EXPERIMENTS. (IN GERMAN)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + CLADDING + STEEL, STAINLESS + CORROSION + GERMANY + R AND D PROGRAM + *RADIATION EFFECT + FUEL ELEMENTS

18-100306 DATED 1974
COMPARISON OF FOREIGN AND U.S. LMFBR PLANT PARAMETERS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1354 +. 4 PAGES, NOVEMBER 25, 1974

PRESENTS A LISTING OF NUCLEAR AND PLANT PARAMETERS FOR FOREIGN AND U.S LMFBR PLANTS. THE PLANTS INCLUDE PHENIX, PHENIX-450, SUPER-PHENIX, PFR, SNR-300, BN-350, BN-600, FFTF, CRBR, AND THE PROBABLE FIRST-GENERATION U.S. COMMERCIAL PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPARISON, REACTOR CHARACTERISTICS + DATA COLLECTION + AGENCY, AEC

18-100309 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, NOVEMBER 1974

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-100305 *CONTINUED*
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-34 +. 125 PAGES, FIGURES, JANUARY 3, 1975

REPORTS PROGRESS DURING THE PERIOD CONCERNING: (1) EBR-2, (2) HOT FUEL EXAMINATION, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION, (5) FUELS AND MATERIALS DEVELOPMENT, (6) REACTOR PHYSICS, (7) REACTOR SAFETY, (8) ENERGY AND ENVIRONMENTAL SYSTEMS, AND (9) OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + DESIGN STUDY + REACTOR PHYSICS + R AND D PROGRAM

18-100310 DATED 1973
LMFBR DEMONSTRATION PLANT STEAM GENERATING SYSTEM
COMBUSTION ENGINEERING INC., CHATTANOOGA, TENN.
CENC-1194(VOL.1)(SUPPL.1) +. 250 PAGES, FIGURES, FEBRUARY 23, 1973

COMBUSTION ENGINEERING HAS PERFORMED ADDITIONAL ANALYSES IN A FOLLOW-ON PROGRAM TO FURTHER DEVELOP THE STEAM GENERATORS FOR THE DEMONSTRATION PLANT. THE BULK OF THE WORK DURING THE FOLLOW-ON PROGRAM ESSENTIALLY CONSISTED OF ADDITIONAL STRUCTURAL ANALYSES OF CERTAIN CRITICAL AREAS OF THE STEAM GENERATOR, SODIUM/WATER REACTOR ANALYSES, STEAM GENERATOR TRANSIENT ANALYSES, AND SHELL SIDE FLOW DISTRIBUTION ANALYSES. RESULTS FROM AN EXPERIMENTAL PROGRAM CONDUCTED TO VERIFY THE BAYONET ASSEMBLY INSULATOR TUBE PRINCIPLE DICTATED A MINOR CHANGE IN THE HEAT TRANSFER SURFACE FOR THE EVAPORATOR AND SUPERHEATER MODULES AND THE MODULE DRAWINGS HAVE BEEN REVISED ACCORDINGLY. ALSO INCLUDED IS A SPECIFICATION FOR THE WATER/STEAM RECIRCULATING SYSTEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN STUDY + STEAM GENERATOR

18-100396 DATED 1974
RADIOLOGICAL ASSESSMENT MODELS
GENERAL ELECTRIC COMPANY
GEAP-14034-1 +. 12 PAGES, 11 REFERENCES, DECEMBER 1974

THE OBJECTIVES OF THIS PROGRAM ARE TO DEVELOP MODELS FOR ANALYZING OR EVALUATING POTENTIAL RADIOLOGICAL SOURCE TERMS, AEROSOL PHENOMENA, SODIUM FIRES, AND RADIOLOGICAL DOSAGES ASSOCIATED WITH THE LMFBR. THE WORK PERFORMED DURING THIS REPORTING PERIOD CENTERED ON REVIEWING THE CURRENT TECHNOLOGY OF RADIOLOGICAL MODELING AND ASSESSMENT TECHNIQUES. MODELS FOR ANALYZING AEROSOL BEHAVIOR AND VAPOR BUBBLE COLLAPSES WERE EXAMINED AND EVALUATED. IN ADDITION, WORK ON UPDATING AND IMPLEMENTING SODIUM FIRE AND DOSAGE CODES WAS INITIATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ANALYTICAL MODEL + HAZARDS ANALYSIS + ACCIDENT, CORE DISRUPTIVE

18-100397 DATED 1975
YOUNG MC + GRINDELL AG
SYSTEMS DESIGN DESCRIPTION OF THE THERMAL TRANSIENT TEST FACILITY (TTTF)
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4607 +. 212 PAGES, FIGURES, REFERENCES, FEBRUARY 1975

THE TTTF IS A HIGH-TEMPERATURE, HIGH-PRESSURE SODIUM TEST FACILITY DESIGNED TO SUBJECT TEST SPECIMENS TO INTERNAL PRESSURE AND INTERMITTENT THERMAL DOWNSHOCKS TO PRODUCE THERMAL RATCHETTING. IN THE TTTF, A TEST SPECIMEN IS FILLED WITH STATIC SODIUM AT PRESSURES TO 700 PSIG AND AT TEMPERATURES TO 1100 F AND SUBJECTED TO A THERMAL DOWNSHOCK AT TEMPERATURE RATES TO 30 F/SEC BY FORCING COLDER TEMPERATURE-GRADED SODIUM THROUGH THE TEST SECTION WHILE MAINTAINING THE TEST SECTION AT PRESSURE. THIS REPORT PRESENTS THE DESIGN DESCRIPTION OF THE VARIOUS SYSTEMS THAT MAKE UP THE TTTF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TESTING + THERMAL EXPERIMENT + ORNL + SYSTEM DESCRIPTION + R AND D PROGRAM + THERMAL TRANSIENT

18-100412 DATED 1975
FONTANA MH + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR APRIL - JUNE 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4727 +. 83 PAGES, TABLES, FIGURES, JANUARY 1975

REPORTS PROGRESS FOR THE PERIOD IN THE FOLLOWING AREAS: (1) ANALYSIS AND DATA EVALUATION; (2) WATER SYSTEM MOCKUP OF THE FFM; (3) DETECTION METHODS DEVELOPMENT; (4) FFM FACILITY OPERATIONS; AND (5) HEATER DEVELOPMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-100412 *CONTINUED*
HEAT TRANSFER, BOILING + FAILURE, FUEL ELEMENT + MOCKUP + ORNL + R AND D PROGRAM + BOILING

18-100559 ALSO IN CATEGORY 12 DATED 1972
BREWER ST + MASON EA + DRISCOLL MJ
THE ECONOMICS OF FUEL DEPLETION IN FAST BREEDER REACTOR BLANKETS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-3060-4 + MITNE-123 +. 342 PAGES, 48 TABLES, 71 FIGURES, NOVEMBER 1972

A FAST BREEDER REACTOR FUEL DEPLETION-ECONOMICS MODEL WAS DEVELOPED AND APPLIED TO A NUMBER OF 1000 MWE LMFBR CASE STUDIES, INVOLVING RADIAL BLANKET-RADIAL REFLECTOR DESIGN, RADIAL BLANKET FUEL MANAGEMENT AND SENSITIVITY OF ENERGY COSTS TO CHANGES IN THE ECONOMIC ENVIRONMENT. CHOICE OF FUEL COST ACCOUNTING PHILOSOPHY, E.G. WHETHER OR NOT TO TAX PLUTONIUM REVENUE, WAS FOUND TO HAVE SIGNIFICANT EFFECT ON ABSOLUTE VALUES OF ENERGY COSTS, WITHOUT, HOWEVER, DISTORTING DESIGN RANKINGS, COMPARATIVE RESULTS, AND IRRADIATION TIME OPTIMIZATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + ECONOMIC STUDY + FUEL MANAGEMENT + BLANKET

18-100661 ALSO IN CATEGORY 2 DATED 1974
POWER PLANT DESIGN AND SITING IN EUROPE AND THE UNITED STATES
3 PAGES, 3 FIGURES, ELECTRICAL REVIEW, 195(17), PP. 595-597 (NOV. 8, 1974)

REPORTS ON THE AIM CONFERENCE IN LIEGE, BELGUIM IN OCTOBER. EUROPE NOW HAS 68 NUCLEAR POWER STATIONS, EITHER IN OPERATION OR UNDER CONSTRUCTION, OF WHICH 21 STATIONS HAVE 35 GCR'S, 46 STATIONS HAVE 33 PWR'S AND 26 BWR'S. IN THE FUTURE, MORE SITES WILL BE NEAR THE SEA. RELATIVE MERITS OF LMC AND GC FAST BREEDERS WERE DISCUSSED. CONCEPTUAL STUDIES OF THE NUCLEAR GASIFICATION OF COAL WERE MENTIONED. HYDRAULIC PUMPED STORAGE AND COMPRESSED AIR STORAGE WERE DISCUSSED. FOR THE LATTER A GERMAN PLANT WILL USE TWO UNDERGROUND CAVERNS WITH A TOTAL VOLUME OF 300,000 M3 AND STORE THE COMPRESSED AIR AT 50-75 BAR.

REACTOR, BWR + REACTOR, PWR + SITING + REACTOR, LWR + REFUELING + FLUOR BOPSSAR (PWR) + REACTOR, HTGR + FUEL, FOSSIL + FUEL, NUCLEAR + PUMPS

18-100720 DATED 1975
SLEMBER RJ
HEDL QUARTERLY TECHNICAL REPORT: OCTOBER, NOVEMBER, DECEMBER 1974 - VOLUME 3, REACTOR AND SAFETY ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-4 (VOL. 3) +. 45 PAGES, 5 FIGURES, JANUARY 1975

DESCRIBES THE PROGRESS DURING THE PERIOD CONCERNING FFTF CORE PHYSICS; RADIATION AND SHIELD ANALYSIS; AND ASSESSMENT OF THE CORE DISRUPTIVE ACCIDENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FFTF (TR) + SHIELDING + REACTOR PHYSICS + R AND D PROGRAM + ACCIDENT, CORE DISRUPTIVE

18-101065 ALSO IN CATEGORY 11 DATED 1974
VITTI JA
PRELIMINARY ASSESSMENT OF PROOF TESTING LMFBR CARBIDE FUELED SUBASSEMBLIES IN FTR DRIVER POSITIONS
COMBUSTION ENGINEERING, INC., WINDSOR, CONNECTICUT
COO-2426-5 + CENP-370 +. 230 PAGES, FIGURES, DECEMBER 1974

PEAK LINEAR POWER AND PEAK DISCHARGE BURNUP SLIGHTLY EXCEED PRESENT COMMERCIAL DESIGN OBJECTIVES OF 30 KW/FT AND 73 MWD/KG. THE LOW OPERATING TEMPERATURE OF THE FTR LEADS TO NONPROTOTYPIC FUEL CLADDING TEMPERATURES. INDIVIDUAL ASSEMBLY POWER HISTORY, FLUX AND ENRICHMENTS CAN BE SIMULATED QUITE WELL IN THE FTR FOR COMMERCIAL OUTER ZONE FUEL ASSEMBLIES BUT INNER ZONE OPERATING CONDITIONS CANNOT BE DUPLICATED AS WELL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + TEST, PROOF + R AND D PROGRAM + FUEL ROD + FUEL ELEMENTS

18-101088 DATED 1974
BAKER RD
ADVANCED PLUTONIUM FUELS PROGRAM QUALITY REPORT, APRIL 1 THROUGH JUNE 30, 1974 AND EIGHTH ANNUAL REPORT, FY 1974
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-5781-PR +. 62 PAGES, 58 PAGES, FIGURES, REFERENCES, NOVEMBER 1974

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: (1) EXAMINATION OF FAST REACTOR FUELS, (2) HIGH PERFORMANCE LMFBR FUEL MATERIALS, AND (3) FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS RESEARCH AND DEVELOPMENT.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-101088 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + QUALITY ASSURANCE + R AND D PROGRAM + FUEL ELEMENTS

18-101090 DATED 1974
KOBAYASHI Y + KONDO S + TOGO Y
APPLICATION OF SEQUENTIAL UNCONSTRAINED MINIMIZATION TECHNIQUE TO LMFBR CORE DESIGN OPTIMIZATION PROBLEMS
UNIVERSITY OF TOKYO
9 PAGES, 4 TABLES, 5 FIGURES, 18 REFERENCES, J. NUCL. SCIENCE & TECHNOLOGY, 11(11), PP. 471-479 (NOVEMBER 1974)

TO MINIMIZE COMPUTING EFFORT IN ESTIMATING THE EQUILIERIUM CORE CONDITION, THE PROCEDURE UTILIZES THE REGRESSION FUNCTIONS OF THE BURNUP CHARACTERISTICS IN A SIMPLIFIED METHOD OF CALCULATION, WHICH IS CALLED THE 'POWER BALANCE METHOD'. AS A NUMERICAL EXAMPLE, THE PROCEDURE WAS APPLIED TO CALCULATIONS ON A 1,000 MWE LMFBR CORE DESIGN, ON WHICH AN EVALUATION IS ALSO MADE OF THE SENSITIVITY SHOWN BY THE RESULTS TO CHANGES IN CRITICAL CONSTRAINTS.

ANALYTICAL TECHNIQUE + DESIGN STUDY

18-101100 DATED 1974
SAFETY ASSESSMENT FIRST PROGRESS REPORT (APRIL-AUGUST 1974)
GENERAL ELECTRIC COMPANY
GEAP-14023-1 +. 26 PAGES, 8 FIGURES, 28 REFERENCES, SEPTEMBER 1974

THE OBJECTIVE OF THE TASK IS ESTABLISHMENT OF THE BASIS FOR SAFETY ASSESSMENT OF LMFBR PLANTS. ACTIVITIES DURING THE REPORTING PERIOD INCLUDED DEVELOPMENT OF A PRELIMINARY PROGRAM PLAN, EVALUATION OF THE STATE OF THE ART OF RISK ANALYSIS METHODS THROUGH LITERATURE SURVEY AND APPLICATION OF AN LMFBR REFERENCE PLANT, DEVELOPMENT OF METHODS, AND SELECTION OF THREE ACCIDENT-INITIATING EVENTS LEADING TO LOCAL AND WHOLE-CORE TRANSIENT OVERPOWER AND LOSS OF FLOW FOR FURTHER ANALYSIS IN THE NEXT PHASE OF THE PROGRAM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT, PROBABILITY OF + FAULT TREE ANALYSIS

18-101102 DATED 1974
SAFETY ENGINEERING NINTH QUARTERLY REPORT, AUGUST-OCTOBER 1974
GENERAL ELECTRIC COMPANY
GEAP-13923-9 +. 20 PAGES, 11 FIGURES, 14 REFERENCES, NOVEMBER 1974

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: (1) FUEL AND CLADDING MOTION STUDIES, (2) ACCIDENT CODE DEVELOPMENT, AND (3) QUALITY ASSURANCE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + CLADDING + QUALITY ASSURANCE + R AND D PROGRAM + FUEL ROD

18-101245 ALSO IN CATEGORY 7 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT. NUCLEAR SAFETY - CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS. OCTOBER-DECEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13144 +. 15 PAGES, 6 FIGURES, FEBRUARY 15, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING (1) COMPUTER PROGRAM DEVELOPMENT FOR CALCULATING TRANSIENT CONVECTION PHENOMENA ARISING FROM POSTULATED PIPE BREAKS AND POOL FIRES; (2) DEVELOPMENT OF EXPERIMENTAL PROGRAMS TO CHARACTERIZE BEHAVIOR OF SODIUM, SODIUM OXIDE, FISSION PRODUCTS, AND AEROSOLS GENERATED BY ACCIDENTS; AND (3) DETERMINATION OF THE GENERATION AND TRANSPORT OF AEROSOL ASSOCIATED WITH ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + AEROSOL + FIRE + FISSION PRODUCT TRANSPORT + AEROSOL PRODUCTION + AEROSOL PROPERTIES + R AND D PROGRAM

18-101275 ALSO IN CATEGORIES 6 AND 11 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT DEC. 1974
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-35 +. 170 PAGES, FIGURES, JANUARY 31, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICS, AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62,

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-101275 *CONTINUED*
OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

18-101882 DATED 1974
FAST BREEDER PROJECT. SECOND QUARTERLY REPORT, 1974
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
EURFNR-1216 + KFK-1274/2 +. 262 PAGES, FIGURES, OCT. 1974

REPORTS PROGRESS FOR THE PERIOD CONCERNING FUEL PIN DEVELOPMENT; MATERIAL STUDIES AND DEVELOPMENT; CORROSION EXPERIMENTS AND COOLANT ANALYSIS; FUEL CYCLE WORK; PHYSICS; SAFETY; AND INSTRUMENTATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CORROSION + COOLANT CHEMISTRY + GERMANY + MATERIAL + REACTOR PHYSICS + *R AND D PROGRAM + FUEL ROD + *FUEL CYCLE + INSTRUMENTS, MISC.

18-101914 ALSO IN CATEGORY 17 DATED 1974
ZEMANICK PF + HORNING J + NULTON JD
IAEA INTERNATIONAL WORKING GROUP ON FAST REACTORS SPECIALISTS MEETING ON OPERATING EXPERIENCE AND DESIGN CRITERIA OF SODIUM VALVES
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-740964 +. 600 PAGES, MEETING HELD IN RICHLAND, WASHINGTON, SEPT. 23-27, 1974

THE SPECIALISTS PRESENTED POSITION PAPERS ON BEHALF OF THEIR COUNTRIES ON THE SUBJECTS OF LARGE SODIUM VALVE DESIGN AND OPERATING EXPERIENCE, SMALL SODIUM VALVE DESIGN AND OPERATING EXPERIENCE, SODIUM VALVE TEST RESULTS AND FACILITY DESCRIPTIONS, SODIUM VALVE ANALYSIS CRITERIA AND METHODS, AND SODIUM VALVE MANUFACTURING DEVELOPMENT. ALL PAPERS ARE REPRODUCED IN THEIR ENTIRETY IN THIS DOCUMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + FRANCE + IAEA + UNITED KINGDOM + GERMANY + ITALY + JAPAN + NETHERLANDS + UNITED STATES + OPERATING EXPERIENCE + VALVES

18-102032 ALSO IN CATEGORY 7 DATED 1974
ANGERER C
TRANSPORT OF CORE MATERIALS DURING ACCIDENTS IN LMFBRS (SLUMPING)
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1192 + KFK-1935 +. 50 PAGES, 11 FIGURES, JUNE 1974

DURING A PUMP-COAST-DOWN ACCIDENT IN AN LMFBR WITH SIMULTANEOUS FAILURE OF THE WHOLE REACTOR PROTECTION SYSTEM FUEL PINS MAY MELT. THE RELOCATION OF THE MATERIALS AS A RESULT OF GRAVITY, GAS AND VAPOR FORCES LEADS TO FEEDBACKS ON THE REACTIVITY AND THEREFORE THE REACTOR POWER, WHICH INFLUENCE THE COURSE OF THE ACCIDENT CONSIDERABLY. THE COMPUTER PROGRAM SLB IS A FIRST ATTEMPT TO DESCRIBE THE MATERIAL TRANSPORT DURING THE ACCIDENT THEORETICALLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + FUEL MELTDOWN + ACCIDENT, FUEL SLUMP + CORE MELTDOWN + THEORETICAL INVESTIGATION

18-102044 ALSO IN CATEGORIES 6 AND 11 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGESS REPORT, JANUARY 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-36 +. 148 PAGES, FIGURES, FEB. 27, 1975

DISCUSSES THE (1) R & D PROGRAM FOR EBR-2, (2) HOT FUEL EXAMINATION FACILITY, (3) LMFBR DESIGN SUPPORT, (4) INSTRUMENTATION AND CONTROL, (5) FUEL AND MATERIAL DEVELOPMENT, (6) REACTOR PHYSICAL, AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + EBR 1 AND 2 (RE) + ACCIDENT, LOSS OF FLOW + TREAT (PRR) + CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS, DYNAMIC + MODEL + VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

18-102056 ALSO IN CATEGORY 12 DATED 1975
THOMPSON DC
CORE RESTRAINT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING NOVEMBER 30, 1974
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-7 +. 35 PAGES, 15 FIGURES, FEB. 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102056 *CONTINUED*
THE 121-ASSEMBLY CORE RESTRAINT DEVELOPMENT TESTS WERE STARTED DURING THIS REPORTING PERIOD. PHASES I AND II HAVE BEEN COMPLETED. DATA ARE BEING ANALYZED AND PHASE I DATA HAVE BEEN ISSUED TO PARTICIPANTS OF THE NATIONAL PROGRAM. THE FACILITY WAS CHARACTERIZED BEFORE TESTING WAS STARTED. THIS CHARACTERIZATION DETERMINES FACILITY DEFLECTIONS UNDER DIFFERENT LOADING CONDITIONS. THIS INFORMATION REDUCES THE ERROR IN RECORDING PERIPHERAL JAW POSITION. THE NEW TARGETS USED IN DUCT BOW MEASUREMENT HAVE BEEN PROCURED AND INSTALLED IN THE SIMULATED ASSEMBLIES. FULL CORE SIMULATED FUEL ASSEMBLIES (FSA) ARE BEING DESIGNED AND RAW MATERIAL PROCURED. CHANGES IN THE CRBRP CONCEPTUAL DESIGN TERMINATED THE WORK OF THE UPPER INTERNALS PLUG-IN DESIGN CONCEPT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

INSTRUMENT, IN CORE + FASTENER + CORE COMPONENTS + SUPPORT STRUCTURE + SIMULATION + R AND D PROGRAM

18-102072 ALSO IN CATEGORY 5 DATED 1974
GROTZBACH G + KUSSMAUL G
THE BEHAVIOR OF THE CORE OF A FAST SODIUM-COOLED REACTOR AFTER SERIOUS HYPOTHETICAL ACCIDENTS
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1213 + KFK-1928 +. 108 PAGES, 28 FIGURES, 68 REFERENCES, AUG. 1974

CONCEIVABLE INITIATING SITUATIONS WERE DEFINED FOR BOTH THE REACTIVITY ACCIDENT AND FOR THE TOTAL PUMP FAILURE ACCIDENT. A CONSERVATIVE ESTIMATION OF THE MASSES OF FUEL WHICH RETURN TO THE CORE AFTER AN ACCIDENT LEADS TO VALUES OF 70-90% OF THE ORIGINAL FUEL INVENTORY. AN ESTIMATE OF THE EFFECTS OF FULLY MAINTAINED COOLANT FLOW PRODUCES NO DECISIVE CHANGE IN THE PERCENTAGE OF FUEL RETURNED TO THE CORE. THE FUEL/STEEL ASSEMBLIES INVESTIGATED REMAIN SUBCRITICAL IF MORE THAN 50% OF THE FUEL INVENTORY IS EXPELLED FROM THE CORE DURING AND AFTER THE HYPOTHETICAL ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FAILURE + ACCIDENT, HYPOTHETICAL + CORE MELTDOWN + GERMANY + FLOW BLOCKAGE + PUMPS

18-102083 DATED 1975
SCIACCA FW + GIBSON AS + NAFY A + COMPRELLI FA
A PROTOTYPE COMMERCIAL LMFBR FOR THE UNITED STATES
GENERAL ELECTRIC COMPANY + BECHTEL CORP.
27 PAGES, PRESENTED AT THE 37TH ANNUAL MEETING OF THE AMERICAN POWER CONFERENCE, HELD IN CHICAGO, ILLINOIS, APRIL 21-23, 1975

DESCRIBES A PLANT DESIGN CONCEPT AND THE APPROACH AND DESIGN GUIDELINES USED. THE DESIGN CONCEPT EMBODIES THOSE CHARACTERISTICS AND FEATURES NECESSARY FOR THE LMFBR TO BECOME A COMMERCIAL REALITY.

AVAILABILITY - CONFERENCE DIRECTOR, AMERICAN POWER CONFERENCE, ILLINOIS INST. OF TECHNOLOGY, CHICAGO, ILLINOIS 60616

REACTOR DESCRIPTION + DESIGN STUDY

18-102084 DATED 1975
FILLNOW RH + FRANCE LL + ZERINVARY MC
COMPONENT DESIGN FOR LMFBRS
WESTINGHOUSE ELECTRIC CORPORATION
15 PAGES, PRESENTED AT THE 37TH ANNUAL MEETING OF THE AMERICAN POWER CONFERENCE, HELD IN CHICAGO, ILLINOIS, APRIL 21-23, 1975

REVIEWS THE PROGRESS MADE IN DEVELOPING THE DESIGN AND FABRICATION CAPABILITY OF LMFBR COMPONENTS. THE ITEMS CONSIDERED ARE THE MAJOR PLANT COMPONENTS INCLUDING THE REACTOR VESSEL, MAIN COOLING PUMPS, AND INTERMEDIATE HEAT EXCHANGERS.

AVAILABILITY - CONFERENCE DIRECTOR, AMERICAN POWER CONFERENCE, ILLINOIS INST. OF TECHNOLOGY, CHICAGO, ILLINOIS 60616

DESIGN CRITERIA + FABRICATION + PRESSURE VESSELS + PUMPS + HEAT EXCHANGERS

18-102095 DATED 1974
STEAM GENERATOR FOR LMFBR'S
10 PAGES, 1 FIGURE, ATOMIC ENERGY REVIEW, 12(4), PP. 853-62 (1974)

PRESENTS A REVIEW OF 51 PAPERS PRESENTED AT A SPECIALISTS MEETING IN OCTOBER OF 1974. THE TOPICS INCLUDE DESIGN AND CONSTRUCTION; SODIUM WATER REACTIONS AND WASTAGE; LEAK DETECTION AND OPERATOR RESPONSE; MATERIALS, CORROSION, MAINTENANCE; AND FUTURE DESIGN ASPECTS.

METAL WATER REACTION + CORROSION + MATERIAL + REVIEW + STEAM GENERATOR + TEST, LEAK

18-102096 ALSO IN CATEGORY 11 DATED 1974
COOKE RL + TRENT DS + POSTMA AK

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102058 *CONTINUED*
A PARAMETRIC STUDY OF TEMPERATURE, PRESSURE, AND BURNING RESULTING FROM LARGE SODIUM FIRES IN THE CSE CONTAINMENT VESSEL
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASHINGTON
BNWL-B-391 +. 40 PAGES, 23 FIGURES, DEC. 1974

A PARAMETRIC STUDY WAS CONDUCTED TO DETERMINE THE EFFECT OF SODIUM BURNING CONDITIONS ON THE TEMPERATURE, PRESSURE, AND SODIUM BURNING RATE IN THE CSE CONTAINMENT VESSEL. FOR THE EXPECTED VALUES OF EXPERIMENTAL PARAMETERS, AVERAGE GAS TEMPERATURE AS HIGH AS 360 F, AND PRESSURES AS HIGH AS 4.5 PSIG WERE PREDICTED. DURING THE BURN PERIOD, CONSIDERABLE HIGHER TEMPERATURES WERE REACHED IN THE FIRE PLUME. THE DOMINANT HEAT INPUT COMES FROM THE HEATED BURN PAN RATHER THAN THE FIRE ITSELF. THE PREDICTED TEMPERATURES AND PRESSURES WERE FOUND TO BE WELL WITHIN THE DESIGN RATINGS OF THE VESSEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT + FIRE + R AND D PROGRAM

18-102101 DATED 1974
KENNEY J
NUCLEAR STEAM SUPPLY SYSTEM FOR THE CLINCH RIVER BREEDER REACTOR PLANT
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740709-3 +. 24 PAGES, PRESENTED AT POWER ENGINEERING SOCIETY SUMMER MEETING AND ENERGY RESOURCES CONFERENCES, ANAHEIM, CALIF., JULY 14, 1974

THE REFERENCE DESIGN OF THE CLINCH RIVER BREEDER REACTOR PLANT HAS BEEN DEFINED AND A REPORT-DESCRIBING THIS CURRENT PLANT DESIGN HAS BEEN ISSUED. CONCEPTUAL AND PRELIMINARY DESIGNS HAVE PROCEEDED TO THE POINT WHERE LONG LEAD MATERIAL FOR THE REACTOR VESSEL AND INTERMEDIATE HEAT EXCHANGERS HAS BEEN PLACED ON ORDER. THE REACTOR VESSEL AND THE CONTAINMENT VESSEL ARE IN THE BIDDING CYCLE AND A NUMBER OF EQUIPMENT SPECIFICATIONS ARE IN THE APPROVAL PROCESS PRIOR TO ISSUE FOR BID. BASELINE SCHEDULES HAVE BEEN DEVELOPED WHICH ESTABLISH A PLAN FOR PROJECT COMPLETION WHICH RESULTS IN INITIAL CRITICALITY BY MID 1982.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REVIEW + CLINCH RIVER (LMFBR)

18-102102 ALSO IN CATEGORY 6 DATED 1974
LAKE JA + DONCALS RA + RATHBUN RW
BREEDING RATIO AND DOUBLING TIME CHARACTERISTICS OF THE CLINCH RIVER BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740903-15 +. 12 PAGES, PRESENTED AT MEETING ON ADVANCED REACTORS; PHYSICS, DESIGN & ECONOMICS, ATLANTA, GA., SEPT. 8, 1974

THE CLINCH RIVER BREEDER REACTOR, PER THE CURRENT DESIGN, WILL HAVE A BREEDING RATIO OF 1.20 AT THE START-OF-LIFE AND 1.23 AT THE END OF THE FIRST CYCLE. THIS VALUE IS EXPECTED TO DROP TO APPROXIMATELY 1.12 IN THE EQUILIBRIUM CYCLES IF THE PRESENT TYPE FUEL AND BLANKET ASSEMBLY DESIGNS ARE RETAINED. HOWEVER, WITH REASONABLE ANTICIPATED ADVANCES IN FUEL DESIGN TECHNOLOGY, A BREEDING RATIO OF AT LEAST 1.20 CAN BE MAINTAINED THROUGHOUT THE LIFE OF THE PLANT. POTENTIAL EQUILIBRIUM FUEL ASSEMBLY DESIGNS HAVE BEEN PROPOSED WHICH WILL ACCOMPLISH THIS OBJECTIVE AS WELL AS ACHIEVE THE DESIGN GOAL BURNUP OF 150,000 MWD/T. CRBR, WITH A PEAK LINEAR POWER RATING OF 14.5KW/FT AND AN EQUILIBRIUM BREEDING RATIO OF 1.20, HAS A COMPOUND SYSTEM DOUBLING TIME OF APPROXIMATELY 34 YEARS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + ECONOMICS + FUEL BURNUP + REVIEW + CLINCH RIVER (LMFBR)

18-102103 ALSO IN CATEGORY 6 DATED 1974
RILEY DR + EUHL AR + DUNCALS RA + GREEBLER PW
NUCLEAR DESIGN OF THE CLINCH RIVER BREEDER REACTOR SYSTEM
U.S. ATOMIC ENERGY COMMISSION + WESTINGHOUSE ELECTRIC CORP. + GENERAL ELECTRIC CO.
CONF-740903-16 +. 16 PAGES, PRESENTED AT THE MEETING ON ADVANCED REACTORS; PHYSICS, DESIGN & ECONOMICS, ATLANTA, GA., SEPT. 8, 1974

REVIEWS THE REACTOR SYSTEM DESIGN, NUCLEAR DATA, COMPUTATIONAL METHODS, AND CRITICAL EXPERIMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR DESCRIPTION + ANALYTICAL TECHNIQUE + SYSTEM DESCRIPTION + CLINCH RIVER (LMFBR)

18-102104 DATED 1974
ZEMANICK PF
SODIUM VALVE MANUFACTURING DEVELOPMENT
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740964-1 +. 16 PAGES, PRESENTED AT SPECIALISTS MEETING ON OPERATING EXPERIENCE & DESIGN CRITERIA OF SODIUM VALVES, RICHLAND, WASHINGTON, SEPT. 23, 1974

REVIEWS SOME ITEMS OF SPECIAL INTEREST FROM RECENT USA EXPERIENCE WITH THE MANUFACTURE OF SODIUM

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102104 *CONTINUED*
VALVES. THE ITEMS DISCUSSED ARE: (1) VALVE FORGING FABRICATION, (2) WELDING PROCESS, (3) HARDFACING PROCESSES, (4) MULTI-DIMENSIONAL MACHINING, AND (5) BELLOWS FABRICATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FABRICATION + WELDING + REVIEW + VALVES

18-102105 DATED 1974
ZEMANICK PP
SODIUM VALVE ANALYSIS CRITERIA AND METHODS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740964-2 +. 50 PAGES. PRESENTED AT SPECIALISTS MEETING ON OPERATING EXPERIENCE & DESIGN CRITERIA OF SODIUM VALVES, RICHLAND, WASHINGTON, SEPT. 23, 1974

SUMMARIZES THE STATE OF THE ART IN THE U.S. ON STRUCTURAL CRITERIA AND ANALYTIC METHODS APPLICABLE TO SODIUM VALVES. FIRST, THE STRUCTURAL CRITERIA TO WHICH SODIUM VALVE PRESSURE BOUNDARIES MUST CONFORM ARE DESCRIBED TO INCLUDE SOME AMOUNT OF HISTORICAL DEVELOPMENT. SECONDLY, ANALYSIS METHODS WILL BE DESCRIBED TO INCLUDE SUMMARY DESCRIPTIONS OF THE MOST PERTINENT AVAILABLE ANALYTIC TOOLS (STRUCTURAL, THERMAL, AND HYDRAULIC) AND SEVERAL EXAMPLES OF SODIUM VALVE ANALYTIC RESULTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + ANALYTICAL TECHNIQUE + STRUCTURAL INTEGRITY + R AND D PROGRAM + VALVES

18-102107 DATED 1974
HOFFMAN EE + PATRIARCA P + SPALARIS CN
LMFBR STEAM GENERATOR MATERIAL SELECTION, DEVELOPMENT PROGRAM, AND TEST RESULTS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-741114-1 +. 9 PAGES. PRESENTED AT JOINT US/USSR STEAM GENERATOR SEMINAR, LOS ANGELES, CALIF., NOV. 1974

THE ASME CODE REQUIRES THAT BOTH ELASTIC AND INELASTIC DESIGN ANALYSES BE CONDUCTED FOR ELEVATED-TEMPERATURE SERVICE. DESIGNERS MUST HAVE RELIABLE MECHANICAL PROPERTIES DATA AND RELATIONSHIPS. AN EXTENSIVE SEARCH IS BEING CONDUCTED BY THE STAFF OF ORNL FOR THESE PROPERTIES. FINAL DESIGN VALUES WILL BE DETERMINED BY REGRESSION ANALYSIS AND MAXIMUM AND MINIMUM VALUES WILL BE DEFINED BY UPPER AND LOWER TOLERANCE LIMITS. DATA WILL BE COMPILED BETWEEN ROOM TEMPERATURE AND 1200 F. WHERE EXISTING DATA WAS FOUND TO BE INADEQUATE, RESEARCH AND DEVELOPMENT PROGRAMS WERE INITIATED AND ARE IN PROGRESS. THIS NEW DATA WILL BE INCLUDED IN FUTURE CORRELATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MATERIAL + R AND D PROGRAM + STEAM GENERATOR + PROPERTY, MECHANICAL

18-102675 DATED 1974
QUARTERLY REPORT - TRANSPORT THEORY, REPORT THEORY AND REACTOR SAFETY, JULY 1 THROUGH SEPT. 30, 1974
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5778-PR +. 36 PAGES, 20 FIGRUES, 54 REFERENCES, NOV. 1974

A TWO-DIMENSIONAL, TIME-DEPENDENT CODE TREATING DELAYED NEUTRONS HAS BEEN WRITTEN AND PRELIMINARY TESTING HAS BEGUN. HTGR SAFETY RESEARCH FOR THE PERIOD HAS CONCENTRATED ON NEUTRONICS ANALYSIS AND THE DEVELOPMENT OF A COMPREHENSIVE SYSTEM RESPONSE CODE. THE DEVELOPMENT OF THE SIMMER CODE FOR PREDICTION OF THE DYNAMICS OF EXTREME HYPOTHETICAL LMFBR ACCIDENT SEQUENCES IS PROCEEDING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + COMPUTER PROGRAM + REACTOR PHYSICS + *R AND D PROGRAM + *REACTOR, HTGR

18-102677 DATED 1974
JEGORCFF L
300 MW PROTOTYPE OF NUCLEAR POWER STATION WITH FAST SODIUM-COOLED REACTOR SNR. SYPPLEMENTARY PROJECT "ENGINEERED SAFEGUARDS". FINAL REPORT
INTERNATIONALE ATOMREAKTORBAU GMBH, F.R. GERMANY
BMFT-FBK-74-02 +. 179 PAGES, FIGURES, NOV. 1974 (IN GERMAN)

PROVIDES DETAILS OF WORK PERFORMED CONCERNING DECAY HEAT REMOVAL, SHUTDOWN SYSTEM, AND INSTRUMENTATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + REACTOR PROTECTION SYSTEM + GERMANY + R AND D PROGRAM + *INSTRUMENTS, MISC.

18-102684 ALSO IN CATEGORY 5 DATED 1974
ROBIN MG + GUCHATELLE L + DENUCHEZE L
STEAM GENERATOR PERFORMANCES OF PHENIX IN STEADY STATE: COMPARISON WITH FORECASTS
CEA CENTRE D'ETUDES NUCLEAIRES DE SACLAY, FRANCE
ERDA-TR-4 + CONF-741085-5 +. 24 PAGES, PRESENTED AT THE SYMPOSIUM ON STEAM GENERATORS FOR LIQUID METAL FAST

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102684 *CONTINUED*
BREEDER REACTORS, HELD IN BENSBERG, F.R. GERMANY, OCT. 14, 1974

THEORETICAL AND EXPERIMENTAL PERFORMANCE AND TEMPERATURE DEVELOPMENT WERE CALCULATED AND MEASURED ON A COMPARATIVE BASIS IN STEADY STATE USING PROTOTYPES AND STEAM GENERATORS OF THE PHENIX FAST BREEDER DEMONSTRATION POWER STATION. IT IS SHOWN THAT, AS EARLY AS 1969, IT WAS POSSIBLE TO MAKE A FAIR PREDICTION OF FULL LOAD PERFORMANCE OF THE STEAM GENERATOR SELECTED FOR PHENIX.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + *COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL TECHNIQUE + *STEAM GENERATOR + *PERFORMANCE

18-102759 ALSO IN CATEGORY 9 DATED 1974
MCCOWN JJ + BALLIF JL
REVIEW OF METHODS FOR MEASURING STAINLESS STEEL INTERSTITIAL ELEMENTS IN SODIUM-APPLICATION TO LMFBR'S
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-SA-649 + CONF-740301-4 +. 30 PAGES, PRESENTED AT NACE MEETING-CORROSION/74, HELD IN CHICAGO, ILLINOIS, MARCH 4, 1974

THE TRACE IMPURITIES PRESENT IN SODIUM ARE OXYGEN, HYDROGEN, CARBON AND NITROGEN. THESE ELEMENETS AFFECT CORROSION AND MASS TRANSFER, INFLUENCE MECHANICAL PROPERTIES AND CONTRIBUTE TO SYSTEM PLUGGING PHENOMENA. NEW ANALYTICAL METHODS AND SAMPLING AND MONITORING HARDWARE DEVELOPED FOR DETERMINING STAINLESS STEEL INTERSTITIALS AT TRACE LEVELS IN SODIUM HAVE BEEN TESTED AT HEDL SINCE MARCH, 1972 IN THE PROTOTYPE APPLICATIONS LOOP (PAL). THE PURPOSE OF THIS PAPER IS TO DESCRIBE THE CURRENT STATUS OF ON-LINE MONITORS FOR MEASURING OXYGEN, HYDROGEN AND CARBON IN SODIUM AND TO PRESENT ANALYSIS DATA OBTAINED USING METAL EQUILIBRATION METHODS FOR MEASURING SPECIFIC CHEMICAL ACTIVITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + HYDROGEN + OXYGEN + *MONITOR, SAMPLING + NITROGEN + *STEEL, STAINLESS + *IMPURITY

18-102767 DATED 1975
PATRIARCA P
FUELS AND MATERIALS DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4678 +. 170 PAGES, FIGURES, APRIL 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING ITEMS: ADVANCED ABSORBER MATERIALS, STEAM GENERATOR MATERIALS, MECHANICAL PROPERTIES AND BEHAVIOR OF STRUCTURAL MATERIALS, AND MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS FOR THE LMFBR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + WELDS + MATERIAL + EUROPIUM + SUPPORT STRUCTURE + *R AND D PROGRAM + STEAM GENERATOR + *PROPERTY, MECHANICAL

18-102845 DATED 1974
FAST REACTOR POWER STATIONS
THE BRITISH NUCLEAR ENERGY SOCIETY
CONF-740318 +. 675 PAGES, FROM CONFERENCE ON FAST REACTOR POWER STATIONS, LONDON, ENGLAND, MARCH 11, 1974

PRESENTS THE TEXT OF 62 PAPERS PRESENTED AT THE CONFERENCE WHICH CONSISTED OF 9 SESSIONS ON THE FOLLOWING SUBJECTS: EXPERIENCE WITH LARGE POWER PLANTS, PLANNED POWER PLANTS, STEAM GENERATORS, NUCLEAR PERFORMANCE, FUELS, CONTROL DYNAMICS AND HYDRAULICS, FUEL HANDLING, COOLANT MANAGEMENT, AND FUTURE PROGRAMS AND PLANS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*FUEL HANDLING + UNITED KINGDOM + REACTOR CONTROL + COOLANT CHEMISTRY + *REVIEW + STEAM GENERATOR + OPERATING EXPERIENCE + FUEL, NUCLEAR + PERFORMANCE + POWER PLANT, NUCLEAR

18-102847 ALSO IN CATEGORY 6 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 1
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P1 +. 600 PAGES, FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS, TOKYO, JAPAN, OCT. 16, 1973

PRESENTS THE TEXT OF 28 PAPERS PRESENTED AT THE SYMPOSIUM ON THE FOLLOWING TOPICS: REVIEWS OF NATIONAL PROGRAMS, PHYSICS EXPERIENCES WITH REACTORS, AND EXPERIMENTS WITH CRITICAL FACILITIES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

UNITED KINGDOM + CRITICALITY EXPERIMENT + GERMANY + ITALY + JAPAN + *REVIEW + *REACTOR PHYSICS

18-102848 ALSO IN CATEGORY 6 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 2

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102846 *CONTINUED*
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P2 +. 512 PAGES. FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS. TOKYO. JAPAN. OCT. 16. 1973

PRESENTS THE TEXT OF 25 PAPERS ON THE FOLLOWING TOPICS: NUCLEAR DATA. NUMERICAL AND ANALYTICAL TECHNIQUES. NEUTRON SPECTRUM AND REACTIVITY COEFFICIENTS. AND EXPERIMENTS WITH CRITICAL FACILITIES.

AVAILABILITY - UNIPUB. INC.. P.O. BOX 433. NEW YORK. N.Y. 10016

CRITICAL ASSEMBLY + FLUX DISTRIBUTION + REACTIVITY COEFFICIENT + ANALYTICAL TECHNIQUE + JAPAN + REVIEW + *REACTOR PHYSICS

18-102849 ALSO IN CATEGORY 6 DATED 1973
PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON PHYSICS OF FAST REACTORS. VOLUME 3
INTERNATIONAL ATOMIC ENERGY AGENCY
CONF-731015-P3 +. 464 PAGES. FROM IAEA CONFERENCE ON PHYSICS OF FAST REACTORS. TOKYO. JAPAN. OCT. 16. 1973

PRESENTS THE TEXT OF 23 PAPERS ON THE FOLLOWING TOPICS: DEVELOPMENT OF METHODS AND DATA. AND REACTOR DESIGN PROBLEMS.

AVAILABILITY - UNIPUB. INC.. P.O. BOX 433. NEW YORK. N.Y. 10016

DATA PROCESSING + DESIGN STUDY + JAPAN + REVIEW + *REACTOR PHYSICS + R AND D PROGRAM

18-102852 DATED 1975
CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION AND ENVIRONMENTAL REPORT
PROJECT MANAGEMENT CORP.. ILLINOIS
DOCKET-50537-2/3/4/5 +. 2.678 PAGES. LETTER WITH ATTACH. AND REPORTS TO NRC OFFICE OF NUCLEAR REACTOR REGULATION. APRIL 7. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

TRANSMITS 4 VOLUMES OF THE ENVIRONMENTAL REPORT FOR THE LIQUID METAL FAST BREEDER REACTOR DEMONSTRATION PLANT. THE INFORMATION GIVEN INCLUDES SITE DESCRIPTION. PLANT DESCRIPTION. EFFECTS OF CONSTRUCTION. EFFECTS OF OPERATION. EFFLUENTS AND MONITORING PROGRAMS. EFFECTS OF ACCIDENTS. ALTERNATIVES. AND A BENEFIT-COST ANALYSIS.

AVAILABILITY - MICROSURANCE. INC.. P.O. ECX 3522 OAK RIDGE. TENN. 37830

CLINCH RIVER (LMFBR) + *REPORT. ENVIRONMENTAL

18-102935 ALSO IN CATEGORIES 6 AND 11 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT FEB. 1975
ARGONNE NATIONAL LABORATORY. ILLINOIS
ANL-RDP-37 +. 151 PAGES. FIGURES. MARCH 31. 1975

DISCUSSES THE (1) R&D PROGRAM FOR EBR-2. (2) HOT FUEL EXAMINATION FACILITY. (3) LMFBR DESIGN SUPPORT. (4) INSTRUMENTATION AND CONTROL. (5) FUEL AND MATERIAL DEVELOPMENT. (6) REACTOR PHYSICS. AND (7) REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT. LOSS OF FLOW + *TREAT (PRR) + *CONTAINMENT STRUCTURE + IN PILE EXPERIMENT + MATERIAL + *IRRADIATION TESTING + CORE COMPONENTS + R AND D PROGRAM + STRUCTURAL ANALYSIS. DYNAMIC + *MODEL + *VOID + FUEL COOLANT INTERACTION + FUEL ELEMENTS

18-102951 ALSO IN CATEGORY 5 DATED 1974
ROWE DS + STEWART CW + WHEELER CL
PROGRESS REPORT SUBCHANNEL CODE DEVELOPMENT AND DATA ANALYSIS
BATTELLE PACIFIC NORTHWEST LABS.. RICHLAND. WASHINGTON
BNWL-B-390-1 +. 30 PAGES. 2 TABLES. 6 REFERENCES. DEC. 1974

CONCERNED PRIMARILY WITH COBRA CODE. DISCUSSES TWO BASICALLY DIFFERENT NUMERICAL TECHNIQUES FOR CALCULATING FLOW REVERSALS IN THE PRESENCE OF PRESSURE BOUNDARY CONDITIONS. SEVERAL MAJOR CHANGES WHICH ALLOW ANALYSIS OF LARGE BUNDLES (217 PINS). LMFBR DATA ANALYSIS. FLOW AND ENTHALPY DISTRIBUTIONS IN LMFBR BUNDLES UNDER BOILING CONDITIONS AND EXPERIMENTAL PROGRAM TO STUDY BUOYANCY DOMINATED FLOWS THROUGH A HEATED ROD BUNDLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*COMPUTER PROGRAM + *DATA PROCESSING + FLOW DISTRIBUTION + BUOYANT RISE + FUEL ELEMENTS

18-102972 ALSO IN CATEGORY 5 DATED 1975
ERDMAN CA + HAAS PM
A REVIEW OF METHODS FOR ANALYSIS OF THE TRANSIENT OVERPOWER ACCIDENT IN THE LIQUID-METAL-COOLED FAST BREEDER REACTOR

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-102972 *CONTINUED*
BROOKHAVEN NATIONAL LABORATORY, UPTON, N.Y.
BNL-19877 + BNL/FRS 75-1 +. 65 PAGES, 10 FIGURES, 47 REFERENCES, JAN. 1975

THE CURRENT STATUS OF METHODS FOR TREATING CERTAIN CRITICAL PROBLEMS IN THE ANALYSIS OF THE UNPROTECTED TRANSIENT OVERPOWER ACCIDENT IS DISCUSSED, WITH EMPHASIS ON THE MODELS USED IN FOUR SPECIFIC COMPUTER CODES: SAS3A, PLUTO, HOPE, AND MELT-III. THE ANALYSIS PROBLEMS ARE GROUPED INTO THE FOLLOWING FOUR GENERAL CATEGORIES: STEADY-STATE INITIALIZATION, PIN CAVITY DYNAMICS, FUEL-PIN FAILURE, AND CHANNEL PHENOMENA. SPECIAL TREATMENT IS GIVEN TO THE QUESTIONS OF FUEL PLATEOUT AND PLUGGING AND TO LARGE-SCALE FISSION-GAS RELEASE. THE MAJOR CONCLUSION IS THAT CURRENTLY AVAILABLE CODES SHOULD CONTINUE TO BE USED IN A CONSERVATIVE MANNER BECAUSE OF THE UNCERTAINTIES ASSOCIATED WITH USING THE PRIMARILY PARAMETRIC MODELS OF KEY PHENOMENA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + FAILURE + FISSION GAS RELEASE + ACCIDENT, LOSS OF FLOW + ACCIDENT, REACTIVITY + FFTF (TR) + FAILURE, CLADDING + *REVIEW + *THERMAL TRANSIENT + FUEL COOLANT INTERACTION + CLINCH RIVER (LMFBR)

18-102985 ALSO IN CATEGORIES 7 AND 12 DATED 1973
SOVIET - SWEDISH SYMPOSIUM ON REACTOR SAFETY PROBLEMS, MARCH 5-7, 1973. PART 2
AB ATOMENERGI, SWEDEN
CONF-730363 +. 120 PAGES, MEETING HELD AT STUDSVIK, MARCH 5-7, 1973

THERE WERE 17 PAPERS PRESENTED AT THE SYMPOSIUM. PART 1 CONTAINS THE SWEDISH PAPERS (8) AND THIS PART (PART 2) CONTAINS THE SOVIET PAPERS (9). THE TOPICS PRESENTED HERE INCLUDE A SAFETY SYSTEM FOR A PWR WITH A CONTROLLED RELEASE OF LOW-ACTIVE COOLANT; PROCESSES OCCURRING IN A PWR DURING A PIPE RUPTURE, MAJOR ACCIDENTS, FISSION PRODUCT TRANSFER AND DEPOSITION; PROBABILITY METHODOLOGY FOR HAZARD ASSESSMENT, MECHANICAL ACTIONS DURING ACCIDENTS; HOT WATER FLOW THROUGH ORIFICES AND TUBES; SAFETY OF SODIUM COOLED FAST REACTORS; AND RADIATION SAFETY OF THE BOR-60.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION + ACCIDENT, LOSS OF COOLANT + REACTOR, PWR + *FISSION PRODUCT TRANSPORT + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SWEDEN + *REVIEW + FLOW DISTRIBUTION + ORIFICE + *ENGINEERED SAFETY FEATURE + FLOW + PROBABILITY

18-103321 DATED 1974
PROPOSED REFERENCE DESIGN FOR THE CLINCH RIVER BREEDER REACTOR PLANT
CONF-741067 +. 101 PAGES, FROM INFORMATION SESSION HELD IN MONROEVILLE, PA., OCT. 7-8, 1974

PRESENTS THE TEXT OF 23 PAPERS PRESENTED AT AN INFORMATION SESSION ON THE BREEDER. TOPICS INCLUDE THE REFERENCE DESIGN, THE NSSS, REACTOR ENCLOSURE, REACTOR INTERNALS, PRIMARY HEAT TRANSPORT, INSTRUMENTATION AND CONTROLS, STEAM GENERATOR, REFUELING, NUCLEAR ISLAND BUILDING ARRANGEMENTS, PLANT SAFETY FEATURES, LICENSING ACTIVITIES, COST ESTIMATE, AND SUPPORTING R AND D.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ECONOMICS + HEAT TRANSFER + *REACTOR DESCRIPTION + REVIEW + CORE COMPONENTS + R AND D PROGRAM + STEAM GENERATOR + ENGINEERED SAFETY FEATURE + *CLINCH RIVER (LMFBR)

18-103379 ALSO IN CATEGORY 11 DATED 1975
KONDO S
CONTAINABILITY OF EFFECT OF MOLTEN FUEL RELEASE IN FAST REACTOR FUEL-SUBASSEMBLY
UNIVERSITY OF TOKYO, JAPAN
12 PAGES, 5 FIGURES, 36 REFERENCES, J. NUCLEAR SCIENCE & TECHNOLOGY, 12(1), PP. 12-23 (JAN. 1975)

DISCUSSES VARIOUS ALTERNATIVE SAFETY IMPLICATIONS RELEVANT TO LOCAL FAULTS IN LMFBR, AND EVALUATES THE BASIC FACTORS AFFECTING THE ABILITY OF THE SUBASSEMBLY WRAPPER WALL TO CONTAIN THE VARIOUS EFFECTS OF MOLTEN FUEL RELEASE. THE RESPONSE OF THE WRAPPER TUBE IS EVALUATED BY THE METHOD PROPOSED BY YOUNGDAHL. FIRSTLY, AN EQUATION IS DERIVED FOR CALCULATING THE ENERGY REPARTITION BETWEEN THE PORTIONS CONSUMED IN WALL DEFORMATION AND SODIUM SLUG ACCELERATION. THEN, USING THIS EQUATION, ANALYSES ARE PERFORMED COVERING VARIOUS SITUATIONS WHERE MOLTEN FUEL COOLANT INTERACTION SIGNIFICANTLY AFFECTS THE SURROUNDING MATTER.

*CLADDING + FUEL MELTDOWN + ANALYTICAL TECHNIQUE + *PERFORMANCE

18-103382 ALSO IN CATEGORY 6 DATED 1975
KOBAYASHI Y + KONDO S + TOGO Y
REGRESSION MODEL FOR NUCLEAR CHARACTERISTICS OF SODIUM-COOLED FAST REACTOR CORE
UNIVERSITY OF TOKYO
3 PAGES, 2 TABLES, 3 REFERENCES, J. NUCLEAR SCIENCE & TECHNOLOGY, 12(1), PP. 61-63 (JAN. 1975)

IN STUDYING THE OPTIMUM DESIGN OR OPTIMUM CONTROL PROBLEM FOR A NUCLEAR REACTOR, NUMERICAL ANALYSIS IS NECESSARY TO OBTAIN THE NUCLEAR CHARACTERISTICS OF THE REACTOR CORE. DESCRIBES IN PRELIMINARY FORM A METHOD FOR THE REGRESSION PROCEDURE AND SOME RESULTS OBTAINED THEREWITH ON THE NUCLEAR CHARACTERISTICS OF A TYPICAL MIXED-OXIDE-FUELED SODIUM-COOLED FAST REACTOR CORE.

ANALYTICAL MODEL + ANALYTICAL TECHNIQUE + *REACTOR CONTROL + *DESIGN STUDY + REACTOR PHYSICS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-103436 ALSO IN CATEGORIES 1 AND 13 DATED 1975
COCHRAN TB
THE LIQUID METAL FAST BREEDER REACTOR - AN ENVIRONMENTAL AND ECONOMIC CRITIQUE
271 PAGES, PUBL. BY RESOURCES FOR THE FUTURE INC., 1974 (BOOK)

COCHRAN TAKES A CRITICAL LOOK AT THE ECONOMIC AND ENVIRONMENTAL ARGUMENTS WHICH HAVE BEEN MADE IN FAVOR OF AN EARLY INTRODUCTION OF THE LMFBR AS CENTRAL COMPONENT OF THE UNITED STATES ELECTRICAL ENERGY SYSTEM. IN GENERAL HE FEELS THAT THE ECONOMIC ARGUMENTS PUT FORTH ARE OPEN TO ANY SERIOUS QUESTIONS. HE ALSO SUGGESTS THAT THE LMFBR APPEARS TO HAVE NO ENVIRONMENTAL ADVANTAGE OVER THE PRESENTLY OPERATING LIGHT WATER REACTORS AND ESPECIALLY NOT OVER THE HIGH TEMPERATURE GAS REACTOR.

AVAILABILITY - THE JOHNS HOPSKINS UNIVERSITY PRESS, BALTIMORE, MARYLAND 21218

*ECONOMICS + PLUTONIUM + ENVIRONMENT + *SAFEGUARDS, NUCLEAR MATERIAL + COST, CAPITAL + *N-POWER, SAFETY OF + OPPONENT + FUEL CYCLE

18-103915 ALSO IN CATEGORY 5 DATED 1975
TODREAS NE + GOLAY MW
COOLANT MIXING IN LMFBR ROD BUNDLES AND OUTLET PLENUM MIXING TRANSIENTS: PROGRESS REPORT, DECEMBER 1, 1974-FEBRUARY 28, 1975
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-15 +. 32 PAGES, 16 FIGURES, 8 REFERENCES, FEB. 28, 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING TASKS: BUNDLE GEOMETRY, WRAPPED AND BARE RODS; SUBCHANNEL GEOMETRY, BARE RODS; AND LMFBR OUTLET PLENUM FLOW MIXING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR COOLANT + R AND D PROGRAM + *FLOW, MIXING + *MIXING COEFFICIENT

18-103919 ALSO IN CATEGORY 1 DATED 1975
CLINCH RIVER BREEDER REACTOR PROJECT: 1974 TECHNICAL PROGRESS REPORT
WESTINGHOUSE ELECTRIC CORPORATION
227 PAGES, 28 TABLES, 1975

PRESENTS A REVIEW OF THE CRBR PROJECT. TOPICS REVIEWED INCLUDE PROJECT MANAGEMENT, REACTOR SYSTEMS, PLANT SYSTEMS, CONTROL AND PROTECTION SYSTEMS, INSTRUMENTATION AND ELECTRICAL SYSTEMS, BUILDING ARRANGEMENT, AND SAFETY AND LICENSING.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CONTROL SYSTEM + *REACTOR DESCRIPTION + SYSTEM DESCRIPTION + REVIEW + COMPONENT DESCRIPTION + *CLINCH RIVER (LMFBR) + LICENSING PROCESS + INSTRUMENTS, MISC.

18-103921 ALSO IN CATEGORY 1 DATED 1975
THE LIQUID METAL FAST BREEDER REACTOR PROGRAM - PAST, PRESENT, AND FUTURE
U.S. GENERAL ACCOUNTING OFFICE
70 PAGES, APROL 28, 1975

PRESENTS A REVIEW OF THE LMFBR PROGRAM INCLUDING: ORIGIN AND EVOLUTION; ELEMENTS AND FACILITIES; MANAGEMENT OF THE PROGRAM; FUNDING FOR ENERGY RESEARCH AND DEVELOPMENT; AND FOREIGN LMFBR PROGRAMS.

AVAILABILITY - U.S. GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.

ECONOMICS + FRANCE + *REVIEW + *AGENCY, AEC

18-103931 ALSO IN CATEGORIES 5 AND 7 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR OCTOBER-DECEMBER 1974. III. LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4805(VOL.3) +. 27 PAGES, 11 FIGURES, APRIL 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING FISSION PRODUCT TRANSIENT RELEASE FROM LMFBR FUEL, AND EFFECTS OF SODIUM SPILLS ON STEEL-LINED EQUIPMENT CELLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, CONSEQUENCES + FISSION PRODUCT RELEASE + AEROSOL PRODUCTION + *R AND D PROGRAM + CONTAINMENT LINER + FUEL ROD + *TRANSIENT

18-103933 ALSO IN CATEGORY 11 DATED 1975
BOLTAX A + SALING JH
OXIDE FUEL ELEMENT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1974
WESTINGHOUSE ELECTRIC CORPORATION

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-103933 *CONTINUED*
WARD-DX-3045-16 +. 60 PAGES. 14 FIGURES. APRIL 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING IRRADIATION TESTING OF MIXED OXIDES; POST-IRRADIATION EXAMINATION OF FAST REACTOR EXPERIMENTS; GRID-TYPE FUEL ASSEMBLIES; FABRICATION, DEVELOPMENT, AND TESTING OF LMFBR FUEL ASSEMBLIES; ANALYSIS OF FUEL AND CLADDING IRRADIATION BEHAVIOR; AND IMPROVEMENT OF ANALYTICAL METHODS AND LIFETIME CODES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CLADDING + ANALYTICAL TECHNIQUE + *IRRADIATION TESTING + EXAMINATION + R AND D PROGRAM + FUEL, NUCLEAR + *MIXED OXIDE + FUEL ELEMENTS

18-103937 DATED 1974
FRIEDRICH H + KNAPE H
CONSTRUCTION AND OPERATIONAL DESCRIPTION OF THE FAST REACTOR CORECATCHER
AEC-TR-7591 +. 6 PAGES. 1 FIGURES. AUG. 8. 1974 (TRANSLATED FROM GERMAN)

PRESENTS A DESCRIPTION OF THE CORECATCHER AND COMPONENTS WHICH INCLUDE THE CATCH TANK WITH INNER INSULATION; BASE COOLER; FUEL CATCHING SHELL WITH DIRECTIONAL SPREADER AND PROTECTIVE LAYER; DOUBLE-TANK STRUT; AND THE CONCRETE FOUNDATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OPERATION + *SYSTEM DESCRIPTION + CONSTRUCTION + *CORE CATCHER

18-103946 ALSO IN CATEGORY 5 DATED 1975
GASSER RD
POST ACCIDENT HEAT REMOVAL WITH ADVANCED LMFBR FUELS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7518 +. 86 PAGES. 49 FIGURES. 41 REFERENCES. MARCH 1975

AN ANALYSIS IS PERFORMED TO STUDY THE PROBLEMS ASSOCIATED WITH RETAINING AND COOLING THE DEBRIS SUBSEQUENT TO A POSTULATED LMFBR CORE DISASSEMBLY AND MELTDOWN ACCIDENT, WITH EMPHASIS PLACED ON ADVANCED REACTOR FUELS SUCH AS THE CARBIDES AND NITRIDES OF URANIUM AND PLUTONIUM. A HEAT TRANSFER MODEL FOR THE FLUIDIZED PARTICLE BED IS CONSTRUCTED, AND A SOLUTION GENERATED TO OBTAIN MAXIMUM BED DEPTH AT WHICH INCIPIENT SODIUM BOILING OCCURS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + CORE MELTDOWN + *HEAT TRANSFER ANALYSIS + FLUIDIZED BED + ACCIDENT, CORE DISRUPTIVE

18-103947 ALSO IN CATEGORY 5 DATED 1975
KEOWEN RS + CATTON I
DRY-OUT OF A FLUIDIZED PARTICLE BED WITH INTERNAL HEAT GENERATION
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7519 +. 52 PAGES. 6 TABLES. 22 FIGURES. MARCH 1975

THE TEMPERATURE RESPONSE AND DRYOUT CONDITION WAS DETERMINED FOR VARIOUS BED LEVELS, PARTICLE DIAMETERS, AND HEAT FLUXES. ANALYSIS OF THE DATA RETRIEVED FROM THE BED WAS USED TO GENERATE A FAMILY OF CURVES TO PREDICT THE NECESSARY CONDITIONS FOR DRYOUT TO OCCUR WITHIN A FLUIDIZED PARTICLE BED WITH INTERNAL HEAT GENERATION. THE RESULTS SHOW THAT PREVIOUS RESULTS WITH BOTTOM HEATING AND VOLUME HEATING ARE CONSERVATIVE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + CORE MELTDOWN + *FLUIDIZED BED + *HEAT FLUX, DRYOUT + ACCIDENT, CORE DISRUPTIVE

18-103948 ALSO IN CATEGORY 5 DATED 1975
CATTON I
LAMINAR NATURAL CONVECTION FROM BLUNT BODIES WITH ARBITRARY SURFACE HEAT FLUX OR SURFACE TEMPERATURE
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7527 +. 82 PAGES. 4 FIGURES. 33 REFERENCES. APRIL 1975

THE LAMINAR BOUNDARY LAYER EQUATIONS FOR FREE CONVECTION OVER BODIES OF ARBITRARY SHAPE AND WITH ARBITRARY SURFACE HEAT FLUX OR SURFACE TEMPERATURE ARE SOLVED IN LOCAL CARTESIAN COORDINATES. BOTH TWO-DIMENSIONAL AXISYMMETRIC BODIES (E.G. HORIZONTAL CYLINDERS) AND THREE-DIMENSIONAL AXISYMMETRIC BODIES (E.G. SPHERES) WITH FINITE RADII OF CURVATURE AT THEIR STAGNATION POINTS ARE CONSIDERED. A BLASIUS SERIES EXPANSION IS APPLIED TO CONVERT FROM PARTIAL TO ORDINARY DIFFERENTIAL EQUATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CORE MELTDOWN + DESIGN STUDY + HEAT TRANSFER, NATURAL CONVECTION + HEAT TRANSFER ANALYSIS + *CORE CATCHER

18-103956 DATED 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-103956 *CONTINUED*
SAFETY ENGINEERING TENTH QUARTERLY REPORT: NOVEMBER 1974-JANUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-13923-10 +. 44 PAGES, 27 FIGURES, 17 REFERENCES, FEB. 1975

THE OBJECTIVE OF THE WORK REPORTED UNDER THIS PROGRAM IS TO PROVIDE AN INDEPENDENT EVALUATION OF EXISTING EXPERIMENTAL DATA AND ANALYTICAL MODELS RELATING TO DESIGN AND SAFETY ANALYSIS OF LMFBR CORES, AND TO IDENTIFY REQUIREMENTS FOR ADDITIONAL MODEL DEVELOPMENT AND TESTING IN SUPPORT OF LONG-TERM LMFBR SAFETY EVALUATIONS. PROGRESS FOR THE PERIOD IS DESCRIBED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + ANALYTICAL MODEL + SAFETY ANALYSIS + *R AND D PROGRAM

18-103960 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, APRIL 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-39 +. 197 PAGES, FIGURES, JUNE 2, 1975

SUMMARIZES THE ARGONNE NATIONAL LABORATORY WORK PERFORMED FOR THE REACTOR DEVELOPMENT PROGRAM AS OF APRIL 1975 IN THE FOLLOWING RESEARCH AND DEVELOPMENT AREAS: EXPERIMENTAL BREEDER REACTOR NO. II (EBR-II), LMFBR DESIGN SUPPORT, INSTRUMENTATION AND CONTROL, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, REACTOR SAFETY, AND OTHER FAST BREEDER REACTORS (GCFR).

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*EBR 1 AND 2 (RE) + ANL + DESIGN STUDY + MATERIAL + REACTOR PHYSICS + *R AND D PROGRAM + *REACTOR, GCFR + INSTRUMENTS, MISC.

18-103961 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, MARCH 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-38 +. 145 PAGES, FIGURES, APRIL 28, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING FBR-2; HOT FUEL EXAMINATION FACILITY; LMFBR DESIGN SUPPORT; FUELS AND MATERIALS DEVELOPMENT; REACTOR PHYSICS; AND REACTOR SAFETY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ANL + DESIGN STUDY + MATERIAL + REACTOR PHYSICS + R AND D PROGRAM

18-103965 ALSO IN CATEGORY 17 DATED 1975
US/USSR SEMINAR ON FAST BREEDER REACTOR CONSTRUCTION AND OPERATING EXPERIENCE
U.S. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
ERDA-42(ENG) +. 262 PAGES, FIGURES, JUNE 5, 1975

PRESENTS THE TEXT OF 11 PAPERS ON THE FOLLOWING SUBJECTS: STATUS OF LMFBR'S IN THE U.S.; EBR-2 CONSTRUCTION EXPERIENCE AND INITIAL PERFORMANCE; EBR-2 OPERATING EXPERIENCE; ENRICO FERMI CONSTRUCTION EXPERIENCE; DECOMMISSIONING OF ENRICO FERMI; SEFOR CONSTRUCTION AND OPERATING EXPERIENCE; FFTF; AND CONSTRUCTIBILITY OF THE CLINCH RIVER BREEDER REACTOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + FERMI (LMFBR) + *OPERATION + FFTF (TR) + USSR + SEFOR (RE) + DECOMMISSIONING + REVIEW + UNITED STATES + *CONSTRUCTION + CLINCH RIVER (LMFBR)

18-103966 ALSO IN CATEGORY 9 DATED 1975
A COMPILATION OF BORON CARBIDE DESIGN SUPPORT DATA FOR LMFBR CONTROL ELEMENTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-19 +. 55 PAGES, 19 FIGURES, 45 REFERENCES, 1975

DATA AND DESIGN CORRELATIONS ARE PRESENTED FOR BORON CARBIDE STRUCTURAL, MECHANICAL, AND PHYSICAL PROPERTIES, COMPATIBILITY WITH STAINLESS STEEL AND SODIUM, AND IRRADIATION BEHAVIOR PERTAINING TO HELIUM RELEASE, SWELLING, AND TRITIUM PRODUCTION AND RETENTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + CARBIDE + *CONTROL ROD BURNUP + FISSION PRODUCT RELEASE + TRITIUM + HELIUM + RADIATION EFFECT + SWELLING + CONTROL RODS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-103965 ALSO IN CATEGORY 5 DATED 1975
PHYSICS OF REACTOR SAFETY QUARTERLY REPORT: JANUARY-MARCH 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-31 +, 33 PAGES, 8 TABLES, 23 REFERENCES, MARCH 1975

PROGRESS IN REACTOR SAFETY RESEARCH AND TECHNICAL COORDINATION OF THE RSR SAFETY ANALYSIS PROGRAM IS REPORTED. PUMP COASTDOWN CALCULATIONS HAVE BEEN CARRIED OUT FOR AN IMPROVED MODEL OF THE CRBR, WITH RESULTS SIMILAR TO PREVIOUS ONES. A MILD INITIAL DISASSEMBLY IS OBTAINED, BUT THERE IS A REMOTE POSSIBILITY OF A MORE SEVERE ONE FROM FAILURE OF LOW-POWER PINS IN THE PRESENCE OF SODIUM. THE PLUTO CODE HAS BEEN APPLIED TO THIS PROBLEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + COMPUTER PROGRAM + ANALYTICAL MODEL + CORE MELTDOWN + *R AND D PROGRAM + *ACCIDENT, CORE DISRUPTIVE

18-103970 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT: SODIUM TECHNOLOGY AND COVER GAS SEAL DEVELOPMENT PROGRAMS: OCTOBER-DECEMBER 1974
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13143 +, 158 PAGES, 84 FIGURES, FEB. 15, 1975

THE REACTION RATE TESTS OF CYLINDRICAL SODIUM SPECIMENS IN GLASS CYLINDERS WITH DENATURED ETHANOL (JAYSOL SS) AND DOWANOL PM WERE ESSENTIALLY COMPLETED, AND ARRHENIUS PLOTS OF RATE VS TEMPERATURE WERE PREPARED. THESE DATA INDICATED WELL-ORDERED AND PREDICTABLE REACTION RATES. THE FRICTION TEST RESULTS OBTAINED FROM THE ELEVENTH MATRIX ARE REPORTED. THE FFTF INSTRUMENT TREE INFLATABLE SEALS COMPLETED ONE LIFE CYCLE WITHOUT LEAKAGE BUT A FAILURE MODE WHICH CRACKED THE SEALING BEAD WAS FOUND. A SECOND LIFE CYCLE IS IN PROGRESS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COVER GAS + GLASS + SEAL + *R AND D PROGRAM + FRICTION

18-103973 DATED 1974
ADAMSON MG
OXYGEN THRESHOLDS FOR THE SODIUM-FUEL REACTION: AN EVALUATION OF EXPERIMENTAL AND THEORETICAL RESULTS
GENERAL ELECTRIC COMPANY
GEAP-12515 +, 36 PAGES, 9 FIGURES, 38 REFERENCES, JULY 1974

DESCRIBES EXPERIMENTAL RESULTS OF DETERMINATION OF THE EQUILIBRIUM OXYGEN CONCENTRATION. THE CURRENT PREFERRED VALUES FOR THE TEMPERATURE RANGE 600 TO 750 C ARE 1.0 + OR - 0.4 AND 1.5 + 5.5 OR -0.8 PPM. AT THIS LEVEL, FAILED LMFBR-TYPE MIXED OXIDE FUEL PINS COULD CONTINUE TO OPERATE IN LARGE SODIUM LOOPS WITHOUT UNDERGOING ADDITIONAL SEVERE SWELLING PROVIDED THE COOLANT OXYGEN LEVEL REMAINS AT 0.5 TO 1.0 PPM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*CHEMICAL REACTION + FUEL BURNUP + OXYGEN + FUEL ROD + CONCENTRATION + SWELLING + MIXED OXIDE + *FUEL COOLANT INTERACTION

18-103976 ALSO IN CATEGORY 11 DATED 1975
LORENZ RA
EVALUATION OF THE REXCO-H AND REXCO-HEP REACTOR EXCURSION CONTAINMENT CODES
NAVAL ORDNANCE LAB., SILVER SPRING, MARYLAND
NOLTR 74-63 +, 46 PAGES, 5 FIGURES, 7 REFERENCES, MARCH 1975

CODES WERE DEVELOPED BY ARGONNE NATIONAL LABORATORY TO ANALYZE RESPONSE TO THE PRIMARY CONTAINMENT SYSTEM OF A LIQUID METAL FAST BREEDER REACTOR TO A CORE DISASSEMBLY ACCIDENT (CDA). REXCO-H ANALYZES THE HYDRODYNAMIC RESPONSE, AND REXCO-HEP ANALYZES THE HYDRODYNAMIC AND ELASTIC-PLASTIC RESPONSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *CONTAINMENT ANALYSIS + EXCURSION, LARGE + MATHEMATICAL TREATMENT + *ACCIDENT, CORE DISRUPTIVE

18-103983 ALSO IN CATEGORY 11 DATED 1975
CRAWFORD RM + MARR WW + PADILLA A + WANG PY
STUDIES ON LMFBR SUBASSEMBLY BOUNDARY INTEGRITY
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-27 +, 55 PAGES, 37 FIGURES, 28 REFERENCES, MAY 1975

INITIAL FAULTS AND THEIR ASSOCIATED FAILURE-PROPAGATION MODES ARE IDENTIFIED WITH THE USE OF SAFETY-ASSURANCE DIAGRAMS. TO PUT THESE INITIAL FAULTS INTO PERSPECTIVE, REACTOR OPERATING EXPERIENCE IS REVIEWED WITH PARTICULAR EMPHASIS ON THE FUEL-MELTING INCIDENT IN THE FERMI REACTOR. THE ABILITY OF THE SUBASSEMBLY DUCT TO WITHSTAND A PRESSURE-PULSE LOADING IS REVIEWED.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-103983 *CONTINUED*
INCLUDING RECENT ANALYSES OF LOCAL MFCIS AND SUBASSEMBLY-DUCT MECHANICAL RESPONSE. THE CONSEQUENCES OF A LOCALIZED FAILURE OF THE SUBASSEMBLY DUCT IS ALSO ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL MELTDOWN + *STRUCTURAL INTEGRITY + PRESSURE PULSE + OPERATING EXPERIENCE + FAILURE MODE ANALYSIS

18-103987 DATED 1974
PROCEEDINGS OF THE US/USSR SEMINAR ON THE DEVELOPMENT OF SODIUM-COOLED FAST BREEDER REACTOR STEAM GENERATORS. VOLUME 1 - PAPERS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
ERDA-32 + CONF-74136 +. 563 PAGES, DEC. 4, 1974

PRESENTS THE TEXT OF 20 PAPERS PRESENTED AT THE SEMINAR ON THE FOLLOWING SUBJECTS: DEVELOPMENT AND OPERATION OF LMFBR STEAM GENERATORS IN THE U.S.; R AND D PROGRAMS; BASIC PRINCIPLES IN THE DEVELOPMENT OF SODIUM-COOLED STEAM GENERATORS; PREOPERATIONAL TESTS AND STARTUP OF THE BN-350 STEAM GENERATORS; HEAT TRANSFER; MATERIALS SELECTION; SODIUM-STEAM REACTION JET EFFECTS; LEAKAGE; LEAK DETECTION; AND LEAK ANALYSIS METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

HEAT TRANSFER + JET + TESTING + MATERIAL + USSR + REVIEW + R AND D PROGRAM + *STEAM GENERATOR + LEAK

18-103994 ALSO IN CATEGORY 1 DATED 1975
CUNNINGHAM DC + GALDE DO
LIQUID METAL FAST BREEDER REACTOR
U.S. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
TID-3333-S2 +. 263 PAGES, JUNE 1975

THIS BIBLIOGRAPHY CITES 1,966 PUBLICATIONS CONTAINING INFORMATION ON LIQUID METAL FAST BREEDER REACTORS. THE CITATIONS WERE TAKEN FROM NUCLEAR SCIENCE ABSTRACTS (NSA) VOLUMES 28 (JULY 1973) THROUGH 30 (DECEMBER 1974). EACH CITATION LISTS THE ORIGINAL NSA ABSTRACT NUMBER AS WELL AS A BIBLIOGRAPHY CITATION NUMBER. A PERSONAL AUTHOR INDEX, A REPORT NUMBER AVAILABILITY INDEX, AND A SUBJECT INDEX ARE PROVIDED IN WHICH CITATIONS ARE IDENTIFIED BY MEANS OF THE BIBLIOGRAPHY CITATION NUMBERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY

18-104244 ALSO IN CATEGORY 5 DATED 1975
ABRAMSON PB
POOL - A TWO-DIMENSIONAL THREE-COMPONENT COUPLED HYDRODYNAMIC THERMODYNAMIC COMPUTER MODEL FOR BOILING POOLS OF FUEL AND STEEL
ARGONNE NATIONAL LABORATORY, ILLINOIS
RSA-TM-3 +. 70 PAGES, 10 FIGS., 23 REFS., MAY 1, 1975

THIS MODEL WAS DEVELOPED AS A SUBSTITUTE FOR VENUS II AND HAS BEEN COUPLED TO FX 2 TO YIELD A COMPLETELY INTERACTIVE THERMOHYDRAULIC-NEUTRONIC COMPUTER PORGRAM WHICH DESCRIBES THE INTERACTIONS IN A BOILING CLINDRICAL POOL OF FUEL AND STEEL. THE MODEL TREATS THE EULERIAN HYDRODYNAMICS AND THERMODYNAMICS OF THE INTERACTIONS IN THE POOL AND FEEDS BACK TO FX2 FOR NEUTRONIC COUPLING. SPECIFICALLY TREATED IN THIS MODEL ARE: HEAT TRANSFER BETWEEN FUEL AND STEEL BOTH INSIDE THE POOL AND AT THE BOUNDARIES; BOILING OF STEEL AND FUEL, MELTING OF STEEL AT THE POOL CONTACT BOUNDARIES AND CONDENSATION OF VAPOR AT THE TOP BOUNDARIES; PRESSURIZATION INSIDE THE POOL AND ON TOP; HYDRODYNAMIC (NAVIER STOKES AND CONTINUITY) INTERNAL MOTION; AND THERMODYNAMIC HEAT DIFFUSION/CONVECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*HEAT TRANSFER, BOILING + *COMPUTER PROGRAM + ACCIDENT, LOSS OF FLOW + CORE MELTDOWN + POOL BOILING + *BOILING + *THERMAL HYDRAULIC ANALYSIS

18-104275 ALSO IN CATEGORY 5 DATED 1975
FAST REACTOR SAFETY - III: LOSS-OF FLOW ACCIDENT ANALYSIS
7 PAGES, TRANS. AMERICAN NUCLEAR SOCIETY, VOL. 21, PP. 295-301, FROM 1975 ANNUAL MEETING, NEW ORLEANS, LA., JUNE 8-13, 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON LOSS-OF-FLOW ACCIDENT ANALYSIS. THE TOPICS INCLUDE: RESPONSE OF THE GAS-COOLED FAST BREEDER REACTOR TO FLOW REDUCTION ACCIDENTS; LOSS-OF-FLOW ACCIDENT PHENOMENOLOGY IN THE GCFR; CORE DISRUPTIVE ACCIDENT ANALYSIS OF GAS COOLED FAST BREEDER REACTOR; ANALYSIS OF LOSS-OF-FLOW ACCIDENTS FOR THE SNR-300 MARK 1A CORE; SAFETY STUDIES FOR 1000-MWE OXIDE AND CARBIDE FAST BREEDER REACTORS; A CODE FOR ANALYZING PARALLEL-CHANNEL THERMAL-HYDRAULICS IN EBR-2 DURING NATURAL CONVECTION CONDITIONS; AND FLOW-CONTROLLED COASTDOWN TESTS ON BOILING IN A SODIUM-COOLED 19-ROD BUNDLE.

