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ORNL-NSIC-48

# INFORMATION SCANNING AND PROCESSING AT THE NUCLEAR SAFETY INFORMATION CENTER

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NUCLEAR SAFETY INFORMATION CENTER



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#### NUCLEAR SAFETY

#### A BIMONTHLY REVIEW JOURNAL PREPARED BY NSIC

 $\underline{\text{Nuclear Safety}}$  covers significant developments in the field of nuclear safety.

The scope is limited to topics relevant to the analysis and control of hazards associated with nuclear reactors, operations involving fissionable materials, and the products of nuclear fission.

Primary emphasis is on safety in reactor design, construction, and operation; however, safety considerations in reactor fuel fabrication, spent-fuel processing, nuclear waste disposal, handling of radioisotopes, and related operations are also treated.

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Nuclear Safety Information Center

INFORMATION SCANNING AND PROCESSING AT THE NUCLEAR SAFETY INFORMATION CENTER

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JULY 1971

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee
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The Nuclear Safety Information Center was established in March 1963 at the Oak Ridge National Laboratory under the sponsorship of the U.S. Atomic Energy Commission to serve as a focal point for the collection, storage, evaluation, and dissemination of nuclear safety information. This report describes the Center's information scanning and processing activities and gives insight into the importance of the information specialists relative to the smooth functioning of an information center. They serve in a fashion that allows the NSIC technical staff to concentrate on answering technical inquiries, writing review articles and reports, and cataloging pertinent reference material.

A system of keywords is used by the information specialists to index the information cataloged by the Center. The title, authors, author's installation, abstract, and keywords for each document reviewed are recorded at the central computer facility in Oak Ridge. The references are cataloged according to categories such as Operational Safety and Experience, Accident Analysis, etc.

Computer programs have been developed that enable NSIC to (1) produce topical indexed bibliographies of its accessions (issued with ORNL-NSIC report numbers), (2) operate a routine program of Selective Dissemination of Information (SDI) to individuals according to their particular profile of interest, and (3) make retrospective searches of the references stored on magnetic tapes at the computer facility.

Other services of the Center include (1) state-of-the-art reports (issued with ORNL-NSIC report numbers); (2) the bimonthly technical progress review, <u>Nuclear Safety</u>; (3) answering technical inquiries; and (4) counsel and guidance on nuclear safety problems.

Services of NSIC are provided without charge to government agencies, research and educational institutions, and the nuclear industry. All documents may be examined at the Center by qualified personnel; NSIC reports, however, are the only documents that are available for distribution by request. Inquiries concerning the capabilities and operation of the Center may be addressed to:

J. R. Buchanan, Assistant Director Nuclear Safety Information Center Oak Ridge National Laboratory Post Office Box Y Oak Ridge, Tennessee 37830 Telephone 615-483-8611, Ext. 3-7253 FTS Number 615-483-7253

# INFORMATION SCANNING AND PROCESSING AT THE NUCLEAR SAFETY INFORMATION CENTER

Celia Parks Carol Julian

#### Abstract

This report is a detailed manual of the information specialist's duties at the Nuclear Safety Information Center. Information specialists scan the literature for documents to be reviewed, procure the documents (books, journal articles, reports, etc.), keep the document location records, and return the documents to the plant library or other lender. These basic duties (selection and acquisition, cataloging, and general record-keeping) represent some of the key functions in the dissemination of information, and the procedures are designed to achieve the goal of error-free, economical operation.

#### NSIC Services and Organization

There are many types of information centers with various types of organization. The Nuclear Safety Information Center, established in 1963 by the USAEC Division of Reactor Development, is organized to collect, analyze, and spread nuclear-safety-oriented information throughout the nuclear community. Some of the many NSIC activities established to accomplish these objectives are listed below:

- 1. Preparation and publication of state-of-the-art reports
- Cooperation in preparation of Nuclear Safety, a bimonthly technical progress review
- 3. Preparation of abstracts of nuclear safety literature
- 4. Publication of topical bibliographies
- 5. Selective dissemination of information (SDI)
- 6. Answering technical inquiries
- 7. Preparation of special retrospective bibliographies
- 8. Provision of information on current research and development
- 9. Provision of technical consultation

# 10. Collection of documents for review by qualified visitors

NSIC's director is also director of the ORNL Nuclear Safety Research and Development Program and editor of the technical progress review Nuclear Safety. NSIC's assistant director is responsible for the overall supervision of the Center's activities. The professional staff at NSIC consists of over 30 technical specialists, the information specialists, and editors, as listed in Table 1. The technical specialists are scientists or engineers who divide their time between working on research and development problems and working at the Center. In this way, they are current both in what is going on in their specialty and in the documentation of new results. While working at NSIC, they write state-of-the-art reports, abstract documentary material, and act as consultants to people in the nuclear industry.

Two of the technical staff work principally with the computerized aspects of the Center, set up special searches, process the Selective Dissemination of Information profiles, and handle file maintenance. The NSIC programming is done at the Computing Technology Center. Most of the information processing was initially done on the IBM-7090, but a complete changeover to the IBM-360 computer has been accomplished. The two most recent equipment additions at the Center are the IBM-2740 typewriter printer and the IBM-2260 cathode ray-tube (CRT) consoles.

The IBM-2740, which looks like an oversized typewriter, provides a direct link to the core of the computer used to store the NSIC data files. All the information entered into the computer's data files carries keywords for retrieval. The IBM-2740 can be used to ask the computer to display what it has stored at the keyword HEAT TRANSFER, for example, and the machine will print out the author(s), title, corporate author, and other bibliographic information for each of the items stored at that address. If there are more than 25 to 50 items, the searcher may wish to further define his query with another keyword. In this case, the computer may be asked, for example, to print out the items indexed to HEAT TRANSFER and HEAT TRANSFER AUGMENTATION. The combination of the two addresses may put

Table 1. NSIC Staff Assignments

Wm. B. Cottrell, Director J. R. Buchanan, Assistant Director

| <u> </u>                    | Staff Member         |              | Subject Area                                      | Time Spent |      |
|-----------------------------|----------------------|--------------|---|------------|------|
| Name                        | Profession           | Category No. | Working for NSIC                                  |            |      |
| J. P. Blakely,              | Chemist              | ВS           | General Safety Considerations                     | 1          | 10   |
| R. H. Bryan, and            | Nuclear Engineer     | PhD          |   |            | 10   |
| M. H. Fontana               | Mechanical Engineer  | PhD          |   |            | 10   |
| H. B. Piper                 | Nuclear Engimeer     | BE           | Siting — General and General Technical Specialist | 2          | 100  |
| O. H. Myers                 | Health Physicist     | BS           | Earthquake Considerations                         | . 2        | 10   |
| R. D. Seagren               | Development Engineer | BS           | Transportation and Handling of Nuclear Materials  | 3          | 10   |
| S. P. Hendrix               | Consultant           | ВA           | Aerospace Safety                                  | 4.         | 10   |
| J. L. Wantland and          | Mechanical Engineer  | . PhD        | Heat Transfer and Thermal Transients              | 5          | 10   |
| T. S. Kress                 | Mechanical Engineer  | MS ·         |   |            | 10   |
| M. L. Tobias                | Physicist            | · PhD        | Reactor Transients, Kinetics, and Stability       | 6          | 10   |
| G. W. Keilholtz             | Physical Chemist     | PhD          | Fission-Product Release, Transport, and Removal   | 7          | · 50 |
| H. A. McLain                | Chemical Engineer    | PhD          | Sources of Energy Release                         | 8          | ; 10 |
| E. W. Hagen                 | .Instrument Ergineer | MS           | Control and Safety Systems and Electrical Power   | 9          | 50   |
| •                           |                      |              | Systems   | 10         |      |
| J. G. Merkle and            | Civil Engineer       | MCE          | Containment of Nuclear Facilities                 | 11         | 10   |
| C. A. Sweet                 | Mechanical Engineer  | BS           |   |            |      |
| W. G. Stockdale             | Chemical Engineer    | MS           | Plant Safety Features - Reactor                   | 12         | 10   |
| •                           | J                    |              | Plant Safety Features - Nonreactor                | 13         | ,    |
| F. M. Empson and            | Chemical Engineer    | BS           | Radionuclide Release                              | 14 '       | 50   |
| B. L. Houser                | Sr. HP Technician    |              | Environmental Surveys                             | 15         | 50   |
| S. D. Swisher <sup>a</sup>  | Meteorologist        | MS           | Meteorological Considerations                     | 16         | 50   |
| R. L. Scott                 | Physicist            | BS           | Operational Safety and Experience                 | 17         | 75   |
| R. D. Gallaher and          | Chemical Engineer    | MS           | Safety Analysis and Design Reports                | 18         | 30   |
| P. H. Harley                | Chemical Engineer    | BS           | ,           |            | 30   |
| B. R. Fish and              | . Physicist          | MS           | Radiation Dose to Man                             | 19         | 50   |
| C. F. Holoway               | Chemist              | MS           |   |            |      |
| M. M. Yarosh,               | Nuclear Engineer     | MS           | Thermal Modifications                             | 20         | 10   |
| J. K. Franzreb and          | Chemical Engineer    | BS           |   |            | 50   |
| J. G. Morgan                | Development Engineer | MS           |   |            | 50   |
| R. M. Carroll and           | Physicist            | BS           | Radiation Ecology                                 | 21         | 50   |
| C. D. Bopp                  | Development Engineer | BS           | <b>.</b> ,  |            | 50   |
| F. A. Heddleson             | Mechanical Engineer  | BS           | PPIF and Reactor Data                             |            | 100  |
| M. L. Winton                | Electrical Engineer  | BS           | SD1 and Reactor Codes                             |            | 100  |
| D. N. Hess                  | Chemist              | BS           | Technical Writing and Environmental Information   |            | 100  |
| H. B. Whetsel               | Chemist              | BS           | Technical Editing                                 |            | 100  |
| E. L. Hairston <sup>b</sup> | Mathematician        | BS           | Computer Programmer                               |            | 100  |
| M. C. Julian and            | English major        | -            | Information Specialist                            |            | 100  |
| J. D. Brown                 | English major        |              |   |            | 100  |