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *ACCIDENT, LOSS OF FLOW + REACTOR, GCFR + THERMAL HYDRAULIC ANALYSIS + ACCIDENT, CORE DISRUPTIVE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-104276 ALSO IN CATEGORY 12 DATED 1975
SAFETY FEATURE ANALYSIS AND LICENSING
8 PAGES. TRANS. AMERICAN NUCLEAR SOCIETY. VOL. 21. PP. 271-78. FROM 1975 ANNUAL MEETING. NEW ORLEANS. LA.. JUNE 8-13. 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON THE SUBJECT OF SAFETY FEATURE ANALYSIS AND LICENSING. THE TOPICS INCLUDE: A RATIONAL APPROACH TO ACCIDENT DOSE ASSESSMENT; REACTOR CAVITY PRESSURE RESPONSE TO A PIPE BREAK; A GENERALIZED COORDINATE TREATMENT OF THE VENT-CLEARING TRANSIENT FOR HORIZONTAL-VENT PRESSURE-SUPPRESSION CONTAINMENT SYSTEM; COMPUTATIONAL FEATURES OF THE CACECO CONTAINMENT ANALYSIS CODE; SELF-ACTUATED SHUTDOWN FOR LMFBR PLANTS; LMFBR LICENSING-COMPARISON WITH OTHER REACTOR DESIGNS; AND EVOLUTIONARY SAFETY DEVELOPMENTS FOR NUCLEAR POWER PLANTS.

COMPUTER PROGRAM + CONTAINMENT + CONTAINMENT. PRESSURE SUPPRESSION + *SAFETY ANALYSIS + *ENGINEERED SAFETY FEATURE + LICENSING PROCESS

18-104277 ALSO IN CATEGORY 5 DATED 1975
FAST REACTOR SAFETY - I: HCDA ANALYSIS
8 PAGES. TRANS. AMERICAN NUCLEAR SOCIETY. VOL. 21. PP. 279-86. FROM 1975 ANNUAL MEETING. NEW ORLEANS. LA.. JUNE 8-13. 1975

PRESENTS 500 WORD ABSTRACTS OF 7 PAPERS PRESENTED AT THE MEETING ON HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS. THE TOPICS INCLUDE: HYDRODYNAMICS OF FUEL EXPANSION FOLLOWING DISASSEMBLY IN AN LMFBR CORE-DISRUPTIVE ACCIDENT; LMFBR/HCDA ENERGY YIELD-FLUID DYNAMIC ASPECTS; HYDRODYNAMIC ASPECTS OF MILD LMFBR CORE DISASSEMBLY; REACTIVITY CHANGES DUE TO BUBBLE GROWTH OR COLLAPSE IN MOLTEN FUEL SYSTEMS; CONSEQUENCES OF CHANNEL PLUGGING DURING FAST REACTOR OVERPOWER EXCURSIONS; ASSESSING RECRITICALITY IN LMFBR CORE DISRUPTIVE ACCIDENTS; AND FX2POOL - A DYNAMIC TWO-DIMENSIONAL MULTIFLUID HYDRO/THERMODYNAMIC AND NEUTRONICS MODEL FOR BOILING POOLS.

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + HYDRODYNAMIC ANALYSIS + *ACCIDENT. CORE DISRUPTIVE

18-104278 ALSO IN CATEGORY 5 DATED 1975
FAST REACTOR SAFETY - V: POST-ACCIDENT HEAT REMOVAL AND STRUCTURAL DYNAMICS
6 PAGES. FIGS.. TRANS.. AMERICAN NUCLEAR SOCIETY. VOL. 21. PP. 309-14. FROM 1975 ANNUAL MEETING. NEW ORLEANS. LA.. JUNE 8-13. 1975

PRESENTS 500 WORD ABSTRACTS OF 6 PAPERS ON THE FOLLOWING SUBJECTS: POST-ACCIDENT HEAT REMOVAL WITH ADVANCED LMFBR FUELS; CORE DEBRIS RETENTION IN THE BELOW-CORE STRUCTURE FOLLOWING AN LMFBR DISASSEMBLY; POST-ACCIDENT DOWNWARD FUEL RELOCATION IN THE LMFBR; MELTING RATES FOR THE ATTACK OF STEEL STRUCTURE BY UO2 FUEL OR STEEL VAPOR; PROPAGATION OF HCDA PRESSURE PULSES IN A PLASTICALLY DEFORMING PIPING LOOP; AND RESPONSE OF A HEXAGONAL FUEL SUBASSEMBLY WALL DUE TO AN AXISYMETRIC PRESSURE SOURCE.

*ACCIDENT. CONSEQUENCES + *DECAY HEAT + EMERGENCY COOLING CONSIDERATIONS + ACCIDENT. CORE DISRUPTIVE

18-104280 ALSO IN CATEGORY 5 DATED 1975
FAST REACTOR SAFETY - VI: LOCALIZED CORE EVENTS
6 PAGES. FIGS.. TRANS. AMERICAN NUCLEAR SOCIETY. VOL. 21. PP. 315-20. FROM 1975 ANNUAL MEETING. NEW ORLEANS. LA.. JUNE 8-13. 1975

PRESENTS 500 WORD ABSTRACTS OF 5 PAPERS ON THE FOLLOWING SUBJECTS: ASSESSMENT OF LOCAL BLOCKAGES IN CARBIDE ASSEMBLIES; COOLANT RECOVERY RATE FOLLOWING FISSION GAS RELEASE FROM A POSTULATED MULTIPLE PIN FAILURE IN AN LFMBR SUBASSEMBLY; TEMPERATURE NOISE MEASUREMENTS IN BLOCKED AND UNBLOCKED 19-PIN ELECTRICALLY HEATED LMFBR FUEL MOCKUPS; EFFECT OF GAS BUBBLE PASSAGE THROUGH CRBR CORE; AND PRELIMINARY ASSESSMENT OF SUBASSEMBLY TO SUBASSEMBLY PROPAGATION IN LMFBR'S.

FUEL MELTDOWN + NOISE ANALYSIS + FUEL RCD + BOILING + *EMERGENCY COOLING CONSIDERATIONS

18-104282 ALSO IN CATEGORY 11 DATED 1975
FAST REACTOR SAFETY - IV: CLADDING FAILURE AND FUEL BEHAVIOR
7 PAGES. TRANS. AMERICAN NUCLEAR SOCIETY. VOL. 21. PP. 302-8. FROM 1975 ANNUAL MEETING. NEW ORLEANS. LA.. JUNE 8-13. 1975

PRESENTS 500 WORD ABSTRACTS OF 6 PAPERS PRESENTED AT THE MEETING ON CLAD FAILURE AND FUEL BEHAVIOR. THE TOPICS INCLUDE: LMFBR CLADDING FAILURE PREDICTION IN TRANSIENT OVERPOWER EXPERIMENTS; FAILURE OF IRRADIATED LMFBR FUEL PINS IN A TRANSIENT OVERPOWER ACCIDENT; FAILURE THRESHOLD CORRELATION FOR FAST REACTOR TRANSIENT OVERPOWER ACCIDENT ANALYSIS; THERMAL INTERACTION OF MOLTEN CARBIDE FUEL WITH STAINLESS-STEEL CLADDING; FUEL BEHAVIOR SLIGHTLY ABOVE OR BELOW THE FAILURE THRESHOLD; AND OUT-OF-REACTOR FUEL-MOTION STUDIES UTILIZING DIRECT ELECTRICAL HEATING.

FUEL MELTDOWN + *REACTOR TRANSIENT + FAILURE. CLADDING

18-104413 ALSO IN CATEGORIES 11 AND 13 DATED 1972
TVERBERG JC
STAINLESS STEEL FUEL CLADDING FOR FAST BREEDER REACTORS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-104413 *CONTINUED*
CARPENTER TECHNOLOGY CORP.
3 PAGES, 4 FIGS., NUCLEAR ENGINEERING INTERNATIONAL, 17(199), PP. 1001-1003 (DEC. 1972)

THE METHODS DESCRIBED IN THIS PAPER REPRESENT THOSE PROCESSES EMPLOYED BY CARPENTER TECHNOLOGY CORPORATION, SPECIAL PRODUCTS DIVISION, SAN DIEGO, CALIFORNIA. IN ITS PRODUCTION OF DEFECT FREE FAST BREEDER FUEL CLADDING TUBES. THE CONCEPTS INCLUDE SPECIAL HANDLING TO PREVENT TUBE-TO-TUBE CONTACT. VERTICAL DEGREASING TO PREVENT SLUDGE FROM ACCUMULATING IN THE TUBES DURING CLEANING, BRIGHT ANNEALING USING PURE HYDROGEN TO YIELD A SCALE FREE SURFACE THUS ELIMINATING ACID PICKLING, AND STATISTICAL CONTROL OF ALL MANUFACTURING VARIABLES.

*FABRICATION + CLADDING + STEEL, STAINLESS + FFTF (TR) + QUALITY ASSURANCE

18-104414 ALSO IN CATEGORY 5 DATED 1974
DUNN FE + FISCHER GJ + HEAMES TK
THE SASZA LMFBR ACCIDENT ANALYSIS COMPUTER CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8138 +, 351 PAGES, 24 FIGS., 18 REFS., OCT. 1974

THE CODE CALCULATES THE INITIAL CONSEQUENCES OF AN ACCIDENT, FROM STEADY-STATE, PREACCIDENT CONDITIONS UP TO THE POINT OF LARGE-SCALE FUEL MOTION OR DISASSEMBLY. THE CODE STARTS WITH A STEADY-STATE THERMAL-HYDRAULICS CALCULATION TO INITIALIZE THE FUEL TEMPERATURES, FUEL AND CLADDING THERMAL EXPANSION, AND THE COOLANT TEMPERATURES, PRESSURES, AND FLOW RATES. THE CODE THEN STARTS A USER-SPECIFIED PERTURBATION IN POWER LEVEL OR FLOW RATE, AND CALCULATES TRANSIENT TEMPERATURES IN FUEL, CLADDING, AND COOLANT. TRANSIENT STRESSES AND STRAINS IN THE FUEL AND CLADDING, AND TRANSIENT COOLANT PRESSURES AND FLOW RATES ARE ALSO CALCULATED, AS WELL AS SODIUM BOILING, FILM DRYOUT, CLADDING MELTING, AND FUEL MELTING. NEUTRON KINETICS IS HANDLED WITH A POINT-KINETICS APPROXIMATION, WITH REACTIVITY FEEDBACK FROM THE DOPPLER EFFECT, FUEL THERMAL EXPANSION, SODIUM VOIDING, USER-SUPPLIED TABLE-LOOKUP FUEL SLUMPING, AND SCRAM REACTIVITY, AS WELL AS USER-SPECIFIED PROGRAMMED REACTIVITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FUEL MELTDOWN + DEFORMATION + REACTIVITY EFFECT, SLUMP + HEAT TRANSFER ANALYSIS + FLOW BLOCKAGE + BUBBLE + *THERMAL HYDRAULIC ANALYSIS

18-104424 ALSO IN CATEGORIES 1 AND 13 DATED 1973
ZEIGLER RK
QUALITY ASSURANCE PLAN FOR MIXED OXIDE FUEL FOR LMFBR
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-UR-73-740 + CONF-730911-1 +, 7 PAGES, FROM WESTERN REGIONAL CONFERENCE OF AMERICAN SOCIETY FOR QUALITY CONTROL, PORTLAND, OREGON, SEPT. 27, 1973

AN EVALUATION OF THE ADEQUACY OF THE METHODS OF ANALYSIS IS PRESENTED FOR CHEMICAL SPECIFICATIONS OF LMFBR/FFTF MIXED URANIUM-PLUTONIUM OXIDE FUEL. THIS EVALUATION IS BASED ON STATISTICAL ANALYSES OF THE RESULTS OBTAINED BY SEVEN LABORATORIES ON A DISTRIBUTED BATCH OF FFTF FUEL PELLETS AND DISTRIBUTED SPECIAL BLENDS OF CERTAIN IMPURITIES AND A HIGH PURITY URANIUM-PLUTONIUM OXIDE MATRIX. BASED UPON THE RESULTS OF THIS EVALUATION A QUALITY ASSURANCE PROGRAM WILL BE DISCUSSED WHICH WILL ENSURE THE CONTINUING EXISTENCE OF QUALITY DATA FOR THE CHEMICAL CHARACTERIZATION OF LMFBR/FFTF MIXED OXIDE FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + URANIUM + FUEL, PELLET TYPE + ANALYTICAL TECHNIQUE + *QUALITY ASSURANCE + MIXED OXIDE

18-104425 ALSO IN CATEGORIES 5 AND 11 DATED 1973
CLAXTON KT + COLLIER JG
MASS TRANSPORT OF STAINLESS STEEL CORROSION PRODUCTS IN FLOWING LIQUID SODIUM
UKAEA RESEARCH GROUP, HARWELL
13 PAGES, 8 TABS., 13 FIGS., J. BRITISH NUCLEAR ENERGY SOCIETY, 12(1), PP. 63-75 (JAN. 1973)

THE MASS TRANSPORT OF CORROSION PRODUCTS LIKELY TO BE ENCOUNTERED IN A FAST REACTOR THROUGH EXPOSURE OF STAINLESS STEEL TO FLOWING LIQUID SODIUM IS DISCUSSED. A PUMPED SODIUM LOOP CAPABLE OF FLOW RATES OF 1100 KG/H AT A TEMPERATURE OF 600 C HAS BEEN COMMISSIONED. THIS RIG INCORPORATES AN INDIRECTLY HEATED ACTIVE CYLINDRICAL TEST SECTION AND COLD TRAPPING AND FILTERING FACILITIES. IT HAS BEEN OPERATED UNDER CONDITIONS WHICH SIMULATE THOSE OBTAINING IN A SINGLE TUBE OF THE INTERMEDIATE HEAT EXCHANGER OF PFR. THE INITIAL EXPERIMENTS HAVE INVESTIGATED THE TRANSPORT AND DEPOSITION CHARACTERISTICS OF FE, MN AND CO. MANGANESE-54 BEHAVIOUR IS CHARACTERIZED BY ITS RAPID AND HIGHLY PREFERENTIAL MIGRATION TO THE DIFFUSION COLD TRAP, THE COLDEST PART OF THE CIRCUIT. EXPERIMENTS WITH 60-CO HAVE INDICATED THAT ITS TRANSPORT IS MORE LIMITED THAN 59-FE AND THAT THE DEPOSIT IS LESS STRONGLY ATTACHED BEING EASILY DISLODGED THROUGH VELOCITY CHANGES IN THE CIRCUIT.

COBALT + MANGANESE + STEEL, STAINLESS + IRON + CORROSION + IN PILE EXPERIMENT + MASS TRANSFER

18-104432 ALSO IN CATEGORY 7 DATED 1975
KIRBIYIK M + ERDMAN CA + REYNOLDS AB
FUEL VAPOR GENERATION IN LMFBR CORE DISRUPTIVE ACCIDENTS
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-104462 *CONTINUED*
7 PAGES, 2 FIGS., 9 REFS., NUCLEAR TECHNOLOGY, 26(2), PP. 165-71 (JUNE 1975)

METHODS TO CALCULATE BOUNDING VALUES FOR THE GENERATION OF FUEL VAPOR DURING DISASSEMBLY AND DURING EXPANSION OF THE FUEL AFTER DISASSEMBLY IN A FAST-REACTOR CORE-DISRUPTIVE ACCIDENT WERE DEVELOPED. ISENTROPIC EXPANSION OF THE FUEL FOLLOWING DISASSEMBLY WITH NO FUEL MIXING BEFORE EXPANSION WAS ASSUMED. IT WAS NECESSARY TO DEVELOP CONSISTENT THERMODYNAMIC FUEL PROPERTIES FOR THE ANALYSIS. THE METHOD WAS APPLIED TO A LIQUID-METAL FAST BREEDER REACTOR DISASSEMBLY, FIRST WITH SODIUM IN THE CORE AND THEN WITH SODIUM REMOVED.

FUEL MELTDOWN + THERMODYNAMICS + CORE MELTDOWN + ACCIDENT, CORE DISRUPTIVE

18-104437 ALSO IN CATEGORY 5 DATED 1975
KENNEDY JR + BELYTSCHKO TB
ENERGY SOURCE AND FLUID REPRESENTATION IN A STRUCTURAL RESPONSE CODE - STRAW
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8140 +, 76 PAGES, 75 FIGS, 12 REFS., MAY 1975

DESCRIBES ADDITIONAL DEVELOPMENTS IN THE STRAW CODE FOR SIMULATING THE SURROUNDINGS OF A FUEL SUBASSEMBLY IN A REACTOR CORE AND GIVES SOME RESULTS OBTAINED WITH THE NEW FEATURES. TWO NEW ELEMENTS ARE ADDED TO THE EXISTING PROGRAM: A HYDRODYNAMIC FINITE ELEMENT REPRESENTING THE PLANE MOTION OF THE FLUID SURROUNDING AND WITHIN THE SUBASSEMBLIES, AND A SUPERIMPOSED SUPERELEMENT REPRESENTING THE EFFECTS OF AXIAL FLOW. AN ENERGY-SOURCE MODEL IS INCORPORATED TO MODEL MOLTEN-FUEL-COOLANT INTERACTIONS (MFCI) OR OTHER POSSIBLE ENERGY-RELEASE SOURCES. ALSO, AN OPTION FOR COMPUTING THE INTERNAL ENERGIES OF ANY ELEMENT OR GROUPS OF ELEMENTS. THE TOTAL KINETIC AND INTERNAL ENERGIES, AND THE EXTERNAL WORK OF FORCING FUNCTIONS WAS ADDED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + ENERGY SOURCE + HEAT TRANSFER + HYDRODYNAMIC ANALYSIS + *FUEL ELEMENT CLUSTER + THERMAL TRANSIENT + *FUEL COOLANT INTERACTION + *FUEL ELEMENTS

18-104846 ALSO IN CATEGORY 11 DATED 1975
FONTANA MH + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR JANUARY-MARCH 1975. III - LIQUID METAL COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4914, VOL. 3 +, 49 PP, TABS., REFS., JULY 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: RELEASE AND BEHAVIOR OF FUEL, FISSION PRODUCTS, AND TRANSURANIC ELEMENTS IN AEROSOLS RESULTING FROM THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT OF A LIQUID METAL FAST BREEDER REACTOR; AND STRUCTURAL INTEGRITY OF LMFBR EQUIPMENT CELL LINERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + FISSION PRODUCT RELEASE + STRUCTURAL INTEGRITY + *R AND D PROGRAM + CONTAINMENT LINER + *ACCIDENT, CORE DISRUPTIVE

18-104847 DATED 1975
FONTANA MH + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR OCTOBER-DECEMBER 1974
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4677 +, 93 PP, FIGS., REFS., JUNE 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: FLOW COASTDOWN TESTS; WATER SYSTEM MOCKUP OF THE FFM; ACOUSTIC BOILING DETECTION, FFM FACILITY OPERATIONS, AND HEATER DEVELOPMENT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

HYDRAULIC ANALYSIS + *R AND D PROGRAM + *BOILING + ACOUSTICS + HEATERS

18-104848 DATED 1975
PATRIARCA P
FUELS AND MATERIALS DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING MARCH 31, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4940 +, 232 PP, FIGS., REFS., JULY 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: ADVANCED ABSORBER MATERIALS; STEAM GENERATOR MATERIALS; MECHANICAL PROPERTIES AND BEHAVIOR OF STRUCTURAL MATERIALS; AND MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS OF LMFBR'S.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + WELDS + WELDING + MATERIAL + *R AND D PROGRAM + STEAM GENERATOR + *STRUCTURE + CONTROL RODS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-104849 ALSO IN CATEGORY 11 DATED 1975
PATRIARCA P
STEAM GENERATOR MATERIALS TECHNOLOGY PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING MARCH 31, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4969 +. 195 PP, FIGS., 54 REFS., JULY 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING STEAM GENERATOR MATERIALS DEVELOPMENT FOR THE CLINCH RIVER BREEDER REACTOR; ADVANCED FERRITIC ALLOYS DEVELOPMENT FOR LMFBR STEAM GENERATORS; AND ALLOY 800 DEVELOPMENT FOR ADVANCED LMFBR STEAM GENERATORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ALLOY + *MATERIAL + STEEL, FERRITIC + *R AND D PROGRAM + *STEAM GENERATOR + CLINCH RIVER (LMFBR)

18-105105 ALSO IN CATEGORY 11 DATED 1974
STEAM GENERATOR MATERIALS ENGINEERING (LMFBR PROGRAM) FIRST QUARTERLY REPORT, JULY-SEPT. 1974
GENERAL ELECTRIC COMPANY
GEAP-14,029-1 +. 24 PPS, 11 TABS, 23 REFS, OCT. 1974

THE MAJOR ACCOMPLISHMENTS FOR THE QUARTER INCLUDE: (1) PRELIMINARY CHARACTERIZATION OF THE BASE METAL AND ALL-WELD-METAL TUBES (2-1/4 CR-1MO) WAS COMPLETED; (2) INITIAL TESTING SHOWED THAT 2-1/4 CR-1MO WELDS ARE AS FULLY RESISTANT TO STRESS CORROSION AS THE BASE METAL; (3) FABRICATION OF THE IHTS SIMULATION COMPONENTS IS PROCEEDING; AND (4) LOOP 1R HAS BEEN MODIFIED FOR PARTICULATE THERMAL DEGRADATION STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + WELDS + STEEL, STAINLESS + *MATERIAL + STRESS CORROSION + R AND D PROGRAM + *STEAM GENERATOR

18-105106 ALSO IN CATEGORIES 7 AND 11 DATED 1974
BOHABOY PE + REGIMBAL JJ + CRAIG CN
EVALUATION OF CAPSULE B9D LOW BURNUP FAILED LMFBR FUEL PERFORMANCE
GENERAL ELECTRIC COMPANY
GEAP-13977 +. 96 PPS, 38 FIGS, NOV. 1974

TWO MIXED-OXIDE FUEL RODS WERE PURPOSELY DEFECTED WHILE OPERATING AT AN AVERAGE LINEAR POWER OF 15 KW/FT. THE TOP FUEL ROD CONTAINED A DEFECT IN THE GAS PLENUM; THE BOTTOM FUEL ROD WAS DEFECTED AT THE AXIAL MIDPOINT OF THE 4.25 INCH LONG FUEL COLUMN. IRRADIATION IN THE DEFECTED CONDITION CONTINUED TO AN AVERAGE FUEL BURNUP OF 6600 MWD/TE. RESULTS OF POST-IRRADIATION EXAMINATION OF THE FUEL, CAPSULE HARDWARE, AND SODIUM COOLANT ARE PRESENTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + *IRRADIATION TESTING + R AND D PROGRAM + FUEL ROD + RADIATION EFFECT + *MIXED OXIDE

18-105563 ALSO IN CATEGORY 11 DATED 1975
JAMES LA + BORISCH RR
EXPOSURE OF PRECRACKED AND PRELOADED FRACTURE MECHANICS SPECIMENS IN LIQUID SODIUM, WITH AN INTERMEDIATE MOIST NITROGEN CLEANING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME-75-51 +. 16 PPS, 5 FIGS, MAY 1975

THIS STUDY WAS UNDERTAKEN IN ORDER TO SURVEY THE APPLICABILITY OF FRACTURE MECHANICS TECHNIQUES IN CHARACTERIZING THE POTENTIAL FOR CRACK EXTENSION WHEN REACTOR COMPONENTS ARE REMOVED FROM SERVICE IN A SODIUM ENVIRONMENT, CLEANED, AND SUBSEQUENTLY RETURNED TO SERVICE. PRECRACKED AND PRELOADED FRACTURE MECHANICS SPECIMENS WERE EXPOSED TO SODIUM, CLEANED, RETURNED TO A SODIUM ENVIRONMENT, AND FINALLY EXAMINED. NO CRACK EXTENSION OCCURRED IN ANY OF THE STATICALLY LOADED SPECIMENS DURING THE TEST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BRITTLE FRACTURE + *CORE COMPONENTS + R AND D PROGRAM + FRACTURE TOUGHNESS + CRACK

18-105573 ALSO IN CATEGORY 5 DATED 1975
JOHNSON FG
SIMULATION OF COOLANT TRANSPORT AND HEAT EXCHANGE IN PIPE RUNS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-35 +. 98 PPS, 32 FIGS, 5 REFS, MAY 1975

PIPE RUNS FOR SODIUM COOLANT SYSTEMS ARE SATISFACTORILY SIMULATED BY SIMPLIFIED MODELS WITH NO MORE THAN 24 AXIAL BY RADIAL NODES, CONSISTING OF COOLANT, PIPE WALL AND AMBIENT NODAL POINTS. HEAT LOSSES FROM THE INSULATED PIPE TO ITS SURROUNDINGS ARE INCLUDED BY A CONSTANT HEAT TRANSFER RESISTANCE FROM THE PIPE'S OUTSIDE SURFACE TO THE AMBIENT. THE BEST ACCURACY FOR SIMPLIFIED MODELS IS OBTAINED BY SIMULATING THE DELTA T/DELTA K DERIVATIVE BY THREE-POINT DIFFERENCE APPROXIMATIONS. AN EXPLICIT NUMERICAL INTEGRATION METHOD IS USED WITH THESE SIMPLIFIED MODELS.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105573 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *ANALYTICAL MODEL + *HEAT TRANSFER ANALYSIS + SIMULATION + R AND D PROGRAM + *COOLING

18-105577 ALSO IN CATEGORY 5 DATED 1974
SODIUM TECHNOLOGY
POWER REACTOR & NUCLEAR FUEL DEVELOPMENT CORP., TOKYO
JAPENR-166 +. 107 PPS, 11 TABS, 35 FIGS, OCT. 1974

DESCRIBES THE STATUS, PROBLEMS, AND PLANS FOR FUTURE R AND D SODIUM TECHNOLOGY. TOPICS DISCUSSED INCLUDE PHYSICAL PROPERTIES OF SODIUM, FLOW AND HEAT TRANSFER, CHEMICAL ANALYSIS, PURITY CONTROL, INSTRUMENTATION, AND A LIST OF SODIUM TEST LOOPS IN THE WORLD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEAT TRANSFER + *CHEMICAL ANALYSIS + COOLANT CHEMISTRY + JAPAN + PROPERTY, PHYSICAL + REVIEW + R AND D PROGRAM

18-105585 ALSO IN CATEGORY 7 DATED 1975
STATUS OF SAFETY TECHNOLOGY FOR RADIOLOGICAL CONSEQUENCE ASSESSMENT OF POSTULATED ACCIDENTS IN LIQUID METAL FAST BREEDER REACTORS
U.S. ERDA, WASHINGTON, D.C.
ERDA-56 +. 600 PPS, FIGS, REFS, JULY 1975

PRESENTS THE TEXT OF 26 PAPERS CONCERNED WITH PRESENTING THE CURRENT CAPABILITY TO PREDICT AND MITIGATE THE RADIOLOGICAL CONSEQUENCES OF POSTULATED ACCIDENTS IN LMFBR'S. THE MAIN TOPICS INCLUDE SOURCE TERMS, SODIUM REACTIONS, AEROSOL BEHAVIOR, RADIOLOGICAL DOSE ASSESSMENT, AND ENGINEERED SAFEGUARDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + AIR CLEANING + CODES AND STANDARDS + *ACCIDENT, CONSEQUENCES + FIRE + FISSION PRODUCT RELEASE + ANALYTICAL MODEL + FISSION PRODUCT TRANSPORT + DOSE CALCULATION, EXTERNAL + *REVIEW + ENGINEERED SAFETY FEATURE + *AGENCY, ERDA

18-105592 ALSO IN CATEGORY 5 DATED 1975
WARD JT
GAMMA HEATING RATES IN FTR EUROPIA CONTROL ASSEMBLIES
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-35 +. 61 PPS, 11 TABS, 5 FIGS, MAY 1975

GAMMA HEATING RATES WERE CALCULATED FOR SEVERAL MATERIALS IN PROPOSED FAST TEST REACTOR (FTR) EUROPIA ABSORBER ASSEMBLIES. THE THREE-DIMENSIONAL FTR ANALYSIS FOUND GAMMA HEATING TO PEAK AT 12.8 WATTS/GM OF EUROPIA NEAR THE TIP OF A HALF-INSERTED ROW 5 CONTROL ROD. EXPERIMENTAL VERIFICATION WAS OBTAINED. SPATIALLY LOCALIZED HEATING GRADIENTS IN THE VICINITY OF A SINGLE ABSORBER ASSEMBLY WERE FOUND TO BE UNIMPORTANT IN AFFECTING PEAK HEATING RATES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

GAMMA + HEAT GENERATION, INTERNAL + EUROPIUM + *THERMAL HYDRAULIC ANALYSIS + *CONTROL RODS + *FTR (TR)

18-105631 ALSO IN CATEGORIES 5 AND 11 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 916 PAGES, AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING NEW FLOW DIAGRAMS, INDUSTRIAL SECURITY, MISSILE PROTECTION, REACTOR VESSEL DESIGN., TRANSIENT EFFECTS, RADWASTE SYSTEMS, AND AIRBORNE RADIOACTIVITY MONITORING. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING THE SAME SUBJECTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + MISSILE GENERATION AND PROTECTION + WASTE TREATMENT + MONITORING SYSTEM, RADIATION + *REPORT, PSAR + TRANSIENT + SECURITY + *CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-105632 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 1.2 - APPENDIX D AS PART OF REFERENCE DESIGN
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.2-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

APPENDIX D IS CONSIDERED PART OF THE REFERENCE DESIGN SUBMITTAL. THE PSAR DISCUSSES THE DERIVATION OF THE DYNAMIC MECHANICAL LOADING REQUIREMENTS, WHICH FORM PART OF THE THIRD LEVEL DESIGN. THE THIRD LEVEL MARGIN REQUIREMENTS WERE BASED ON FFTF EXPERIENCE AND A MEASURE OF

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105632 *CONTINUED*
ENGINEERING JUDGEMENT, REPRESENTING AN ENERGY RELEASE OF APPROXIMATELY 300 MWSEC. AT THE TIME OF THEIR SELECTION, THE CRBRP HCDA ANALYSES WERE IN A VERY PRELIMINARY STAGE AND WERE NOT UTILIZED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *DESIGN CRITERIA + RELEASE RATE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *ACCIDENT, CORE DISRUPTIVE

18-105633 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.8 - NOZZLES BEING THE REACTOR COOLANT BOUNDARY
PROJECT MANAGEMENT CORP.
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE JUSTIFICATION FOR IDENTIFYING THE NOZZLES CONNECTING THE SYSTEM TO THE PRIMARY HEAT TRANSPORT SYSTEM AS BEING THE REACTOR COOLANT BOUNDARY FOR THOSE SYSTEMS WHOSE FAILURE COULD NOT RESULT IN THE FUEL DESIGN LIMITS IS AS FOLLOWS: THE ONLY SYSTEMS WHICH FALL INTO THIS CATEGORY ARE THE ARGON COVER GAS PRESSURIZATION AND EQUALIZATION SYSTEMS AND THE PRIMARY SODIUM MAKEUP AND OVERFLOW SYSTEMS. THESE LOW PRESSURE SYSTEMS ARE CONNECTED TO THE PRIMARY COOLING SYSTEM AND ARE LOCATED IN INERTED INNER CELLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT INTEGRITY + *NOZZLE + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

18-105634 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.11 - NOZZLES THAT ARE INTERMEDIATE COOLING BOUNDARY
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.11-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE JUSTIFICATION FOR IDENTIFYING THE NOZZLES CONNECTING THE SYSTEM TO THE INTERMEDIATE HEAT TRANSPORT SYSTEM AS BEING THE INTERMEDIATE COOLANT BOUNDARY FOR THOSE SYSTEMS WHOSE FAILURE COULD NOT IMPAIR THE CAPABILITY OF THE INTERMEDIATE COOLANT SYSTEM TO PERFORM ITS SAFETY FUNCTION IS AS FOLLOWS: THE ONLY SYSTEM WHICH FALL INTO THIS CATEGORY ARE THE COVER GAS PRESSURIZATION AND EQUALIZATION SYSTEM AND THE SODIUM FILL AND DRAIN SYSTEM. FAILURE OF THESE LOW PRESSURE SYSTEMS WOULD ONLY RESULT IN MINOR CONSEQUENCES SUCH AS LOSS OF COVER GAS AND MINOR SODIUM SPILLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CONTAINMENT INTEGRITY + *NOZZLE + RESPONSE TO NRC QUESTION + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

18-105635 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.12 - FUEL DESIGN LIMITS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.12-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FUEL DESIGN LIMITS MEANS THOSE LIMITS SUCH AS TEMPERATURE, BURNUP, FLUENCE, AND CLADDING STRAIN WHICH ARE SPECIFIED BY THE DESIGNER FOR NORMAL OPERATION AND OFF-NORMAL CONDITIONS.

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*DESIGN CRITERIA + CLADDING + FUEL BURNUP + STRESS + RESPONSE TO NRC QUESTION + TEMPERATURE + CLINCH RIVER (LMFBR) + *FUEL ELEMENTS

18-105636 DATED 1975
RESPONSE TO QUESTION 1.13 - DEFINITION OF PLANT CONDITIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TEXT OF THIS SECTION GIVES CLEAR DEFINITIONS OF FOUR PLANT CONDITIONS: NORMAL OPERATION, ANTICIPATED FAULTS, UNLIKELY FAULTS, AND EXTREMELY UNLIKELY FAULTS, WHICH ARE CONSISTENTLY USED THROUGHOUT THIS PSAR.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ACCIDENT + DESIGN CRITERIA + *OPERATION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105637 DATED 1975
RESPONSE TO QUESTION 1.17 - APPLICATION OF CRITERION 52
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.17-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
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18-105637 *CONTINUED*
CRITERION 52 APPLIES TO THE CONTAINMENT ONLY. LEAKAGE RATE TESTING REQUIREMENT WILL BE IMPOSED, AS APPROPRIATE, ONLY TO THOSE STRUCTURES FOR WHICH A LEAKAGE RATE LIMIT IS SPECIFIED AND IS RELIED UPON FOR MITIGATING RADIOLOGICAL CONSEQUENCES OF SEVERE ACCIDENTS TO WITHIN 10 CFR 100 GUIDELINE EXPOSURES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT + *NRC DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *LEAK RATE + CLINCH RIVER (LMFBR)

18-105638 DATED 1975
RESPONSE TO QUESTION 1.18 - IHTS MAIN LINES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q001.18-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SYSTEM BOUNDARY OF THE IHTS MAIN LINES IS CLASSIFIED AS ASME-III CODE CLASS 2. IT WILL BE PROTECTED AGAINST ACCIDENTS, EXTREME ENVIRONMENTAL CONDITIONS AND NATURAL PHENOMENA BY A SEISMIC CATEGORY 1 STRUCTURE.

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CODES AND STANDARDS + *DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

18-105639 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.21 (3A.1.2) - RAPS SURGE AND DELAY TANK CELL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q001.21-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY INNER CELL SPECIFICALLY DESIGNED TO ACT AS A CONTAINMENT BARRIER AGAINST THE ACCIDENTAL RELEASE OF RADIOACTIVITY IS THE RAPS SURGE AND DELAY TANK CELL LOCATED IN THE REACTOR SERVICE BUILDING. NO CREDIT FOR RETENTION, HOLDUP, PLATE-OUT, OR SETTLING OF ACCIDENTALLY RELEASED RADIOACTIVE MATERIAL IS TAKEN FOR ANY OTHER INNER CELL IN THE REFERENCE DESIGN EVALUATIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*CONTAINMENT INTEGRITY + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + COMPARTMENT + CLINCH RIVER (LMFBR)

18-105640 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.25 - PERIODIC TESTING OF CELLS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q001.25-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INNER CELLS SYSTEM IS NOT AN ENGINEERED SAFETY FEATURE, AND NO CREDIT IS TAKEN FOR CELL LEAKTIGHTNESS IN THE SAFETY ANALYSIS FOR ANY ACCIDENT CONDITION, THUS PERIODIC TESTING OF THE CELLS IS NOT A SAFETY REQUIREMENT. FOR INERTED CELLS, THE ATMOSPHERE CONTROL SYSTEM WILL ENSURE DETECTION OF ANY EXCESSIVE LEAKAGE DURING PLANT OPERATION WHETHER LEAKAGE IS CELL-TO-CELL OR CELL-TO-UPPER-CONTAINMENT. THE INERTED CELLS ARE DESIGNED TO OPERATE AT SLIGHTLY NEGATIVE PRESSURE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *TEST, LEAK RATE + CONTAINMENT INTEGRITY + RESPONSE TO NRC QUESTION + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-105641 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.26 - IDENTIFICATION OF CELL MATERIALS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q001.26-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LOWER PORTIONS OF THE CELL INCLUDING FLOORS AND LOWER AREAS OF CELL WALLS WHERE SODIUM SPILL IS A POSTULATED DBA, ARE PROVIDED WITH CARBON STEEL LINERS. INERTED CELLS ARE ALSO PROVIDED WITH CARBON STEEL LINERS. IN SODIUM AREAS WHERE CELLS ARE NOT LINED, CARBON STEEL CATCH PANS ARE PROVIDED TO CONTAIN THE POSTULATED SODIUM SPILL. GRATED FLOORS WILL BE PROVIDED ABOVE ALL CATCH PAN AREAS FOR ACCESSIBILITY. EXPOSED CONCRETE WITHIN UNLINED SODIUM AREAS WILL BE SUBJECT TO LOCALIZED SPILL OR SPRAY EFFECTS FROM HOT SODIUM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT INTEGRITY + *STEEL LINER + RESPONSE TO NRC QUESTION + LEAK + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-105642 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.60 - ACCESS TO INDIVIDUAL CELLS
PROJECT MANAGEMENT CORP

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18-105642 *CONTINUED*
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.60-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

EACH OF THE THREE PHTS CELLS AND THE REACTOR CAVITY HAS ITS OWN RECIRCULATING GAS COOLING SYSTEM. THE PHTS CELLS AND THE REACTOR CAVITY ARE SEPARATED FROM EACH OTHER BY CONCRETE WALLS AND THE PIPING PENETRATIONS. THIS ARRANGEMENT PROVIDES THE CAPABILITY TO INDIVIDUALLY INERT OR DEINERT A PHTS CELL OR THE REACTOR CAVITY. EACH LOOP CAN BE ISOLED AND VENTED.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + CONTAINMENT ATMOSPHERE + *SYSTEM CAPABILITY + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-105643 DATED 1975
RESPONSE TO QUESTION 1.62 - BALANCE OF FLOW BETWEEN EVAPORATORS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.62-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE LOOP PIPING WITHIN THE STEAM GENERATOR CELLS IS IDENTICAL (MIRROR IMAGE) FOR THE TWO EVAPORATORS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*FLOW DISTRIBUTION + RESPONSE TO NRC QUESTION + *STEAM GENERATOR + COOLING SYSTEM. SECONDARY + CLINCH RIVER (LMFBR)

18-105644 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.66 - ADHERENCE TO CODES AND STANDARDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.66-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

WHERE GENERALLY RECOGNIZED CODES AND STANDARDS DO NOT COVER CONDITIONS THAT WILL BE IMPOSED ON THE EQUIPMENT. THEY WILL BE SUPPLEMENTED AS NEEDED. EXAMPLES ARE THE EFFECTS OF SODIUM AND COVER GAS ON THE STRUCTURAL PROPERTIES OF THE MATERIALS USED. AND SPECIAL REQUIREMENTS FOR PROTECTION OF THE EQUIPMENT FROM CONTAMINATION DURING FABRICATION. SHIPMENT. AND STORAGE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*CODES AND STANDARDS + DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *EQUIPMENT + CLINCH RIVER (LMFBR)

18-105645 DATED 1975
RESPONSE TO QUESTION 1.68 - COMPARISON OF DESIGN AND EXPECTED CONDITIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.68-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

CONDITIONS IMPOSED ON THE EQUIPMENT IN ACTUAL OPERATION WILL BE LESS SEVERE THAN THE DESIGN CONDITIONS WHICH WILL BE USED IN THE THERMAL AND STRUCTURAL ANALYSES. THESE DESIGNS WILL BE SHOWN TO SATISFY SELECTED CRITERIA FOR THE RESPECTIVE CONDITIONS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*DESIGN CRITERIA + *OPERATION + RESPONSE TO NRC QUESTION + EQUIPMENT + *COMPARISON + CLINCH RIVER (LMFBR)

18-105646 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.145 - DUTY CYCLE EVENTS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.145-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

DUTY CYCLE EVENTS RESULTING IN SIMILAR TRANSIENTS ON A PARTICULAR COMPONENT WERE GROUPED TOGETHER WITH THE MOST SEVERE TRANSIENT IN EACH GROUP SELECTED AS THE UMBRELLA TRANSIENT FOR THAT GROUP. THE FREQUENCY SPECIFIED FOR EACH TRANSIENT IS THE SUM OF ALL DUTY CYCLE EVENTS ASSIGNED TO THAT GROUP. SINCE INDIVIDUAL DUTY CYCLE EVENTS HAVE DIFFERENT EFFECTS ON DIFFERENT COMPONENTS. THE GROUPING OF DUTY CYCLE EVENTS RESULTS IN DIFFERING UMBRELLA TRANSIENTS AND FREQUENCIES FOR EACH COMPONENT.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + *EQUIPMENT + *FREQUENCY ANALYSIS + *TRANSIENT + CLINCH RIVER (LMFBR)

18-105647 DATED 1975
RESPONSE TO QUESTION 1.72 - REACTOR VESSEL SUPPORT LEDGE

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18-105647 *CONTINUED*
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.72-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE REACTOR VESSEL SUPPORT LEDGE IS PRIMARILY A SHORT SPAN STIFF CANTILEVER. BECAUSE OF LOW SPAN/DEPTH RATIO (LESS THAN UNITY). THE BRACKET HAS BEEN CHECKED IN ACCORDANCE WITH PROVISIONS OF PARAGRAPH 11.14 OF ACI-318. SOME FLEXURAL LOADS WILL BE INDUCED IN THE LEDGE BECAUSE OF RING ACTION. IN ADDITION TO SHEAR REINFORCEMENT. ADEQUATE FLEXURAL REINFORCEMENT WILL BE PROVIDED TO WITHSTAND RING MOMENTS.

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DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *SUPPORT STRUCTURE + STRUCTURAL INTEGRITY + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

18-105648 DATED 1975
RESPONSE TO QUESTION 1.74 - GUARD VESSEL INSPECTION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.74-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THERE IS NO PLANNED PERIODIC TESTING OF THE GUARD VESSEL. HOWEVER. THE INNER SURFACE OF THE GUARD VESSEL IS ACCESSIBLE FOR IN-SERVICE INSPECTION BY THE SAME TELEVISION CAMERA EQUIPMENT THAT IS USED FOR IN-SERVICE INSPECTION OF THE EXTERNAL SURFACE OF THE REACTOR VESSEL. THE GUARD VESSEL WILL BE INSPECTED PERIODICALLY AT INTERVALS TO BE DETERMINED AS THE DESIGN PROGRESSES.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CONTAINMENT + RESPONSE TO NRC QUESTION + TEST INTERVAL + CLINCH RIVER (LMFBR) + *INSERVICE INSPECTION

18-105649 DATED 1975
RESPONSE TO QUESTION 1.76 - RADIAL GAP BETWEEN GUARD VESSEL AND REACTOR VESSEL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.76-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE MAXIMUM AND MINIMUM WIDTHS OF THE RADIAL GAP BETWEEN THE GUARD VESSEL AND THE REACTOR VESSEL HAVE BEEN CONSERVATIVELY CALCULATED. TAKING INTO ACCOUNT ALL RELEVANT FACTORS SUCH AS TOLERANCES ON THE DIAMETERS OF THE TWO VESSELS. PERMISSIBLE OUT-OF-ROUNDNESS OF THE TWO VESSELS. POSSIBLE DEVIATIONS FROM STRAIGHTNESS DUE TO MANUFACTURE AND SUBSEQUENT OPERATION. THERMAL EXPANSION. INITIAL DEVIATIONS IN THE ALIGNMENT OF THE TWO VESSELS. ETC. THE TRANSPORTER FOR THE TELEVISION CAMERA WILL BE DESIGNED TO ACCOMMODATE ITSELF TO THIS MAXIMUM POSSIBLE RANGE OF GAPS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CONTAINMENT + RESPONSE TO NRC QUESTION + *EQUIPMENT + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + PRESSURE VESSELS + *INSERVICE INSPECTION

18-105650 DATED 1975
RESPONSE TO QUESTION 1.80 - USE OF FFTF EXPERIENCE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.80-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

A LARGE NUMBER OF APPLICABLE TECHNICAL DECISIONS. PROCEDURES AND PROCESSES WERE DEVELOPED AND DOCUMENTED WITHIN THE FFTF PROJECT. COGNIZANT CRBR ENGINEERING PERSONNEL ARE ENCOURAGED TO CONTACT THEIR FFTF COUNTERPARTS WHO PROVIDE THEM WITH THE WRITTEN INFORMATION. MANY FIRST-LEVEL AND UPPER LEVEL CRBR MANAGERS. COGNIZANT ENGINEERS. AND KEY TECHNICAL PEOPLE HAVE HAD DIRECTLY APPLICABLE FFTF EXPERIENCE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

PROCEDURES AND MANUALS + FFTF (TR) + RESPONSE TO NRC QUESTION + *OPERATING EXPERIENCE + COMPARISON + CLINCH RIVER (LMFBR)

18-105651 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.83 - FAILURE DETECTION OF OMEGA SEAL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.83-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE DESIGN OF THE REACTOR VESSEL. CLOSURE HEAD. AND SUPPORT SYSTEM HAS BEEN REVISED TO ELIMINATE THE OMEGA SEAL.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*MODIFICATION + *SEAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + LEAK + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105652 DATED 1975
RESPONSE TO QUESTION 1.85 - QUALITY CONTROL DURING SHIPPING AND STORAGE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.85-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE SPECIFICATIONS WILL REQUIRE THAT PACKAGING AND PACKING BE ADEQUATE TO PROTECT ITEMS WHILE AT THE SUPPLIERS FACILITIES. DURING TRANSPORTATION TO THE DELIVERY POINT AND DURING FOUR MONTHS OUTSIDE STORAGE AT THE SITE. THE APPLICABLE REQUIREMENTS WILL BE IN THE RESPECTIVE EQUIPMENT SPECIFICATIONS RATHER THAN IN RDT STANDARDS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*TRANSPORTATION AND HANDLING + RESPONSE TO NRC QUESTION + *EQUIPMENT + QUALITY ASSURANCE + CLINCH RIVER (LMFBR)

18-105653 DATED 1975
RESPONSE TO QUESTION 1.89 - COMPARISON OF NATURAL FREQUENCIES WITH PUMP FREQUENCIES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.89-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE FREQUENCIES OF VIBRATIONS GENERATED BY THE PUMPS. BOTH PRIMARY AND INTERMEDIATE ARE GIVEN. THE LOWEST NATURAL FREQUENCY MODE OF THE IHX TUBES OCCURS AT ABOUT 63 HZ. THE CALCULATION OF THE IHX TUBE FREQUENCY IS FOR A SINGLE FULL LENGTH ACTIVE TUBE. IN 995 F SODIUM. CONSTRAINED BY THE TUBE SUPPORTS PROVIDED BETWEEN THE TUBE SHEETS. WATER TESTS OF A FULL SCALE. 30 DEGREE SEGMENT IHX MODEL ARE PLANNED TO VERIFY THE ANALYSIS. THE ESTIMATED FUEL ASSEMBLY AND FUEL ROD BUNDLE FIRST MODE NATURAL FREQUENCY IS IN THE RANGE OF 50 HERTZ.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*FREQUENCY SPECTRA + RESPONSE TO NRC QUESTION + TUBING + *COMPARISON + CLINCH RIVER (LMFBR) + PUMPS + HEAT EXCHANGERS + FUEL ELEMENTS

18-105654 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 1.123 - REQUIREMENTS FOR INTERMEDIATE HEAT TRANSPORT SYSTEM PUMP
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.123-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE IHTS COOLANT PUMPS ARE REQUIRED TO REMAIN OPERABLE ONLY AT PONY MOTOR SPEED FOLLOWING ALL SYSTEM RELATED EMERGENCY CONDITIONS AND THE FAULTED CONDITIONS. THE DECAY HEAT REMOVAL FUNCTION CAN BE ACCOMPLISHED WITH AS FEW AS ONE OF THE THREE IHTS LOOPS OPERATING.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + *COOLING SYSTEM. SECONDARY + CLINCH RIVER (LMFBR) + *PUMPS

18-105655 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 1.129 - MAINTAINING CIRCULATION WITH NATURAL CONVECTION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.129-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE PLANT TRANSIENT COMPUTER PROGRAM DEMO IS USED TO CALCULATE THE NATURAL CIRCULATION FLOW RATES. THE IHX MODEL PROGRAM IS HIGHLY NODALIZED (45 NODES IN THE DIRECTION OF FLOW PATH ON EACH SIDE). HEAT TRANSFER IS INDIVIDUALLY CALCULATED AT EACH NODE. AS A RESULT. SHIFTS IN THERMAL CENTER ELEVATION ARE INHERENTLY CALCULATED BY THIS MODEL. CONSEQUENTLY. THE TRANSIENT RESULTS PRESENTED INCLUDE CHANGES IN COOLANT CIRCULATION DUE TO THE SHIFT OF THE THERMAL CENTER.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CIRCULATION. NATURAL + ANALYTICAL MODEL + *HEAT TRANSFER. NATURAL CONVECTION + *FLOW DISTRIBUTION + RESPONSE TO NRC QUESTION + FLOW + CLINCH RIVER (LMFBR)

18-105656 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.71 - ACCESS FOR REFUELING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.71-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

NO STRUCTURAL COMPONENTS OF THE REACTOR ENCLOSURE OR INTERNALS MUST BE MODIFIED OR REMOVED TO ACCOMPLISH REFUELING.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*MODIFICATION + *REFUELING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105657 DATED 1975
RESPONSE TO QUESTION 1.164 - TEMPERATURE AND FLOW TRANSIENT CURVES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.164-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THERE ARE APPROXIMATELY 450 INDIVIDUAL TEMPERATURE AND FLOW TRANSIENT CURVES (EXCLUDING MOST PRESSURE TRANSIENTS) FOR THE IHX. PRIMARY PUMP. INTERMEDIATE PUMP. STEAM GENERATOR MODULE. CHECK VALVE. AND REACTOR VESSEL. THESE CURVES IN THEMSELVES. PROVIDE NO VERIFICATION OF THE STRUCTURAL ADEQUACY OF INDIVIDUAL COMPONENTS. FOR THIS REASON THEY HAVE NOT BEEN SUBMITTED WITH THE PSAR. THEY FURNISH INLET TRANSIENTS. (FOR FLOW. TEMPERATURE AND PRESSURE) TO THE COMPONENT MANUFACTURERS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + EQUIPMENT + *FLOW + *THERMAL TRANSIENT + *TRANSIENT + CLINCH RIVER (LMFBR)

18-105658 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.178 - CONTAINMENT RESPONSE TO SODIUM FIRE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 2 PAGES. PP. Q001.178-1 THRU Q001.178-2 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE CONTAINMENT TEMPERATURES (ATMOSPHERE AND WALL) WILL CONTINUE TO SLOWLY DECREASE AS INDICATED IN FIGURES 6.2-3 AND 6.2-4 OF THE PSAR AND ASYMPTOTICALLY APPROACH AMBIENT CONDITIONS. THE CONTAINMENT PRESSURE WILL ALSO CONTINUE TO DECREASE SLOWLY (LESS THAN 0.5 PSIG PER DAY) AND MAY DECREASE TO SUBATMOSPHERIC PRESSURE BECAUSE OF THE OXYGEN DEPLETION WHICH OCCURS DURING SODIUM COMBUSTION. PROVISIONS TO INCLUDE VACUUM RELIEF CAPABILITY FOR THE CONTAINMENT HAVE BEEN MADE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CONTAINMENT + *FIRE + *RESPONSE TIME + *CONTAINMENT STRUCTURE + PRESSURE. INTERNAL + RESPONSE TO NRC QUESTION + TEMPERATURE + *TRANSIENT + CLINCH RIVER (LMFBR)

18-105659 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.180 - NON-SEISMIC CATEGORY 1 STRUCTURE WITHIN CONTAINMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.180-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

ALL INTERIOR STRUCTURES WITHIN CONTAINMENT SUCH AS WALLS. SLABS. STEEL FRAMING AND SUPPORT FRAMES OVER THE EI&C CUBICLES ABOVE THE OPERATING FLOOR WILL BE DESIGNED AS SEISMIC CATEGORY I STRUCTURES. THEREFORE. NO FAILURE OF STRUCTURES WITHIN THE CONTAINMENT WILL RESULT FROM A SSE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

ACCIDENT ANALYSIS + CONTAINMENT + RESPONSE TO NRC QUESTION + *SEISMIC DESIGN + *STRUCTURE + CLINCH RIVER (LMFBR)

18-105660 DATED 1975
RESPONSE TO QUESTION 1.192 - DESIGN OF OVERHEAD HANDLING SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.192-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

ALL THE PRINCIPAL OVERHEAD HANDLING SYSTEMS FOR SERVICING SAFETY-RELATED EQUIPMENT ARE DESIGNATED AS SEISMIC CATEGORY I CRANES. ALL THE STRUCTURAL. AUTOMATIC AND MANUAL MECHANICAL AND ELECTRICAL COMPONENTS OF THE CATEGORY I CRANES WILL BE DESIGNED SO THAT NO SINGLE FAILURE OR MALFUNCTION WILL RESULT IN DROPPING OR LOSING CONTROL OF THE HEAVIEST LOADS TO BE HANDLED.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CONTROL SYSTEM + DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *SEISMIC DESIGN + *CRANE + CLINCH RIVER (LMFBR)

18-105661 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.229 - PHTS CELL CAPACITY TO WITHSTAND 24 PSIG
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q001.229-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PRELIMINARY CALCULATIONS HAVE BEEN DEVELOPED TO ESTABLISH PHTS CELL CAPACITY TO WITHSTAND 24 PSIG. THE WALLS AND SLABS ARE ASSUMED AS PLATES SUPPORTED AND RESTRAINED AT ALL EDGES. A LINEAR TEMPERATURE GRADIENT OF 25C F WAS ASSUMED TO ESTABLISH THERMAL MOMENTS. THIS APPROACH IS CONSIDERED CONSERVATIVE SINCE SIGNIFICANT TIME WILL BE NECESSARY TO REACH A STEADY STATE GRADIENT AND THE PEAK PRESSURE MAY NOT BE APPLICABLE DURING THE STEADY STATE CONDITION. DURING TRANSIENT STATE. THE THERMAL STRESSES WILL BE LIMITED TO A FEW INCHES OF DEPTH ON THE BACK SIDE OF THE LINER.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105661 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*DESIGN CRITERIA + ANALYTICAL MODEL + *PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-105662 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.231 - CELL LEAK RATE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q001.231-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE CALCULATION OF BOTH THE PRIMARY HEAT TRANSPORT SYSTEM AND REACTOR CAVITY CELL PRESSURE TRANSIENTS, THE CELLS WERE ASSUMED LEAK TIGHT; I.E., NO ESCAPE OF CELL ATMOSPHERE OR COMBUSTION PRODUCE HEAT AS A RESULT OF LEAKAGE. THIS ASSUMPTION IS CONSERVATIVE AND MAXIMIZES THE PRESSURE TRANSIENTS IN THE CELLS. FOR RADIOLOGICAL CONSIDERATIONS, THE CELLS WERE ASSUMED TO HAVE AN INFINITE LEAK RATE; I.E., ALL SODIUM AEROSOL WAS RELEASED INSTANTLY FROM THE CELLS TO THE UPPER RCB VOLUME.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *LEAK RATE + *COMPARTMENT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-105663 DATED 1975
RESPONSE TO QUESTION 11.2 - RADWASTE SYSTEM QUALITY GROUP CLASSIFICATION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q0011.2-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

COMPONENTS AND PIPING OF THE LIQUID AND SOLID RADWASTE SYSTEMS OF THE CRBRP WILL BE DESIGNED TO QUALITY GROUP D (AUGMENTED) CLASSIFICATION AS DESCRIBED IN SECTIONS I.B.1 AND I.B.2 OF BRANCH TECHNICAL POSITION - ETSB NO. 11-1, "DESIGN GUIDANCE FOR RADIOACTIVE WASTE MANAGEMENT SYSTEMS INSTALLED IN LIGHT-WATER COOLED NUCLEAR POWER REACTOR PLANTS".

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + WASTE TREATMENT + *WASTE TREATMENT, EQUIPMENT + RESPONSE TO NRC QUESTION + *QUALITY ASSURANCE + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

18-105664 DATED 1975
RESPONSE TO QUESTION 11.3 - INDOOR TANKS CONTAINING RADIOACTIVE MATERIAL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 3 PAGES, PP. Q011.3-1 THRU Q011.3-3 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A TABLE LISTING INDOOR TANKS, EXCEPT THOSE TANKS LOCATED IN THE REACTOR CONTAINMENT, WHICH CONTAIN POTENTIALLY RADIOACTIVE MATERIALS. FOR EACH TANK, INDICATES THE PROVISIONS INCORPORATED TO MONITOR TANK LIQUID LEVELS, TO ANNUNCIATE POTENTIAL OVERFLOW CONDITIONS, AND TO COLLECT AND PROCESS LIQUIDS IN THE EVENT OF AN OVERFLOW.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*WASTE STORAGE + BUILDING + *STORAGE CONTAINER + RADIOISOTOPE + RESPONSE TO NRC QUESTION + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR)

18-105665 DATED 1975
RESPONSE TO QUESTION 11.8 - STORAGE CAPACITY FOR SOLID WASTES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q011.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SHIELDED DRUM STORAGE VAULTS HAVE A COMBINED CAPACITY OF 200 DRUMS (55 GALLONS EACH). EXPECTED ON-SITE STORAGE PERIOD FOR SOLID RADWASTE DRUMS IS 6 MONTHS. ESTIMATED DECREASE IN ACTIVITY DURING THIS 6 MONTH STORAGE PERIOD IS APPROXIMATELY 75%.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*WASTE STORAGE + WASTE TREATMENT + WASTE TREATMENT, SOLID + RESPONSE TO NRC QUESTION + *SYSTEM CAPACITY + CLINCH RIVER (LMFBR)

18-105666 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 20.1 - PROTECTION OF SAFETY RELATED EQUIPMENT FROM FLOODING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE, PAGE Q020.1-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105666 *CONTINUED*
THE SAFETY-RELATED EQUIPMENT, LOCATED IN ALL AREAS BELOW GRADE, WILL BE PROTECTED AGAINST HIGH GROUNDWATER LEVEL OR MAXIMUM FLOOD. BY DESIGN CONSIDERATION, THERE WILL BE NO EXTERIOR ACCESSES OR ENTRANCES BELOW THE PLANT GRADE AT EL.815, TO ALL SEISMIC CATEGORY I STRUCTURES, THEREBY COMPLETELY ELIMINATING THE POTENTIAL INGRESS OF GROUNDWATER OR FLOOD WATER. THERE ARE NO EXTERIOR PENETRATIONS INTO REACTER CONTAINMENT STRUCTURE BELOW GRADE LEVEL.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + RESPONSE TO NRC QUESTION + *ENGINEERED SAFETY FEATURE + WEATHER, SEVERE + *FLOOD + CLINCH RIVER (LMFBR)

18-105667 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 20.2 - PROTECTION OF SAFETY RELATED EQUIPMENT LOCATED OUTDOORS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.2-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY SAFETY-RELATED COMPONENTS THAT WILL BE LOCATED OUTDOORS ARE: DIESEL FUEL OIL STORAGE TANKS, CATEGORY I ELECTRIC MANHOLES AND THE EMERGENCY COOLING TOWER BASIN. THE PROTECTION PROVIDED FOR POTENTIAL DAMAGE AGAINST TORNADO GENERATED MISSILES IS DESCRIBED. ALL VENTILATION SYSTEM AIR INTAKES AND EXHAUSTS WHICH ARE SAFETY RELATED, INCLUDING THOSE FOR EMERGENCY DIESEL GENERATOR UNITS, WILL BE PROTECTED AGAINST THE TORNADO-GENERATED MISSILES BY REINFORCED CONCRETE ENCLOSURES OR HEAVY METAL GRILLS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*MISSILE GENERATION AND PROTECTION + VENTILATION SYSTEM + RESPONSE TO NRC QUESTION + *DESTRUCTIVE WIND + ENGINEERED SAFETY FEATURE + CLINCH RIVER (LMFBR)

18-105668 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 20.5 - PRELIMINARY LAYOUT DRAWING OF SAFETY RELATED AREAS OUTSIDE CONTAINMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.5-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DRAWINGS ARE NOT YET AVAILABLE BECAUSE SYSTEM ROUTING DESIGN IS NOT COMPLETE. HOWEVER, THE EFFECTS OF PIPE RUPTURE ARE BEING CONSIDERED IN THE DESIGN PROCESS USING SEPARATION OF RUPTURE SOURCES AND SAFETY RELATED EQUIPMENT AS THE PRINCIPAL MEANS OF PROTECTION FROM PIPING RUPTURE. THE ATTACHED TABLE LISTS BY BUILDING ALL SAFETY RELATED EQUIPMENT AND THE PIPING SYSTEMS WHICH THREATEN THEIR FUNCTION IN THE EVENT OF POSTULATED PIPING FAILURES DURING NORMAL PLANT OPERATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ACCIDENT + HYDRAULIC EFFECT + RESPONSE TO NRC QUESTION + DAMAGE + *ENGINEERED SAFETY FEATURE + DATA COLLECTION + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

18-105669 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 20.6 - PROTECTION OF SAFETY RELATED SYSTEMS FROM FREEZING
PROJECT MANAGEMENT CORP.
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY COMPONENT NOT HOUSED WITHIN TEMPERATURE CONTROLLED AREAS AND ESSENTIAL IN ATTAINING AND MAINTAINING A SAFE REACTOR SHUTDOWN ARE THE EMERGENCY COOLING TOWERS. PIPING TO THE EMERGENCY COOLING TOWERS WILL BE ROUTED UNDERGOUND BELOW THE FROST LEVEL TO PREVENT FREEZING. THE PIPING AT THE EMERGENCY COOLING TOWER IS DRAINED BY A 3/4 INCH PERMANENT BLEED LINE TO THE BASIN TO PREVENT FREEZING OF THE PIPES WHEN THE EMERGENCY COOLING TOWER IS NOT OPERATING.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

THERMAL INSULATION + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + ENGINEERED SAFETY FEATURE + *WEATHER, SEVERE + CLINCH RIVER (LMFBR)

18-105670 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 20.17 - AUXILIARY COOLANT FLUID SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q020.17-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SAFETY RELATED PORTION OF THE ACFS PROVIDES HEAT REMOVAL SERVICE TO THE EX-VESSEL STORAGE TANK COMPONENT CELLS, TO THE FUEL HANDLING CELL AND TO THE OVERFLOW HEAT REMOVAL SYSTEM COMPONENT CELLS VIA THE RECIRCULATING GAS COOLING SYSTEM. THE ACFS IN CONJUNCTION WITH THE RGCS AND AUXILIARY LIQUID METAL SYSTEM IS DESIGNED TO PREVENT FUEL DAMAGE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *EMERGENCY COOLING + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105671 ALSO IN CATEGORIES 5 AND 12 DATED 1975
RESPONSE TO QUESTION 20.19 - DECAY HEAT REMOVAL SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q020.19-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE STEAM GENERATOR AUXILIARY HEAT REMOVAL SYSTEM PROVIDES PRIMARY HEAT REMOVAL FOR THE REACTOR DECAY HEAT. THE OVERFLOW HEAT REMOVAL SYSTEM PROVIDES BACKUP FOR THE SGAHRS AS A SECONDARY MEANS FOR THE REACTOR DECAY HEAT REMOVAL. THE 100% REDUNDANT EX-VESSEL STORAGE TANK COOLING SYSTEM (EVS) PROVIDES SPENT FUEL DECAY HEAT REMOVAL SERVICE. ALL THREE SYSTEMS USE THE ATMOSPHERE AS AN ULTIMATE HEAT SINK. THE EMERGENCY PLANT SERVICE WATER SYSTEM WITH THE EMERGENCY COOLING TOWERS PROVIDES AUXILIARY HEAT REMOVAL TO SUPPORT THE OPERATION OF THE ABOVE SYSTEMS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DECAY HEAT + FUEL STORAGE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + COOLING + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

18-105672 DATED 1975
RESPONSE TO QUESTION 20.24 - WATER IN TURBINE BUILDING FROM FEEDWATER FAILURE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q020.24-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE MAXIMUM AMOUNT OF FEEDWATER VOLUME THAT CAN DRAIN INTO THE TURBINE GENERATOR BUILDING (TGB) IN CASE OF A BREAK IN THE FEEDWATER AND CONDENSATE PIPING IS -205 CU. FT. IF THIS WATER SPREADS OVER THE GROUND FLOOR IT WOULD RESULT IN A -0.1 IN. WATER LAYER SPREADING UNIFORMLY OVER THE FLOOR. ASSUMING NO PROVISIONS FOR DRAIN WATER DISPOSAL. HOWEVER. THERE ARE SEVERAL FLOOR DRAIN FITTINGS PROVIDED IN THE GROUND FLOOR OF THE TGB WHICH ARE PIPED TO FLOOR SUMPS. THE CAPACITY OF EACH SUMP IS -54 CU. FT.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*ACCIDENT + BUILDING + RESPONSE TO NRC QUESTION + TURBINE + *FLOOD + CLINCH RIVER (LMFBR) + *FEEDWATER + PIPES AND PIPE FITTINGS

18-105673 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 110.4 - STRAIN FOR PIPE WHIP RESTRAINTS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q110.4-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

FOR METALLIC DUCTILE MATERIALS. THE PERMANENT STRAIN FOR PIPE WHIP RESTRAINTS WILL BE LIMITED TO 50% OF THE ULTIMATE UNIFORM STRAIN OF THE MATERIALS OF THE RESTRAINTS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DESIGN CRITERIA + *SHOCK ABSORBER + *STRESS STRAIN DATA + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-105674 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 110.13 - PREOPERATIONAL VIBRATIONAL AND DYNAMIC EFFECTS TESTING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q110.23-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE PREOPERATIONAL VIBRATIONAL AND DYNAMIC EFFECTS TESTING PROGRAM THAT IS TO BE CONDUCTED DURING STARTUP FUNCTIONAL TESTING FOR SAFETY-RELATED PIPING CLASSIFIED AS CODE CLASS 1. 2 AND 3 AND FOR PIPING AND COMPONENT SUPPORTS WILL BE DESCRIBED FULLY IN THE FSAR. THE PURPOSE OF THESE TESTS WILL BE TO CONFIRM THAT THE PIPING. COMPONENTS. AND SUPPORTS HAVE BEEN DESIGNED TO WITHSTAND THE DYNAMIC LOADINGS FROM OPERATIONAL TRANSIENT CONDITIONS THAT WILL BE ENCOUNTERED DURING SERVICE. AS REQUIRED BY THE ASME CODE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

HYDRAULIC EFFECT + *TEST. PREOPERATIONAL + RESPONSE TO NRC QUESTION + *VIBRATION + *STABILITY + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-105675 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 110.14 - SEISMIC QUALIFICATION PROGRAM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q110.14-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE SEISMIC QUALIFICATION PROGRAM WHICH WILL BE EMPLOYED TO QUALIFY ALL SAFETY-RELATED EQUIPMENT WILL BE DESCRIBED FULLY IN THE FSAR. THE PURPOSE OF THIS PROGRAM WILL BE TO CONFIRM THE ABILITY OF ALL SEISMIC CATEGORY I MECHANICAL EQUIPMENT TO FUNCTION AS NEEDED DURING AND AFTER AN EARTHQUAKE OF MAGNITUDE UP TO AND INCLUDING THE SSE.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105675 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*TEST, PROOF + TEST, PREOPERATIONAL + RESPONSE TO NRC QUESTION + EQUIPMENT + ENGINEERED SAFETY FEATURE + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

18-105676 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 110.15 - DYNAMIC SYSTEM ANALYSIS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q110.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DYNAMIC SYSTEM ANALYSIS METHODS AND PROCEDURES (I.E., RESPONSE SPECTRUM AND/OR TIME-HISTROY ANALYSIS METHODS) WHICH WILL BE USED TO DETERMINE THE DYNAMIC RESPONSES OF REACTOR INTERNALS AND THE HEAT TRANSPORT COOLANT LOOPS AND CONNECTING EQUIPMENT UNDER SEISMIC LOADINGS ARE DEFINED IN DETAIL IN SECTION 3.7 OF THE PSAR. THESE ANALYSIS METHODS WITH PROPER APPLICATION WILL ALSO BE USED TO CONFIRM THE STRUCTURAL DESIGN ADEQUACY OF THE REACTOR INTERNALS AND THE HEAT TRANSPORT COOLANT PIPING TO WITHSTAND THE DYNAMIC LOADINGS OF THE MOST SEVERE THIRD LEVEL DESIGN MARGIN LOADINGS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + MAIN COOLING SYSTEM + *STRUCTURAL ANALYSIS, DYNAMIC + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-105677 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 120.3 - ROTATING OR MOVING PARTS OF REACTOR INTERNALS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.3-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES THE WELDING AND SEIZING OF ROTATING OR MOVING PARTS OF THE REACTOR INTERNALS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + WELDING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + CLINCH RIVER (LMFBR)

18-105678 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION 120.6 - IRRADIATION TESTING OF BORON CARBIDE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENTLY COMMITTED B(SUB 4)C TESTS PROVIDING EBR-II RADIATION DATA IN SUPPORT OF CRBRP CONTROL ASSEMBLY DESIGN ARE GIVEN IN TABLE Q120.6-1. THIS TABLE SUMMARIZES EACH TEST USING THE HEDL NAME FOR THE TEST. TYPICAL TEST PARAMETERS FOR PELLET TEMPERATURE, PELLET DIAMETER AND B-10 CAPTURES ARE GIVEN. THE TESTS WILL EXTEND THE RADIATION DATA WELL ABOVE THE TEMPERATURES OF 2200 F AND PELLET SIZES OF 0.46 TO 0.47 INCH DIAMETER ANTICIPATED FOR THE PRIMARY CONTROL ASSEMBLY.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

BORON + IN PILE EXPERIMENT + *IRRADIATION TESTING + RESPONSE TO NRC QUESTION + *POISON, FIXED + CLINCH RIVER (LMFBR) + CONTROL RODS

18-105679 DATED 1975
RESPONSE TO QUESTION 120.7 - USE OF 17-4 PH MATERIAL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.7-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ONLY THE LEADSCREW WILL BE FABRICATED FROM 17-4 PH MATERIAL AND EXPOSED TO ELEVATED TEMPERATURES. THE 17-4 PH MATERIAL BEING UTILIZED IN THE LEADSCREW WILL BE PROCURED AND HEAT-TREATED PER ASME STANDARD SA-564 AS MODIFIED BY RDT STANDARD M7-6. THE LATTER STANDARD PERMITS ONLY TWO HEAT TREAT TEMPERATURES, 1100 F AND 1150 F. IN SERVICE, THE MAXIMUM TEMPERATURE EXPERIENCED BY THE LOWER PORTION OF THE LEADSCREW, WHICH IS FABRICATED FROM 17-4 PH, WILL BE IN THE TEMPERATURE RANGE OF FROM 400 TO 450 F.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*THERMAL MECHANICAL EFFECT + *STEEL, STAINLESS + PROPERTY, PHYSICAL + RESPONSE TO NRC QUESTION + HEAT TREATMENT + CLINCH RIVER (LMFBR)

18-105680 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 120.10 - EFFECT OF THERMAL LINER BY-PASS COOLANT FLOW
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.10-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105660 *CONTINUED*
THE MIXING OF COOLER BY-PASS FLOW AT A TEMPERATURE BETWEEN 800 AND 900 F WITH THE OUTLET PLENUM COOLANT AT 1050 F AT THE TOP OF THE VESSEL LINER HAS BEEN RECOGNIZED AS A POTENTIAL FOR HIGH CYCLE FATIGUE ON THE LINER INNER SURFACE. THE BASELINE DESIGN UTILIZES A WEIR BOX ARRANGEMENT AT THE TOP OF THE LINER WHICH WOULD PROVIDE AN INTERMEDIATE TEMPERATURE MIXING REGION THAT WOULD MITIGATE THE MIXING/FATIGUE PROBLEM BUT NOT IN ITSELF TOTALLY RESOLVE THE PROBLEM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

STRESS + RESPONSE TO NRC QUESTION + *THERMAL SHIELD + *FLOW, MIXING + COOLING + TEMPERATURE + CLINCH RIVER (LMFBR)

18-105661 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 120.11 - SPECIAL WELDING TECHNIQUES FOR REACTOR VESSEL AND CORE SUPPORT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.11-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRIOR TO ANY WELDING, THEORETICAL CENTERLINES WERE ESTABLISHED, USING REFERENCE SURFACES ON THE VESSEL FLANGE AND THE CORE SUPPORT STRUCTURE. DURING WELDING, THE POSITION OF THE CORE SUPPORT STRUCTURE IN RELATIONSHIP TO THE VESSEL WAS MONITORED USING OPTICAL INSTRUMENTS. THE WELD CIRCUMFERENCE WAS DIVIDED INTO FOUR QUADRANTS, EACH OF WHICH WAS DIVIDED FURTHER INTO 12-INCH INCREMENTS. THE FIRST WELD PASS WAS MADE USING FOUR WELDERS WORKING SIMULTANEOUSLY, ONE WELDER PER QUADRANT.

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PROCEDURES AND MANUALS + *WELDING + RESPONSE TO NRC QUESTION + CORE COMPONENTS + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-105662 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 120.15 - CONTROL OF DELTA FERRITE IN WELDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REQUIREMENTS FOR DELTA FERRITE CONTENT ARE GIVEN IN THE ASME CODE, SECTION III, ASME CODE CASE 1592-1, RDT STANDARDS M1-1T AND M1-2T, AND THE REACTOR VESSEL SPECIFICATION. IN ALL CASES, THE DETERMINATION OF DELTA FERRITE CONTENT WILL BE MADE FROM CHEMICAL ANALYSES OF WELDING MATERIALS AS APPLIED TO THE SHAEFFLER DIAGRAM IN THE ASME CODE. THERE IS NO REQUIREMENT THAT DELTA FERRITE DETERMINATIONS BE MADE FROM PRODUCTION WELDS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CODES AND STANDARDS + WELDS + CHEMICAL ANALYSIS + MATERIAL + PROPERTY, PHYSICAL + RESPONSE TO NRC QUESTION + METALLURGY + CLINCH RIVER (LMFBR)

18-105663 DATED 1975
RESPONSE TO QUESTION 120.20 - COUPON SURVEILLANCE PROGRAM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.20-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PURPOSE OF THE COUPON SURVEILLANCE PROGRAM FOR CRBRP IS TO ACQUIRE INFORMATION ON THE EFFECTS OF THE NEUTRON ENVIRONMENT ON THE VARIOUS COMPONENT MATERIAL PROPERTIES SO AS TO ASSESS THE SERVICE LIFETIMES OF COMPONENTS BASED ON THE BEHAVIOR IN THE SPECIFIC SERVICE ENVIRONMENT. COUPON SURVEILLANCE IS A NECESSARY PART OF THE OVERALL PROGRAM OF INSPECTION AND SURVEILLANCE CONDUCTED TO ASSURE SAFE AND RELIABLE PERFORMANCE OF COMPONENTS AND MATERIALS IN SERVICE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

MATERIAL + RESPONSE TO NRC QUESTION + *SURVEILLANCE PROGRAM + *RADIATION EFFECT + METALLURGY + CLINCH RIVER (LMFBR)

18-105664 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 120.22 - AVOIDANCE OF SENSITIZATION
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q120.22-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AT THIS POINT IT IS NOT POSSIBLE TO SPECIFY DETAILED HEAT TREATMENT SCHEDULES. EACH COMPONENT WILL BE EVALUATED INDEPENDENTLY TO DETERMINE WHETHER HEAT TREATMENT IS NECESSARY. IF IT IS REQUIRED, THE HEAT TREATMENT WILL BE OPTIMIZED TO GIVE THE MAXIMUM DEGREE OF STRESS RELIEF TOGETHER WITH THE MINIMUM DEGREE OF SENSITIZATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + *STEEL, STAINLESS + RESPONSE TO NRC QUESTION + *DAMAGE + *HEAT TREATMENT + RATE + COOLING + THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105685 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 130.1 - EFFECTIVE LOADINGS ON STRUCTURE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q130.1-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PROVIDES A DESCRIPTION OF THE METHOD USED TO COMBINE TORNADO MISSILE. WIND AND VACUUM PRESSURE STRUCTURAL EFFECTS.

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*ANALYTICAL MODEL + STRESS ANALYSIS + PRESSURE. INTERNAL + RESPONSE TO NRC QUESTION + DESTRUCTIVE WIND + *STRUCTURAL ANALYSIS. DYNAMIC + STRUCTURE + CLINCH RIVER (LMFBR)

18-105686 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 130.14 - VENTING TO REDUCE TORNADO LOADING
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q130.14-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

IN THE DESIGN OF ALL SEISMIC CATEGORY I STRUCTURES. VENTING IS NOT CONSIDERED. THEREFORE. THE FULL EFFECT OF TORNADO DIFFERENTIAL PRESSURE OF 3 PSI WILL BE TAKEN INTO ACCOUNT IN THE STRUCTURAL DESIGN IN ACCORDANCE WITH REGULATORY GUIDE 1.76.

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CONTAINMENT + DESIGN CRITERIA + STRESS + PRESSURE RELIEF + *PRESSURE DROP + RESPONSE TO NRC QUESTION + DESTRUCTIVE WIND + *STRUCTURE + CLINCH RIVER (LMFBR) + VALVES

18-105687 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 130.16 - MULTIPLE BARRIER MISSILE SHIELDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q130.16-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

MULTIPLE BARRIER MISSILE SHIELDS ARE NOT UTILIZED IN THE DESIGN OF SEISMIC CATEGORY I STRUCTURES. WHENEVER MISSILE BARRIERS ARE REQUIRED FOR PROTECTING SAFETY RELATED EQUIPMENT OR COMPONENTS WHICH ARE VULNERABLE TO DAMAGE. PROTECTIVE MEASURES WILL BE INCLUDED IN THE DESIGN. COMPOSITE SECTIONS. UTILIZED FOR THE ECONOMIC DESIGN OF STRUCTURAL STEEL BEAMS FOR SUPPORTING CONCRETE FLOOR OR ROOF SLABS IN SOME OF THE SEISMIC CATEGORY I BUILDINGS. ARE NOT CONSIDERED IN THE ASSESSMENT OF LOCAL DAMAGE DUE TO EITHER EXTERNAL OR INTERNAL MISSILES.

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DESIGN CRITERIA + MISSILE GENERATION AND PROTECTION + RESPONSE TO NRC QUESTION + STRUCTURE + CLINCH RIVER (LMFBR)

18-105688 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 130.21 - CELL LINER DESIGN
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q130.21-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE LINER DESIGN FOR THE REACTOR CAVITY AND OTHER CELLS CAN BE DIVIDED INTO TWO BROAD CATEGORIES. VIZ (A) LINERS DESIGNED TO WITHSTAND HOT SODIUM SPILLS AND (B) LINERS DESIGNED TO REMAIN GAS-TIGHT IN ORDER TO CONSERVE INERT GAS IN INERTED CELLS. THE FORMER WILL BE DESIGNED TO WITHSTAND HIGH TEMPERATURE SODIUM SPILLS WITHOUT RUPTURE WHEREAS THE LATTER WILL BE REQUIRED TO REMAIN GAS-TIGHT DURING NORMAL PLANT OPERATION TO CONSERVE INERT GAS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DESIGN CRITERIA + *STEEL LINER + RESPONSE TO NRC QUESTION + *COMPARTMENT + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR)

18-105689 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 222.8 - RDT STANDARD TO BE USED
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

FOR THE PLANT PROTECTION SYSTEM. THE C AND E SERIES OF RDT STANDARDS LISTED IN TABLE 7.1-4 WILL BE USED TO FORM THE BASIS FOR PREPARATION OF EQUIPMENT SPECIFICATIONS. IN ORDER TO ENSURE THEIR CORRECT USE IN THE PROCUREMENT OF EQUIPMENT. SPECIFIC SECTIONS OR PARAGRAPHS WILL BE INCLUDED IN THE SPECIFICATIONS. AS APPROPRIATE. FOR OTHER SAFETY RELATED INSTRUMENTATION AND CONTROLS. THE C AND E SERIES OF RDT STANDARDS LISTED IN THIS TABLE WILL BE USED AS REQUIRED TO SUPPLEMENT EXISTING COMMERCIAL AND NUCLEAR CODES ALREADY IN EXISTENCE.

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CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105689 *CONTINUED*
*CODES AND STANDARDS + FABRICATION + *REACTOR PROTECTION SYSTEM + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105690 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 222.10 - COMPLIANCE OF THE PPS AND ESF WITH STANDARDS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 5 PAGES. PP. Q222.10-1 THRU Q222.10-5 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

DISCUSSES HOW THE REQUIREMENTS OF GDCS AND IEEE STANDARD 279-1971 ARE MET ON AN INDIVIDUAL AND SECTION BY SECTION BASIS. ALSO. SHOWS COMPLIANCE WITH THE RECOMMENDATIONS OF APPLICABLE IEEE STANDARDS. REGULATORY GUIDES AND BRANCH POSITIONS AS GIVEN IN APPENDIX 7A OF THE STANDARD REVIEW PLAN.

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*CODES AND STANDARDS + DESIGN CRITERIA + REACTOR PROTECTION SYSTEM + RESPONSE TO NRC QUESTION + SINGLE FAILURE CRITERION + ENGINEERED SAFETY FEATURE + CLINCH RIVER (LMFBR)

18-105691 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 222.13 - PRIMARY SHUTDOWN SYSTEM CAPABILITY
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE SECONDARY SHUTDOWN SYSTEM. ACTING ALONE. CAN TERMINATE ALL ANTICIPATED AND UNLIKELY EVENTS WITHOUT EXCEEDING THE SPECIFIED LIMITS EVEN IF THE MOST REACTIVE CONTROL ROD IN THE SECONDARY SYSTEM CANNOT BE INSERTED. THE OBJECTIVE OF PROVIDING SEPARATE PRIMARY AND SECONDARY SHUTDOWN SYSTEMS IS PROTECTION AGAINST COMMON MODE FAILURE DEGRADATION OF THE REACTOR TRIP FUNCTION. NOT REDUNDANCY.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

REACTOR TRANSIENT + CONTROL + *SHUTDOWN SYSTEM. SECONDARY + RESPONSE TO NRC QUESTION + REACTIVITY. NEGATIVE + REACTOR SHUTDOWN + CLINCH RIVER (LMFBR)

18-105692 ALSO IN CATEGORY 10 DATED 1975
RESPONSE TO QUESTION 222.20 - POWER TRANSMISSION SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.20-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE POWER TRANSMISSION SYSTEM IS DESIGNED AND ARRANGED TO MINIMIZE THE LIKELIHOOD OF A COMMON MODE FAILURE. THE PREFERRED AND THE RESERVE POWER SUPPLIES AS DESCRIBED IN SECTIONS 8.2.1.2 AND 8.2.1.3 ARE INDEPENDENT OF EACH OTHER IN THAT THEY TERMINATE IN DISTINCTLY SEPARATE SWITCHYARDS - THE GENERATING SWITCHYARD AND THE RESERVE SWITCHYARD. ELECTRICAL POWER FROM THE POWER GRID TO THE PLANT SITE IS SUPPLIED BY FOUR PHYSICALLY SEPARATE OFFSITE SOURCES DESIGNED AND LOCATED SO AS TO MINIMIZE THE LIKELIHOOD OF SIMULTANEOUS FAILURE.

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SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *REDUNDANCE + *INDEPENDENCE + *POWER TRANSMISSION + ON SITE + CLINCH RIVER (LMFBR)

18-105693 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 222.22 - VENTILATION IN ELECTRICAL EQUIPMENT ROOM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q222.22-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

ROOM VENTILATION IS NOT REQUIRED FOR INITIAL OPERATION OF CLASS IE CIRCUIT BREAKERS LOCATED IN THE ELECTRICAL EQUIPMENT ROOM. DURING CONTINUED OPERATION UNDER LOAD. THE ELECTRICAL EQUIPMENT ROOM VENTILATION FANS ARE REQUIRED TO OPERATE FOR PROPER FUNCTIONING OF LOCAL INSTRUMENTATION. PROTECTIVE RELAYS. AND CONTROL DEVICES INSTALLED ON THE CIRCUIT BREAKERS. EACH ELECTRICAL EQUIPMENT ROOM IS VENTILATED BY 2-100% CAPACITY HVAC SYSTEMS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*VENTILATION SYSTEM + *ELECTRIC POWER + SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *EQUIPMENT + COMPARTMENT + BREAKER + CLINCH RIVER (LMFBR)

18-105694 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 310.4 - CONTROL ROOM VENTILATION SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 3 PAGES. 1 TABLE. PP. Q310.4-1 THRU Q310.4-3 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105694 *CONTINUED*
THE CONTROL ROOM IS CLASSIFIED AS TYPE B CONSTRUCTION IN ACCORDANCE WITH REGULATORY GUIDE 1.78 AND IS CONSTRUCTED SUCH THAT THE LEAKAGE RATE IS ABOUT 0.06 AIR CHANGES PER HOUR. THE CONTROL ROOM IS PRESSURIZED TO MAINTAIN A MINIMUM OF 1/4 INCH WATER POSITIVE PRESSURE. THE CONTROL ROOM HVAC SYSTEM AIR INTAKES WILL BE PROVIDED WITH REDUNDANT, SEISMIC CATEGORY I DETECTORS FOR THOSE TOXIC MATERIALS WHICH CAN ENTER THE CONTROL ROOM AIR INTAKE IN UNACCEPTABLE CONCENTRATIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

VENTILATION SYSTEM + CONTROL + CHLORINE + RESPONSE TO NRC QUESTION + *CONTROL PANEL/ROOM + *TOXICITY + CLINCH RIVER (LMFBR)

18-105695 DATED 1975
RESPONSE TO QUESTION 310.8 - INGRESS/EGRESS DOSE TO CONTROL ROOM OPERATOR
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q310.8-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONTROL BUILDING IS DESIGNED TO PERMIT CONTINUOUS OCCUPANCY UNDER ACCIDENT CONDITIONS. THESE PROVISIONS ENABLE THE OPERATORS TO REMAIN ON DUTY WITHOUT RELIEF FOR AS LONG AS REQUIRED. IT IS, THEREFORE, NOT NECESSARY TO PLAN ON ROUTINE SHIFT CHANGES BY THE CONTROL ROOM PERSONNEL. HOWEVER, IF CONDITIONS NECESSITATE A CHANGE IN PERSONNEL, THIS CAN BE ACCOMPLISHED WITHOUT UNDUE RADIATION EXPOSURE. THE CALCULATED RADIATION EXPOSURE FOR EITHER INGRESS AND EGRESS AT 24 HOURS AFTER THE ACCIDENT IS 180 MREM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + *DOSE CALCULATION, EXTERNAL + RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + *CONTROL PANEL/ROOM + STAFFING + CLINCH RIVER (LMFBR)

18-105696 DATED 1975
RESPONSE TO QUESTION 310.9 - RADIATION SOURCE FOR CONTROL ROOM DOSE ANALYSIS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 5 PAGES, 1 TABLE, PP. Q310.9-1 THRU Q310.9-5 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE REFERENCE DESIGN, THE CONTROL ROOM SHIELDING DESIGN RADIOACTIVE SOURCE TERM IS A THIRD LEVEL DESIGN REQUIREMENT; PROVIDED TO EXTEND THE PLANT CAPABILITY BEYOND THAT NECESSARY TO ACCOMMODATE THE EXTREMELY UNLIKELY FAULTS INCLUDED IN THE REFERENCE DESIGN. WITH RESPECT TO THE CONTROL ROOM SHIELDING DESIGN SOURCE TERM, "1% ALL OTHER FISSION PRODUCTS" MEANS 1% OF THE HALOGENS, PLUS 1% OF THE VOLATILE SOLIDS, PLUS 1% OF THE REMAINING FISSION PRODUCTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + DESIGN CRITERIA + *SOURCE, RADIATION + *DOSE CALCULATION, EXTERNAL + SHIELDING + RESPONSE TO NRC QUESTION + CONTROL PANEL/ROOM + STAFFING + CLINCH RIVER (LMFBR)

18-105697 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 310.10 - EFFECTIVENESS OF CONTROL ROOM HABITABILITY SYSTEM FOR SODIUM FIRE
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q310.10-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RELEASE OF SODIUM AND SUBSEQUENT SODIUM FIRES RESULTING IN THE RELEASE OF NA(SUB 2)O, NA(SUB 2)O(SUB 2), NAOH, NAH AND NA(SUB 2)CO(SUB 3) TO THE ATMOSPHERE IS DESCRIBED IN SECTION 7.2.1.1 OF THE ENVIRONMENTAL REPORT. THE EFFECT OF THE RELEASE OF SODIUM COMBUSTION PRODUCTS TO THE ATMOSPHERE ON THE HABITABILITY OF THE CONTROL ROOM WILL BE ANALYZED IN ACCORDANCE WITH REGULATORY GUIDE 1.78. THE RESULTS OF THIS ANALYSIS WILL BE PRESENTED IN THE FSAR.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*FIRE + *VENTILATION SYSTEM + COMBUSTION + RESPONSE TO NRC QUESTION + CONTROL PANEL/ROOM + TOXICITY + CLINCH RIVER (LMFBR)

18-105698 DATED 1975
RESPONSE TO QUESTION 310.13 - PLUTONIUM CONCENTRATION IN REACTOR COOLANT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q310.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

BASED ON LIMITED DATA, CONSERVATIVE CALCULATIONS INDICATE THAT FOR 1% FAILED FUEL A MAXIMUM REACTOR COOLANT PLUTONIUM CONCENTRATION OF 1 PPM WAS CALCULATED. HOWEVER, THE PROJECT HAS ACCEPTED A COMMITMENT TO LIMIT THE PLUTONIUM CONCENTRATION IN THE REACTOR COOLANT TO 100PPB.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + *PLUTONIUM + ANALYTICAL MODEL + *REACTOR COOLANT + RESPONSE TO NRC QUESTION + CONCENTRATION + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105695 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 310.17 - CONTAINMENT BUILDING COOLERS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 4 PAGES. PP. Q310.17-1 THRU Q310.17-4 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

INDICATES THE LOCATION OF THE COOLERS WITHIN THE PRIMARY CONTAINMENT AND THE TOTAL QUANTITY OF THIS FLUID WITHIN THE COOLING UNITS IN THIS AREA. EVALUATES THE EFFECTS OF A DOWTHERM J FIRE ON THE GASKETING MATERIAL USED ON THESE VALVES AND OTHER SEALED OPENINGS SUCH AS PERSONNEL AND EQUIPMENT HATCHES.

AVAILABILITY - MICROSURANCE, INC.. P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + CONTAINMENT + *FIRE + BUILDING + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + *COOLING + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

18-105700 DATED 1975
RESPONSE TO QUESTION 310.20 - RELEASE OF REACTOR COVER GAS TO ENVIRONMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q310.20-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE POSTULATED REACTOR COVER GAS RELEASE IS ASSUMED TO OCCUR DURING REFUELING WITH THE RCB/RSB EQUIPMENT HATCH OPEN. WITH THE EQUIPMENT HATCH OPEN CONTAINMENT ISOLATION CANNOT BE AFFECTED BECAUSE THE RSB IS NOT SPECIFICALLY DESIGNED AS A CONTROLLED LEAKAGE BARRIER.

AVAILABILITY - MICROSURANCE, INC.. P.O. BOX 3522 OAK RIDGE, TENN. 37830

*AIRBORNE RELEASE + ATMOSPHERIC POLLUTION + ANALYTICAL MODEL + *COVER GAS + DOSE CALCULATION, INTERNAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105701 DATED 1975
RESPONSE TO QUESTION 310.21 - DESIGN BASIS ACCIDENT DOSE CALCULATIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q310.21-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THERE ARE TWO DESIGN BASIS ACCIDENTS EVALUATED IN THE PSAR FOR WHICH CREDIT FOR CONTAINMENT ISOLATION AND SUBSEQUENT CONTROLLED LEAKAGE ARE TAKEN: PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK FAILURE DURING MAINTENANCE AND PRIMARY HEAT TRANSPORT SYSTEM PIPING LEAKS. THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF EACH OF THESE EVENTS HAVE BEEN RE-EVALUATED ASSUMING CONTAINMENT LEAKAGE AT ITS DESIGN RATE, 0.1% DAY, FOR THE DURATION OF THE EVENTS.

AVAILABILITY - MICROSURANCE, INC.. P.O. BOX 3522 OAK RIDGE, TENN. 37830

ANALYTICAL MODEL + DOSE CALCULATION, INTERNAL + RESPONSE TO NRC QUESTION + *ACCIDENT, DESIGN BASIS + CLINCH RIVER (LMFBR)

18-105702 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 310.26 - CONTAINMENT PURGE ISOLATION VALVES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q310.26-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

NO EVENT RESULTING IN POSTULATED EJECTION OF BURNING SODIUM ONTO THE OPERATING FLOOR HAS BEEN IDENTIFIED. HOWEVER, EVEN IF THIS WERE TO BE POSTULATED, IT COULD NOT REACH THE ISOLATION VALVES BECAUSE OF THEIR LOCATION. THE CONTAINMENT ISOLATION VALVES GASKETING MATERIAL WILL BE BASED ON AN ASSUMED CONSERVATIVE TEMPERATURE OF 400 F AND ON ITS ABILITY TO WITHSTAND ANY CHEMICAL REACTION WITH THE COMBUSTION PRODUCTS OF BURNING SODIUM.

AVAILABILITY - MICROSURANCE, INC.. P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + FIRE + CONTAINMENT PURGE + *CONTAINMENT ISOLATION + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + *VALVES

18-105703 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 310.30 - CONTAINMENT ATMOSPHERE CLEANUP SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE 310.30-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE MOST LIMITING IN-CONTAINMENT RADIOACTIVE SODIUM FIRES RESULT FROM (1) THE POSTULATED FAILURE OF THE PRIMARY SODIUM STORAGE TANK DURING MAINTENANCE, AND (2) A POSTULATED PRIMARY HEAT TRANSPORT SYSTEM PIPING LEAK DURING OPERATION. A CONTAINMENT ATMOSPHERE CLEANUP SYSTEM, OR SOME OTHER ACCIDENT MITIGATING DEVICE, WOULD BE NECESSARY IF LEAKAGE OF RADIOACTIVE SODIUM AEROSOL TO THE ENVIRONMENT, RESULTING FROM EITHER OF THESE POSTULATED FIRES, RESULTED IN UNACCEPTABLE OFF-SITE EXPOSURES.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105703 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + *AIR CLEANING + AIRBORNE RELEASE + *CONTAINMENT + FIRE + CONTAINMENT PURGE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + FILTERS

18-105704 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.13 - JOINT FREQUENCY DISTRIBUTION DATA
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q322.13-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES THE TWO SETS OF JOINT FREQUENCY DISTRIBUTION USED TO OBTAIN THE INFORMATION IN THE SECTION WIND AND STABILITY DATA AND IN TABLE 2.3B-20 OF SUPPLEMENT 1 TO CHAPTER TWO - REVISED ON-SITE METEOROLOGY OF THE PSAR. THE FIRST SET BASED ON WIND SPEED AND DIRECTION MEASURED AT THE 75-FT LEVEL AND VERTICAL TEMPERATURE DIFFERENCE BETWEEN THE 33- AND 200-FT LEVELS. THE SECOND SET IS BASED ON THE WINDS MEASURED AT THE 75-FT LEVEL BUT WITH THE VERTICAL TEMPERATURE DIFFERENCE MEASURED BETWEEN THE 75- AND 200-FT LEVELS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITING, REACTOR + WIND PROFILE + METEOROLOGY + *WIND STATISTICS + RESPONSE TO NRC QUESTION + DATA COLLECTION + WEATHER DATA + CLINCH RIVER (LMFBR)

18-105705 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.15 - DISTRIBUTION OF PERCENTAGE OF CALMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q322.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TOTAL PERCENTAGE OF CALMS LISTED AT THE BOTTOM OF TABLES 2.3B-21 THROUGH 2.3B-36 ARE EVENLY DISTRIBUTED THROUGHOUT THE VARIOUS DIRECTION GROUPS IN THE FIRST WIND SPEED CATEGORY. THE DISTRIBUTION IS DONE BY USING THE TOTAL PERCENTAGE OF CALMS FOR EACH STABILITY AND DIVIDING BY THE NUMBER OF WIND DIRECTION GROUPS. THIS ONE-SIXTEENTH OF THE CALM PERCENTAGE IS THEN ADDED TO EACH DIRECTION'S CLASSIFICATION OF 0.0-1.3 KNOTS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITING, REACTOR + WIND PROFILE + METEOROLOGY + *WIND STATISTICS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105706 DATED 1975
RESPONSE TO QUESTION 331.1 - MANAGEMENT COMMITMENT ON RADIATION EXPOSURES
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q331.1-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MANAGEMENT COMMITMENT FOR PLANT DESIGN IS SUCH THAT EVERY REASONABLE EFFORT SHALL BE MADE IN THE PLANT DESIGN TO KEEP RADIATION EXPOSURES TO PLANT PERSONNEL AS FAR BELOW REGULATORY LIMITS AS PRACTICABLE. THE MANAGEMENT POLICY FOR ASSURING THAT OCCUPATIONAL EXPOSURES ARE AS LOW AS PRACTICABLE IS SET FORTH IN TVA'S GENERAL RELEASES MANUAL.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*ADMINISTRATIVE CONTROL + PROCEDURES AND MANUALS + CONTROL + *PERSONNEL EXPOSURE, RADIATION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105707 DATED 1975
RESPONSE TO QUESTION 331.5 - DESIGN BASIS RADIATION LEVEL IN HOT LABORATORY
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +, 1 PAGE, PAGE Q331.5-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 28, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HOT LABORATORY AND COUNTING ROOM ARE LOCATED WITHIN THE RADIOLOGICAL RESTRICTED AREA OF THE PLANT SERVICES BUILDING. THE RADIATION ZONE FOR THESE FACILITIES IS ZONE 1, WHICH LIMITS THE RADIATION LEVEL TO 0.2 MREM/HR OR LESS. THERE ARE NO SIGNIFICANT SOURCES OF RADIATION IN ADJACENT AREAS OF THE PLANT SERVICES OR REACTOR SERVICE BUILDING DURING NORMAL OPERATION, WHICH WILL BE DETECTABLE IN THE HOT LABORATORY OR COUNTING ROOM FACILITIES. THE RADIATION LEVEL WILL BE CONTROLLED BY THE SIZE AND NATURE OF THE RADIOCHEMICAL SOURCES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *HOT LABORATORY + *RADIATION EXPOSURE + CLINCH RIVER (LMFBR)

18-105708 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 331.6 - FIELD RUN PIPING CARRYING RADIOACTIVE MATERIAL
PROJECT MANAGEMENT CORP

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105708 *CONTINUED*
DOCKET-50537-23 +. 1 PAGE. PAGE Q331.6-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PIPING CARRYING RADIOACTIVE MATERIALS WILL NOT BE FIELD RUN. A FULLY STAFFED FIELD QA PROGRAM AT BOTH THE CONTRACTOR LEVEL AND OWNER LEVEL WILL ENSURE THAT THE PIPING IS RUN ACCORDING TO THE HOME OFFICE DRAWINGS. ENGINEERING SITE PERSONNEL ARE LIMITED. IN WRITING. IN THE TYPE OF CHANGES THEY ARE PERMITTED TO APPROVE IN THE FIELD. ALL OTHER CHANGES. WHICH INCLUDE PIPING CARRYING RADIOACTIVE MATERIALS. MUST BE APPROVED IN THE HOME OFFICE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

RADIOISOTOPE + RESPONSE TO NRC QUESTION + INSTALLATION + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-105709 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 331.9 - MAKE-UP RATE FOR PLANT HVAC SYSTEMS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q331.9-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE FRESH AIR MAKE-UP RATE FOR THE PLANT HVAC SYSTEMS IS BASED ON THE FREQUENCY OF OCCUPATION OF THE VARIOUS AREAS. THE OCCUPATION FREQUENCY WAS DETERMINED IN A CONSERVATIVE MANNER. ON THE BASIS OF THE FRESH AIR MAKE-UP RATE. THE PLANT HVAC SYSTEM IS CAPABLE OF DILUTING THE AIRBORNE CONTAMINATION CONCENTRATION IN ALL OCCUPIED AREAS WELL BELOW THE PERMISSIBLE LIMITS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

DESIGN CRITERIA + *VENTILATION SYSTEM + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + *INTAKE + CLINCH RIVER (LMFBR)

18-105710 DATED 1975
RESPONSE TO QUESTION 331.11 - RELATIVE AIR PRESSURE GRADIENTS
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q331.11-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE POTENTIAL SOURCES FOR AIRBORNE RADIOACTIVE CONTAMINATION ARE LOCATED IN THE REACTOR CONTAINMENT. REACTOR SERVICE AND IN THE STEAM GENERATOR BUILDINGS. ALL BUILDINGS ARE SEPARATED BY HEAVY STRUCTURAL. SHIELDING AND FIRE SEPARATION WALLS. THE PENETRATIONS THROUGH THESE WALLS ARE HERMETICALLY SEALED. THE REACTOR CONTAINMENT. REACTOR SERVICE AND STEAM GENERATOR BUILDINGS ARE SERVED BY TOTALLY INDEPENDENT HVAC SYSTEMS. THE RELATIVE PRESSURE DIFFERENTIAL BETWEEN CERTAIN PORTIONS OF THE ABOVE OR OTHER BUILDINGS ARE SMALL (MAX. 1/4 INCH H(SUB 2)O.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522. OAK RIDGE. TENN. 37830

AIRBORNE RELEASE + CONTROL + *PRESSURE DROP + RESPONSE TO NRC QUESTION + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-105711 DATED 1975
RESPONSE TO QUESTION 331.14 - HEALTH PHYSICS STAFF
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q331.14-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE 6-PERSON HEALTH PHYSICS STAFF IS INTENDED TO PERFORM ROUTINE FUNCTIONAL OPERATIONS SUCH AS EXPEDITING WORK ASSIGNMENTS. SUPPLYING SPECIAL PROTECTIVE EQUIPMENT. PERFORMING LABORATORY WORK. CONDUCTING GENERAL AND SPECIFIC PLANT SURVEYS. AND OVERSEEING THE SAFETY OF PERSONNEL WORKING AT SPECIFIC WORK STATIONS IN CONTAMINATED AREAS ON SPECIAL WORK PERMITS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*RADIATION PROTECTION. ORGANIZATION + RESPONSE TO NRC QUESTION + SURVEY + CLINCH RIVER (LMFBR)

18-105712 DATED 1975
RESPONSE TO QUESTION 331.15 - SELECTION OF HEALTH PHYSICS PERSONNEL
PROJECT MANAGEMENT CORP
DOCKET-50537-23 +. 1 PAGE. PAGE Q331.15-1 OF AMENDMENT 1 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 28. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

HEALTH PHYSICS PERSONNEL THAT ARE ASSIGNED TO THE PLANT STAFF WILL MEET THE PROVISIONS OF REGULATORY GUIDES 8.8 AND 8.10 OR REGULATORY GUIDE 1.8 AND SECTION 4 OF ANSI N18.1. WHICHEVER IS APPLICABLE AT THE TIME OF APPOINTMENT. AS TVA HAS A HIGHLY QUALIFIED HEALTH PHYSICS STAFF. THERE SHOULD BE NO PROBLEM IN MEETING THE PROVISIONS OF THE APPLICABLE GUIDES.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

TRAINING + *RADIATION PROTECTION. ORGANIZATION + RESPONSE TO NRC QUESTION + *STAFFING + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105741 ALSO IN CATEGORIES 5 AND 6 AND 11 DATED 1974
KASTENBERG WE
TRANSIENT ANALYSIS OF LMFBR OXIDE FUEL ELEMENTS DURING ACCIDENTS. FINAL REPORT FOR THE PERIOD 1 JULY 1973-30 JUNE 1974
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7468 +. 136 PPS, 68 FIGS, 137 REFS, AUG. 1974

REPORTS ON A STUDY OF THE MODE OF FAILURE FOR LMFBR OXIDE FUEL PINS DURING AN OVERPOWER TRANSIENT AND THE IMPLICATIONS ON THE COURSE OF AN UNPROTECTED OVERPOWER TRANSIENT ACCIDENT. SECTION 2 IS DEVOTED TO FAILURE MECHANISM. SECTION 3 ADDRESSES LOCATION AND MODE OF FAILURE; AND SECTION 4 CONTAINS A SUMMARY AND THE MAJOR CONCLUSIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + FUEL ROD + FAILURE MODE ANALYSIS + *TRANSIENT

18-105742 DATED 1975
KASTENBERG WE
SAFETY RESEARCH NEEDS FOR CARBIDE AND NITRIDE FUELED LMFBR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7545 +. 63 PPS, 1 FIG, 73 REFS, JUNE 1975

SUMMARIZES THE RESULTS OF A STUDY ON RESEARCH NEEDS FOR ADVANCED FUELS. SPECIFIC TASKS REVIEWED INCLUDE (1) REVIEW OF CORE AND PRIMARY SYSTEM DESIGNS, (2) REVIEW OF CARBIDE AND NITRIDE FUEL ELEMENT IRRADIATION BEHAVIOR, (3) REVIEW REACTOR BEHAVIOR IN POSTULATED ACCIDENTS, (4) EXAMINE ANALYTICAL METHODS OF ACCIDENT ANALYSIS, AND (5) EXAMINE POST ACCIDENT HEAT REMOVAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + NITRIDE + SAFETY PROGRAM + *R AND D PROGRAM + *FUEL, NUCLEAR

18-105743 ALSO IN CATEGORY 5 DATED 1975
KNAPP RB
THERMAL STRESS INITIATED FRACTURE AS A FRAGMENTATION MECHANISM IN THE UO2-SODIUM FUEL-COOLANT INTERACTION
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
TID-26627 +. 201 PPS, 59 FIGS, 134 REFS, MAY 1975

AN ANALYTIC STUDY WAS CARRIED OUT TO DETERMINE THE APPLICABILITY OF THE CONCEPT OF THERMAL STRESS FRAGMENTATION TO THE UO2/SODIUM FUEL-COOLANT INTERACTION. MAJOR EMPHASIS WAS PUT ON THE FRACTURE MECHANICS APPROACH TO ASSESSING WHETHER OR NOT THE SOLIDIFYING UO2 WOULD FRACTURE UNDER THE THERMALLY INDUCED STRESSES. IT WAS FOUND THAT THE STRESS LEVELS WERE SUFFICIENT TO GENERATING K(SUB I) VALUES SUBSTANTIALLY IN EXCESS OF THE UO2 FRACTURE TOUGHNESS, K(SUB IC). THUS, RAPID INSTANTANEOUS PROPAGATION OF INHERENT FLAWS IS ANTICIPATED. PARAMETRIC STUDIES IN WHICH THE SURFACE HEAT TRANSFER BOUNDARY CONDITION WAS VARIED DID NOT ALTER THIS CONCLUSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STRESS + THERMAL MECHANICAL EFFECT + URANIUM DIOXIDE + FRACTURE TOUGHNESS + *FUEL COOLANT INTERACTION

18-105745 ALSO IN CATEGORY 11 DATED 1975
MATHEYS WL
SODIUM LEAK CHARACTERIZATION TESTS
WESTINGHOUSE ELECTRIC CORPORATION
WARD-LT-3045-1 +. 31 PPS, 3 TABS, 18 FIGS, JUNE 1975

A SERIES OF LEAK CHARACTERIZATION TESTS WAS CONDUCTED TO STUDY SODIUM FLOW THROUGH PIPE CRACKS AND DETERMINE THE MINIMUM CRACK SIZE FOR CONTINUOUS LEAKAGE. RESULTS OF THESE TESTS SHOW THAT SMALL CRACKS DO PLUG IN TIME, AND A CONTINUOUS LEAKAGE CRACK SIZE WAS NOT ESTABLISHED IN THIS SERIES. IT WAS SHOWN, HOWEVER, THAT PRIOR TO PLUGGING, LEAKAGE WAS OF SUCH MAGNITUDE AS TO ASSURE DETECTION BY THE MORE SENSITIVE LEAK DEVICES AVAILABLE OR IN ADVANCED STAGES OF DEVELOPMENT TODAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + R AND D PROGRAM + LEAK RATE + LEAK + *TEST, LEAK + CRACK + *PIPES AND PIPE FITTINGS

18-105746 DATED 1975
MEACHAM SA + WHITLOW GA
THE STABILITY OF EXTRANEOUS ARTIFACTS IN LIQUID SODIUM
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-25 +. 35 PPS, 4 TABS, 6 FIGS, JUNE 1975

VARIOUS MATERIALS CONSIDERED LIKELY TO BE ASSOCIATED WITH CONSTRUCTION, CLEANING, AND INSPECTION OF A NUCLEAR POWER PLANT WERE EXPOSED TO SODIUM AND EXAMINED FOR PHYSICAL STABILITY. THE MATERIALS INCLUDED SUCH ITEMS AS WOOD, COTTON, PLASTICS, ASBESTOS, AND GRAPHITE. IT WAS DETERMINED THAT A ONE-DAY EXPOSURE TO 995 F SODIUM WILL PRODUCE FRIABLE MATERIAL IN ALL BUT ONE OF THE ARTIFACTS TESTED. IN ADDITION, A TWO-WEEK EXPOSURE TO 730 F ARGON PRODUCED NEARLY THE SAME PHYSICAL CONDITION AS THE 730 F SODIUM EXPERIMENTS. RECOMMENDATIONS FOR A POTENTIAL CLEANUP PROCEDURE PRIOR TO SODIUM FILL OF THE PLANT ARE PRESENTED.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105746 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + MAINTENANCE AND REPAIR + MATERIAL + TEST, PREOPERATIONAL + R AND D PROGRAM + CONSTRUCTION

18-105757 ALSO IN CATEGORIES 5 AND 6 AND 8 AN DATED 1975
A COMPENDIUM OF COMPUTER CODES FOR THE SAFETY ANALYSES OF LMFBR'S
U.S. ERDA, WASHINGTON
ERDA-31 +. 189 PPS, JUNE 1975

AN ALPHABETICAL LIST OF 55 COMPUTER CODES. GIVES A BRIEF STATEMENT OF THE PROBLEM SOLVED, THE STATUS OF THE CODE, THE MODEL DESCRIPTION, LIMITATIONS, FUTURE EFFORTS TO IMPROVE THE CODE, INTERFACES WITH OTHER CODES AND REFERENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CONTAINMENT + FISSION GAS RELEASE + FUEL MELTDOWN + ACCIDENT, LOSS OF COOLANT + *SAFETY ANALYSIS + PRESSURE PULSE + PRESSURE TRANSIENT + STRUCTURAL ANALYSIS, DYNAMIC + *THERMAL TRANSIENT + COMPARTMENT + FUEL SWELLING + THERMAL HYDRAULIC ANALYSIS + PIPES AND PIPE FITTINGS

18-105761 ALSO IN CATEGORY 11 DATED 1975
KURZEKA WJ + WLECH FM
PERMEATION, LEAKAGE, AND COMPRESSION SET TESTING OF ELASTOMERIC SEALS FOR LMFBR USE
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-AEC-13146 +. 91 PPS, 43 FIGS, 24 REFS, APRIL 2, 1975

ELASTOMER SEALS WERE EVALUATED TO FFTF/LMFBR CONDITIONS. BASIC PERMEATION MEASUREMENTS OF THE ELASTOMERS WERE CONDUCTED AND COMPRESSION SET MEASUREMENTS OF O-RINGS WERE MADE. PERMEATION MEASUREMENTS ON STATIC O-RINGS WERE MADE AT VARIOUS COMPRESSIONS AND FINISHES. DYNAMIC QUAD-, O-, AND T-SEAL LEAKAGE, PERMEATION, AND WEAR AT VARIOUS COMPRESSIONS AND FINISHES WERE EVALUATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + FFTF (TR) + *SEAL + LEAK + POLYMERIC

18-105769 ALSO IN CATEGORY 5 DATED 1975
DEVERALL JE + KEDDY ES + KEMME JE + PHILLIPS JR
GRAVITY - ASSIST HEAT PIPES FOR THERMAL CONTROL SYSTEMS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5989-MS +. 15 PPS, 17 FIGS, 12 REFS, JUNE 1975

INVESTIGATIONS WERE MADE OF NEW WICK STRUCTURES FOR POTASSIUM HEAT PIPES TO OPERATE AT LOWER TEMPERATURES AND HIGHER HEAT TRANSFER RATES, AND A HELICAL TROUGH WICK STRUCTURE WAS DEVELOPED WITH AN IMPROVED HEAT TRANSFER CAPABILITY IN THE TEMPERATURE RANGE OF INTEREST. TEST RESULTS OF THESE HEAT PIPES LED TO THE STUDY OF A NEW HEAT PIPE LIMIT WHICH HAD NOT PREVIOUSLY BEEN CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MATERIAL + IRRADIATION TESTING + SYSTEM DESCRIPTION + R AND D PROGRAM + *HEAT PIPE

18-105774 ALSO IN CATEGORY 5 DATED 1974
WALTAR AE + PARTAIN WL + KOLESAR DC + SHIELDS RJ
MELT III - A NEUTRONICS, THERMAL-HYDRAULICS COMPUTER PROGRAM FOR FAST REACTOR SAFETY ANALYSIS - VOLUME I
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-47 (VOL. I) +. 480 PAGES, 60 FIG, 22 REF, DEC. 1974

A CODE FOR INVESTIGATING THE TRANSIENT BEHAVIOR OF A FAST REACTOR DURING POSTULATED ACCIDENT CONDITIONS. REACTIVITY FEEDBACK RESULTING FROM DOPPLER BROADENING, COOLING DENSITY CHANGE AND EXPANSION, AND FUEL MOVEMENT ARE EXPLICITLY TAKEN INTO ACCOUNT. ALTHOUGH A WIDE VARIETY OF ACCIDENT CONDITIONS MAY BE INVESTIGATED, PARTICULAR MODELING EMPHASIS HAS BEEN PLACED ON THE SIMULATION CAPABILITIES FOR AN UNPROTECTED TRANSIENT OVERPOWER ACCIDENT SEQUENCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + DOPPLER EFFECT + *FAILURE, FUEL ELEMENT + MOLTEN FUEL + *SAFETY ANALYSIS + VOID + TRANSIENT + FUEL COOLANT INTERACTION + THERMAL HYDRAULIC ANALYSIS

18-105778 ALSO IN CATEGORY 10 DATED 1975
MARTIN MM + CLARK DL
ANALYSIS OF FAILED CATEGORY II ELECTRIC HEATERS THAT SIMULATE LMFBR FUEL PINS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4886 +. 54 PG., 4 TAB, 26 FIG, AUG. 1975

EXAMINATION OF PREMATURELY FAILED HIGH-PERFORMANCE ELECTRICAL HEATERS, WHICH SIMULATE LMFBR FUEL

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105778 *CONTINUED*
PINS, REVEALED THAT ALL HAD BEEN DAMAGED SIMILARLY DURING OPERATIONAL TESTING. FAILURE CULMINATED IN SEVERANCE OF THEIR HEATING ELEMENTS AND, IN MOST INSTANCES, PENETRATION OF THEIR TYPE 316 STAINLESS STEEL SHEATHS. THE PRINCIPAL REASON FOR INCIPIENT FAILURE WAS INADEQUATE TRANSFER OF HEAT FROM THE HEATING ELEMENT INTO THE SURROUNDING BORON NITRIDE INSULATION. ADVERSE PREFERRED ORIENTATION AND NUMEROUS LOW-DENSITY REGIONS REDUCED THE EFFECTIVE THERMAL PROPERTIES OF THE BORON NITRIDE INSULATION AND THEREBY CONTRIBUTED TO FAILURE OF THE HEATERS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE + HEAT TRANSFER + SIMULATION + FUEL ROD + *FAILURE, INCIPIENT + *HEATERS

18-105780 DATED 1975
BAKER RD
QUARTERLY REPORT, JANUARY 1 THROUGH MARCH 31, 1975. EXAMINATION OF FAST REACTOR FUELS, FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS, AND ANALYTICAL METHODS DEVELOPMENT - IRRADIATION TESTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5968-PR +, 13 PGS., FIGS., REF., MAY 1975

REPORTS PROGRESS ON (1) THE EXAMINATION AND COMPARISON OF THE EFFECTS OF NEUTRON IRRADIATION ON LMFBR PROGRAM FUEL MATERIALS; (2) DEVELOPMENT OF FBR ANALYTICAL QUALITY ASSURANCE STANDARDS AND METHODS; AND (3) DEVELOPMENT OF ANALYTICAL METHODS FOR MEASUREMENT OF BURNUP, OXYGEN-TO-METAL RATIO, AND GASES IN IRRADIATED FUELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + FUEL BURNUP + MEASUREMENT + MATERIAL + QUALITY ASSURANCE + R AND D PROGRAM + FUEL ROD

18-105786 ALSO IN CATEGORIES 5 AND 7 DATED 1975
KERRISK JF
PINTEMP: A COMPUTER PROGRAM FOR FUEL ELEMENT DESIGN CALCULATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5868-MS +, 26 PPS, 2 TABS, 19 REFS, FEB. 1975

PINTEMP PERFORMS DESIGN CALCULATIONS FOR FUEL ELEMENTS IN THE EBR-II REACTOR. THE PROGRAM CALCULATES FUEL ELEMENT AND SODIUM COOLANT TEMPERATURES, THERMAL STRESSES IN THE CLAD AND FISSION GAS GENERATED IN THE FUEL DURING STEADY STATE IRRADIATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + EBR 1 AND 2 (RE) + FISSION GAS RELEASE + KRYPTON + STRESS + THERMAL MECHANICAL EFFECT + XENON + ARGON + TEMPERATURE + *FUEL ELEMENTS

18-105825 ALSO IN CATEGORIES 6 AND 9 DATED 1975
BAGSASAROV YE
SOVIET-FRENCH SEMINAR ON CORE DIAGNOSIS AND SAFETY OF FAST REACTORS-CADARACHE, JUNE 9-14, 1974
3 PPS, SOVIET ATOMIC ENERGY, 37(5), PP. 1213-15 (MAY 1975)

THE SEMINAR DISCUSSED PROBLEMS ASSOCIATED WITH THE GENERAL APPROACH TO THE SAFETY OF SODIUM-COOLED FAST REACTORS, DESIGN AND OPERATING METHODS OF CORE MONITORING, CONSEQUENCES OF FUEL ELEMENT LEAKS, METHODS OF LEAKAGE INDICATION AND ON-LINE DETERMINATION OF DEFECTIVE FUEL BUNDLES, SPECIFIC PROBLEMS ENCOUNTERED IN WORKING WITH LEAKY FUEL ELEMENTS, METHODS OF DETECTING DEFECTIVE FUEL ELEMENTS WITH THE AID OF LABELED GASES, SYSTEMS AND EQUIPMENT FOR FAST DATA ACQUISITION AND PROCESSING AND REACTOR CONTROL, AND MANY OTHERS.

*FRANCE + OPERATION + DATA PROCESSING + REACTOR CONTROL + *DESIGN STUDY + INSTRUMENT, FAILED FUEL DETECTION + INSTRUMENT, SURVEILLANCE + USSR + CORE COMPONENTS + SAFETY EVALUATION + REACTOR PHYSICS + OPERATING EXPERIENCE

18-105850 ALSO IN CATEGORY 11 DATED 1974
PROCEEDINGS OF THE US-USSR SEMINAR ON THE DEVELOPMENT OF SODIUM-COOLED FAST BREEDER REACTOR STEAM GENERATORS. VOLUME 2 - DISCUSSION
U.S. ERDA, WASHINGTON
ERDA-32 +, 126 PPS, DEC. 1974

THIS DOCUMENT CONTAINS THE OPENING REMARKS AND THE DISCUSSION FOLLOWING PRESENTATION OF PAPERS AT THE SEMINAR IN LOS ANGELES, DEC. 2-4, 1974. THE LAST DAY OF THE SEMINAR, PROBLEMS, ETC. WERE DISCUSSED BY PANEL MEMBERS. ALL COMMENTS ARE DOCUMENTED. SUBJECTS COVERED WERE HEAT TRANSFER AND HYDRODYNAMICS, CORROSION AND STRENGTH IN MATERIALS, STEAM GENERATOR LEAKS, STEAM GENERATOR MODEL TESTING, FABRICATION, QUALITY CONTROL AND MAINTENANCE, AND FUTURE STEAM GENERATOR CONCEPTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FABRICATION + FAILURE + CORROSION + WATER TREATMENT + QUALITY ASSURANCE + HEAT TREATMENT + *STEAM GENERATOR + TUBING + LEAK

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-105651 ALSO IN CATEGORY 11 DATED 1974
TRIP REPORT - UNITED STATES LMFBR STEAM GENERATOR TEAM, IAEA SYMPOSIUM, BENSBERG, GERMANY, OCT. 14-17, 1974
U.S. ERDA, WASHINGTON
ERDA-36 +, 71 PPS, 5 TABS, OCT. 1974

PURPOSE OF THIS TEAM VISIT WAS TWOFOLD. FIRST, FOR THE US TO HAVE A STRONG PARTICIPATION IN THE TECHNICAL INFORMATION EXCHANGE. SECONDLY, THE TEAM DESIRED TO MEET SEPARATELY WITH DIFFERENT EUROPEAN ORGANIZATIONS TO EXPLORE DETAILS OF ITEMS PRESENTED AT THE SYMPOSIUM. IT IS THE TEAM'S OPINION THAT SEVERAL VIABLE PROGRAMS ARE UNDERWAY, AND THAT DEVELOPMENT OF SEVERAL CONCEPTS HAS ADVANCED TO THE DEMONSTRATION STAGE. ALSO NO FOREIGN ORGANIZATION IS CLEARLY LEADING IN DEVELOPMENT OF LMFBR STEAM GENERATORS. THERE ARE MANY SIMILARITIES AND OVERLAPS BETWEEN THE SEVERAL COUNTRY'S PROGRAMS. THE NOTABLE EXCEPTION IS THE FRENCH EFFORT EPITOMIZED BY THE PHENIX PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + FABRICATION + FAILURE + MAINTENANCE AND REPAIR + MATERIAL + WATER TREATMENT + SAFETY EVALUATION + *STEAM GENERATOR + TUBING + LEAK + OPERATING EXPERIENCE

18-105883 ALSO IN CATEGORY 11 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. SAFETY ASSESSMENT, SECOND QUARTERLY REPORT, SEPT.-NOV. 1974
GENERAL ELECTRIC COMPANY
GEAP-14022-2 +, 50 PPS, 12 TABS, 28 FIGS, NOV. 1974

THIS REPORT IS THE SECOND IN A SERIES OF QUARTERLY REPORTS PUBLISHED UNDER THE SAFETY ASSESSMENT PROGRAM. THE OBJECTIVE OF THE WORK REPORTED HERE IS TO ESTABLISH PROCEDURE AND TECHNIQUES, SUCH AS PROBABILISTIC METHODOLOGY, FOR QUANTITATIVE ASSESSMENTS OF LMFBR SAFETY. PROGRESS DURING SEPTEMBER, OCTOBER AND NOVEMBER 1974 IS DESCRIBED FOR TASKS RELATED TO LMFBR RISK ASSESSMENT METHODS AND PROBABILISTIC PIPEBREAK.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT, LOSS OF COOLANT + FAILURE, PIPE + *ACCIDENT, PROBABILITY OF + R AND D PROGRAM + *PROBABILITY

18-105884 ALSO IN CATEGORIES 5 AND 9 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM. RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL. FIRST QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14045-1 +, 14 PPS, 5 FIGS, 3 REFS, MARCH 1975

THE OBJECTIVES OF THE LMFBR SHUTDOWN HEAT REMOVAL (SHR) RELIABILITY PROGRAM ARE TO ASSESS ANALYTICALLY AND EMPIRICALLY THE RELIABILITY OF HEAT REMOVAL SYSTEMS TO REMOVE HEAT FROM THE REACTOR AFTER SCRAM OR NORMAL SHUTDOWN AND TO PROVIDE TECHNOLOGY FOR ASSURING THAT RELIABILITY OBJECTIVES ARE ACHIEVED. THIS REPORT OUTLINES LMFBR SHR RELIABILITY PROGRAM ACTIVITIES AND RESULTS OF THOSE ACTIVITIES FROM JULY 1974 THROUGH FEBRUARY 1975. THE MAJORITY OF EFFORT TO DATE HAS BEEN CONCENTRATED ON INITIATING AND IMPLEMENTING RELIABILITY TASKS FOR THE CLINCH RIVER BREEDER REACTOR PLANT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + RELIABILITY ANALYSIS + *RELIABILITY, SYSTEM + *SHUTDOWN COOLING SYSTEM + CLINCH RIVER (LMFBR)

18-105885 ALSO IN CATEGORY 11 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM. REFERENCE FUEL STUDIES. SECOND QUARTERLY REPORT, NOVEMBER-DECEMBER 1974 AND JANUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14032-2 +, 60 PPS, 13 TABS, 22 FIGS, FEB. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING THE THERMODYNAMIC DATA PROGRAM ON PUO2-UO2 AT HIGH TEMPERATURES, FUEL ROD ENGINEERING, AND THE FUEL ROD TEST PROGRAM AIMED AT PROVIDING VIABLE FUEL RODS FOR THE FTR, CRBR, AND COMMERCIAL LMFBR'S.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + THERMODYNAMICS + HIGH TEMPERATURE + R AND D PROGRAM + FUEL ROD + CLINCH RIVER (LMFBR) + FTR (TR)

18-105886 DATED 1975
LIQUID METAL FAST BREEDER REACTOR PROGRAM. ADVANCED OXIDE FUEL SYSTEM DESIGN AND TRADE-OFF STUDIES. FIRST QUARTERLY REPORT, JULY-NOVEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14039-1 +, 38 PPS, 14 TABS, 8 FIGS, 10 REFS, JAN. 1975

A DRAFT OF THE PROGRAM MASTER PLAN WAS PREPARED. INITIAL REFERENCE PLANT DESIGNS WERE PREPARED FOR A 1200 MWE AND A 2000 MWE LMFBR, AND A REACTOR PHYSICS DESIGN ANALYSIS WAS COMPLETED. AN

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-10588E *CONTINUED*
EVALUATION OF LINEAR POWER DESIGN LIMITS WAS CARRIED OUT. SENSITIVITY STUDIES ON FUEL CYCLE COST, DOUBLING TIME AND BREEDING RATIO WERE COMPLETED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + ECONOMICS + *DESIGN STUDY + *R AND D PROGRAM + FUEL ROD

18-10588F ALSO IN CATEGORIES 9 AND 11 AND 12 DATED 1974
LIQUID METAL FAST BREEDER REACTOR PROGRAM. ADVANCED SAFETY ANALYSIS. FIRST QUARTERLY REPORT, JULY-NOVEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-14038-1 +. 65 PPS, 20 TABS, 23 FIGS, NOV. 1974

REPORTS PROGRESS FOR THE PERIOD IN THE FOLLOWING AREAS: ESTABLISHMENT OF SHUTDOWN SYSTEM RELIABILITY GOALS AND SUCCESS CRITERIA; INHERENT SAFE CORE DESIGN; FUEL ROD FAILURE MECHANISMS; AND ENGINEERING ANALYSIS OF POST-ACCIDENT HEAT REMOVAL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*DESIGN CRITERIA + FAILURE, FUEL ELEMENT + RELIABILITY, SYSTEM + *R AND D PROGRAM + *EMERGENCY COOLING CONSIDERATIONS

18-10589Z ALSO IN CATEGORY 11 DATED 1975
CORE RESTRAINT ENGINEERING SECOND QUARTERLY REPORT, NOVEMBER-DECEMBER 1974 AND JANUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14031-2 +. 10 PPS, 5 FIGS, FEB. 1975

THE OVERALL OBJECTIVE IS TO PROVIDE HIGH PRIORITY NEEDS ASSOCIATED WITH LMFBR CORE RESTRAINT SYSTEM AND DESIGN REQUIREMENTS, SUB-COMPONENTS, AND ANALYTICAL METHODS. FIRST PHASE OF WITHDRAWAL FORCE TESTS WERE COMPLETED AT HEDL. IN GENERAL, THE ANALYTICAL PREDICTIONS COMPARE WITH THE TEST RESULTS. THE UPDATED VERSION OF CORTAC, PROGRAMMED BY ANL, HAS BEEN SUCCESSFULLY RUN AT GE-FBRD. A MODIFIED CALCULATIONAL PROCEDURE HAS BEEN DEVELOPED FOR CORTAC TO HANDLE STEP CHANGES IN FLOW AND POWER AND IS BEING DEBUGGED. THE CONCEPTUAL LAYOUT OF THE COMPRESSION FIXTURE FOR THE LOAD PAD AND CHANNEL WALL LATERAL LOAD LIMITS HAS BEEN COMPLETED. TWO-DIMENSIONAL LOAD PAD MODELING USING THE ANSYS COMPUTER CODE IS IN PROCESS. A PRELIMINARY CONCEPT OF THE LEAD-IN SYSTEM OF THE IN-REACTOR LOAD PAD SURVEILLANCE SYSTEM FROM THE SIGNAL CONDITIONING EQUIPMENT TO THE INSTRUMENTED LOAD PADS HAS BEEN COMPLETED. CONCEPTUAL LAYOUTS OF THE IVTM (IN-VESSEL TRANSFER MACHINE) AND PERIPHERAL WITHDRAWAL FORCE MINIMIZER SYSTEMS HAVE BEEN COMPLETED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + EQUIPMENT DESIGN + CORE COMPONENTS + *CORE RESTRAINT

18-10589S ALSO IN CATEGORY 11 DATED 1975
THOMPSON DC
CORE RESTRAINT DEVELOPMENT QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1975
WESTINGHOUSE ELECTRIC CORPORATION
WARD-CR-3045-8 +. 25 PPS, 9 FIGS, MAY 1975

THE LMFBR (LIQUID METAL FAST BREEDER REACTOR) REQUIRES A CORE RESTRAINT SYSTEM TO PROVIDE BOTH AXIAL AND RADIAL SUPPORT FOR THE REACTOR ASSEMBLIES. THE PRIMARY REQUIREMENTS OF THE CORE RESTRAINT SYSTEM ARE: (1) LOCATION OF FUEL, CONTROL BLANKET, AND REMOVABLE SHIELD ASSEMBLIES IN PREDICTABLE AND REPRODUCIBLE POSITIONS; (2) REFUELING SHOULD BE ACCOMPLISHED WITHOUT DAMAGE TO THE ASSEMBLIES; AND (3) OPERATING LOADS MUST NOT BE EXCESSIVE. VARIABLES AFFECTING THE CORE RESTRAINT SYSTEM ARE PRIMARILY THE RADIATION-INDUCED MATERIALS EFFECTS OF SWELLING CREEP AND LOAD PAD FRICTION CHARACTERISTICS. THESE CAUSE BOWING DEFORMATIONS OF THE CORE ASSEMBLIES DURING LIFE. THE OBJECTIVE OF THIS DEVELOPMENT PROGRAM IS TO EVALUATE POTENTIAL RESTRAINT CONCEPTS BOTH ANALYTICALLY AND EMPIRICALLY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DESIGN CRITERIA + FUEL ELEMENT BOWING + CORE COMPONENTS + *CORE RESTRAINT

18-10596C ALSO IN CATEGORIES 1 AND 9 AND 11 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-22 +. 179 PAGES, AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, AUG. 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING COMPONENTS NOT COVERED BY ASME CODE, CONTROL RODS, SOURCE RANGE FLUX MONITORING SYSTEM, SODIUM DUMP SYSTEM, SODIUM FIRE PROTECTION SYSTEM, AND CUMULATIVE MECHANICAL DAMAGE FUNCTION. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING THE ABOVE MENTIONED SUBJECTS.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105980 *CONTINUED*
AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*NRC QUESTION + CODES AND STANDARDS + CONTAINMENT DESIGN + DESIGN CRITERIA + STORAGE CONTAINER + EQUIPMENT + *REPORT, PSAR + INSTRUMENT, STARTUP RANGE + FIRE PROTECTION + *CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

18-105981 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.19 - GENERAL CRITERIA FOR SYSTEM HANDLING IRRADIATED FUEL
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.19-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SYSTEMS WHICH HANDLE OR CONTAIN IRRADIATED FUEL ASSEMBLIES WILL CONFORM SPECIFICALLY TO THE FOLLOWING CRBRP GENERAL DESIGN CRITERIA: 61, 62 AND 63 WHICH ARE ESSENTIALLY IDENTICAL TO THE RELATED CRITERIA IN 10CFR50. THE DESIGN FEATURES NECESSARY TO MEET THE CRITERIA 61, 62 AND 63 ARE ADDRESSED IN DETAIL IN SECTION 9.1.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*FUEL HANDLING + *NRC DESIGN CRITERIA + *FUEL STORAGE + RADIATION SAFETY AND CONTROL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

18-105982 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 1.28 - LOSS OF HEAT REMOVAL SYSTEM TO HEAD ACCESS AREA
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.28-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE LOSS OF THE HEAT REMOVAL SYSTEM FOR THE HEAD ACCESS AREA WOULD RESULT IN A NATURAL CONVECTIVE AIR FLOW THAT WOULD TRANSFER HEAT TO THE REACTOR CONTAINMENT BUILDING ATMOSPHERE. IN THE WORST CASE (LOSS OF OFF-SITE POWER AND POWER TO THE HEAD ACCESS AREA COOLING SYSTEM) THE RCB ATMOSPHERE IS EXPECTED TO RISE TO A MAXIMUM OF 120 F FROM ITS NORMAL TEMPERATURE OF 80 TO 85 F. THIS WOULD RESULT IN A TEMPERATURE RISE OF THE COMPONENTS WITHIN THE HEAD ACCESS AREA WHICH WILL NOT EXCEED 40 F.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT + CONTAINMENT + HEAT TRANSFER + *ACCIDENT, LOSS OF POWER + RESPONSE TO NRC QUESTION + *COOLING + COMPARTMENT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-105983 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.58 - VISUAL INSERVICE INSPECTION
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.58-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

VISUAL INSPECTION OF THE EXTERIOR SURFACE OF ALL SODIUM-RETAINING BOUNDARIES IS THE ONLY TYPE OF IN-SERVICE INSPECTION WHICH IS PRACTICAL AND WITHIN THE STATE-OF-THE-ART TODAY. VISUAL INSPECTION CAPABILITY IS BEING PROVIDED THROUGHOUT THE PRIMARY SYSTEM OF CRBRP VIA TELEVISION CAMERAS, PERISCOPES, AND/OR CONTACT MEANS. HOWEVER, THE NEED FOR ADDITIONAL ASSURANCE OF VIABLE HARDWARE IS RECOGNIZED. FOR THIS PUPOSE, MULTIPLE, REDUNDANT, LEAK DETECTION SYSTEMS (SECTION 7.5.5 OF THE PSAR) ARE PROVIDED TO DETECT VERY SMALL LEAKS, IF ANY SHOULD DEVELOP, AND PERMIT PLANT SHUTDOWN BEFORE ANY SIGNIFICANT LOSS OF SODIUM CAN OCCUR.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

STORAGE CONTAINER + NOZZLE + *REMOTE MANIPULATING AND VIEWING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + PRESSURE VESSELS + PIPES AND PIPE FITTINGS + *INSERVICE INSPECTION

18-105984 DATED 1975
RESPONSE TO QUESTION 1.73 - SODIUM LEAK PATHS UNDER CDA CONDITIONS
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.73-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

UNDER THIRD LEVEL DESIGN LOADING CONDITIONS, AN UPWARD PRESSURE PULSE WOULD CAUSE THE LARGE ROTATING PLUG, INTERMEDIATE ROTATING PLUG, AND SMALL ROTATING PLUG TO IMPACT SEQUENTIALLY AGAINST THE MARGIN SHEAR RINGS. THIS LOADING WOULD MAKE THE HEAD/RISER ASSEMBLY DEFLECT WITH MAXIMUM DEFLECTION OCCURRING AT THE SMALL ROTATING PLUG. THE RISER STRUCTURES WOULD MAINTAIN THEIR CONCENTRICITY AT THE UPPER END AND PROVIDE PASSAGE FOR SODIUM THROUGH THE RISER ANNULUS. LEAKAGE PATHS TO THE HEAD ACCESS AREA COULD DEVELOP ONLY THROUGH THE BEARING ASSEMBLIES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *RESPONSE TO NRC QUESTION + *LEAK + PRESSURE TRANSIENT + CLINCH RIVER (LMFBR) + *ACCIDENT, CORE DISRUPTIVE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105985 DATED 1975
RESPONSE TO QUESTION 1.79 - GAS SUPPRESSOR PLATE
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.79-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE GAS ENTRAINMENT SUPPRESSOR PLATE ASSEMBLY IS SUSPENDED FROM THE LOWER RADIOLOGICAL SHIELD PLATE INTO THE VESSEL OUTLET PLENUM TO A DEPTH OF 110.65 INCHES BELOW THE TOP OF EACH ROTATING PLUG. THIS ASSEMBLY PROTECTS THE HEAD SHIELDING FROM BEING CONTACTED BY THE CORE COOLANT AND MINIMIZES THE AMOUNT OF COVER GAS ENTRAINED WITHIN THE CORE COOLANT. THE ASSEMBLY IS DESIGNED TO ACCOMMODATE ALL OPERATING. UPSET. EMERGENCY. AND FAULTED EVENTS. FOR THE THIRD LEVEL DESIGN MARGIN LOADINGS. THE SUPPRESSOR PLATE ASSEMBLY WOULD BE DRIVEN UP AGAINST THE LOWER SHIELD PLATE.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

COVER GAS + RESPONSE TO NRC QUESTION + *COMPONENTS + *EFFECT + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR) + PRESSURE VESSELS + *ACCIDENT. CORE DISRUPTIVE

18-105987 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.87 - BACKUP SEALS FOR CDA
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.82-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE CURRENT DESIGN OF THE RISER ASSEMBLIES INCORPORATES A BACKUP SEAL FOR THIRD LEVEL DESIGN MARGIN ON THE ASSUMPTION THAT THE INFLATED ELASTOMER DYNAMIC SEALS MAY NOT HAVE THE CAPABILITY OF CONTAINING THE MASS OF LIQUID SODIUM PROPELLED UPWARD UNDER SOME HYPOTHESIZED MARGIN LOADING INCIDENT. THE BACKUP SEAL IS DESIGNED TO STOP SODIUM FLOW THROUGH THE BEARING RACES. WHICH WOULD SEPARATE UNDER THE RELATIVE MOTION OF THE ROTATING PLUGS RESULTING FROM A THIRD LEVEL DESIGN MARGIN.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

CONTAINMENT + DESIGN CRITERIA + CONTAINMENT INTEGRITY + *SEAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + ACCIDENT. CORE DISRUPTIVE + *CONTROL ROD DRIVES

18-105988 DATED 1975
RESPONSE TO QUESTION 1.99 - OSCILLATIONS OF FREE SURFACES FOLLOWING SCRAM
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.99-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

SUBSTANTIAL FLOW OSCILLATIONS DO NOT OCCUR FOLLOWING REACTOR SCRAM. THE FREE SURFACES IN THE REACTOR COOLANT SYSTEM ARE (1) THE FREE SURFACE IN THE REACTOR VESSEL. (2) THE FREE SURFACES IN EACH OF THE THREE PRIMARY PUMP TANKS AND (3) POSSIBLY A FREE SURFACE AT THE HIGH POINT OF THE PRIMARY SIDE OF THE IHX IN THE ANNULUS BETWEEN THE OUTER SHELL AND THE TUBE BUNDLE SUPPORT CYLINDER. THE ONLY GAS WHICH WOULD BE UNDER ANY SIGNIFICANT PRESSURE WOULD BE THAT WHICH MAY ACCUMULATE IN THE IHX.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

SCRAM. REAL + *REACTOR COOLANT + COVER GAS + *SURFACE + RESPONSE TO NRC QUESTION + *OSCILLATION + CLINCH RIVER (LMFBR)

18-105989 DATED 1975
RESPONSE TO QUESTION 1.100 - FORCES TO CENTER SHAFT IN HYDROSTATIC BEARING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.100-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

VENDOR INFORMATION SHOWS THAT THE CRBRP PUMP HYDROSTATIC BEARING WILL HAVE A LOAD CAPACITY AT PONY MOTOR SPEED OF ABOUT 165 LBS. AMPLE FOR THE EXPECTED TOTAL SIDE LOAD OF ABOUT 50 LBS. BECAUSE THE PUMP ROTOR IS COUPLED TO THE DRIVE MOTOR BY A RIGID SPOOL TYPE COUPLING AND THE UPPER ROTOR SUPPORT IS IN THE LOWER MOTOR BEARING. A 50 MILS ANTICIPATED MAXIMUM RADIAL MISALIGNMENT OF THE HYDROSTATIC BEARING WILL CAUSE AN 18 LBS RADIAL SIDE LOAD ON THE BEARING AT STARTUP. BASED ON VENDOR BEARING ANALYSIS. THE JOURNAL UNDER THIS LOAD CONDITION WILL BE SUPPORTED BY A 5 MILS THICK FLUID FILM AT A SHAFT SPEED OF APPROXIMATELY 30 RPM.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

HYDRAULIC EFFECT + PRESSURE. INTERNAL + RESPONSE TO NRC QUESTION + LUBRICATION + *BEARING + CLINCH RIVER (LMFBR) + *PUMPS

18-105990 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.108 - STRUCTURAL EVALUATION PLAN (SEP)
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.108-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-105990 *CONTINUED*
SEPS ARE INVOKED BY RDT F9-4 WHICH IS A MANDATORY RDT STANDARD FOR ALL DESIGNS TO THE ASME CODE FOR TEMPERATURES ABOVE 800 F. WHEN A SINGLE SEP INVOLVES TWO OR MORE REACTOR MANUFACTURERS (RMS), THE LEAD REACTOR MANUFACTURER (LRM) SHALL REVIEW AND APPROVE. WHEN A SINGLE SEP INVOLVES AN RM AND IS PREPARED BY THEM FOR THEIR DESIGN, IT SHALL BE REVIEWED AND APPROVED BY THE LRM. WHEN A SINGLE SEP IS CREATED FOR AN RM BY ONE OF ITS SUPPLIERS, THE RM SHALL REVIEW AND APPROVE.

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DESIGN CRITERIA + *REVIEW + RESPONSE TO NRC QUESTION + *STRUCTURAL INTEGRITY + CLINCH RIVER (LMFBR)

18-105991 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.110 - DYNAMIC LOAD ON IHX FROM STEAM GENERATOR FAILURE
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.110-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN EVALUATING THE STRUCTURAL ADEQUACY OF THE IHX WITH RESPECT TO THE SODIUM WATER REACTION, THE DYNAMIC NATURE OF THE INTERMEDIATE SODIUM PRESSURE HISTORY IS BEING ACCOUNTED FOR BY USING DYNAMIC LOAD FACTORS. THE FACTOR WILL BE APPLIED TO THE MAXIMUM INTERMEDIATE PRESSURE WHICH IN TURN IS USED TO DETERMINE THE PRESSSURE-INDUCED PRIMARY STRESSES. THESE PRIMARY STRESSES ARE LIMITED BY THE EMERGENCY CONDITION ALLOWABLES OF CODE CASE 1592, PARAGRAPH 3224, AS MODIFIED BY RDT F9-4T.

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ACCIDENT + METAL WATER REACTION + *STRESS + RESPONSE TO NRC QUESTION + STEAM GENERATOR + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

18-105992 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 1.188 - DESIGN BASIS FOR EVST COOLING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.188-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN BASIS DECAY HEAT LOADS FOR THE EVST AND ITS COOLING SYSTEM, GIVEN IN SECTION 9.1.3.1.1 (1103 KW AND 1332 KW), ARE RELATED TO THE TYPE AND NUMBER OF ASSEMBLIES, THEIR OPERATING AND DECAY TIMES, AND POWER LEVELS, AND THEIR BURNUP AS SHOWN IN TABLE Q001.188-7. THESE CALCULATIONS WERE PERFORMED AT AN EARLY TIME IN THE CRBRP PROGRAM AND CONTAIN DESIGN MARGINS.

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DECAY HEAT + DESIGN CRITERIA + FUEL STORAGE + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *COOLING + CLINCH RIVER (LMFBR)

18-105993 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 1.189 - FHC SPENT FUEL STORAGE TANK COOLING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.189-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN BASIS DECAY LOADS FOR THE FHC SPENT FUEL STORAGE TANK AND ITS COOLING SYSTEM, GIVEN IN SECTION 9.1.3.2.1 (51 KW AND 36 KW) ARE RELATED TO THE TYPE AND NUMBER OF ASSEMBLIES AND DECAY POWER LEVELS AS SHOWN IN TABLE QCC1.189-1. THESE DESIGN CONDITIONS CONTAIN CONSERVATIVE DESIGN MARGINS AND CAN ACCOMMODATE FUTURE CHANGES IN THE REFUELING SCHEMES AND FUEL MANAGEMENT. AN EXPLANATION OF THE DESIGN HEAT LOADS IS GIVEN.

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DECAY HEAT + DESIGN CRITERIA + FUEL STORAGE + *STORAGE CONTAINER + RESPONSE TO NRC QUESTION + *COOLING + CLINCH RIVER (LMFBR)

18-105994 DATED 1975
RESPONSE TO QUESTION 1.190 - USE OF SIMULATED CORE ASSEMBLIES
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q001.190-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THERE ARE 367 SIMULATED CORE ASSEMBLIES PROVIDED IN THE CRBRP. THEY ARE USED FOR: (1) INITIAL REACTOR CORE LOADING, (2) REACTOR CORE UNLOADING, (3) CORE ASSEMBLY MODULE REPLACEMENT, AND (4) REMOVING JAMMED FUEL ASSEMBLIES. PRIOR TO THE FIRST REACTOR STARTUP, THE SIMULATED CORE ASSEMBLIES ARE REPLACED ON A ONE-FOR-ONE BASIS BY NEW FUEL, BLANKET AND CONTROL ASSEMBLIES. IF THE CORE IS UNLOADED, THE SIMULATED CORE ASSEMBLIES ARE INSERTED FOR SPENT CORE ASSEMBLIES ON A ONE-FOR-ONE BASIS.

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RESPONSE TO NRC QUESTION + *CORE COMPONENTS + CLINCH RIVER (LMFBR) + *FUEL LOADING + FUEL ELEMENTS

CATEGORY 18
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18-105955 ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 1.212 - LIMITING THE POTENTIAL SOURCE OF GASEOUS ACTIVITY
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 4 PAGES. 3 TABLES. PP. Q001.212-1 THRU Q001.212-4 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PROVIDES THE BASIS FOR LIMITING THE POTENTIAL SOURCE TO ISOTOPES OF KR. XE. I.

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*FISSION GAS RELEASE + IODINE + KRYPTON + XENON + *CONTROL + COVER GAS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-105956 ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 1.213 - DIFFUSION OF GASES THROUGH BUNA-N SEALS
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 3 PAGES. 1 FIGURE. PP. Q001.213-1 THRU Q001.213-3 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE ANALYSIS OF THE EVENT DESCRIBED IN SECTION 15.5.2.3 WAS BASED ON THE MAXIMUM MEASURED PERMEABILITIES FOR BUNA-N SEALS. TEST DATA FOR THIS TYPE OF SEALS ARE REPORTED IN REFERENCE 1. FIGURE Q01.213-1 WHICH IS ATTACHED TO THIS RESPONSE. THE DIFFUSION RATE FOR EACH ELEMENT WAS CALCULATED FROM ITS PERMEABILITY AND THE PROPER SEAL DIMENSIONS.

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DIFFUSION + *FISSION GAS RELEASE + SEAL + RESPONSE TO NRC QUESTION + POLYMERIC + CLINCH RIVER (LMFBR)

18-105957 DATED 1975
RESPONSE TO QUESTION 1.249 - IHTS PUMP OPERATING PRESSURE
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q001.249-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

IT IS A DESIGN BASIS THAT THE PHTS PUMPS OPERATE WITH 10 INCHES W.G. (0.36 PSIG) COVER GAS PRESSURE. SINCE THE PHTS AND IHTS PUMPS ARE BEING PROCURED AS IDENTICAL UNITS. THE IHTS PUMPS WILL ALSO OPERATE WITH ESSENTIALLY ATMOSPHERIC COVER GAS PRESSURE WITHOUT CAVITATION EVEN THOUGH THIS IS NOT A DESIGN BASIS. THIS TYPE OF IHTS OPERATION IS NOT ANTICIPATED. HOWEVER. BECAUSE THE IHTS PUMP COVER GAS PRESSURE REQUIREMENT IS 100 PSIG DURING NORMAL OPERATION.

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DESIGN CRITERIA + *PRESSURE. INTERNAL + RESPONSE TO NRC QUESTION + INTAKE + COOLING SYSTEM. SECONDARY + CLINCH RIVER (LMFBR) + *PUMPS

18-105958 DATED 1975
RESPONSE TO QUESTION 11.6 - SEISMIC AND QUALITY GROUP CLASSIFICATION OF SOLID WASTE SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q011.6-1 OF AMENDMENT 2 TO CLINCH RIVER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

THE STRUCTURE IN WHICH THE SOLID RADWASTE SYSTEM IS LOCATED IS DESIGNED TO SEISMIC CATEGORY III. PIPING IS DESIGNED TO SEISMIC CATEGORY III AND QUALITY GROUP D (AUGMENTED). WITH THE EXCEPTION OF THE ACTUAL SOLIDIFICATION EQUIPMENT. ALL EQUIPMENT IN THE SOLID RADWASTE SYSTEM IS DESIGNED TO QUALITY GROUP D (AUGMENTED). THE ACTUAL SOLIDIFICATION EQUIPMENT IS DESIGNED TO QUALITY GROUP D.

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WASTE TREATMENT + WASTE TREATMENT. SOLID + *WASTE TREATMENT. EQUIPMENT + RESPONSE TO NRC QUESTION + EQUIPMENT + *QUALITY ASSURANCE + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

18-105959 ALSO IN CATEGORY 10 DATED 1975
RESPONSE TO QUESTION 20.11 - POWER SOURCE OF THE AUXILIARY FEEDWATER SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q020.11-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PROVIDES COMMENT ON THE REDUNDANCY AND DIVERSITY OF POWER SOURCE INCORPORATED INTO THE DESIGN OF THE AUXILIARY FEEDWATER SYSTEM (AFS) AS DESCRIBED IN BTP APCSB 10-1. 'DESIGN GUIDELINES FOR AUXILIARY FEEDWATER SYSTEM PUMP DRIVE AND POWER SUPPLY DIVERSITY FOR PRESSURIZED WATER REACTOR PLANTS'.

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*STEAM + *ELECTRIC POWER + SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + REDUNDANCE + INDEPENDENCE + CLINCH RIVER (LMFBR) + *FEEDWATER

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18-106CCC DATED 1975
RESPONSE TO QUESTION 120.9 - CONDENSATION OF SODIUM ON REACTIVITY CONTROL SYSTEM
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q120.9-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN OF THE CRBRP PRIMARY CRDM/CRD IS BASICALLY THE SAME AS THAT USED ON THE FFTF PROGRAM. THIS DESIGN EMPLOYES SOME PROVEN DESIGN CONCEPTS THAT INHIBIT THE UPWARD MOVEMENT OF SODIUM VAPOR LADEN COVER GAS BY REDUCING THE ANNULUS WIDTH WHILE INCREASING THE LENGTH THEREBY MINIMIZING THE EFFECT OF NATURAL CONVECTION. TO FURTHER INSURE THE RELIABILITY OF THE PRIMARY CRDM/CRD A CONTINUOUS PRUGE SYSTEM CONSISTING OF RECYCLE COVER GAS WILL BE UTILIZED TO PROVIDE A CONSTANT DOWNWARD FLOW THROUGH THE ANNULI INTO THE REACTOR.

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*REACTOR CONTROL + RELIABILITY, SYSTEM + RESPONSE TO NRC QUESTION + OBSTRUCTION + CLINCH RIVER (LMFBR) + *CONTROL ROD DRIVES

18-106001 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 130.4 - LUMPED MASS SEISMIC SYSTEM ANALYSIS
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q130.4-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN A LUMPED MASS SEISMIC SYSTEM ANALYSIS, THE MASSES ARE CONCENTRATED AT A SERIES OF MASS-POINTS OR NODES. THE NODES ARE SELECTED AT CHANGE OF SECTIONS, AT LOCATIONS OF EQUIPMENT SUPPORT WHERE THE EQUIPMENT'S MASS IS LUMPED, AT LOCATIONS WHERE THE DYNAMIC RESPONSE IS DESIRED, AND AT INTERMEDIATE LOCATIONS TO LIMIT THE LENGTH OF THE ELEMENTS SO THAT THE MATHEMATICAL MODEL WILL ADEQUATELY REPRESENT THE ACTUAL SYSTEM.

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*ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + *STRUCTURAL ANALYSIS, DYNAMIC + SEISMIC DESIGN + CLINCH RIVER (LMFBR)

18-106002 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 222.36 - CONFORMANCE TO IEEE STANDARD 352-1975
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 2 PAGES, PP. Q222.36-1 THRU Q222.36-2 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP RELIABILITY PROGRAM IS STRUCTURED ALONG THE GUIDELINES PROVIDED IN IEEE 352-75 AND CONFORMS TO THE INTENT OF THAT STANDARD. THE STATED OBJECTIVE OF IEEE-352-75 IS TO PRESENT THE GENERAL PRINCIPLES THAT MAY BE USED TO EVALUATE THE QUALITATIVE AND QUANTITATIVE RELIABILITY AND AVAILABILITY OF SAFETY RELATED NUCLEAR POWER PLANT SYSTEMS. THUS, WHILE GENERAL PRINCIPLES MAY BE FOLLOWED, UTILIZATION OR NON-UTILIZATION OF SPECIFIC METHODS DESCRIBED IN THE STANDARD DOES NOT INDICATE A DEGREE OF CONFORMANCE.

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*CODES AND STANDARDS + DESIGN CRITERIA + *ELECTRIC POWER + RELIABILITY, SYSTEM + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106003 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 222.37 - QUALIFICATION PROCEDURES IN IEEE STANDARD 323-1974
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q222.37-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

TYPE TESTING, OPERATING EXPERIENCE, ANALYSIS OR COMBINATIONS THEREOF WILL BE USED TO DOCUMENT THAT CLASS IE EQUIPMENT WILL MEET OR EXCEED ITS PERFORMANCE REQUIREMENTS THROUGHOUT THE EQUIPMENT'S QUALIFIED LIFE.

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CODES AND STANDARDS + *TESTING + RELIABILITY, COMPONENT + RESPONSE TO NRC QUESTION + *EQUIPMENT + CLINCH RIVER (LMFBR)

18-106004 DATED 1975
RESPONSE TO QUESTION 310.11 - RADIOLOGICAL CONSEQUENCES FROM TURBINE TRIP
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE, PAGE Q310.11-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE BLANKETING EVENT CONCERNING THE RADIOLOGICAL CONSEQUENCES OF THE POSTULATED OCCURRENCE INVOLVES ASSUMING A COMPLETE RELEASE OF THE ACTIVITY ASSOCIATED WITH THE STEAM-WATER SYSTEM. THE ASSUMED RELEASE RESULTS IN A CONSERVATIVELY CALCULATED 2 HOUR SITE BOUNDARY DOSE OF 100 MREM - APPROXIMATELY 99 MREM ASSOCIATED WITH A WHOLE BODY DOSE AND 1 MREM DUE TO BETA SKIN DOSE. THE

CATEGORY 18
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18-106004 *CONTINUED*
ASSOCIATED DOSE IS LESS THAN 1% OF THE REQUIREMENTS OF 10CFR100.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + AIRBORNE RELEASE + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + RESPONSE TO NRC QUESTION + *TURBINE + CLINCH RIVER (LMFBR)

18-106005 DATED 1975
RESPONSE TO QUESTION 310.18 - RELEASES OF RADIOACITIVITY FROM CONTAINMENT
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q310.18-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINMENT ISOLATION WILL BE INITIATED IF SENSORS IN THE HEAD ACCESS AREA OF H/V DUCTS INDICATE ACTIVITY LEVELS AT A TO-BE-DETERMINED FRACTION OF 10CFR20. AS INDICATED IN SECTION 7.3 OF THE PSAR, THE REQUIREMENT FOR CONTAINMENT ISOLATION IS A DELAY TIME OF 4 SECONDS FROM TIME OF DETECTION TO EXHAUST ISOLATION. AS MENTIONED IN SECTION 6.2.4, THE AIR TRANSPORT TIME BETWEEN THE HEAD ACCESS AREA SENSOR AND ISOLATING SIGNAL IS SUCH THAT ACTIVITY WILL NOT BE RELEASED TO THE ATMOSPHERE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

*AIRBORNE RELEASE + *CONTAINMENT + CONTAINMENT ISOLATION + VENTILATION SYSTEM + RESPONSE TIME + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106006 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.45 - RADIOMETRIC DATING
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q323.45-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES ALL AVAILABLE DATA USED TO DEVELOP RADIOMETRIC DATES FOR MYLONITES ALONG THE COPPER CREEK FAULT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GEOLOGY + ARGON + DATA PROCESSING + POTASSIUM + *RADIOCHEMICAL ANALYSIS + RESPONSE TO NRC QUESTION + *FAULT + CLINCH RIVER (LMFBR)

18-106007 DATED 1975
RESPONSE TO QUESTION 331.13 - RADIATION ZONES GREATER THAN LEVEL II
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q331.13-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

UNDER NORMAL OPERATIONAL CONDITIONS ALL AREAS WITH RADIATION ZONES GREATER THAN LEVEL II ARE LOCATED IN THE REACTOR CONTAINMENT BUILDING, REACTOR SERVICE BUILDING INCLUDING THE RADWASTE AREA AND THE INTERMEDIATE BAY. ACCESS TO THE INTERMEDIATE BAY AREAS IS THROUGH FLOOR HATCHES REQUIRING REMOVAL OF SHIELD PLUGS OR THROUGH LOCKED DOORS. ALL ACCESS TO THE REACTOR SERVICE BUILDING AND REACTOR CONTAINMENT BUILDING IS THROUGH THE DOOR LOCATED BETWEEN LINES R4 AND R5 ON LINE RA ON PSAR FIGURE 1.2-11.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CONTAINMENT + OPERATION + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + RESPONSE TO NRC QUESTION + RADIATION EXPOSURE + CLINCH RIVER (LMFBR)

18-106008 DATED 1975
RESPONSE TO QUESTION 331.16 - PERSONNEL TRAFFIC PATTERN
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +, 1 PAGE, PAGE Q331.16-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JULY 25, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HEALTH PHYSICS LABORATORY IS LOCATED ADJACENT TO THE LOCKER ROOM COMPLEX. UPON ENTERING, PERSONNEL WILL PASS THROUGH THE HEALTH PHYSICS LABORATORY, RECEIVE INSTRUCTION AND APPROPRIATE DOSIMETRY, AND PROCEED TO THE LOCKER ROOM. WHILE IN THE LOCKER ROOM, PERSONNEL WILL REMOVE STREET CLOTHES, ACQUIRE CLEAN PROTECTIVE CLOTHING, AND PROCEED VIA CORRIDOR TO THEIR WORK STATIONS IN THE REACTOR SERVICE BUILDING OR OTHER LOCATIONS IN THE PLANT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

DOSIMETRY + CONTROL + CONTAMINATION + *RADIATION SAFETY AND CONTROL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + PERSONNEL PROTECTIVE CLOTHING

18-106009 DATED 1975
RESPONSE TO QUESTION 331.18 - RADIATION MONITORING EQUIPMENT

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106005 *CONTINUED*
PROJECT MANAGEMENT CORP
DOCKET-50537-22 +. 1 PAGE. PAGE Q331.18-1 OF AMENDMENT 2 TO CLINCH RIVER BREEDER LICENSE APPLICATION. JULY 25. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST.. AE--BURNS & ROE

PROVIDES THE CRITERIA FOR SELECTION OF PORTABLE AND LABORATORY TECHNICAL EQUIPMENT AND INSTRUMENTATION FOR PERFORMING RADIATION AND CONTAMINATION SURVEYS. FOR AIRBORNE RADIOACTIVITY SAMPLING. FOR AREA RADIATION MONITORING. AND FOR PERSONNEL MONITORING DURING NORMAL OPERATION. ANTICIPATED OPERATIONAL OCCURRENCES AND ACCIDENT CONDITIONS.