 $<sup>^{\</sup>mathrm{a}}$ U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

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bComputing Technology Center.

the request in the proper range to prevent a deluge of inappropriate references. The items desired may either be printed at the computer facility or listed on the IBM-2740. Since all the indexing terms are available in the form of a keyword thesaurus, it is simple to select the keywords, type them to the computer, and receive the printout of references.

The IBM-2260 consoles are being used for direct data input to the computer. This bypasses the keypunching step previously required. In addition to the input and inquiry capability, the remote stations are also used for direct maintenance of the computer files.

#### Duties of Information Specialist

The major job of literature acquisition, record keeping, routing, and cataloging of abstracts for storage is done by the information specialist, whose duties may be divided into six categories:

- 1. scanning and locating,
- 2. ordering and procuring,
- 3. keeping track of documents at the Center,
- 4. preparing documentation of abstracts for typing,
- 5. proofreading and logging,
- 6. placing source documents in final repository.

NSIC processed over 15,000 items during 1970 and there are over 53,000 items in the NSIC accession files, 49,000 of which are in the computer data bank. The NSIC system is growing rapidly, and therefore the information specialist's operation must remain flexible to expand with the Center's growth. The Center may be one of the largest users of the libraries of the Oak Ridge National Laboratory because it borrows between 700 and 800 documents a month, which supply 82% of the NSIC document input. The remaining documents are obtained from other installations through direct distribution. Because most documents are borrowed, the NSIC system must include special provisions to prevent their loss or damage. This may mean keeping track of more than 10,000 documents at a time, although the average number of items in the system is usually around 5000 to 6000.

Documents flow through NSIC in the following steps (see Fig. 1 for flow chart):

- 1. The information specialist selects information for review during a scan of new issues of technical journals, books, abstract journals, reports of conferences, lists of report titles, etc.
- 2. The information specialist checks for duplication in system and orders items selected.
- 3. When material arrives at NSIC, it is logged into the system and routed to the appropriate technical specialist (reviewer).
- 4. The reviewer abstracts the material, selects appropriate keywords, and puts the abstract and keywords on the "greensheet." The greensheet, so-called because it is customarily printed on green paper, is Form UCN-6107A, which presents the information needed to index a document into the NSIC master file (see Fig. 6 of the next section for an example of the greensheet). The reviewer returns the material abstracted and the greensheet to the information specialist.
- 5. The information specialist fills out the rest of the greensheet, assigns an NSIC accession number, and sends the document and greensheet to the editor.
- 6. The editor checks the abstract for readability, verifies the keywords, and sends the material to the typists.
- 7. The typist types the greensheet data into the IBM-2260, which puts the information directly into the computer.
- 8. The information specialist logs the accession number in the files and returns the report to the lender.
- 9. The greensheets are held for two week until corrections can be made.
  - 10. The assistant specialist files the greensheets.

#### Scarning the Literature for Pertinent Items To Be Reviewed

Scanning is the first step in the NSIC flow of material and one of the most important, since it keeps the center supplied with a regular flow of fresh, pertinent material. An idea of what is involved in scanning may be gained by considering that well over 4000 report titles, more than 20

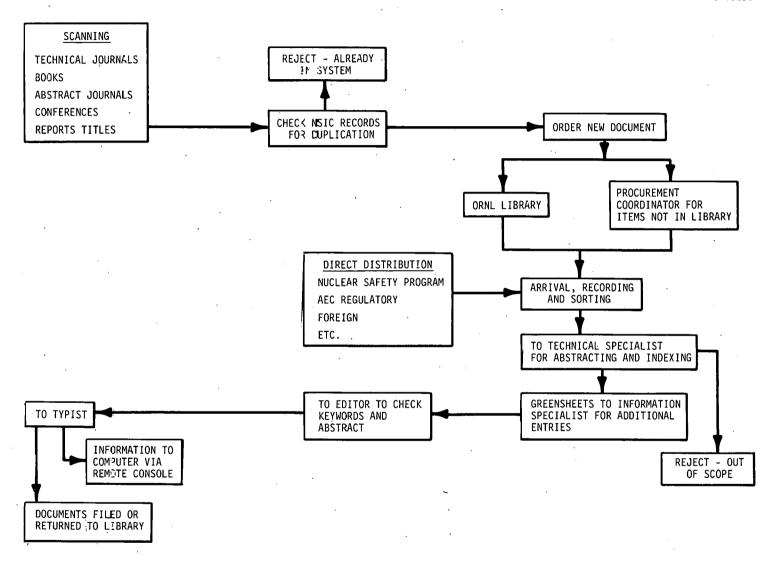


Fig. 1. Flow Chart for NSIC.

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journals, some of which are in foreign languages, and more than 1000 other journal titles are scanned each month. Some major sources of these items are listed below:

- 1. ORNL Library Accession List
- 2. Nuclear Science Abstracts
- 3. Foreign and domestic exchange agreements
- 4. EURATOM information
- 5. Publications in the Nuclear Sciences (IAEA)
- 6. List of References on Nuclear Energy (IAEA)
- 7. Current Contents
- 8. Plutonium Abstracts
- 9. Meteorological Abstracts
- 10. Bibliographies, such as

A Selected Listing of NASA Scientific and Technical Reports Liste Recapitulative des Textes C.E.A. Publies dans la Presse Scientifique 1962-1964

List of Publications, September 1959 to March 1966 (Atomic Energy of Canada)

- 11. Press releases
- 12. Conference transactions: ANS, ASME, AIEE, ASTM, ACS, IAEA, IEEE, Health Physics Society, American Industrial Hygiene Society, Heat Transfer Conference, Hot Labs, American Power Conference
- 13. Patents (U.S. and foreign)

The two major ways for source material to come into NSIC are through direct distribution and through the scanning and ordering process. When an organization is doing the type of work that regularly falls into the NSIC scope, the Center asks for routine distribution of its documents. This usually accounts for about 18% of the NSIC report input. The bulk of the Center's input must be obtained by the scanning and ordering process.

The information specialist starts by going over the acquisition lists issued weekly by the USAEC Division of Technical Information Extension (DTIE) and the Oak Ridge National Laboratory (ORNL). These lists include complete bibliographic citations suitable for ordering documents. Both

lists are prepared in report form and as  $3-\times 5-in$ . cards (see Fig. 2 for examples of these cards).

The cards are preferred for scanning because they can be immediately incorporated into the record-keeping system. There is a  $3-\times 5-in$ . card in the files for every item that has ever passed through NSIC. If the item

ORNL DWG 70-15292

Uncl 4(BNWL-1445) 5INVESTIGATION OF MIXED OXIDE (U<sub>0.75</sub>Pu<sub>0.25</sub>)O<sub>2</sub> PROCESSING USING A NINE VARIABLE FRACTIONAL FACTORIAL EXPERIMENT. 6Barr, M. J.; Jaech, J. L.; Anderson, A. G. 7(Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.). 12Jul 1970. 14Contract AT(45-1)-1830. 2073p. 24Dep. CFSTI.

26ceramics; reactor fuels 2711B, 18J

28STD-80 29P NSA

AN ORNL CARD

OCT 1 1970

COO-1018-1215 Uncl

DIDDING SPECIFICATIONS FOR THE WIRE-WRAP WIRING OF THE 1018-299-00 PRINTED CIRCUIT BOARD. Krabbo, Paul (Illinois Univ., Urbana. Dept. of Computer Science). 11 Aug 1970. 10p.

electronics and electrical engineering

A DTIE CARD

ND-38 P RC

Unlimited

OCT 1 1970

Fig. 2. Examples of Some Cards Issued by Oak Ridge National Laboratory and Division of Technical Information Extension.

is from other than the ORNL or DTIE lists, a card is prepared that presents the bibliographic information. NSIC subscribes to bibliographies, such as Euratom Information, the IAEA List of References on Nuclear Energy, and Nuclear Science Abstracts, and regularly scans many other topical and company bibliographies, such as those produced by Argonne National Laboratory and Battelle Memorial Institute, as well as lists of references in reports. In scanning foreign journals, it is helpful to know a few key words in the major foreign languages.