AVAILABILITY - MICROSURANCE. INC.. P.O. BOX 3522 OAK RIDGE. TENN. 37830

*DESIGN CRITERIA + MONITOR + RESPONSE TO NRC QUESTION + EQUIPMENT + MONITORING SYSTEM. RADIATION + MONITOR. AREA + CLINCH RIVER (LMFBR) + *RADIATION MONITORS

18-106121 DATED 1974
DICKSON PW
DESIGN AND STATUS OF THE CLINCH RIVER BREEDER REACTOR PLANT
WESTINGHOUSE ELECTRIC CORPORATION
CONF-741070-2 +. 26 PPS. FROM FRONTIERS OF POWER TECHNOLOGY CONFERENCE. HELD IN STILLWATER. OKLAHOMA. OCT. 9. 1974

BRIEFLY DESCRIBES THE DESIGN AS IT PRESENTLY EXISTS. INCLUDING THE PLANNED PHYSICAL LAYOUT. THE DESIGN OPERATING PARAMETERS. AND SOME OF THE HARDWARE. THE KEY MILESTONES LEADING TO CRITICALITY IN JULY. 1982 ARE ALSO NOTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR DESCRIPTION + SYSTEM DESCRIPTION + *CLINCH RIVER (LMFBR)

18-106178 ALSO IN CATEGORY 8 DATED 1972
DUMM K + SALERMANN F + SCHNITKER W
EXPERIMENTAL AND THEORETICAL INVESTIGATIONS ON SAFETY OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATOR WITH SODIUM-WATER REACTIONS
INTERATOM. BENSBERG/KOELN. F.R. GERMANY
ERDA-TR-27(VOL.1) +. 70 PPS. 15 REFS. APRIL 1972 (TRANSLATION)

A NUMBER OF LARGE SODIUM WATER REACTION TESTS HAS BEEN PERFORMED IN A STEAM GENERATOR MODEL IN ORDER TO VERIFY THE LAYOUT CRITERIA OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATORS UNDER ACCIDENT CONDITIONS. THE EXPERIMENTAL SETUP IS DESCRIBED. THE TEST RESULTS AND THEIR APPLICABILITY TO THE SNR STEAM GENERATORS ARE GIVEN AND DISCUSSED. (SEE ALSO VOL. 2)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

METAL WATER REACTION + TESTING + GERMANY + R AND D PROGRAM + STEAM GENERATOR

18-106179 ALSO IN CATEGORY 8 DATED 1972
DUMM K + SALERMANN F + SCHNITKER W
EXPERIMENTAL AND THEORETICAL INVESTIGATIONS ON SAFETY OF THE SNR STRAIGHT-TUBE DESIGN STEAM GENERATOR WITH SODIUM-WATER REACTIONS
INTERATOM. BENSBERG/KOELN. F.R. GERMANY
ERDA-TR-27(VOL.2) +. 113 PPS. 107 FIGS. APRIL 1972 (TRANSLATION)

EXPERIMENTAL AND THEORETICAL INVESTIGATIONS WERE CARRIED OUT IN BEHALF OF THE NETHERLANDS CONSORTIUM PARTNER. N.V. NERATOM. FOR BUILDING THE FAST SODIUM-COOLED BREEDER REACTOR SNR 300. THE TEST PLAN HAD A RUNNING TIME FROM THE BEGINNING OF 1968 TO THE BEGINNING OF 1972 WHICH INCLUDED THE MANUFACTURE AND INSTALLATION OF A LARGE STEAM GENERATOR MODEL AS WELL AS THE FINAL EVALUATION OF TESTING. THE TOTAL SCOPE OF WORK CARRIED ON IN ACCORDANCE WITH THE CONTRACT IS PRESENTED. (SEEL ALSO VOL. 1)

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*METAL WATER REACTION + TESTING + GERMANY + R AND D PROGRAM + STEAM GENERATOR

18-106467 ALSO IN CATEGORY 5 DATED 1975
DUTT DS + BAKER RB
SIEX - A CORRELATED CODE FOR THE PREDICTION OF LIQUID METAL FAST BREEDER REACTOR (LMFBR) FUEL THERMAL PERFORMANCE
HANFORD ENGINEERING DEVELOPMENT LAB.. RICHLAND. WASHINGTON
HEDL-TME 74-55 +. 77 PPS. 21 FIGS. 24 REFS. JUNE 1975

THE SIEX COMPUTER PROGRAM IS A STEADY STATE HEAT TRANSFER CODE DEVELOPED TO PROVIDE THERMAL PERFORMANCE CALCULATIONS FOR A MIXED-OXIDE FUEL ELEMENT IN A FAST NEUTRON ENVIRONMENT. FUEL RESTRUCTURING. FUEL-CLADDING HEAT CONDUCTION AND FISSION GAS RELEASE ARE MODELED TO PROVIDE ASSESSMENT OF THE TEMPERATURES. MODELING EMPHASIS HAS BEEN PLACED ON CORRELATIONS TO MEASURABLE QUANTITIES FROM EBR-II IRRADIATION TESTS AND THE INCLUSION OF THESE CORRELATIONS IN A PHYSICALLY BASED COMPUTATIONAL SCHEME. SIEX IS COMPLETELY MODULAR IN CONSTRUCTION ALLOWING THE WEAR OPTIONS FOR MATERIAL PROPERTIES AND CORRELATED MODELS.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106467 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + HEAT TRANSFER + THERMAL ANALYSIS + HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ROD + *PERFORMANCE

18-106505 ALSO IN CATEGORY 1 DATED 1975
DELVES PF
SODIUM RIG ENGINEERING: SAFETY PHILOSOPHY AND CODE OF PRACTICE
UKAEA REACTOR GROUP, RISLEY, UK
NP-20,417 +, 11 PPS, MARCH 1975

THE BROAD PRINCIPLES OF GOOD SODIUM ENGINEERING ARE STATED AGAINST THE BACKGROUND OF EXPERIENCES TO DATE, AND INCORPORATES THE COMMENTS AND VIEWS OF MANY FROM PARTICIPATING NATIONS. TOPICS SPECIFICALLY ADDRESSED INCLUDE ORGANIZATION, PLANT DESIGN, RIG CONTAINMENT, PERSONNEL, AND FIRE PROTECTION.

AVAILABILITY - HER MAJESTY'S STATIONERY OFFICE, P.O. BOX 569, LONDON, S.E.1, ENGLAND

GUIDE + *SAFETY PRINCIPLES AND PHILOSOPHY + R AND D PROGRAM + FIRE PROTECTION

18-106506 DATED 1974
FIFTY FIRST QUARTERLY REPORT, MAY-JULY 1974. CORE ENGINEERING (LIQUID METAL FAST BREEDER REACTOR PROGRAM)
GENERAL ELECTRIC COMPANY
GEAP-10,028-51 +, 100 PPS, FIGS, AUG. 1974

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING. FUEL ROD DESIGN ENGINEERING, FUEL ROD TEST PROGRAM, GRID-SPACER ASSEMELY, WIRE-WRAP FUEL ASSEMBLY, CORE COMPONENT STRUCTURAL CRITERIA, AND CORE RESTRAINT ENGINEERING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + DESIGN STUDY + CORE COMPONENTS + SUPPORT STRUCTURE + *R AND D PROGRAM + FUEL ROD

18-106507 DATED 1974
FIFTY SECOND QUARTERLY REPORT, AUGUST-OCTOBER 1974. CORE ENGINEERING (LIQUID) METAL FAST BREEDER REACTOR PROGRAM
GENERAL ELECTRIC COMPANY
GEAP-10,028-52 +, 100 PPS, FIGS, NOV. 1974

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: GRID-SPACER DRIVER ASSEMBLY, WIRE-WRAP ASSEMBLY ENGINEERING, CORE COMPONENT STRUCTURAL DESIGN CRITERIA, AND PROBABILISTIC DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + DESIGN STUDY + CORE COMPONENTS + SUPPORT STRUCTURE + *R AND D PROGRAM + PROBABILITY

18-106520 DATED 1970
SODIUM COOLED REACTORS FAST CERAMIC REACTOR DEVELOPMENT PROGRAM THIRTY-FIFTH QUARTERLY REPORT MAY 1970-JULY 1970
GENERAL ELECTRIC COMPANY
GEAP-10026-35 +, 140 PPS, 74 FIGS, SEPT. 1970

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING SUBJECTS: DEFECTED FUEL BEHAVIOR; TRANSIENT OVERPOWER EXPERIMENTS, LOSS OF FLOW; FUEL MATERIALS PROPERTIES AND PERFORMANCE EVALUATION; FAST FLUX TESTS, CORE DESIGN ANALYSIS, KINETIC ANALYSIS, CLADDING DEVELOPMENT, CORE PHYSICS ANALYSIS; AND FUEL ELEMENT DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FUEL BURNUP + ACCIDENT, LOSS OF FLOW + REACTOR TRANSIENT + DESIGN STUDY + REACTOR PHYSICS + *R AND D PROGRAM + FUEL ROD

18-106672 ALSO IN CATEGORIES 5 AND 7 AND 11 A DATED 1975
REVISIONS TO THE SAR
PROJECT MANAGEMENT CORP., TENN.
400 PGS, LTR W/AMENDMENT 5 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, OCT. 6, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

AMENDS THE PRELIMINARY SAR BY SUBMITTING TWO APPENDICES, (E) PRIMARY PIPE RUPTURE FALLBACK POSITION AND (F) CORE DISRUPTIVE ACCIDENT ACCOMMODATION. THESE INCLUDE DETAILS OF THE PARALLEL DESIGN IN WHICH A PRIMARY PIPE RUPTURE AND A CORE DISRUPTIVE ACCIDENT RESPECTIVELY ARE TREATED AS DESSIGN BASIS ACCIDENTS. INCLUDES DESCRIPTIONS OF THE INITIATING ACCIDENTS, EVALUATIONS, DESIGN REQUIREMENTS, ALTERNATIVE ADDITIONAL PARALLEL DESIGN FEATURES AND ASSESSMENT OF DESIGN CAPABILITIES NECESSARY FOR TREATMENT OF THESE EXTREME AND LOW PROBABILITY ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106672 *CONTINUED*
*ACCIDENT ANALYSIS + ACCIDENT + DESIGN CRITERIA + *REPORT, PSAR + MAIN COOLING SYSTEM + SYSTEM CAPABILITY + ACCIDENT, DESIGN BASIS + *CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS + ACCIDENT, CORE DISRUPTIVE

18-106710 DATED 1975
AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR PLANT ENVIRONMENTAL REPORT
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-9 +. 389 PGS. OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

INCLUDES INFORMATION PREVIOUSLY SUBMITTED IN RESPONSE TO NRC LETTERS AND CORRECTED PAGES FOR THE TEXT OF THE ENVIRONMENTAL REPORT; AFFECTED SECTIONS ARE 1, 2, 3, 9, 10, & 13.

AVAILABILITY - MICROSURANCE, IN., P.O. BOX 3522, OAK RIDGE, TENN. 37830

NRC QUESTION + CLINCH RIVER (LMFBR) + REPORT, ENVIRONMENTAL

18-106711 DATED 1975
RESPONSE TO QUESTION 010.2 (SECTION 3.5) - RADWASTE SYSTEM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 2 TABS, PG. A1-9 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LISTS THE CAPACITIES AND VOLUMES FOR THE COMPONENTS IN THE RADWASTE SYSTEMS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

WASTE TREATMENT + RESPONSE TO NRC QUESTION + SYSTEM CAPACITY + CLINCH RIVER (LMFBR)

18-106712 ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 010.3 (SECTION 3.5) - CHARCOAL DELAY BEDS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 3 FIGS, PP. A1-7 THRU A1-18 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENT DESIGN OF THE DELAY BEDS HAS EACH BED CONTAINING 625 POUNDS OF CHARCOAL. CURRENT DESIGN OF THE CAPS CHARCOAL BEDS INCLUDES AN OPERATING PRESSURE OF 35 PSIG AND AN OPERATING TEMPERATURE OF ABOUT -140 DEGREES F. DESIGN OF THE RAPS CHARCOAL BEDS INCLUDES AN OPERATING PRESSURE OF 30 PSIG AND AN OPERATING TEMPERATURE RANGE OF FROM -70 DEGREES F TO -210 DEGREES F.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

FILTER SYSTEM + CHARCOAL ADSORBER + CHARCOAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106713 DATED 1975
RESPONSE TO QUESTION 010.4 (SECTION 3.5) - COMPUTER CODES FOR SOURCE TERMS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 5 PGS, 6 TABS, PP A1-11 THRU A1-21 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DESIGN VALUES FOR THE FISSION PRODUCT ISOTOPIC RADIOACTIVITY IN THE HEAT TRANSPORT SYSTEM SODIUM ARE DEVELOPED USING A TWO-STEP MODEL PROCEDURE. THE FIRST STEP ESTABLISHES THE ISOTOPIC EQUILIBRIUM OR TOTAL ACTIVITY RELEASED FROM THAT FRACTION OF FUEL CONTAINING SMALL CLAD DEFECTS. THE SECOND STEP ESTABLISHES THE DISTRIBUTION OF THIS ACTIVITY BETWEEN THE SODIUM COOLANT AND THE 'WETTED' SURFACES (INCLUDING COLD TRAPS) OF THE HEAT TRANSPORT SYSTEMS (HTS).

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + ANALYTICAL MODEL + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106714 DATED 1975
RESPONSE TO QUESTION 010.5 (SECTION 3.5) - FISSION PRODUCT INVENTORY IN PRIMARY COOLANT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 2 TABS, PP. A1-22, A1-25 THRU A1-26 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MODEL CURRENTLY BEING USED IN THE CRBRP ANALYSIS FOR DETERMINING THE RELEASE OF FISSION PRODUCT ACTIVITY FROM FUEL RODS CONTAINING SMALL CLAD DEFECTS DOES NOT EMPLOY THE 'ESCAPE RATE COEFFICIENT' MODEL USED BY LIGHT WATER REACTOR DESIGNERS. INSTEAD, THE MODEL CURRENTLY USED BY ARD EMPLOYS A 'FISSION PRODUCT ESCAPE FRACTION' MODEL. THE FISSION PRODUCT ESCAPE FRACTIONS WERE DEVELOPED FROM A MODEL SIMILAR TO THAT USED FOR THE PHENIX AND FFTF.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN., 37830

ANALYTICAL MODEL + FISSION PRODUCT RETENTION + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106715 DATED 1975
RESPONSE TO QUESTION 010.6 (SECTION 3.5) - RADIOACTIVITY LEAKAGE RATES FROM COOLANT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 5 PGS, 3 TABS, PP. A1-27 THRU A1-37 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

JUSTIFIES THE ASSUMED LEAKAGE RATES FROM THE REACTOR COOLANT SYSTEM AND OTHER SYSTEMS CONTAINING RADIOACTIVITY FOR BOTH LIQUIDS AND GASES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

REACTOR COOLANT + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + LEAK RATE + CLINCH RIVER (LMFBR)

18-106716 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION 010.7 (SECTION 3.5) - RADIATION MONITORING INSTRUMENTATION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 3 PGS, 2 FIGS, 1 TAB, PP A1-38 THRU A1-44 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP DESIGN SYSTEMS FOR TREATING THE RADIOACTIVE LIQUID AND GASEOUS WASTES WERE SELECTED ON THE BASIS OF EQUIPMENT PERFORMANCE DATA AT OPERATING LIGHT WATER REACTORS AS WELL AS FROM FFTF DESIGN INFORMATION. EQUIPMENT SIZES, ARRANGEMENTS AND PROCESS REQUIREMENTS ARE BASED ON CONSERVATIVE ESTIMATES OF SYSTEM LEAKAGE, DECONTAMINATION REQUIREMENTS AND ACTIVITY CONCENTRATIONS. IN ADDITION, RADIATION MONITORING OF PROCESS SYSTEMS PROVIDES EARLY WARNING OF EQUIPMENT MALFUNCTION AND POTENTIAL RADIOLOGICAL HAZARDS AND PREVENTS RELEASE OF ACTIVITY TO THE ENVIRONMENT IN EXCESS OF 10 CFR 20 LIMITS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

RELEASE RATE + WASTE TREATMENT + RESPONSE TO NRC QUESTION + GAS + LIQUID + CLINCH RIVER (LMFBR) + RADIATION MONITORS

18-106717 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.4 (SECTION 2.6.2.3) - HUMIDITY DATA AT CRBRP SITE
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-64 THRU A1-65 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ON-SITE HUMIDITY DATA IS NOT AVAILABLE AT THIS TIME. EVIDENCE OF THE REPRESENTATIVENESS CANNOT BE PROVIDED ON A QUANTITATIVE BASIS, BUT ON A QUALITATIVE BASIS. THE BULL RUN DATA IS INFLUENCED BY THE RIDGES RUNNING NORTHEAST AND SOUTHWEST AS WELL AS BY THE CLINCH RIVER PROVIDING AN ABUNDANT SOURCE OF ATMOSPHERIC MOISTURE. THIS IS SIMILAR TO THE SITUATION AT THE CRBRP SITE. HOWEVER, A COMPARISON CAN BE MADE BETWEEN BULL RUN STEAM PLANT DATA AND KNOXVILLE DATA. THIS COMPARISON IS FOR THE MOST ADVERSE CONDITIONS, LOW TEMPERATURE AND HIGH HUMIDITY AND IS PRESENTED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

SITE CLIMATOLOGY + HUMIDITY, RELATIVE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106718 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.13 - METEOROLOGICAL DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-71 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE WIND SPEED USED IN THE EVALUATION WAS A MEAN SPEED FROM THE 75-FOOT AND 200-FOOT WIND LEVELS OF THE CRBRP METEOROLOGICAL TOWER. THE FREQUENCY OF WIND DIRECTION WAS BASED UPON THE DIRECTION DISTRIBUTION OF DATA FROM THE 75-FOOT LEVEL AT THE SAME LOCATION. THE TEMPERATURE AND RELATIVE HUMIDITY DATA WAS OBTAINED FROM THE TVA BULL RUN STEAM PLANT WHERE THE HEIGHT OF THE SENSORS ABOVEGROUND WAS FOUR FEET.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

SAFETY ANALYSIS REPORT, METEOROLOGY + SITE CLIMATOLOGY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106719 DATED 1975
RESPONSE TO QUESTION 340.3 (SECTION 10.1) - PLANT AVERAGE CAPACITY FACTOR
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-9 +. 1 PAGE, PAGE A1-73 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CAPACITY FACTOR IS THE RATIO OF THE AVERAGE PLANT LOAD FOR THE PERIOD OF TIME CONSIDERED TO THE RATED PLANT CAPACITY. THEREFORE, THE AVERAGE PLANT CAPACITY FACTORS FOR THE FOUR TIME PERIODS GIVEN ABOVE ARE: FIRST 5 YEARS - 55.2%; NEXT 5 YEARS - 75.1%; NEXT 10 YEARS - 80.2%; FINAL 10 YEARS - 60.2%. OVER 30 YEARS OF PLANT OPERATION THE AVERAGE CAPACITY FACTOR IS 68.5 PERCENT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522, OAK RIDGE, TENN. 37830

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106719 *CONTINUED*
OPERATION + RESPONSE TO NRC QUESTION + PERFORMANCE + CLINCH RIVER (LMFBR)

18-106720 DATED 1975
RESPONSE TO QUESTION 340.5 (SECTION 10.5) - ALTERNATE BIOCIDE SYSTEMS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-75 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

COMPARES ALTERNATIVE BIOCIDE SYSTEMS GIVING QUANTITATIVE INDICATIONS OF RELATIVE COSTS, RELATIVE AMOUNTS OF CHLORINE REQUIRED, AND RELATIVE EFFECTS ON PLANT PERFORMANCE.

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CHLORINE + RESPONSE TO NRC QUESTION + EFFECT + BIOCHEMICAL + BIOLOGICAL CONTROL + CLINCH RIVER (LMFBR)

18-106721 DATED 1975
RESPONSE TO QUESTION 350.1 (SECTION 2.5.1.3) - CLINCH RIVER FLOW
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-9 +. 1 PAGE, PAGE A1-76 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP CAN BE SAFELY SHUT DOWN AND MAINTAINED IN A SAFE SHUTDOWN CONDITION WITHOUT MAKEUP WATER REQUIRED FROM THE CLINCH RIVER. THUS, FROM THE STANDPOINT OF SAFETY, THE CRBRP IS COMPLETELY INDEPENDENT OF THE FLOW IN THE CLINCH RIVER AT THE SITE.

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RIVER, CLINCH + RESPONSE TO NRC QUESTION + FLOW + REACTOR SHUTDOWN + CLINCH RIVER (LMFBR)

18-106722 DATED 1975
RESPONSE TO QUESTION 350.2 (SECTION 2.7.1.4.2) - WATERFOWL DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-78 THRU A1-79 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRELIMINARY WATERFOWL INVESTIGATIONS WERE CONDUCTED AT THE CRBRP SITE DURING THE PERIOD OCTOBER-MARCH 1972-1973 AND 1973-1974. THE PURPOSE OF THESE INVESTIGATIONS WAS TO DOCUMENT USE OF THE SITE ENVIRONS BY WINTERING DUCKS, GEESE, RAPTORS AND SHOREBIRDS. ADDITIONALLY, SURVEYS OF RESIDENT BREEDING WOOD DUCK POPULATIONS WERE CONDUCTED DURING THE PERIOD MARCH 13, 1973 - JUNE 26, 1973. OBSERVATIONS OF OTHER WETLAND BIRD SPECIES, AS WELL AS RAPTORS, ARE ALSO TAKEN DURING WOOD DUCK COUNTS. FURTHER INVENTORY OF THE CRBRP SITE WAS RESUMED IN DECEMBER 1974. DATA SUMMARIES WILL BE PREPARED AND DISTRIBUTED TWICE YEARLY.

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SITING + RESPONSE TO NRC QUESTION + SURVEY + ANIMAL, BIRD + CLINCH RIVER (LMFBR)

18-106723 DATED 1975
RESPONSE TO QUESTION 350.11 (SECTION 3.4.3) - MONITORING CHLORINE IN DISCHARGE
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-81 THRU A1-82 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CHLORINE DOSAGE WILL BE AUTOMATICALLY CONTROLLED TO SATISFY THE CHLORINE DEMAND OF THE COOLING WATER AND WILL BE DETERMINED DURING STARTUP. OPERATION OF THE CHLORINE INJECTORS WILL BE COORDINATED BY COMMERCIALLY AVAILABLE FEEDBACK CONTROL INSTRUMENTATION TO PREVENT THE DAILY AVERAGE AND ONE-DAY MAXIMUM FREE AVAILABLE CHLORINE CONCENTRATION IN THE BLOWDOWN FROM EXCEEDING FEDERAL EPA LIMITS.

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EFFLUENT + MONITOR + CHLORINE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106724 DATED 1975
RESPONSE TO QUESTION 350.13 (SECTION 6.1.1.1) - RIVER BANK SAMPLING STATIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-83 THRU A1-84 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PURPOSE OF THE AQUATIC BASELINE MONITORING PROGRAM AT THE SITE WAS TO IDENTIFY AND CHARACTERIZE: (1) PHYSICAL AND CHEMICAL PARAMETERS, (2) EXISTING BIOLOGICAL COMMUNITIES, AND (3) ENDANGERED SPECIES. THE EFFECTS OF ENTRAINMENT CAN BE ESTIMATED ON THE BASIS OF THE PERCENTAGE OF CLINCH RIVER FLOW TAKEN INTO THE PLANT AND THE CORRESPONDING NUMBERS OF PLANKTON ESTIMATED IN THE VOLUME OF WATER TAKEN INTO THE PLANT. AFTER THE PLANT IS IN OPERATION, AN ADDITIONAL TRANSECT WILL BE LOCATED BELOW THE INTAKE TO VERIFY THE ESTIMATED EFFECT OF ENTRAINMENT.

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18-106724 *CONTINUED*
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RIVER + SAMPLING + RESPONSE TO NRC QUESTION + MONITORING PROGRAM, ENVIRONMENTAL + PHYTOPLANKTON + CLINCH RIVER (LMFBR)

18-106725 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION A1 - OTHER PLUME SOURCES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-94 THRU A1-95 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUEN 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTACT WAS MADE WITH THE ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION LOCATED AT OAK RIDGE, TENNESSEE, TO OBTAIN INFORMATION ABOUT OTHER POSSIBLE PLUME SOURCES IN THE AREA OF THE SITE. DRS. GARRY BRIGGS, STEVE HANNA AND RAY HOSKER HAVE STUDIED MANY PLUME SOURCES IN THE OAK RIDGE AREA AND HAVE INDICATED THAT THERE ARE ONLY FIVE POSSIBLE PLUME SOURCES WITHIN A 15-MILE RADIUS OF THE CRBRP SITE. THESE FIVE POSSIBLE PLUME SOURCES ARE IDENTIFIED.

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PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106726 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION A2 - COOLING TOWER PLUME LENGTHS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-96 THRU A1-97 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY DISTRIBUTION TABLE (IN PERCENT) OF DIRECTION AND INCREMENTAL DISTANCES FROM THE COOLING TOWERS OF PLUME LENGTHS ON AN ANNUAL BASIS.

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PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + COOLING TOWER + CLINCH RIVER (LMFBR)

18-106727 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION A3 - FOG AND ICE OBSERVATION PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-98 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PLANS FOR THE FOG AND ICE OBSERVATION PROGRAM HAVE NOT BEEN FORMALIZED. IT IS ANTICIPATED THAT THIS PROGRAM WILL BE LIMITED TO ROUTINE VISUAL INSPECTION BY PLANT PERSONNEL OF THE COOLING TOWER PLUME AND THE PLUME'S RELATION TO FOG AND ICE OCCURRENCE AT THE SITE. THE DEGREE OF PROGRAM SOPHISTICATION AND OTHER OPTIONS WILL BE INVESTIGATED AND DETAILS OF THE PROGRAM DEFINED APPROXIMATELY TWO YEARS PRIOR TO PLANT OPERATION.

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FOG + SITE CLIMATOLOGY + RESPONSE TO NRC QUESTION + WEATHER, SEVERE + CLINCH RIVER (LMFBR)

18-106728 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION A4 - COOLING TOWER PLUME
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-99 THRU A1-100 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY TABLE (IN PERCENT) OF DIRECTION AND INCREMENTAL DISTANCE FROM THE COOLING TOWERS FOR FOGGING AND ICING DUE TO COOLING TOWER PLUME.

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FOG + PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + COOLING TOWER + EFFECT + CLINCH RIVER (LMFBR)

18-106729 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION A5 - COOLING TOWER DRIFT DEPOSITION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 1 TAB, PP. A1-101 THRU A1-103 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A JOINT FREQUENCY PROBABILITY TABLE OF DIRECTION AND INCREMENTAL DISTANCE FROM THE COOLING TOWERS FOR DRIFT DEPOSITION.

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DEPOSITION + RESPONSE TO NRC QUESTION + COOLING TOWER + EFFECT + CLINCH RIVER (LMFBR)

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18-106730 ALSO IN CATEGORIES 9 AND 16 DATED 1975
RESPONSE TO QUESTION A6 - ON-SITE HUMIDITY DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-104 THRU A1-105 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICNESE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURRENTLY IN USE IS A BELFORT INSTRUMENT CO. MODEL 5-594 HYGROTHERMOGRAPH (4 FEET ABOVEGROUND, IN A STEVENSON SCREEN) WITH AN AMBIENT TEMPERATURE CHART RANGE OF -30 TO +110 DEGREES F AND RELATIVE HUMIDITY RANGE OF 0 TO 100 PERCENT. THE MAXIMUM POSSIBLE RELATIVE HUMIDITY ERROR IS + OR - 4 PERCENT. THE READING ACCURACY OF TEMPERATURE IS TO THE NEAREST WHOLE DEGREE. DATA IS RECORDED ON ANALOG STRIP-CHARTS AND MUST BE REDUCED MANUALLY. A MORE ELABORATE RELATIVE HUMIDITY SYSTEM, TO BE INSTALLED IN THE NEAR FUTURE, WILL ELECTRONICALLY RECORD THE AMOUNT OF AMBIENT WATER VAPOR IN THE AIR. A YEAR'S RECORD IS TO BE COLLECTED AND ANALYZED FOR FUTURE UTILIZATION.

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*INSTRUMENT, METEOROLOGICAL + SITE CLIMATOLOGY + HUMIDITY, RELATIVE + RESPONSE TO NRC QUESTION + WEATHER DATA + CLINCH RIVER (LMFBR)

18-106731 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION A6A - HYGROTHERMOGRAPH
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-105 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INITIAL HYGROTHERMOGRAPH WAS NOT INTENDED FOR USE IN HEAT DISSIPATION FOGGING ANALYSIS AND ADMITTEDLY DID NOT MEET THE REQUIREMENTS FOR HUMIDITY OR DEW POINT MONITORING SPECIFIED IN REGULATORY GUIDE 1.23. A NEW DEW POINT SYSTEM WAS INSTALLED AT THE ON-SITE METEOROLOGICAL FACILITY AND BEGAN OPERATION ON APRIL 3, 1975. THE NEW SYSTEM HAS A CAMBRIDGE MIRROR UNIT AND IS MONITORING THE DEW POINT TEMPERATURE AT 10 METERS ABOVE GROUND. THE INSTRUMENT ACCURACY MEETS THE REQUIREMENT OF + OR - 0.5 DEGREES CELSIUS SPECIFIED IN REGULATORY GUIDE 1.23.

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INSTRUMENT, METEOROLOGICAL + HUMILITY, RELATIVE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106732 DATED 1975
RESPONSE TO QUESTION B1 - ANNUAL LITTER-FALL
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-107 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ESTIMATES OF ANNUAL LEAF LITTER-FALL AND MINERAL CONTENT ARE PRESENTED.

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SURVEY, ENVIRONMENT + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106733 DATED 1975
RESPONSE TO QUESTION B2 - APPLICATION OF HERBICIDES TO TRANSMISSION LINE RIGHTS-OF-WAY
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-108 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICNESE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONSTRUCTION OF THE PROPOSED TRANSMISSION LINES INTO THE CLINCH RIVER BREEDER REACTOR SITE WILL REQUIRE THE CLEARING OF APPROXIMATELY 58 ACRES OF WOODLAND AND OLD FIELD COMMUNITIES. REMOVAL OF VEGETATION WILL BE ACCOMPLISHED BY THE "SHEAR CLEARING" METHOD EXCEPT WHERE OUTCROPPING OF ROCKS, STEEP SLOPES, PROXIMITY TO STREAMS AND ROADS MAKE IT IMPRACTICAL. HAND CLEARING OR SPANNING OF VEGETATION WILL BE UTILIZED WHERE THESE EXCEPTIONS ARE ENCOUNTERED. IT IS EXPECTED THAT NEARLY ALL OF THE CLEARING WILL BE DONE BY BULLDOZERS WITH ROMAN CUTTER BLADES WHICH MECHANICALLY REMOVE ALL VEGETATION AT GROUND LEVEL AND NO HERBICIDES WILL BE USED DURING THE CLEARING OPERATIONS.

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SITING + RESPONSE TO NRC QUESTION + POWER TRANSMISSION + CLINCH RIVER (LMFBR)

18-106734 DATED 1975
RESPONSE TO QUESTION B3 - SMALL MAMMAL POPULATIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 3 PGS, 1 FIG, 2 TABS, PP. A1-109 THRU A1-114 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

GIVES QUANTITATIVE ESTIMATES OF SMALL MAMMAL POPULATIONS ON THE SITE INCLUDING SAMPLING METHODS, LOCATIONS AND TIMES.

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18-106734 *CONTINUED*
SITING + POPULATION DISTRIBUTION + RESPONSE TO NRC QUESTION + MONITOR. AREA + ANIMAL + MAMMAL + CLINCH RIVER (LMFBR)

18-106735 DATED 1975
RESPONSE TO QUESTION 84 - BIRD POPULATIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 1 FIG, 2 TABS, PP. A1-115 THRU A1-119 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

SAMPLING TECHNIQUES RELATIVE TO SPECIES DIVERSITY AND POPULATION DENSITY DETERMINATION ON 12 TRANSECTS WERE AS FOLLOWS. MEASURED TRANSECTS ON REPRESENTATIVE HABITAT PLOTS WERE ESTABLISHED IN MAJOR VEGETATION TYPES. POPULATIONS WITHIN THE TRANSECT AREAS WERE MEASURED DURING THE COURSE OF SEVEN SURVEY TRIPS ALONG EACH OF THE 12 TRANSECTS BOTH IN LATE MAY AND IN MID-DECEMBER. ALL BIRDS OCCURRING WITHIN THE TRANSECTS (EXTENDED 208 FEET TO BOTH SIDES OF THE TRANSECT LINE CENTER) WERE INCLUDED. THE LOCATION, EXTENT AND STATION NUMBERS OF EACH TRANSECT ARE SHOWN ON AN ACCOMPANYING MAP OF THE PROPERTY AREA.

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POPULATION DISTRIBUTION + RESPONSE TO NRC QUESTION + ANIMAL, BIRD + CLINCH RIVER (LMFBR)

18-106736 DATED 1975
RESPONSE TO QUESTION 85 - GAME BIRDS AND GAME MAMMALS
PROJECT MANAGEMENT CORP., ILL.
DOCKET-50537-9 +. 2 PGS, PP. A1-120 THRU A1-121 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LFMBR, MFG--WEST., AE--BURNS & ROE

INDICATES RELATIVE ABUNDANCE OF GAME BIRDS AND GAME MAMMALS ON THE SITE.

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POPULATION DISTRIBUTION + RESPONSE TO NRC QUESTION + ANIMAL + MAMMAL + ANIMAL, BIRD + CLINCH RIVER (LMFBR)

18-106737 DATED 1975
RESPONSE TO QUESTION 86 - LAND MANAGEMENT PRACTICES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-122 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

TVA HAS GIVEN ERDA-OR PERMISSION TO CONTINUE ITS FORESTRY MANAGEMENT PROGRAM UNTIL THE SITE IS NEEDED FOR DEVELOPMENT. ERDA-OR HAS AGREED TO TERMINATE THEIR PROGRAM ON ANY PART OF THE SITE AT TVA'S REQUEST WHEN THAT PART IS NEEDED FOR DEVELOPMENT. WE WOULD EXPECT THAT THE ERDA-OR FORESTRY MANAGEMENT PROGRAM COULD CONTINUE ON ANY PORTIONS OF THE SITE NOT DISTURBED BY CONSTRUCTION ACTIVITIES.

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RESPONSE TO NRC QUESTION + PLANNING, LAND + CLINCH RIVER (LMFBR)

18-106738 DATED 1975
RESPONSE TO QUESTION 87 - RARE PLANT SPECIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-123 THRU A1-124 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FIVE PLANT SPECIES WHICH MIGHT BE CATEGORIZED AS RARE OR ENDANGERED HAVE BEEN COLLECTED ON THE CLINCH RIVER SITE. IN ADDITION, SIX PLANT SPECIES WERE OBSERVED AND COLLECTED WHICH HAD NOT PREVIOUSLY BEEN COLLECTED IN THE AREA ACCORDING TO SPECIMENS IN THE UNIVERSITY OF TENNESSEE HERBARIUM. THE FIVE RARE SPECIES INCLUDE BLACK SNAKEROOT (CIMICIFUGA RUBIFOLIA FORMERLY DESCRIBED AS CIMICIFUGA AMERICANA VAR. CORDIFOLIA), GINSING (PANAX QUINQUEFOLIA), PINK LADY-SLIPPER (CYPRIPEDIUM ACAULE), LARGE TWAY-BLADE (LIPARIS LILIFOLIA) AND SQUIRREL CORN (DICENTIA CANADENSIS).

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RESPONSE TO NRC QUESTION + ECOSYSTEM + PLANT + CLINCH RIVER (LMFBR)

18-106739 DATED 1975
RESPONSE TO QUESTION 88 - ECOLOGICAL MONITORING
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-125 THRU A1-126 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE BASIC OBJECTIVE OF THE TERRESTRIAL NONRADIOLOGICAL CONSTRUCTION MONITORING PROGRAM IS TO DEVELOP NECESSARY PROGRAMS TO PROTECT AND PRESERVE CRITICAL ECOLOGICAL ELEMENTS IDENTIFIED IN THE BASELINE STUDIES (E.G., RARE OR ENDANGERED SPECIES, UNIQUE VEGETATION ASSOCIATIONS). PRIOR TO

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18-106739 *CONTINUED*
INITIATION OF PLANT CONSTRUCTION, ECOLOGISTS WILL MEET WITH THE PLANT CONSTRUCTION PROJECT MANAGER AND PROVIDE HIM WITH NECESSARY MAPS AND PHOTOS SHOWING LOCATIONS OF CRITICAL ECOLOGICAL ELEMENTS. SEMIANNUAL VISITS WILL THEN BE MADE TO THE PLANT SITES TO VISUALLY INSPECT, ON THE GROUND, SPECIES AND COMMUNITY LOCATIONS.

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MONITOR + RESPONSE TO NRC QUESTION + MONITORING PROGRAM, ENVIRONMENTAL + ENVIRONMENTAL CONTROL MEASURE + ECOSYSTEM + CLINCH RIVER (LMFBR)

18-106740 DATED 1975
RESPONSE TO QUESTION C1 - EURASIAN WATER MILFOIL
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-128 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTROL OF EURASIAN WATER MILFOIL IS ACCOMPLISHED THROUGH RESERVOIR WATER LEVEL MANAGEMENT AND TREATMENT WITH A HERBICIDE. HERBICIDE TREATMENT IN THE PAST HAS BEEN CONDUCTED DURING PERIODS OF LOW OR NO FLOW FROM MELTON HILL DAM IN ORDER TO INCREASE ITS EFFECTIVENESS. IT IS NOT ANTICIPATED THAT IT WOULD EVER BECOME NECESSARY TO CLOSE DOWN MELTON HILL DAM SOLELY FOR CONTROL OF EURASIAN WATER MILFOIL.

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RESPONSE TO NRC QUESTION + ECOSYSTEM, AQUATIC + PLANT + CLINCH RIVER (LMFBR)

18-106741 DATED 1975
RESPONSE TO QUESTION C2 - COMMERCIAL FISH CATCH
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-129 THRU A1-130 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AN ATTEMPT WAS MADE TO GATHER INFORMATION PERTAINING TO COMMERCIAL AND SPORT FISHING IN THE AREA OF THE SITE. NO DATA WERE AVAILABLE ON SPORT-FISHING HARVEST FROM EITHER WATTS BAR RESERVOIR OR MELTON HILL RESERVOIR. COMMERCIAL CATCHES IN 1972 WITHIN A 10-MILE RADIUS OF THE SITE WERE NEGLIGIBLE AND AMOUNTED TO ABOUT ONE PERCENT OF THE TOTAL CATCH FROM WATTS BAR RESERVOIR OR AROUND 1,000 POUNDS.

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RESPONSE TO NRC QUESTION + ANIMAL, FISH + BENEFICIAL USE, COMMERCIAL + CLINCH RIVER (LMFBR)

18-106743 DATED 1975
RESPONSE TO QUESTION C4 - ZERO FLOW FROM MELTON HILL RESERVOIR
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-133 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TWO LONGEST PERIODS OF ZERO RELEASE FROM MELTON HILL RESERVOIR WERE THE RESULT OF SPECIAL OPERATIONS TO AID IN CONTROLLING THE GROWTH OF EURASIAN WATER MILFOIL IN THE MELTON HILL RESERVOIR. IT WAS POSSIBLE TO SCHEDULE THESE OPERATIONS OF MELTON HILL RESERVOIR AT THESE TIMES BECAUSE THERE WAS SUFFICIENT FLOOD CONTROL STORAGE IN NORRIS RESERVOIR, BULL RUN STEAM PLANT WAS NOT IN COMMERCIAL OPERATION AND NOT A MAJOR FACTOR, AND THERE WERE NO DOWNSTREAM COMMITMENTS FOR RELEASES FROM THE RESERVOIR. PRIOR TO THE OPERATIONS IN 1966, MELTON HILL RESERVOIR WAS DRAWN TO FIVE FEET BELOW NORMAL MINIMUM LEVEL WHICH WOULD NOT BE PERMISSIBLE IN THE FUTURE BECAUSE THE LOCATION OF UTILITY WATER INTAKES WOULD NOT PERMIT LOWERING THE RESERVOIR TO THIS LEVEL.

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RIVER + RESPONSE TO NRC QUESTION + FLOW + COOLANT LEVEL TRANSIENT + CLINCH RIVER (LMFBR)

18-106744 DATED 1975
RESPONSE TO QUESTION C5 - SERVICE FACILITIES TO AND FROM THE RIVER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-134 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES MORE INFORMATION ON HOW THE WATER PUMPHOUSE, INLET PIPE, DISCHARGE PIPE AND BARGE UNLOADING FACILITIES WILL BE BUILT. ESTIMATES THE AMOUNTS OF MATERIAL TO BE DREDGED, AND THE DURATION OF ADVERSE EFFECTS ON VARIOUS FORMS OF AQUATIC LIFE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

BUILDING + RESPONSE TO NRC QUESTION + AUXILIARY COOLING + ECOSYSTEM, AQUATIC + CLINCH RIVER (LMFBR)

18-106745 DATED 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106745 *CONTINUED*
RESPONSE TO QUESTION C6 - BIOLOGICAL SAMPLING TRANSECT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-135 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

THE PURPOSE OF THE AQUATIC BASELINE MONITORING PROGRAM AT THE SITE WAS TO IDENTIFY AND CHARACTERIZE: (1) PHYSICAL AND CHEMICAL PARAMETERS, (2) EXISTING BIOLOGICAL COMMUNITIES, AND (3) ENDANGERED SPECIES. TO PROVIDE BASELINE INFORMATION FOR EVALUATING THIS EFFECT IT WAS NECESSARY TO LOCATE A CONTROL TRANSECT ABOVE THE AREA WHERE THIS IMPACT WOULD OCCUR. WHEN THE AQUATIC SURVEY WAS INITIATED THE LOCATION OF THE INTAKE STRUCTURE WAS UNCERTAIN SO TRANSECT 1 WAS LOCATED ABOVE THE SUGGESTED INTAKE AREA. FOR THE PURPOSE OF THE BASELINE STUDY, TRANSECT 1 ADEQUATELY REFLECTS THE ENVIRONMENTAL CONDITIONS IN THE AREA OF THE PROPOSED INTAKE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SAMPLING + RESPONSE TO NRC QUESTION + ECOSYSTEM, AQUATIC + BIOLOGICAL CONTROL + CLINCH RIVER (LMFBR)

18-106746 DATED 1975
RESPONSE TO QUESTION C7 - VERTICAL STRATIFICATION OF ORGANISMS IN RIVER NEAR SITE
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 2 TABS, PP. A1-136 THRU A1-141 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

VERTICAL STRATIFICATION OF ZOOPLANKTON SPECIES HAS BEEN ESTIMATED BY PUMPING ZOOPLANKTON SAMPLES FROM DIFFERENT DEPTHS IN THE WATER COLUMN.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + ZOOPLANKTON + STRATIFICATION + CLINCH RIVER (LMFBR)

18-106747 DATED 1975
RESPONSE TO QUESTION C8 - FISH SURVEYS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-142 THRU A1-143 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

METHODS FOR FISH SURVEYS HAVE RECENTLY BEEN REVIEWED BY THE IBP AND BY THE EPA. BOTH REVIEWS RECOGNIZE THAT ALL SAMPLING GEAR IS SELECTIVE BECAUSE OF THE EFFICIENCY OF THE GEAR AND THE VARIETY OF HABITATS SAMPLED. IT SHOULD ALSO BE NOTED THAT THE EFFICIENCY OF COLLECTING GEAR FOR A PARTICULAR SPECIES MAY VARY IN DIFFERENT HABITATS. SAMPLING GEAR CAN BE CLASSIFIED AS EITHER PASSIVE OR ACTIVE. GILL NETTING AND ELECTROSHOCKING WERE CHOSEN FOR USE IN THE BASELINE STUDY BECAUSE USE OF MIXED GILL NETS, AS OUTLINED IN THE ER ON PAGE 6.1-20, IS , IS A PASSIVE METHOD THAT PROVIDES A MORE NEARLY EQUAL PROPORTION OF FISH FROM A WIDE RANGE OF SIZES AND USE OF ELECTROSHOCKING IS AN ACTIVE METHOD THAT PROVIDES THE LEAST SELECTIVITY FOR FISH SAMPLING.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + SURVEY + ANIMAL, FISH + CLINCH RIVER (LMFBR)

18-106748 DATED 1975
RESPONSE TO QUESTION C9 - ICHTHYOPLANKTON SAMPLING
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 2 TABS, PP. A1-144 THRU A1-146 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE OBJECTIVE OF THE ICHTHYOPLANKTON BASELINE SAMPLING PROGRAM WAS TO DETERMINE AREAS WHERE FISH EGGS AND LARVAE MAY BE CONCENTRATED IN THE VICINITY OF THE CRBRP SITE. OBSERVATION OF THE RIVER SUGGESTS THAT BECAUSE OF THE LACK OF SHALLOW AREAS, VERY LITTLE SPAWNING OCCURS IN THE CLINCH RIVER IN THE AREA OF THE SITE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SAMPLING + RESPONSE TO NRC QUESTION + ECOSYSTEM, AQUATIC + BIOLOGICAL CONTROL + CLINCH RIVER (LMFBR)

18-106749 DATED 1975
RESPONSE TO QUESTION C10 - EFFECTIVENESS OF ICHTHYOPLANKTON NET
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-147 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A 1,000 MICRON MESH ICHTHYOPLANKTON NET IS MODERATELY EFFECTIVE FOR SAMPLING FISH EGGS AND QUITE ADEQUATE FOR SAMPLING FISH LARVAE. IT MUST BE NOTED THAT COLLECTIONS MADE WITH THIS SIZE SAMPLING NET HAVE DEMONSTRATED THAT EGG ABUNDANCE IS GREATEST IN THE RIVER IN LATE MAY AND EARLY JUNE. THE RIVER HAS BEEN SHOWN TO BE A POOR AREA FOR FISH LARVAE BECAUSE ONLY ONE SAUGER LARVA WAS COLLECTED IN THE RIVER DURING THE SAMPLING PERIOD. DURING THE PREOPERATIONAL AND OPERATIONAL MONITORING PROGRAMS ICHTHYOPLANKTON WILL BE SAMPLED WITH A 794 MICRON MESH NET.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106749 *CONTINUED*
RESPONSE TO NRC QUESTION + LIMNOLOGY + ANIMAL, FISH + ECOSYSTEM, AQUATIC + CLINCH RIVER (LMFBR)

18-106750 DATED 1975
RESPONSE TO QUESTION C11 - COLLECTION DATA FROM A CLEAN FLOWING SYSTEM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-148 THRU A1-149 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ANALYSIS OF DATA COLLECTED BY THE AQUATIC BASELINE SURVEY FOR THE PERIOD OF MARCH 1974 THROUGH OCTOBER 1974 INDICATES THAT IN TERMS OF SPECIES THIS AREA OF THE CLINCH RIVER IS TYPICAL OF OTHER EAST TENNESSEE RIVER COMMUNITIES. NO RARE, ENDANGERED OR UNUSUAL SPECIES HAVE BEEN IDENTIFIED FROM THE SITE LOCATION. ANALYSIS OF DATA REPORTED BY WESD CONSULTANTS WHO ARE FAMILIAR WITH BIOLOGICAL COMMUNITIES IN THE EAST TENNESSEE AREA INDICATE THAT THE SUCCESSIONAL TRENDS IN SPECIES ABUNDANCE OBSERVED AT THE SITE ARE COMMON FOR OTHER RIVERS IN THE TVA SYSTEM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + DATA COLLECTION + LIMNOLOGY + ECOSYSTEM, AQUATIC + CLINCH RIVER (LMFBR)

18-106751 DATED 1975
RESPONSE TO QUESTION C12 - SAMPLING FREQUENCY IN THE LIMNOLOGICAL MONITORING PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-150 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LIMNOLOGICAL SAMPLING FREQUENCY IS MONTHLY. IN PRACTICE, THIS MEANS MONTHLY SAMPLING FROM MARCH AND/OR APRIL TO OCTOBER AND/OR NOVEMBER AND ONCE DURING THE WINTER (EITHER JANUARY OR FEBRUARY DEPENDING ON THE WEATHER).

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SAMPLING + RESPONSE TO NRC QUESTION + MONITORING PROGRAM, ENVIRONMENTAL + LIMNOLOGY + CLINCH RIVER (LMFBR)

18-106752 DATED 1975
RESPONSE TO QUESTION C13 - FISH SAMPLING
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-151 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO SAMPLING IS PLANNED DURING THE PRECONSTRUCTION AND CONSTRUCTION PHASES. GENERALLY, TURBIDITY AND SILTATION RESULTING FROM CONSTRUCTION ARE TEMPORARY AND DOCUMENTATION OF FISH AVOIDANCE OF THESE EFFECTS IS UNNECESSARY.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SAMPLING + RESPONSE TO NRC QUESTION + LIMNOLOGY + ANIMAL, FISH + CLINCH RIVER (LMFBR)

18-106753 DATED 1975
RESPONSE TO QUESTION C14 - FISH SAMPLING DURING CONSTRUCTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-152 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FISH ARE KNOWN TO AVOID AREAS OF HIGH TURBIDITY IF THEY CAN. IN ADDITION, HIGH TURBIDITIES ARE USUALLY OF SHORT DURATION WHICH MAKES IT DIFFICULT TO SAMPLE FISH TO FIND OUT WHETHER OR NOT THEY ARE AVOIDING TURBID AREAS. THEREFORE, WE DO NOT PLAN TO CONDUCT ANY STUDIES TO DETERMINE THE EFFECTS OF TURBIDITY ON THE FISH POPULATION. SILTATION EFFECTS SHOULD BE MOST PRONOUNCED IN THE SHALLOW WATER OVERBANK AREAS IMMEDIATELY DOWNSTREAM OF ANY CONSTRUCTION. THROUGH AERIAL PHOTOGRAPHY AND RIVER BOTTOM TOPOGRAPHY MEASUREMENTS, THE ACREAGES WHICH ARE EFFECTED BY SILTATION CAN BE DETERMINED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SAMPLING + RESPONSE TO NRC QUESTION + CONSTRUCTION + ANIMAL, FISH + CLINCH RIVER (LMFBR)

18-106754 DATED 1975
RESPONSE TO QUESTION C15 - ADEQUACY OF PERFORATED PIPE INTAKES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-153 THRU A1-154 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN A CONVENTIONAL INTAKE STRUCTURE THE FISH MAY BE TRAPPED IN A CONFINED WATERWAY LEADING TO WATER SCREENS. THIS CANNOT HAPPEN IN THE CASE OF THE PERFORATED PIPE INTAKE DUE TO ITS LOCATION OFFSHORE, SURROUNDED ON ALL SIDES BY THE RIVER. THE INLET APPROACH VELOCITIES ARE VERY LOW AND BECOME TOO SMALL TO MEASURE WITHIN INCHES FROM THE FACE OF THE PERFORATED PIPE. IN ADDITION, THE RIVER CURRENT PASSING THE PERFORATED PIPE WILL NORMALLY TEND TO CARRY FISH AWAY FROM THE INTAKE

CATEGORY 18
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18-106754 *CONTINUED*
AREA.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + EFFECT + ANIMAL, FISH + INTAKE + CLINCH RIVER (LMFBR)

18-106755 DATED 1975
RESPONSE TO QUESTION C16 - CONSTRUCTION ACTIVITIES ON AQUATIC ORGANISMS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-155 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES TIMING OF THOSE CONSTRUCTION ACTIVITIES WHICH ARE PERTINENT TO AQUATIC ORGANISMS' REPRODUCTION AND MIGRATION CYCLES.

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RESPONSE TO NRC QUESTION + LIMNOLOGY + ECOSYSTEM, AQUATIC + CLINCH RIVER (LMFBR)

18-106756 DATED 1975
RESPONSE TO QUESTION C17 - CHARACTERISTICS OF PERFORATED PIPE INTAKES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-156 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

STATES THE ANTICIPATED INTERNAL VELOCITIES FOR THE PERFORATED PIPES OF THE INTAKE STRUCTURE, AND DISCUSSES DEAD SPACES AND/OR VELOCITIES LOW ENOUGH TO ALLOW CORBICULA LARVAE TO SETTLE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

EQUIPMENT DESIGN + RESPONSE TO NRC QUESTION + INTAKE + CLINCH RIVER (LMFBR)

18-106757 DATED 1975
RESPONSE TO QUESTION C18 - MAINTENANCE SCHEDULE FOR PERFORATED PIPE INTAKES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-157 THRU A1-158 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

MAINTENANCE OF THE PERFORATED PIPE SECTIONS WILL NORMALLY BE ACCOMPLISHED IN THREE STAGES AS FOLLOWS: (1) WATER BACKWASHING AS A NORMAL OPERATING PROCEDURE; (2) IN-PLACE SURFACE CLEANING BY A SCUBA DIVER; AND (3) REMOVAL OF PERFORATED PIPE SECTIONS.

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MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + INTAKE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-106758 DATED 1975
RESPONSE TO QUESTION C19 - CORBICULA PROBLEMS WITH THE PERFORATED PIPE INLET
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-159 THRU A1-160 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

SUFFICIENT INFORMATION IS NOT AVAILABLE TO KNOW FOR CERTAIN THAT CORBICULA WILL BE PRESENT TO SETTLE IN THE LOW VELOCITY PIPE SECTIONS. ACCORDINGLY, SEVERAL DESIGN FEATURES ARE BEING INVESTIGATED TO PRECLUDE THE DEVELOPMENT OF THE PROBLEM.

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DESIGN STUDY + ENVIRONMENT + RESPONSE TO NRC QUESTION + EFFECT + INTAKE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-106759 DATED 1975
RESPONSE TO QUESTION D1 - TEMPERATURE AND THERMAL STRATIFICATION OF THE RIVER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 5 PGS, 3 FIGS, PP. A1-161 THRU A1-168 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DESCRIBES THE STRATIFICATION EXPECTED FOR THE FLOW CONDITION THAT COULD RESULT IN WATER OF THE COLDER CLINCH RIVER ENTERING THE MAINSTREAM OF THE TENNESSEE RIVER ALONG THE STREAM BOTTOM WHILE THE WARMER TENNESSEE RIVER WATER FLOWS UPSTREAM IN THE CLINCH RIVER PAST THE SITE. PROVIDES ADDITIONAL DATA MEASURED AT OR NEAR THE SITE FOR ALL SEASONS TO INDICATE THE DEGREE OF STRATIFICATION IN THE RIVER THROUGHOUT THE YEAR. SUPPLIES RIVER TEMPERATURE DATA AT OR NEAR THE SITE DURING THE 1966 AND 1967 EXTENDED PERIODS OF NO FLOW FROM THE MELTON HILL DAM.

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18-106759 *CONTINUED*
RIVER + RESPONSE TO NRC QUESTION + TEMPERATURE + STRATIFICATION + CLINCH RIVER (LMFBR)

18-106760 DATED 1975
RESPONSE TO QUESTION D2 - CLOGGING OF THE PERFORATED INTAKE PIPES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-165 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

DEBRIS REMOVAL IS ACCOMPLISHED BY FLOW REVERSAL IN THE INTAKE PIPING.

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MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + INTAKE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-106761 DATED 1975
RESPONSE TO QUESTION D3 - PERFORATED INTAKE PIPES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-170 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

THERE ARE TWO PERFORATED PIPE INTAKE ASSEMBLIES EACH WITH AN OVERALL LENGTH OF APPROXIMATELY 18 FT. THE PERFORATED PIPES HAVE AN OUTSIDE DIAMETER OF 3 FT., AND AN INSIDE DIAMETER OF 2 FT. THESE DIMENSIONS WILL BE SUBJECT TO CHANGE, HOWEVER, PENDING THE RESULTS OF A HYDRAULICS STUDY OF THE INTAKE SYSTEM.

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RESPONSE TO NRC QUESTION + INTAKE + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-106762 DATED 1975
RESPONSE TO QUESTION D4 - ENVIRONMENTAL EFFECTS DURING CONSTRUCTION OF INTAKE
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-171 THRU A1-172 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

CONSTRUCTION OF THE CRBRP, EXCLUDING TRANSMISSION LINES, WILL RESULT IN THE TEMPORARY DISTURBANCE OF APPROXIMATELY 155.6 ACRES OF LAND AND THE PERMANENT DISTURBANCE OF APPROXIMATELY 73.0 ACRES. OF THIS TOTAL, APPROXIMATELY 1.0 ACRE WILL BE DISTURBED BY CONSTRUCTION OF THE RIVER INTAKE AREA AND INTAKE PIPELINE. THE RAINFALL INTENSITY WHICH IS USED AS THE BASIS FOR THE ENVIRONMENTAL PROTECTION AGENCY EFFLUENT LIMITATIONS ON CONSTRUCTION RUNOFF IS THE 10-YEAR, 24-HOUR RAINFALL. THE WEIGHT OF SOLIDS WHICH WOULD BE DISCHARGED TO THE RIVER AS A RESULT OF THIS RAINFALL FALLING ON THE INTAKE CONSTRUCTION AREA WOULD BE 130,000 POUNDS.

AVAILABILITY - MICROSURANCE. INC., P.O. BOX 3522 OAK RIDGE. TENN. 37830

ENVIRONMENT + RESPONSE TO NRC QUESTION + EFFECT + CONSTRUCTION + INTAKE + CLINCH RIVER (LMFBR)

18-106763 DATED 1975
RESPONSE TO QUESTION D5 - RIVER VELOCITIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-173 THRU A1-174 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

DISCUSSES THE MANNER IN WHICH RIVER VELOCITIES USED IN THE PLUME ANALYSES WERE COMPUTED. PROVIDES ADDITIONAL VALUES FOR CROSS-SECTIONAL AREAS OF THE RIVER IN THE VICINITY OF THE DISCHARGE CORRESPONDING TO SUMMER FLOW CONDITIONS. PROVIDES ADDITIONAL DETAILS REGARDING RIVER VELOCITIES IN THE VICINITY OF THE DISCHARGE STRUCTURE.

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RIVER + RESPONSE TO NRC QUESTION + BEHAVIOR + CLINCH RIVER (LMFBR)

18-106764 DATED 1975
RESPONSE TO QUESTION D6 - COOLING TOWER BLOWDOWN
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-175 THRU A1-176 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION. JUNE 10. 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

SINCE EPA'S EFFLUENT CHLORINE LIMITATIONS WERE ONLY ISSUED OCTOBER 8. 1974. NO POWER PLANTS. TO OUR KNOWLEDGE. CURRENTLY STOP BLOWDOWN DURING CHLORINATION CYCLES. SEVERAL STATIONS. HOWEVER. ARE CONSIDERING CLOSING THE BLOWDOWN VALVE DURING CHLORINATION CYCLES WITH TIME DELAY CONTROLS SET TO MATCH THE TIME-RESIDUAL CHARACTERISTICS OF THE SYSTEM.

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RESPONSE TO NRC QUESTION + BLOWDOWN + COOLING TOWER + CLINCH RIVER (LMFBR)

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18-106765 DATED 1975
RESPONSE TO QUESTION D8 - DISCHARGE PLUME STUDY
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 12 PGS, 6 FIGS, 4 TABS, PP. A1-179 THRU A1-201 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

TO PROVIDE UPPER-BOUND ESTIMATES OF THE TEMPERATURE FIELDS RESULTING FROM CROSS THERMAL DISCHARGES, TWO HYPOTHETICAL EXTREME CASES WERE DEVELOPED. EACH INCORPORATES VALUES FOR WATER AND ATMOSPHERIC TEMPERATURES AND RIVER POOL ELEVATION AND FLOW CHARACTERISTICS THAT CONSTITUTE THE WORST SET OF CONDITIONS FOR MIXING. THREE DIFFERENT APPROACHES PRESENTLY ARE IN GENERAL USE FOR MAKING PREDICTIONS OF THE CHARACTERISTICS AND BEHAVIOR OF THERMAL PLUMES. IN ORDER OF INCREASING RELIABILITY THESE ARE: (1) MATHEMATICAL MODES, EITHER NUMERICALLY BASED OR EXPRESSED IN CLOSED FORM EQUATIONS. (2) SMALL-SCALE, THERMAL-HYDRAULIC MODELS. (3) PROTOTYPE MEASUREMENTS.

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PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106766 DATED 1975
RESPONSE TO QUESTION D9 - CHEMICAL PLUME BOUNDARIES AND CHEMICAL ISOPLETHS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-202 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE USE OF PRECISE BOUNDARIES (ISOPLETHS) TO DESCRIBE A CHEMICAL OR THERMAL PLUME IS A MATHEMATICAL MEANS OF CHARACTERIZING A COMPLEX PHYSICAL OCCURRENCE. IT IS NECESSARILY AN OVERSIMPLIFICATION AND THE RESULTS OBTAINED MUST BE UTILIZED WITH THIS FACT FIRMLY IN MIND. THE ATTEMPT MADE IN PHYSICAL MODELS AND SUBSEQUENT MATHEMATICAL COMPUTATIONS WAS TO DEFINE THE CHEMICAL AND THERMAL PLUMES TO THE DEGREE THAT WOULD BE OF IMPORTANCE IN THE ASSESSMENT OF ENVIRONMENTAL IMPACT.

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CONCENTRATION, ISOPLETH + PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106767 DATED 1975
RESPONSE TO QUESTION D10 - RIVER VELOCITY MEASUREMENTS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 P, 2 TABS, 1 FIG, PP. A1-203 THRU A1-206 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE NO-FLOW CASES EVALUATED IN THE DISCHARGE PLUME ANALYSIS WERE BASED ON THE ASSUMPTION OF ZERO VELOCITY AT ALL POINTS IN THE WATER COLUMN. VELOCITY MEASUREMENTS MADE IN THE RIVER WERE NOT PURPOSEFULLY CORRELATED WITH THE OCCURRENCES OF ZERO DISCHARGE FROM MELTON HILL DAM, HOWEVER, VELOCITY MEASUREMENTS ON SEVERAL OCCASIONS OBVIOUSLY INDICATE A NO-FLOW CONDITION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

MEASUREMENT + RIVER + RESPONSE TO NRC QUESTION + FLOW + CLINCH RIVER (LMFBR)

18-106768 DATED 1975
RESPONSE TO QUESTION D11 - CALCULATED WORST-CASE RIVER FLOW
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-207 THRU A1-209 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES RESULTS FROM ADDITIONAL CALCULATIONS FOR WORST-CASE CONDITIONS OF RIVER FLOW, RIVER TEMPERATURE, BLOWDOWN FLOW, AND AMBIENT TEMPERATURE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RIVER + ANALYTICAL MODEL + RESPONSE TO NRC QUESTION + FLOW + CLINCH RIVER (LMFBR)

18-106769 DATED 1975
RESPONSE TO QUESTION D12 - MONITORING THERMAL EFFLUENT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-210 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE THERMAL EFFLUENT TEMPERATURE MONITORING PROGRAM WILL CONSIST OF STREAM TEMPERATURE MONITORS SITUATED UPSTREAM AND DOWNSTREAM OF THE DISCHARGE TO THE CLINCH RIVER WHICH IS LOCATED AT RIVER MILE 16.0. BY TAKING INTO CONSIDERATION THE RESULTS OF EFFLUENT DISPERSION STUDIES AN ESTIMATE OF THE NUMBER AND LOCATION OF THE MONITORS CAN BE MADE AT THIS TIME. THERE WILL BE A TOTAL OF FOUR MONITORS USED FOR THERMAL EFFLUENT MONITORING. TWO WILL BE PLACED UPSTREAM OF THE DISCHARGE JUST BELOW THE LOCATION OF THE INTAKE AT CRM 17.6 AND THE OTHER TWO WILL BE PLACED APPROXIMATELY ONE-HALF MILE DOWNSTREAM OF THE DISCHARGE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106765 *CONTINUED*
EFFLUENT + THERMAL CONSIDERATION + MONITOR + RESPONSE TO NRC QUESTION + MONITORING PROGRAM, ENVIRONMENTAL + CLINCH RIVER (LMFBR)

18-106770 DATED 1975
RESPONSE TO QUESTION D23 - COOLING TOWER DISCHARGES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 3 PGS, PP. A1-236 THRU A1-238 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES ADDITIONAL INFORMATION REGARDING DISCHARGE VELOCITIES AND TEMPERATURES FOR COOLING TOWER.

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RESPONSE TO NRC QUESTION + BLOWDOWN + COOLING TOWER + DISCHARGE + CLINCH RIVER (LMFBR)

18-106771 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION D24 - ADDITIONAL DETAILS REGARDING THE RIVER BOTTOM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 FIG, PP. A1-239 THRU A1-240 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

BORINGS WERE MADE IN THE RIVER BOTTOM TO EVALUATE FOUNDATION CONDITIONS AT SELECTED INTAKE AND DISCHARGE SITES. THE GEOLOGIC LOGS OF THE BORINGS IN AND NEAR THE RIVER ARE CONTAINED IN A REPORT SUBMITTED TO BURNS & ROE, INC., REPORT OF PRELIMINARY FOUNDATION INVESTIGATION, GEOTECHNICAL REPORT NUMBER 3, CRBRP, S.A. -679, LAW ENGINEERING, FEBRUARY 12, 1975. THESE BORINGS INDICATED A THIN (0-2 FEET) LAYER OF SANDY, CLAYEY SILT OVERLYING BEDROCK. BEDROCK IN THESE AREAS WAS LIMESTONE AND SILTSTONE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GEOLOGY + RIVER + PROPERTY, PHYSICAL + RESPONSE TO NRC QUESTION + COMPOSITION + CLINCH RIVER (LMFBR)

18-106772 DATED 1975
RESPONSE TO QUESTION D25 - WORST-CASE THERMAL AND CHEMICAL RIVER PLUMES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-241 THRU A1-242 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RESULTS OF THE PHYSICAL MODEL OF THE CRBRP DISCHARGE INDICATE THAT UNDER NO CONDITIONS WILL ANY MEASUREABLE THERMAL INFLUENCE BE FELT 1.5 MILES DOWNSTREAM DUE TO THE CRBRP DISCHARGE. IN REGARD TO CHEMICALS, IT IS CONCLUDED THAT CONDITIONS WOULD NOT BE ANTICIPATED UNDER WHICH THE CHEMICAL DISCHARGES FROM THE CRBRP COULD ADVERSELY AFFECT THE K25 WATER INTAKE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RIVER + PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106773 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION D27 - DAILY TEMPERATURE DATA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-244 THRU A1-250 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES THE DAILY TEMPERATURES UPON WHICH THE MONTHLY TEMPERATURES ARE BASED, INCLUDES THE TEMPERATURES FOR BOTH THE RIVER WATER AND THE COOLING TOWER BLOWDOWN.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITE CLIMATOLOGY + TEMPERATURE + CLINCH RIVER (LMFBR)

18-106774 DATED 1975
RESPONSE TO QUESTION E1 - CHARACTERIZATION OF WASTEWATER DISCHARGED TO CLINCH RIVER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 1 TAB, PP. A1-251 THRU A1-253 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A COMPLETE CHARACTERIZATION OF THE WATER DISCHARGED TO THE CLINCH RIVER AS WASTEWATER, OR BLOWDOWN. INCLUDES POUNDS OF CHEMICAL DISCHARGED PER YEAR, IN-PLANT SOURCE OF CHEMICAL, FREQUENCY OF DISCHARGE, AVERAGE AND MAXIMUM CONCENTRATIONS WHICH WILL BE DISCHARGED, BACKGROUND CONCENTRATION OF CHEMICAL IN THE CLINCH RIVER, CONCENTRATION OF THE CHEMICAL IN THE RIVER PRIOR TO DISCHARGE, PERCENT INCREASE IN CONCENTRATION IN THE RIVER CAUSED BY DISCHARGES FROM THE CRBRP.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

WASTE DISPOSAL, RIVER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106775 DATED 1975
RESPONSE TO QUESTION E2 - ANALYTICAL TECHNIQUES TO DETERMINE CHLORINE CONCENTRATIONS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 *. 1 PG, P. A1-254 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AMPEROMETRIC TITRATION METHOD WILL BE EMPLOYED AS THE PRIMARY STANDARD TO DETERMINE FREE AND COMBINED RESIDUAL CHLORINE CONCENTRATIONS. THIS METHOD IS DESCRIBED IN DETAIL BEGINNING ON PAGE 112 OF 'STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER', THIRTEENTH EDITION, (1971).

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MEASUREMENT + ANALYTICAL TECHNIQUE + CHLORINE + RESPONSE TO NRC QUESTION + CONCENTRATION + CLINCH RIVER (LMFBR)

18-106776 DATED 1975
RESPONSE TO QUESTION E3 - CHLORINE DEMAND IN CLINCH RIVER WATER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 *. 4 PGS, PP. A1-255 THRU A1-258 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AQUATIC BASELINE DATA FOR CHLORINE DEMAND IN THE CLINCH RIVER WAS COLLECTED IN MARCH AND SEPTEMBER. ON BOTH SAMPLING DATES THE ONE HOUR CHLORINE DEMAND WAS LESS THAN 0.5 MG/LITER. THIS LEVEL OF DEMAND WAS AT THE LOWER LIMITS OF RESOLUTION OF THE ANALYSIS METHOD. TVA SAMPLED CHLORINE DEMAND AT CLINCH RIVER MILE 17.9 ON MAY 6, 1973 AND REPORTED A VALUE FOR A 1/2 HOUR CHLORINE DEMAND OF 0.2 MG/LITER. CHLORINE DEMAND IN THE CLINCH RIVER IN THE AREA OF THE SITE DOES NOT APPEAR TO VARY SEASONALLY.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RIVER + RIVER, CLINCH + CHLORINE + RESPONSE TO NRC QUESTION + CONCENTRATION + CLINCH RIVER (LMFBR)

18-106777 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION E4 - WATER INTAKE FOR ORGDP
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 *. 1 PG, P. A1-259 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE WATER INTAKE LOCATED ON THE NORTH BANK OF THE CLINCH RIVER AT (APPROXIMATELY) CRM 14.5 IS USED BY THE OAK RIDGE GASEOUS DIFFUSION PLANT (ORGDP) FOR SANITARY AND POTABLE PURPOSES. APPROXIMATELY FOUR MILLION GALLONS PER DAY ARE PUMPED FROM THE CLINCH RIVER TO A NEARBY TREATMENT PLANT, PROCESSED THROUGH A SAND FILTRATION UNIT, CHLORINATED AND DISTRIBUTED TO ORGDP.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

WATER + RESPONSE TO NRC QUESTION + INTAKE + CLINCH RIVER (LMFBR)

18-106778 DATED 1975
RESPONSE TO QUESTION E5 - CONTROLLING ASIATIC CLAMS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 *. 2 PGS, PP. A1-260 THRU A1-261 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IT IS POSSIBLE THAT CLAMS MIGHT START GROWING ON THE INNER OR OUTER SURFACES OF THE PERFORATED PIPES AND INNER SLEEVES AND IN THE MAIN LEAD-IN PIPES. PROVISIONS ARE BEING MADE IN THE DESIGN OF PERFORATED PIPES TO UNBOLT THEM AND BRING THEM TO THE SURFACE FOR DISASSEMBLY AND CLEANING IF CLAMS OR ALGAE ARE ADHERING TO THE OUTER OR INNER SURFACES.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + ECOSYSTEM, AQUATIC + BIOLOGICAL CONTROL + CLINCH RIVER (LMFBR)

18-106779 DATED 1975
RESPONSE TO QUESTION E6 - DURATION OF BLOWDOWN FLOW STOPPAGES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 *. 1 PG, P. A1-262 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

WHEN BLOWDOWN IS STOPPED BECAUSE OF EXCESSIVE RESIDUAL CHLORINE CONCENTRATION, IT IS ESTIMATED THAT THE DURATION OF SUCH BLOWDOWN FLOW STOPPAGE WILL BE 20 TO 30 MINUTES. THE ESTIMATED FREQUENCY OF BLOWDOWN FLOW STOPPAGE IS UP TO FOUR TIMES A DAY. ACTUAL OPERATING EXPERIENCE WILL DETERMINE FREQUENCY AND DURATION OF FLOW STOPPAGES.

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RESPONSE TO NRC QUESTION + BLOWDOWN + FLOW + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106780 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION E7 - ION EXCHANGE RESINS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-262 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THREE TO FIVE HOURS PER UNIT IS THE EXPECTED TIME REQUIRED FOR REGENERATION OF ION EXCHANGE RESINS, DEPENDING ON UNIT BEING REGENERATED.

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ION EXCHANGE + RESIN + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106781 DATED 1975
RESPONSE TO QUESTION E8 - SODIUM DISPOSAL METHODS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-264 THRU A1-265 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PROJECT HAS CONSIDERED TWO POTENTIAL ALTERNATIVES FOR SODIUM DISPOSAL FOR THE SMALL QUANTITIES OF SODIUM WASTES ASSOCIATED WITH THE CRBRP. ONE METHOD IS THE INERT CARRIER PROCESS. THIS PROCESS WAS DEMONSTRATED AT THE UNITED TECHNOLOGY CENTER AT COYOTE, CALIFORNIA. THE OTHER METHOD IS EXPECTED TO UTILIZE EXISTING CRBRP CLEANING, LIQUID RADWASTE AND SOLID RADWASTE SYSTEMS. SODIUM WOULD BE REACTED WITH CONTROLLED AMOUNTS OF WATER (MOIST GAS) WITH THE RESULTING LIQUID EVAPORATED AND THE NAOH EVAPORATOR BOTTOMS SOLIDIFIED INTO CEMENT SUITABLE FOR BURIAL.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

WASTE DISPOSAL + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106782 DATED 1975
RESPONSE TO QUESTION E9 - HEAVY METAL AND PESTICIDE CONCENTRATIONS IN RIVER NEAR SITE
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 1 TAB, PP. A1-266 THRU A1-268 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

BASELINE CONDITIONS FOR THE HEAVY METALS AND PESTICIDE CONCENTRATIONS WERE DETERMINED TWICE DURING THE SAMPLING PROGRAM. THE TWO SAMPLINGS OF THESE PARAMETERS OCCURRED SIX MONTHS APART SO THAT SEASONAL VARIATIONS WOULD BE APPARENT. RESULTS OF SAMPLE ANALYSIS INDICATE THAT LEVELS OF THESE SUBSTANCES WERE LOW AND THAT CONCENTRATIONS OF THESE SUBSTANCES VARIED LITTLE DURING THE SAMPLING PERIOD.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

METAL + RIVER, CLINCH + RESPONSE TO NRC QUESTION + SEDIMENT + PESTICIDE + CLINCH RIVER (LMFBR)

18-106783 DATED 1975
RESPONSE TO QUESTION E10 - ULTIMATE DISPOSAL OF SOLID WASTES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG., P. A1-269 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SOLID WASTES FROM THE CRBRP WILL BE COMPRISED OF SPENT RESINS FROM PROCESS WATER DEMINERALIZERS, SLUDGE AND SETTLED SOLIDS FROM THE CHEMICAL WASTE TREATMENT SYSTEM, AND SLUDGE FROM THE SEWAGE TREATMENT PLANT. IN ADDITION TO THE NORMAL AMOUNTS OF GARBAGE. ALL OF THE WASTE WILL BE NON-RADIOACTIVE IN NATURE, SO NO SPECIAL HANDLING IS EXPECTED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

WASTE DISPOSAL, SOLID + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106784 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F2 - PROJECT COST CATEGORIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-271 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ENVIRONMENTAL REPORT WILL BE ADJUSTED TO REFLECT THE CURRENT PROJECT COST ESTIMATE IN AMENDMENT 11.

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ECONOMICS + RESPONSE TO NRC QUESTION + COST ANALYSIS + CLINCH RIVER (LMFBR)

18-106785 DATED 1975
RESPONSE TO QUESTION D13 - GROUNDWATER FLOW

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106785 *CONTINUED*
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-212 THRU A1-213 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES DATA TO SUPPORT THE ASSUMPTION THAT NO GROUNDWATER FLOW COULD PASS BENEATH THE RIVER, PARTICULARLY DOWN THE SOUTHEASTERLY-DIPPING STRATA UNDER THE RIVER.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106786 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION D14 - SITE AQUIFER
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-214 THRU A1-215 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES DATA ON PERMEABILITIES IN THE MORE WEATHERED ZONES OF THE AQUIFER, AND ESTIMATES THE MAXIMUM PERMEABILITIES OF THE AQUIFER AT THE SITE.

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GROUND WATER + GROUND WATER, PROPERTY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106787 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION D15 - GROUNDWATER CONTOURS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-216 THRU A1-217 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE STATEMENT THAT GROUNDWATER MOVES IN A DIRECTION NORMAL TO CONTOURS OF CONSTANT HEAD IS TRUE WHENEVER THE FLOW IS OCCURRING THROUGH A MEDIUM WHOSE HYDRAULIC PROPERTIES DO NOT CHANGE WITH LOCATION OR DIRECTION. SUCH A MEDIUM IS CALLED HOMOGENEOUS AND ISOTROPIC.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GEOLOGY + GROUND WATER + GROUND WATER, PROPERTY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-106788 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION D16 - DEWATERING FOR CONSTRUCTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-218 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DEWATERING DURING THE CONSTRUCTION OF THE PLANT ISLAND WILL BE ACCOMPLISHED BY PUMPING FROM OPEN SUMPS WITHIN THE EXCAVATION. THE FOUNDATION OF THE PLANT ISLAND STRUCTURES IS TO BE PLACED AT ELEVATION 720, SO THE SUMPS WILL BE AT OR SLIGHTLY BELOW THIS ELEVATION. THE BASE OF THE AQUIFER IN THIS AREA IS ABOVE ELEVATION 720; THEREFORE, WATER LEVELS WILL BE DRAWN DOWN TO NEAR THE BOTTOM OF THE AQUIFER AT THE EDGE OF THE EXCAVATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

GROUND WATER + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + CLINCH RIVER (LMFBR)

18-106789 DATED 1975
RESPONSE TO QUESTION D17 - TENNESSEE WATER QUALITY CRITERIA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 3 PGS, PP. A1-219 THRU A1-221 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TENNESSEE WATER QUALITY CRITERIA FOR TEMPERATURE ARE SUMMARIZED. WITHIN THE NEAR-FIELD, THE THERMAL PLUMES RESULTING FROM THE CRBRP DISCHARGE MIX SUFFICIENTLY WITH AMBIENT RIVER WATER TO ACHIEVE COMPLIANCE WITH THE ABOVE CRITERIA FOR ALL CASES OF TYPICAL SEASONAL AND HYPOTHETICAL WORST CASES CONDITIONS EXAMINED.

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DESIGN CRITERIA + REGULATION, STATE + WATER + PLUME BEHAVIOR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + TENNESSEE

18-106790 DATED 1975
RESPONSE TO QUESTION D22 - ALLUVIAL RIVERS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, 1 FIG, PP. A1-233 THRU A1-235 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106790 *CONTINUED*
CITES ADDITIONAL EVIDENCE IN SUPPORT OF THE STATEMENT THAT NO SCOURING EFFECTS ARE ANTICIPATED.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RIVER + RESPONSE TO NRC QUESTION + FLOW + BEHAVIOR + CLINCH RIVER (LMFBR)

18-106791 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F3 - LABOR SUPPLY AND DEMAND
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-272 THRU A1-273 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IT IS NOT APPROPRIATE TO CUMULATE THE DEMAND NUMBERS BECAUSE THE PEAK DEMAND FOR CARPENTERS AND ELECTRICIANS OCCURS AROUND THE THIRD YEAR OF CONSTRUCTION WHILE ELECTICIANS AND STEAMFITTERS PEAK AROUND THE FOURTH YEAR. THE ORIGINAL TABLE WAS PREPARED WHEN THE ESTIMATED PEAK EMPLOYMENT WAS 1,200 AND IT WAS THE ONLY EMPLOYMENT FIGURE AVAILABLE. THE SUMMING OF THE DATA WAS BASED ON PEAK NUMBERS FOR THOSE CRAFTS AT TVA'S PROPOSED HARTSVILLE NUCLEAR PLANTS PROJECT. THESE FOUR CRAFTS WERE EVALUATED BECAUSE OF THE NUMBER REQUIRED AND THE HIGH SKILL LEVEL INVOLVED FOR NUCLEAR PLANT WORK. THUS, THEY WOULD BE THE CRAFTS MOST LIKELY TO TAX THE LOCAL LABOR MARKET.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

IMPACT PROPERTY + RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

18-106792 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F5 - MAXIMUM NUMBER OF CONSTRUCTION WORKERS FROM OUTSIDE KNOXVILLE AREA
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-275 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A SERIES OF SURVEYS OF CONSTRUCTION WORKERS AT MAJOR TVA PROJECTS PROVIDED THE BASIS FOR THE ESTIMATE OF WORKERS ORIGINATING OUTSIDE THE KNOXVILLE LABOR AREA. THESE SURVEYS HAVE COVERED A FOSSIL-FUEL GENERATING PLANT AND THREE NUCLEAR PLANTS. PEAK EMPLOYMENT HAS RANGED FROM 2,200 TO 3,200 WITH SURVEYS CONDUCTED AT OTHER EMPLOYMENT LEVELS AS WELL. THE GEOGRAPHIC SETTING OF THE SITES HAS VARIED FROM THE EDGE OF A METROPOLITAN AREA TO A VERY ISOLATED SITE.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

18-106793 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F7 - SUMMARY OF ECONOMIC COMPARISON OF LMFBR DEMONSTRATION PLANT ALTERNATIVES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, 2 TABS, PP. A1-277 THRU A1-280 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A SUMMARY OF THE ECONOMIC COMPARISON OF LMFBR DEMONSTRATION PLANT ALTERNATIVES. THE COMPARISON DID NOT INCLUDE INTEREST DURING CONSTRUCTION AND WAS MADE IN TOTAL CURRENT DOLLARS. A CASH FLOW ANALYSIS WAS NOT PERFORMED EXCEPT FOR THE OPERATING COST ITEMS DURING THE DEMONSTRATION PERIOD. AN ESCALATION ALLOWANCE OF 30 PERCENT WAS USED TO ESTIMATE THE TOTAL PROJECT COST.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMIC STUDY + RESPONSE TO NRC QUESTION + COST ANALYSIS + ELECTRIC POWER, ALTERNATE + POWER PLANT, FOSSIL FUEL + COMPARISON + POWER PLANT, NUCLEAR + CLINCH RIVER (LMFBR)

18-106794 ALSO IN CATEGORIES 1 AND 10 DATED 1975
RESPONSE TO QUESTION F9 - VALUE OF ELECTRICITY PRODUCED
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-282 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A TOTAL GENERATION DURING THE DEMONSTRATION PERIOD OF APPROXIMATELY 9.5 BILLION KWH, BASED ON AN ASSUMED PLANT AVAILABILITY OF 55 PERCENT DURING THE DEMONSTRATION PERIOD, WHEN VALUED AT 4.9 MILLS/KWH, TOTALS NEARLY $47 MILLION OR AN AVERAGE OF $9.4 MILLION PER YEAR FOR A 5-YEAR PERIOD.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMICS + ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + COST BENEFIT + CLINCH RIVER (LMFBR)

18-106795 ALSO IN CATEGORIES 1 AND 10 DATED 1975
RESPONSE TO QUESTION F10 - VALUE OF ELECTRICITY PRODUCED ON TVA SYSTEM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-283 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106795 *CONTINUED*
THE AVERAGE COST OF ELECTRICITY PRODUCED ON THE TVA SYSTEM BY TVA GENERATING PLANTS IN FISCAL YEAR 1974 (JULY 1, 1973, THROUGH JUNE 30, 1974) WAS 4.929 MILLS/KWH INCLUDING DEPRECIATION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ELECTRIC POWER + RESPONSE TO NRC QUESTION + COST ANALYSIS + PRODUCTION + TVA + CLINCH RIVER (LMFBR)

18-106796 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F11 - PAYROLL EFFECTS AND BENEFITS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-284 THRU A1-285 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

ESTIMATED NET INCREASE IN RETAIL SALES AND SALES TAX RESULTING FROM DIRECT AND INDIRECT PAYROLLS ARE SHOWN. IT IS ESTIMATED THAT 45 PERCENT OF PAYROLLS WILL BE SPENT ON RETAIL PURCHASES. FURTHER ALLOWANCE IS MADE FOR GASOLINE SALES, WHICH ARE NOT SUBJECT TO RETAIL SALES TAX; IT IS ESTIMATED THAT FIVE PERCENT OF RETAIL SALES WILL BE FOR GASOLINE. WE DO NOT CONSIDER THE USE OF IRS ALLOWABLE PROPORTIONS TO BE ADEQUATE BECAUSE THEY DO NOT NECESSARILY REFLECT TOTAL AGGREGATE SALES OR SALES TAX. CERTAIN MAJOR CATEGORIES OF RETAIL PURCHASES ARE ALLOWABLE IN ADDITION TO THE TABLE VALUE, INCLUDING AUTOMOBILES, BOATS, MOBILE HOMES AND BUILDING MATERIALS UNDER CERTAIN CONDITIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ECONOMIC STUDY + RESPONSE TO NRC QUESTION + COST BENEFIT + CLINCH RIVER (LMFBR)

18-106797 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION F12 - PLANT EMPLOYMENT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-286 THRU A1-287 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

PROVIDES DATA ON THE 'NORMAL' EMPLOYMENT TRENDS AND PROJECTIONS FOR THE STUDY AREA AND FOR PLANT CONSTRUCTION EMPLOYMENT OVER THESE NORMAL LEVELS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONSTRUCTION + MAN + CLINCH RIVER (LMFBR)

18-106798 DATED 1975
RESPONSE TO QUESTION G1 - STRETCH THERMAL OUTPUT
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-288 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

THE STRETCH THERMAL OUTPUT IS 1121 MWT WITH GROSS GENERATOR OUTPUT OF 439 MWE. THE PLANT POWER REQUIREMENTS HAVE BEEN INCREASED TO 60 MWE (VS 27 MWE PREVIOUSLY REPORTED) RESULTING IN A NET POWER OF 379 MWE. THE INITIAL CORE NET POWER PRODUCTION WILL SHOW A SIMILAR REDUCTION WHEN THE INCREASED PARASITIC POWER REQUIREMENTS ARE TAKEN INTO ACCOUNT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ELECTRIC POWER + RESPONSE TO NRC QUESTION + PRODUCTION + CLINCH RIVER (LMFBR)

18-106799 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION G2 - PLANT IMPACT ON HISTORICAL AND CULTURAL RESOURCES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 5 PGS. PP. A1-289 THRU A1-293 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

TVA SUBMITTED PROJECT PLANS AND LOCATIONS TO THE TENNESSEE HISTORICAL COMMISSION ON MAY 23, 1973, ALONG WITH AN ARCHAEOLOGICAL SURVEY OF THE SITE. WE ASKED THE COMMISSION TO ADVISE US OF IMPACT ON ANY HISTORICAL RESOURCES. THE COMMISSION RESPONDED BY LETTER OF JUNE 5, 1973, THAT "IT DOES NOT APPEAR THAT ANY STRUCTURES OF HISTORICAL SIGNIFICANCE OR ANY ARCHAEOLOGICAL SITES THAT WOULD QUALIFY FOR THE NATIONAL REGISTER WOULD BE AFFECTED."

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITING + RESPONSE TO NRC QUESTION + EFFECT + CULTURE + CLINCH RIVER (LMFBR)

18-106800 ALSO IN CATEGORY 13 DATED 1975
RESPONSE TO QUESTION G6 - NATURAL URANIUM REQUIREMENTS
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS. PP. A1-301 THRU A1-302 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR. MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-106800 *CONTINUED*
FOR THE PLANT'S 30-YEAR LIFE, ESTIMATES IN METRIC TONS THE NATURAL URANIUM REQUIREMENT, THE PU-239 REQUIREMENT, THE U-235 AND U-238 CONSUMPTION, AND THE PU-239 PRODUCTION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

FUEL BURNUP + PLUTONIUM + URANIUM + RESPONSE TO NRC QUESTION + FUEL, NUCLEAR + CLINCH RIVER (LMFBR)

18-106801 ALSO IN CATEGORY 10 DATED 1975
RESPONSE TO QUESTION G7 - TRANSMISSION LINE ROUTES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-303 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN GENERAL, AESTHETIC IMPACTS WERE MINIMIZED BY FOLLOWING APPLICABLE PORTIONS OF THE U.S. DEPARTMENT OF INTERIOR/AGRICULTURE PUBLICATION ENVIRONMENTAL CRITERIA FOR ELECTRIC TRANSMISSION SYSTEMS AND THE FEDERAL POWER COMMISSION PUBLICATION ELECTRIC POWER TRANSMISSION AND THE ENVIRONMENT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CABLES AND CONNECTORS + POWER TRANSMISSION + CLINCH RIVER (LMFBR)

18-106802 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION G8 - EROSION CONTROL PRACTICES DURING TRANSMISSION LINE CONSTRUCTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-304 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRIOR TO CLEARING OF THE TRANSMISSION LINE RIGHT-OF-WAY, AN ENGINEER WALKS THE RIGHT-OF-WAY TO ESTIMATE THE COST OF CLEARING AND NOTES ANY UNUSUAL CONDITIONS WHERE EROSION CONTROL MEASURES SHOULD BE TAKEN TO AVOID RUNOFF AND SILTATION. BASED ON THE ON-SITE VISIT AND A REVIEW OF THE DRAWINGS, THERE ARE NO STREAM CROSSINGS OF ANY SIGNIFICANCE ON THE TRANSMISSION LINE CORRIDOR. THE CONSTRUCTION OF THIS LINE WILL BE DONE DURING THE DRY TIME OF THE YEAR WHICH WILL NOT AFFECT ANY WET WEATHER STREAMS. ON SLOPES, CONTOURS OR WATER SWELLS ARE INSTALLED TO CHECK RUNOFF AND PREVENT EROSION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

SITING + EROSION + RESPONSE TO NRC QUESTION + CONSTRUCTION + POWER TRANSMISSION + CLINCH RIVER (LMFBR)

18-106803 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION G11 - HIGHWAY CONGESTION
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-308 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO PRELIMINARY PLANS HAVE BEEN DEVELOPED FOR HIGHWAY CONGESTION. HOWEVER, STAGGERED STARTING TIMES WOULD PROBABLY BE CONSIDERED IN SUCH PLANS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + CONCENTRATION + MAN + ON SITE + CLINCH RIVER (LMFBR)

18-106804 ALSO IN CATEGORIES 2 AND 10 DATED 1975
RESPONSE TO QUESTION G12 - MITIGATION OF CONSTRUCTION ACTIVITIES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG, P. A1-309 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DESCRIBES THE CONTROL PROGRAM INCLUDING PERIODIC REVIEW OF ALL CONSTRUCTION ACTIVITIES TO ASSURE THAT APPROPRIATE MITIGATING ACTIONS WILL BE TAKEN TO AVOID UNNECESSARY ADVERSE ENVIRONMENTAL IMPACTS DURING PLANT AND TRANSMISSION LINES CONSTRUCTION.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

ADMINISTRATIVE CONTROL + RESPONSE TO NRC QUESTION + EFFECT + CONSTRUCTION + CLINCH RIVER (LMFBR)

18-106805 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 1 - ER SCHEDULES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 2 PGS, PP. A1-312 THRU A1-313 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PROVIDES A SCHEDULE FOR THE ISSUANCE OF THE FINAL ENVIRONMENTAL STATEMENT ON THE LMFBR PROGRAM AND THE FINAL ERDA DETERMINATIONS RELATING THERETO. IDENTIFIES MAJOR DIFFERENCES BETWEEN THE DRAFT AND PROPOSED FINAL STATEMENTS OF THE CRBRP ER AND AMENDS THESE SECTIONS TO REFLECT THE LATEST

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18-106805 *CONTINUED*
EVALUATIONS IN THE PROPOSED FINAL STATEMENT.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + PUBLIC HEARING + CLINCH RIVER (LMFBR) + LICENSING PROCESS

18-106806 ALSO IN CATEGORY 17 DATED 1975
RESPONSE TO QUESTION 5 - PLANTS DEMONSTRATION OBJECTIVES
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-317 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE STATED OBJECTIVES OF THE CRBRP WILL BE FULFILLED WITHIN THE FIVE-YEAR DEMONSTRATION PERIOD. AT THIS TIME, THE PRECISE ROLE OF THE CRBRP IN THE LMFBR PROGRAM DURING THE POST-DEMONSTRATION PERIOD CANNOT BE PRECISELY DETERMINED. IT IS PRESENTLY ANTICIPATED HOWEVER THAT DURING THE POST-DEMONSTRATION PERIOD, THE CRBRP WILL BE USED FOR A NUMBER OF SPECIFIC EXPERIMENTAL AND OPERATIONAL TESTS, SUCH AS TESTING VARIATIONS IN FUEL ASSEMBLY DESIGNS, NATURAL CIRCULATION PERFORMANCE, ETC.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

OPERATION + RESPONSE TO NRC QUESTION + OPERATING EXPERIENCE + CLINCH RIVER (LMFBR)

18-106807 DATED 1975
RESPONSE TO QUESTION 6 - LMFBR PROGRAM REVIEW GROUP
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 6 PGS. PP. A1-318 THRU A1-323 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DESCRIBES THE STATUS OF ERDA'S ACCEPTANCE AND IMPLEMENTATION OF THE REVIEW GROUP'S RECOMMENDATIONS.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

OPERATION + STATE PROGRAM + REVIEW + RESPONSE TO NRC QUESTION + R AND D PROGRAM + CLINCH RIVER (LMFBR)

18-106808 ALSO IN CATEGORIES 1 AND 17 DATED 1975
RESPONSE TO QUESTION 7 - LMFBR PROGRAM
PROJECT MANAGEMENT CORP., ILL.
DOCKET 50537-9 +. 1 PG. P. A1-324 OF AMENDMENT 1 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, JUNE 10, 1975. DOCKET 50-537. TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DISCUSSES THE RELATIONSHIP OF THE CRBRP TO SUBSEQUENT PHASES OF THE LMFBR PROGRAM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

RESPONSE TO NRC QUESTION + R AND D PROGRAM + COMPARISON + CLINCH RIVER (LMFBR)

18-106827 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JUNE 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-41 +. 200 PPS. FIGS. REFS. AUG. 25, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING FBR-2 OPERATIONS, LMFBR DESIGN SUPPORT, INSTRUMENTATION AND CONTROLS, REACTOR PHYSICS, REACTOR SAFETY, GCFR'S AND ADVANCED FUELS PROGRAM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + TESTING + REACTOR PHYSICS + *R AND D PROGRAM + *REACTOR, GCFR + INSTRUMENTS, MISC.

18-106830 DATED 1975
GOTZMANN O
MATERIALS PROBLEMS RELATED TO THE CORE CATCHER OF SODIUM COOLED REACTORS (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2135 +. 31 PPS. 8 FIGS. 13 REFS. MAY 1975

THERE ARE TWO POSSIBLE SOLUTIONS FOR THE EXTERNAL CORE CATCHER, AS FOR AS MATERIALS ARE CONCERNED: (1) A BARRIER CONSISTING OF A MATERIAL WITH A HIGH MELTING POINT, AND (2) A TRAY OF COMPARATIVELY LOW MELTING MATERIAL WITH A HIGH SOLUBILITY FOR THE FUEL. BOTH CONCEPTS ARE DISCUSSED IN DETAIL.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

DESIGN STUDY + GERMANY + MATERIAL + REVIEW + *CORE CATCHER

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-106834 ALSO IN CATEGORY 11 DATED 1975
ZIMMERMANN W
TRANSFERCELL AND CORE-ELEMENT STORAGE-FACILITY FOR THE SNR 2 (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2132 +. 55 PPS, 6 TABS, 12 FIGS, MAY 1975

PRESENTS A SHORT SURVEY OF THE DEVELOPMENT AND STATE OF THE ART, FOLLOWED BY THE CONCEPT OF THE FUEL ELEMENT HANDLING CHOSEN FOR SNR-2. THE TRANSFER CELL CONNECTING THE REACTOR WITH THE FUEL STORAGE IS DESCRIBED IN DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FUEL STORAGE + DESIGN STUDY + GERMANY + STORAGE CONTAINER + SYSTEM DESCRIPTION

18-106841 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY-MARCH 1975 - SODIUM TECHNOLOGY AND COVER GAS SEAL DEVELOPMENT PROGRAMS
ATOMICS INTERNATIONAL, CANOGA PARKS, CALIF.
AI-ERDA-13,147 +. 123 PPS, 16 TABS, 47 FIGS, MAY 15, 1975

DEMONSTRATION TESTING OF THE HOT GAS LANCE WAS COMPLETED WITH THE SUCCESSFUL REMOVAL OF SODIUM FROM SEVERAL ITEMS, INCLUDING A SODIUM-WETTED CHAIN. RESULTS OF FRICTION TESTING ARE GIVEN. ALL ELASTOMER SEAL CHARACTERIZATION TESTS HAVE BEEN COMPLETED AND THE RESULTS, CONCLUSIONS, AND RECOMMENDATIONS WERE INCORPORATED IN AND ISSUED AS THE ELASTOMER SEAL DESIGN GUIDE, AI-AEC-13145.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + DECONTAMINATION + COVER GAS + SEAL + *R AND D PROGRAM + FRICTION + *POLYMERIC

18-106842 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, MAY 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-40 +. 220 PPS, FIGS, REFS, JULY 30, 1975

THIS PROGRESS REPORT SUMMARIZES THE ARGONNE NATIONAL LABORATORY WORK PERFORMED FOR THE REACTOR DEVELOPMENT PROGRAM DURING MAY 1975 IN THE FOLLOWING RESEARCH AND DEVELOPMENT AREAS: EXPERIMENTAL BREEDER REACTOR NO. II(EBR-II), HOT FUEL EXAMINATION FACILITY, LMFBR DESIGN SUPPORT, INSTRUMENTATION AND CONTROL, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, REACTOR SAFETY, AND OTHER FAST BREEDER REACTORS (GCFR).

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EBR 1 AND 2 (RE) + DESIGN STUDY + MATERIAL + R AND D PROGRAM + FUEL ROD + REACTOR, GCFR + INSTRUMENTS, MISC.

18-106938 ALSO IN CATEGORY 5 DATED 1975
EVANS SK + AITKEN EA
OXYGEN REDISTRIBUTION IN (U,PU)O/SUB 2-X/FUELS
GENERAL ELECTRIC COMPANY
GEAP-14036 +. 34 PPS, 23 FIGS, 21 REFS, JAN. 1975

DESCRIBES EXPERIMENTAL DATA WHICH CHARACTERIZE THE OXYGEN TRANSPORT IN MIXED OXIDE FUEL SUBJECTED TO A TEMPERATURE GRADIENT. THE EXPERIMENTS ARE ANALYZED IN A MANNER WHICH LEND THEMSELVES TO INTEGRATION WITH ANALYSES OF IRRADIATED FUEL BEHAVIOR. USE OF THESE DATA AND ASSOCIATED ANALYSES MAKE POSSIBLE AN UNDERSTANDING OF IRRADIATED FUEL BEHAVIOR WHICH IS BASED ON STOICHIOMETRY-DEPENDENT PARAMETERS. SUCH ANALYSES WILL RESULT IN BETTER PREDICTIONS OF FUEL THERMAL, CHEMICAL, AND MECHANICAL BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + OXIDE + *OXYGEN + PLUTONIUM + TEMPERATURE GRADIENT + *TRANSPORT PROPERTY + STOICHIOMETRY + R AND D PROGRAM + FUEL ROD + DISTRIBUTION + DISTRIBUTION, MICRO

18-106943 ALSO IN CATEGORIES 5 AND 7 DATED 1975
RADIOLOGICAL ASSESSMENT MODELS THIRD QUARTERLY REPORT, MARCH-MAY 1975
GENERAL ELECTRIC COMPANY
GEAP-14034-3 +. 60 PPS, 18 FIGS, 63 REFS, JUNE 1975

THE OBJECTIVES OF THIS PROGRAM ARE TO DEVELOP MODELS FOR ANALYZING AND EVALUATING POSTULATED RADIOLOGICAL SOURCES, AEROSOL DYNAMICS, SODIUM FIRES, AND RADIOLOGICAL DOSAGES ARISING IN THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENT OF LIQUID METAL FAST BREEDER REACTOR. THE WORK PERFORMED DURING THIS REPORTING PERIOD CONTINUED THE REVIEW AND EVALUATING OF CURRENT TECHNOLOGY, EXPERIMENTS, ANALYTICAL MODELS, AND COMPUTER CODES USED IN RADIOLOGICAL MODELING AND ASSESSMENT. THE IMMEDIATE OBJECTIVE IS TO DEVELOP A PRELIMINARY, OVER-ALL RADIOLOGICAL ASSESSMENT MODEL FOR THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS.

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18-106943 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + ACCIDENT + AEROSOL + FIRE + *FISSION GAS RELEASE + FISSION PRODUCT RELEASE + SOURCE, RADIATION + ANALYTICAL MODEL + ACCIDENT MODEL + *ACCIDENT, CORE DISRUPTIVE

18-107073 ALSO IN CATEGORIES 2 AND 9 AND 10 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
127 PGS. AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS THE PROJECT'S SITE SUITABILITY SOURCE TERM FROM THE CRBRP PARALLEL DESIGN AND NEW AND REVISED PAGES TO THE PRELIMINARY SAR. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING RELIABILITY ANALYSIS, WEATHER DATA, SEISMIC RESPONSES DURING WASTE INJECTIONS, AND SODIUM FIRES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + DESIGN CRITERIA + RELIABILITY ANALYSIS + SEISMOLOGY + SITING, REACTOR + SOURCE, RADIATION + *REPORT, PSAR + ENGINEERED SAFETY FEATURE + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR)

18-107074 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 1.1 - RELIABILITY ALLOCATIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
3 PGS. PP. 1.1-1 THRU 1.1-3 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DISTINCTION BETWEEN 8 X 10(-7TH) AND 1 X 10(-6TH) IS MEANINGFUL IN PROVIDING GUIDELINES, AS ARE CUSTOMARILY ESTABLISHED IN THE RELIABILITY ALLOCATION PROCESS. THE SAFETY RELIABILITY APPORTIONMENT AS PRESENTED FOR THE CLINCH RIVER PLANT IS CONSISTENT WITH ACCEPTED APPORTIONMENT PRINCIPLES, AND DOES INDEED INCLUDE MEANINGFUL DISTINCTION AMONG ITS COMPONENTS. SPECIFICALLY, THE 8 TO 1 DIFFERENCE IN UNRELIABILITY ALLOCATION BETWEEN THE SHUTDOWN HEAT REMOVAL SYSTEM AND THE SHUTDOWN SYSTEM IS CONSIDERED TO BE CLEARLY MEANINGFUL AND REFLECTS THE RELATIVE CONTRIBUTIONS OF THE TWO SYSTEMS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*RELIABILITY ANALYSIS + ACCIDENT, PROBABILITY OF + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

18-107075 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.15 - LEAK IDENTIFICATION
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.15-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

DETECTION AND CONFIRMATION OF A LEAK IN THE PRIMARY SYSTEM LEADS TO SHUTDOWN OF THE PLANT REGARDLESS OF THE PRECISE LOCATION. THEREFORE, LOCATION OF THE LEAK IS AN ECONOMIC CONSIDERATION AND A MANDATORY REQUIREMENT IN THE CRITERION IS NOT WARRANTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

TEST, LEAK LOCATION + RESPONSE TO NRC QUESTION + *CONTAINMENT LEAK MONITOR + CLINCH RIVER (LMFBR)

18-107076 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.24 - DESIGN BASIS OF INNER CELLS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.24-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INNER CELLS WITHIN THE CONTAINMENT ARE DESIGNED AND REQUIRED ONLY TO HAVE A NOMINAL LEAKTIGHTNESS FOR THE PURPOSE OF MAINTAINING THE PURITY OF THE INERTED ATMOSPHERE IN THESE CELLS DURING NORMAL PLANT OPERATION. NOTE THAT THE INERTED CELLS ARE OPERATED AT A SLIGHT NEGATIVE PRESSURE TO PROVIDE THE DESIRED NORMAL OPERATING LEAKAGE PATH. THE INNER CELLS ARE NOT ENGINEERED SAFETY FEATURES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + CONTAINMENT + *DESIGN CRITERIA + ACCIDENT, LOSS OF COOLANT + RESPONSE TO NRC QUESTION + *COMPARTMENT + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107077 DATED 1975
RESPONSE TO QUESTION 1.75 - MAINTENANCE OF HEAD MOUNTED COMPONENTS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, PP. 1.75-1 THRU 1.75-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SEALS FOR HEAD MOUNTED EQUIPMENT ARE LOCATED IN AREAS THAT ARE ACCESSIBLE FOR MAINTENANCE BY SPECIAL TOOLS OR FOR HANDS-ON-MAINTENANCE. THOSE ITEMS REQUIRING HANDS-ON-SERVICE ARE KEPT AT A MAXIMUM OF 150 F AND MOST ARE ELEVATED A DISTANCE ABOVE THE 400 F HEAD. ALL OF THE COMPONENTS REQUIRING MAJOR REPAIR ARE DESIGNED TO BE REMOVED IN MODULAR ASSEMBLIES. A BRIEF DESCRIPTION OF THE MAJOR HEAD MOUNTED COMPONENTS IS GIVEN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT + *MAINTENANCE AND REPAIR + *SEAL + RESPONSE TO NRC QUESTION + EQUIPMENT + COMPONENTS + CLINCH RIVER (LMFBR)

18-107078 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.126 - EFFECT OF INERT ATMOSPHERE ON LEAK MONITOR
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.126-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

OF THE TYPES OF LEAK DETECTION DEVICES PROPOSED FOR THE LEAK DETECTION SYSTEM, ONLY SODIUM VAPOR/AEROSOL LEAK DETECTION DEVICES WOULD SHOW A DIFFERENCE IN THEIR RESPONSE WHEN OPERATED IN AN AIR ATMOSPHERE AS OPPOSED TO AN INERT ATMOSPHERE. THE ELECTRICAL SENSING TYPES SUCH AS CABLE AND CONTACT DETECTORS WOULD SHOW NO DIFFERENCE IN RESPONSE DUE TO OPERATING ATMOSPHERES. HOWEVER, THE POTENTIAL FOR HIGHER MOISTURE CONTENT IN AIR COULD RESULT IN GREATER INHIBITION TO SODIUM FLOW GIVEN A SMALL LEAK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + *CONTAINMENT LEAK MONITOR + EFFECT + CLINCH RIVER (LMFBR)

18-107079 DATED 1975
RESPONSE TO QUESTION 1.193 - TYPES OF MAINTENANCE
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.193-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

MAINTENANCE OPERATIONS WILL BE OF THE HANDS-ON AND SEMI-REMOTE TYPE. THERE ARE NO FULLY REMOTE OPERATIONS. REVISED PSAR SECTION 9.2.1.1 PROVIDES THE CRITERIA FOR DETERMINING WHICH OPERATION IS TO BE PERFORMED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + *MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107080 DATED 1975
RESPONSE TO QUESTION 1.204 - TRITIUM RELEASE CRITERIA
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.204-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN OBJECTIVES OF CRBR PLANT OPERATION INCLUDE LEVELS OF RADIOACTIVE MATERIALS IN THE PLANT EFFLUENTS TO THE ENVIRONMENT BEING KEPT AS LOW AS PRACTICABLE. ANALYSIS OF CRBR PLANT DESIGN, INCLUDING ACCIDENT CONDITIONS, ARE BASED ON CONSERVATION ESTIMATES OF TRITIUM IN THE PRIMARY SODIUM. RESULTS OF THE ANALYSES CONFIRM THAT A STIPULATION OF A TRITIUM CONTENT LIMIT IS NOT REQUIRED. ANALYSIS OF PLANT RELEASES SHOW THE DESIGN TRITIUM RELEASES TO BE LESS THAN 10% OF 10CFR20.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + DESIGN CRITERIA + *TRITIUM + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107081 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 1.248 - ELASTOMER SEAL SYSTEM LEAKAGE
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 1.248 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG.--WEST., AE--BURNS & ROE

THE ELASTOMER SEAL SYSTEM IN THE UPPER SECTION OF THE RISER ASSEMBLY IS MADE UP OF 2 SETS OF 'O' RINGS AND ONE SET OF INFLATABLE SEALS. DOUBLE-BUFFERING AND PURGING BETWEEN THE 'O' RINGS MINIMIZE THE AMOUNT OF NOBLE GAS LEAKAGE. THE CALCULATED INFLATABLE SEAL LEAKAGE RATE DUE TO

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107081 *CONTINUED*
DIFFUSION IS 2.6 X 10 (EXP -5) SCC/SEC CM OVER THE RANGE 5 TO 15.0 PSID BETWEEN THE PRESSURIZED SEAL AND ATMOSPHERE. A BUFFER GAS FLOW OF APPROXIMATELY 2 SCFM IN COMBINATION WITH THIS LEAK RATE LIMITS RADIATION IN THE HEAD ACCESS AREA FROM THE SEALS TO LESS THAN 0.2 MR/HR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DIFFUSION + *SEAL + RESPONSE TO NRC QUESTION + *LEAK RATE + CLINCH RIVER (LMFBR)

18-107082 ALSO IN CATEGORY 10 DATED 1975
RESPONSE TO QUESTION 110.8 - SEISMIC QUALIFICATION OF ELECTRICAL EQUIPMENT
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, PP. 110.8-1 THRU 110.8-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IEEE 344-1975, "IEEE RECOMMENDED PRACTICES FOR SEISMIC QUALIFICATION OF CLASS IE EQUIPMENT FOR NUCLEAR POWER GENERATING STATIONS" WILL BE USED AS DESCRIBED IN SECTION 3.10.1 FOR SEISMIC QUALIFICATION BY TESTING OF CLASS 1 ELECTRICAL EQUIPMENT. THE QUALIFICATION TESTS WILL BE BASED ON SINGLE FREQUENCY SINE BEAT TESTING AT RESONANCE. THIS CONSTITUTES SEVERE TESTING UNDER THE MOST UNFAVORABLE CONDITIONS WHERE A MEASURED EQUIPMENT NATURAL FREQUENCY HAS BEEN CONSERVATIVELY ASSUMED TO COINCIDE WITH A BUILDING OR SUPPORTING SYSTEM NATURAL FREQUENCY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CODES AND STANDARDS + *TESTING + ELECTRIC POWER + RESPONSE TO NRC QUESTION + *EQUIPMENT + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

18-107083 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION 120.5 - SELF-WELDING PHENOMENA OF COUPLINGS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, PP. 120.5-1 THRU 120.5-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ONLY MATERIAL COUPLE INVOLVED IN THE OPERATING PARTS OF THE PRIMARY COUPLING IS INCONEL 718/INCONEL 718. THIS PARTICULAR MATERIALS COMBINATION HAS BEEN SUBJECTED TO EXTENSIVE TESTING IN SODIUM AND HAS PROVEN TO HAVE EXCELLENT RESISTANCE TO SELF-WELDING. TEST CONDITIONS HAVE INCLUDED TEMPERATURES OF 850 AND 1050 F, FOR CONTACT PRESSURES OF 16,000 AND 148,000 PSI, AND TIMES UP TO 6 MONTHS, WITH SEPARATIONS BEING PERFORMED AT THE EXPOSURE TEMPERATURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*WELDING + *MATERIAL + RESPONSE TO NRC QUESTION + INCONEL + CABLES AND CONNECTORS + CLINCH RIVER (LMFBR) + CONTROL ROD DRIVES

18-107084 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION 222.14 - SODIUM-WATER REACTION PRESSURE RELIEF SYSTEM INSTRUMENTATION
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 222.14-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FUNCTIONS OF THE SWRPRS INSTRUMENTATION AND CONTROL SYSTEM THAT RESULT IN SCRAM OF THE REACTOR ARE SAFETY RELATED AND ARE PART OF THE PLANT PROTECTION SYSTEM. THE SODIUM-WATER REACTION DETECTION INSTRUMENTATION FOR MONITORING RUPTURE DISK FAILURE FALLS INTO THIS CATEGORY. UPON RECEIPT OF THESE SODIUM-WATER REACTION SIGNALS, INDICATING RUPTURE DISK FAILURE, THE SECONDARY PLANT PROTECTION SYSTEM INITIATES SCRAM AND TRIPS THE PHTS AND IHTS SODIUM PUMPS IN THE AFFECTED LOOP.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

METAL WATER REACTION + CONTROL + *PRESSURE RELIEF + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *INSTRUMENTS, MISC.

18-107085 ALSO IN CATEGORY 10 DATED 1975
RESPONSE TO QUESTION 222.23 - DIESEL GENERATOR CAPABILITIES
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, 2 FIGS, PP. 222.23-1 THRU 222.23-4 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CURVES INDICATING VARIATION OF LOAD AT DIFFERENT TIME PERIODS FOR EACH DIESEL GENERATOR ARE PROVIDED IN FIGURES Q222.23-1 AND Q222.23-2. SINCE THE DIESEL GENERATORS HAVE NOT BEEN PURCHASED, THE VARIATION OF VOLTAGE AND FREQUENCY VS. TIME CANNOT BE FURNISHED AT THIS TIME. HOWEVER, THESE CURVES WILL BE FURNISHED SUBSEQUENT TO PURCHASE OF THE DIESELS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107085 *CONTINUED*
DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + ENGINES, INTERNAL COMBUSTION + *GENERATOR, DIESEL

18-107086 DATED 1975
RESPONSE TO QUESTION 222.30 - EFFECT OF PREVIOUSLY UNIDENTIFIED EVENTS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 222.30-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AN UPDATING OF THE EVALUATION OF EVENTS HAVING POTENTIAL TO CAUSE 10CFR100 GUIDELINES TO BE EXCEEDED IS BEING PERFORMED. HOWEVER, BASED ON THE PRELIMINARY EVALUATION WHICH CONSIDERS A LARGE AMOUNT OF EXPERIENCE WITH, AND HISTORICAL INFORMATION FROM OPERATING REACTORS, DISCOVERY OF EVENTS IN THIS CATEGORY NOT PREVIOUSLY IDENTIFIED, IS BELIEVED TO BE UNLIKELY. SHOULD SUCH AN EVENT BE UNCOVERED, THE FIRST STEP WOULD BE TO EVALUATE THE REFERENCE DESIGNS ABILITY TO COPE WITH IT WITHIN THE DEFINED RELIABILITY REQUIREMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *ACCIDENT, CONSEQUENCES + DESIGN CRITERIA + *RELIABILITY ANALYSIS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107087 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 222.31 - RELIABILITY ALLOCATION FOR SUBSYSTEMS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, 1 TAB, PP. 222.31-1 THRU 222.31-2 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ALLOCATIONS FOR THE MAJOR SUBSYSTEMS OF THE SHUTDOWN SYSTEMS AND SHUTDOWN HEAT REMOVAL SYSTEMS ARE THE BASIS FOR DESIGN REQUIREMENTS RELATED TO RELIABILITY. THE ALLOCATION AT THIS LEVEL FOR THE SHUTDOWN SYSTEM IS INCLUDED IN APPENDIX C, SECTION C.14.1. ALLOCATION OF THE SUBSYSTEM TO THE LOWER LEVEL IS GENERATED BY THE DESIGN ORGANIZATION FOR TEST PLANNING AND COMPONENT SPECIFICATIONS. THE INITIAL REPORT SHOWING THE LOWER LEVEL ALLOCATIONS USED FOR TEST PLANNING PURPOSES IS CURRENTLY BEING PREPARED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107088 DATED 1975
RESPONSE TO QUESTION 222.34 - FAILURE MODE AND EFFECTS ANALYSIS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, 35 TABS, PP. 222.34-1 THRU 222.34(C-17) OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A FAILURE MODES AND EFFECTS ANALYSIS FOR THE SHUTDOWN SYSTEM HAS BEEN COMPLETED, AND IS ATTACHED. THE PURPOSE OF THIS ANALYSIS WAS TO SYSTEMATICALLY SEARCH FOR AND IDENTIFY FAILURE MODES WHICH COULD DEGRADE THE SCRAM FUNCTION. WHILE THE FORMAT USED FOR THE SDS ANALYSIS DIFFERS SLIGHTLY FROM THAT SHOWN IN TABLE C.2.2-2, THE BASIC ELEMENTS ARE THE SAME. IT IS ALSO NOTED THAT THE SDS EVALUATION DOES NOT PROVIDE NUMERICAL ESTIMATES FOR INDIVIDUAL FAILURE RATES, AS WAS DONE FOR THE HEAT REMOVAL SYSTEMS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + RELIABILITY, SYSTEM + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + *FAILURE MODE ANALYSIS + EFFECT + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

18-107089 DATED 1975
RESPONSE TO QUESTION 310.16 - LEAK PATHS FOR DOWTHERM J INTO SODIUM
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
4 PGS, PP. 310.16-1 THRU 310.16-4 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN BASIS FOR THE AIRCONDITIONING DOWTHERM J AND THE PRIMARY SODIUM SYSTEM SEPARATION IS TO PROVIDE AT LEAST TWO PASSIVE BARRIERS BETWEEN THE TWO COOLANTS TO PREVENT THE INTRODUCTION OF DOWTHERM J INTO THE SODIUM. THE TWO BARRIERS ARE THE DOWTHERM J PIPE AND COOLER COILS, AND THE SODIUM PRIMARY BOUNDARY. A POTENTIAL PATH FROM DOWTHERM J TO PRIMARY SODIUM EXISTS THAT DOES NOT INVOLVE THE AIRCONDITIGNING SYSTEM. THIS IS THROUGH A NAK SUBSYSTEM WHICH IS THE INTERMEDIATE FLUID BETWEEN DOWTHERM J AND THE PRIMARY SODIUM IN COLD TRAPS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT AIR COOLING + *ORGANIC COOLANT + RESPONSE TO NRC QUESTION + COOLANT PURIFICATION SYSTEM + *LEAK + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107090 DATED 1975
RESPONSE TO QUESTION 310.19 - SODIUM FIRE CONTAINMENT DESIGN BASIS ACCIDENT
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 310.19-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A SPECTRUM OF POSTULATED IN-CONTAINMENT SODIUM FIRES HAS BEEN ANALYZED. TABLE 6.2-1 SUMMARIZES THE RESULTS OF THE ANALYSIS FOR THE MOST LIMITING FIRE INVESTIGATED, WHICH IS THE PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK FAILURE DURING MAINTENANCE. THIS POSTULATED FAILURE RESULTS IN THE MAXIMUM POSTULATED SPILL OF LIQUID PRIMARY SODIUM IN ANY DE-INERTED IN-CONTAINMENT CELL, AND THUS REPRESENTS THE MOST LIMITING FIRE CONDITION WITH RESPECT TO CONTAINMENT INTEGRITY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTAINMENT + DESIGN CRITERIA + *FIRE + MAINTENANCE AND REPAIR + *RESPONSE TO NRC QUESTION + *ACCIDENT, DESIGN BASIS + CLINCH RIVER (LMFBR)

18-107091 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.14 - WIND AND STABILITY DATA
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
2 PGS, 23 TABS, PP. 322.14-1 THRU 322.14-25 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A TEMPERATURE SENSOR WAS INSTALLED ON THE METEOROLOGICAL TOWER AT THE 33-FT. LEVEL ON APRIL 3, 1974. HOWEVER, DATA AT THIS SENSOR WAS FOUND TO BE IN ERROR FOR A SIX WEEK PERIOD OCCURRING IN OCTOBER - NOVEMBER, 1974. THEREFORE, THE REQUESTED ONE FULL YEAR OF JOINT FREQUENCY DISTRIBUTIONS OF WIND SPEED AND DIRECTION MEASURED AT THE 75-FT. LEVEL AND ATMOSPHERIC STABILITY DETERMINED BY THE VERTICAL TEMPERATURE DIFFERENCE BETWEEN THE 33- AND 200-FT. LEVELS IS NOT AVAILABLE WITH A DATA RECOVERY RATE EQUAL OR EXCEEDING 90%.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INSTRUMENT, METEOROLOGICAL + METEOROLOGICAL SUPPORT + WIND STATISTICS + RESPONSE TO NRC QUESTION + *TEMPERATURE + *STABILITY + WEATHER DATA + CLINCH RIVER (LMFBR) + SENSORS, TEMPERATURE

18-107092 ALSO IN CATEGORY 16 DATED 1975
RESPONSE TO QUESTION 322.16 - METEOROLOGICAL CONDITIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
1 PG, P. 322.16-1 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL PLANT STRUCTURES ARE DESIGNED ACCORDING TO THE SOUTHERN STANDARD BUILDING CODE AND ANSI A58.1-1972, 'BUILDING CODE REQUIREMENTS FOR MINIMUM DESIGN LOADS IN BUILDINGS AND OTHER STRUCTURES'. THE APPLICATION OF THESE STANDARDS TO THE CRBRP LEADS TO A (FASTEST MILE) WIND SPEED OF 90 MILES PER HOUR. ROOFS ARE DESIGNED TO WITHSTAND THE LOAD CAUSED BY THE ONE IN 100 YEAR STORM (3.5 INCHES PER HOUR). SAFETY-RELATED HVAC SYSTEMS ARE DESIGN TO MAINTAIN THE BUILDING ATMOSPHERE TEMPERATURE WITHIN THE LIMITS IDENTIFIED IN SECTION 9.6 UP TO A MAXIMUM OUTSIDE TEMPERATURE OF 105 F AND A MINIMUM OUTSIDE TEMPERATURE OF -16 F.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + *METEOROLOGY + RESPONSE TO NRC QUESTION + *STRUCTURE + CLINCH RIVER (LMFBR)

18-107093 DATED 1975
RESPONSE TO QUESTION 323.43 - SEISMIC MONITORING OF WASTE INJECTIONS
PROJECT MANAGEMENT CORP., CHICAGO, ILL.
7 PGS, 4 TABS, 16 FIGS, PP. 323.43-1 THRU 323.43-29 OF AMENDMENT 3 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, AUG. 29, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

INFORMATION REGARDING SEISMIC MONITORING OF THE WASTE INJECTIONS HAS BEEN PROVIDED BY MR. W. C. MCCLAIN, HEALTH PHYSICS DIVISION, OAK RIDGE NATIONAL LABORATORY. THE SEISMOGRAPH MONITORING RECORDS OBTAINED DURING THE INJECTION WERE EXAMINED FOR ANY UNUSUAL SIGNALS. THERE WAS A CONSIDERABLE AMOUNT OF NOISE OF ABOUT 8 CPS FREQUENCY SUPERIMPOSED ON THE NORMAL SEISMOGRAPH RECORD THROUGHOUT THE WHOLE TWO DAYS. SOME OF THIS NOISE OCCURRED DURING ACTUAL PUMPING AND SOME WAS NOT. THIS NOISE USUALLY ARRIVED IN EITHER SHORT BURSTS OF APPROXIMATELY 40-SECOND DURATION OR AS A LONG WAVE TRAIN LASTING FROM 4 TO 7 MINUTES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SEISMOLOGY + WASTE DISPOSAL + WASTE DISPOSAL, TERRESTRIAL + RESPONSE TO NRC QUESTION + *INSTRUMENT, EARTHQUAKE + *WASTE DISPOSAL, DEEP WELL + CLINCH RIVER (LMFBR)

18-107191 ALSO IN CATEGORY 5 DATED 1975
LORENZ JJ

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107191 *CONTINUED*
MIX: A COMPUTER CODE FOR TRANSIENT THERMAL HYDRAULIC ANALYSIS OF LMFBR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-41 +. 111 PPS. 27 FIGS. 16 REFS. MAY 1975

MIX IS A TWO DIMENSIONAL PLENUM ANALYSIS CODE DEVELOPED UNDER CRBRP UPPER PLENUM MIXING PROGRAM. THE GOVERNING EQUATIONS AND BOUNDARY CONDITIONS ARE DEVELOPED AND THE CORRESPONDING FINITE DIFFERENCE FORMULATIONS ARE PRESENTED. COMPARISONS WITH EXPERIMENTAL DATA ARE GIVEN.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + COMPARISON, THEORY AND EXPERIENCE + THERMAL TRANSIENT + MIXING COEFFICIENT + *MIXING ZONE + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

18-107192 ALSO IN CATEGORIES 9 AND 12 DATED 1975
BOURQUIN RD + BIRNEY KR
SCRAM - A COMPUTER PROGRAM FOR CALCULATING SCRAM TIMES FOR LMFBR CONTROL RODS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-83 +. 33 PPS. 5 FIGS. 5 REFS. AUG. 1975

THE ANALYTICAL TECHNIQUE INVOLVES THE DETERMINATION OF ALL THE FORCES ACTING ON THE CONTROL ROD SUB-SYSTEM DURING SCRAM. THE PROGRAM COMPLETES A FORCE BALANCE AS A FUNCTION OF THE DISTANCE TRAVELED DURING SCRAM AND DETERMINES THE TIME, PRESSURE DROP, BUNDLE VELOCITY, BUNDLE COOLANT VELOCITY, BYPASS COOLANT VELOCITY, AND BUNDLE ACCELERATION. THE PROGRAM IS SPECIFICALLY APPLICABLE FOR FFTF TYPE CONTROL RODS. RESULTS OBTAINED USING THE SCRAM MODEL ARE COMPARED WITH EXPERIMENTAL RESULTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL TECHNIQUE + FFTF (TR) + CONTROL ROD SCRAM MECHANISM + *CONTROL RODS

18-107195 DATED 1975
FAST FLUX TEST FACILITY QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1975
WESTINGHOUSE ELECTRIC CORPORATION
WARD-2171-51 +. 50 PAGES, 13 FIGURES. 1975

REPORTS PROGRESS ON THE FOLLOWING: REACTOR ENGINEERING; HEAD COMPARTMENT AND SHIELDING DESIGN, IVHM AND I AND C SYSTEMS AND COMPONENTS, PLANT FLUID SYSTEMS AND MECHANICAL COMPONENTS; NUCLEAR SAFETY; AND TECHNOLOGY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*FFTF (TR) + SHIELDING + COMPONENTS + R AND D PROGRAM + CONSTRUCTION + INSTRUMENTS, MISC.

18-107200 ALSO IN CATEGORY 6 DATED 1975
FOURTEENTH QUARTERLY REPORT JANUARY-MARCH 1975. CRITICAL EXPERIMENTS AND ANALYSIS (LMFBR PROGRAM)
GENERAL ELECTRIC COMPANY
GEAP-13,771-14 +. 66 PPS. 19 FIGS. 9 REFS. MAY 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING CRITICAL EXPERIMENTS AND FUEL MANAGEMENT METHODS. TWO DIMENSIONAL CELL CALCULATIONS OF THE GAMMA HEATING INSIDE SEVERAL ZPPR-4 UNIT CELLS HAVE BEEN COMPLETED. THE USE OF INFLUENCE FUNCTIONS TO PREDICT THE CHANGE IN THE FLUX DISTRIBUTION DUE TO CONTROL ROD MOVEMENTS HAS BEEN FOUND TO BE AN EFFECTIVE APPROXIMATION CARRYING OUT FUEL BURNUP CALCULATIONS.

AVAILABILITY - ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL BURNUP + CRITICALITY EXPERIMENT + *R AND D PROGRAM + *FUEL MANAGEMENT + CLINCH RIVER (LMFBR)

18-107458 ALSO IN CATEGORY 11 DATED 1975
CARLSON BA
FFTF/IVHM LIQUID METAL MAINTENANCE SEAL TEST
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-58 +. 31 PPS. 17 FIGS. 2 REFS. JULY 1975

THIS REPORT DESCRIBES THE OPERATION AND EFFECTIVENESS OF THE IN-VESSEL HANDLING MACHINE (IVHM) LIQUID METAL MAINTENANCE SEAL WHICH WAS TESTED AT HANFORD ENGINEERING DEVELOPMENT LABORATORY (HEDL) IN OCTOBER 1974. OPERATION IN THE FAST FLUX TEST FACILITY (FFTF) OF THE IVHM MAINTENANCE SEAL IS EXPECTED FOR ONLY SHORT PERIODS OF TIME DURING MAINTENANCE ON THE MAIN IVHM ELASTOMER SEALS. SUCCESSFUL OPERATION OF ONE COMPLETE MAINTENANCE SEAL CYCLE WAS DEMONSTRATED DURING THE TEST. THIS CYCLE INCLUDED (1) INSTALLATION OF MAINTENANCE SEAL HARDWARE ON THE IVHM, (2) ANNULUS HEAT UP AND FILL WITH ALLOY, (3) ANNULUS COOL DOWN AND CHECK OF SEAL EFFECTIVENESS, AND (4) HEAT UP AND DRAIN.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62,

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107456 *CONTINUED*
OAK RIDGE, TENN. 37830

MAINTENANCE AND REPAIR + OPERATION + TESTING + FFTF (TR) + METAL, LIQUID + *SEAL + EQUIPMENT DESIGN + *REMOTE MANIPULATING AND VIEWING + EQUIPMENT + CORE COMPONENTS + POLYMERIC

18-107616 DATED 1975
SAFETY ENGINEERING ELEVENTH QUARTERLY REPORT, FEBRUARY-APRIL 1975
GENERAL ELECTRIC COMPANY
GEAP-13923-11 +. 40 PPS, 19 FIGS, 25 REFS, JUNE 1975

THIS REPORT IS THE ELEVENTH IN A SERIES. THE OBJECTIVE OF THE WORK REPORTED UNDER THIS PROGRAM IS TO PROVIDE AN INDEPENDENT EVALUATION OF EXISTING EXPERIMENTAL DATA AND ANALYTICAL MODELS RELATING TO DESIGN AND SAFETY ANALYSIS OF LMFBR CORES, AND TO IDENTIFY REQUIREMENTS FOR ADDITIONAL MODEL DEVELOPMENT AND TESTING IN SUPPORT OF LONG-TERM LMFBR SAFETY EVALUATIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *ANALYTICAL MODEL + *SAFETY ANALYSIS

18-107615 DATED 1975
SAFETY ASSESSMENT THIRD QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14023-3 +. 20 PPS, 12 FIGS, MARCH 1975

LMFBR RISK ASSESSMENT METHODS DEVELOPMENT AND EVALUATIONS INCLUDED DEVELOPMENT OF A WORK PLAN WHICH EXTENDS THE CURRENT APPLICATION OF FTR TO INCLUDE APPLICATIONS OF EARLY LMFBRS IN ORDER TO ESTIMATE THE RISK WORTH OF INFORMATION UNCERTAINTIES, DESIGN VARIATIONS AND OPERATING PROCEDURES. DEVELOPMENT OF PROBABILITY MODELS FOR QUANTIFICATION OF MODULE 1 WHICH DESCRIBES AN ACCIDENT FROM ITS INITIATION TO ITS EFFECT ON THE REACTOR CORE. A PROBABILISTIC MODEL OF PIPE FAILURES IN LMFBR PRIMARY PIPING WAS DEVELOPED. THIS MODEL COMBINES THE RESULTS OF FRACTURE MECHANICS ANALYSIS OF CRACK PROPAGATION INTO A PROBABILISTIC FAILURE ANALYSIS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, PIPE + ANALYTICAL MODEL + FFTF (TR) + ACCIDENT, PROBABILITY OF + FTR (TR)

18-107620 ALSO IN CATEGORY 9 DATED 1975
ADVANCED SAFETY ANALYSIS SECOND QUARTERLY REPORT, DECEMBER 1974 AND JANUARY-FEBRUARY 1075
GENERAL ELECTRIC COMPANY
GEAP-14038-2 +. 23 PPS, 22 FIGS, MARCH 1975

LIGHT WATER REACTOR SCRAM SYSTEM DESIGN FEATURES AND FUNCTIONAL REQUIREMENTS WERE COMPILED TO PROVIDE A STARTING POINT FOR COMMERCIAL LMFBR RELIABILITY EVALUATIONS. A LITERATURE REVIEW AND INFORMAL DISCUSSION SESSIONS WERE CONDUCTED IN A CONTINUING EFFORT TO IDENTIFY AND QUALITATIVELY ASSESS INHERENT SAFETY DESIGN FEATURES. THE LIST OF INHERENT SAFETY DESIGN FEATURES WAS EXPANDED AND A BRIEF QUALITATIVE ASSESSMENT OF EACH ITEM ON THE LIST WAS PREPARED. COMPUTATIONAL TOOLS WERE READIED FOR STUDYING THE DYNAMIC BEHAVIOR OF THE REFERENCE COMMERCIAL LMFBR CORE SUBJECTED TO HYPOTHETICAL, UNPROTECTED ACCIDENT SEQUENCES. LOCALIZED, SYSTEMATIC INCOHERENCE EFFECTS IN ACCIDENT TRANSIENTS WERE IDENTIFIED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + *REACTOR PROTECTION SYSTEM + INTRINSIC SAFETY + CONTROL ROD SCRAM MECHANISM + *RELIABILITY, SYSTEM + R AND D PROGRAM + TRANSIENT

18-107621 DATED 1975
ADVANCED OXIDE FUEL SYSTEM DESIGN AND TRADE-OFF STUDIES SECOND QUARTERLY REPORT DECEMBER 1974 AND JANUARY-FEBRUARY 1975
GENERAL ELECTRIC COMPANY
GEAP-14039-2 +. 22 PPS, 11 FIGS, 5 REFS, MARCH 1975

THIS REPORT IS THE SECOND IN A SERIES OF QUARTERLY REPORTS PUBLISHED UNDER THE ADVANCED OXIDE FUEL SYSTEMS DESIGN AND TRADE-OFF STUDIES. THE OBJECTIVE OF THE WORK REPORTED HERE IS TO CONDUCT SYSTEM DESIGN AND TRADE-OFF STUDIES OF ADVANCED OXIDE LMFBRS TO AID IN THE FOCUSING OF ADVANCED OXIDE FUELS, MATERIALS, AND CORE SYSTEMS PROGRAMS. PROGRESS DURING DECEMBER 1974, JANUARY AND FEBRUARY 1975 IS DESCRIBED FOR TASKS RELATED TO ADVANCED OXIDE FUEL SYSTEM DESIGN AND TRADE-OFF STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + *DESIGN STUDY + REACTOR PHYSICS + R AND D PROGRAM

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107625 ALSO IN CATEGORY 9 DATED 1975
INSTRUMENTATION DEVELOPMENT TWELTH QUARTERLY REPORT OCTOBER-DECEMBER 1974
GENERAL ELECTRIC COMPANY
GEAP-13825-12 +. 30 PPS. 10 FIGS. JAN. 1975

REPORTS PROGRESS FOR THE PERIOD COVERING THE DEVELOPMENT OF INSTRUMENTATION FOR SURVEILLANCE OF THE CORE AND IN-VESSEL COMPONENTS OF LIQUID METAL FAST BREEDER REACTORS. CURRENT DEVELOPMENT EFFORTS ARE FOCUSED ON HIGH TEMPERATURE NEUTRON DETECTORS AND ADVANCED SIGNAL TRANSMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

*INSTRUMENT. NUCLEAR + HIGH TEMPERATURE + INSTRUMENT. SURVEILLANCE + MONITOR + CORE COMPONENTS + *R AND D PROGRAM + *INSTRUMENTS. MISC.

18-107627 ALSO IN CATEGORY 11 DATED 1975
STEAM GENERATOR MATERIALS ENGINEERING THIRD QUARTERLY REPORT. JANUARY-MARCH 1975
GENERAL ELECTRIC COMPANY
GEAP-14029-3 +. 22 PPS. 7 FIGS. 34 REFS. APRIL 1975

MAJOR ACCOMPLISHMENTS FOR THIS QUARTER WERE AS FOLLOWS: (1) DECARBURIZATION POT NO. 1 WAS RE-STARTED AND EXPOSURE OF 2-1/4 CR-1MO BASE METAL TO 10.000 HOURS. AND WELD METAL TO 7000 HOURS. IS UNDER WAY. (2) HIGH TEMPERATURE ELECTROCHEMICAL EXPERIMENTS HAVE BEEN INITIATED IN 5% CAUSTIC SOLUTIONS AT 600 F WITH 2-1/4 CR-1MO STEEL. POLARIZATION CURVES WERE DEVELOPED. (3) A REPORT ON THE SECOND PHASE OF TESTING OF 2-1/4CR-1MO AND INCOLOY 800 TUBING IN SUPERHEATED STEAM HAS BEEN COMPLETED AND ISSUED - CAUSTIC-SUPERHEAT STRESS CORROSION TESTING. FEBRUARY 1975 (NEDM-14007). (4) CREEP-FATIGUE TESTS OF TYPE-316 STAINLESS STEEL HAVE BEEN INITIATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

TESTING + STEEL. STAINLESS + *MATERIAL + ENVIRONMENT + CREEP + R AND D PROGRAM + *STEAM GENERATOR + PERFORMANCE + FATIGUE

18-107628 ALSO IN CATEGORY 11 DATED 1975
CORE RESTRAINT ENGINEERING THIRD QUARTERLY REPORT. FEBRUARY-APRIL 1975
GENERAL ELECTRIC COMPANY
GEAP-14031-3 +. 22 PPS. 11 FIGS. 2 REFS. JUNE 1975

THIS REPORT IS THE THIRD IN A SERIES. THE OBJECTIVE OF THE WORK REPORTED HERE IS TO PROVIDE CORE RESTRAINT SYSTEM DESIGN REQUIREMENTS. SUBCOMPONENTS. AND ANALYTICAL METHODS IN ACCORDANCE WITH LMFBR PROGRAM PLANT TASKS. PROGRESS IS DESCRIBED FOR SUBTASKS RELATED TO WITHDRAWAL FORCE TESTING. TRANSIENT ANALYSIS. LOAD PAD AND CHANNEL WALL LATERAL LIMITS. IN-REACTOR LOAD PAD SURVEILLANCE. AND WITHDRAWAL FORCE MINIMIZER.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

FASTENER + DESIGN STUDY + CORE COMPONENTS + SUPPORT STRUCTURE + *R AND D PROGRAM

18-107630 ALSO IN CATEGORY 11 DATED 1975
CORUM JM + PUGH CE
HIGH-TEMPERATURE STRUCTURAL DESIGN PROGRAM PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31. 1974
OAK RIDGE NATIONAL LABORATORY. TENNESSEE
ORNL-5048 +. 326 PPS. TABS. FIGS. OCT. 1975

KEY ACCOMPLISHMENTS DURING THIS REPORTING PERIOD INCLUDE (1) THE FORMULATION OF RECOMMENDED INTERIM CONSTITUTIVE EQUATION GUIDELINES FOR INELASTIC DESIGN ANALYSIS OF 2 1/4 CR-1 MO STEEL REACTOR SYSTEM COMPONENTS; (2) COMPLETION OF PIRAX 2. A SIMPLIFIED INELASTIC PIPING SYSTEM FLEXIBILITY ANALYSIS COMPUTER PROGRAM; (3) COMPLETION OF A BASIC SET OF HIGH-TEMPERATURE STRUCTURAL TESTS. INCLUDING TWO PIPE RATCHETTING TEST SERIES. FOR VERIFICATION AND QUALIFICATION OF INELASTIC DESIGN ANALYSIS PROCEDURES THROUGH BENCHMARK CALCULATIONS; AND (4) COMPLETION OF AN ANALYTICAL STUDY OF ELASTIC CREEP-FATIGUE DESIGN PROCEDURES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

*COMPUTER PROGRAM + TESTING + ORNL + *HIGH TEMPERATURE + *DESIGN STUDY + CREEP + FATIGUE + *STRUCTURE

18-107635 ALSO IN CATEGORY 9 DATED 1975
NOORDHOFF BH + WEBER SA + TREGO AL + YATABE JM
HEDL QUARTERLY TECHNICAL REPORT - JANUARY. FEBRUARY. MARCH 1975. ENGINEERING AND DEVELOPMENT
HANFORD ENGINEERING DEVELOPMENT LAB.. RICHLAND. WASHINGTON
HEDL-TME 75-1 +. 120 PPS. 5 TABS. FIGS. MAY 1975

REPORTS PROGRESS FOR THE PERIOD ON THE FOLLOWING: TEST PROGRAM. REFUELING. MECHANICAL EQUIPMENT. HYDRAULICS AND MECHANICS. CONTROL AND DATA SYSTEMS. FFTF OPERATOR TRAINING SIMULATOR. REACTOR

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107635 *CONTINUED*
INSTRUMENT DEVELOPMENT, UNDER-SODIUM VIEWING, RADIOGRAPHY, EDDY CURRENT METHODS, ULTRASONIC TESTING, AND ACOUSTIC EMISSION METHODS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + TRAINING + FFTF (TR) + INSTRUMENT, CONTROL + REFUELING + TEST, NONDESTRUCTIVE + REMOTE MANIPULATING AND VIEWING + SIMULATION + *R AND D PROGRAM

18-107636 ALSO IN CATEGORIES 6 AND 9 DATED 1975
BURGESS CA + SHEELY WF
LMFBR REFERENCE CONTROL MATERIALS SEMIANNUAL REPORT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 75-71 +. 40 PPS, 12 FIGS, JULY 1975

PROGRESS ON NEUTRON ABSORBER DEVELOPMENT ACTIVITIES FROM JANUARY, 1975 THROUGH JUNE, 1975 IS PRESENTED. INCLUDED IN THE REPORT ARE DESCRIPTIONS OF ACTIVITIES RELATED TO PERFORMANCE ANALYSIS, DEVELOPMENT TESTING, AND FABRICATION TECHNOLOGY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POISON, BURNABLE + TESTING + CONTROL ROD FABRICATION + FFTF (TR) + MATERIAL + R AND D PROGRAM + PERFORMANCE + *CONTROL RODS

18-107643 ALSO IN CATEGORY 6 DATED 1974
CHRISTENSEN JA
GAS RELEASE VENT PERFORMANCE DURING LMFBR IRRADIATION
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASHINGTON
HEDL-TME 74-42 +. 45 PPS, 14 TABS, 6 REFS, JULY 1974

A NINETEEN-PIN SUBASSEMBLY CONTAINING FOURTEEN VENTED BORON CARBIDE PINS WAS IRRADIATED FOR 100 EFFECTIVE FULL POWER DAYS IN EBR-II. FOUR TYPES OF VENTS WERE INCLUDED IN THE TESTS. POSTIRRADIATION EXAMINATION OF THE PINS WAS COMPLETED, AND THE RESULTS PROVIDE A BASIS FOR VENT DESIGN IN FUTURE LMFBR APPLICATIONS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

BORON + POISON, BURNABLE + *CONTROL ROD BURNUP + DESIGN STUDY + *PRESSURE RELIEF + IRRADIATION TESTING + GAS + RADIATION EFFECT + CONTROL RODS

18-107645 ALSO IN CATEGORY 11 DATED 1975
SHIELS SA + BAGNALL C + ORBON SJ + SCHROCK SL + RAY WE
INTERSTITIAL TRANSFER PROGRAM ITF RUNS 2 AND 3
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-22 +. 60 PPS, 23 FIGS, 25 REFS, JULY 1975

THE EFFECT OF SODIUM EXPOSURE UPON THE MECHANICAL PROPERTIES OF STAINLESS STEEL IS EXPECTED TO INVOLVE THE CHANGE OF THE CONCENTRATION AND DISTRIBUTION OF THE INTERSTITIAL ALLOYING ELEMENTS, CARBON AND NITROGEN. RECENT OBSERVATIONS SUGGEST THAT BOTH LONG-TERM PROPERTIES, SUCH AS CREEP RUPTURE STRENGTH, AND SHORT-TERM TENSILE PROPERTIES ARE THUS ALTERED. THE ITF IS A UNIQUE SODIUM TEST FACILITY WHICH WAS DESIGNED PRIMARILY TO REPRODUCE THE INTERSTITIAL TRANSFER BEHAVIOR OF THE FFTF PRIMARY SYSTEM. AS THIS TOPICAL REPORT IS THE FIRST COMPILATION OF ITF INFORMATION, THE DESIGN OF THE FACILITY IS DISCUSSED AND THE BACKGROUND TO THE TEST PROGRAM IS GIVEN. THE REPORTED RESULTS ARE FROM THE FIRST TWO TEST RUNS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ALLOY + DIFFUSION + *TENSILE PROPERTY + *STEEL, STAINLESS + STRUCTURAL INTEGRITY + CREEP + *PROPERTY, MECHANICAL + METALLURGY

18-107680 ALSO IN CATEGORY 1 DATED 1975
ADVANCED NUCLEAR REACTORS - AN INTRODUCTION
U.S. ERDA, WASHINGTON
ERDA-46 +. 25 PPS, FIGS, SEPT. 1975

PRESENTS AN INTRODUCTION TO FISSION AND NUCLEAR REACTORS AND DISCUSSES URANIUM RESOURCES, BREEDING, AND PLUTONIUM PRODUCTION. THE BREEDER DEVELOPMENT PROGRAM IS DESCRIBED AND BENEFITS OF THE BREEDER ARE LISTED. BRIEF PARAGRAPHS ARE GIVEN WHICH DISCUSS THE LMFBR DEVELOPMENT PROGRAM ISSUES INCLUDING ENVIRONMENTAL IMPACT, SAFETY, WASTE MANAGEMENT, PLUTONIUM TOXICITY, AND SAFEGUARDS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

PLUTONIUM + URANIUM + WASTE MANAGEMENT + *REVIEW + *TOXICITY + RESOURCE, NATURAL

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-10768 ALSO IN CATEGORY 11 DATED 1975
MCGREGOR DJ + CLIFFORD CE + MUCKENTHALER FJ + MYNATT FR
ORNL TSF PIPE CHASE NEUTRON STREAMING EXPERIMENT - PHASE TWO
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4283 +, 53 PPS, 11 TABS, 19 FIGS, AUG, 1975

A SECOND ORNL TOWER SHIELDING FACILITY EXPERIMENT HAS BEEN PERFORMED AND ANALYZED IN THE INVESTIGATION OF TECHNIQUES FOR PREDICTING THE EXTENT OF NEUTRON STREAMING THROUGH THE SODIUM COOLANT PIPES OF THE FAST FLUX TEST FACILITY. THE ANALYSIS CONSISTED OF CALCULATIONS OF THE SCANNER BALL AND SPECTROMETER RESPONSES WITH THE TWO-DIMENSIONAL DISCRETE ORDINATES CODE DOT-III USING 50-GROUP AND 14-GROUP CROSS-SECTION SETS AND ASSUMPTIONS OF BOTH ISOTROPIC AND ANISOTROPIC BOUNDARY SOURCES AT THE PIPE-CHASE ENTRANCE. IT IS CONCLUDED THAT THE SAME CALCULATIONAL APPROACH WOULD ACCURATELY PREDICT, OR POSSIBLY SLIGHTLY OVERPREDICT, THE NEUTRON FLUX LEVELS THAT WILL EXIST IN THE HEAT EXCHANGER VAULTS OF THE FFTF.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION, SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ANALYTICAL TECHNIQUE + FFTF (TR) + ORNL + SHIELDING + NEUTRON + RADIATION MODEL + HEAT EXCHANGERS

18-10771 ALSO IN CATEGORIES 2 AND 11 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 359 PGS, AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING AN UPDATED SEISMIC MODEL, FLOOD DESIGN, WEATHER STATISTICS, LOGS OF BORINGS, AND FULL ASSEMBLY DESIGN. RESPONSES TO NRC QUESTIONS ARE GENERALLY GIVEN AS REFERENCES TO REVISED SECTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + CONTAINMENT DESIGN + GEOLOGY + RIVER + SITING, REACTOR + SITE CLIMATOLOGY + SOIL PROPERTY + *REPORT, PSAR + WEATHER, SEVERE + FLOOD + SEISMIC DESIGN + WEATHER DATA + *CLINCH RIVER (LMFBR) + FUEL ELEMENTS

18-10771 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.136 - REACTION FORCES FROM RELIEF/SAFETY VALVES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.136-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RELIEF/SAFETY VALVE REACTION FORCES, DUE TO DEAD WEIGHT, SEISMIC EVENTS, DISCHARGING FLUID, THERMAL EXPANSION, AND THE DYNAMIC EFFECTS OF VALVE OPENING OR CLOSURE, WILL BE ACCOMMODATED WITH THE USE OF SUPPORTS ON THE VALVE DISCHARGE PIPING AND PROPER SIZING OF THE INLET NOZZLE TO LIMIT THE STRESS IN THE VALVE AND NOZZLE WITHIN CODE ALLOWABLES. MAGNITUDES OF THESE REACTION FORCES WILL BE DETERMINED AFTER FINALIZATION OF THE DISCHARGE PIPING CONFIGURATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

STRESS + *PRESSURE RELIEF + RESPONSE TO NRC QUESTION + SUPPORT STRUCTURE + CLINCH RIVER (LMFBR) + *VALVES + PIPES AND PIPE FITTINGS

18-10771 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.165 - DECAY HEAT REMOVAL SYSTEMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q001.165-1 THRU Q001.165-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN RATIONALE FOR THE REMOVAL OF DECAY HEAT IS TO USE THE MAIN CONDENSER FOR SHORT TERM HEAT REMOVAL WHENEVER IT IS AVAILABLE. THE PLANT OPERATOR MAY INITIATE HEAT REMOVAL VIA THE PROTECTED AIR COOLED CONDENSERS (PACC) FOR LONG TERM HEAT REMOVAL AT ANY TIME. HOWEVER, DUE TO THE LIMITED HEAT REMOVAL ABILITY OF THE PACC'S (45 MWT TOTAL FOR THREE UNITS) EITHER THE MAIN TURBINE GENERATOR CONDENSER OR THE SHORT TERM STEAM VENTING AND AUXILIARY FEEDWATER WHICH MAKE-UP A SGAHRS SUBSYSTEM MUST FUNCTION UNTIL THE STEAM GENERATOR HEAT LOAD DROPS BELOW THE CAPABILITY OF THE PACCS (APPROX. 4 1/2% OF RATED).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DECAY HEAT + OPERATION + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + EMERGENCY COOLING SYSTEM + CLINCH RIVER (LMFBR)

18-10771 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.199 - INTERMEDIATE SODIUM REMOVAL SYSTEM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107714 *CONTINUED*
1 PG. P. Q001.199-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE FUNCTION OF THE INTERMEDIATE SODIUM REMOVAL SYSTEM, LOCATED IN THE STEAM GENERATOR BUILDING, IS TO REMOVE THE RESIDUAL SODIUM, WHICH IS CONTAMINATED WITH TRITIUM, FROM THE COMPONENTS OF THE INTERMEDIATE HEAT TRANSFORT SYSTEM. THE MAJOR COMPONENTS TO BE CLEANED IN THE INTERMEDIATE SYSTEM ARE THE STEAM GENERATOR MODULE AND THE IHTS PUMP ASSEMBLY. THE ISRS PROVIDES THE CAPABILITY TO CLEAN THESE COMPONENTS 12 AND 6 TIMES IN 30 YEARS, RESPECTIVELY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

MAINTENANCE AND REPAIR + RESPONSE TO NRC QUESTION + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

18-107715 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.225 - ESTIMATES OF VOLUME OF A SODIUM SPILL
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q001.225-1 THRU Q001.225-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IF A PHTS LEAK OCCURS IN PIPING OUTSIDE THE GUARD VESSEL, THE AMOUNT OF SODIUM WHICH COULD DRAIN FROM THE LOOP DEPENDS ON THE LOCATION OF THE LEAK RELATIVE TO THE HIGH POINT OF THE PRIMARY PIPING. THE HIGH POINT OF THE PRIMARY PIPING IS LOCATED IN THE HTS EQUIPMENT CELL. IF A LEAK WERE TO OCCUR, VENTING AT THE HIGH POINT WOULD BREAK THE SYPHON ACTION AND LIMIT THE DRAINAGE QUANTITY TO THAT VOLUME OF SODIUM WHICH IS ON THE LEAK SIDE OF THE VENT AND WHOSE ELEVATION IS ABOVE THE ELEVATION OF THE LEAK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + LEAK + *SYSTEM CAPACITY + CLINCH RIVER (LMFBR)

18-107716 DATED 1975
RESPONSE TO QUESTION 001.239 - CONFIDENCE IN RESULTS OBTAINED WITH SOFIRE II
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q001.239-1 THRU Q001.239-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AN EXTENSIVE SODIUM FIRE TEST PROGRAM, USED TO SUPPORT SOFIRE II CODE DEVELOPMENT, PROVIDED SUFFICIENT CONFIDENCE THAT THE CODE CONSERVATIVELY PREDICTS PRESSURES AND TEMPERATURES RESULTING FROM POSTULATED SODIUM POOL FIRES. THE CODE HAS BEEN VERIFIED BY USING IT TO ANALYZE THE TEST DATA.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + *FIRE + PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + TEMPERATURE + CLINCH RIVER (LMFBR)

18-107717 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 130.18 - DECONVOLUTION ANALYSIS PROCEDURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q130.18-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DESIGN RESPONSE SPECTRA ARE APPLIED DIRECTLY AT THE FOUNDATION LEVEL; THEREFORE, THERE IS NO DECONVOLUTION FROM THE FINISHED GRADE TO THE FOUNDATION LEVEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

STRESS ANALYSIS + RESPONSE TO NRC QUESTION + RESPONSE SPECTRUM + *STRUCTURAL ANALYSIS, DYNAMIC + *SEISMIC DESIGN + CLINCH RIVER (LMFBR)

18-107718 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 321.9 - EFFECTS OF TELLICO DAM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q321.9-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONSTRUCTION AND OPERATION OF TELLICO DAM WILL HAVE NO INFLUENCE ON THE WATER SUPPLY, WATER LEVELS, AND FLOW VELOCITIES AT THE SITE. AN ADDITIONAL 118,500 SFD OF WATER WILL BE STORED BEHIND THE DAM WHICH COULD BE USED TO MAINTAIN WATER LEVELS IN WATTS BAR RESERVOIR IN THE UNLIKELY EVENT THAT AUGMENTATION WOULD BE REQUIRED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RIVER + HEAT SINK + RESPONSE TO NRC QUESTION + *EFFECT + *DAM + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107719 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 322.5 - ESTIMATE OF LIGHTNING STRIKES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, 1 FIG, PP. Q322.5-1 THRU Q322.5-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A FORMULA HAS BEEN DEVELOPED FOR ESTIMATING THE FREQUENCY OF LIGHTNING FLASHES TO THE EARTH PER THUNDERSTORM DAY PER SQUARE KILOMETER FOR A PARTICULAR REGION. THE RESULTS SHOW AN ESTIMATED 6.47 FLASHES PER YEAR PER SQUARE KILOMETER. IT HAS BEEN DETERMINED THAT A STRUCTURE ATTRACTS LIGHTNING OF AVERAGE INTENSITY UP TO A DISTANCE EQUAL TO TWICE ITS HEIGHT. THE PROBABILITY OF A LIGHTNING DISCHARGE STRIKING THE REACTOR CONTAINMENT BUILDING CAN BE DERIVED USING THE PREVIOUSLY CALCULATED FREQUENCIES OF DISCHARGES EXPECTED IN THE SITE VICINITY AND THE ATTRACTION AREA OF THE STRUCTURE. THESE RESULTS SHOW THAT THE STRUCTURE IS LIKELY TO BE STRUCK BY LIGHTNING ONCE IN EVERY 2.5 YEARS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT, PROBABILITY OF + CONTAINMENT STRUCTURE + RESPONSE TO NRC QUESTION + ELECTRIC ARC + WEATHER, SEVERE + FREQUENCY ANALYSIS + STRUCTURE + CLINCH RIVER (LMFBR)

18-107720 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.26 - LOCATION OF DRAG FOLDS IN THE SITE AREA
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, 1 FIG, PP. Q323.26-1 THRU Q323.26-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

'MINOR (SHEAR) DISLOCATIONS' AND 'OFFSETS' ARE DISPLACEMENTS OF TRACEABLE BEDS MEASURED IN TERMS OF INCHES OR AT MOST A FEW FEET. THESE TERMS ARE USED INTERCHANGEABLY IN THE PSAR. MINOR SHEAR DISLOCATIONS AND OFFSETS ARE INTERBED ADJUSTMENTS WHICH FORMED CONTEMPORANEOUSLY WITH THE REGIONAL THRUST FAULTS. DURING GEOLOGIC SURFACE MAPPING FOR THE CRBRP SITE INVESTIGATION, A SMALL TIGHT FOLD AND THREE MINOR SHEAR DISLOCATIONS WERE OBSERVED. SINCE THE ORIGINAL MAPPING, AN ADDITIONAL SMALL TIGHT FOLD WAS EXPOSED IN A BANK OF A NEWLY CONSTRUCTED ROAD.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*GEOLOGY + SITING, REACTOR + RESPONSE TO NRC QUESTION + DISPLACEMENT + *FAULT + CLINCH RIVER (LMFBR)

18-107721 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.28 - RESIDUAL STRESS IN ROCK
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q323.28-1 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE FOUNDATION ROCKS FOR THE BELLEFONTE NUCLEAR PLANT ARE THE SAME AS THE FOUNDATION ROCKS FOR THE CLINCH RIVER BREEDER REACTOR PROJECT. THE CHICKAMAUGA FORMATION OF MIDDLE ORDOVICIAN AGE. TENNESSEE VALLEY AUTHORITY HAS INDICATED THAT THEIR EXPERIENCE IN NUMEROUS PREVIOUS MAJOR CONSTRUCTION PROJECTS HAS SHOWN THAT UNRELIEVED RESIDUAL STRESS IN THE BEDROCK IS NOT A MAJOR CONSIDERATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SITING, REACTOR + *STRESS + RESPONSE TO NRC QUESTION + *SOIL PROPERTY, IN SITU + COMPARISON + CLINCH RIVER (LMFBR)

18-107722 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.35 - CLAY SEAMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
3 PGS, PP. Q323.35-1 THRU Q323.35-3 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE GRAPHIC LOG FORMAT WAS INITIALLY DEVELOPED FOR THE 24 PRELIMINARY BORINGS, BORINGS 1 THROUGH 24. FOR THESE BORINGS THE TERM 'CLAY SEAM' WAS USED TO DESIGNATE AN INTERVAL OF CLAY WITHIN THE ROCK GENERALLY LESS THAN 1/2IN THICK. THE TERM 'CAVITY' WAS USED TO DESIGNATE INTERVALS OF CLAY THICKER THAN 1/2IN OR OPEN VOIDS IN THE ROCK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

GEOLOGY + TESTING + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + *SOIL PROPERTY, IN SITU + CLINCH RIVER (LMFBR)

18-107723 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.38 - BACKFILL INFORMATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q323.38-1 THRU Q323.38-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975,

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-107722 *CONTINUED*
DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL CATEGORY I STRUCTURES WILL BE SUPPORTED ON COMPETENT SILTSTONE AND CONSEQUENTLY CLASS A FILL WILL ONLY BE REQUIRED AROUND AND IN THE IMMEDIATE VICINITY OF THE NUCLEAR PLANT ISLAND AND EMERGENCY COOLING TOWER. COOLING WATER PIPELINES WILL BE EMBEDDED IN CLASS A FILL. A DETAILED EVALUATION HAS BEEN MADE OF THE RESIDUAL CLAYS AND TERRACE DEPOSITS OCCURRING AT THE SITE TO DETERMINE THEIR ACCEPTABILITY FOR USE AS CLASS A STRUCTURAL FILL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*MATERIAL + SOIL PROPERTY + RESPONSE TO NRC QUESTION + FOUNDATION ENGINEERING + INTERACTION, SOIL AND STRUCTURE + *FILL + CLINCH RIVER (LMFBR)

18-107724 DATED 1975
RESPONSE TO QUESTION 323.39 - ROCK DAMAGE FROM BLASTING
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q323.39-1 THRU Q323.39-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

TO MINIMIZE ROCK DAMAGE TO THE FOUNDATION AREA, A CAREFULLY DESIGNED AND CONTROLLED BLASTING PROGRAM WILL BE DEVELOPED BEFORE START OF CONSTRUCTION AND WILL BE SUPERVISED BY A QUALIFIED ENGINEER/GEOLOGIST DURING THE CONSTRUCTION. THE BLASTING CONTRACTOR WILL PROVIDE THE SERVICES OF AT LEAST ONE (1) PERSON, THOROUGHLY QUALIFIED IN THE USE OF EXPLOSIVES, FOR DESIGNING EACH BLAST AND DIRECTING THE EXECUTION OF THE BLAST.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.0

*EXPLOSION + SITING, REACTOR + RESPONSE TO NRC QUESTION + *DAMAGE + ROCK MECHANICS + CLINCH RIVER (LMFBR)

18-107725 ALSO IN CATEGORY 2 DATED 1975
RESPONSE TO QUESTION 323.42 - MARYVILLE, TENNESSEE EARTHQUAKE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q323.42-1 THRU Q323.42-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MARYVILLE-ALOCA, TENNESSEE EARTHQUAKE OCCURRED AT 2:48 A.M. EST, NOVEMBER 30, 1973 AT LATITUTE 35.80 DEGREES NORTH AND LONGITUDE 83.96 DEGREES WEST. INTENSITY REPORTS FROM SURROUNDING COMMUNITIES DETERMINED THAT THE EARTHQUAKE FELT AREA WAS ABOUT 65,000 SQUARE KILOMETERS (25,000 SQUARE MILES) AND THAT THE EPICENTRAL INTENSITY WAS VI MM. THE NEAREST SEISMIC RECORDING STATION TO THE EPICENTER THAT RECORDED THE EARTHQUAKE WAS THE CUMBERLAND PLATEAU OBSERVATORY WHICH IS 90 MILES WEST OF THE EPICENTER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

GEOLOGY + SEISMOLOGY + SITING, REACTOR + RESPONSE TO NRC QUESTION + *EARTHQUAKE RECORDS + CLINCH RIVER (LMFBR)

18-107726 DATED 1975
RESPONSE TO QUESTION 331.17 - HOURS OF OCCUPANCY FOR RADIATION AREA
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
2 PGS, PP. Q331.17-1 THRU Q331.17-2 OF AMENDMENT 7 TO CLINCH RIVER BREEDER LICENSE APPLICATION, NOV. 7, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANTICIPATED MAN HOURS OF OCCUPANCY FOR ROUTINE MAINTENANCE, OPERATIONS, AND REFUELING HAS BEEN ESTIMATED FOR THE NORMAL ACCESSIBLE CELLS OF THE REACTOR CONTAINMENT AND REACTOR SERVICE BUILDING. THE ANTICIPATED MAN HOURS OF ACCESS DURING REACTOR SHUTDOWNS TO CELLS WHICH NORMALLY CONTAIN PRIMARY SODIUM, REACTOR COVER GAS OR FUEL SOURCES HAVE NOT BEEN ESTIMATED BUT WILL BE SMALL IN COMPARISON TO THE ACCESS REPORTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*MAINTENANCE AND REPAIR + OPERATION + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + REFUELING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107737 ALSO IN CATEGORIES 2 AND 11 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
271 PGS, AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING CHAPTER AND APPENDIX SUMMARIES, GENERAL DESCRIPTION OF THE PLANT, RELIABILITY PROGRAM, EQUIPMENT ARRANGEMENT DIAGRAMS, ORGANIZATION, TORNADO LOADINGS, MISSILE PROTECTION, RADIOLOGICAL MONITORING SYSTEM, MANUFACTURER'S QUALITY ASSURANCE PROGRAM, AND COMPUTER CODES. RESPONSES TO NRC QUESTIONS CONCERN THESE SAME TOPICS.