Roughly 20% of the bibliographic listings duplicate those already scanned and, if selected for ordering, can be found quickly in the order file, which is a temporary file, or in the master file. With these two checks, most duplication is eliminated.

The objective of the scanning is to find all the reports, journal articles, etc., that might be of interest to the technical specialists. Of the titles scanned, less than 10% of those ordered are duplicates or material outside the NSIC scope (see App. A for NSIC scope and category listing).

#### Procuring Reports, Journal Articles, Books, and Other Material

Reports with alphanumeric numbers may be obtained readily, particularly the reports published by USAEC contractors, but reports published by the Eastern European and Asian countries are difficult to secure. As a rule of thumb, NSIC subscribes to journals that regularly publish at least three articles of NSIC interest per issue. There are about 20 of these journals. All other journal articles of interest are ordered through the ORNL library. (Appendix B lists journals abstracted at NSIC; journals subscribed to by NSIC are indicated with an asterisk.)

Not many books are abstracted by NSIC because there are not many books on safety topics, but approximately 20 books are reviewed per month. For the most part, these are selected from the library's acquisition lists, but some come from book advertisements. Book reviews are another good source, and a hard-to-get book is often abstracted from its review. Most books ordered for the permanent NSIC collection are conference proceedings.

In addition to material selected by scanning, there is a large amount of material obtained directly through an agreement with the AEC regulatory

staff. These documents relate to the licensing for construction and operation of nuclear facilities, principally power reactors. The collection for each reactor starts with a safety analysis report, which is followed by many amendments, supplements, etc. These licensing documents filed at NSIC comprise the most complete collection outside the USAEC Public Document Room in Washington, D.C.

NSIC orders each month between 700 and 800 documents, between 300 and 400 journal articles, about 20 books, and about 50 patents. Most orders are placed through the ORNL library, which also provides such important services as checking references and arranging interlibrary loans.

The first step in the ordering process is, as mentioned previously, to look for duplication by checking the card file to determine whether the information has been received previously at NSIC. The cards for reports are filed alphanumerically by report number. The journal file is set up by alphabetic journal name and then by issue and volume number; the book file has a cross reference of the title to the author. Cards for other items, such as press releases and patents, are filed by the most standard bit of identification (i.e., patent number and press release number). Cards listing conference papers are filed by initiating organization so that the cards for all meetings of a particular group, say, the American Nuclear Society, are in the same place in the file. Even with this precise system, it is often difficult to spot duplications, since some items have as many as three alphanumeric designations and may also reappear as a journal article and a conference paper. Where possible, such items are cross referenced, since it is simpler to make up three or four cross-reference cards than to order and return documents.

After all the cards and cross references are made, each new card is checked against the order file, which is a small file that contains only the cards for material to be ordered. Two lists are then made of the cards for material remaining to be ordered by Xeroxing the cards. One copy of the list is cut up, and the card copy is put with the card original. The other copy of the list is used as the library order list. The card copy and the card original are placed in a plastic folder and checked against the master file, which has a card for every item that has ever entered the NSIC system. If the card is truly a new entry, the plastic folder is

filed in the master file. If the citation is a duplicate, the cards are destroyed and the citation is crossed off the library order list.

The library then uses the order list to supply documents and make arrangements for interlibrary loan of material close to the local area. There is usually a small number of references that are not local, so the library sends these back to NSIC for ordering from outside the area. This additional processing consists of filling out form UNC-5502 (see Fig. 3), which is sent to the Information Center Procurement Coordinator. NSIC always specifies that it wants a full-size loan copy. The Information Center Procurement Coordinator obtains items such as patents, translations, and limited-distribution unclassified reports, of which about 50 are ordered each month for NSIC.

ORNL-DWG 70-15293

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| TO: INFORMATION                              | CENTER          | ITEM IDENTITY                        | NO. OF  | REQUEST DATE           | COORDINA   | TOR ACTION  | DATE COMPLETED   |  |
|--|-----------------|--------------------------------------|---|------------------------|--|---|--|--|
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| UCN-5502<br>(9 2-64)                         |                 | ORNL INFOR                           | MATION  | CENTER REQ             | UEST   | · .   | 5  |  |

Fig. 3. Form Used to Order Material Not Found on the Area.

Copies of journal articles are ordered in a similar fashion. A card is prepared for each article to be ordered and checked against the order and master files. One Xerox list of the journal cards is then made and given to the library (see Fig. 4), which provides a Xerox copy of the journal article and returns the Xerox copy of the card with it. The card copy identifies the article properly.

Patents are ordered directly through the Information Center Procurement Coordinator. Books are ordered through the library by using only one Xerox copy of the original card. It is usually necessary to make a more complete card on the book when it arrives.

It is also important to have a followup on the initial order to prevent the files becoming clogged with items that cannot be obtained. If an item has not been obtained by the end of one year, it becomes inactive and the master card is marked to indicate the disposition.

The NSIC files are set up on a color-coded system, with the colors being the bands of color across the top of the plastic card cover. The colors indicate the following:

RED - Material ordered between January and June GREEN - Material ordered between July and December

ORNL-DWG 70-15294

Bulletin of the Seismological Society of America, 60(2): 393-446 (April 1970)

Study of Regional Seismicity and Associated Problems
J. F. Evernden

Fig. 4. Example of a Journal Article Order for ORNL Library.

BLACK — Material circulating inside NSIC system

NO CARD COVER — Material processed through the system

and filed or returned; or, material is an inactive

order

The files are audited twice a year to change the order colors and to review material not yet received to decide whether to keep the order active and to start followup measures.

Followups are accomplished by making a Xerox list of the cards, on which the initial order date was stamped, and sending it to the library. Many times the followup is a way of assuring that documents recalled by the library before being abstracted at NSIC will be returned. If NSIC is at the bottom of a rather long waiting list for a document, the followup assures getting the document eventually. When a followup is made the color is changed and the card is put back for another six months. The initial order date on the front of the card is checked at each followup period to determine when to remove the item from the active order list.

The color coding works most effectively with the documents and books that are obtained on loan and which form the largest part of the NSIC ordering. Only the in-system color (black) is required for journal articles, which are permanent acquisitions. For patents and conference papers that belong to NSIC, no color is needed, but the acquisition date is stamped on the back of the card.

#### Record Keeping

When books and reports are received on loan from the library, a check is made to assure that there is a card in the files for that item. If there is not, a card is made and a Xerox copy is attached to the document. If there is a card and a Xerox copy, the copy is placed with the document, the plastic cover on the card is changed from the order color to black, the arrival date is stamped on the back of the card, and the same date is stamped on the routing slip for sending the document to the subject specialists. (See Fig. 5 for an example of the information that may be put on the card.) When it is necessary to recall a document, this date tells how long the material has been in the system and thus is a clue to where it should be. After the document is located it is returned to the library,

Uncl 4(EUR-4412) 5ENVIRONMENTAL RADIOACTIVITY:
ISPRA, 1968. 6de Bortoli, M.; Gaglione, P. 7(European Atomic
Energy Community, Ispra (Italy). Joint Nuclear Research Center).
1210 Sep 1969. 2060p. 24Dep. CFSTI (U. S. Sales Only). EUR FF
7.75.

 $_{26}$ health and safety  $_{27}$ 06R $_{28}$ MN-41  $_{28}$ NP NSA

NSIC NUMBERS

H5454

DATE ORDERED

ABSTRACTOR'S
INITIALS

Fig. 5. The Information on the File Card.

the card copy is put back in the file with the card, and the order-colored plastic cover is again put on the card group.

When journal-article copies are received from the library, there is no need to pull a card copy from the files because the articles arrive with the card copy already on them. A routing slip is added and the article sent to the proper reviewer. Occasionally, the library cuts off the bottom of a long abstract or loses the card copy, so to make sure that all the necessary information is with the journal article, a Xerox copy of each card is kept.

An effort is made to have either an NSA abstract or an abstract from a press release announcing issuance of the patent for each patent ordered, but the card for the abstract is not made until the patent is received. The abstract is attached to the patent, along with the routing slip, and sent to the technical specialist, who is often able to use the abstract and thus needs only to add keywords to complete the greensheet.

Since USAEC docket material is obtained automatically through an agreement with the AEC Regulatory Staff, the ordering processes are not required. Another difference is that it is retained on the NSIC shelves. Special attention is given to keeping this collection complete and up to date, and as a result, NSIC has the most complete collection of this material outside the USAEC Public Document Room in Washington. The docket collection is regarded as reference material and as such may be used by any qualified visitor who comes to the Center. However, just like all library reference items, NSIC does not lend the docket items.

As for other items, a card is made for the docket material, which is then sent to the appropriate reviewer. The cards are filed by docket number (a number assigned by the AEC to each applicant for a license) and by date. Docket material rarely has an alphanumeric number.