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18-107737 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT DESIGN + MISSILE GENERATION AND PROTECTION + REACTOR DESCRIPTION + SITING, REACTOR + RELIABILITY, SYSTEM + MONITORING SYSTEM, RADIATION + DESTRUCTIVE WIND + *REPORT, PSAR + QUALITY ASSURANCE + *CLINCH RIVER (LMFBR)

18-107738 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.56 - SELECTION OF SODIUM VELOCITY LIMIT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.56-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HEAT TRANSPORT SYSTEM SODIUM VELOCITY LIMIT OF 30 FEET PER SECOND WAS SELECTED BASED ON OPTIMIZATION OF PIPE SIZE, REQUIRED INSULATION, PREHEAT, SODIUM INVENTORY AND PIPE CORROSION. THIS OPTIMIZATION IS BASED ON CONSIDERATION THAT THE HIGHER THE ALLOWABLE SODIUM VELOCITY THE SMALLER IS THE DIAMETER OF THE HTS PIPING, WHICH RESULTS IN SHORTER PIPE RUNS. THE CORROSION RATE REMAINS NEARLY CONSTANT OVER A RANGE OF SODIUM VELOCITIES FROM 10 TO 40 FPS, THEREBY VERIFYING THE ACCEPTABILITY OF THE HIGHER SODIUM VELOCITY ALLOWANCE OF 30 FPS. THE 30 FPS WAS CHOSEN TO ENSURE MINIMUM EROSION/CORROSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + CORROSION + EROSION + RESPONSE TO NRC QUESTION + *FLOW + *RATE + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-107739 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.57 - USE OF WELDED PIPE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.57-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SELECTION OF WELDED PIPE WAS BASED ON A DETAILED EVALUATION OF STRESS CRITERIA, AVAILABLE ANALYTICAL RESULTS AND PIPE FABRICATION VARIABLES REPORTED IN REFERENCE Q001.57. THE CRITERIA FOR STRESS CONDITIONS IS THAT SHOWN IN CODE CASE 1592. THE IN-SERVICE INSPECTION REQUIREMENTS FOR LIQUID METAL PIPING AND SYSTEMS IS UNDER DEVELOPMENT BY AN ASME CODE COMMITTEE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *WELDS + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS + INSERVICE INSPECTION

18-107740 ALSO IN CATEGORY 9 DATED 1975
RESPONSE TO QUESTION 001.59 - STANDPIPE BUBBLER CONCEPT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.59-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

SINCE THE STANDPIPE BUBBLER IS PHYSICALLY JUST A PIPE CONNECTING THE PUMP TANK TO THE GAS EQUALIZATION LINE BETWEEN THE REACTOR AND THE OVERFLOW TANK, THERE ARE NO IDENTIFIABLE MALFUNCTIONS WHICH COULD RESULT IN OVERPRESSURING THE COVER GAS REGION OF THE PUMP SUCH THAT THE SODIUM LEVEL IN THE PUMP WOULD DROP TO A POINT WHICH WOULD PERMIT THIS GAS TO ENTER THE HYDRAULICS OF THE PUMP. THE VENT LINE FROM THE TOP OF THE IHX TO THE PUMP TANK ENTERS THE PUMP TANK AT AN ELEVATION BELOW THE MINIMUM SODIUM LEVEL IN THE TANK (WHICH IS 8IN BELOW THE MINIMUM SAFE LEVEL IN THE REACTOR).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + COMPONENT DESCRIPTION + CLINCH RIVER (LMFBR) + *PUMPS + *SENSORS, LEVEL

18-107741 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 001/64 - USE OF REGULATORY GUIDE 1.87
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
5 PGS, PP. Q001.64-1 THRU Q001.64-5 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ALL FIVE CODE CASES SHOULD BE INVOKED, WHERE APPLICABLE, FOR COMPONENTS IN HIGH-TEMPERATURE GAS-COOLED REACTORS, GAS-COOLED FAST BREEDER REACTORS, AND LIQUID METAL FAST BREEDER REACTORS. THE SUBJECT CODE CASES ARE IMPOSED BY THE EQUIPMENT SPECIFICATIONS, EXCEPT THE CODE CASE REVISION DISTRIBUTED AT TIME OF CONTRACT PLACEMENT, OR LATER, WILL BE USED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

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18-107741 *CONTINUED*
DESIGN CRITERIA + *HIGH TEMPERATURE + RESPONSE TO NRC QUESTION + *COMPONENTS + CLINCH RIVER (LMFBR) + NRC REGULATORY GUIDE

18-107742 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.69 - METHOD OF COMBINING LOADS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.69-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE METHOD OF COMBINING LOADS IS DIRECTED BY THE ACCEPTANCE CRITERIA OF THE DESIGN SECTIONS OF THE ASME CODE. IN THE DESIGN EVALUATION, THE COMBINING AND ORDERING OF THE DUTY CYCLE EVENTS WITHIN THE LOADING HISTOGRAMS TO BE USED IS FIRST CHECKED TO VERIFY THE PROPOSED HISTOGRAM WILL PRODUCE A CONSERVATIVE CUMULATIVE DAMAGE ASSESSMENT. IN ADDITION, HISTOGRAMS FOR THE REACTOR VESSEL, GUARD VESSEL, AND CLOSURE HEAD WHICH DEFINE THE NORMAL, UPSET AND EMERGENCY OPERATING HISTORY FOR THOSE COMPONENTS FOR THEIR DESIGN OF TIME FROM INITIAL START-UP ARE PROVIDED IN THE EQUIPMENT SPECIFICATIONS.

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ACCIDENT + THERMAL MECHANICAL EFFECT + *STRESS ANALYSIS + RESPONSE TO NRC QUESTION + STRUCTURAL INTEGRITY + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

18-107743 ALSO IN CATEGORIES 1 AND 11 DATED 1975
RESPONSE TO QUESTION 001.84 - COMPLIANCE WITH APPENDIX H, 10CFR50
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.84-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

APPENDIX H IS DIRECTED SPECIFICALLY TOWARD REACTOR VESSELS FABRICATED FROM FERRITIC STEELS. AS THE CRBR VESSEL IS TO BE MADE FROM AN AUSTENITIC STAINLESS STEEL, CERTAIN SECTIONS OF APPENDIX H (IN PARTICULAR, THOSE RELATED TO FRACTURE TOUGHNESS TESTING) ARE NOT CONSIDERED APPLICABLE. ALTHOUGH BOTH TYPES OF MATERIAL SUFFER A LOSS OF IMPACT RESISTANCE AS A CONSEQUENCE OF NEUTRON IRRADIATION, THAT UNDERGONE BY THE FERRITIC STEELS IS ACCOMPANIED BY A SIGNIFICANT UPWARD CHANGE IN THE DUCTILE-TO-BRITTLE TRANSITION TEMPERATURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BRITTLE FRACTURE + CODES AND STANDARDS + THERMAL MECHANICAL EFFECT + *MATERIAL + NEUTRON + RESPONSE TO NRC QUESTION + DAMAGE + FRACTURE TOUGHNESS + *RADIATION EFFECT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-107744 ALSO IN CATEGORY 1 DATED 1975
RESPONSE TO QUESTION 001.86 - SUPPLEMENTAL REQUIREMENTS TO RDT STANDARDS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.86-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

EACH RDT STANDARD IS FORMATTED TO CONTAIN A TABLE OF CONTENTS AND A SCOPE OF APPLICATIONS. THE SCOPE GENERALLY PROVIDES A DESCRIPTION OF THE SUPPLEMENTAL REQUIREMENTS TO EXISTING CODES. NONE OF THE STANDARDS DESIGNATED E OR M ARE UNIQUE IN THAT EACH IS BASED UPON AN EXISTING STANDARD SUCH AS THE ASME CODE. THE UNIQUENESS OF STANDARDS DESIGNATED F IS SPECIFIED IN THE SCOPE AND APPLICABLE DOCUMENTS SECTION, IF ANY, OF EACH STANDARD. AN INDEX OF RDT STANDARDS IS ISSUED ON A QUARTERLY BASIS BY OAK RIDGE NATIONAL LABORATORY FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CODES AND STANDARDS + *DESIGN CRITERIA + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-107745 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.88 - HOT STANDBY CONDITION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.88-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HOT STANDBY CONDITION IS A TEMPERATURE CONDITION THAT WILL USUALLY EXIST FOLLOWING A NORMAL SHUTDOWN OR A PLANT TRIP. THERE ARE TIMES SUCH AS A SHUTDOWN FOR THE PURPOSE OF REFUELING OR WHEN HTS OR STEAM GENERATOR SYSTEM MAINTENANCE IS INDICATED WHEN THE SODIUM TEMPERATURE WILL BE BROUGHT DOWN TO 400 F. ORDINARILY, HOWEVER, THE SODIUM TEMPERATURES WILL BE BROUGHT TO THE HOT STANDBY TEMPERATURE OF APPROXIMATELY 600 F.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *REACTOR SHUTDOWN + *TEMPERATURE + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-10774E ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.90 - STRESS FROM PIPE DIAMETRAL TEMPERATURE GRADIENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. 0001.90-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

FOR THE PHTS PIPING, THE PRESENT TRACE HEATING DESIGN LOCATES THE HEATERS AT THE BOTTOM OF THE PIPING. THE HEATER POWER IS SELECTED SO AS TO PRODUCE A SPECIFIC HEATUP RATE FOR THE PIPING AND TO LIMIT THE DIAMETRAL TEMPERATURE GRADIENT ACROSS THE PIPE. THE STRESSES THAT RESULT FROM THE DIAMETRAL TEMPERATURE GRADIENT ON THE PIPING WILL BE COMBINED WITH OTHER STRESSES IN THE PIPING DURING THE FILLING CONDITION TO ENSURE THAT CODE STRESS LIMITS ARE NOT EXCEEDED. PRELIMINARY EVALUATIONS OF THIS CONDITION HAVE SHOWN THAT THE STRESSES RESULTING FROM THE TEMPERATURE GRADIENTS ARE WELL WITHIN CODE ALLOWABLES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*STRESS + THERMAL MECHANICAL EFFECT + *TEMPERATURE GRADIENT + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-107747 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.91 - FAULTED CONDITION IN HEAT TRANSPORT SYSTEM
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. 0001.91-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LOADINGS AND STRESSES ON THE HEAT TRANSPORT SYSTEM RESULTING FROM FAULTED CONDITIONS SHALL BE EVALUATED AGAINST THE CRITERIA AND LIMITS GIVEN IN THE ASME CODE, SECTION III, FOR FAULTED CONDITIONS. THIS WILL ASSURE THAT THE INTEGRITY OF PRESSURE BOUNDARY WILL NOT BE BREACHED. ANY FUNCTIONAL DEMANDS FOR ACTIVE COMPONENTS NEEDED TO PROVIDE DECAY HEAT REMOVAL DURING FAULTED CONDITIONS SHALL BE PROVIDED IN THE RESPECTIVE EQUIPMENT SPECIFICATION OF THE COMPONENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT + DESIGN CRITERIA + RESPONSE TO NRC QUESTION + SHUTDOWN COOLING SYSTEM + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR)

18-10774E ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.92 - LIMITING VALUE FOR HEAT TRANSPORT SYSTEMS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. 0001.92-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

PRELIMINARY ANALYSIS OF THE PRIMARY PIPING FOR THIRD LEVEL MARGIN PRESSURE LOADINGS AND THE REACTOR VESSEL MOVEMENTS SHOW THAT THESE CONDITIONS DO NOT ESTABLISH OR LIMIT THE DESIGN OF THE PRIMARY PIPING BOUNDARY. CHAPTER 15 OF THE PSAR GIVES A SUMMARY OF THESE INITIAL ANALYSES. SIMILARLY, PRELIMINARY ESTIMATES OF THE THIRD LEVEL MARGIN LOADINGS FOR THE CHECK VALVE, PUMP AND IHX INDICATE THAT THIS LOADING IS NOT LIMITING UPON THESE COMPONENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*HEAT TRANSFER + RESPONSE TO NRC QUESTION + COMPONENTS + ACCIDENT, DESIGN BASIS + *COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + ACCIDENT, CORE DISRUPTIVE

18-107749 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.102 - LOCATING AND PLUGGING LEAKING TUBES
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. 0001.102-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

AT PRESENT, THE DETAILS FOR LOCATING AND PLUGGING A LEAKING TUBE HAVE NOT BEEN DEVELOPED. HOWEVER, PLANS ARE UNDERWAY TO DEVELOP DETAILS FOR BOTH OF THESE. CONCEPTUALLY, IT IS PLANNED TO DO BOTH THE LEAK DETECTION AND THE TUBE PLUGGING WITH THE IHX AT THE REFUELING TEMPERATURE, NAMELY, 400 F, WITH THE REACTOR SHUT DOWN AND THE AFFECTED PRIMARY LOOP DRAINED. IT IS PLANNED TO LOCATE LEAKS IN TWO OR MORE STEPS, NAMELY, GROSS DETECTION OF THE AREA OF THE HEAT EXCHANGER BUNDLE IN WHICH THE LEAK IS LOCATED AND SECONDLY, BY TUBE-TO-TUBE ISOLATION OF THE FINAL LEAKING TUBE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + FAILURE, TUBING + *TUBING + *LEAK + CLINCH RIVER (LMFBR) + HEAT EXCHANGERS

18-107750 DATED 1975
RESPONSE TO QUESTION 001.105 - PIPE HANGERS AND SNUBBERS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-107750 *CONTINUED*
1 PG, P. Q001.105-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RDE

COMMERCIALLY AVAILABLE PIPE HANGERS AND SEISMIC SNUBBERS WILL BE USED TO PROVIDE PIPE SUPPORT AND RESTRAINTS, INCLUDING IN THE REACTOR CAVITY. IN THE REACTOR CAVITY, REMOVABLE ACCESS HATCHES ARE LOCATED TO ALLOW INSERVICE INSPECTION AND COMPONENT MAINTENANCE FOR THE PIPE SUPPORT/RESTRAINT COMPONENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SHOCK ABSORBER + RESPONSE TO NRC QUESTION + *SUPPORT STRUCTURE + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

18-107751 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.113 - OSCILLATIONS IN FREE SURFACE LEVELS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.113-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RDE

THERE ARE NO OSCILLATIONS IN FREE SURFACE LEVELS NOR OSCILLATIONS IN LOOP FLOWS WHICH MAY BE ASSOCIATED WITH OSCILLATING FREE SURFACE LEVELS. THE DEMO CODE USED IN THE NATURAL CIRCULATION ANALYSIS INCLUDES A MODEL OF THE COVER GAS SYSTEM AND COMPUTES SODIUM LEVELS IN THE PUMPS AND REACTOR VESSEL AS A FUNCTION OF TIME. INCLUDING THESE EFFECTS IN THE CALCULATION DOES NOT SIGNIFICANTLY AFFECT THE RESULTING CLADDING TEMPERATURES FOR NATURAL CIRCULATION EVENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + FLOW + *OSCILLATION + FLOW, CONVECTION + *EFFECT + CLINCH RIVER (LMFBR)

18-107752 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.115 - LONGITUDINAL AND CIRCUMFERENTIAL CRACK GROWTH
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.115-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RDE

THE CRITERIA FOR JUDGING ACCEPTABILITY IS THAT NO FAILURES DUE TO CRACK GROWTH LEAD TO LOSS OF CORE COOLABLE GEOMETRY. LOSS OF CORE COOLABLE GEOMETRY IS CONSERVATIVELY DEFINED AS SODIUM BOILING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTAINMENT INTEGRITY + RESPONSE TO NRC QUESTION + CORE COMPONENTS + COOLING + *CRACK + CLINCH RIVER (LMFBR) + *PRESSURE VESSELS

18-107753 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.117 - TRIAXIAL LOADING RELATION TO UNIAXIAL LOADING
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. A001.117-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RDE

NORMAL PRACTICE IS TO RESOLVE THE STRESS FIELD INTO AN EQUIVALENT STRESS FOR COMPARISON WITH THE UNIAXIAL BASED MATERIAL DATA. THIS APPROACH IS BEING USED IN LMFBR COMPONENT STRUCTURAL ANALYSIS. THIS APPROACH IS CONSISTENT WITH MULTI-AXIAL STRESS EVALUATION METHODS IN THE ASME CODE SECTION III.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

TESTING + ANALYTICAL MODEL + *STRESS ANALYSIS + RESPONSE TO NRC QUESTION + *CREEP + CLINCH RIVER (LMFBR)

18-107754 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.118 - CREEP-FATIGUE DAMAGE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.118-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RDE

THE CREEP STRENGTH OF THE MATERIAL WILL BE DEGRADED TO ACCOUNT FOR THE EFFECT OF THE SODIUM ENVIRONMENT. BY ALSO IGNORING THE FATIGUE STRENGTH IMPROVEMENT DUE TO THE SODIUM ENVIRONMENT, THE NET RESULT IS A CONSERVATIVE ESTIMATE OF THE CUMULATIVE CREEP-FATIGUE DAMAGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CREEP PROPERTY + MATERIAL + RESPONSE TO NRC QUESTION + *CREEP + EFFECT + PROPERTY, MECHANICAL + *FATIGUE +

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18-107754 *CONTINUED*
CLINCH RIVER (LMFBR)

18-107755 DATED 1975
RESPONSE TO QUESTION 001.120 - USE OF PERISCOPE DURING PLANT OPERATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.120-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE CURRENT INSERVICE INSPECTION PLAN USES TWO SEPARATE PERISCOPES FOR CELL AND GUARD VESSEL INSPECTIONS RESPECTIVELY. IT IS A REQUIREMENT OF BOTH PERISCOPES, THAT USE DOES NOT REQUIRE DEINERTING OF THE HTS CELL OR REQUIRE DECAY OF NA-24, HOWEVER, DUE TO TEMPERATURE LIMITATIONS OF THE PERISCOPE LENSES, GUARD VESSEL INSPECTIONS REQUIRE LOOP COOLDOWN TO 400 F. HTS CELL INSPECTIONS CAN BE CONDUCTED DURING POWER OPERATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*OPERATION + REMOTE MANIPULATING AND VIEWING + RESPONSE TO NRC QUESTION + EQUIPMENT + EFFECT + TEMPERATURE + CLINCH RIVER (LMFBR) + *INSERVICE INSPECTION

18-107756 DATED 1975
RESPONSE TO QUESTION 001.121 - TIME EFFECT ON PUMP MASS FLOW RATE
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.121-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE CURVE ON FIGURE 5.3-22 SHOWS MASS FLOW VS. TIME FOLLOWING PUMP TRIP TO PONY MOTOR. THE PONY MOTOR IS ENERGIZED AT ALL TIMES DURING OPERATION AND THEREFORE IS EFFECTIVE THE INSTANT THE PUMP COASTS DOWN TO PONY MOTOR SPEED. PER FIGURE 5.3-22 THIS WILL OCCUR AT APPROXIMATELY 30 SECONDS AFTER PUMP TRIP. THE SODIUM TEMPERATURE WILL REDUCE WITH TIME RESULTING IN AN INCREASE IN SODIUM DENSITY AND MASS FLOW PUMPED BY THE PONY MOTOR. THIS INCREASE TENDS TO BE COMPENSATED BY THE LOSS IN THERMAL DRIVING HEAD IN THE SYSTEM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + *EMERGENCY COOLING + *FLOW + *RATE + EFFECT + CLINCH RIVER (LMFBR) + PUMPS

18-107757 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.122 - EFFECT OF ACCIDENT LOADS ON CRACK GROWTH
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.122-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

IT IS ANTICIPATED THAT THE ADDITION OF OBE, SSE AND THIRD LEVEL DESIGN MARGIN LOADINGS WILL NOT CHANGE SIGNIFICANTLY THE CRACK GROWTH AS DETERMINED USING THE LOAD CYCLE GIVEN IN FIG. 5.3-29. HOWEVER, ALL OF THE LOADING CYCLES ON THE PIPING WILL BE USED IN THE DETAILED ASSESSMENT OF CRACK GROWTH.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + *STRESS + RESPONSE TO NRC QUESTION + EFFECT + ACCIDENT, DESIGN BASIS + *CRACK + CLINCH RIVER (LMFBR)

18-107758 DATED 1975
RESPONSE TO QUESTION 001.147 - PIPE SUPPORT PROTECTION FROM EXCESSIVE LOADS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.147-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

IF THE THIRD LEVEL DESIGN MARGIN LOADINGS WERE TO CAUSE RAPID AND EXTREME PIPE MOTION THE SEISMIC RESTRAINT COULD CAUSE EXCESSIVE PIPE LOADS. THIS SITUATION IS AVOIDED BY USE OF SHEAR PINS IN THE SNUBBER SHAFTS WHICH ARE SET TO FAIL ONLY UNDER SUCH A SEVERE EVENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*STRESS + RESPONSE TO NRC QUESTION + *SUPPORT STRUCTURE + SEISMIC DESIGN + CLINCH RIVER (LMFBR) + PIPES AND PIPE FITTINGS

18-107759 DATED 1975
RESPONSE TO QUESTION 001.149 - SODIUM SPLASH EFFECTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.149-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

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18-107759 *CONTINUED*
THE FOLLOWING GROUND RULES HAVE BEEN USED TO MINIMIZE THE EFFECTS OF LEAKS (INCLUDING SPLASH EFFECTS) FROM OTHER COMPONENTS. A) ALL PIPING AND MAJOR COMPONENTS ARE SUSPENDED FROM THE CEILING OR SIDE WALLS ABOVE THE FLOOR. B) ALL PIPING AND MAJOR COMPONENTS HAVE AN OUTER LAYER OF METAL SHEATHING OVER THE INSULATION. C) ALL INSTRUMENTATION IN GENERAL PENETRATES THE TOP OF THE PIPE AND IS PROTECTED BY METAL GUARDS OR BOXES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + EQUIPMENT + *LEAK + *EFFECT + CLINCH RIVER (LMFBR)

18-107760 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.183 - INITIATION SIGNALS FOR CONTAINMENT ISOLATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.183-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

EARLIER IN THE DESIGN BOTH TEMPERATURE AND PRESSURE WERE CONSIDERED FOR INITIATION OF THE CIS, HOWEVER, BOTH WERE ELIMINATED. CALCULATIONS SHOW THAT SUBSTANTIAL (FOR DETECTION PURPOSES) PRESSURE AND/OR TEMPERATURE RISES ARE DELAYED MANY HOURS AFTER THE INITIATION OF ACCIDENTS. FURTHER, THE MAXIMUM PRESSURE IS IN THE RANGE OF 2 PSIG AND THE MAXIMUM TEMPERATURE IS 250 F. IN ADDITION THE DIRECT MEASUREMENT OF THE LIMITING PARAMETER, WHICH IS RADIOACTIVITY IN THIS CASE, IS THE MOST DESIRABLE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTROL SYSTEM + *CONTAINMENT ISOLATION + RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + PRESSURE TRANSIENT + THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

18-107761 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.247 - EFFECT OF PRESSURE CHANGE OF SODIUM LEVEL IN REACTOR VESSEL
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
1 PG, P. Q001.247-1 OF AMENDMENT 6 TO CLINCH RIVER BREEDER LICENSE APPLICATION, OCT. 23, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE REACTOR VESSEL, PUMP TANK AND REACTOR OVERFLOW TANK ARE ALL CONNECTED WITH A GAS EQUALIZATION LINE WHICH WILL MAINTAIN THE PRESSURES EQUAL DURING THIS PRESSURE TRANSIENT. LEVELS, THEREFORE, WILL NOT CHANGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + *PRESSURE TRANSIENT + *SYSTEM CAPACITY + EFFECT + CLINCH RIVER (LMFBR) + PRESSURE VESSELS

18-107842 ALSO IN CATEGORY 7 DATED 1975
FONTANA MF + KRESS TS
QUARTERLY PROGRESS REPORT ON REACTOR SAFETY PROGRAMS SPONSORED BY THE NRC DIVISION OF REACTOR SAFETY RESEARCH FOR APRIL-JUNE 1975. III. LIQUID-METAL-COOLED FAST BREEDER REACTOR SAFETY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5021(VOL.3) +. 51 PPS, 22 FIGS, 5 REFS, OCT. 1975

REPORTS ON PROGRESS FOR THE PERIOD CONCERNING TRANSIENT RELEASE FROM LMFBR FUEL AND STRUCTURAL INTEGRITY OF EQUIPMENT CELL LINERS. A CAPACITOR DISCHARGE VAPORIZATION TECHNIQUE IS BEING DEVELOPED FOR GENERATING ELECTRICAL ENERGY DIRECTLY IN LMFBR FUEL THAT WILL PRODUCE HCDA-LIKE FUEL DISASSEMBLIES. THE SCOPING TESTS FOR THIS TECHNIQUE WERE CONTINUED. THE U(SUB 3) O(SUB 8) AEROSOL EXPERIMENTS HAVE SERVED TO CALIBRATE AND CHECK OUT THE SYSTEM AND INSTRUMENTATION AND HAVE PROVIDED USEFUL INFORMATION ON AEROSOL CHARACTERISTICS AND TRANSIENT BEHAVIOR. THE INDUCTION FURNACE USED FOR PRODUCING THE U(SUB 3) O(SUB 8) AEROSOL PROVED TO BE LIMITED IN CAPACITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + FISSION PRODUCT RELEASE + PLUTONIUM + FISSION PRODUCT TRANSPORT + ORNL + *R AND D PROGRAM + ACCIDENT, CORE DISRUPTIVE

18-107838 ALSO IN CATEGORY 11 DATED 1975
PATRIARCA P
FUELS AND MATERIAL DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5025 +. 40 PPS, FIGS, REFS, SEPT. 1975

THERMAL EXPANSION DATA ON EU2O3 WAS EXTENDED TO 1500 C. THE FIRST-STAGE IRRADIATION OF THE EU2O3 FTR DESIGN-ORIENTED TEST IN EBR-II HAS BEEN COMPLETED. POSTIRRADIATION EXAMINATION OF EU2O3 PELLETS FROM EXPERIMENT BICM-1 CONTINUED. STRAIN GAGE ROSETTE DATA FROM A ROOM-TEMPERATURE TENSILE TEST PERFORMED ON A WHOLE WELD CROSS SECTION OF AN FFTF VESSEL TEST WELD HAVE BEEN ANALYZED. PRELIMINARY REPORTS SUMMARIZING THE FINDINGS OF THE TASK FORCE ON ALTERNATE STRUCTURAL

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18-107638 *CONTINUED*
MATERIALS FOR LIQUID METAL FAST BREEDER REACTORS HAVE BEEN COMPLETED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION. SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER. P.O. BOX 62. OAK RIDGE. TENN. 37830

POISON. BURNABLE + WELDS + WELDING + FFTF (TR) + THERMAL PROPERTY + EUROPIUM + R AND D PROGRAM + METALLURGY + CONTROL RODS

18-107849 ALSO IN CATEGORY 1 DATED 1975
GRAHAM J
NUCLEAR SAFETY DESIGN OF THE CLINCH RIVER BREEDER REACTOR PLANT
WESTINGHOUSE ELECTRIC CORPORATION
17 PPS. 5 TABS. 10 FIGS. 9 REFS. NUCLEAR SAFETY. 16(5). PP. 561-80 (SEPT.-OCT. 1975)

REVIEWS THE DESIGN PHILOSOPHY AND SAFETY FEATURES OF THE 975-MW(T) CLINCH RIVER BREEDER REACTOR. A SODIUM-COOLED DEMONSTRATION REACTOR TO BE BUILT NEAR OAK RIDGE. TENN. THE OVERALL SAFETY OF THE PLANT IS BASED ON THREE LEVELS OF PROTECTION: (1) RELIABLE OPERATION THROUGH INTRINSIC FEATURES OF THE DESIGN. (2) PROTECTION PROVIDED AGAINST ANTICIPATED FAULTS AND UNLIKELY EVENTS. AND (3) PROVISION FOR EXTREMELY UNLIKELY EVENTS. THE PRINCIPAL FEATURES OF EACH OF THESE THREE SAFETY DESIGN LEVELS ARE DISCUSSED. IN ADDITION. WORK IS CONTINUING ON A PARALLEL DESIGN APPROACH THAT TREATS A CORE-DISRUPTIVE ACCIDENT AS A DESIGN BASIS.

DESIGN CRITERIA + FUEL HANDLING + *REACTOR DESCRIPTION + SAFETY PRINCIPLES AND PHILOSOPHY + SYSTEM DESCRIPTION + *CLINCH RIVER (LMFBR)

18-107656 ALSO IN CATEGORY 11 DATED 1975
BRAGER HR
THE EFFECTS OF COLD WORKING AND PRE-IRRADIATION HEAT TREATMENT ON VOID FORMATION IN NEUTRON-IRRADIATED TYPE 316 STAINLESS STEEL
WESTINGHOUSE HANFORD CO.. RICHLAND. WASHINGTON
15 PPS. 12 FIGS. 25 REFS. J. NUCLEAR MATERIALS. 57(1). PP. 103-18 (JULY 1975)

THE EFFECT OF FAST-NEUTRON IRRADIATION ON VOID FORMATION IN TYPE 316 STAINLESS STEEL HAVING UNDERGONE SPECIFIC THERMAL-MECHANICAL TREATMENTS WAS INVESTIGATED BY TRANSMISSION ELECTRON MICROSCOPY. THE STUDY SHOWED THAT. FOR IRRADIATION AT THE THREE LOWER TEMPERATURES (420. 475 AND 580 C): (1) THE VOID VOLUME DECREASED WITH INCREASING COLD WORK; (2) THE REDUCTION IN SWELLING WAS DUE TO A DECREASE IN BOTH VOID-NUMBER DENSITY AND VOID SIZE; (3) THE DECREASE IN VOID SIZE WITH INCREASING COLD-WORK LEVEL WAS ENHANCED AT HIGHER IRRADIATION TEMPERATURES; (4) COLD WORKING FROM 0 TO 10% DECREASED THE VOID-NUMBER DENSITY. AND VOID VOLUME. MORE THAN IN THE RANGE FROM 10 TO 20%. (5) VOID FORMATION IN THE 20% CW STEEL WHICH HAD BEEN HEAT TREATED 100 H AT 650 C BEFORE IRRADIATION WAS SIMILAR TO THAT OF THE SOLUTION-TREATED STEEL.

*STEEL. STAINLESS + FAST NEUTRON + R AND D PROGRAM + VOID + *RADIATION EFFECT + METALLURGY

18-108071 ALSO IN CATEGORIES 8 AND 12 DATED 1975
SARMA BLB + THOMPSON RC + STITT RK
REVIEW OF SODIUM FIRE ANALYTICAL MODELS
GENERAL ELECTRIC COMPANY
GEAP-14053 +. 100 PPS. 43 FIGS. 22 REFS. JUNE 1975

THE CODES SPRAY. SOFIRE II AND CACECO WERE UTILIZED FOR ANALYZING SODIUM FIRES AND MODELING SEVERAL SODIUM FIRE EXPERIMENTS CONDUCTED BY ATOMICS INTERNATIONAL. THE RESULTS ARE INTER-COMPARED TO EVALUATE THE CODE. WITHIN A LIMITED RANGE OF SPRAY FIRES IN LOW OXYGEN ENVIRONMENTS. THE SPRAY CODE APPEARS TO YIELD REASONABLE RESULTS. WITH CAREFUL APPLICATION AND USING SPRAY. SOFIRE II AND CACECO IN CONJUNCTION WITH EACH OTHER. PRIMARY SODIUM FIRES IN INERTED ENVIRONMENT (<- 2 VOL % OXYGEN) CAN BE ADEQUATELY ANALYZED. HOWEVER. THERE IS NO CODE AVAILABLE FOR ANALYZING SPRAY FIRES IN AIR ENVIRONMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM. 1717 H STREET. WASHINGTON. D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + *FIRE + *ANALYTICAL MODEL + SPRAY

18-108100 DATED 1975
LMFBR PROGRAM ADVANCED SAFETY ANALYSIS THIRD QUARTERLY REPORT MARCH-MAY 1975
GENERAL ELECTRIC COMPANY
GEAP-14038-3 +. 95 PPS. FIGS. REFS. JUNE 1975

REPORTS PROGRESS FOR THE PERIOD ON ENGINEERING ANALYSIS OF POST-ACCIDENT HEAT REMOVAL. INHERENT SAFE CORE DESIGN. FUEL ROD FAILURE MECHANISMS. AND LMFBR SHUTDOWN SYSTEM RELIABILITY GOALS. INVESTIGATIONS HAVE BEEN INITIATED TO DETERMINE THE CONSEQUENCES OF DEBRIS MELT-THROUGH INTO A LOWER REACTOR CAVITY WITHOUT AN EX-VESSEL CORE RETENTION SYSTEM. THE SEQUENCE OF EVENTS AFTER THE CORE DEBRIS HAS COME INTO CONTACT WITH CONCRETE IS DESCRIBED. CALCULATIONS OF MATERIAL WORTH DISTRIBUTIONS AND KINETIC PARAMETERS FOR THE REFERENCE 1200 MWE CORE DESIGN HAVE BEEN COMPLETED. A PRELIMINARY FUNCTIONAL DESCRIPTION OF THE SHUTDOWN SYSTEM FOR A COMMERCIAL LMFBR WAS DEFINED. THIS DESCRIPTION PROVIDES THE BASIS FOR AN ANALYSIS OF SYSTEM RELIABILITY GOALS AND TEST REQUIREMENTS.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108100 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT, CONSEQUENCES + FAILURE, FUEL ELEMENT + REACTOR PROTECTION SYSTEM + DESIGN STUDY + RELIABILITY, SYSTEM + *R AND D PROGRAM

18-108101 DATED 1975
FONTANA MH + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR JANUARY-MARCH 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4980 +. 122 PPS, FIGS, REFS, NOV. 1975

A FLOW-COASTDOWN TEST WAS CONDUCTED WITH FFM BUNDLE 5D. NO EFFECTS ATTRIBUTABLE TO THE PRESENCE OF INERT GAS WERE ASCERTAINED. THE SUCCESSFUL ACOUSTIC DETECTION OF SODIUM BOILING IN TEST 3 OF SERIES 7 DEMONSTRATED THAT THESE METHODS CAN BE USED IN THE FFM TO DETECT SODIUM BOILING WHEN THERE ARE NO GAS BUBBLES PRESENT. AT THE END OF THE REPORT PERIOD THE FFM FACILITY HAD BEEN OPERATED FOR A TOTAL OF 14,322 HR, 1649 HR AT VARYING POWER LEVELS. FABRICATION OF THE FFM BUNDLE 6A HEATERS SHOULD BE COMPLETED BY THE END OF THE FIRST WEEK OF APRIL 1975.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*FAILURE, FUEL ELEMENT + NOISE ANALYSIS + HEAT TRANSFER ANALYSIS + *R AND D PROGRAM + *BOILING + ACOUSTICS + HEATERS

18-108108 ALSO IN CATEGORY 5 DATED 1975
FROHLICH R
SENSITIVITY STUDIES FOR FAST REACTOR WHOLE CORE ACCIDENTS
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE, F.R. GERMANY
EURFNR-1254 + KFK-2086 +. 30 PPS, 6 TABS, 14 FIGS, 7 REFS, MARCH 1975

THE ENERGY YIELD OF A HYPOTHETICAL TRANSIENT OVERPOWER ACCIDENT OF AN LMFBR IS STRONGLY INFLUENCED BY CORE DESIGN PARAMETERS. THE SENSITIVITY OF THIS TYPE OF ACCIDENT ON SOME INTERESTING DESIGN PARAMETERS IS STUDIED FOR THE FRESH SNR 300 MARK 1 CORE. IN ADDITION THE SENSITIVITY OF THE ENERGY YIELD ON OTHER PARAMETERS OF MORE SPECULATIVE NATURE, E.G. THE FUEL COOLANT INTERACTION PARAMETERS AND THE PIN FAILURE LOCATION, IS ANALYSED. THE CODES CARMEN 2 AND KADIS ARE USED FOR THE ANALYSES OF THE PREDISASSEMELY AND DISASSEMBLY PHASES RESPECTIVELY. MOST OF THE PARAMETER VARIATIONS ARE PERFORMED CONSISTENTLY FOR THE PREDISASSEMBLY AND THE DISASSEMBLY PHASES. AREAS ARE INDICATED WHERE FURTHER EXPERIMENTAL AND THEORETICAL WORK IS NEEDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + GERMANY + *SENSITIVITY ANALYSIS + FUEL COOLANT INTERACTION

18-108109 ALSO IN CATEGORY 5 DATED 1975
JACOBI S + KRAMER W + SCHLEISIEK K
THE PROBLEM OF PIN-TO-PIN FAILURE PROPAGATION IN SODIUM-COOLED FAST BREEDER REACTORS
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY
EURFNR-1242 + KFK-2047 +. 30 PPS, 55 REFS, FEB. 1975

THE POSSIBILITY OF A PIN TO PIN FAILURE PROPAGATION IS AN IMPORTANT QUESTION IN CONNECTION WITH THE SAFETY ANALYSIS OF LMFBR. THIS REPORT GIVES A BRIEF REVIEW OF THE PRESENT STATE OF KNOWLEDGE. CONCEIVABLE MECHANISMS OF AN ACCIDENT SEQUENCE ARE DISCUSSED AND THE POSSIBILITIES FOR FAST FAILURE PROPAGATION ARE DEMONSTRATED. AS A RESULT OF THE PRESENT INVESTIGATION TO THIS QUESTION A PIN TO PIN FAILURE PROPAGATION IS CONSIDERED TO BE RATHER UNLIKELY BUT IT MAY NOT BE EXCLUDED COMPLETELY UNDER CERTAIN ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *FAILURE, FUEL ELEMENT + FAILURE, SEQUENTIAL

18-108115 ALSO IN CATEGORY 5 DATED 1974
ARMSTRONG GR
POSTACCIDENT HEAT REMOVAL ASSESSMENT FOR THE FFTF
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-60 +. 75 PPS, 34 FIGS, 8 REFS, NOV. 1974

AN ASSESSMENT OF THE POTENTIAL FOR SAFELY REMOVING THE RESIDUAL HEAT GENERATED BY FISSION PRODUCT DECAY AFTER POSTULATED HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS WAS PERFORMED USING AVAILABLE ANALYTICAL AND EXPERIMENTAL DATA. THE RESULTANT STRUCTURAL CONFIGURATION, FLOW CONDITIONS, AND CORE DEBRIS DISTRIBUTION AND CHARACTERISTICS WERE THE MAJOR AREAS ADDRESSED. THE RESULTS CONFIRM THAT 100% OF THE DISPERSED CORE RESULTING FROM THE POSTULATED INITIATION HCDA EVENTS IN THE FFTF CAN BE ADEQUATELY COOLED AND PERMANENTLY RETAINED IN THE REACTOR VESSEL.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*DECAY HEAT + FFTF (TR) + EMERGENCY COOLING CONSIDERATIONS + *ACCIDENT, CORE DISRUPTIVE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108127 ALSO IN CATEGORIES 5 AND 6 AND 11 DATED 1975
NICKERSON G + KASTENBERG WE
PRELIMINARY ASSESSMENTS OF CARBIDE FUEL PINS DURING MILD OVERPOWER TRANSIENTS
UNIVERISTY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7562 +. 72 PPS, 16 TABS, 64 REFS, OCT. 1975

SEVERAL ASPECTS OF CARBIDE FUELED LMFBR'S ARE STUDIED. DISCUSSES THE STATE OF DEVELOPMENT OF CARBIDE FUEL AND CURRENT INFORMATION ABOUT AVAILABLE THERMOPHYSICAL PROPERTIES OF THIS MATERIAL IS PRESENTED. DESCRIBES THE CONCEPTUAL CARBIDE CORE DESIGN THAT IS STUDIED BY HOPE AND COMPARES IT WITH CRBRP DESIGN DATA. THE SCOPE OF THE BULK BOILING STUDY UNDERTAKEN WITH HOPE AND THE RESULTS OF THIS STUDY ARE ALSO PRESENTED IN THIS CHAPTER. A SUMMARY OF THE THESIS, CONCLUSIONS DRAWN FROM THE WORK COMPLETED, AND SOME RECOMMENDATIONS FOR FUTURE RESEARCH NEEDS ARE PRESENTED.

AVAILABILITY - ENERGY & KINETICS DEPARTMENT, SCHOOL OF ENGINEERING AND APPLIED SCIENCE, UNIV. OF CALIFORNIA, LOS ANGELES, CALIF.

*CARBIDE + COMPUTER PROGRAM + REACTOR TRANSIENT + DESIGN STUDY + *FUEL ROD + BOILING

18-108154 DATED 1975
PROGRESS REPORT ON FAST BREEDER REACTOR IN JAPAN, JULY-SEPTEMBER 1974
POWER REACTOR & NUCLEAR FUEL DEVELOPMENT CORP., TOKYO, JAPAN
JAPFNR-193 +. 4 PPS, JAN. 1975

REPORTS ON THE RESEARCH AND DEVELOPMENT CONCERNING REACTOR PHYSICS, COMPONENTS AND EQUIPMENT, INSTRUMENTATION, SODIUM TECHNOLOGY AND FUELS AND MATERIALS. REFINEMENT OF THE MONJU DESIGN WAS COMPLETED. CONSTRUCTION OF JOYO CONTINUED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JAPAN + *R AND D PROGRAM

18-108162 ALSO IN CATEGORY 6 DATED 1975
KASTENBERG WE + FRANK MV
PRELIMINARY ANALYSIS OF THE TRANSIENT OVERPOWER ACCIDENT FOR CRBRP
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7557 +. 64 PPS, 21 FIGS, JULY 1975

SUMMARIZES THE RESULTS OF STUDIES CONDUCTED IN SUPPORT OF THE UNITED STATES NUCLEAR REGULATORY COMMISSION'S REVIEW OF THE PSAR FOR THE CRBRP. IN CHAPTER 2, PRELIMINARY RESULTS FOR THE PREDISASSEMBLY STAGE OF THE UNPROTECTED OVERPOWER TRANSIENT FOR CRBRP USING THE HOPE CODE ARE PRESENTED. CHAPTER 3 CONTAINS A BRIEF REVIEW OF THE MAJOR UNCERTAINTIES IN THE ANALYSIS OF TRANSIENT OVERPOWER ACCIDENTS AND CHAPTER 4 CONTAINS A PROCEDURE FOR ESTIMATION OF THE RANGE OF RAMP RATES THAT CAN BE EXPECTED DURING THE TRANSITION TO DISASSEMBLY FOR THOSE CASES NOT TERMINATED BY HYDRAULIC SWEEPOUT OF FUEL. CHAPTER 5 CONCLUDES THE REPORT WITH A BRIEF SUMMARY AND CONCLUSIONS. EACH CHAPTER CONTAINS ITS OWN SET OF REFERENCES.

AVAILABILITY - WILLIAM E. KASTENBERG, PROFESSOR, ENERGY AND KINETICS DEPARTMENT, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA 90024

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR TRANSIENT + TRANSIENT + CLINCH RIVER (LMFBR)

18-108175 ALSO IN CATEGORY 12 DATED 1975
RELIABILITY PROGRAM FOR SHUTDOWN HEAT REMOVAL SECOND QUARTERLY REPORT, MARCH-MAY 1975
GENERAL ELECTRIC CO.
GEAP-14045-2 +. 50 PPS, 4 TABS, 9 FIGS, JUNE 1975

THE LMFBR SHUTDOWN HEAT REMOVAL AND STRUCTURAL RELIABILITY PROGRAM PLAN 2 WAS COMPLETED IN APRIL 1975. THE PLAN HAS BEEN STRUCTURED TO INCLUDE THE APPLICABLE PORTIONS OF RELIABILITY ASSURANCE STANDARD RDT F2-9T AND RELIABILITY ENGINEERING DISCIPLINES DEVELOPED FOR THE DEFENSE AND SPACE INDUSTRY. THE PROGRAM PLAN EMPHASIZES THE ANALYSES NEEDED TO CONFIRM STRUCTURAL INTEGRITY OF THE CORE SUPPORT STRUCTURE AND COOLANT BOUNDARIES AS WELL AS SHUTDOWN HEAT TRANSFER SYSTEMS OPERATIONAL RELIABILITY. A PRELIMINARY ASSESSMENT OF LMFBR HEAT REMOVAL SYSTEMS WAS COMPLETED. THE NUMERICAL RELIABILITY ANALYSIS IS PRIMARILY A PREDICTION OF THE PROBABILITY THAT THE CRBRP SHUTDOWWN HEAT REMOVAL SYSTEMS (SHRS) WILL BE UNABLE TO REMOVE REACTOR HEAT WHEN REQUIRED TO PREVENT LOSS OF CORE COOLABLE GEOMETRY. THE CURRENT ESTIMATE OF THIS PREDICTION IS 3.5 X 10(EXP -7)/YEAR, AND IT HAS BEEN INCORPORATED INTO APPENDIX C OF THE CRBRP PSAR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + *RELIABILITY ANALYSIS + RELIABILITY, SYSTEM + SHUTDOWN COOLING SYSTEM + R AND D PROGRAM + PROBABILITY + CLINCH RIVER (LMFBR)

18-108179 ALSO IN CATEGORY 6 DATED 1975
LMFBR PROGRAM CRITICAL EXPERIMENTS AND ANALYSIS, APRIL-JUNE 1975
GENERAL ELECTRIC COMPANY
GEAP-13771-15 +. 75 PPS, 27 TABS, 19 FIGS, JULY 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108179 *CONTINUED*
THE DETAILED SPECIFICATIONS OF THE EMC PHASE 1B EXPERIMENTAL PROGRAM HAVE BEEN COMPLETED. THE PRIMARY OBJECTIVE OF PHASE 1B WILL BE TO GET A SECOND SET OF MATERIAL REDISTRIBUTION WORTHS IN A MINIMUM OF FACILITY TIME. ALSO, INCLUDED IN THE PROGRAM IS A SERIES OF LOW LEVEL FLUX MONITOR EXPERIMENTS AND A SMALL SAMPLE DOPPLER MEASUREMENT FOR 238U. ANALYSIS OF THE SUBCRITICAL MEASUREMENTS OF CONTROL ROD WORTHS PERFORMED IN PHASE 2 OF ZPPR-4 HAS BEEN COMPLETED. A COMPARISON OF THE EXPERIMENTAL AND CALCULATED RESULTS SHOWS A BIAS FACTOR OF 1.01.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTROL ROD WORTH + CRITICAL ASSEMBLY + DOPPLER COEFFICIENT + REACTIVITY EFFECT + *CRITICALITY EXPERIMENT + REACTOR PHYSICS + R AND D PROGRAM

18-108181 DATED 1974
PROGRESS REPORT ON FAST BREEDER REACTOR DEVELOPMENT AT PNC, JAPAN, APRIL-JUNE 1974
POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORP., TOKYO, JAPAN
JAPFNR-195 +. 9 PPS, OCT. 1974

REPORTS PROGRESS FOR THE PERIOD CONCERNING: CONSTRUCTION OF THE EXPERIMENTAL FAST BREEDER REACTOR JOYO; DESIGN OF MONJU; REACTOR PHYSICS; COMPONENTS AND EQUIPMENT; INSTRUMENTS AND CONTROL; SODIUM TECHNOLOGY; FUELS AND MATERIALS DEVELOPMENT; SAFETY R AND D; AND STEAM GENERATOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JAPAN + REACTOR PHYSICS + *R AND D PROGRAM + STEAM GENERATOR + *INSTRUMENTS, MISC.

18-108187 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, JULY-AUGUST 1975
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-42 +. 220 PPS, FIGS, REFS, OCT. 7, 1975

SUMMARIZES WORK PERFORMED IN THE FOLLOWING RESEARCH AND DEVELOPMENT AREAS: EXPERIMENTAL BREEDER REACTOR NO. II (EBR-II), HOT FUEL EXAMINATION FACILITY, LMFBR DESIGN SUPPORT, INSTRUMENTATION AND CONTROL, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, REACTOR SAFETY, AND OTHER FAST BREEDER REACTORS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + DESIGN STUDY + EXAMINATION + REACTOR PHYSICS + *R AND D PROGRAM + FUEL ROD + *REACTOR, GCFR + INSTRUMENTS, MISC.

18-108188 DATED 1975
LIQUID METAL ENGINEERING CENTER ANNUAL TECHNICAL PROGRESS REPORT, JANUARY-DECEMBER 1974
LIQUID METAL ENGINEERING CENTER, CANOGA PARK, CALIF.
LMEC-75-1 +. 540 PPS, 63 TABS, 249 FIGS, MARCH 15, 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING FFTF PUMP SEAL TEST, PUMP HEAT EXCHANGER TESTING, PROTOTYPE PUMP TESTING, SECONDARY ISOLATION VALVE TEST PROGRAM, MATERIALS COMPATIBILITY IN SODIUM, BUTTERFLY VALVE TESTING, SPTF MIXING TEE WATER TESTS, SODIUM LEVEL TRANSDUCER TESTING, SODIUM FIRE SUPPRESSION, AND THE LMEC FACILITIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + *FFTF (TR) + METAL, LIQUID + SEAL + R AND D PROGRAM + FIRE PROTECTION + LMEC + PUMPS + VALVES

18-108196 ALSO IN CATEGORIES 5 AND 6 DATED 1975
SLEMBER RJ
REACTOR AND SAFETY ENGINEERING TECHNICAL PROGRESS REPORT - APRIL, MAY, JUNE 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-70 +. 144 PPS, 21 TABS, 41 FIGS, AUG. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING CORE PHYSICS, RADIATION AND SHIELD ANALYSIS, REACTOR DYNAMICS, REACTOR SAFETY, SAFETY DEVELOPMENT, AND SYSTEMS SAFETY ANALYSIS. SPECIFIC TOPICS INCLUDE ASSESSMENT OF FTR STABILITY, REACTIVITY EFFECTS OF NEUTRON STREAMING THROUGH VOIDS IN MOLTEN FUEL, COOLANT BOILING, FUEL MOTION DURING FAST REACTOR OVERPOWER TRANSIENTS, CONTAINMENT ANALYSIS CODE, AND CORE REDISTRIBUTION ASSUMING LOSS OF FLOW.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + CONTAINMENT + ACCIDENT, LOSS OF FLOW + REACTIVITY EFFECT + REACTOR STABILITY + FFTF (TR) + SHIELDING + REACTOR PHYSICS + *R AND D PROGRAM + *BOILING + TRANSIENT

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108198 ALSO IN CATEGORY 11 DATED 1975
RAY WE
SODIUM TECHNOLOGY PROGRAM - FRICTION, WEAR, AND SELF-WELDING - QUARTERLY PROGRESS REPORT FOR PERIOD ENDING APRIL 30, 1975
WESTINGHOUSE ELECTRIC CORPORATION
WARD-NA-3045-27 +, 85 PPS, 30 FIGS, OCT. 1975

POST-TEST SPECIMEN EXAMINATIONS INDICATED THE USE OF PLASMA-SPRAYED TRIBALOY TO BE UNACCEPTABLE FROM A WEAR AND COMPATABILITY STANDPOINT. THE TESTS ALSO SHOWED THAT THE REFERENCE MATERIALS COMBINATION (HAYNES 273/HAYNES 273) EXHIBITS THE WORST OVERALL FRICTION BEHAVIOR OF THE FOUR MATERIALS COMBINATIONS EVALUATED. SEPARATION FORCE MEASUREMENTS FOR THE FFTF PRIMARY HOT LEG ISOLATION VALVE MATERIALS WERE COMPLETED AFTER EIGHT-MONTH EXPOSURE. WITH THE FIRST FOUR MONTHS AT 850 F, THE NEXT TWO MONTHS AT 1000 F, AND THEN A TWO-MONTH EXPOSURE AT 1115 F.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

WELDING + MATERIAL + PRESSURE DROP + R AND D PROGRAM + *FRICTION

18-108213 ALSO IN CATEGORY 17 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT JULY-AUGUST 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-7 +, 18 PPS, AUG. 1974

REPORTS ON OPERATION OF THE TEST LOOP AND INCLUDES COOLANT CHEMISTRY, THE FEEDWATER/STEAM SYSTEM, THE SODIUM SYSTEM, AND MAINTENANCE AND REPAIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COOLANT CHEMISTRY + *NETHERLANDS + R AND D PROGRAM

18-108214 ALSO IN CATEGORY 17 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT, JUNE 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-6 +, 11 PPS, JUNE 1974

REPORTS ON THE OPERATION OF THE TEST LOOP INCLUDING COOLANT CHEMISTRY, THE CHEMISTRY OF THE COVER GAS, AND FAILURES AND MAINTENANCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COVER GAS + COOLANT CHEMISTRY + NETHERLANDS + R AND D PROGRAM

18-108215 ALSO IN CATEGORY 17 DATED 1974
50 MWE TEST LOOP: MONTHLY REPORT, SEPTEMBER 1974
CENTRAAL TECHNISCH INSTITUUT, THE NETHERLANDS
TNO-LMEC-8 +, 15 PPS, 3 FIGS, SEPT. 1974

REPORTS ON THE OPERATION OF THE TEST LOOP INCLUDING COOLANT CHEMISTRY, CHEMISTRY OF THE COVER GAS, AND FAILURES AND MAINTENANCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + COVER GAS + COOLANT CHEMISTRY + NETHERLANDS + R AND D PROGRAM

18-108217 ALSO IN CATEGORY 7 DATED 1975
ATWOOD JM
SODIUM TECHNOLOGY - HEDL QUARTERLY TECHNICAL REPORT, JANUARY, FEBRUARY, MARCH, 1975
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-3 +, 113 PPS, 11 TABS, 40 FIGS, MAY 1975

REPORTS PROGRESS IN THE FOLLOWING AREAS: SODIUM SYSTEMS DEVELOPMENT, SODIUM REMOVAL, FLOW IMPEDANCE PHENOMENA, RADIOACTIVITY CONTROL TECHNOLOGY, CORROSION PRODUCT RELEASE, RADIONUCLIDE FUEL FAILURE MONITORING, COLD TRAP TESTING, AND CRBRP SYSTEM 85.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*TRITIUM + INSTRUMENT, FAILED FUEL DETECTION + FISSION PRODUCT RETENTION + R AND D PROGRAM + FLOW + CLINCH RIVER (LMFBR)

18-108218 ALSO IN CATEGORY 11 DATED 1975
DILLON RL + LEVY IS + BRIMHALL PD + PAVLOV C + SCHWENK EB
A STATE OF THE ART REVIEW OF DEGRADATION PROCESSES IN LMFBR MATERIALS. VOLUME 1 - MECHANICAL PROPERTIES
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-1901 (VOL.1) +, APPROX. 160 PPS, FIGS, REFS, MARCH 7, 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108218 *CONTINUED*
REVIEWS THE DEGRADATION PROCESSES TO METALS IN SODIUM REACTOR SERVICE. THE PROCESSES DISCUSSED INCLUDE THOSE AFFECTING MECHANICAL PROPERTIES - NEUTRON IRRADIATION, THERMAL EXPOSURE AND SODIUM - AND FUEL-CLAD INTERACTION. THE CHAPTERS DEAL WITH SWELLING, TENSILE PROPERTIES, HIGH STRAIN RATE PROPERTIES, CREEP-RUPTURE PROPERTIES, FATIGUE, WELD PERFORMANCE, AND MECHANICAL PROPERTIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL + STEEL + TENSILE PROPERTY + THERMAL MECHANICAL EFFECT + STEEL, STAINLESS + WELDING + *MATERIAL + PROPERTY, PHYSICAL + REVIEW + STRESS RUPTURE + STRESS STRAIN DATA + CREEP + *DATA COLLECTION + PROPERTY, MECHANICAL + RADIATION EFFECT + SWELLING + METALLURGY + FATIGUE

18-108219 ALSO IN CATEGORY 11 DATED 1975
DILLON RL + LEVY IS + DIVINE JR + GRIGGS B + WESTERMAN RE + ZIMA GE
A STATE OF THE ART REVIEW OF DEGRADIATION PROCESSES IN LMFBR MATERIALS. VOLUME 2 - CORROSION BEHAVIOR
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-1901(VOL.2) +. APPROX. 250 PPS, FIGS, MARCH 7, 1975

REVIEWS THE DEGRADATION PROCESSES TO METALS IN SODIUM REACTOR SERVICE. THE PROCESSES DISCUSSED CONCERN ENVIRONMENTAL EFFECTS SPECIFIC TO SODIUM COOLANTS - CORROSION AND MASS TRANSFER, EROSION, WEAR AND SELF WELDING, SODIUM-WATER REACTIONS, AND EXTERNAL CORROSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

METAL + METAL WATER REACTION + WELDING + *CORROSION + *MATERIAL + EROSION + REVIEW + FRICTION + DATA COLLECTION + PROPERTY, MECHANICAL + METALLURGY

18-108590 ALSO IN CATEGORY 11 DATED 1969
LMFBR LARGE VALVE TECHNOLOGY DEVELOPMENT
CRANE U.S.A., CHICAGO
COO-2004-1 +. 74 PPS, JUNE 1969

DESCRIBES THE PRIMARY DESIGN CONSIDERATIONS PERTINENT TO LMFBR LARGE VALVE DEVELOPMENT. THE EFFECTS OF HIGH-TEMPERATURE SODIUM SERVICE ARE DETAILED AS WELL AS THE PRIMARY FUNCTIONAL REQUIREMENTS FOR ISOLATION, FLOW CONTROL, AND CHECK VALVES. UPON THE STATED CRITERIA, EIGHTEEN DESIGN CONCEPTS, THREE FOR EACH FUNCTIONAL VALVE TYPE FOR EACH OF TWO EXTERNAL ENVIRONMENTS, HAVE BEEN DEVELOPED. EACH OF THE DESIGN CONCEPTS WILL BE EXPANDED INTO PRELIMINARY DESIGNS AND ANALYZED IN DEPTH UNDER LATER PROGRAM TASKS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + HIGH TEMPERATURE + *DESIGN STUDY + FLOW + *VALVE, CHECK + *VALVES

18-108595 ALSO IN CATEGORY 6 DATED 1975
FAST REACTOR SAFETY
ARGONNE NATIONAL LABORATORY
CONF-750303-6 +. 8 PPS, FROM PROCEEDINGS ON NUCLEAR CROSS SECTION AND TECHNIQUE, WASHINGTON, D.C., MARCH 3, 1975

THE CURRENT STATE OF KNOWLEDGE WITH RESPECT TO THE ANALYSIS OF POTENTIAL ACCIDENT SEQUENCES IN FAST BREEDER REACTORS AND THE UNDERSTANDING OF ASSOCIATED ACCIDENT PHENOMENA, AS WELL AS IMPLICATIONS TO REACTOR DESIGN, ARE REVIEWED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + DOPPLER EFFECT + REACTIVITY COEFFICIENT + REACTIVITY EFFECT + REACTOR KINETICS + SAFETY PROGRAM + REACTOR PHYSICS + REACTIVITY EFFECT, VOID + ACCIDENT, DESIGN BASIS

18-108671 ALSO IN CATEGORIES 7 AND 8 AND 11 A DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TENN.
APPROX. 270 PGS, AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING THE QUALITY ASSURANCE PROGRAM, TEST GROUTING PROGRAM (NEW APPENDIX 2-C), COMPARISON WITH FFTF AND MONJU, CORE INTERNALS, SHUTDOWN COOLING SYSTEMS, DOSES FROM EXPOSURE TO LIQUID EFFLUENTS, LEAKAGE FROM SODIUM COLD TRAPS AND PUMP SEIZURE ANALYSIS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING DECAY HEAT REMOVAL, STRESS FROM CDA, PRIMARY PUMP SEAL FAILURES, FISSION PRODUCTS IN SODIUM AEROSOL, CELL TEMPERATURE AND PRESSURE DURING SODIUM FIRE, AND SURFACE AREA FOR CONDENSATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + CONCRETE + CONTAINMENT + FIRE + TESTING + RADIOACTIVITY RELEASE + SEAL + *REPORT, PSAR + QUALITY ASSURANCE + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *CLINCH RIVER (LMFBR) + PUMPS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108672 ALSO IN CATEGORIES 5 AND 12 DATED 1975
RESPONSE TO QUESTION 001.61 - DECAY HEAT REMOVAL CAPABILITY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.61-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE VERIFICATION OF NATURAL CIRCULATION DECAY HEAT REMOVAL CAPABILITY OF CRBRP WILL BE BASED ON ANALYSIS USING DATA FROM COMPONENT TESTS. THE SYSTEM RESISTANCE FLOW TESTS ON KEY COMPONENTS. THAT IS, THE SPECIFIED REQUIREMENTS FOR DELTA P AS A FUNCTION OF FLOW WILL BE VERIFIED BY TESTS ON AN INDIVIDUAL COMPONENT BASIS. THE REACTOR PRESSURE DROPS WILL BE DETERMINED BY OUT-OF-REACTOR TESTS ON INDIVIDUAL COMPONENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DECAY HEAT + TESTING + RESPONSE TO NRC QUESTION + COMPONENTS + *SHUTDOWN COOLING SYSTEM + *SYSTEM CAPABILITY + CLINCH RIVER (LMFBR)

18-108673 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.87 - NATURAL CONVECTION DECAY HEAT REMOVAL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.87-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

VERIFICATION OF NATURAL CONVECTION DECAY HEAT REMOVAL IS DISCUSSED IN THE RESPONSE TO QUESTION 001.61. NO SINGLE LOOP OPERATION IS PLANNED FOR CRBR. WITH REGARD TO THE CHECK VALVE CONTRIBUTION TO THE SYSTEM PRESSURE DROP, PRELIMINARY ANALYSES INDICATE THAT THE CHECK VALVE PRESSURE DROP AT 3% FLOW WILL BE LESS THAN 21% OF THE TOTAL SYSTEM PRESSURE DROP FOR THE THREE LOOP NATURAL CONVECTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DECAY HEAT + *TESTING + HEAT TRANSFER, NATURAL CONVECTION + PRESSURE DROP + RESPONSE TO NRC QUESTION + *SHUTDOWN COOLING SYSTEM + CLINCH RIVER (LMFBR)

18-108674 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.111 - OVERPRESSURE LOADS FROM CORE DISRUPTIVE ACCIDENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.111-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HCDA IS NOT PART OF THE DESIGN BASIS FOR THE CRBRP REFERENCE DESIGN AS EXPLAINED IN SECTION 1.1 AND 15.1. THE THIRD LEVEL DESIGN LOADINGS ON THE PRIMARY PUMP OF 550-575 NSI WILL RESULT IN HIGH PRIMARY PRESSURE LOADS AT THE PUMP TANK NOZZLES--THE MOST CRITICAL AREA IN THE PUMP IN TERMS OF STRESS. THESE PRESSURE LOADINGS IN THE PRIMARY PUMP WILL CAUSE STRESSES IN THE DISCHARGE NOZZLE TO APPROACH THE YIELD POINT. IN THE PUMP TANK SUCTION NOZZLE, THE YIELD STRESS MAY BE EXCEEDED, BUT THE RESULTING STRESS WILL BE WITHIN THE ALLOWABLE STRESS FOR ASME SECTION III FAULTED CONDITIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *STRESS + NOZZLE + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PUMPS + *ACCIDENT, CORE DISRUPTIVE

18-108675 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.112 - PRIMARY SODIUM PUMP SEAL FAILURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.112-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE DETAILED DESIGN OF THE SHAFT SEAL SYSTEM FOR THE PRIMARY SODIUM PUMP HAS NOT BEEN COMPLETED. THEREFORE, THE MAXIMUM RELEASE TO THE CONTAINMENT BUILDING RESULTING FROM DESIGN BASIS FAULTS IN THE SHAFT SEAL SYSTEM CANNOT BE PRECISELY QUANTIFIED NOW. HOWEVER, THE CONSEQUENCES OF PUMP SHAFT SEAL FAILURES ARE BOUNDED BY THE HYPOTHETICAL EVENT ANALYZED IN CHAPTER 15 AND ARE THEREFORE ORDERS OF MAGNITUDE LESS THAN THE GUIDELINES VALVES OF 10CFR100.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + RADIOACTIVITY RELEASE + *SEAL + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + CLINCH RIVER (LMFBR) + *PUMPS

18-108676 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.146 - INGRESS OF CELL ATMOSPHERE INTO COOLANT SYSTEM
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS, Q001-146-1 THRU Q001-146-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11,

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-10867C *CONTINUED*
1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POTENTIAL FOR LEAKS IN THE PIPING IS EXTREMELY REMOTE. THE POTENTIAL FOR CELL ATMOSPHERE INGRESS INTO THE COOLANT SYSTEM IN THE EVENT OF A LEAK EXISTS AT ANY POINT IN THE SYSTEM THAT OPERATES UNDER A NEGATIVE PRESSURE RELATIVE TO ATMOSPHERIC. THEREFORE, THE POTENTIAL FOR CELL ATMOSPHERE INGRESS INTO THE COOLANT SYSTEM DEPENDS ON WHETHER THE LOOP IS SHUT DOWN, THE PUMP IN EA PONY MOTOR OPERATION, OR THE PUMP IS ON MAIN MOTOR OPERATION. EACH OF THESE THREE LOOP CONDITIONS PRODUCE A UNIQUE PRESSURE PROFILE AROUND THE LOOP, AND THEREFORE, MUST BE ADDRESSED SEPARATELY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + RESPONSE TO NRC QUESTION + *CONTAINMENT ATMOSPHERE + *MAIN COOLING SYSTEM + LEAK + CLINCH RIVER (LMFBR)

18-10867? ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 001.150 - RATE OF EACK DIFFUSION OF SODIUM-22
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.150-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RESULTS OF ANALYSIS OF EACK DIFFUSION SHOW THE FOLLOWING RELATIONSHIP: C(IHTS) = C(PHTS) EXP (-1.6 X 10(EXP +7)); C(PHTS) IS THE PRIMARY HEAT TRANSPORT SYSTEM VOLUMETRIC CONCENTRATION OF NA-22 AT THE DEFECT SOURCE; C(IHTS) IS THE RESULTANT NA-22 CONCENTRATION IN THE INTERMEDIATE HEAT TRANSPORT SYSTEM. AS CAN BE SEEN FROM THE ABOVE RELATIONSHIP, THE ACTIVITY THAT CAN DIFFUSE UPSTREAM INTO THE INTERMEDIATE SODIUM IS INSIGNIFICANT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DIFFUSION + *RADIOISOTOPE + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

18-10867? ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 001.219 - FISSION PRODUCTS ASSOCIATED WITH AIRBORNE SODIUM
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS, PP. Q001.219-1 THRU Q001.219-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

IN THE SODIUM FIRE ANALYSES OF SECTION 15.6 OF THE PSAR, IT IS ASSUMED THAT THE CONCENTRATION OF FISSION PRODUCTS IN THE SODIUM AEROSOL IS THE SAME AS THAT IN THE SODIUM POOL. THE ASSUMPTION IS CONSERVATIVE WHEN APPLIED TO NON-VOLATILES. EXPERIMENTAL WORK AT ATOMICS INTERNATIONAL WAS CONDUCTED IN WHICH SAMPLES OF SODIUM CONTAINING URANIUM WERE BURNED IN A 7.4 LITER TEST CHAMBER CONTAINING AIR. THE RELEASE FRACTION OF SODIUM FROM THE SAMPLES WAS LESS THAN 5%, BUT THE RELEASE FRACTION OF URANIUM WAS 0.1% IN ONE CASE, AND IN THE OTHER CASE, WAS TOO SMALL TO BE DETECTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + AEROSOL + *FIRE + PLUTONIUM + *TESTING + URANIUM + *FISSION PRODUCT TRANSPORT + RESPONSE TO NRC QUESTION + TRANSPORT PROPERTY + CLINCH RIVER (LMFBR)

18-10867? ALSO IN CATEGORY 8 DATED 1975
RESPONSE TO QUESTION 001.232 - CELL TEMPERATURE AND PRESSURES FROM FIRE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
2 PGS, 1 FIG, PP. Q001-232-1 THRU Q001.232-2 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE RELATIVELY HIGH BURNING RATE OF THE SPRAY PORTION OF THE FIRE RESULTS IN BOTH RAPID EXPANSION OF THE CELL ATMOSPHERE CAUSED BY HEATING, AND HIGH LOCAL GAS TEMPERATURES. WITH AN ASSUMED 700,000 CFM VENTING RATE, THE RATE OF PRESSURIZATION AND INCREASES IN OVERALL TEMPERATURE OF GAS IN THE CELL ARE MINIMAL DURING THE SPRAY PHASE OF THE FIRE. IN THE ABSENCE OF VENTING, THE MAXIMUM RATE OF PRESSURIZATION IN THE CELL DURING THE SPRAY PHASE WILL BE APPROXIMATELY 1.2 PSIG/SEC. THIS CORRESPONDS TO A LOCALIZED GAS HEAT UP RATE OF APPROXIMATELY 38 F/SEC IN THE CELL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + CONTAINMENT + *FIRE + RESPONSE TO NRC QUESTION + PRESSURE TRANSIENT + THERMAL TRANSIENT + COMPARTMENT + CLINCH RIVER (LMFBR)

18-10868? ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.241 - CALCULATION OF PRESSURE DECAY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
3 PGS, 2 REFS, PP. Q001.241-1 THRU Q001-241-3 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108680 *CONTINUED*
THE OVERALL PRESSURE IN A CONTAINMENT SPACE IS CALCULATED BY THE SOFIRE II CODE WHICH RELATES THE DENSITY AND TEMPERATURE EFFECTS OF THE CONTAINED GASES TO THE HEAT INPUT AND REMOVAL RATES THROUGH THE UTILIZATION OF THE PERFECT GAS EQUATIONS. THE PRESSURE STARTS TO DECREASE AND DECAYS CONTINUOUSLY AS THE HEAT LOSSES TO THE OUTSIDE ATMOSPHERE AND TO THE STRUCTURAL HEAT SINKS WITHIN THE CONTAINMENT CELL OVERCOME THE RATE OF HEAT ADDITION VIA SODIUM COMBUSTION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + CONTAINMENT + RESPONSE TO NRC QUESTION + *PRESSURE TRANSIENT + COMPARTMENT + CLINCH RIVER (LMFBR)

18-108681 DATED 1975
RESPONSE TO QUESTION 001.266 - SODIUM VAPOR VELOCITIES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.266-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE VAPOR VELOCITY OF LESS THAN 10 FT/SEC REPORTED ON PAGE QS-18 OF THE PSAR APPENDIX Q IS THE TIME AND SPACE AVERAGED VELOCITY THROUGHOUT THE VAPOR BUBBLE DURING THE TIME THAT THE APPARENTLY ANOMOLOUS CLAD BEHAVIOR OCCURS. THE LOCAL, INSTANTANEOUS VELOCITIES AS CALCULATED BY THE SAS CODE VARY SIGNIFICANTLY IN BOTH TIME AND SPATIAL DISTRIBUTION. THE LOW AVERAGE VELOCITY IS AN INDICATION THAT, ALTHOUGH VIGEROUS 'CHURNING' MOTION MAY BE OCCURRING LOCALLY, LITTLE NET MOVEMENT OF THE CLAD SHOULD BE EXPECTED DURING THIS PERIOD.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPUTER PROGRAM + RESPONSE TO NRC QUESTION + *BUBBLE + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR) + *VAPOR EXCHANGE

18-108682 DATED 1975
RESPONSE TO QUESTION 001.267 - SURFACE AREA FOR CONDENSATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN.
1 PG, PP. Q001.267-1 OF AMENDMENT 8 TO CLINCH RIVER BREEDER REACTOR LICENSE APPLICATION, DEC. 11, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

ONE OF THE ASSUMPTIONS FOR THE CALCULATION OF THE TOTAL SURFACE AREA OF THE HEAT TRANSFER FROM THE VAPOR BUBBLE IN APPENDIX D IS THAT IN ITS INITIAL CONDITION, THE ASSEMBLIES OCCUPY ALL OF THE BUBBLE VOLUME. THUS, THE ASSEMBLIES (I.E., THE ACTION CORE AND BLANKET), WHICH HAVE A SURFACE OF HIGH DENSITY STRUCTURAL MATERIAL PROVIDE THE SURFACE OF VAPOR CONDENSATION. ONE OF THE BASES FOR THE CALCULATION OF THE TOTAL SURFACE AREA FOR HEAT TRANSFER FROM THE VAPOR BUBBLE IN APPENDIX D IS THAT THE ENTIRE BUBBLE ENCLOSES A HIGH DENSITY OF STRUCTURAL MATERIAL ENCOMPASSING THE SAME VOLUME AS THE BUBBLE AND WHICH PROVIDES THE SURFACE FOR CONDENSATION OF VAPORS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + ANALYTICAL MODEL + *CONDENSATION + RESPONSE TO NRC QUESTION + *CORE COMPONENTS + CLINCH RIVER (LMFBR)

18-10874B ALSO IN CATEGORIES 7 AND 8 AND 12 DATED 1975
ANNUAL TECHNICAL PROGRESS REPORT - NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS - GOVERNMENT FISCAL YEAR 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13155 +. 53 PPS, 34 FIGS, 7 REFS, AUG. 15, 1975

PROJECT OBJECTIVES ARE TO (1) DEVELOP A COMPUTER PROGRAM FOR CALCULATING TWO-DIMENSIONAL, TRANSIENT NATURAL CONVECTION PHENOMENA, SUCH AS THOSE ARISING FROM VARIOUS POSTULATED SODIUM SPILL ACCIDENTS IN LMFBR HEAT TRANSFER VAULTS, HEAD COMPARTMENTS, CONTAINMENT BUILDINGS, AND SECONDARY HEAT TRANSFER SYSTEMS. (2) DEVELOP EXPERIMENT PROGRAMS AND CONDUCT TESTS THAT WILL CHARACTERIZE THE BEHAVIOR OF SODIUM, SODIUM OXIDE, FUEL, FISSION PRODUCT, AND OTHER AEROSOLS AS THEY MIGHT BE GENERATED BY VARIOUS POSTULATED LMFBR ACCIDENTS. (3) DETERMINE BY ANALYSIS AND EXPERIMENT THE GENERATION AND TRANSPORT OF THESE AEROSOLS WITH RESPECT TO SOURCE (LOCATION, TYPE, AND CONFIGURATION) RELEASE DISPERSAL, AGGLOMERATION ATTENUATION, AND REMOVAL FOR THE ENTIRE COURSE OF EVENTS ASSOCIATED WITH REAL AND HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT + AEROSOL + COMPUTER PROGRAM + FIRE + FUEL MELTDOWN + SPRAY + HEAT TRANSFER, NATURAL CONVECTION + IGNITION + TRANSPORT PROPERTY + BUBBLE + *R AND D PROGRAM + LEAK + BEHAVIOR

18-108765 ALSO IN CATEGORIES 5 AND 6 AND 8 AN DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 154 PGS, AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108755 *CONTINUED*
CONTAINS NEW AND REVISED PAGES TO THE PRELIMINARY SAR CONCERNING DOPPLER COEFFICIENT, VOID REACTIVITY EFFECTS, FLOW MODEL TESTS, REACTOR VESSEL PREHEAT, AND STEAM GENERATOR LEAKS. INCLUDES RESPONSES TO NRC QUESTIONS CONCERNING FUEL PIN TRANSIENTS, THERMAL HYDRAULIC DESIGN, AUXILIARY FEEDPUMP, SODIUM SPILLS AND ACCOMPANYING FIRE, FUEL ELEMENT DESIGN, CLAD TEMPERATURE CALCULATIONS, AND AEROSOL DEPOSITION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + DESIGN CRITERIA + FIRE + FLOW THEORY AND EXPERIMENTS + REACTIVITY COEFFICIENT + *REPORT, PSAR + MODEL TESTING + LEAK + COMPARTMENT + TRANSIENT + *CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS + FUEL ELEMENTS

18-108760 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.38 - FUEL PIN TRANSIENTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
3 PGS, 3 TABS, PP. Q001.38-1 THRU Q001.38-5 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THERE ARE BASICALLY THREE TYPES OF FUEL PIN TRANSIENTS: OVERPOWER, UNDERCOOLING AND OVERCOOLING. THE LOADING MECHANISMS ON THE CLADDING ARE BASICALLY DIFFERENT FOR THE FIRST TWO TRANSIENT TYPES. THEY WILL BE DESCRIBED FOR FRESH FUEL AND FOR HIGH BURNUP FUEL WHICH HAS BEEN SUBJECTED TO EITHER LOW AND HIGH POWER STEADY STATE OPERATION. THE CHARACTERIZATION OF THE RELEVANT PARAMETERS OF THESE THREE FUEL TYPES IS GIVEN IN TABLE Q001.38-1. THE CLADDING CAN BE LOADED BY TWO MECHANISMS, GAS PRESSURE IF THERE IS A GAP BETWEEN THE FUEL AND CLADDING AND DIRECT MECHANICAL LOADING OF THE CLADDING BY THE FUEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FUEL BURNUP + FUEL INTEGRITY + STRESS + RESPONSE TO NRC QUESTION + *FUEL ROD + THERMAL TRANSIENT + *TRANSIENT + CLINCH RIVER (LMFBR)

18-108761 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.107 - TECHNIQUE FOR SELECTING HEAT TRANSFER COEFFICIENTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, PP. Q001.107-1 THRU Q001.107-2 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE THERMAL/HYDRAULIC DESIGN CONDITIONS GIVEN IN TABLE 5.3-1 OF THE PSAR HAD THEIR ORIGIN IN A SYSTEM ANALYSIS WHICH USED A MONTE CARLO TECHNIQUE FOR ESTABLISHING THESE PARAMETRIC VALUES. THE IDEA WAS THAT IF A SET OF PRINCIPAL PLANT PARAMETERS WERE SELECTED, AND INDIVIDUAL COMPONENTS SUCH AS THE IHX, THE STEAM GENERATOR MODULES, THE MAIN SODIUM PUMPS AND THE RECIRCULATING PUMPS WERE DESIGNED WITH THEIR OWN MARGINS TO ACCOUNT FOR UNCERTAINTIES IN HEAT TRANSFER COEFFICIENTS, PRESSURE DROPS AND HEAD-FLOW CAPABILITIES, THE PROBABILITY OF ACTUALLY OPERATING THE PLANT AT THE SELECTED SET OF PRINCIPAL PLANT PARAMETERS WOULD BE SMALL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + HEAT TRANSFER + RESPONSE TO NRC QUESTION + COMPONENTS + *HEAT TRANSFER COEFFICIENT + CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

18-108762 ALSO IN CATEGORY 12 DATED 1975
RESPONSE TO QUESTION 001.144 - AUXILIARY FEEDPUMP TURBINE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.144-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AUXILIARY FEEDPUMP TURBINE IS NOT KEPT HOT FOR QUICK START OPERATION. THE DRIVE TURBINE CONCEPT SELECTED FOR THE AUXILIARY FEED PUMP IS BASED ON THE CAPABILITY OF THIS TURBINE TO WITHSTAND SEVERE SERVICE CONDITIONS. THIS IS ACCOMPLISHED BY CONSTRUCTING THE TURBINE WHEEL FROM A SINGLE FORGING WITH BUCKETS MILLED INTO THE FORGING. THE START-UP PROCEDURE IS SIMILAR TO THAT FOR THE RCIC TURBINE IN A BWR IN THAT IT WILL OCCUR WITHOUT PRE-WARMING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + RESPONSE TO NRC QUESTION + TURBINE + THERMAL TRANSIENT + *AUXILIARY + CLINCH RIVER (LMFBR) + *FEEDWATER

18-108763 ALSO IN CATEGORY 8 DATED 1975
RESPONSE TO QUESTION 001.226 - SODIUM FIRE ANALYSIS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.226 -1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SPRAY FIRE COMPONENT ANALYZED (SPRAY-1) IN SECTION 15.6.1.4 WAS EVALUATED AS THE PRESSURIZED

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108766 *CONTINUED*
DISCHARGE OF 30 GPM (100% OF WHICH WAS ASSUMED TO REACT AS A SODIUM SPRAY) FOR A 10 MINUTE DURATION. THE POOL FIRE COMPONENT (SOFIRE-II) WAS EVALUATED BY CONSERVATIVELY ASSUMING THE INSTANTANEOUS FORMATION OF A LARGE SODIUM POOL (1500 GALLONS FOR THE PHTS CELLS AND 18,000 GALLONS FOR THE REACTOR CAVITY - THE RESPECTIVE MAXIMUM SODIUM DRAINAGES BASED ON SYSTEM EQUILIBRIUM CONDITIONS) IMMEDIATELY FOLLOWING THE 10 MINUTE SPRAY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPUTER PROGRAM + *FIRE + *SPRAY + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-108764 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.228 - SYSTEM PRESSURE DURING LEAKS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.228-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANALYSES REFERENCED ON PAGE 15.6-23 OF THE PSAR WERE BASED ON PRELIMINARY ASSESSMENTS OF 1) PHTS CELL MAXIMUM PRESSURES VERSUS SODIUM LEAK RATE AND 2) REACTOR VESSEL INLET PLENUM MINIMUM PRESSURES VERSUS SODIUM LEAK RATE. THE CELL PRESSURES WERE COMPUTED WITH THE SPRAY-1 COMPUTER CODE AND THE PLENUM PRESSURES WITH THE DFNO COMPUTER CODE. NEW FIGURE 15.6.1.4-10 PRESENTS THE RESULTS OF THESE ANALYSES. THE TWO CELL PRESSURE CURVES WHICH ARE INCLUDED IN THE FIGURE ARE ONE FOR HOT LEG (1015 F) LEAKS AND ANOTHER FOR COLD LEG (730 F) LEAKS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPUTER PROGRAM + *PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + LEAK + *COMPARTMENT + CLINCH RIVER (LMFBR)

18-108765 ALSO IN CATEGORY 8 DATED 1975
RESPONSE TO QUESTION 001.240 - PRESSURE AND TEMPERATURE RESPONSES DURING SODIUM FIRE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.240-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE PRESSURE AND TEMPERATURE RESPONSES OF A CELL/BUILDING TO A SODIUM SPILL AND ACCOMPANYING COMBUSTION ARE DEPENDENT UPON SEVERAL FACTORS, WHICH INCLUDE: SURFACE AREA OF THE SODIUM POOL, INITIAL SODIUM TEMPERATURE, SODIUM POOL DEPTH, INITIAL OXYGEN CONTENT OF THE CELL ATMOSPHERE, AND CELL VOLUME. A POOL WITH A SMALL SURFACE AREA WOULD GIVE OFF LESS HEAT PER UNIT TIME (FROM BOTH COMBUSTION AND SENSIBLE HEAT) THAN A POOL WITH LARGER SURFACE AREA, ALL OTHER FACTORS EQUAL. THE LOWER HEAT ADDITION RATE TO THE CELL ATMOSPHERE GIVES THE CELL ATMOSPHERE TIME TO TRANSFER HEAT TO THE CELL WALLS AND RESULTS IN LOWER TEMPERATURE/PRESSURE TRANSIENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FIRE + RESPONSE TO NRC QUESTION + LEAK + PRESSURE TRANSIENT + THERMAL TRANSIENT + *COMPARTMENT + *TRANSIENT + CLINCH RIVER (LMFBR)

18-108766 ALSO IN CATEGORY 8 DATED 1975
RESPONSE TO QUESTION 001.243 - CONSERVATISM IN SPRAY-1 COMPUTER CODE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
3 PGS, PP. Q001.243-1 THRU Q001.243-3 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SPRAY-1 CODE WAS USED FOR THE ANALYSIS OF SODIUM SPRAY FIRES IN LOW OXYGEN CONCENTRATION (EQUAL TO OR LESS THAN 2%) GAS IN ORDER TO PREDICT THE RESULTANT TEMPERATURE AND PRESSURE TRANSIENTS IN A CELL. THE CODE WAS ALSO USED AS PART OF EXPERIMENTAL VERIFICATION TO SIMULATE AND ANALYZE SEVERAL EXPERIMENTAL SODIUM (SPRAY) JET TESTS CONDUCTED BY ATOMICS INTERNATIONAL (AI). THESE COMPARATIVE STUDIES HAVE SHOWN THAT THE CALCULATIONAL RESULTS OBTAINED BY USING THE SPRAY-1 CODE AGREE WITH THE EXPERIMENTALLY MEASURED RESULTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPUTER PROGRAM + FIRE + *COMPARISON, THEORY AND EXPERIENCE + TESTING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-108767 DATED 1975
RESPONSE TO QUESTION 001.258 - RELEASE OF COVER GAS TO THE HAA
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
3 PGS, PP. Q001.258-1 THRU Q001.258-3 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE HEAD ACCESS AREA (HAA) ATMOSPHERE COMMUNICATES FREELY WITH THE UPPER RCB ATMOSPHERE. TO PROVIDE A CONSERVATIVE, UPPER BOUND ESTIMATE OF THE POTENTIAL CONSEQUENCES OF POSTULATED COVER GAS RELEASES TO THE HAA, AN INSTANTANEOUS RELEASE OF THE ENTIRE PRIMARY SYSTEM COVER GAS INVENTORY TO THE RCB IS EVALUATED. SUCH A RELEASE IS CONSIDERED HYPOTHETICAL, ITS CONSEQUENCES

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-108767 *CONTINUED*
ARE EVALUATED TO DEMONSTRATE THAT EVEN FOR THIS LIMITING CASE RELEASE, NO DANGER TO THE HEALTH AND SAFETY OF THE PUBLIC EXISTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *CONTAINMENT + RELEASE RATE + *COVER GAS + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + COMPARTMENT + CLINCH RIVER (LMFBR)

18-108768 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.280 - CALCULATION OF CLAD HOT SPOT TEMPERATURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.280-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CURVES SHOWN BY FIGURES 4.2-19 AND 20 SERVE AS TRANSIENT ENVELOPES, AND AS SUCH SHOULD NOT BE CONSIDERED TO BE CALCULATED INFORMATION. THE CALCULATED HOT SPOT CLADDING TEMPERATURES FOR VARIOUS UNDERCOOLING AND OVERPOWER TRANSIENTS SUCH AS THOSE DESCRIBED IN CHAPTER 15.0 ARE THEN COMPARED TO THE ENVELOPE. IF THE TRANSIENT HAS TEMPERATURES LESS THAN THE ENVELOPE, THE 'UMBRELLAING' PROCESS IS ASSUMED TO BE VAILD. IF THE TRANSIENT HAS TEMPERATURES OVER THE ENVELOPE, THE PARTICULAR EVENT HAS TO BE INDIVIDUALLY ANALYZED, AND THE ADDITIONAL CLADDING DAMAGE INCLUDED IN THE ROD DESIGN EVALUATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

DESIGN CRITERIA + *HOT SPOT FACTOR ANALYSIS + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + TEMPERATURE + CLINCH RIVER (LMFBR)

18-108769 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.295 - MAXIMUM CLAD MIDWALL TEMPERATURES
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.295-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MAXIMUM CLADDING MIDWALL TEMPERATURES ON WHICH THE ORIFICING SCHEME HAS BEEN DERIVED, ARE BASED ON EQUALIZING THE END-OF-LIFE TEMPERATURES AT THE 2 SIGMA LEVEL IN THE HOTTEST ASSEMBLY PER ORIFICING ZONE. THE HOTTEST ASSEMBLY PER ZONE IS IDENTIFIED IN FIGURE 4.4-30; THE CORRESPONDING TEMPERATURES CAN BE FOUND IN FIGURE 4.4-24.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CLADDING + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + *TEMPERATURE + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

18-108770 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.298 - PLANNED SCALE MODEL TESTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.298-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TITLE OF PSAR SECTION 4.4.4.2 INADVERTENTLY IMPLIES THAT PHASE II TESTING IN THE INTEGRAL REACTOR FLOW MODEL (IRFM), WILL UTILIZE A COMPLETE REACTOR HYDRAULIC SIMULATION. THE SCALE OF THE IRFM WAS SELECTED TO MATCH THAT OF THE INLET PLENUM FLOW MODEL (IPFM), TO PERMIT COMBINATION OF THE TWO MODELS INTO A COMPLETE REACTOR HYDRAULIC SIMULATION, SHOULD THIS BE SHOWN TO BE REQUIRED. PHASE II TESTING HAS NOT BEEN COMPLETELY DEFINED, AND ADDITIONAL WORK IS REQUIRED TO DETERMINE IF A COMPLETE REACTOR STRUCTURE SIMULATION IS REQUIRED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FLOW THEORY AND EXPERIMENTS + FLOW DISTRIBUTION + RESPONSE TO NRC QUESTION + *MODEL TESTING + FLOW + CLINCH RIVER (LMFBR)

18-108771 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 001.319 - CLAD DETERIORATION DUE TO IRRADIATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.319-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INCREASES IN FUEL ROD CLADDING TEMPERATURE DUE TO THE UMBRELLA TRANSIENTS ARE THE GREATEST AT BEGINNING-OF-LIFE. THUS, THE CLADDING TEMPERATURE VERSUS TIME RELATIONSHIPS DUE TO THESE TRANSIENTS WERE ANALYZED AT BEGINNING-OF-LIFE. THE PROCEDURES USED IN ASSESSING THE EFFECTS OF THESE TRANSIENTS IS DISCUSSED FULLY IN SECTION 4.2.1.3.1.1. BRIEFLY, THE CLADDING DUCTILITY LIMITED STRAIN WAS CALCULATED WITH THE REQUIRED NUMBER OF UMBRELLA TRANSIENTS APPLIED SIMULTANEOUSLY AT END-OF-LIFE. FOR CONSERVATISM, THE CLADDING TEMPERATURE INCREASES DURING THESE END-OF-LIFE TRANSIENTS WERE ASSUMED TO EQUAL THE MORE SEVERE BEGINNING-OF-LIFE VALUES.

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18-108771 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CLADDING + *RADIATION DAMAGE + RESPONSE TO NRC QUESTION + CREEP + TEMPERATURE + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

18-108772 ALSO IN CATEGORY 5 DATED 1975
RESPONSE TO QUESTION 001.325 - LOCATION OF HEAT-GENERATING BLOCKAGE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.325-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POSTULATED FORMATION OF A HEAT GENERATING BLOCKAGE IMPLIES THE PRESENCE OF FUEL MATERIAL IN THE FLOW CHANNEL. CONSEQUENTLY, THIS IMPLIES THAT A FUEL PIN HAS ALREADY FAILED. ANY MATERIAL FROM THAT FAILED FUEL PIN HAVING BLOCKAGE POTENTIAL WOULD BE EXPECTED TO REMAIN ADJACENT TO THE FAILURE LOCATION. OTHERWISE IT WOULD BE SWEPT OUT OF THE ASSEMBLY DUE TO THE DISPERSIVE NATURE OF FLOW IN A WIRE WRAP ASSEMBLY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT + RESPONSE TO NRC QUESTION + *FLOW BLOCKAGE + FUEL ROD + CLINCH RIVER (LMFBR) + *FUEL ELEMENTS

18-108773 DATED 1975
RESPONSE TO QUESTION 001.336 - RANDOM DISTRIBUTION OF DEBRIS WITHIN HEATED ZONE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q001.336-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE STATEMENT THAT PARTICULATES POSTULATED TO BECOME TRAPPED IN THE HEATED ZONE OF THE PIN BUNDLE WOULD BE RANDOMLY DISTRIBUTED IS BASED ON THE WIRE WRAPPED PIN BUNDLE DESIGN. THE HELICAL SPACER WIRE GEOMETRY PROVIDES NO PREFERENTIAL AXIAL OR RADIAL LOCATION WHERE PARTICULATE RETENTION COULD OCCUR. WHILE IT IS RECOGNIZED THAT THERE IS A VARIATION IN THE COOLANT VELOCITY RADIALLY ACROSS THE PIN BUNDLE, THIS EFFECT IS NOT EXPECTED TO SIGNIFICANTLY INFLUENCE THE LIKELIHOOD OF PARTICULATE TRAPPING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CRUD + RESPONSE TO NRC QUESTION + FLOW + *DISTRIBUTION + CLINCH RIVER (LMFBR) + FUEL ELEMENTS

18-108774 ALSO IN CATEGORY 7 DATED 1975
RESPONSE TO QUESTION 001.344 - AEROSOL DEPLETION FACTOR
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, PP. Q001.344-1 THRU Q001.344-2 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE AEROSOL DEPLETION FACTORS DEFINED IN THE REFERENCED TABLES DESCRIBE THE RATE (FRACTION/SEC) AT WHICH THE SUSPENDED AEROSOL CONCENTRATION IS REDUCED VIA NATURAL AEROSOL DEPOSITION PROCESSES: PLATEOUT AND SETTLING. MATHEMATICALLY, THIS FACTOR IS ANALOGOUS TO A RADIOACTIVE DECAY CONSTANT, WHICH DESCRIBES THE RATE OF DECAY (REDUCTION) OF THE ACTIVITY OF A PARTICULAR ISOTOPE. HOWEVER, WHEREAS THE RATE OF RADIOACTIVE DECAY IS CONSTANT WITH TIME, AEROSOL DEPLETION IS TIME-DEPENDENT DUE TO THE CHANGING SUSPENDED AEROSOL CONCENTRATION, AND THE FACT THAT THE AEROSOL DEPOSITION PROCESSES ARE DEPENDENT ON THE CONCENTRATION OF THE SUSPENDED AEROSOL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AEROSOL + *DEPOSITION + AEROSOL PROPERTIES + RESPONSE TO NRC QUESTION + MATHEMATICAL TREATMENT + CLINCH RIVER (LMFBR)

18-108775 ALSO IN CATEGORY 11 DATED 1975
RESPONSE TO QUESTION 130.35 - HEAVY AGGREGATE CONCRETE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, P. Q130.35-1 OF AMENDMENT 9 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 17, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

A VERY LIMITED AMOUNT OF HEAVY-AGGREGATE CONCRETE WILL BE USED FOR MAINLY SHIELDING PURPOSES ON A SIDE WALL OF THE FUEL HANDLING CELL. THIS SIDE WALL IS LOCATED BELOW THE OPERATING FLOOR AND FACING THE OPERATING GALLERY. INFORMATION PERTAINING TO THE CHARACTERISTICS AND PHYSICAL CONSTANTS OF SUCH HIGH-DENSITY CONCRETE WILL BE PROVIDED WHEN THEY ARE AVAILABLE IN THE FUTURE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONCRETE + *SHIELDING + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-108891 ALSO IN CATEGORY 5 DATED 1975
CARRE FC + TORDREAS NE
DEVELOPMENT OF INPUT DATA TO ENERGY CODE FOR ANALYSIS OF REACTOR FUEL BUNDLES
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
COO-2245-21TR +. 180 PPS, 44 FIGS, MAY 1975

THE ENERGY I CODE IS A SEMI-EMPERICAL METHOD FOR PREDICTING TEMPERATURE DISTRIBUTIONS IN WIRE WRAPPED ROD BUNDLES OF AN LMFBR. FOUR SEPARATE STUDIES WERE MADE TO DETERMINE MORE ACCURATELY THE LIMITS WITHIN WHICH THE SIMPLIFIED FLOW MODEL ASSUMED IN THE CODE LEADS TO CORRECT PREDICTIONS. (1) COMPARISON OF ENERGY I WITH ITS GERMAN ALTERNATE MISTRAL II. (2) PREDICTION OF TEMPERATURE DISTRIBUTION. (3) TRACER INJECTION EXPERIMENTS. (4) ANALYSIS OF THE VALIDITY OF ENERGY I'S RESULTS WHEN THE SIZE OF THE GAP AT THE PERIPHERY OF THE BUNDLE IS REDUCED TO ITS HALF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + FLOW, AXIAL + FLOW, CROSS + *FLOW + *FUEL ELEMENT CLUSTER + DISTRIBUTION + TEMPERATURE

18-109094 ALSO IN CATEGORY 1 DATED 1975
GRAHAM J
LMFBR DESIGN BASIS ACCIDENTS AND THEIR ACCOMMODATION
WESTINGHOUSE ELECTRIC CORPORATION
8 PPS, PRESENTED AT THE ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUCSON, ARIZONA, OCT. 5-8, 1975

IN THE PAST A CORE DISRUPTION WAS USED TO SET REQUIREMENTS FOR CONTAINMENT BARRIERS OF SMALL LMFBRS. IT NOW SEEMS THAT THE USE OF SUCH A DESIGN BASIS ACCIDENT HAS CREATED A MISPLACED EMPHASIS. GREATER SAFETY IS TO BE PROVIDED BY THE PROVISION OF RELIABILITY ASSURANCE, THAT SUCH AN ACCIDENT IS OF SUCH LOW PROBABILITY THAT IT IS INAPPROPRIATE AS A DESIGN BASIS ACCIDENT, AND GREATER EMPHASIS SHOULD BE PLACED ON THE BASIC PROTECTION AGAINST ACCIDENTS RATHER THAN ON THE MITIGATION OF PRESUMED CONSEQUENCES.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILLINOIS 60521

DESIGN CRITERIA + REACTOR TRANSIENT + RELIABILITY ANALYSIS + ACCIDENT, PROBABILITY OF + QUALITY ASSURANCE + ACCIDENT, DESIGN BASIS + ACCIDENT, CORE DISRUPTIVE

18-109162 ALSO IN CATEGORY 11 DATED 1975
KEAIRNS DL + NEWBY RA + COOPER MH + BIEBERBACH G
CONCEPTUAL DESIGN OF A FLUIDIZED BED STEAM GENERATOR FOR THE LMFBR
WESTINGHOUSE ELECTRIC CORPORATION
4 PPS, PP. 338-41, FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, NEWARK, DELAWARE, AUG. 18-22, 1975

A FLUIDIZED BED STEAM GENERATION SYSTEM, FBSG, IS BEING DEVELOPED. THE FBSG ELIMINATES NEED FOR AN INTERMEDIATE SODIUM LOOP AND HEAT EXCHANGER UTILIZED IN CURRENT DESIGN AND ISOLATES THE SODIUM AND WATER THUS REDUCING THE POSSIBILITY OF A SODIUM-WATER REACTION. A CONCEPTUAL DESIGN FOR A STACKED SODIUM AND WATER TUBE BUNDLE FLUIDIZED BED STEAM GENERATOR IS PRESENTED AND THE CIRCULATING FLUIDIZING GAS SYSTEM IS DESCRIBED. AN EXPERIMENTAL PROGRAM IS UNDERWAY TO DEVELOP DESIGN DATA AND DEMONSTRATE CONCEPT FEASIBILITY. THE DEVELOPMENT PROGRAM IS DISCUSSED AND OBJECTIVES OUTLINED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

DESIGN CRITERIA + REACTOR, RESEARCH + DESIGN STUDY + *FLUIDIZED BED + *STEAM GENERATOR

18-109164 ALSO IN CATEGORIES 1 AND 11 DATED 1975
IACOBELLIS SF
DEVELOPMENT AND TESTING REQUIREMENTS FOR MAJOR LMFBR COMPONENTS
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
8 PPS, PP. 70-77, FROM 10TH INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, NEWARK, DELAWARE, AUG. 18-22, 1975

THE MOST SIGNIFICANT DEVELOPMENT REQUIRED TO MOVE FROM CRBRP COMMERCIAL PLANTS IS A SCALEUP IN THE SIZE OF HEAT TRANSFER COMPONENTS. TO ACHIEVE THIS SCALEUP WITH ADEQUATE ASSURANCE OF SUCCESSFUL RELIABLE PERFORMANCE, SIGNIFICANT TESTING OF THESE COMPONENTS WILL BE REQUIRED. THIS PAPER WILL FOCUS ON THAT ASPECT OF THE LMFBR PROGRAM. IN THE CURRENT LMFBR PROGRAM NO INTERMEDIATE-SIZED PLANTS ARE PLANNED. INSTEAD, THE CURRENT PROGRAM PLACES A MUCH GREATER EMPHASIS ON NEED FOR A COMPREHENSIVE COMPONENT TESTING PROGRAM. THIS PAPER WILL REVIEW DEVELOPMENT STATUS OF MAJOR LMFBR COMPONENTS, EXPLORE TECHNICAL UNCERTAINTIES, AND DISCUSS BOTH THE CURRENT MAJOR COMPONENT TESTING CAPABILITIES AND PLANNED FUTURE EXPANSIONS OF THESE FACILITIES.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*RELIABILITY ANALYSIS + *TEST, COMPONENT + *COMPONENTS + STEAM GENERATOR + *COMPONENT DESCRIPTION + PUMPS + PIPES AND PIPE FITTINGS + HEAT EXCHANGERS

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109204 ALSO IN CATEGORY 17 DATED 1975
SICARD E + COULON P + MOUGIOT JC
FUEL MANAGEMENT CODES FOR FAST REACTORS
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
CONF-750411-41 +. 30 PPS, FROM EUROPEAN NUCLEAR CONFERENCE, APRIL 21-25, 1975

THE CAPHE CODE CARRIES OUT ALL THE NEUTRONIC, THERMAL AND HYDRAULIC CALCULATIONS FOR A CORE LOAD (AT THE BEGINNING AND AT THE END OF THE WORKING CYCLE) AND MAKES IT POSSIBLE TO FORCE THE CHARACTERISTICS OF A SUBSEQUENT LOAD PLAN. AMONG THE CHARACTERISTICS CALCULATED FOR EACH SUBASSEMBLY ARE: TOTAL POWER, SODIUM FLOW, SODIUM TEMPERATURE INCREASE, MAXIMUM NOMINAL CLAD TEMPERATURE, MAXIMUM HOT POINT TEMPERATURE OF A CLAD, MAXIMUM FISSION BURNUP ATTAINED BY THE FUEL, NUMBER OF DISPLACEMENTS ATTAINED PER ATOM OF STEEL AND THE BALANCE IN HEAVY ATOMS FOR THE FUEL AND THE LOWER AND UPPER AXIAL BLANKETS. CODE WAS APPLIED TO FUEL MANAGEMENT OF PHENIX.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COMPUTER PROGRAM + CLADDING + *FRANCE + FUEL BURNUP + *FUEL MANAGEMENT + TEMPERATURE + PHENIX (LMFBR) + BLANKET

18-109343 ALSO IN CATEGORIES 5 AND 11 DATED 1975
KERRISK JF
THE CONSEQUENCES OF SODIUM BOND LOSS FROM AN LMFBR CARBIDE FUEL ELEMENT
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6095-MS +. 20 PPS, 7 FIGS, 36 REFS, OCT. 1975

THE CONSEQUENCES OF SODIUM BOND LOSS FROM A URANIUM-PLUTONIUM CARBIDE FUEL ELEMENT DURING NORMAL STEADY STATE OPERATION HAVE BEEN ASSESSED. THE ELEMENTS CONSIDERED ARE TYPICAL OF THOSE CURRENTLY BEING IRRADIATED IN EBR-II, AND INCLUDE ELEMENTS WITH AND WITHOUT SHROUD TUBES. THE ANALYSIS PRESENTED IS VERY CONSERVATIVE IN THAT THE MANY SIMPLIFYING ASSUMPTIONS REQUIRED WERE MADE TO PREDICT WORSE CONSEQUENCES THAN WOULD BE FOUND IN A REALISTIC ANALYSIS. FOLLOWING SODIUM BOND LOSS, FUEL MELTING OCCURS, BUT THE FUEL RAPIDLY RESOLIDIFIES AFTER SLUMPING OUT TO CONTACT THE CLAD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + CLADDING + FUEL MELTDOWN + FAILURE, CLADDING + *HEAT CONDUCTANCE, FUEL TO CLAD + FUEL ELEMENTS

18-109344 ALSO IN CATEGORY 11 DATED 1975
HALL J
FFTF PUMP SEAL TEST FINAL REPORT
LIQUID METAL ENGINEERING CENTER, CANOGA PARK, CALIF.
LMEC-75-11 +. 200 PPS, 19 TABS, 32 FIGS, SEPT. 15, 1975

THE TEST PROGRAM CONFIRMED THAT THE BASIC SEAL DESIGN WAS SATISFACTORY. TESTING OF AN ALTERNATE DESIGN WAS INCLUDED, ALTHOUGH TESTING OF THE PROTOTYPE DESIGN OCCUPIED MOST OF THE PROGRAM. RESULTS OBTAINED IN THIS TEST PROGRAM REVEALED THE NEED FOR CERTAIN MODIFICATIONS TO THE PROTOTYPE PUMP. A SIGNIFICANT RESULT OF CHECKOUT TESTING REVEALED THE NEED FOR HYDROSTATIC LIFT-OFF CAPABILITY IN THE KINGSBURY THRUST BEARING. THIS REPORT CONTAINS A DESCRIPTION AND DISCUSSION OF TEST FACILITIES, TEST HARDWARE, AND THE TEST PROGRAM, WITH APPENDIXES DESCRIBING LABYRINTH SEAL OPERATION (APPENDIX A), SIGNIFICANT PROBLEMS (APPENDIX B), SUMMARIES OF TEST DATA (APPENDIX C), AND PRE- AND POST-TEST INSPECTION RESULTS AND MEASUREMENTS (APPENDIX D).

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

OPERATION + TESTING + FFTF (TR) + DESIGN STUDY + *SEAL + LMEC + *PUMPS

18-109346 ALSO IN CATEGORY 6 DATED 1975
FIFTEENTH QUARTERLY REPORT, APRIL-JUNE 1975. CRITICAL EXPERIMENTS AND ANALYSIS (LMFBR PROGRAM)
GENERAL ELECTRIC COMPANY
GEAP-13771-15 +. 94 PPS, 27 TABS, 19 FIGS, JULY 1975

CURRENT ACTIVITIES AND TECHNICAL PROGRESS FOR THE PERIOD APRIL THROUGH JUNE 1975 ARE REPORTED FOR TWO SUBTASKS. SUBTASK A COVERS THE TECHNICAL DIRECTION FOR CRITICAL EXPERIMENTS AND ANALYSIS AS APPLICABLE TO LMFBR COMMERCIAL PLANTS AND THE CLINCH RIVER BREEDER REACTOR PLANT BENCHMARK CRITICAL EXPERIMENTS IN ZPPR ASSEMBLY 4 AND THE CRBRP EMC. SUBTASK B IS DIRECTED TOWARD THE DEVELOPMENT OF LMFBR PLANT CALCULATIONAL METHODS THAT ALSO CAN BE USED AT THE SITES OF THE CLINCH RIVER BREEDER REACTOR TO DETERMINE THE REACTOR POWER DISTRIBUTION, REACTIVITY AND FUEL STATUS, AND FOR CONSIDERATION OF ALTERNATIVE FUEL AND CONTROL MANAGEMENT SCHEMES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

POWER DISTRIBUTION + ANALYTICAL TECHNIQUE + CRITICALITY EXPERIMENT + ZPPR (CAF) + REACTOR PHYSICS + *R AND D PROGRAM + *FUEL MANAGEMENT + CLINCH RIVER (LMFBR)

18-109347 ALSO IN CATEGORY 17 DATED 1975
CURRIE AJ

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109347 *CONTINUED*
SODIUM FROST OBSERVATIONS IN CRCTA: IVHM PENETRATION PLUG
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-92 +. 22 PPS, 11 FIGS, 2 REFS, AUG. 1975

SODIUM FROST FORMATIONS ON THE IN-VESSEL HANDLING MACHINE (IVHM) PENETRATION PLUG ARE DESCRIBED. THIS PLUG, INSTALLED IN THE COMPOSITE REACTOR COMPONENTS TEST ACTIVITY (CRCTA) TO CLOSE AND INSULATE THE IVHM PENETRATION IN THE ABSENCE OF THE IVHM COMPONENT, WAS EXPOSED TO SODIUM VAPOR FOR 210 DAYS. DURING PLUG RESIDENCE, THE CRCTA SODIUM POOL TEMPERATURES RANGED BETWEEN 350 DEG. F AND 1100 DEG. F. A DETAILED COMPARISON OF THE ANNULAR PROFILES OF THE CRCTA/IVHM PLUG AND CRCTA/IVHM TEST COMPONENT IS MADE, FOLLOWED BY PREDICTED PATTERNS OF SODIUM FROST FORMATION ON THE IVHM TEST COMPONENT. IMPLICATIONS FOR FFTF OPERATIONS ARE DISCUSSED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DEPOSITION + OPERATION + FFTF (TR) + COOLANT CHEMISTRY + *FUEL HANDLING MACHINE + *SURFACE FILM DEPOSIT + CORE COMPONENTS + *EFFECT

18-109396 ALSO IN CATEGORY 11 DATED 1975
PATRIARCA P
FUELS AND MATERIALS DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5029 +. 40 PPS, 13 FIGS, 14 REFS, SEPT. 1975

THIS REPORT COVERS WORK IN THE ORNL METALS AND CERAMICS DIVISION ON ADVANCED ABSORBER MATERIALS AND THE MECHANICAL AND METALLURGICAL BEHAVIOR OF WELDMENTS FOR THE LMFBR. WORK ON EUZO3 IS DESCRIBED; AND STUDIES OF STAINLESS STEEL PIPING AND PRESSURE VESSEL WELDING MATERIALS ARE REPORTED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

WELDS + STEEL, STAINLESS + R AND D PROGRAM

18-109404 ALSO IN CATEGORY 11 DATED 1975
PATRIARCA P
QUARTERLY PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1975. STEAM GENERATOR MATERIALS TECHNOLOGY PROGRAM
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5027 +. 292 PPS, TABS, FIGS, OCT. 1975

THIS IS THE SECOND REPORT CONTAINING COLLECTED RESULTS OF ALL R AND D PROGRAMS ON MATERIALS FOR STEAM GENERATORS. TOPICS INCLUDE SG MATERIALS DEVELOPMENT FOR THE CLINCH RIVER BREEDER; ADVANCED FERRITIC ALLOYS DEVELOPMENT; ALLOY 800 DEVELOPMENT FOR ADVANCED SG'S; LARGE INGOT/FORGING TECHNOLOGY DEVELOPMENT; AND ALTERNATE STRUCTURAL MATERIALS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALLOY + MATERIAL + STEEL, FERRITIC + R AND D PROGRAM + STEAM GENERATOR + METALLURGY + STRUCTURE

18-109406 DATED 1975
ANNUAL TECHNICAL PROGRESS REPORT - FUELS, MATERIALS, AND CONTROL ROD DEVELOPMENT PROGRAMS FOR GOVERNMENT FISCAL YEAR 1975
ATOMIC INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13153 +. 47 PPS, 11 TABS, 9 FIGS, 3 REFS, AUG. 30, 1975

TOPICS REPORTED ON INCLUDE IRRADIATION DAMAGE IN CLADDING AND CORE STRUCTURAL MATERIALS; HELIUM GENERATION IN REACTOR MATERIALS; ABSORBER STUDIES, HEATING EXPERIMENTS AND DESIGN STUDIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CLADDING + RADIATION DAMAGE + DESIGN STUDY + HELIUM + MATERIAL + CORE COMPONENTS + *R AND D PROGRAM + FUEL ROD + *STRUCTURE + CONTROL RODS

18-109407 DATED 1975
AMOROSI A + FROMM LW
A CONCEPTUAL DESIGN FOR A 1200-MWE LIQUID METAL FAST BREEDER REACTOR (LMFBR) POWER PLANT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-29 +. 32 PPS, 20 FIGS, JUNE 1975

THE CONCEPT DESCRIBED IN THIS REPORT IS A SYNTHESIS OF TODAY'S EXPERIENCE WITH AN INTEGRATED PLANT. SOME FEATURES, ALTHOUGH BASICALLY SOUND IN PRINCIPLE, REMAIN TO BE PROVEN. THE PLANT ARRANGEMENT CONSISTS OF A COLD-LEG PUMP, A THREE-LOOP PIPED SYSTEM WITH HELIUM COVER GAS, AND A HELIUM-COOLED CANNED MOTOR DRIVE FOR THE PRIMARY PUMP. IT HAS A LOW-PRESSURE-DROP INTERMEDIATE HEAT EXCHANGER (IHX) BASED ON EBR-II EXPERIENCE. THE STEAM GENERATORS ARE CONTAINED IN A BUILDING WRAPPED AROUND THE REACTOR BUILDING. THIS BUILDING ALSO CONTAINS AUXILIARY SYSTEMS THAT MAKE ACCESS FOR INSPECTION AND REPAIR EASIER THAN LOCATING THESE SYSTEMS IN THE AREA BELOW THE FLOOR OF THE REACTOR BUILDING.

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109407 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR DESCRIPTION + DESIGN STUDY

18-109408 DATED 1975
WEBER M + KAPTA JA
PROGRESS REPORT FOR SEPTEMBER 1975. REACTOR DEVELOPMENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-RDP-43 +. 150 PPS, FIGS, NOV. 3, 1975

REPORTS PROGRESS ON THE FOLLOWING TOPICS. EXPERIMENTAL BREEDER REACTOR NO. II, HOT FUEL EXAMINATION FACILITY, LMFBR DESIGN SUPPORT, INSTRUMENTATION AND CONTROL, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS; REACTOR SAFETY, ENERGY AND ENVIRONMENTAL SYSTEMS, OTHER FAST BREEDER REACTORS; SAFETY RESEARCH EXPERIMENT FACILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*EBR 1 AND 2 (RE) + DESIGN STUDY + REACTOR PHYSICS + *R AND D PROGRAM + *INSTRUMENTS, MISC.

18-109411 ALSO IN CATEGORY 11 DATED 1974
EVANS EA
HEDL QUARTERLY TECHNICAL REPORT FOR JULY, AUGUST, SEPTEMBER 1974. VOL. 2 - FUELS AND SAFETY ENGINEERING
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 74-3(VOL. 2) +. 60 PPS, 12 TABS, 30 FIGS, OCT. 1974

PRESENTS A TABLE INDICATING THE STATUS OF FUELS TESTING AND BRIEFLY DISCUSSES FFTF COMPONENT FABRICATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FABRICATION + TESTING + CORE COMPONENTS + *R AND D PROGRAM + *FUEL ELEMENTS

18-109425 ALSO IN CATEGORIES 5 AND 6 DATED 1975
FULFORD PJ + FOX JN + YACKLE TR
CORTAC: A CORE RESTRAINT TRANSIENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-76-10 +. 181 PPS, 11 FIGS, JULY 1975

CORTAC TREATS THE REACTOR CORE SYSTEM AS AN AXISYMMETRIC MODEL CONSISTING OF A CENTRAL CYLINDRICAL REGION AND FIFTEEN CONCENTRIC ANNULAR REGIONS. THE THERMAL-HYDRAULIC SIMULATION INCLUDES HEAT CONDUCTION BETWEEN RADIAL REGIONS, GAMMA AND NEUTRON HEATING OF STRUCTURE AND COOLANT, AND TIME DEPENDENT FLOW RATES WITHIN AND BETWEEN EACH REGION. EACH RADIAL REGION IS DIVIDED INTO A MAXIMUM OF NINE NODES, INCLUDING FOUR REPRESENTATIVE FUEL PIN NODES, AND UP TO THIRTY AXIAL SECTIONS. THE TRANSIENT TEMPERATURE EQUATIONS USE A RECENTLY DEVELOPED CONDUCTION-CONVECTION HEAT TRANSFER COMPUTATIONAL TECHNIQUE. STRUCTURAL RESPONSE OF THE CORE ASSEMBLIES IS SIMULATED BY A ROUTINE BASED ON THE NUBOW CODE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*COMPUTER PROGRAM + HEAT TRANSFER + REACTOR KINETICS + TRANSIENT + *CORE RESTRAINT + *THERMAL HYDRAULIC ANALYSIS

18-109474 ALSO IN CATEGORY 11 DATED 1975
CLEMENT CF
THEORY OF MASS TRANSPORT IN LIQUID CIRCUITS
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, UK
AERE-TP-606 +. 38 PPS, 3 FIGS, 10 REFS, 1975

THE ISOTHERMAL SOLUBILITY EXPERIMENTS WHICH COULD BE USED TO OBTAIN THE SURFACE REACTION RATE AND DIFFUSIVITY PARAMETERS ARE DESCRIBED. MOLECULAR MASS TRANSPORT IN LOOPS IS THEN TREATED WITH A COLLECTION OF MASS TRANSFER COEFFICIENTS TO BE USED WHEN DIFFUSIVITIES ARE SMALL. TYPES OF CIRCUIT BEHAVIOUR DESCRIBED INCLUDE THE APPROACH TO SATURATION IN ISOTHERMAL LEGS, THE CHARACTERISTICS OF RISING TEMPERATURE REGIONS AND THE DEPENDENCE ON GEOMETRICAL PROPERTIES IN SIMPLE CIRCUITS. A SURFACE TEMPERATURE EFFECT IS SHOWN TO PRODUCE A POSSIBLE CORROSION PEAK AT THE ENTRANCE TO AN ISOTHERMAL HOT LEG. A COUPLED MODEL FOR THE TRANSPORT OF SMALL PARTICLES AND MOLECULAR SPECIES IS FORMULATED IN WHICH PARTICLE GROWTH AND DISSOLUTION IS ALLOWED, AND THE EXPECTED SIZE OF PERSISTENT PARTICLES IN CIRCUITS IS DISCUSSED. SOME PROBLEMS ASSOCIATED WITH EXTENSION OF THE THEORY TO MULTICOMPONENT SYSTEMS ARE BRIEFLY DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DIFFUSION + *CORROSION + TRANSPORT THEORY + METAL, LIQUID + *MASS TRANSFER + TRANSPORT + SOLUBILITY + MASS

18-109479 ALSO IN CATEGORIES 5 AND 12 DATED 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109475 *CONTINUED*
CATTON I
POST-ACCIDENT HEAT REMOVAL FOR LMFBR'S
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7593 +. 54 PPS, 4 FIGS, 29 REFS, NOV. 1975

PREDICTIONS OF DRYOUT CONDITIONS FOR FFTF ARE MADE AND FOUND TO DIFFER FROM THOSE PREVIOSULY REPORTED. AN APPROXIMATE CRITERION FOR CORE DISPERSAL IS PRESENTED WHICH INDICATES THAT MUCH HIGHER DECAY HEAT LEVELS MAY BE REQUIRED FOR CORE DISPERSAL THAN PREDICTED. APPLICATION OF RECENT WORK ON PREDICTION OF HEAT TRANSFER FROM DOWNWARD FACING SURFACES INDICATES THAT NON-UNIFORM HEAT FLUX HAS A SIGNIFICANT EFFECT ON THE FFTF LOWER DOME THICKNESS.

AVAILABILITY - UNIVERSITY OF CALIFORNIA, SCHOOL OF ENGINEERING & APPLIED SCIENCE, ENERGY AND KINETICS DEPARTMENT, LOS ANGELES, CALIFORNIA

DECAY HEAT + *FFTF (TR) + CORE MELTDOWN + HEAT TRANSFER ANALYSIS + HEAT FLUX, DRYOUT + EMERGENCY COOLING + *ACCIDENT, CORE DISRUPTIVE

18-109485 ALSO IN CATEGORY 11 DATED 1974
U.S./U.S.S.R. SEMINAR ON THE DEVELOPMENT OF SODIUM-COOLED FAST BREEDER REACTOR STEAM GENERATORS
U.S. ERDA, WASHINGTON
ERDA-32(ADD.) +. 246 PPS, MEETING HELD IN LOS ANGELES, CALIF., DEC. 2-4, 1974

PRESENTS THE TEXT OF 10 PAPERS CONCERNING BASIC PRINCIPLES IN THE DEVELOPMENT OF SODIUM-COOLED STEAM GENERATORS, PREOP TESTS AND STARTUP OF THE BN-350 STEAM GENERATORS, HEAT TRANSFER IN ONCE THROUGH STEAM GENERATORS, DNB, FAILURE OF STEELS CAUSED BY A SODIUM-STEAM REACTION JET, AND LEAK DETECTION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FABRICATION + FAILURE + HEAT TRANSFER + JET + TESTING + REACTOR COOLANT + *STEAM GENERATOR + LEAK + *TEST, LEAK

18-109503 ALSO IN CATEGORY 12 DATED 1975
CARVER JR + TEAL GR + WALDO JB
INSTALLATION OF THE FFTF IN-VESSEL HANDLING MACHINE INTO A SODIUM ENVIRONMENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 75-93 +. 36 PPS, 26 FIGS, NOV. 1975

THE FFTF IN-VESSEL HANDLING MACHINE ENGINEERING MODEL WAS SUCCESSFULLY INSTALLED IN THE SODIUM/ARGON ENVIRONMENT OF THE COMPOSITE REACTOR COMPONENT TEST ACTIVITY. SINCE ALL OF THE COMPONENTS OF THE FFTF LARGE COMPONENT HANDLING SYSTEM WERE NOT AVAILABLE, SPECIAL EQUIPMENT AND PROCEDURES WERE REQUIRED TO ACCOMPLISH THE INSTALLATION. HIGHLIGHTING THE TRANSFER WAS THE SUCCESSFUL USE OF A CYLINDRICAL PLASTIC SHROUD, 42 FEET LONG AND 8.5 FEET IN DIAMETER, TO EXCLUDE AIR FROM THE CRCTA VESSEL WHILE THE IVHM WAS LOWERED INTO POSITION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL HANDLING + ARGON + COVER GAS + FFTF (TR) + TEST, COMPONENT + FUEL HANDLING MACHINE + COMPONENTS + OPERATING EXPERIENCE

18-109508 ALSO IN CATEGORY 17 DATED 1975
KERRISK JF
EXPERIENCE RELATED TO THE SAFETY OF ADVANCED LMFBR FUEL ELEMENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6028 +. 29 PPS, 16 TABS, 78 REFS, NOV. 1975

EXPERIMENTS AND EXPERIENCE RELATIVE TO THE SAFETY OF ADVANCED FUEL ELEMENTS FOR THE LIQUID METAL FAST BREEDER REACTOR ARE REVIEWED. THE DESIGN AND OPERATING PARAMETERS AND SOME OF THE UNIQUE FEATURES OF ADVANCED FUEL ELEMENTS ARE DISCUSSED BRIEFLY. TRANSIENT AND STEADY STATE OVERPOWER OPERATION AND LOSS OF SODIUM BOND TESTS AND EXPERIENCE ARE DISCUSSED IN DETAIL. AREAS WHERE INFORMATION IS LACKING ARE ALSO MENTIONED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR TRANSIENT + REVIEW + HEAT CONDUCTANCE, FUEL TO CLAD + *OPERATING EXPERIENCE + *FUEL ELEMENTS

18-109556 ALSO IN CATEGORIES 9 AND 11 DATED 1975
MCCLUNG RW
NEEDS FOR DEVELOPMENT IN NONDESTRUCTIVE TESTING FOR LMFBR AND OTHER ADVANCED REACTOR SYSTEMS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5093 +. 75 PPS, NOV. 1975

THE NEEDS FOR DEVELOPMENT OF NONDESTRUCTIVE TESTING TECHNIQUES AND EQUIPMENT WERE SURVEYED AND ANALYZED TO RESOLVE PROBLEM AREAS FOR THE LIQUID-METAL FAST BREEDER REACTOR, THE MOLTEN-SALT BREEDER REACTOR AND THE ADVANCED GAS-COOLED REACTOR. THE REPORT DISCUSSES FIRST THE DEVELOPMENTAL NEEDS THAT ARE BROAD-BASED REQUIREMENTS IN NONDESTRUCTIVE TESTING AND THE RESPECTIVE METHODS AND APPLICABLE, IN GENERAL, TO ALL COMPONENTS AND REACTOR SYSTEMS. NEXT IN

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109556 *CONTINUED*
ORDER ARE THE REQUIREMENTS OF GENERIC MATERIALS AND COMPONENTS (E.G., STEAM GENERATORS) THAT ARE COMMON TO ALL REACTOR SYSTEMS. THESE ARE FOLLOWED BY SECTIONS SPECIFIC TO MATERIALS AND COMPONENTS PECULIAR TO EACH OF THE THREE CITED REACTOR SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

REACTOR, GCR + *TEST, NONDESTRUCTIVE + REVIEW + MSBR (RE) + INSERVICE INSPECTION

18-109563 ALSO IN CATEGORIES 5 AND 7 DATED 1975
GIESEKE JA + REED LD
WORK PLAN: AEROSOL BEHAVIOR MODELLING FOR FAST REACTOR SAFETY. TASK 56
BATTELLE COLUMBUS LABS., OHIO
BMI-X-663 +. 22 PPS, 1 FIG, AUG. 1975

A WORK PLAN FOR EFFORTS IN THE TIME PERIOD FROM JULY 1, 1974, THROUGH JUNE 31, 1977, (FY 75, 76, AND 77) IS DESCRIBED. THE OVERALL GOALS OF THIS STUDY ARE TO PROVIDE IMPROVEMENTS IN THE CAPABILITY TO PREDICT AEROSOL BEHAVIOR IN POSTULATED FAST REACTOR ACCIDENT SITUATIONS AND VERIFY THIS BEHAVIOR TO THE EXTENT POSSIBLE BY COMPARISON WITH AVAILABLE EXPERIMENTAL RESULTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *AEROSOL + ANALYTICAL MODEL + *AEROSOL PROPERTIES + *BEHAVIOR

18-109571 ALSO IN CATEGORIES 5 AND 11 DATED 1975
KLIMA BB
LMFBR SPENT FUEL TRANSPORT: SINGLE ASSEMBLY HEAT TRANSPORT TEST
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4936 +. 100 PPS, 8 TABS, 20 FIGS, OCT. 1975

THE SINGLE ASSEMBLY HEAT TRANSPORT TEST FACILITY OPERATING EXPERIENCE AND TEST DATA ARE PRESENTED. THIS FACILITY WAS SET UP TO TEST THE HEAT TRANSPORT OF A SIMULATED LMFBR SINGLE FUEL ASSEMBLY CONSISTING OF 217 STAINLESS STEEL TUBES EACH OF WHICH WAS INDIVIDUALLY WRAPPED WITH 0.091-IN.-DIAM WIRE. THIS ASSEMBLY FAILED AND WAS REPLACED BY AN ASSEMBLY WITH 0.060-IN.-WIRE WRAPPING. HEAT TRANSPORT WAS TESTED USING SODIUM, HELIUM AND ARGON GASES, DOWTHERM A, AND A VACUUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

DECAY HEAT + FUEL BURNUP + *HEAT TRANSFER + TESTING + TRANSPORT PROPERTY + *FUEL ELEMENTS

18-109576 ALSO IN CATEGORIES 5 AND 11 DATED 1975
SHIN YS + WAMBSGANSS MW
FLOW-INDUCED VIBRATION IN LMFBR STEAM GENERATORS: A STATE-OF-THE-ART REVIEW
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-75-16 +. 76 PPS, 38 FIGS, 119 REFS, MAY 1975

IDENTIFIES AND DISCUSSES EXISTING METHODS OF FLOW-INDUCED VIBRATION ANALYSIS APPLICABLE TO STEAM GENERATORS, THEIR LIMITATIONS, AND BASE-TECHNOLOGY NEEDS. ALSO INCLUDED ARE DISCUSSIONS OF FIVE DIFFERENT LMFBR STEAM-GENERATOR CONFIGURATIONS AND IMPORTANT DESIGN CONSIDERATIONS, FAILURE EXPERIENCES, POSSIBLE FLOW-INDUCED EXCITATION MECHANISMS, VIBRATION TESTING, AND AVAILABLE METHODS OF VIBRATION ANALYSIS. THE OBJECTIVES ARE TO AID LMFBR STEAM-GENERATOR DESIGNERS IN MAKING THE BEST POSSIBLE EVALUATION OF POTENTIAL VIBRATION IN STEAM-GENERATOR INTERNALS AND TO PROVIDE THE BASIS FOR DEVELOPMENT OF DESIGN GUIDELINES TO AVOID DETRIMENTAL FLOW-INDUCED VIBRATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDRAULIC EFFECT + DESIGN STUDY + *VIBRATION + *STEAM GENERATOR + FLOW + EFFECT

18-109584 DATED 1974
EVANS EA
HEDL QUARTERLY TECHNICAL REPORT; APRIL, MAY, JUNE 1974
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-TME 74-2(VOL.2) +. 70 PPS, 31 FIGS, JULY 1974

REPORTS PROGRESS FOR THE PERIOD CONCERNING FUELS TECHNOLOGY AND COMPONENT FABRICATION. REACTOR GRADE FUEL PINS AND DUMMY PINS ARE BEING FABRICATED FOR THE ANL/FFTF SAFETY DEVELOPMENT PROGRAM. CUTFITTING OF THE FIRST HEDL MARK-IIC LOOP IS 90 PERCENT COMPLETE. EQUIPMENT WAS DEVELOPED FOR THE ASSEMBLY, WELDING, AND GAGING OF FFTF NONFUEL CORE COMPONENTS AND FFTF NONFUEL TEST ASSEMBLIES. THE EQUIPMENT HAS BEEN INSTALLED AND IS READY FOR SHAKEDOWN. AN EDDY CURRENT TEST DEVICE HAS BEEN PURCHASED FOR MEASURING THE THICKNESS OF HARDFACING ON CORE COMPONENTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FABRICATION + *FFTF (TR) + CORE COMPONENTS + *R AND D PROGRAM

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109585 ALSO IN CATEGORY 9 DATED 1975
HILL MR
NONDESTRUCTIVE TESTING DEVELOPMENT QUARTERLY PROGRESS REPORT FOR PERIOD ENDING SEPTEMBER 30, 1975
OAK RIDGE NATIONAL LABORATORY
ORNL-5095 +. 55 PPS, 35 FIGS, 3 REFS, NOV. 1975

THE FABRICATION OF THE DRIVE SYSTEM FOR BORE-SIDE TUBE INSPECTION IS PROCEEDING ON SCHEDULE. AS A RESULT OF THE INITIAL INSPECTION TRIALS WITH A THREE-TRANSDUCER ULTRASONIC PROBE, MODIFICATIONS TO THE SYSTEM HAVE BEEN INITIATED. THE FAST BREEDER REACTOR DEPARTMENT'S EFFORTS ON THE CLINCH RIVER BREEDER REACTOR PROGRAM ARE DESCRIBED. STEAM GENERATORS - THE CURRENT EMPHASIS IN THIS PROGRAM IS THE DEVELOPMENT OF BORE-SIDE INSPECTION TECHNIQUES FOR THE TUBE-TO-TUBESHEET JOINTS AND TUBING. THE NEW MICROFOCUS ROD-ANODE X-RAY UNIT HAS ARRIVED FROM HOLLAND. BRIEF STUDIES WITH NONAQUEOUS ULTRASONIC COUPLANTS DEMONSTRATED FEASIBILITY. BOTH ULTRASONIC AND EDDY-CURRENT TECHNIQUES WERE USED TO DEMONSTRATE DETECTABILITY OF A SMALL LEAK IN A TUBE SECTION. BOTH THEORETICAL AND EXPERIMENTAL ULTRASONIC FREQUENCY ANALYSIS IS BEING FOLLOWED FOR QUANTITATIVE FLAW CHARACTERIZATION. CURRENT EFFORTS ARE BASED ON DIFFRACTION MODELS. SAMPLES ARE BEING PREPARED WITH KNOWN DISCONTINUITIES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TEST, NONDESTRUCTIVE + R AND D PROGRAM + STEAM GENERATOR + TUBING + ULTRASONICS + CLINCH RIVER (LMFBR)

18-109586 ALSO IN CATEGORY 5 DATED 1975
VALIDATION OF HIGH TEMPERATURE DESIGN METHODS AND CRITERIA QUARTERLY PROGRESS REPORT FOR PERIOD ENDING FEBRUARY 28, 1975
WESTINGHOUSE ELECTRIC CORPORATION, MADISON, PA.
WARD-HT-3045-11 +. 125 PPS, 14 TABS, 55 FIGS, AUG. 1975

BASIC SPECIMEN TESTING CONTINUED WITH TESTS ON WELDED PLATE WITH A CENTRAL HOLE, NOTCHED BAR BASE METAL, NOTCHED BAR WITH A TRANSVERSE WELD, AND AN ECCENTRICALLY LOADED PLATE. MULTIAXIAL, VARIABLE LOAD (STEP-LOADED) CREEP TESTING IS CONTINUING, AS IS PROGRESS ON THE MULTIAXIAL, VARIABLE LOAD TEST MATRIX FOR THE TYPE 304 STAINLESS STEEL TUBULAR SPECIMENS. HARDNESS MEASUREMENTS AND EXAMINATION OF GRAIN SIZE DISTRIBUTION, CRACKING CHARACTERISTICS, AND ANISOTROPY EFFECTS WERE PERFORMED TO COMPLETE MICROSTRUCTURAL CHARACTERIZATION OF POST-TEST SPECIMENS. A CONTROLLED TEST HAS BEEN SET UP TO DETERMINE AND MINIMIZE THE SOURCE OF ERRORS INTRODUCED IN THE MEASUREMENT OF PHOTOGRAPHIC PLATES RESULTING FROM THE STRAIN-GRID TECHNIQUE WHICH IS TO BE USED TO MEASURE STRAINS IN THE BASIC SPECIMENS AT ELEVATED TEMPERATURES.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + STEEL, STAINLESS + FFTF (TR) + HIGH TEMPERATURE + DESIGN STUDY + CREEP + *R AND D PROGRAM + *METALLURGY + HEAT EXCHANGERS

18-109592 ALSO IN CATEGORIES 6 AND 9 AND 11 DATED 1975
WEBER M + KOPTA JA
REACTOR DEVELOPMENT PROGRAM PROGRESS REPORT, OCTOBER 1975
ARGONNE NATIONAL LABORATORY
ANL-RDP-44 +. 188 PPS, FIGS, OCT. 1975

REPORTS PROGRESS FOR THE PERIOD CONCERNING EBR-2 OPERATIONS, LMFBR DESIGN SUPPORT, DEVELOPMENT OF LMFBR INSTRUMENTATION, FUELS AND MATERIALS DEVELOPMENT, REACTOR PHYSICS, ACCIDENT ANALYSIS, ENERGY AND ENVIRONMENTAL SYSTEMS, GCFR FUELS AND MATERIALS DEVELOPMENT, AND THE SAFETY RESEARCH EXPERIMENT FACILITY.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

ACCIDENT ANALYSIS + EBR 1 AND 2 (RE) + TESTING + DESIGN STUDY + SAFETY PROGRAM + REACTOR PHYSICS + R AND D PROGRAM + REACTOR, GCFR + INSTRUMENTS, MISC. + FUEL ELEMENTS

18-109618 DATED 1975
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 365 PGS, AMENDMENT 10 TO CLINCH RIVER BREEDER LICENSE APPLICATION, DEC. 30, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

CONTAINS RESPONSES TO QUESTIONS ON THE QUALITY ASSURRANCE PROGRAM DESCRIPTION, AND UPDATES CHAPTER 17 OF THE PRELIMINARY SAR AND APPENDICES A AND C WHICH DESCRIBES THE QA PROGRAMS FOR THE OWNER AND THE BALANCE OF PLANT SUPPLIES AND APPENDIX J WHICH IS A NEW PROGRAM DESCRIPTION FOR THE REACTOR MANUFACTURER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + DESIGN CRITERIA + FABRICATION + *REPORT, PSAR + QUALITY ASSURANCE + *CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109745 ALSO IN CATEGORY 5 DATED 1975
CHEN BCJ + TODREAS NE
PREDICTION OF COOLANT TEMPERATURE FIELD IN A BREEDER REACTOR INCLUDING INTERASSEMBLY HEAT TRANSFER
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE
COO-2245-20TR +. 131 PPS, 2 TABS, 38 FIGS, 8 REFS, MAY 1975

A GENERAL MULTI-ASSEMBLY COMPUTER CODE, SUPERENERGY, FOR INVESTIGATING THE EFFECT OF THE INTERASSEMBLY HEAT TRANSFER ON THE TEMPERATURE FIELD OF A BREEDER REACTOR IS DISCUSSED ALONG WITH A LISTING OF THE CODE AND A SAMPLE PROBLEM USING CRBR INPUT. THIS CODE WAS USED TO STUDY THE EFFECT OF INCLUDING VARIOUS RINGS OF COUPLED ASSEMBLIES ON THE TEMPERATURE PREDICTION OF THE CENTRAL CRBR ASSEMBLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TEMPERATURE GRADIENT + HEAT TRANSFER ANALYSIS + COMPUTER PROGRAM, DIGITAL + CLINCH RIVER (LMFBR) + THERMAL HYDRAULIC ANALYSIS

18-109830 ALSO IN CATEGORY 5 DATED 1975
SLAFTER W + ROODEERGEN HA
NUMERICAL CALCULATION OF TEMPERATURE FIELDS IN ROD ASSEMBLIES WITH LIQUID METAL COOLING
REACTOR CENTRUM NEDERLAND, PETTEN, THE NETHERLANDS
RCN-227 +. 34 PPS, 10 FIGS, 13 REFS, JULY 1975

THE FINITE ELEMENT METHOD IS USED TO NUMERICALLY PREDICT 3-D TEMPERATURE DISTRIBUTION IN SMALL REGIONS OF HEXAGONAL LMFBR FUEL ASSEMBLIES COOLED BY LIQUID METAL. THE STUDY ASSUMES STEADY-STATE HEAT TRANSFER WITH A PRESCRIBED HEAT FLUX AND SLUG FLOW. COMPARISON WITH AVAILABLE EXPERIMENTAL AND THEORETICAL RESULTS SHOWED THAT CONTRIBUTION OF TURBULENCE TO INTERSUBCHANNEL HEAT TRANSPORT IN SODIUM EQUALS THAT DUE TO CONDUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + ANALYTICAL MODEL + FUEL ROD + THERMAL HYDRAULIC ANALYSIS

18-109831 ALSO IN CATEGORY 5 DATED 1976
FONTANA MH + GNADT PA + KRESS TS + MACPHERSON RE
TEMPERATURE DISTRIBUTION IN 19-ROD SIMULATED LMFBR FUEL ASSEMBLIES WITH AND WITHOUT EDGE BLOCKAGES (OUT-OF-REACTOR TESTS FOR ANL SLSF P1 EXPERIMENT)-RECORD OF EXPERIMENTAL DATA FOR FUEL FAILURE MOCKUP BUNDLES 5B AND 5C
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5003 +. 60 PPS, 16 TABS, 26 FIGS, 21 REFS, JAN. 1976

A RECORD OF UNEVALUATED EXPERIMENTAL DATA IS GIVEN FOR LMFBR-FUEL FAILURE MOCKUP (FFM) BUNDLES 5B AND 5C. BUNDLE 5B, IS A 19-ROD BUNDLE WITH A PARTIAL BLOCKAGE FLUSH AGAINST THE DUCT WALL. BUNDLE 5C IS THE SAME AS BUNDLE 5B, BUT WITHOUT BLOCKAGE. PURPOSE OF TESTS WAS TO DETERMINE EFFICACY OF THE BLOCKAGE FOR INDUCING FUEL FAILURE IN THE SLSF-P1 EXPERIMENT (TO BE CONDUCTED BY ANL) AND TO PREVIEW THERMAL-HYDRAULIC COOLANT BEHAVIOR OF THE SLSF ROD BUNDLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FAILURE, FUEL ELEMENT + HYDRAULIC EXPERIMENT + REACTOR, SAFETY RESEARCH + OUT OF PILE EXPERIMENT + THERMAL EXPERIMENT + HEAT TRANSFER EXPERIMENT + FLOW BLOCKAGE + DATA COLLECTION + HEATERS

18-109908 ALSO IN CATEGORY 11 DATED 1974
STEPNEWSKI DD + FOX GL + SIMPSON DE + PEAK RD
FFTF SCALE MODEL STRUCTURAL DYNAMICS TESTS
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P2 +. 21 PPS, PP. 679-700, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

ANALYZES THE STRUCTURAL DYNAMIC RESPONSE OF A REACTOR SYSTEM PRIMARY COOLANT BOUNDARY TO A HYPOTHETICAL CORE DISRUPTIVE ACCIDENT (HCDA) BASED ON SCALE MODEL EXPERIMENTS. THE BUCKINGHAM PI THEOREM IS USED TO IDENTIFY MATERIAL AND PROCESS PARAMETER RELATIONSHIPS BETWEEN MODEL AND PROTOTYPE REQUIRED FOR EXACT SIMILITUDE. DEPARTURES FROM SIMILITUDE REQUIREMENTS IN THE SCALE MODEL TESTS ARE IDENTIFIED, AND THE EFFECTS OF THESE DEPARTURES ON FULL-SCALE VESSEL RESPONSE ARE ASSESSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FFTF (TR) + MAIN COOLING SYSTEM + *STRUCTURAL ANALYSIS, DYNAMIC

18-109910 ALSO IN CATEGORY 11 DATED 1974
HOLTBECKER H + STIEVENART M + EGLEME M
STUDY OF NUCLEAR ACCIDENTS BY CHEMICAL SIMULATION EXPERIMENTS
EURATOM, ISPRA, ITALY + BELGONUCLEAIRE, BRUSSELS, BELGIUM
CONF-740401-P2 +. 15 PPS, PP. 716-31, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-109910 *CONTINUED*
DESCRIBES THE EXPERIMENTAL AND THEORETICAL PROGRAMME CARRIED OUT BY BELGONUCLEAIRE IN CLOSE COOPERATION WITH THE ISPRA RESEARCH CENTRE AND INTERATOM AND AIMING AT THE SIMULATION OF THE SNR HYPOTHETICAL CORE DISRUPTIVE ACCIDENT IN A VESSEL MODE. THIS PROGRAMME INCLUDES SIX PHASES: (1) THE DEFINITION OF THE ACCIDENT TO BE SIMULATED AND THE CHOICE OF THE SCALING FACTOR AND OF THE EXPLOSIVE POWDER; (2) A SERIES OF EXPLOSION TESTS IN AN OLD FLOODED QUARRY TO DETERMINE THE POWDER CHARACTERISTICS; (3) A SERIES OF EXPLOSION TESTS IN THREE TYPES OF 1/12 SCALED DOWN AND SIMPLIFIED VESSELS; (4) A SERIES OF EXPLOSION TESTS IN A 1/6 SCALED DOWN VESSEL; (5) A SERIES OF DYNAMIC TESTS ON MATERIALS, AND (6) A FINAL EXPLOSION TEST IN A 1/6 SNR VESSEL MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + EXPLOSION + TESTING + ACCIDENT, HYPOTHETICAL + SIMULATION + *STRUCTURAL ANALYSIS, DYNAMIC + ACCIDENT, CORE DISRUPTIVE

18-109912 ALSO IN CATEGORIES 5 AND 8 AND 11 DATED 1974
KRIEG R + CRAWFORD RM
DEFORMATION IN A 19-PIN BUNDLE DUE TO A SUDDEN FLUID EXPANSION
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 15 PPS, PP. 748-62, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE TRANSIENT FLOW AND PRESSURE FIELDS AS WELL AS THE PIN DEFORMATIONS ARE DETERMINED FOR A FLEXIBLE TWO-ROW PIN BUNDLE SURROUNDED BY AN INFINITE FLUID WITH A TRANSIENT FLUID SOURCE IN THE BUNDLE CENTER. BY NEGLECTING THE FLUID COMPRESSIBILITY AND VISCOSITY, THE SOLUTION FOR THE FLOW PROBLEM IS OBTAINED BY SUPERPOSITION OF SOLUTIONS FOR CERTAIN SINGULARITIES (SOURCES, DIPOLES, QUADRUPOLES). THE FLEXIBILITY OF THE PINS IS ESSENTIALLY APPROXIMATED BY ELASTIC PIN-BUNDLE DEFORMATIONS DUE TO A FUEL-COOLANT INTERACTION CAUSED BY A FAILED PIN IN A LIQUID-METAL-COOLED REACTOR. THE RESULTS MAY HELP TO ESTIMATE THE POTENTIAL FOR FAILURE PROPAGATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FLOW THEORY AND EXPERIMENTS + *DEFORMATION + EXPANSION + *FUEL ELEMENT CLUSTER + STRUCTURAL ANALYSIS, DYNAMIC

18-109913 ALSO IN CATEGORY 11 DATED 1974
FISTEDIS SH + CHANG YW + MARCINIAK TJ
FAST REACTOR CONTAINMENT ANALYSIS. RECENT IMPROVEMENTS, APPLICATIONS, AND FUTURE DEVELOPMENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 21 PPS, PP. 763-84, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

GIVES A BRIEF DESCRIPTION OF (1) THE PROBLEMS INVOLVED IN THE EVALUATION OF THE RESPONSE OF THE LIQUID METAL-COOLED FAST BREEDER REACTOR (LMFBR) TO HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS (HCDA), (2) THE CURRENT CAPABILITY OF THE PROGRAM AT ARGONNE NATIONAL LABORATORY TO PROVIDE ANSWERS TO THESE PROBLEMS, AND (3) THE ULTIMATE OJECTIVES OF THE PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, HYPOTHETICAL + *STRUCTURAL ANALYSIS, DYNAMIC + *ACCIDENT, CORE DISRUPTIVE

18-109915 ALSO IN CATEGORIES 5 AND 11 DATED 1974
PECKOVER RS
THE THERMAL CONTAINMENT OF REACTOR CORE MATERIAL AFTER SHUTDOWN
UKAEA CULHAM LABORATORY, UK
CONF-740401-P2 +. 20 PPS, PP. 802-22, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A TEMPERATURE EXCURSION ARISING THROUGH SOME HYPOTHETICAL BLOCKAGE OF THE COOLING SYSTEM IN A LIQUID COOLED REACTOR SYSTEM COULD LEAD TO THE MELT-OUT OF THE CORE OR PART OF THE CORE. ONE WAY OF CONTAINING THE CORE DEBRIS MAY BE TO ALLOW IT TO FALL INTO SUITABLY DESIGNED CORE CATCHERS PLACED BELOW THE CORE SUBASSEMBLIES. AN ALTERNATIVE APPROACH WOULD BE TO ALLOW THE CORE MATERIAL TO SETTLE ON THE BOTTOM OF THE REACTOR POT WHICH IS COOLED FROM BELOW BY FORCED CONVECTION. A THIRD POSSIBILITY IS TO ALLOW THE CORE TO FALL INTO A SUBTERRANEAN CAVITY BUILT ESPECIALLY FOR THE PURPOSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + EMERGENCY COOLING + COOLING + *CORE CATCHER

18-109916 ALSO IN CATEGORY 5 DATED 1974
GABOR JD + SOWA ES + BAKER L
STUDIES AND EXPERIMENTS ON HEAT REMOVAL FROM FUEL DEBRIS IN SODIUM
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P2 +. 21 PPS, PP. 823-44, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DEBRIS-BED HEAT TRANSFER AND SELF-LEVELING EXPERIMENTS WERE CARRIED OUT TO PROVIDE INFORMATION NEEDED FOR POSTACCIDENT HEAT REMOVAL ANALYSIS OF SODIUM-COOLED REACTORS. THE EXPERIMENTS WERE WITH PARTICULATE UC2 IN WATER, WITH PARTICULATE UO2 IN SODIUM, AND WITH PARTICULATE UO2 AND

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109916 *CONTINUED*
STAINLESS STEEL IN SODIUM. TWO TYPES OF EXPERIMENTS WERE PERFORMED: (1) BOTTOM-HEATING FROM FLAME SOURCES AND (2) ELECTRICAL HEATING WITHIN THE COOLANT PHASE OF THE BEDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECAY HEAT + HEAT TRANSFER + *THERMAL EXPERIMENT + EMERGENCY COOLING + COOLING

18-109930 ALSO IN CATEGORY 5 DATED 1974
GOETZMANN CA + DALLE DONNE M
DESIGN AND SAFETY STUDIES FOR A 1000-MWE GAS-COOLED FAST REACTOR
GESELLSCHAFT FUR KERNFORSCHUNG M.B.H., KARLSRUHE
CONF-740401-P2 +. 21 PPS, PP. 1061-82, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

REVIEWS THE WORK THAT IS CURRENTLY BEING DONE IN THE FEDERAL REPUBLIC OF GERMANY ON THE DESIGN AND SAFETY ASPECTS OF A LARGE 1000 MWE GAS COOLED FAST REACTOR. MENTION IS MADE OF THE CONCURRENT EXPERIMENTAL PROGRAM AIMED AT THE INPILE TESTING OF A REDUCED SIZED FUEL ELEMENT HAVING FEATURES TYPICAL FOR THE GAS COOLED FAST REACTOR SYSTEM. THE DESIGN STUDIES COMPRISE THE LAYOUT OF BOTH THE PRIMARY AND SECONDARY SYSTEM, THE LATTER TO THE EXTENT NECESSARY TO DETERMINE ITS FEED BACK ON THE PRIMARY SYSTEM. DATA RELATING TO THE NUCLEAR AND THERMO-HYDRAULIC CORE DESIGN AND ITS DEPENDENCE ON ENRICHMENT ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *REACTOR, CCR + *DESIGN STUDY + GERMANY + SAFETY EVALUATION + R AND D PROGRAM

18-109932 ALSO IN CATEGORY 5 DATED 1974
GAST K + PEPPLER W + SMIDT D
SODIUM BOILING EXPERIMENTS AND THEIR IMPORTANCE FOR THE REACTOR SAFETY
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 17 PPS, PP. 1121-38, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

WITHIN THE SCOPE OF THE R AND D PROGRAM OF THE LMFBR'S (SNR) THE BEHAVIOR OF LOCAL AND INTEGRAL COOLING-DISTRUBANCES IN SUBASSEMELIES IS INVESTIGATED UP TO BOILING. THESE PROCESSES ARE OF INTEREST WITH RESPECT TO THE FAILURE PROPAGATION AND THE COURSE OF SEVERE HYPOTHETICAL ACCIDENTS. A SHORT SURVEY IS GIVEN OF THE DIFFERENT SAFETY REQUIREMENTS WITH RESPECT TO THE NATIONAL REACTOR CONCEPTS. THE KARLSRUHE WORK ON THE PROBLEMS OF COOLING DISTURBANCES, DETECTION AND SODIUM BOILING IS REVIEWED AND FUTURE PROSPECTS ARE INDICATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*GERMANY + NUCLEATE BOILING + *R AND D PROGRAM + *BOILING

18-109933 ALSO IN CATEGORY 5 DATED 1974
FONTANA MH + GNADT PA + KRESS TS
EFFECT OF PARTIAL BLOCKAGES IN SIMULATED LMFBR FUEL ASSEMBLIES
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-740401-P3 +. 21 PPS, PP. 1139-60, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

EXPERIMENTAL DATA ON THE EFFECTS OF PARTIAL BLOCKAGES IN SIMULATED LMFBR ROD BUNDLES ARE REVIEWED AND THE RESULTS PRESENTED. EXPERIMENTS PERFORMED IN THE ORNL FUEL FAILURE MOCKUP WITH 13- AND 24-CHANNEL INLET BLOCKAGES IN 19-ROD SODIUM-COOLED ELECTRICALLY HEATED ROD BUNDLES INDICATE THAT EXCESSIVE TEMPERATURES DO NOT OCCUR AS A RESULT OF THE BLOCKAGES. A SIMPLE REPRESENTATION OF FLOW RECIRCULATION IN THE WAKE OF THE BLOCKAGE INDICATES THAT A SMALL RECIRCULATING FLOW SIGNIFICANTLY REDUCES TEMPERATURES IN THE WAKE ZONE. CALCULATIONS OF TEMPERATURES WITHIN HEAT-GENERATING BLOCKAGES INDICATE THAT IN ORDER TO OBTAIN TEMPERATURES ABOVE THE CLADDING LIMIT MORE THAN ONE SUBCHANNEL MUST BE BLOCKED OVER A LENGTH IN EXCESS OF 0.5 IN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FLOW THEORY AND EXPERIMENTS + *FLOW BLOCKAGE + *SIMULATION + FUEL ROD + BOILING

18-109936 ALSO IN CATEGORIES 5 AND 8 DATED 1974
HENRY RE + SINGER RM + LAMBERT GA
SODIUM EXPULSION TESTS FOR THE SEVEN-PIN GEOMETRY
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 13 PPS, PP. 1188-1201, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

SODIUM EXPULSION DATA ARE REPORTED FOR SINGLE- AND SEVEN-PIN GEOMETRIES WITH LMFBR HEAT FLUX CONDITIONS FOLLOWING PUMP COASTDOWN FLOW TRANSIENTS. ANALYSIS OF THE DATA SHOWS THAT IN BOTH CASES BOILING INCEPTION OCCURRED AT THE END OF THE HEATED ZONE WITH A SMALL SUPERHEAT. NET POSITIVE FLOW WAS OBSERVED DURING THE EARLY VOIDING STAGE AND THE GENERAL FLOW PATTERN APPEARS TO BE ANNULAR

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

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18-109936 *CONTINUED*
*FLOW THEORY AND EXPERIMENTS + VOID FRACTION + BOILING + VOID

18-109938 ALSO IN CATEGORY 1 DATED 1974
ANGERER G + EISEMANN E + FISCHER EA
CRITICAL DISCUSSION OF SOME IMPORTANT TOPICS IN FAST BREEDER SAFETY ANALYSIS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 17 PPS, PP. 1223-40, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE THEORETICAL SAFETY ANALYSIS OF LMFBRS PRESENTLY CONCENTRATES ON A MECHANISTIC DESCRIPTION OF ACCIDENT SEQUENCES WHICH COINCIDE WITH A COMPLETE FAILURE OF THE REACTOR SAFETY SYSTEM. THESE UNPROTECTED ACCIDENTS MAY LEAD TO A DISASSEMBLY OF THE CORE. DISCUSSES THE UNCERTAINTIES IN THIS ANALYSIS, WHICH ARE DUE TO NEUTRONIC AND NON-NEUTRONIC METHODS AND DATA, AND THE IMPACT OF THESE UNCERTAINTIES ON IMPORTANT SAFETY CHARACTERISTICS OF THE REACTOR HAS BEEN INVESTIGATED IN VARIOUS SENSITIVITY STUDIES. BY THIS PROCEDURE, THE MOST RELEVANT UNCERTAINTIES ARE IDENTIFIED. IT IS FOUND THAT PRESENTLY ESSENTIAL EXPERIMENTAL VERIFICATIONS ON CERTAIN HYPOTHESIZED PHENOMENA IN THE AREAS OF PIN FAILURE, FUEL COOLANT INTERACTION, FUEL MOVEMENT, AND FUEL SLUMPING ARE LACKING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *ACCIDENT, HYPOTHETICAL + THEORETICAL INVESTIGATION + *SAFETY ANALYSIS + ACCIDENT, CORE DISRUPTIVE

18-109939 ALSO IN CATEGORY 1 DATED 1974
JACKSON JF + STEVENSON MG + SEVY RH
TRENDS IN LMFBR HYPOTHETICAL-ACCIDENT ANALYSIS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 23 PPS, PP. 1241-64, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE CURRENT PHILOSOPHY IN THE U.S. EMBRACES THREE LEVELS OF SAFETY CONSIDERATION IN FAST REACTOR DESIGN. THE FIRST LEVEL EMPHASIZES PROPER DESIGN AND CONSTRUCTION IN ORDER TO PRODUCE AN INHERENTLY SAFE AND RELIABLE REACTOR. THE SECOND LEVEL PROVIDES PROTECTION SYSTEMS TO ENSURE THAT ANY OFF-NORMAL CONDITIONS CAN BE SAFELY ARRESTED OR ACCOMMODATED. THE THIRD LEVEL CONSIDERS SPECIAL FEATURES THAT PROVIDE AN ADDITIONAL MARGIN OF PUBLIC PROTECTION IN CASE EXTREMELY UNLIKELY OR UNFORSEEN CIRCUMSTANCES SHOULD ARISE. HCDAS ARE USUALLY CONSIDERED AS PART OF THIS THIRD-LEVEL EVALUATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, HYPOTHETICAL + *ACCIDENT, CORE DISRUPTIVE

18-109940 ALSO IN CATEGORIES 1 AND 6 DATED 1974
BOUDREAU JE + JACKSON JF
RECRITICALITY CONSIDERATIONS IN LMFBR ACCIDENTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO + ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 24 PPS, PP. 1265-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

RECENT STUDIES SUGGEST THAT FUEL WHICH IS DISPERSED UPWARD BY A MILD PROMPT CRITICAL BURST MAY REENTER THE CORE REGION CAUSING A SECONDARY EXCURSION. IN THIS PAPER, SEVERAL MODES OF FUEL REENTRY RECRITICALITY ARE EXAMINED, AND PHENOMENA WHICH STRONGLY AFFECT REACTIVITY RAMP RATE ESTIMATES ARE EVALUATED. A BROAD RANGE OF RAMP RATES RESULTS FROM THESE STUDIES. THE RESULTS ALSO INDICATE THAT A NUMBER OF EFFECTS EXPECTED TO BE PRESENT IN REALISTIC SITUATIONS CAN STRONGLY MITIGATE THE REACTIVITY INSERTION RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + *ACCIDENT, HYPOTHETICAL

18-109941 ALSO IN CATEGORY 5 DATED 1974
FRANCOIS P + ANTONAKAS D + FORTUNATO M
SOME PROBLEMS CONCERNING FAST REACTOR SAFETY
ELECTRICITE DE FRANCE
CONF-740401-P3 +. 12 PPS, PP. 1290-1302, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

DISCUSSES PROBABLE ACCIDENTS IN A MECHANISTIC WAY. DESCRIBES THE TREES OF EVENTS ISSUED FROM ANY INITIAL DEFECT, QUALITATIVELY AND QUANTITATIVELY. THE COURSES OF EVENTS WHICH CAN BE DESCRIBED IN A MECHANISTIC WAY ARE ANALYSED. CLASSICAL INCIDENTS SUCH AS A BLOCKAGE, OR ACCIDENTS WHICH ASSUME A SIMULTANEOUS FAILURE OF TWO LEVELS OF PROTECTION-DETECTION AND SHUTDOWN ARE CONSIDERED. A PARAMETRIC ANALYSIS OF AN UNREALISTIC ACCIDENT IS PERFORMED, WHICH GIVES AN EXAMPLE TO ILLUSTRATE THE POSSIBILITIES OF THE CODES UNDER DEVELOPMENT IN THE CEA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + ACCIDENT, HYPOTHETICAL + FLOW BLOCKAGE + FAULT TREE ANALYSIS + *ACCIDENT, ATWS

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-109942 ALSO IN CATEGORIES 5 AND 6 DATED 1974
STEVENSON MG + EGHL WR + DUNN FE
CURRENT STATUS AND EXPERIMENTAL BASIS OF THE SAS LMFBR ACCIDENT ANALYSIS CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 18 PPS, PP. 1303-21. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE LATEST VERSION, SAS3A, INCLUDES MODELS WHICH ALLOW AN INTEGRAL TREATMENT OF BOTH TRANSIENT OVERPOWER AND LOSS-OF-FLOW UNPROTECTED ACCIDENT SEQUENCES THROUGH FUEL-PIN DISRUPTION AND UP TO THE POINT OF SUBASSEMBLY DISRUPTION. IN SOME CASES, THESE MODELS CAN FOLLOW THE SEQUENCE FROM INITIATION TO NEUTRONIC SHUTDOWN BY DISPERSIVE FUEL MOTION AND CAN BE USED TO EVALUATE THE POSSIBILITY OF ESTABLISHING IN-PLACE COOLING. FOR CASES WHICH PROCEED TO AN ENERGETIC CORE DISASSEMBLY, THE NEW MODELS PROVIDE AN IMPROVED DEFINITION OF CORE CONDITIONS AND REACTIVITY INSERTION RATE AT THE TIME OF A TRANSITION TO VENUS-II. THE NEW CAPABILITIES PROVIDED BY SAS3A INCLUDE A STEADY-STATE FUELS-INITIALIZATION ROUTINE, A PRIMARY-LOOP HYDRAULICS MODEL, A FUEL-COOLANT-INTERACTION MODEL FOR TRANSIENT OVERPOWER CONDITIONS, A NEW MOVING-FILM TREATMENT IN THE MULTIBUBBLE SODIUM-BOILING MODEL, AND CLADDING AND FUEL MOTION MODELS FOR VOIDED ASSEMBLIES IN A LOSS-OF-FLOW ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, REACTIVITY + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *FUEL COOLANT INTERACTION + ACCIDENT, CORE DISRUPTIVE

18-109943 ALSO IN CATEGORIES 5 AND 6 DATED 1974
BLEIWEIS PB + OKRENT D + KASTENBERG WE
A COMPARISON STUDY AND ANALYSIS OF MODELS FOR 1000 MWE AND 4000 MWE LMFBR HYPOTHETICAL ACCIDENTS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-740401-P3 +. 10 PPS, PP. 1322-32. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A 1000 MWE AND TWO 4000 MWE LMFBR'S WERE ANALYZED FOR UNPROTECTED LOSS-OF-COOLANT FLOW AND REACTIVITY INSERTION ACCIDENTS USING A VERSION OF THE SAS-VENUS COMPUTER CODE. FOR SIMILAR ACCIDENTS, THE FINAL ENERGY DEPOSITED IN THE MOLTEN FUEL INCREASED NEARLY DIRECTLY PROPORTIONAL TO THE CORE MASS. A FOUR ZONE, MORE HIGHLY FLATTENED 4000 MWE REACTOR YIELDED BETWEEN 5% AND 15% MORE ENERGY IN MOLTEN FUEL THAN A TWO ZONE REACTOR FOR THE SAME ACCIDENT CONDITIONS. THE ENERGY YIELDS WERE RELATIVELY INSENSITIVE TO THE ASSUMED VALUES OF SODIUM SUPERHEAT. THE COMPUTER CODE WAS FOUND TO INTRODUCE POTENTIALLY LARGE ERRORS BECAUSE OF THE MANNER IN WHICH REACTIVITY INSERTION RATES WERE SELECTED FOR THE DISASSEMBLY PHASE AT THE TIME OF SWITCHING TO THE VENUS MODULE (AT A PRE-SPECIFIED PEAK CORE FUEL TEMPERATURE). FURTHER ATTENTION SHOULD BE GIVEN TO THIS ASPECT OF COUPLED-CODE ACCIDENT ANALYSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ACCIDENT, LOSS OF COOLANT + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + ACCIDENT, HYPOTHETICAL + *COMPARISON

18-109944 ALSO IN CATEGORIES 5 AND 6 AND 7 DATED 1974
BOGENSBERGER HG + FISCHER EA + SCHMUCK P
ON THE EQUATION OF STATE OF MIXED OXIDE FUEL FOR THE ANALYSIS OF FAST REACTOR DISASSEMBLY ACCIDENTS
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 15 PPS, PP. 1333-48. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE VAPOR PRESSURE FOR MIXED OXIDE IS CALCULATED BY FOLLOWING THE METHOD USED BY RAND AND MARKIN. THE VAPOR PRESSURE OF THE FISSION PRODUCTS IS ALSO CALCULATED, AND FOUND TO BE MUCH LARGER THAN THAT OF MIXED OXIDE AT TEMPERATURES AROUND THE MELTING POINT. THE DISASSEMBLY PHASE OF AN UNPROTECTED REACTIVITY ACCIDENT IN A LMFBR IS ANALYZED USING THESE VAPOR PRESSURE DATA. THE ACCIDENT IS INITIATED BY A 5 $/SEC REACTIVITY RAMP; THE PREDISASSEMBLY PART WAS ANALYZED EARLIER WITH THE SAS-2A CODE. IT IS FOUND THAT THE VAPOR PRESSURE OF THE FISSION PRODUCTS HAS THE EFFECT OF GREATLY REDUCING THE ENERGY RELEASE IN THE ACCIDENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + VAPOR PRESSURE + MIXED OXIDE + *ACCIDENT, CORE DISRUPTIVE

18-109947 ALSO IN CATEGORIES 9 AND 12 DATED 1974
NOYES RC + GILBERTSON JC
LMFBR ALTERNATE SHUTDOWN SYSTEMS - TEST EXPERIENCE AND GENERAL DESIGN CRITERIA
COMBUSTION ENGINEERING INC., WINDSOR, CONN.
CONF-740401-P3 +. 13 PPS, PP. 1379-92. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A BRIEF REVIEW OF THE HISTORY OF ALTERNATE SHUTDOWN SYSTEMS FOR LMFBR'S IS PRESENTED TOGETHER WITH A DISCUSSION OF THE RATIONALE USED IN DEVELOPING SIX PROPOSED GENERAL DESIGN CRITERIA FOR SUCH SYSTEMS. A REACTOR SHUTDOWN SYSTEM DEVELOPED AT COMBUSTION ENGINEERING, INC. IS DESCRIBED WHICH USES A MODIFIED EBR-II TYPE CONTROL ROD SYSTEM WITH A REDUNDANT SECOND SYSTEM SIMILAR TO FERMI SAFETY RODS EXCEPT THAT THE SCRAM MECHANISM IS PNEUMATICALLY ACTUATED. TEST RESULTS OF A MODEL OF THE PNEUMATIC SCRAM RELEASE MECHANISM OPERATED IN SODIUM AT 1100 F ARE GIVEN.