Except for the docket file number and the NSIC accession number, which appear on the front of the card, all other notes are put on the back of the file card. Every movement of this material is recorded, rather than just its date of entry and date of exit, as for the loan documents. This extra bookkeeping is necessary to enable locating material quickly when a visitor wants to see it. After the docket material has been processed, it is filed on the shelves in the NSIC reference room. Each item is given a file number composed of its docket number and its shelf-position number, but the NSIC accession number remains its major identification. The 34th item filed in the space for Docket 50-256 will have 1256.34 as its file number. All loose items are filed in folders so that when a visitor takes something off the shelf, he can lcave the file folder in place to show what item is out.

#### Entries on the Creensheet (Office Form)

The technical specialist (reviewer) decides either to reject the report or to initiate action to catalog the report into the NSIC system. About 10% of the reports are rejected as being outside the NSIC scope. To start the cataloging action, the reviewer writes an abstract or forms an abstract from the report and selects the keywords (which are the word addresses used to file material in the computer memory) from the list in the NSIC thesaurus. He also fills out the sections of the greensheet

marked REPORT NUMBER OR OTHER IDENTIFICATION, ABSTRACTORS INITIALS, TYPE, EVALUATION, CATEGORY, TITLE, ABSTRACT, and KEYWORDS, and he may add the SIGNIFICANT DATE, LANGUAGE, and COUNTRY. The information specialist fills out the rest of the greensheet.

The greensheet entries are listed and described below (see overlay numbers on greensheet in Fig. 6 for entry number):

- 1. Report Number or Other Identification. The technicial specialist puts the report number, the journal name, the book's author, or some other sort of identification in this space.
- 2. Abstractor's Initials. The technical opecialist identifies himself by his initials.
- 3. Accession Number. This is the identification number given to each item in the NSIC master file. It is assigned by the information specialist from an NSIC number logbook in which the technical specialist's initials, the report number, and the local availability (which is where the ORNL people can get the item) are entered. These numbers are assigned in consecutive order so that each number represents the latest entry into the master file up to that point. A note is also made as to whether the item is an unclassified or proprietary report. The NSIC accession number is also the file number for all the nondocket material kept at NSIC. There is only one NSIC number per greensheet, and it is right-justified.
- 4. <u>Type</u>. The code for the type of item being abstracted is inserted by the technical specialist to show that the item is a book, thesis, patent, bibliography, trip report, topical report, etc.; a complete list of the types is given in Appendix C. This is one of the codes that can be used for a computer search.
- 5. Evaluation. The technical specialist "rates" the report as exceptionally good, good, average, or below average, and this rating is used as an "in-house" aid in making specialized searches. It is not printed out in either the SDI or the indexed bibliography.
- 6. <u>Category</u>. NSIC has divided the subject of nuclear safety into 21 categories, which are used as a means of selecting SDI profiles, and as limitors when making literature searches of the master files. In general, there is one technical specialist assigned to each category. These specialists put the code numbers for the category on the greensheet. Spaces

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Fig. 6. The Greensheet.

for three categories provide for reports that may be of interest in more than one category.

- 7. <u>Journal Abbreviation</u>. This is the code used to identify the journal name. It is assigned by the information specialist from *Codes* for Periodic Titles, An Aid to Storage and Retrieval of Information and to Communication Involving Journal References, which is published by the American Society for Testing and Materials as ASTM Special Publication No. 329. There are four blanks allowed for this code, so Publication No. 329 is used rather than the newer edition, which has five-letter codes that supersede the four-letter codes. The computer can search on this information.
- 8. <u>Significant Date</u>. For reports, the date of publication is used as the significant date; for journals, the journal's date; and for patents, the date of government issue. For conference papers, it is the date of the conference rather than the date the paper was written or submitted. This date can be put in the blanks by either the technical specialist or the information specialist. The date is frequently useful for restricting computer searches and for keeping the most current material on the SDI and indexed bibliography.
- 9. Language and Country. The codes are filled in from a list (Table 2) of letter codes identifying the language and the country that are in most instances the first letter of the language or country. The technical specialist usually fills in the most common codes such as E and A and leaves the uncommon ones for the information specialist to fill in. The computer can recognize this code so that "English-Only" searches can be produced if desired.
- 10. <u>Subject Number</u>. The information specialist assigns this code to reports from nuclear safety projects sponsored by the AEC Division of Reactor Development and Technology. This is an in-house tool to sort reports issued by these projects.
- 11. Corporate Author Code. These blanks are for a code to indicate the corporate author (the company of the author of the report or the company or organization that published the report). The information specialist assigns this code from a coding system set up at NSIC by using USAEC report TID-5059 (6th ed.) as a reference basis. There are spaces for

Table 2. Abbreviations for Machine for Countries of Origin and Languages

| Language<br>Abbreviation <sup>a</sup> | Language           | Country  | Country<br>Abbreviation |
|---------------------------------------|--------------------|--|-------------------------|
| <b>C</b> , ,                          | <u>C</u> zeck      | <u>C</u> zechoslovakia                                   | С                       |
| D                                     | <u>D</u> anish     | <u>D</u> enmark  | D                       |
| £                                     | <u>E</u> nglish    | United States of America O-India Q-Canada United Kingdom | A<br>O<br>Q<br>U        |
| F                                     | <u>F</u> rench     | <u>F</u> rance<br>Be <u>Lg</u> ium                       | F . L                   |
| G                                     | <u>G</u> erman     | <u>G</u> ermany<br>Aus <u>T</u> ria                      | G<br>T                  |
| . Н                                   | <u>H</u> ungarian  | Hungary  | Н                       |
| I                                     | <u>I</u> talian    | <u>I</u> taly  | I                       |
| J ·                                   | <u>J</u> apanese   | <u>J</u> apan  | J                       |
| K                                     | Tur <u>K</u> ish   | Tur <u>K</u> ey  | ·K                      |
| : <b>N</b>                            | Norwegian          | <u>N</u> orway´  | N                       |
| P                                     | <u>P</u> ortuguese | <u>P</u> ortugal<br><u>B</u> razil                       | Р<br>В .                |
| R                                     | Russian            | Russia   | R                       |
| S                                     | <u>S</u> pani.sh   | <u>S</u> pain<br><u>M</u> exico                          | S<br>M                  |
| <b>W</b> .                            | S <u>W</u> edish   | S <u>W</u> eden  | W                       |
| Y                                     | <u>Y</u> ugoslav   | <u>Y</u> ugoslavia                                       | Y                       |
| X                                     | <u>X</u> -Other    | <u>X</u> -Other  | Хр                      |
| Z                                     | Z-Dutch            | <u>Z</u> -Netherlands                                    | Z                       |

 $<sup>\</sup>ensuremath{^{a}}$  The letters V for China and W for Egypt are not used and these countries are not listed.

<sup>&</sup>lt;sup>b</sup>Used for New Zealand, Israel, Switzerland, and Poland.

three corporate author codes, which can be used for a computer search. If there are more than three corporate authors, the extra entries are made in the bibliographic citation but are unavailable for search. One of the duties of the information specialist is to maintain the corporate author code. The code files were computerized by the Computer Technology Center at K-25 so that two types of files are outputted from the same input, and the master file is kept and updated by the information specialist. The master file has cards and cross references sorted alphabetically by corporate author. The card lists the corporate-author name, the corporateauthor code, and whether or not this form of the name is preferred over other forms. The second type of file contains only preferred corporate cards and is used by the typists to check corporate author entries to determine the correct entry. For example, Oak Ridge National Laboratory can be listed in the following ways and not be wrong: ORNL, X-10, and Union Carbide Nuclear Division, Oak Ridge, Tennessee. However, we prefer Oak Ridge National Laboratory, Oak Ridge, Tennessee. The NSIC master file has over 2200 entries, and the typist file has about half that many. extra cards in the master file represent cross references so that an orgamization, no matter how many name changes or satellite groups it has, can be designated by only one code. This is important for getting a complete group of abstracts during a corporate author search.

New codes are assigned by working down the alphabetic permutations from AAA to ZZZ, with the last letter varying the fastest (i.e., AAA, AAB, AAC, etc.). At one time an attempt was made to assign the codes by using mnemonic combinations, but since the code is restricted to only three letters, it soon became difficult to assign unique codes. It was found that alphabetic permutations were much faster to assign and also provided a way of telling which codes were new.

- 12. Format. This code indicates that the material should be key-punched in a manner other than the usual one-paragraph form used for the abstract. It is used primarily to ask the keypunchers to set up the abstract in the "table-of-contents" format. The information specialist puts a "1" in this column at the request of the technical specialist.
- 13. <u>Bibliographic Limit</u>. This code decides whether the material will be printed in the indexed bibliography. The information specialist puts a

"1" in this column to show that the report is being put on the master file for background information rather than current awareness.

14. Report. This code is used to show that the report has an alphanumeric number(s). The information specialist puts a "1" in column 52 (see Fig. 7 for an example of a completed greensheet) and then the typist puts the alphanumeric number in the first part of the line preceding the abstract (see Fig. 8 for an example of computer output). The symbols "plus period" (+.) mark the end of the searchable portion of the report identification. Multiple numbers are connected with a plus so that an entry may look like this:

ORNL-P-2711 + CONF-660,413-2 +.,

and then it will be followed with the number of pages, figures, tables, references, the date, and other pertinent bibliographic information. This report code is used to call for all the alphanumeric numbers for preparing a report number index, for example.

15. Proprietary. These two columns are used to allow NSIC to computerize material that must have a proprietary storage area. Proprietary material is restricted, unclassified material, as distinguished from classified material. Most of the restrictions on proprietary material are patent restrictions, limited distribution, preliminary-report restrictions, and official-use-only markings. The proprietary code is designed by NSIC to direct material to a separate file and to provide a searchable address for it. The proprietary material has all the searchable handles of open-literature material plus the additional searchable code.

The code is assigned just for the major corporate author. The most frequently used corporate authors were given unique codes, and the occasional entries are put under their first letter in a "general" code. There are blank numbers in the code to allow room for expansion. The code is restricted to two digits, so there are 99 possible codes.

16. Availability. This is the "where-to-get-it" entry. It is made by the information specialist. NSIC tries to see that every item released to the public is available in one form or another. The Center supplies only documents that carry the ORNL-NSIC numbers (see App. D for a list of these documents).

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| A Radio che             |             | •           | M            | ice         | 5SIN        | 9          |        |                    |          |     |          |                |             |  |              |          |                   |             |
| Deni                    | v1 a f      | K           |              |             |             |            |        |                    |          |     |          |                | •           |  |              |          |                   | ٠           |
| NEW<br>KEY WORD         |             |             |              |             |             |            |        |                    |          |     |          |                |             |  |              |          |                   |             |
|                         |             |             |              |             |             |            |        |                    |          |     |          | <del>.</del> . |             |  |              |          | <del></del>       |             |

Fig. 7. Completed Greensheet Ready for Computer Input.

#### PARTS AND METHOD OF INDEXING ABSTRACTS

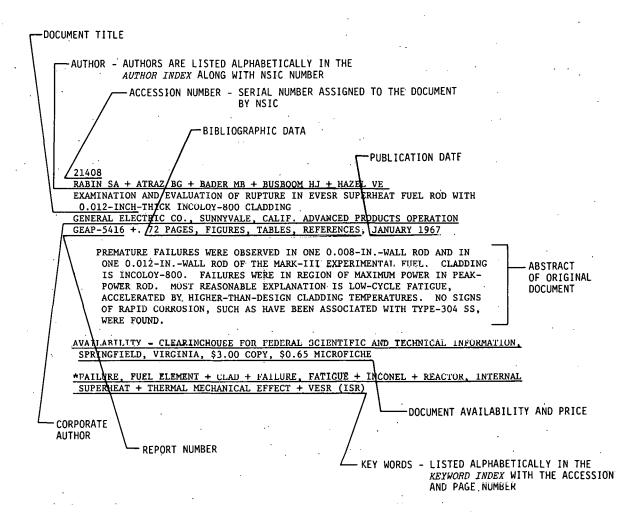


Fig. 8. Parts and Method of Indexing

There are several standard availability sources, but the most common is the National Technical Information Service (NTIS). Appendix E lists some of the other sources. The availability information was formerly carried as the last item in the section preceding the abstract, but it became so important that now it has its own section in the format and appears after the abstract. The information specialist investigates to find out where the item is on sale and then enters the code. The local availability, which is where the ORNL people can find the item, is listed on the second line of the Availability box. The local availability does not appear in the bibliography, but ORNL employees can locate a cited item by calling either the library or NSIC.

- 17. <u>Title</u>. This portion of the greensheet is usually filled in by the technical specialist. Normally he reviews the whole item and puts the title of the book, document, patent, etc., on the title line. Sometimes when he wants to review only a chapter of a book or a section of a document, he uses the chapter or section title, or, if the section has no heading, he makes up a title. In that case, the book or document title appears in the 05 section of the citation.
- 18. Abstract. The technical specialist may write his own abstract or use the author's abstract. There are several NSIC rules for writing abstracts, which are covered in a report by the NSIC editor<sup>4</sup> (see report ORNL-NSIC-47). Generally a 100-word limit is suggested because it is the number of words that fits an SDI card. The NSIC computer cannot prince either superscripts or subscripts, so they cannot be in the title or abstract. The use of formulas is discouraged because they are not very readable when reduced to capital letters on a single line.
- 19. <u>Keywords</u>. The keywords are selected by the technical specialist from the NSIC thesaurus of about 3000 terms for indexing and later retrieval of references. The editor maintains the keyword list and verifies the keywords. A section on this subject is included in his report.<sup>4</sup>
- 20. New Keywords. When the technical specialist wants a new keyword, he submits it along with its definition to the technical editor. The definition is incorporated into an NSIC keyword dictionary, and the keyword goes into the thesaurus.

#### Proofreading and Logging Typed Material

After the information specialist completes the greensheet, it and the report are given to the technical editor for reviewing the abstract and checking the keywords for accuracy. From the technical editor the report and the greensheet go to the typists. The typist puts the information in the correct form and then gives the report and the computer input sheet to the information specialist, who proofreads the bibliographic information and the availability section against the card in the master file. If satisfied that the typed bibliographic information and availability correspond with the information on the card, the information specialist stamps the date of completion at the top of the card, takes the black plastic cover off the card, writes the NSIC number on the card, and puts it back in the files. The date is stamped at the top of the card so that it is possible to go through the files quickly and check which items left the system and when without unfiling the cards. After the information specialist finishes proofreading the input sheet, it goes to the editor.

#### Returning or Filing Material

All loan documents are marked with the name and plant address of the lender, and these are put into the plant mail immediately after the typed greensheet is proofread. Other material is divided into throw-aways, library donations, and NSIC reports.

The disposition of direct-distribution reports is determined by establishing how hard it would be to get another copy of the report. If it would not be difficult, the report is given to the library, from which it can be requested when needed. These reports are usually those available at NTIS or some other large distributor. Difficult-to-get reports are filed by NSIC accession number at the center. These include items such as proprietary reports, press releases, patents, and conference papers. Available duplicates are given to the library.

The NSIC collection is considered reference material just like the docket collection, and visitors are welcome to view it at the Center.

Loans are not made, however, because of frequent need and the reference nature of the material.

#### Miscellaneous Duties

The preceding presents the major activities of the information specialists at the Nuclear Safety Information Center, but there are others. Information must be maintained for answering the frequent "have-we-done-this?" or the "do-we-have-this?" questions. All the files are the responsibility of the information specialist and, correspondingly, all the filing, which must be orderly so that material may be found quickly.

Such housekeeping is important in keeping an information center clean and running. In the words of Pipino Vlannes, Deputy Director, Army Technical Information Office:

"... consider the functions that information systems have to perform to support the services they furnish their clients. There are three basic functions involved. They are the following:

Selection and acquisition Cataloging (and sometimes indexing and abstracting) Record keeping

Even the relatively simple descriptive or non-subject aspects or document cataloging are rife with detail and potential housekeeping pitfalls.

"Housekeeping is the most expensive, time-consuming and errorprone activity performed by a computerized retrieval system.

It is not something that can be taken for granted or skimped
on. Housekeeping should be made an integral part of the design
of any retrieval system. ... If provision for good housekeeping
is not made a part of the system in the first place, it gets
provided for later, most likely after considerable expense and
anguish. ... systems rise and fall on [housekeeping]."5

#### Summary and Conclusions

Each of the information specialist's duties is a link in the chain of the information center, and each link must be well kept or the whole chain is weakened. The information specialist strives to provide the Nuclear Safety Information Center with the complete input through an effective scanning process; operates an efficient ordering service, coordinated with the libraries; insures that all the items located in the scanning come into the Center; maintains the bookkeeping system

accurate and current; works for an orderly method for getting the information processed and typed; proofreads the typed items to assure that they are as error free as possible; and continuously updates the collection of reference items to reflect the growing needs of the nuclear industry. In essence the information specialist tries to harness the energy released by the information explosion.

#### References

- 1. J. R. Buchanan and Wm. B. Cottrell, A Summary of NSIC Activities 1963—1967, USAEC Report ORNL-NSIC-46, Oak Ridge National Laboratory, September 1968.
- 2. J. R. Buchanan and F. C. Hutton, Analysis and Automated Handling of Technical Information at the Nuclear Safety Information Center, *American Documentation*, Vol. 18, No. 4, October 1967.
- 3. J. R. Buchanan and E. M. Kidd, Development of a Computer System with Console Capability for the Nuclear Safety Information Center, Oak Ridge National Laboratory, Proceedings of the American Society for Information Science, October 1-4, 1969, Vol. 6.
- 4. H. B. Whetsel, Guidelines for Reviewers and the Editor at the Nuclear Safety Information Center, USAEC Report ORNL-NSIC-47, Oak Ridge National Laboratory, January 1970.
- 5. P. Vlannes, Requirements for Information Retrieval Networks, pp. 10 and 11 in Colloquium on Technical Preconditions for Retrieval Center Operations, edited by B. F. Cheydleur, Spartan Books, 1965.