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-109947 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + EBR 1 AND 2 (RE) + FERMI (LMFBR) + CONTROL ROD SCRAM MECHANISM + *SHUTDOWN SYSTEM, SECONDARY + REVIEW + EQUIPMENT DESIGN

18-109948 ALSO IN CATEGORIES 9 AND 12 DATED 1974
MCKEEHAN ER + SHANVER BM
THE ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 7 PPS, PP. 1393-99, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2 ,1974

AN ALTERNATE SHUTDOWN SYSTEM DEVELOPMENT PROGRAM IS DESCRIBED. THE SYSTEM BEING DEVELOPED IS FOR APPLICATION TO THE LIQUID METAL FAST BREEDER REACTOR (LMFBR) AND SERVES AS A BACKUP TO THE PRIMARY SHUTDOWN SYSTEM. THE SYSTEM IS DISCUSSED, AND COMPONENT DEVELOPMENT TESTS ARE OUTLINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SHUTDOWN SYSTEM, SECONDARY + *R AND D PROGRAM + EQUIPMENT DEVELOPMENT

18-109949 ALSO IN CATEGORIES 11 AND 12 DATED 1974
HOPKINS HC + SNYDER HJ
GCFR'S SOLUTION TO RADIATION AND THERMAL DISTORTION
GENERAL ELECTRIC COMPANY
CONF-740401-P3 +. 15 PPS, PP. 1400-14, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN FEATURES OF THE GAS-COOLED FAST BREEDER REACTOR (GCFR) THAT ALLOW ACCOMMODATION OF RADIATION AND THERMAL DISTORTION WITHOUT RESORTING TO A COMPLEX CORE-RESTRAINT MECHANISM ARE DISCUSSED. A COMPARISON OF RADIATION SWELLING AND GEOMETRIC PARAMETERS FOR THE GCFR AND LMFBR ARE PRESENTED TO ILLUSTRATE WHY A RESTRAINT SYSTEM IS UNNECESSARY. THE ANALYSIS OF GCFR CORE BEHAVIOR IS DESCRIBED BRIEFLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GCR + SHUTDOWN SYSTEM, SECONDARY + *EQUIPMENT DESIGN + *CORE COMPONENTS + BEHAVIOR + *SWELLING

18-109951 ALSO IN CATEGORIES 9 AND 12 DATED 1974
VAN ERP JB + FAUSKE HK
ROLE AND DEVELOPMENT OF LMFBR PROTECTION SYSTEMS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 15 PPS, PP. 1430-45, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IT IS RECOMMENDED THAT A BALANCED APPROACH BE FOLLOWED WITH RESPECT TO RELIANCE ON (1) REACTOR SAFETY SHUTDOWN SYSTEMS (PLANT PROTECTION SYSTEMS), AND (2) ENGINEERED SAFEGUARDS, FOR PROTECTION OF PUBLIC HEALTH AND SAFETY: REACTOR SAFETY SHUTDOWN SYSTEMS, AS WELL AS ENGINEERED SAFEGUARDS (CONTAINMENT SYSTEMS, BLAST SHIELDS, POST-ACCIDENT-HEAT-REMOVAL SYSTEMS, ETC.) OF HIGH RELIABILITY AND PROVEN PERFORMANCE SHOULD BE PROVIDED FOR FAST BREEDER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR PROTECTION SYSTEM + RELIABILITY, SYSTEM + SHUTDOWN SYSTEM, SECONDARY + *ENGINEERED SAFETY FEATURE + PROBABILITY

18-109952 ALSO IN CATEGORY 9 DATED 1974
HIKIDO K + MEYER RA + REGIMBAL JJ
LMFBR SAFETY INSTRUMENTATION
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
CONF-740401-P3 +. 6 PPS, PP. 1446-51, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE STATUS OF LMFBR SAFETY INSTRUMENTATION IS REVIEWED WITH EMPHASIS ON IN-VESSEL SENSORS WHICH MAY BE EMPLOYED TO AVOID CONDITIONS LEADING TO POSSIBLE FUEL FAILURE PROPAGATION. FOCUS IS PLACED ON CORE-EXIT TEMPERATURE AND FLOW SENSORS, ACOUSTIC MONITORS, AND FEDAL EQUIPMENT PLANNED FOR FFTF AND THE CRBRP. SPECIAL EMPHASIS IS GIVEN TO POSSIBLE INSTRUMENTATION REQUIREMENTS BASED ON DATA FROM FAILED FUEL SWELLING MEASUREMENTS. ADDITIONAL DEVELOPMENT WORK RELATING TO INSTRUMENTATION REQUIRED FOR OPERATION WITH FAILED FUEL IS SUGGESTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*INSTRUMENT, IN CORE + *REACTOR PROTECTION SYSTEM + FFTF (TR) + INSTRUMENT, FAILED FUEL DETECTION + PROBABILITY + CLINCH RIVER (LMFBR)

18-109953 ALSO IN CATEGORIES 1 AND 9 DATED 1974
CAVE L

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18-109953 *CONTINUED*
A COMPARATIVE STUDY OF THE SAFETY OF LIQUID METAL-COOLED AND GAS-COOLED FAST REACTORS
POLLUTION PREVENTION (CONSULTANTS) INC.
CONF-740401-P3 +. 28 PPS. PP. 1452-80. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE PRINCIPAL FEATURES OF THE METHOD USED IN THIS PAPER ARE AS FOLLOWS: (1) A QUANTITATIVE STANDARD OF SAFETY IS DEFINED WHICH IS COMMON TO BOTH SYSTEMS. (2) THE POSSIBILITY OF ATTAINING THIS STANDARD OF SAFETY IN EACH SYSTEM WITH FEASIBLE DESIGN FEATURES. LARGELY IRRESPECTIVE OF COST. (3) THE EFFECT OF SUBSTANTIAL CHANGES IN THE BASIC ASSUMPTIONS. INCLUDING THE STANDARD OF SAFETY REQUIRED ON DESIGN FEASIBILITY. (4) THE EFFECT ON SAFETY OF THE GENERATING COSTS AND DOUBLING TIMES PREDICTED FOR THE TWO SYSTEMS. TAKING INTO ACCOUNT FACTORS WHICH MAY LEAD TO DIFFERENCES IN AVAILABILITY. THE EFFECTS ON SAFETY OF THE DIFFERENCES BETWEEN THE MAIN VARIANTS OF EACH SYSTEM (I.E.. 'POOL' AND 'LOOP' TYPE LMFBR; UPWARD AND DOWNWARD CORE FLOW GCFR) ARE EXAMINED BRIEFLY BUT THESE ARE FOUND TO BE UNIMPORTANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

REACTOR. GCR + *COMPARISON. REACTOR CHARACTERISTICS + PROBABILITY

18-109955 ALSO IN CATEGORY 7 DATED 1974
FULLWOOD RR + ERDMANN RC + 1KWD
ON THE USE OF LEAK PATH ANALYSIS IN FAULT TREE CONSTRUCTION FOR FAST REACTOR SAFETY
SAI SERVICES. MCLEAN. VA
CONF-740401-P3 +. 14 PPS. PP. 1492-1507. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

DESCRIBES A METHOD FOR DETERMINING THE TOP OF A FAULT TREE FOR AN ACCIDENTAL RELEASE OF RADIOACTIVITY. WITH APPLICATION TO THE FFTF. THE ANALYSIS LEADS FROM DESIGN DRAWINGS AND RELATED INFORMATION TO A LOGICAL EXPRESSION FOR THE FAILURE PATHS. THIS ALGEBRAIC EXPRESSION. WHEN REDUCED. IS REPRESENTED BY A FAULT TREE. ADDITIONAL TREES ARE ALSO DRAWN FOR OTHER PARTS OF THE SYSTEM. THE RESULTS OF THE METHOD ARE COMPARED TO ALTERNATE SCHEMES AND THE CONCEPT OF FAULT TREE COMPLETENESS IS CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*FFTF (TR) + *FAULT TREE ANALYSIS + PROBABILITY + FAILURE MODE ANALYSIS

18-109956 ALSO IN CATEGORIES 1 AND 11 DATED 1974
BROWN NW + STITT RK + WILSON RJ
AN ESTIMATE OF LMFBR STEAM GENERATOR SYSTEM RELIABILITY AND AVAILABILITY
GENERAL ELECTRIC CO.. SUNNYVALE. CALIF.
CONF-740401-P3 +. 16 PPS. PP. 1508-24. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

A PROBABILISTIC EVALUATION OF A REFERENCE STEAM GENERATOR SYSTEM IS DISCUSSED. THE STUDY WAS CONDUCTED IN SUPPORT OF THE AEC LMFBR STEAM GENERATOR SYSTEMS DEVELOPMENT PROGRAM. THE OBJECTIVE OF THE STUDY WAS TO HELP IN IDENTIFYING THE RELATIVE IMPORTANCE OF CRITICAL DEVELOPMENT AREAS. THE STUDY ESTIMATES THE PROBABILITY OF STRUCTURAL DAMAGE TO THE SECONDARY SODIUM SYSTEM BOUNDARY AND THE AVAILABILITY OF A SINGLE LOOP OF A THREE LOOP REFERENCE PLANT. CRITICAL DEVELOPMENT NEEDS AND THEIR RELATIVE IMPORTANCE TO RELIABILITY AND AVAILABILITY GOALS ARE IDENTIFIED BASED ON THE PROBABILISTIC EVALUATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*RELIABILITY. COMPONENT + *STEAM GENERATOR + PROBABILITY + EQUIPMENT DEVELOPMENT

18-109957 ALSO IN CATEGORIES 5 AND 6 DATED 1974
STRUWE D + ROYL P + WIRTZ P
CAPRI - A COMPUTER CODE FOR THE ANALYSIS OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS IN THE PREDISASSEMBLY PHASE
KERNFORSCHUNGSZENTRUM KARLSRUHE. F.R. GERMANY
CONF-740401-P3 +. 15 PPS. PP. 1525-40. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

THE NEWLY DEVELOPED CODE SYSTEM CAPRI-2 IS DESCRIBED. RESULTS OF A PARAMETRIC STUDY FOR THE PREDISASSEMBLY PHASE OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS FOR THE MARK I-CORE OF THE SNR-300 ARE PRESENTED. FOR THE OVERPOWER ACCIDENT THE INFLUENCE OF DIFFERENT RAMP RATES AND FOR THE PUMP FLOW COAST DOWN THE INFLUENCE OF DIFFERENT THERMOHYDRAULIC DESIGN DATA IS ANALYSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE. U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + ACCIDENT. HYPOTHETICAL + *ACCIDENT. CORE DISRUPTIVE

18-109958 ALSO IN CATEGORIES 6 AND 8 AND 11 DATED 1974
WIDER HU + JACKSON JF + SMITH LL
AN IMPROVED ANALYSIS OF FUEL MOTION DURING AN OVERPOWER EXCURSION
ARGONNE NATIONAL LABORATORY. ILLINOIS
CONF-740401-P3 +. 14 PPS. PP. 1541-55. FROM CONFERENCE ON FAST REACTOR SAFETY. BEVERLY HILLS. CALIF.. APRIL 2. 1974

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18-109958 *CONTINUED*
DURING AN OVERPOWER EXCURSION IN A LMFBR, IRRADIATED FUEL PINS ARE EXPECTED TO RUPTURE AND EJECT MOLTEN FUEL AND FISSION GAS INTO THE COOLANT CHANNELS. THE EJECTED FUEL IS SUBSEQUENTLY DISPLACED BY THE INITIAL SODIUM MOMENTUM, BY PRESSURES RESULTING FROM FUEL-COOLANT THERMAL INTERACTIONS, AND BY FISSION GAS RELEASED THROUGH THE CLAD RUPTURE. THIS FUEL AND SODIUM MOTION IN THE CORE REGION AFFECTS THE REACTIVITY OF THE REACTOR AND DETERMINES THE ULTIMATE COURSE OF THE NEUTRONICS TRANSIENT. IN THIS PAPER THE RESULTS OF PLUTO, A NEW MODEL FOR PREDICTING THIS FUEL AND SODIUM MOTION, ARE COMPARED WITH SAS/FCI, A CURRENT FUEL-COOLANT INTERACTION MODEL USED IN WHOLE-CORE ACCIDENT ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + *COMPARISON + *FUEL COOLANT INTERACTION + FUEL ELEMENTS

18-109959 ALSO IN CATEGORY 6 DATED 1974
KASTENBERG WE + RUMBLE ET + OKRENT D
FUEL MOVEMENT INVESTIGATIONS DURING LMFBR OVERPOWER EXCURSIONS USING A NEW MODEL
UNIVERSITY OF CALIFORNIA, LOS ANGELES
CONF-740401-P3 +. 15 PPS, PP. 1556-71, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

SEVERAL PHYSICAL MODELS APPROXIMATED IN A COMPUTER SIMULATION OF THE PREDISASSEMBLY PHASE OF LMFBR OVERPOWER EXCURSIONS ARE DESCRIBED. RESULTS ARE PRESENTED SHOWING CLAD FAILURE PREDICTIONS, FUEL MOVEMENT AND RELATED PHENOMENA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *COMPUTER PROGRAM + ANALYTICAL MODEL + *FAILURE, CLADDING + SIMULATION + *PROBABILITY

18-109960 ALSO IN CATEGORIES 5 AND 6 DATED 1974
WILLENBERG HJ + PARTAIN WL + WALTAR AE
DYNAMICS OF MOLTEN FUEL MOTION DURING A FAST-REACTOR OVERPOWER TRANSIENT
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
CONF-740401-P3 +. 17 PPS, PP. 1572-89, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

A TREATMENT OF THE INTERNAL MOLTEN FUEL/GAS MIXTURE AS A TWO-PHASE, COMPRESSIBLE FLUID YIELDS A MARKEDLY DIFFERENT REACTIVITY FEEDBACK THAN THAT PREDICTED WITH A FLUID OF UNIFORM INTERNAL DENSITY AND COMPOSITION, BUT DOES NOT APPEAR TO SUBSTANTIALLY ALTER PREVIOUS CONCLUSIONS REGARDING THE ABILITY OF A REACTOR TO ULTIMATELY SHUT DOWN SAFELY. DESPITE RATHER PEAKED DENSITY SKEWING DISTRIBUTIONS POSTULATED FOR FUEL BEING SWEPT OUT INTO THE COOLANT CHANNEL, THE OVERALL TRANSIENT BEHAVIOR DOES NOT APPEAR TO VARY APPRECIABLY FROM PREVIOUS STUDIES, SO LONG AS OFF-CENTER FAILURES PREDOMINATE. EARLY FUEL PLATEOUT DOES NOT APPRECIABLY ALTER THE REACTIVITY SHUTDOWN MECHANISM, ALTHOUGH IT MAY BECOME A FACTOR REGARDING LONG-TERM HEAT REMOVAL QUESTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT ANALYSIS + *ACCIDENT, REACTIVITY + POWER DISTRIBUTION + REACTOR POWER + TRANSIENT + *FUEL COOLANT INTERACTION

18-109961 ALSO IN CATEGORY 6 DATED 1974
ROYL P + SMITH LL + STEVENSON MG
SIMULATION OF AN UNPROTECTED OVERPOWER ACCIDENT IN THE SNR-300 WITH THE SAS 3A CODE
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-740401-P3 +. 12 PPS, PP. 1590-1602, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE UNPROTECTED OVERPOWER ACCIDENT IN AN LMFBR IS ONE OF THE HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS WHOSE ANALYSIS IS USUALLY CONSIDERED IN THE DESIGN AND LICENSING OF THE REACTOR. EARLIER ANALYSES OF THIS ACCIDENT PERFORMED FOR THE SNR-300 HAVE BEEN OVERLY PESSIMISTIC BECAUSE THE REACTIVITY FEEDBACK DUE TO FUEL MOVEMENT DURING MOLTEN FUEL-SODIUM INTERACTION HAD BEEN NEGLECTED IN THE PREDISASSEMBLY PHASE. KASTENBERG AND RUMBLE HAVE DEVELOPED A SIMPLE MODEL TO CALCULATE FUEL MOTION AND ITS REACTIVITY EFFECT DURING THIS PHASE OF THE ACCIDENT AND HAVE SHOWN ITS POTENTIAL FOR LOWERING THE WORK ENERGY FOR THE SNR-300. HOWEVER, IN THEIR MODEL THE FAILURE CONDITIONS AND THE EJECTION OF MOLTEN FUEL INTO THE COOLANT STREAM COULD ONLY BE POSTULATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + ANALYTICAL MODEL + *ACCIDENT, HYPOTHETICAL + GERMANY + *ACCIDENT, CORE DISRUPTIVE

18-109962 ALSO IN CATEGORIES 6 AND 9 AND 12 DATED 1974
BURGSMULLER P + DEKAIS JJ + KRAHE A
GBR-4 PROTECTION SYSTEMS - FAILURES AND THEIR CONSEQUENCES
GAS-COOLED BREEDER REACTOR ASSOCIATION, BURSSELS, BELGIUM
CONF-740401-P3 +. 15 PPS, PP. 1603-18, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN THE GBR-4 DESIGN OF A GAS-COOLED FAST REACTOR, EMPHASIS IS PLACED ON USING TO ADVANTAGE THE

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18-109962 *CONTINUED*
SINGLE-PHASE CHARACTER OF THE COOLANT. SPECIFIC FEATURES OF THE PROTECTIVE SYSTEMS ARE FAIL-SAFE NEUTRON ABSORPTION, PERMANENTLY OPERATING AUXILIARY SUPPLIES AND ATMOSPHERIC PRESSURE COOLING. FOR TRANSIENT ANALYSIS A COMPUTER PROGRAM IS APPLIED USING A POINT REACTOR MODEL FOR HEAT TRANSFER AND NEUTRON KINETICS. A DYNAMIC STEAM GENERATOR CODE HAS BEEN EMPLOYED TO DESCRIBE SECONDARY SIDE EFFECTS. ANTICIPATED DISTURBANCES IN OPERATION ARE REACTIVITY INSERTION, LOSS OF SUPPLIES AND LOSS OF COOLANT PRESSURE. FOR THESE ACCIDENTS, FAILURES IN REACTOR PROTECTION ARE POSTULATED IN DECREASING ORDER OF PROBABILITY. THE CONSEQUENCES ARE ANALYSED AND DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + *REACTOR, GCR + *REACTOR KINETICS + REACTOR PROTECTION SYSTEM + STEAM GENERATOR + ENGINEERED SAFETY FEATURE

18-109963 ALSO IN CATEGORY 6 DATED 1974
BUTTEMER D + CHI H + REINSCH W
SAFETY ANALYSIS OF A 300 MWE GAS-COOLED FAST BREEDER REACTOR
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
CONF-740401-P3 +. 15 PPS, PP. 1619-34, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

EXTENSIVE SAFETY EVALUATIONS OF THE 300-MW(E) GCFR DEMONSTRATION PLANT TO DETERMINE THE RESPONSE TO ANTICIPATED PLANT TRANSIENTS AND TO POSTULATED ACCIDENTS ARE SUMMARIZED IN THIS PAPER. CASES PRESENTED INCLUDE NORMAL REACTOR TRIP, LOOP ISOLATION, CONTROL-ROD WITHDRAWAL ACCIDENTS, ACCIDENTS INVOLVING MALFUNCTIONS IN THE CIRCULATOR CONTROL VALVES, AND DEPRESSURIZATION ACCIDENTS. THE RESULTS ARE VERY ENCOURAGING WITH RESPECT TO THE CAPABILITY OF THE GCFR TO SAFELY ACCOMMODATE THE SPECTRUM OF CASES INVESTIGATED WITHOUT EXCEEDING FUEL OR COOLANT-SYSTEM SAFETY LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *REACTOR, GCR + SAFETY EVALUATION + *ACCIDENT, ATWS

18-109964 ALSO IN CATEGORY 1 DATED 1974
SMIDT D
SELECTION OF SAFETY DESIGN BASIS OF FAST REACTORS IN THE FEDERAL REPUBLIC OF GERMANY
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
CONF-740401-P3 +. 11 PPS, PP. 1625-46, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE SAFETY DESIGN BASIS OF FAST REACTORS TO A VERY GREAT EXTENT IS DETERMINED BY DESIGN BASIS ACCIDENTS. DBA'S ARE DESCRIBED FOR THE SNR-300 AND COMPARED TO THOSE FOR LWR'S. FOR FUTURE LARGE FAST REACTORS TOO CONSERVATIVE ASSUMPTIONS WITH RESPECT TO THE WHOLE CORE ACCIDENT MAY LEAD TO SERIOUS FEASIBILITY PROBLEMS. THREE DIFFERENT STRATEGIES FOR THE SOLUTION ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GERMANY + SAFETY ANALYSIS + *COMPARISON, REACTOR CHARACTERISTICS + *ACCIDENT, DESIGN BASIS

18-109965 ALSO IN CATEGORY 1 DATED 1974
GRAHAM J
SELECTION OF SAFETY DESIGN BASES FOR FAST POWER REACTORS
WESTINGHOUSE ELECTRIC CORPORATION
CONF-740401-P3 +. 12 PPS, PP. 1647-59, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE SAFETY OF FAST REACTORS DESIGNED AND BUILT TO DATE IS REAL - IT IS NOT HYPOTHETICAL. REACTOR PLANTS ARE DESIGNED TO PREVENT FAULTS FROM OCCURRING AND TO PROTECT AGAINST FAULTS EVEN IF THEY SHOULD OCCUR. MOREOVER, THEY HAVE EXTRA CAPABILITY IN HEAT REMOVAL AND CONTAINMENT THAT PROVIDES AN ADDED MARGIN OF SAFETY EVEN BEYOND THAT OF THE MULTIPLE PROTECTIVE SYSTEMS AND DEVICES. HOWEVER, THESE PLANTS ALSO HAVE BEEN DESIGNED IN ONE WAY OR ANOTHER TO ACCOMMODATE CERTAIN HYPOTHETICAL ACCIDENTS CHOSEN EITHER TO EVALUATE THE EXTRA MARGIN INHERENT IN THE DESIGN, OR TO DEFINE EXTRA MARGIN BY THE ADDITION OF SPECIFIC SAFETY FEATURES. THIS PAPER IS AIMED AT A DISCUSSION OF THE VALUE OF THIS HYPOTHETICAL SAFETY, ITS POSSIBLE CONSEQUENCES AND A SUGGESTED RATIONAL ALTERNATIVE TO ENSURING THE HEALTH AND SAFETY OF THE PUBLIC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCIDENT, HYPOTHETICAL + *SAFETY EVALUATION + *ACCIDENT, DESIGN BASIS + COMPARISON

18-109966 ALSO IN CATEGORY 11 DATED 1974
NICHOLSON RE
THE ROLE OF HYPOTHETICAL ACCIDENT ANALYSIS IN FAST BREEDER DESIGN AND LICENSING
THE OHIO STATE UNIVERSITY
CONF-740401-P3 +. 8 PPS, PP. 1660-68, FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE STUDY OF HYPOTHETICAL CORE DISASSEMBLY ACCIDENTS IS AN ESSENTIAL PROCESS IN THE DESIGN AND LICENSING OF FAST BREEDER REACTORS. THE DESIGNER FROM THE BEGINNING OF THE DESIGN PROCESS MUST

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109966 *CONTINUED*
WORK TOWARD A CONTAINMENT SYSTEM THAT HAS MINIMUM PRACTICABLE FAILURE PROBABILITY FOR A CORE DISASSEMBLY ACCIDENT IN THE GENERIC SENSE. WITH THE SPECIFIC INITIATING CIRCUMSTANCES UNSPECIFIED. THE ROLE OF ENGINEERING JUDGMENT IN SETTING SAFETY DESIGN CRITERIA AND THE INDIVIDUALS MAKING THE JUDGMENTS SHOULD BE GIVEN GREATER VISIBILITY. THE EXPERIMENTAL PROGRAM ON FAST REACTOR MELTDOWN ACCIDENTS MUST BE PURSUED VIGOROUSLY WITH NEW EXPERIMENTAL FACILITIES IN ORDER TO REDUCE THE EXTENT OF THE JUDGMENT FACTOR IN THE CONTAINMENT DESIGN BASIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *ACCIDENT, HYPOTHETICAL + ACCIDENT, DESIGN BASIS + *LICENSING PROCESS + ACCIDENT, CORE DISRUPTIVE

18-109967 ALSO IN CATEGORY 1 DATED 1974
KINTNER EE
SELECTION OF SAFETY DESIGN BASIS FOR FAST POWER REACTORS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
CONF-740401-P3 +. 5 PPS, PP. 1669-73. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

THE DESIGN BASES FOR SAFETY FOR LMFBR'S IN THE IMMEDIATE FUTURE OUGHT NOT TO BE CHOSEN PRIMARILY ON THE BASIS OF EASING THE LICENSING PROCESS FOR THE FFTF AND THE DEMONSTRATION PLANT, BUT MOST IMPORTANTLY, THEY SHOULD BE CHOSEN FOR THEIR POTENTIAL EFFECT ON THE SAFETY OF THE HUNDREDS OF LMFBR'S ON WHICH WE MUST DEPEND DURING THE NEXT CENTURY. THIS LATTER FUNCTION OF DESIGN BASES HAS BEEN OFTEN OVERLOOKED IN THE PAST AND IS IN GRAVE DANGER OF BEING OVERLOOKED NOW IN THE LMFBR PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + *ACCIDENT, DESIGN BASIS

18-109968 DATED 1974
WOLFE B + HIKIDO K + MEYERS R
SELECTION OF SAFETY DESIGN BASES FOR FAST POWER REACTORS; ANOTHER "CATCH 22"?
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
CONF-740401-P3 +. 5 PPS, PP. 1674-78. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

AN ACCEPTABLE DESIGN BASIS ACCIDENT IS ONE THAT IS SEVERE ENOUGH TO DO GROSS PLANT DAMAGE AND TO RAISE CONCERNS, BUT NOT SUFFICIENT TO SERIOUSLY AFFECT THE GENERAL PUBLIC. CONSISTENT WITH THIS DEFINITION THEN, ONE MIGHT DEFINE SAFETY DESIGN BASES AS THE SERIES OF POSTULATED EVENTS GUIDING THE PLANT DESIGN SUCH THAT AN ACCEPTABLE DESIGN BASIS ACCIDENT WILL RESULT. THE COMPLEMENTARITY OF THESE TWO DEFINITIONS IS USEFUL TO ILLUSTRATE THE POINT; NAMELY, IF THE REACTOR IS DESIGNED OR HAS INHERENT PROPERTIES SUCH THAT A GIVEN DESIGN BASIS ACCIDENT DOES NOT PRODUCE THE NECESSARY RESULT (ALMOST, BUT NOT QUITE, AFFECTING THE GENERAL PUBLIC) THEN ONE MERELY HAS TO CHANGE THE UNDERLYING ACCIDENT ASSUMPTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + SAFETY PRINCIPLES AND PHILOSOPHY + *ACCIDENT, DESIGN BASIS

18-109969 DATED 1974
FARMER FR
CONTRIBUTION TO PANEL DISCUSSION ON SELECTION OF SAFETY DESIGN BASES FOR FAST POWER REACTORS
UKAEA SAFETY & RELIABILITY DIRECTORATE, RISLEY, UK
CONF-740401-P3 +. 4 PPS, PP. 1679-82. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

IN DISCUSSING REACTOR ACCIDENTS, IT IS OFTEN CONVENIENT TO REFER TO THE IODINE CONTENT OF ANY RELEASE. A REACTOR OF 1200 MW(E) WILL CONTAIN ABOUT 10 (EXP 8) CURIES OF 131-I. IT IS CONVENTIONAL PRACTICE TO DISCUSS A RANGE OF ACCIDENTS TO A LEVEL VARIOUSLY CALLED THE "MAXIMUM CREDIBLE" OR THE "MAXIMUM DESIGN". IN THE U.S. YOU PLACE ACCIDENTS IN ONE OF NINE CATEGORIES OF VARYING PROBABILITY, OF WHICH THE FIRST EIGHT INCLUDE THOSE ACCIDENTS WHICH ARE POSSIBLE OR UNLIKELY, WHEREAS THE NINTH INCLUDES THOSE REGARDED AS HYPOTHETICAL. IT IS ALWAYS SHOWN THAT ACCIDENTS ANALYSED AGAINST THE FIRST EIGHT CATEGORIES LEAD TO RELEASES OF RADIOACTIVITY WHICH MEET THE REQUIREMENTS FOR SITING AS REQUIRED BY LICENSING PROCEDURES AND, AS INDICATED IN WASH-1250.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT, DESIGN BASIS + *COMPARISON

18-109970 DATED 1974
PETIT J
SAFETY DESIGN BASIS FOR POWER LMFBR IN FRANCE
COMMISSARIAT A L'ENERGIE ATOMIQUE, FRANCE
CONF-740401-P3 +. 15 PPS, PP. 1683-98. FROM CONFERENCE ON FAST REACTOR SAFETY, BEVERLY HILLS, CALIF., APRIL 2, 1974

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-109970 *CONTINUED*
EARLY IN 1972, THE NUCLEAR SAFETY DEPARTMENT OF CEA FELT IT NECESSARY TO DEFINE RECOMMENDATIONS FOR SAFETY CRITERIA OF SUPER-PHENIX IN ORDER TO GIVE SAFETY DESIGN GUIDANCE TO THE CONSTRUCTORS AT THE PRE-DESIGN STAGE. THE SAFETY GUIDANCE DOCUMENT WAS APPROVED IN FEBRUARY 1973 BY THE LICENSING AUTHORITY UNDER THE TITLE OF: 'RECOMMENDATIONS FOR SAFETY CRITERIA APPLYING TO THE 1200 MWE SUPER-PHENIX FAST POWER STATION'. THIS DOCUMENT GIVES IN THE FIRST PART SOME GENERAL IDEAS ABOUT IT, AND IN A SECOND PART EXAMPLES OF VARIOUS CRITERIA WITH TECHNICAL SOLUTIONS TAKEN, OR ENVISIONED BY THE DESIGNERS, TO COMPLY WITH THESE CRITERIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DESIGN CRITERIA + FRANCE + *ACCIDENT, DESIGN BASIS

18-109979 ALSO IN CATEGORIES 7 AND 11 DATED 1976
PARSLY LF
WORK PLAN: TRANSIENT RELEASE FROM LMFBR FUEL. ADDENDUM 1: INVESTIGATION OF LMFBR AEROSOL BEHAVIOR IN THE AEROSOL TEST FACILITY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4875 +. 17 PPS, 3 FIGS, 32 REFS, JAN. 1976

THE OBJECTIVES OF THIS TASK ARE TO CHARACTERIZE THE PROPERTIES AND TRANSIENT BEHAVIOR OF MIXED-OXIDE (SODIUM AND URANIUM) AEROSOLS IN A RELATIVELY LARGE CONTAINMENT VESSEL AND TO CORRELATE THEIR BEHAVIOR WITH ANALYTICAL MODELS. EXPERIMENTS ARE TO BE CONDUCTED UNDER CONDITIONS THAT CAN BE RELATED TO RELEASE INTO AN LMFBR CONTAINMENT BUILDING AS A RESULT OF A CDA. THE CONDITIONS WILL COVER THOSE RESULTING FROM A RANGE OF ACCIDENT SEVERITY UP TO AND INCLUDING LOSS OF FLOW AND UNPROTECTED TRANSIENT OVERPOWER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AEROSOL + CONTAINMENT + FUEL MELTDOWN + ACCIDENT, LOSS OF FLOW + ANALYTICAL MODEL + AEROSOL PROPERTIES + SAMPLING + BEHAVIOR + TRANSIENT + MIXED OXIDE

18-109998 ALSO IN CATEGORIES 9 AND 11 DATED 1975
MCELROY WN + BENNETT RA + JOHNSON DL
NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAM
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH. + ARGONNE NATIONAL LAB., ILLINOIS
HEDL-SA-911 + CONF-750935-7 +. 29 PPS, FROM 1ST ASTM-EURATOM SYMPOSIM ON REACTOR DOSIMETRY, DEVELOPMENTS AND STANDARDIZATION, PETTEN, THE NETHERLANDS, SEPT. 22, 1975

NEUTRON ENVIRONMENTAL CHARACTERIZATION REQUIREMENTS FOR REACTOR FUELS AND MATERIALS DEVELOPMENT AND SURVEILLANCE PROGRAMS ARE REVIEWED FOR THE U.S. LMFBR AND CTR PROGRAMS. PRESENTLY, THE MOST DEMANDING REQUIREMENTS ARE ASSOCIATED WITH THE DEVELOPMENT OF LMFBRS WHERE GOAL ACCURACIES IN THE RANGE OF 1 TO 3% HAVE BEEN REQUESTED FOR THE DETERMINATION OF NEUTRONICS PARAMETERS. CTR MATERIALS IRRADIATION STUDIES HAVE ONLY RECENTLY BEGUN IN EARNEST; CONSEQUENTLY, THE CURRENT DEMANDS UPON DOSIMETRY ARE MODEST, WITH PRECISION OF THE DATA TAKING PRECEDENCE OVER ACCURACY. IT IS EVIDENT THAT THE NEED FOR INTERNATIONAL STANDARDIZED AND WELL-DOCUMENTED PROCEDURES FOR NEUTRON ENVIRONMENTAL CHARACTERIZATION FOR LWRS, HTGRS, LMFBRS, AND CTRS WILL CONTINUE TO INCREASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MATERIAL + ENVIRONMENT + NEUTRON + PROPERTY, PHYSICAL + REVIEW + SURVEILLANCE PROGRAM + *REACTOR, THERMONUCLEAR

18-109995 ALSO IN CATEGORIES 5 AND 9 DATED 1976
FONTANA MF + WANTLAND JL
LMFBR SAFETY AND CORE SYSTEMS PROGRAMS PROGRESS REPORT FOR APRIL-JUNE 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-5076 +. 134 PPS, FIGS, REFS, JAN. 1976

A CODE WAS DEVELOPED FOR ANALYZING FLOW IN THE FFM LOOP DURING FLOW TRANSIENTS, AND ANALYSES ARE BEING MADE TO DETERMINE THE POWER TRANSIENTS THAT MUST BE PRODUCED IN THE ELECTRICAL HEATERS TO SIMULATE THE APPLICABLE NUCLEAR FLUX TRANSIENTS. AN EVALUATION WAS MADE OF ONE FLOW TRANSIENT TEST IN BUNDLE 3B (WITH A SIX-CHANNEL CENTRAL BLOCKAGE) IN WHICH SODIUM BOILING WAS INITIATED AND SUSTAINED IN THE BLOCKED CHANNELS DURING A 14-SEC PERIOD. THE ANALYSIS SHOWS THAT BOILING IN THE FIRST 6 IN. DOWNSTREAM OF THE BLOCKAGE APPEARS NEITHER TO HAVE SPREAD NOR TO HAVE INCREASED THE TEMPERATURES AT THE 2-IN AND 4-IN. LEVELS IN THE ADJACENT UNBLOCKED CHANNELS. THE EFFECTS OF ENTRAINED ARGON GAS ON ACOUSTIC INTENSITIES OF NUCLEATE SODIUM BOILING WERE INVESTIGATED.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + FAILURE, FUEL ELEMENT + HEAT TRANSFER + ORNL + NOISE ANALYSIS + FLOW BLOCKAGE + *R AND D PROGRAM + FLOW + *BOILING + ACOUSTICS + TRANSIENT

18-110000 ALSO IN CATEGORY 11 DATED 1975
HUEBOTTER PR + FULFORD PJ + MCLENNAN GA

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110000 *CONTINUED*
ADVANCED LMFBR CORE RESTRAINT SYSTEM AND INTERFACING SYSTEMS: TENTATIVE DESIGN CONCEPT AND EVALUATION WORK PLAN
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-CT-75-44 +. 26 PPS, 5 FIGS, 12 REFS, JULY 1975

A STUDY EFFORT TO EVOLVE AN ADVANCED LMFBR CORE RESTRAINT SYSTEM HAS BEEN RECOMMENDED. THE PROPOSED DESIGN ELIMINATES THE TCP LOAD PADS (TLPS), CONVERTS THE ABOVE CORE LOAD PADS (ACLPS) TO STAMPED BUTTONS ON THE DUCTS, AND ELIMINATES THE TLP AND ACLP CORE FORMER RINGS. IT USES A LONG BENDING-BAR-TYPE NOZZLE WITH AN UPPER PIVOT POINT TAKING THE VERTICAL LOAD AND A SMALL DIAMETRAL CLEARANCE AT THE BOTTOM END. THE DESIGN ANTICIPATES THE USE OF A BOTTOM FISSION GAS PLENUM WITH THE FUEL AND BLANKET DUCTS ABOVE THE PIN BUNDLE EITHER REDUCED IN DIAMETER OR ARTICULATED TO AVOID STRONG MECHANICAL INTERACTIONS AT THE FREE ENDS. CONTROL ASSEMBLIES HAVE CONVENTIONAL DUCTS (FULL DIAMETER AND NONARTICULATED) WHOSE TOP-END POSITIONS ARE GOVERNED BY NOZZLE SUPPORT AND THEIR OWN FREE-BOWING BEHAVIOR.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

*FASTENER + *DESIGN STUDY + *CORE COMPONENTS + SUPPORT STRUCTURE

18-110002 ALSO IN CATEGORY 1 DATED 1975
MCGOUGH CB
FFTF: ROSETTA STONE OF THE U.S. BREEDER REACTOR PROGRAM
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-SA-934 + CONF-750464-1 +. 44 PPS, FROM JOINT MEETING OF THE ASME AND AIEEE HAWAII SECTIONS, HONOLULU, APRIL 17, 1975

SUMMARIZES THE IMPORTANT FEATURES OF THE FAST FLUX TEST FACILITY AND EXPLAINS ITS PLACE IN THE U.S. LIQUID METAL FAST BREEDER REACTOR PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FFTF (TR) + *REVIEW

18-110007 ALSO IN CATEGORIES 7 AND 11 DATED 1975
NISHIO G + KITANI S + TAKADA J
EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASE FROM AN LMFBR IN A HYPOTHETICAL ACCIDENT
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE, TOKAI-MURA
12 PPS, 6 TABS, 10 FIGS, 19 REFS, NUCLEAR ENGINEERING & DESIGN, 34(3), PP. 417-28 (NOV. 1975)

DESCRIBES THE WORK UNDERTAKEN TO PREPARE A COMPUTER CODE FOR THE HAZARD EVALUATION OF PLUTONIUM OXIDE AEROSOL RELEASED TO THE ATMOSPHERE IN THE EVENT OF A HYPOTHETICAL ACCIDENT IN A 50 MW(TH) SCALE LMFBR. THE REACTOR BUILDING STRUCTURE CONSISTS OF SEMI-DOUBLE CONTAINMENTS AS FOLLOWS: THE PRIMARY CONTAINMENT HAS A LARGE VOLUME IN COMPARISON WITH THE SECONDARY ANNULAR CONTAINMENT IN WHICH A PART IS CONNECTED TO THE ATMOSPHERE THROUGH AN EMERGENCY FILTER SYSTEM. SODIUM OXIDE AEROSOL CONTAINING PUO2-UO2 FUEL, FISSION PRODUCTS AND STRUCTURAL STEEL AGGGLOMERATES QUICKLY BY COAGULATION DUE TO ITS HIGH CONCENTRATION. SIMULTANEOUSLY, THE AEROSOL CONCENTRATION DECREASES DUE TO SETTLING, PLATING AND THERMOPHORESIS. USING THE PRESENT CODE, THE AMOUNT OF PUO2 AEROSOL LEAKAGE TO THE ATMOSPHERE WAS EVALUATED.

AEROSOL + CONTAINMENT + FILTER SYSTEM + FISSION PRODUCT RELEASE + OXIDE + PLUTONIUM + URANIUM + AGGLOMERATE

18-110017 ALSO IN CATEGORIES 7 AND 8 DATED 1975
QUARTERLY TECHNICAL PROGRESS REPORT, NUCLEAR SAFETY CHARACTERIZATION OF SODIUM FIRES AND FAST REACTOR FISSION PRODUCTS: JULY - SEPTEMBER 1975
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
AI-ERDA-13161 +. 21 PPS, 2 TABS, 9 FIGS, NOV. 15, 1975

THE BURNING CHARACTERISTICS OF A SINGLE DROP OF SODIUM WERE DETERMINED UNDER VARIOUS TEST CONDITIONS IN THE LABORATORY DROP MODELING TEST APPARATUS (LDM). FROM THESE TESTS, IT WAS OBSERVED THAT THE BURNING RATE WAS RELATIVELY CONSISTENT FOR BOTH HIGH AND LOW HUMIDITY 21 VOL % O2 TESTS (0.008 GM/SEC) WITH A SLIGHT DEPENDENCY OF COMBUSTION PRODUCT RELEASE FRACTION AS A FUNCTION OF HUMIDITY (88.5% AT HUMIDITIES > 10,000 PPM, AND 76.1% AT HUMIDITIES < 1,000 PPM). AS THE AIR RECIRCULATION AROUND THE STATIONARY DROP WAS CHANGED FROM NATURAL TO FORCED, IT WAS OBSERVED THAT THE BURNING RATE INCREASED BY A FACTOR OF 40. THREE DROP BURNING TESTS CONDUCTED IN < 1,000 PPM HUMIDITY AIR ATMOSPHERE EXHIBITED LOW BURNING RATES WHICH WERE ATTRIBUTED TO INERT GAS BUILDUP WITHIN THE LDM COLUMN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FIRE + FISSION PRODUCT RELEASE + *R AND D PROGRAM

18-110047 DATED 1975
JACKSON JF
IMPROVEMENT AND VERIFICATION OF FAST REACTOR SAFETY ANALYSIS TECHNIQUES, PROGRESS REPORT MARCH 1-MAY 31, 1975
BRIGHAM YOUNG UNIV., PROVO, UTAH
COO-2571-1 +. 7 PPS, 9 REFS, MAY 31, 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110047 *CONTINUED*
THE INITIAL STEPS REQUIRED IN ESTABLISHING A LINKUP BETWEEN BYU AND THE CDC-7600 COMPUTER AT LAWRENCE BERKELEY HAVE BEEN TAKEN. THE LINKUP SHOULD BE COMPLETED DURING THE NEXT QUARTER. THE FIRST PHASE OF THE VENUS-II/PAD COMPARISON STUDY HAS BEEN ACCOMPLISHED VIA THE COMPARISON OF 2 REPRESENTATIVE EXCURSIONS IN A DEMO-SIZED LMFBR. A CALCULATION THAT PROVIDES THE WORK-ENERGY OBTAINED FROM AN ISENTROPIC EXPANSION OF FUEL-VAPOR DOWN TO ONE ATMOSPHERE HAS BEEN INCLUDED IN VENUS-II. A TECHNIQUE TO PROVIDE THE FULL P-V-WORK CURVE AS A FUNCTION OF THE DEGREE OF EXPANSION IS CURRENTLY UNDER DEVELOPMENT. PREVIOUS COMPARISONS BETWEEN DISASSEMBLY CODES AND EXPERIMENTS HAVE BEEN REVIEWED AND AN INITIAL MODEL FOR ANALYZING THE KIWI-TNT EXPERIMENT WITH VENUS-II IS BEING FORMULATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + COMPUTER PROGRAM + ANALYTICAL TECHNIQUE + *SAFETY ANALYSIS

18-110050 ALSO IN CATEGORY 17 DATED 1975
NOORDHOFF EF + MCGOUGH CB + NOLAN JE
TESTING EXPERIENCE WITH FAST FLUX TEST FACILITY
HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
HEDL-SA-916 + CONF-750604-3 +. 21 PPS, FROM U.S./USSR SEMINAR ON FAST BREEDER REACTOR CONSTRUCTION AND EXPERIENCE, OBINSK, USSR, JUNE 2, 1975

SEVERAL NEW SODIUM FACILITIES WERE CONSTRUCTED AND CONFIRMATION TESTS ON THE PROTOTYPE COMPONENTS ARE NOW IN PROGRESS. TEST CONDITIONS AND RESULTS TO DATE ARE REPORTED FOR THE PRIMARY PUMP, INTERMEDIATE HEAT EXCHANGER, SODIUM-TO-AIR DUMP HEAT EXCHANGER, LARGE AND SMALL SODIUM VALVES, PURIFICATION COLD TRAP, IN-VESSEL HANDLING MACHINE, INSTRUMENT TREE, CORE RESTRAINT, CONTROL ROD SYSTEM, SELECTED MAINTENANCE EQUIPMENT. THE SIGNIFICANCE AND CONTRIBUTION OF THESE TESTS TO THE FFTF AND LMFBR PROGRAM ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TESTING + FFTF (TR) + FUEL HANDLING MACHINE + CORE COMPONENTS + CONTROL RODS + PUMPS + VALVES + HEAT EXCHANGERS

18-110051 ALSO IN CATEGORIES 1 AND 8 AND 11 A DATED 1976
REVISIONS TO THE SAR AND RESPONSES TO NRC QUESTIONS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
APPROX. 279 PGS. AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1975, DOCKET 50-537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

REVISES THE PRELIMINARY SAR BY SUBMITTING NEW APPENDICES 17D, AND LEAD REACTOR MANUFACTURER QA PROGRAM. INCLUDES THE REVISIONS TO THE QA SECTION. RESPONSES TO NRC QUESTIONS CONCERN ECCS, TRANSIENTS DURING SODIUM FIRES, CONTAINMENT LEAK RATE DURING ACCIDENT, SECURITY, AND TRAINING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *NRC QUESTION + COMPUTER PROGRAM + CONTAINMENT + FIRE + *REPORT, PSAR + QUALITY ASSURANCE + SYSTEM OPERABILITY IN ACCIDENT + LEAK RATE + EMERGENCY COOLING SYSTEM + TRANSIENT + *CLINCH RIVER (LMFBR)

18-110052 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 001.103 - IHX TUBE BUNDLE HANDLING
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. QC01.103-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE-LMFBR, MFG--WEST., AE--BURNS & ROE

THE IHX TUBE BUNDLE WILL NOT BE REMOVED SEPARTATELY. THE ENTIRE IHX WOULD BE REMOVED IF NECESSARY. TUBE LEAK DETECTION AND TUBE PLUGGING WILL BE HANDLED IN SITU. ALSO, BELLOWS REPLACEMENT WILL BE HANDLED IN SITU.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*MAINTENANCE AND REPAIR + CONTAMINATION + RESPONSE TO NRC QUESTION + TUBING + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

18-110053 ALSO IN CATEGORY 12 DATED 1976
RESPONSE TO QUESTION 001.160 - ADEQUACY OF NATURAL CIRCULATION FOR THE PACC
PROJECT MANAGMENT CORP., OAK RIDGE, TN
4 PGS, 1 TAB, 1 FIG, PP. Q001.160-1 THRU Q001.160-4 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE TUBE BUNDLES DURING NORMAL PLANT OPERATION ARE FILLED WITH SATURATED STEAM. THE CONDENSATE OUTFLOW FROM THE BUNDLE DURING THIS PERIOD IS PRIMARILY DUE TO GRAVITY. UPON SGAHRS INITIATION SIGNAL, THE ISOLATION DOORS ARE OPENED, THE FAN IS TURNED ON, AND STEAM CONDENSATION INCREASES. CONDENSATION CAUSES A VOLUME COLLAPSE INSIDE THE FINNED TUBE BUNDLE. THIS VOLUME COLLAPSE CAUSES THE BUNDLE PRESSURE TO DROP BELOW THE STEAM DRUM PRESSURE AS MAKEUP FLOW FROM THE DRUM IS ESTABLISHED.

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SAFETY-ANALYSIS AND DESIGN REPORTS

18-110053 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CIRCULATION, NATURAL + RESPONSE TO NRC QUESTION + EMERGENCY COOLING + SYSTEM CAPABILITY + CLINCH RIVER (LMFBR) + *HEAT EXCHANGERS

18-110054 ALSO IN CATEGORY 12 DATED 1976
RESPONSE TO QUESTION 001.168 - OVERCOOLING DURING SGAHRS OPERATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.168-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SGAHRS TRANSIENT WAS BEEN ACCOUNTED FOR IN THE EVALUATION OF THE PLANT DUTY CYCLE EVENTS SINCE THESE THERMAL TRANSIENT EVENTS ARE INCLUDED IN THE DESIGN DUTY CYCLE FOR THE HTS COMPONENTS. IN THE TIME PERIOD FOLLOWING THE INITIAL THERMAL TRANSIENTS, THE SGAHRS CONTROL SYSTEM WILL MAINTAIN SYSTEM TEMPERATURE WITHIN THEIR ACCEPTABLE RANGES SUCH THAT NO COOLING WILL RESULT. IF THE MAIN CONDENSER AND NORMAL FEEDWATER ARE AVAILABLE, SHORT TERM HEAT REMOVAL WILL BE ACCOMPLISHED VIA THE TURBINE BYPASS SYSTEM. SGAHRS WILL NOT BE INVOLVED UNTIL THE OPERATOR ACTIVATES THE PROTECTED AIR COOLED CONDENSERS (PACC) FOR LONG TERM HEAT REMOVAL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + *EMERGENCY COOLING + *THERMAL TRANSIENT + CLINCH RIVER (LMFBR)

18-110055 ALSO IN CATEGORIES 5 AND 8 AND 11 DATED 1976
RESPONSE TO QUESTION 001.179 - PASSIVE POST ACCIDENT HEAT REJECTION BY CONTAINMENT
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
2 PGS, 1 REF, PP. Q001.179-1 THRU Q001.179-2 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE SOFIRE-II COMPUTER CODE IS USED TO DETERMINE THE RATE OF SODIUM COMBUSTION AND HEAT INPUT TO CONTAINMENT AND THE RESULTANT TEMPERATURE AND PRESSURE HISTORIES OF THE CONTAINMENT. THE PREDOMINANT MECHANISM FOR HEAT REJECTION FROM THE CONTAINMENT ATMOSPHERE IS NATURAL CONVECTION HEAT TRANSFER TO THE CONTAINMENT VESSEL STEEL SHELL. HEAT THEN CONDUCTS THROUGH THE STEEL SHELL AND INSULATION ON THE OUTER SURFACE OF THE STEEL SHELL TO THE ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*CONTAINMENT + FIRE + *HEAT TRANSFER + HEAT TRANSFER, NATURAL CONVECTION + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-110056 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 001.218 - JUSTIFICATION FOR USE OF SOFIRE-II
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.218-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POSTULATED EVENT EVALUATED IS THE EXTREMELY UNLIKELY FAILURE OF THE PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK DURING MAINTENANCE. BECAUSE OF THE DESIGN, LOCATION, AND OPERATING PRESSURE OF THE TANK, NO MECHANISM RESULTING IN THE PRESSURIZED DISCHARGE OF SODIUM, IN THE EVENT OF POSTULATED TANK FAILURE, EXISTS. THE EXPECTED RELEASE MODE, IN THE EVENT OF TANK FAILURE, IS A SLOW GRAVITY DRAIN OF THE CONTAINED SODIUM TO THE CELL FLOOR, APPROXIMATELY 2 FEET BENEATH THE TANK.

AVAILABILITY - ERDA PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D.C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + ACCIDENT + *COMPUTER PROGRAM + FIRE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-110057 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 001.220 - JUSTIFICATION FOR LEAK RATE USED
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.220-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CRBRP REACTOR CONTAINMENT BUILDING IS DESIGNED TO LIMIT LEAKAGE TO 0.1% VOL/DAY AT A CONTAINMENT OVERPRESSURE OF 10 PSIG. TO ASSUME CONTAINMENT LEAKAGE AT THE DESIGN RATE IMPLIES A CONSTANT CONTAINMENT OVERPRESSURE OF 10 PSIG. HOWEVER, FOR THE REFERENCED ACCIDENT (PRIMARY SODIUM IN-CONTAINMENT STORAGE TANK FAILURE DURING MAINTENANCE) THE MAXIMUM RCB OVERPRESSURE IS 1.8 PSIG, MORE THAN A FACTOR OF 5 LESS THAN THE CONTAINMENT DESIGN PRESSURE. BECAUSE THIS PEAK ACCIDENT PRESSURE IS CONSIDERABLY LESS THAN THE CONTAINMENT DESIGN PRESSURE, LEAKAGE AT THE CONTAINMENT DESIGN RATE, 0.1% VOL/DAY @ 10 PSIG, WOULD NOT OCCUR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110057 *CONTINUED*
CHARGE $2.00)

ACCIDENT ANALYSIS + *CONTAINMENT + NRC DESIGN CRITERIA + RESPONSE TO NRC QUESTION + *LEAK RATE + COMPARISON + CLINCH RIVER (LMFBR)

18-110058 ALSO IN CATEGORY 8 DATED 1976
RESPONSE TO QUESTION 001.221 - USE OF SOFIRE-II IN LIEU OF SPRAY-I
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.221-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE ANALYSIS PRESENTED IN SECTION 15.6.1.2.2 CONSIDERS THE MAXIMUM SPILLAGE OF SODIUM FROM THE EVST AND REQUIRES A SIMULTANEOUS MAJOR PIPING FAILURE PLUS FAILURE OF THE AUTOMATIC ISOLATION VALVE. THIS EXTREMELY UNLIKELY EVENT WAS POSTULATED TO DEMONSTRATE THAT, EVEN FOR MAXIMUM SODIUM SPILLAGE FOR THE EVST, CONTINUED EVST COOLING WOULD BE MAINTAINED. THE POTENTIAL RADIOLOGICAL CONSEQUENCES OF SUCH AN EVENT ARE CONTROLLED BY THE EXTENT OF RADIOACTIVE SODIUM AEROSOL FORMATION. THE AEROSOL FORMATION IS CONTROLLED BY THE LIMITED AMOUNT OF OXYGEN AVAILABLE IN THE INERTED (2% 02) EVST COOLING EQUIPMENT CELL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FIRE + RESPONSE TO NRC QUESTION + COMPARISON + CLINCH RIVER (LMFBR)

18-110059 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 001.222 - USE OF SOFIRE-II FOR 90,000 GALLON SPILL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.222-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE POSTULATED EVENT EVALUATED IN SECTION 15.6.1.3 IS THE EXTREMELY UNLIKELY FAILURE OF THE PRIMARY SODIUM EX-CONTAINMENT STORAGE TANK. THE TANK IS USED TO STORE PRIMARY SODIUM COOLANT ONLY IN THE EVENT MAJOR MAINTENANCE REQUIRES COMPLETE DRAINAGE OF THE REACTOR VESSEL OR EVST. THE SODIUM STORED IN THE TANK WILL BE ESSENTIALLY A STAGNANT POOL UNDER VERY LOW GAS PRESSURE AND THUS ANY FORSEEABLE FAILURE, SUCH AS THE CRACKING OF A FILL OR DRAIN LINE, WOULD RESULT IN ONLY A SLOW LEAKAGE OF SODIUM AND A SPILL ORDERS OF MAGNITUDE LESS THAN THE ASSUMED 90,000 GALLONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACCIDENT ANALYSIS + *COMPUTER PROGRAM + FIRE + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-110060 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 001.242- COMPUTING THE LEAK VS TIME CURVE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q001.242-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

LEAKAGE FROM THE CONTAINMENT IS COMPUTED BASED ON THE DESIGN LEAKAGE SPECIFICATION OF THE RCB, 0.1% VOL/DAY AT A CONTAINMENT OVERPRESSURE OF 10 PSIG, AND THE RELATIONSHIP THAT LEAKAGE IS PROPERTIONAL TO THE SQUARE ROOT OF DELTA P WHERE DELTA P IS DEFINED AS THE PRESSURE DIFFERENTIAL ACROSS THE CONTAINMENT VESSEL SHELL, BETWEEN THE RCB ATMOSPHERE AND THE OUTSIDE ENVIRONMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CONTAINMENT + RESPONSE TO NRC QUESTION + *MATHEMATICAL TREATMENT + *LEAK RATE + CLINCH RIVER (LMFBR)

18-110061 DATED 1976
RESPONSE TO QUESTION 011.18 - HANDLING RADIOACTIVE METALLIC SODIUM
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q011.18-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

RADIOACTIVE SODIUM IS PLACED IN SEALED 55-GALLON DRUMS IN SOLID FORM AND IS TRANSFERRED TO A SHIELDED VAULT, WHERE IT IS STORED TO ALLOW RADIOACTIVE DECAY OF NA24 BEFORE PROCESSING. GENERALLY, SODIUM IS NOT EXPOSED TO AIR OR WATER SINCE IT IS IN A SEALED DRUM. EVEN WHEN EXPOSED TO AIR, SOLIDIFIED SODIUM WILL NOT IGNITE AND NO WATER CONNECTIONS ARE PRESENT IN THE STORAGE VAULT. THUS THE POSSIBILITY OF A SODIUM FIRE IN THE SHIELDED STORAGE VAULT IS HIGHLY UNLIKELY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*WASTE HANDLING + WASTE STORAGE + WASTE DISPOSAL, SOLID + RADIOISOTOPE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110062 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 120.36 - CRITICAL STRESS LOCATION IN PRIMARY AND SECONDARY PIPING
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q120.36-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE MOST HIGHLY STRESSED SECTION OF THE PRIMARY LOOP IS THE CROSS OVER PIPING FROM THE PUMP DISCHARGE TO THE IHX PRIMARY INLET. THIS IS THE ONLY SECTION OF PRIMARY PIPING WHICH HAS BOTH HIGH TEMPERATURE AND FULL PRESSURE DURING NORMAL CONDITIONS. THE HIGHEST STRESSED PIPING COMPONENTS OF THE INTERMEDIATE SYSTEM ARE IN LOOP 1. THE LOOP 1 HOT LEG (REACTOR CONTAINMENT PENETRATION TO SUPERHEATER INLET) HAS THE HIGHEST THERMAL EXPANSION STRESSES. THE ELBOWS, THE SWRPRS TEE AND THE 2 1/4 CR-1 MO STAINLESS STEEL TRANSITION PIECE ARE THE CRITICAL ITEMS IN THE PIPE LINE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*STRESS ANALYSIS + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + COOLING SYSTEM, SECONDARY + CLINCH RIVER (LMFBR) + *PIPES AND PIPE FITTINGS

18-110063 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 120.48 - EFFECT OF CARBIDE PHASE ON FATIGUE LIFE OF STAINLESS STEEL
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
7 PGS, 4 FIGS, 10 REFS, PP. Q120.48-1 THRU Q120.48-7 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

NO REDUCTION OF FATIGUE PROPERTIES DUE TO CARBIDE PRECIPITATION IS EXPECTED IN EITHER TYPE 304 OR TYPE 316 AUSTENITIC STAINLESS STEEL AT THE OPERATING TEMPERATURES OF THE CRBR. VARIOUS INVESTIGATORS HAVE SHOWN THAT AT TEMPERATURES ABOVE 750 DEG F THERE IS EITHER NO EFFECT OR A BENEFICIAL EFFECT DUE TO THE PRECIPITATION OF CARBIDES ON THE FATIGUE PROPERTIES OF EITHER TYPE 304 AUSTENTIC STAINLESS STEEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CARBIDE + *STEEL, STAINLESS + PRECIPITATION + RESPONSE TO NRC QUESTION + EFFECT + *FATIGUE + CLINCH RIVER (LMFBR)

18-110064 ALSO IN CATEGORY 11 DATED 1976
RESPONSE TO QUESTION 310.25 - USE OF CONTINUOUS CONTAINMENT PURGE
PROJECT MANAGMENT CORP., OAK RIDGE, TN
1 PG, PP. Q310.25-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE INTEGRATED SYSTEM DESIGN (AIR TRANSPORT TIME, ISOLATION VALVE CLOSURE TIME, AND SENSOR LOCATION) OF THE REACTOR CONTAINMENT BUILDING ISOLATION SYSTEM INSURES CONTAINMENT ISOLATION PRIOR TO ACTIVITY RELEASES APPROACHING 10CFR20 GUIDELINES. PSAR ACCIDENT ANALYSES HAVE TAKEN CREDIT FOR CONTAINMENT ISOLATION. USE OF A CONTINUOUS CONTAINMENT PURGE, DURING NORMAL REACTOR OPERATION, DOES NOT LEAD TO UNACCEPTABLE CONSEQUENCES TO THE HEALTH AND SAFETY OF THE PUBLIC EVEN IN THE EVENT OF DESIGN BASIS SODIUM FIRE ACCIDENTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACCIDENT ANALYSIS + *ACCIDENT + *CONTAINMENT PURGE + RESPONSE TIME + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR)

18-110065 DATED 1976
RESPONSE TO QUESTION 310.27 - CONTROL ROOM SHIELDING DESIGN
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
7 PG, 1 TAB, 4 FIGS, PP. Q310.27-1 THRU Q310.27-7 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537, TYPE--LMFBR, MFG--WEST., AE--BURNS & ROE

THE CONTROL ROOM SHIELDING DESIGN RADIOACTIVE SOURCE TERM IS A THRID LEVEL DESIGN REQUIREMENT, PROVIDED TO EXTEND THE PLANT CAPABILITY BEYOND THAT NECESSARY TO ACCOMMODATE THE EXTREMELY UNLIKELY FAULTS INCLUDED IN THE REFERENCE DESIGN. THE SPECIFICATION OF THIS ADDITIONAL REQUIREMENT IS NOT BASED ON THE CONSEQUENCES OF ANY DEFINED MECHANISTIC EVENT. THEREFORE A MECHANISTIC BASIS IS NOT INTENDED FOR THE THIRD LEVEL DESIGN REQUIREMENTS. RATHER, THE SPECIFICATION OF THE CONTROL ROOM SHIELDING DESIGN SOURCE TERM PROVIDES CAPABILITY FOR A SPECTRUM OF HIGHLY IMPROBABLE EVENTS, AND PROVIDES A LARGE MARGIN FOR EVENTS BEYOND THE EXTREMELY UNLIKELY FAULTS INCLUDED IN THE REFERENCE DESIGN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + *SHIELDING + RESPONSE TO NRC QUESTION + SYSTEM OPERABILITY IN ACCIDENT + CONTROL PANEL/ROOM + CLINCH RIVER (LMFBR)

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110066 DATED 1976
RESPONSE TO QUESTION 331.23 - USE OF HIGH TEMPERATURE/HIGH FLOW FILTRATION
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q331.23-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537.
TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

HIGH TEMPERATURE/HIGH FLOW RATE FILTRATION OF THE PRIMARY SODIUM WILL BE ACCOMPLISHED PRIOR TO INITIAL CORE LOADING. STAINLESS STEEL MATERIALS IN THE CORE ASSEMBLIES, CONTROL ASSEMBLIES, RADIAL BLANKET ASSEMBLIES, REMOVABLE RADIAL SHIELDING, AND UPPER INTERNALS HAVE CONTROLLED CO-59 CONTENT DEFINED IN EQUIPMENT SPECIFICATIONS. THE ONLY STELLITE IDENTIFIED FOR USE IN CONTACT WITH THE PRIMARY COOLANT IS IN THE COLD LEG CHECK VALVE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COBALT + HIGH TEMPERATURE + FLOW, HIGH SPEED + SURFACE + RESPONSE TO NRC QUESTION + CLINCH RIVER (LMFBR) + *FILTERS

18-110067 DATED 1976
RESPONSE TO QUESTION 331.24 - AIRBORNE RADIOACTIVITY
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q331-24-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537.
TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

NO AREA WITHIN THE PLANT IS AN 'AIRBORNE RADIOACTIVITY AREA'. THE HEAD ACCESS AREA OF THE REACTOR CONTAINMENT BUILDING IS THE ONLY AREA OF THE PLANT IN WHICH CONTINUOUS (40 HOURS/WEEK) EXPOSURE TO THE ENVIRONMENT WOULD RESULT IN A MEASURABLE EXPOSURE (100 MREM/YEAR) DUE TO AIRBORNE RADIOACTIVITY. THE MAN HOURS OF OCCUPANCY IN THE HEAD AREA HAS BEEN ESTIMATED AS 220 MAN-HOURS/QUARTER. THIS ESTIMATE OF OCCUPANCY INCLUDES HEAD ACCESS AREA ACTIVITIES DURING PERIODS OF REACTOR OPERATION, REACTOR SHUTDOWN AND REACTOR REFUELING. THE UPPER LIMIT MAN-REM DOSE DUE SOLELY TO AIRBORNE RADIOACTIVITY IS 0.21 REM/YEAR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + CONTAINMENT + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIOISOTOPE + RESPONSE TO NRC QUESTION + FORECAST + CLINCH RIVER (LMFBR)

18-110068 ALSO IN CATEGORY 1 DATED 1976
RESPONSE TO QUESTION 421.7 - INTRUSION ALARM ON CONTROLLED ACCESS POINTS
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q421.7-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537.
TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

ALL CARD-KEY CONTROLLED ACCESS POINTS ARE PROVIDED WITH INTRUSION ALARMS. THE CARD-KEY SYSTEM, IN ADDITION TO PROVIDING OPERATIONAL SURVEILLANCE TO VITAL AREA ACCESS POINTS, ALSO PROVIDES CONTINUOUS MONITORING OF THE STATUS OF THE DOORS UNDER CARD-KEY CONTROL. THE SYSTEM WILL MONITOR THE STATUS OF EACH DOOR WHETHER OPEN OR CLOSED AND WILL PROVIDE AN AUDIBLE AND VISUAL ALARM SIGNAL IN THE EVENT A DOOR REMAINS OPEN LONGER THAN A PRESET TIME LIMIT, CONTROL WIRING TO A DOOR IS CUT, POWER SUPPLY TO A DOOR STRIKE FAILS OR A DOOR IS FORCED OPEN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SYSTEM DESCRIPTION + RESPONSE TO NRC QUESTION + *SECURITY + CLINCH RIVER (LMFBR) + *ANNUNCIATORS

18-110069 DATED 1976
RESPONSE TO QUESTION 430.3 - TRAINING SCHEDULE
PROJECT MANAGEMENT CORP., OAK RIDGE, TN
1 PG, PP. Q430.3-1 OF AMENDMENT 11 TO CLINCH RIVER BREEDER LICENSE APPLICATION, JAN. 15, 1976, DOCKET 50537.
TYPE--LMFBR, MFG--WEST., AE--BURNS & RCE

THE PROPOSED TRAINING SCHEDULE IS DESIGNED TO REFLECT THE VARIOUS STAGES OF TRAINING THAT WILL BE MADE AVAILABLE FOR THE MANY DISCIPLINES WHICH COMPRISE THE PLANT STAFF. IT IS INTENDED TO REFLECT THOSE POSITIONS WHERE ASSIGNMENT AT A LIGHT WATER REACTOR WILL BE ADVANTAGEOUS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*TRAINING + RESPONSE TO NRC QUESTION + STAFFING + CLINCH RIVER (LMFBR)

18-110077 ALSO IN CATEGORIES 1 AND 5 AND 12 DATED 1975
ZEMANICK PP + BROWN NW
DECAY HEAT REMOVAL FOR THE LIQUID METAL FAST BREEDER REACTOR
WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
CONF-750468-1 +, 62 PGS., FROM SPECIALIST MEETING ON RELIABILITY OF DECAY HEAT REMOVAL SYSTEMS PROPOSED FOR FAST REACTORS, HARWELL, UK, APRIL 28, 1975

CATEGORY 18
SAFETY-ANALYSIS AND DESIGN REPORTS

18-110077 *CONTINUED*
THE FUNCTIONAL AND RELIABILITY REQUIREMENTS OF THE DECAY HEAT REMOVAL SYSTEMS ARE DESCRIBED. THE RELIABILITY REQUIREMENT AND ITS RATIONALE AS ADEQUATE ASSURANCE THAT PUBLIC HEALTH AND SAFETY ARE SAFEGUARDED ARE PRESENTED. THE MEANS BY WHICH THE RELIABILITY OF THE DECAY HEAT REMOVAL SYSTEMS ARE ESTABLISHED TO MEET THEIR REQUIREMENT ARE IDENTIFIED. THE HEAT REMOVAL SYSTEMS AND THEIR OPERATING CHHARACTERISTICS ARE DESCRIBED. THE DISCUSSION INCLUDES THE OVERFLOW HEAT REMOVAL SERVICE AND ITS ROLE IN DECAY HEAT REMOVAL IF NEEDED. THE DETAILS OF THE SYSTEMS ARE DESCRIBED TO DEMONSTRATE THE ELEMENTS OF REDUNDANCY AND DIVERSITY IN THE SYSTEMS DESIGN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECAY HEAT + RELIABILITY, SYSTEM + EMERGENCY COOLING + *SHUTDOWN COOLING SYSTEM + R AND D PROGRAM

18-110096 ALSO IN CATEGORY 11 DATED 1975
KAPLAN S + FEERICK BT + MARRON JV
FTR GRID-SPACED ASSEMBLY DESIGN BASIS REPORT
GENERAL ELECTRIC CO., SUNNYVALE, CALIF.
GEAP-14002 +. 150 PPS, 35 TABS, FIGS, MAY 1975

DEVELOPED FOR USE AT LMFBR CORE DESIGN AND OPERATING CONDITIONS AS AN ALTERNATE FUEL ROD SUPPORT SYSTEM TO THE WIRE-WRAP DESIGN. PROJECTED BENEFITS INCLUDE A DESIGN ALTERNATIVE FOR EXTENDED LIFE, GREATER TOLERANCE TO DIFFERENTIAL PLANAR SWELLING, AND AN LMFBR DRIVER ASSEMBLY THAT IS RELIABLE, SAFE, AND ECONOMICAL. THREE GRID SPACER DRIVER ASSEMBLIES ARE BEING FABRICATED FOR IRRADIATION IN FTR. THE DESIGN IS BASED ON EXPERIENCE GAINED FROM CONDUCTING THE F9E AND F9F GRID SPACED ASSEMBLIES IN EBR-II AND A PROGRAM OF OUT-OF-PILE TESTING AND DEVELOPMENT. DESIGN AND THE ASSOCIATED DESIGN METHODS WILL BE EVALUATED AND IMPROVED BASED ON A COMPARISON OF THE PREDICTED PERFORMANCE SUMMARIZED IN THIS REPORT WITH THE ACTUAL PERFORMANCE OBSERVED DURING THE INTERIM AND POST-IRRADIATION EXAMINATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

TESTING + CORE COMPONENTS + *SUPPORT STRUCTURE + R AND D PROGRAM + *FUEL ROD + *FTR (TR)

18-110134 ALSO IN CATEGORIES 5 AND 7 AND 11 DATED 1976
KAZIMI MS
ANALYSIS OF PRESSURE PULSE GENERATION DUE TO GAS RELEASE FROM FAILED FUEL PINS IN A LIQUID METAL FAST BREEDER REACTOR
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY
11 PPS, 11 FIGS, NUCLEAR SCIENCE & ENGINEERING, 59(1), PP. 1-11 (JAN. 1976)

A MODEL FOR THE ANALYSIS OF PRESSURE PULSE GENERATION DUE TO SUDDEN GAS RELEASE FROM FAILED PINS IN A LIQUID-METAL FAST BREEDER REACTOR IS PRESENTED. THE PREDICTIONS OF THE MODEL ARE COMPARED TO EXPERIMENTAL DATA ON SUDDEN GAS RELEASE IN THE DUCTS OF THE EXPERIMENTAL BREEDER REACTOR II. THE PREDICTED MAGNITUDES OF PRESSURE PULSES ARE IN GOOD AGREEMENT WITH THE EXPERIMENTAL OBSERVATIONS. THE PREDICTED PRESSURE PULSE, HOWEVER, SEEMS TO DECAY AT A FASTER RATE THAN THE EXPERIMENTALLY OBSERVED RATE. THE EFFECTS OF THE PIN INTERNAL PRESSURE UPON RUPTURE, THE RUPTURE AREA, AND THE AMOUNT OF COMPRESSED GAS ARE STUDIED PARAMETRICALLY.

EBR 1 AND 2 (RE) + FISSION GAS RELEASE + FAILURE, FUEL ELEMENT + COMPARISON, THEORY AND EXPERIENCE + ANALYTICAL MODEL + PRESSURE PULSE

KEYWORD INDEX

INFORMATION AT NSIC IS DIVIDED INTO 21 CATEGORIES. AN ITEM OF INFORMATION MAY BE KEYED TO AS MANY AS THREE OF THESE. A COLLECTION OF SELECTORS OR KEY-WORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN AN ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF SELECTORS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT. THE CATEGORY NUMBER IS GIVEN FIRST, FOLLOWED BY THE ACCESSION NUMBER. THE ACCESSION NUMBERS ARE USED TO LOCATE BIBLIOGRAPHIC ITEMS WITHIN A CATEGORY.

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