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#### Appendix A

#### CATEGORIES OF NUCLEAR SAFETY

Brief descriptions of the technical scopes of the categories of information reviewed at the Nuclear Safety Information Center follow:

# 1. General Safety Considerations

Deals with all safety aspects of radiation policy, standards, codes, cost, financial liability, and insurance. Covers also the comparative risk to public health and safety from nuclear and nonnuclear hazards.

#### 2. Siting of Nuclear Facilities

Considers factors used in evaluating sites, e.g., facility design, proposed operation, population density, use characteristics of the environs, physical characteristics of the site, earthquake considerations, and the relation between engineered safeguards and nuclear-facility siting.

#### 3. Transportation and Handling of Radioactive Materials

Pertains to shipping containers, shipping regulations, criticality safety, transportation accidents, design of tiedowns, shipping conditions (impact, fire, vibration, etc.), heat-transfer capability, etc.

# 4. Aerospace Safety .

Deals with safety considerations unique to nuclear systems used in aerospace vehicles — launch and re-entry problems only.

# 5. Heat Transfer and Thermal Transients

Considers all facets of the analysis of postulated accidents. Includes burnout heat flux, critical heat transfer, reliability analyses, thermal-mechanical effects, in-pile experiments, coolant-activity buildup, and experiments such as in LOFT. Studies and experiments related to reactor kinetics are catalogued in Category 6.

# 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

such mechanisms as deposition, adsorption, filtration, fallout, plateout, etc.

# 8. Sources of Energy Release Under Accident Conditions

Considers nuclear, Wigner, and gamma energies, also energy released by chemical reactions, metal-water reactions, and all other types of energy that might be released as a result of a nuclear accident (e.g., steam-engendered explosion).

# 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, pressure-related containment, and multiple-barrier containment for reactors, radiochemical plants, hot cells, sources, etc. Includes design considerations, leakage, penetrations, structural integrity (piping and pressure vessel), and leak testing.

# 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 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 — mining, ore conversion, enrichment, fuel-element fabrication, hot cells, fuel processing, fuel conversion, waste disposal, and radioisotopes.

# 14. Radionuclide Release and Movement in the Environment

Pertains to intentional or accidental releases of radionuclides to the environment, along with the subsequent fate of the materials. Considers the nuclide source (reactor, chemical processing plant, waste-management scheme, fallout, etc.). Deals with release of radionuclides, effluent-control systems, behavior and cycling of radionuclides in the biological and chemical environments (including analytical methods), and counter-measures to retard or prevent release or movement.

# 15. Environmental Surveys, Monitoring, and Radiation Dose Measurements

Includes information related to (1) environmental and personnel monitoring during routine or accidental releases of radionuclides, (2) monitoring methods, and (3) measurements of external exposure to individuals or population groups in the immediate environs of nuclear facilities.

# 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 or 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 AEC Regulatory Staff.

#### 19. Radiation Dose to Man from Radioactivity Release to the Environment

Primary emphasis is on factors related to internal exposure of man to radionuclides in the environment. Pertinent material includes the metabolic and dosimetric characteristics of radioactive or toxic wastes which bear on hazards resulting from deliberate or accidental releases to the environment.

#### 20. Effects of Thermal Modifications of Ecological Systems

Pertains to natural and man-modified heat budgets of water bodies and other environments and to negative and positive influences of thermal releases on the environment's suitability for man and other organisms. The influence of heat on circulation of radionuclides in the biosphere is included as are the engineering aspects of thermal plume behavior. Considers various alternate means of dissipating heat such as cooling towers.

# 21. Effects of Radionuclides and Ionizing Radiation on Ecological Systems

Includes the movement of radionuclides released to environmental pathways through accidental releases, through low-level waste discharges, and through ecological experiments using tracers. Considers the effects of ionizing radiation on natural populations of organisms where the radiation is part of their environment. The interacting influences of ionizing radiation and natural environmental factors with respect to mortality, reproduction, and other functions of plants and animals are included.

#### Appendix B

#### JOURNALS ABSTRACTED BY NSIC

The following list of journals includes only the prominent ones reviewed and abstracted by the technical specialists at NSIC.

Academy of Sciences of the USSR, Proceedings of the

ACTA Crystallographica

Aerospace Medicine

Aerospace Sciences, Journal of the

AIAA Journal

AICHE Journal

Air Pollution Control Association, Journal of the

Air Repair

American Chemical Society, Journal of the

\*American Documentation

American Geophysical Union, Transactions of the

American Industrial Hygience Association Journal

American Institute of Mining and Metallurgical Engineers

American Nuclear Society, Transactions of the

Analyst

Analytical Chemistry

Annales de Geophysique

Annals of Occupational Hygiene

Applied Chemistry (London), Journal of

Applied Mechanics, Journal of

Applied Meteorology, Journal of

Applied Physics, Journal of

Archives of Environmental Health

Arkhimedes, Journal of Finnish Physical Society

ASHRAE Journal

Atmospheric Environment, Journal of

<sup>\*</sup>Journals subscribed to by NSIC.

Atmospheric Sciences, Journal of

Atmospheric and Terrestrial Physics, Journal of

Atom

Atomic Energy (USSR)

\*Atomic Energy Clearing House

Atomnaya Energiya

Atomics

Atomkernenergie

\*Atompraxis

Atom und Strom

\*Atomwirtschaft

Australian Journal of Applied Science

Battelle Technical Review

British Chemical Engineering

British Coal Utilisation Research Association, Monthly Bulletin

\*British Nuclear Energy Society, Journal of

Brisish Journal of Radiology

Bulletin of the American Meteorological Society

\*Bulletin d'Information Scientifique et Technique (Paris)

Canadian Journal of Chemical Engineering

Canadian Chemical Processing

Canadian Electronics Engineer

Canadian Journal of Physics

Chemical Documentation, Journal of

Chemical Education, Journal of

Chemical Engineering - Transactions of the Institute of Chemical Engineers

Chemical Engineering

Chemical & Engineering Data Series

Chemical and Engineering News

Chemical Engineering Progress

Chemical Engineering Science

Chemical & Process Engineering

Chemie-Ingenieur Technik

Chemische Technik

Chemistry & Industry (London)

Chimica, la et l' Industria (Milan)

Colloid Science, Journal of

Comptes Rendus

Concrete and Constructional Engineering

Control and Automation Progress

Czechoslovak Journal of Physics

Dissertation Abstracts

Dopovidi Akademic Nauk Ukrains' koi RSR

Electrochemical Society, Journal of the

Electrochemical Technology

Energia Nucleare

Energie Nucleaire

Engineer

Engineering for Industry, Journal of

Engineering for Power, Journal of, Transactions of the ASME

Federation Proceedings, Transactions Supplement

Fluid Mechanics, Journal of

Geochimica et Cosmochimica Acta

Geomagnetism and Geoelectric, Journal of (Kyoto)

Geophysical Research, Journal of

\*Health Physics

Hitachi Hyoron

Hygiene, The Journal of

IEEE, Transactions on Nuclear Science

Industrial and Engineering Chemistry, Journal of

Industrial and Engineering Chemistry, Fundamentals

Industrial and Engineering Chemistry, Process Design and Development

Industrial Laboratories

Ingenieur-Archiv

Institute of Fuel, Journal of

International Journal of Air and Water Pollution

\*International Journal of Heat and Mass Transfer

ISA Transactions

Isotopes and Radiation Technology

Kernenergie

Kerntechnik

Laboratory Practice

Machine Design

Mathematics and Physics, Journal of

Metals, Journal of

Materials, Journal of

Materials Protection

Material Research & Standards

Measurement Techniques (USSR)

Mechanical Engineering

Meteorology, Journal of

Nature

Nippon Genshryoku Gakkaishi

\*Nuclear Applications & Technology

\*Nuclear Energy, Journal of

\*Nuclear Engineering

Nuclear Engineering Bulletin

\*Nuclear Engineering and Design

Nuclear Instruments and Methods

Nuclear Materials, Journal of

\*Nuclear News

\*Nuclear Safety

\*Nuclear Science and Engineering

Nucleonics Week

Nukleonik

Physical Chemistry, Journal of

Physics of Fluids

Physical Review

\*Power Reactor Technology

Proceedings of the Royal Society (London)

Przemysl Chemiczny

Quarterly Journal of the Royal Meteorological Society

Radio and Electronic Engineer

Radiological Health Data

\*Reactor Materials

Science

Scientific American

Seismological Society of America, Bulletin of the

\*Soil Science

Soil Science Society of America Proceedings

Spacecraft, Journal of

Stadtehygiene

Tellus

Transactions of Institution of Chemical Engineers

Water Pollution Control Federation, Journal of the

Weather

Zeitschift fur Meteorologie

Zeitschrift fur Naturforhschung

#### Appendix C

#### CODES FOR TYPE OF DOCUMENT AND EVALUATION

# Type Codes

G

The type code letters are entered in columns 13 through 15 of the greensheet (see Fig. 6), and the evaluation code is entered in column 16. These entries are made by the technical specialists. The type code indicates whether the item being abstracted is a report, journal article, etc., and since an item may fall into more than one type, provision was made for three type code entries on the greensheet. The type codes are listed and explained below:

# EXPLANATION CODE Α DATA SOURCE: A collection of tabular and/or graphical data. The collection may range from handbook or report size to a page or less in an engineering-data journal. BIBLIOGRAPHY: B is used for the usual bibliography В or to denote the fact that a document contains one. C THEORETICAL EXPOSITION: Denotes any document in which theory represents the main theme. It may also be used to indicate especially useful theory in a document in which experimental work is the central issue. D STATE-OF-THE-ART REVIEW: This applies to extensive reviews. E PRIMARILY OF HISTORICAL IMPORTANCE: Refers to a document that traces the ancestry of a reactor type, apparatus, theory, etc., or to a document in which chronology dominates. F ELEMENTARY, NONTECHNICAL DISCUSSION.

PROGRESS REPORT: A periodical document about a single

subject or possibly several related ones. Intended for special audiences such as AEC sponsors and others

intimately connected with the work. More or less a diary of work done to reach one or more major objectives.

- H ENGINEERING REPORT: These are straightforward engineering reports about large-scale work or about laboratory work intended to provide engineering data. Some may be conceptual design reports or will represent detailed design.
- I THESIS.
- J BOOK.
- K PATENT.
- L TRANSACTIONS: This includes the publications resulting from meetings and symposiums.
- M NEWS RELEASES AND PRESS REPORTS: These are often concerned with regulatory information and sometimes have recent viewpoints or other news about some aspects of nuclear safety.
- N TOPICAL REPORT: Any report about completed, soundly evaluated work is a topical report. Topical report means a report issued by AEC contractors, National Laboratories, NASA, Naval Research and Development Lab., etc. This excludes anything issued by a technical society or, for example, a journal article.
- O JOURNAL ARTICLE.
- P MOVIE FILM.
- Q LICENSING AND REGULATORY MATERIAL: This includes pre- and postoperational material. The post-operational material is often in the form of amendments to the preoperational material.
- R TRIP REPORT
- S PROGRESS REVIEW: This applies to review articles such as those in *Nuclear Safety*.

# Evaluation Codes

The evaluation codes are an internal tool of NSIC used to limit the size of the computer printouts. The following is a listing of the evaluation codes:

| Z | Exceptionally | good |
|---|---------------|------|
| Y | Good          |      |
| X | Average       |      |
| W | Below Average |      |

#### Appendix D

# NUCLEAR SAFETY INFORMATION CENTER REPORTS

- ORNL-NSIC-1 Effects of Particle Agglomeration on the Penetration of Filters Utilized with Double Containment Systems, by M. H. Fontana and W. E. Browning, Jr., September 1963
- ORNL-NSIC-2 Nuclear Safety Contract File, by J. R. Buchanan, November 1963
- ORNL-NSIC-3 Current Practices in the Release and Monitoring of <sup>131</sup>I at NRTS, Hanford, Savannah River, and ORNL, by K. E. Cowser, August 1964
- ORNL-NSIC-4 Behavior of Iodine in Reactor Containment Systems, by G. W. Keilholtz, February 1965
- ORNL-NSIC-5 U. S. Reactor Containment Technology, A Compilation of Current Practice in Analysis, Design, Construction, Test, and Operation, by Wm. B. Cottrell and A. W. Savolainen, Eds., August 1965
- ORNL-NSIC-6 Index to Microfiche Collection of Selected Technical Information on Containment of Nuclear Facilities (for use at the Third Geneva Conference), September 1964
- ORNL-NSIC-7 Secondary Shutdown Systems of Nuclear Power Plants, by C. S. Walker, January 1966
- ORNL-NSIC-8 Indexed Bibliography of Current Nuclear Safety Literature No. 1, by NSIC Staff, April 1965
- ORNL-NSIC-9 Indexed Bibliography of Current Nuclear Safety Literature No. 2, by NSIC Staff, August 1965
- ORNL-NSIC-10 Current Nuclear Safety Research and Development Projects, by J. R. Buchanan and N. F. Cross, June 1966
- ORNL-NSIC-11 1965 Compilation of United States Nuclear Standards, 2nd Edition, 1965, by Wm. B. Cottrell, December 1965
- ORNL-NSIC-12 Indexed Bibliography of Current Nuclear Safety Literature No. 3, by NSIC Staff, November 1965
- ORNL-NSIC-13 Filters, Sorbents, and Air-Cleaning Systems as Engineered Safeguards in Nuclear Installations, by G. W. Keilholtz, October 1966

- ORNL-NSIC-14 Indexed Bibliography of Current Nuclear Safety Literature No. 4, by NSIC Staff, March 1966
- ORNL-NSIC-15 The Integrity of Reactor Pressure Vessels, by E. C. Miller, May 1966
- ORNL-NSIC-16 Indexed Bibliography of Current Nuclear Safety Literature No. 5, by NSIC Staff, June 1966
- ORNL-NSIC-17 Abnormal Reactor Operating Experiences, by USAEC Division of Operational Safety, August 1966
- ORNL-NSIC-18 Compilation of National and International Nuclear Standards (Excluding U.S. Activities) 2nd Edition, 1966, by Wm. B. Cottrell, June 1966
- ORNL-NSIC-19 Indexed Bibliography of Current Nuclear Safety Literature No. 6, by NSIC Staff, September 1966
- ORNL-NSIC-20 Indexed Bibliography of Current Nuclear Safety Literature, No. 7, by NSIC Staff, November 1966
- ORNL-NSIC-21 Technology of Steel Pressure Vessels for Water-Cooled Nuclear Vessels, by G. D. Whitman, G. C. Robinson, Jr., and A. W. Savolainen, Eds., December 1967
- ORNL-NSIC-22 Missile Generation and Protection in Light-Water-Cooled Power Reactor Plants, by Richard C. Gwaltney, September 1968
- ORNL-NSIC-23 Potential Metal-Water Reactions in Light-Water-Cooled Power Reactors, by Howard A. McTalu, August 1968
- ORNL-NSIC-24 Emergency Core-Cooling Systems for Light-Water-Cooled Power Reactors, by C. G. Lawson, September 1968
- ORNL-NSIC-25 Air Cleaning as an Engineered Safety Feature in Light-Water-Cooled Power Reactors, by G. W. Keilholtz, C. E. Guthrie, and G. C. Battle, Jr., September 1968
- ORNL-NSIC-26 Testing of Containment Systems Used with Light-Water-Cooled Power Reactors, by Frank C. Zapp, August 1968
- ORNL-NSIC-27 Review of Methods of Mitigating Spread of Radioactivity
  From a Failed Containment System, by NSIC Staff, September
  1968
- ORNL-NSIC-28 Earthquakes and Nuclear Power Plant Design, by T. F. Lomenick and C. G. Bell, July 1970

- ORNL-NSIC-29 Protection Instrumentation Systems in Light-Water-Cooled Power Reactor Plants, by H. G. O'Brien and C. S. Walker, October 1969
- ORNL-NSIC-30 Compilation of United States Nuclear Standards, 3rd ed., 1966, USASI Subcommittee N6-9, Wm. B. Cottrell, December 1966
- ORNL-NSIC-31 Index to *Nuclear Safety*, A Technical Progress Review by Chronology, Permuted Title, and Author, Vol. 1, No. 1 Through Vol. 7, No. 4, January 1967
- ORNL-NSIC-32 Indexed Bibliography of Current Nuclear Safety Literature No. 8, by NSIC Staff, March 1967
- ORNL-NSIC-33 Indexed Bibliography on Transportation and Handling of Radioactive Materials, by L. B. Shappert and R. S. Burns, June 1967
- ORNL-NSIC-34 Indexed Bibliography of Current Nuclear Safety Literature No. 9, by NSIC Staff, May 1967
- ORNL-NSIC-35 NSIC Keyword Thesaurus, August 1967
- ORNL-NSIC-36 Indexed Bibliography of Current Nuclear Safety Literature No. 10, by NSIC Staff, August 1967
- ORNL-NSIC-37 Fission Product Release and Transport in Liquid Metal Fast Breeder Reactors, by G. W. Keilholtz and G. C. Battle, Jr., March 1969
- ORNL-NGIC-38 Compilation of National and International Nuclear Standards (Excluding U.S. Activities), 3rd ed., 1967, Wm. B. Cottrell, October 1967
- ORNL-NSIC-39 Sources of Tritium and Its Behavior Upon Release to the En-(TID-24635) vironment, by D. G. Jacobs (published as AEC Critical Review Series, USAEC, Division of Technical Information, 1968)
- ORNL-NSIC-40 Indexed Bibliography of Current Nuclear Safety Literature No. 11, by NSIC Staff, November 1967
- ORNL-NSIC-41 Index to *Nuclear Safety*, A Technical Progress Review by Chronology, Permuted Title, and Author, Vol. 1, No. 1 Through Vol. 8, No. 6, February 1968
- ORNL-NSIC-42 Indexed Bibliography of Current Nuclear Safety Literature No. 12, by NSIC Staff, February 1968
- ORNL-NSIC-43 Compilation of United States Nuclear Standards, 4th ed., 1967, Wm. B. Cottrell, May 1968

- ORNL-NSIC-44 Indexed Bibliography of Current Nuclear Safety Literature No. 13, by NSIC Staff, May 1968
- ORNL-NSIC-45 Indexed Bibliography of Current Nuclear Safety Literature No. 14, by NSIC Staff, July 1968
- ORNL-NSIC-46 A Summary of NSIC Activities, 1963-1967, by J. R. Buchanan and Wm. B. Cottrell, September 1968
- ORNL-NSIC-47 Guidelines for Reviewers and the Editor at the Nuclear Safety Information Center, by H. B. Whetsel, January 1970
- ORNL-NSIC-48 Information Scanning and Processing at the Nuclear Safety Information Center, by Celia Murphy and Carol Julian, 1970
- ORNL-NSIC-49 Plume Rise: Critical Survey, by G. A. Briggs (published as (TID-24190) AEC Critical Review Series, USAEC, Division of Technical Information), 1969
- ORNL-NSIC-50 Compilation of National and International Nuclear Standards (Excluding U.S. Activities), 4th ed., 1968, Wm. B. Cottrell, September 1968
- ORNL-NSIC-51 Design Principles of Reactor Protection Instrument Systems, by S. H. Hanauer and C. S. Walker, September 1968
- ORNL-NSIC-52 Indexed Bibliography of Current Nuclear Safety Literature No. 15, by NSIC Staff, October 1968
- ORNL-NSIC-53 Patterns in Radiography Incidents and Overexposures, by R. L. Scott and E. N. Cramer, to be published
- ORNL-NŠĪC-54 Indexed Bibliography of Current Nuclear Safety Literature No. 16, by NSIC Staff, January 1969
- ORNL-NSIC-55 Comparison of Design Features for Light-Water-Power Reactors: A Special Report for the ACRS, compiled by C. G. Bell, September 1968
- ORNL-NSIC-56 Guide to Nuclear Power Plant Staffing: Requirements,
  Training and Education Programs, by E. N. Cramer and H. B.
  Whetsel (published as WASH-1130, Utility Staffing for Nuclear Power, July 1969, USAEC, Division Nuclear Education and Training), July 1969
- ORNL-NSIC-57 Compilation of U.S. Standards, 5th ed., Wm. B. Cottrell, 1968
- ORNL-NSIC-58 Indexed Bibliography of Current Nuclear Safety Literature-17, by NSIC Staff, February 1969

- ORNL-NSIC-59 Indexed Bibliography of Current Nuclear Safety Literature-18, by NSIC Staff
- ORNL-NSIC-60 Index to *Nuclear Safety*, A Technical Progress Review by Chronology, Permuted Title, and Author, Vol. 1, No. 1 Through Vol. 9, No. 6, March 1969
- ORNL-NSIC-61 Dynamic Conditions in Collision Tests of Vehicles Transporting Nuclear or Fissile Materials, by L. B. Shappert, W. C. Stoddart, and O. A. Kelly
- ORNL-NSIC-62 Indexed Bibliography of Current Nuclear Safety Literature No. 19, by NSIC Staff, June 1969
- ORNL-NSIC-63 Compilation of National and International Nuclear Standards (Excluding U. S. Activities), 5th ed., 1969, Wm. B. Cottrell, September 1969
- ORNL-NSIC-64 Abnormal Reactor Operating Experiences 1966-1968, USAEC, October 1969
- ORNL-NSIC-65 C. A. Burchsted and A. B. Fuller, Design, Construction and Testing of High Efficiency Air Filtration Systems for Nuclear Application, January 1970
- ORNL-NSIC-66 Nuclear Reactor Siting Practice and Its Relationship to Population, by H. B. Piper, G. L. West, and F. A. Heddleson
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| AEC-DOS             | USAEC, Division of Operational Safety, Washington, D. C. 20545  |
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| AECL                | Atomic Energy of Canada Ltd., Scientific Document<br>Distribution Office, Chalk River, Ont., Canada   |
| AUSTRALIA           | Library, Australian Atomic Research Establishment, Private Mail Bag, Sutherland, New South Wales, Australia   |
| BELGIUM             | Centre d-Etude de l-Energie Nucleaire (C.E.N.),<br>Studiecentrum voor Kernenergie (S.C.K.), Technical<br>Information Dept., MOL-DONK, Belgium             |
| CISE                | CISE Press Office, Casella Postale 3986, Milano, Italy  |
| CNEN                | Comitato Nazionale per l-Energia Nucleare, Divisione<br>Affari Internazionali e Studi Economici, Ufficio<br>Pubblicazioni, Via Belisario, 15, Roma, Italy |
| CEA                 | La Documentation Française, 31 quai Voltaire, 75, Paris (7e), France  |
| CERN                | CERN European Organization for Nuclear Research,<br>Geneva 23, Switzerland  |
| DANATOM .           | Danatom, Aurehojvej 2, Hellerup, Denmark  |
| DEP (and<br>DEP/MN) | USAEC Depository Libraries in the U.S. and overseas   |

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| DESY    | Deutsches Elcktronen-Synchrontron DESY, Dokumentation, 2000 Hamburg 52, Notkestieg 1, Germany                     |
| EURATOM | Office central de vente des publications des Communautes<br>Europeennes, 2, place de Metz, Luxemburg              |
| EIR'    | Eidgenossisches Institut fuer Reaktorforschung, c/o<br>Bibliothek, 5303 Wurenlingen, Switzerland                  |
| GMELIN  | Atomic Energy Documentation Center, Gmelin Institute, 40-42 Varrentrappstrasse, Frankfurt (Main), West Germany    |
| GPO     | Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402                             |
| HMSO    | Her Majestys Stationery Office, Head Office, Atlantic<br>House, Holborn Viaduct, London E.C.l., England           |
| IAEA    | National Agency for International Publications, Inc., 317 East 34th Street, New York, N.Y. 10016                  |
| ISRAEL  | Israel Atomic Energy Commission, Soreq Nuclear Research<br>Centre, Yavne, Israel                                  |
| JAERİ   | Staff Supply Cooperative of Japan Atomic Energy Research<br>Institute, Tokal=mura, Naka-gun, Ibaraki-ken, Japan   |
| JCL ·   | Special Libraries Association Translation Center, John Crerar Library, 35 West 33rd Street, Chicago, III. 60616   |
| JEN     | Servico de Documentation, Junta de Energia Nuclear,<br>Ciudad Universitaria, Madrid (3)+ Espana                   |
| JŲT.    | Jul. Gjellerup, Booksellers, 87 Solvgade, Kobenhavn K,<br>Denmark   |
| JULICH  | Zentralbibliothek der Kernforschungsanlage<br>Julich, Julich, Bundesrepublik Deutschland                          |
| H=M.    | Hahn-Meitner-Institute fuer Kernforschung,<br>Berlin, Bibliothek, Glicnicker Strasse 100,<br>1 Berlin 39, Germany |
| KFK :.  | Gesellschaft fuer Kernforschung mbh, 75 Karlsruhe,<br>Postfach 947, Germany                                       |
| KR      | Library, Institute for Atomenergi, Box 40, Kjeller, Norway  |

| N.Z.              | Librarian, N.Z. Institute of Nuclear Sciences, D.S.I.R., Private Bag, Lower Hutt, New Zealand  |
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| NAS               | National Academy of Sciences, National Research<br>Council, Washington, D. C. 20418  |
| NORW              | Norwegian Defense Research Establishment, Library, P. O. Box 25, Kjeller, Norway   |
| NRC               | National Research Council of Canada, Ottawa, Ontario,<br>Canada  |
| NTIS              | National Technical Information Service, U.S. Department of Commerce, Springfield, Va. 22151 \$3.00 copy, \$0.95 microfiche             |
| PAK               | Atomic Energy Center, P. O. Box 658, Lahore,<br>West Pakistan  |
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| Patents<br>(US)   | The U.S. Patent Office, Department of Commerce, Washington, D. C. (\$0.25/copy)  |
| PDR               | USAEC Public Document Room, 1717 H St.,<br>Washington, D. C. 20545 (\$0.25/page)   |
| RCN               | Reactor Centrum Nederland, 112 Scheveningsweg, s-Gravenhage, The Netherlands   |
| SCRPI             | Ministere de la Sante Publique, Service<br>Central de Protection Centre Les Rayonnements<br>Ionisants, B.P. no. 78, Le Vesinet, France |
| Tokyo             | Institute for Nuclear Study, University of Tokyo,<br>Tanashi-Machi, Kitatama-gun, Tokyo, Japan   |
| TURKEY            | T.A.E.C., Cekmece Nuclear Research Center,<br>P. O. Box 1, Airport, Istanbul, Turkey   |
| VDDIT             | Aktiebolaget Atomenergi, Information Office,<br>Scientific and Technical Information, Box 43041,<br>Stockholm 43, Sweden               |
| UKAEA             | United Kingdom Atomic Energy Authority, 11<br>Charles II Street, London, S.W.1, England  |

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