

UNITED STATES GOVERNMENT

Memorandum

Handwritten notes and signatures at top right.

TO : Those listed below

DATE: December 6, 1963

FROM : Curtis A. Nelson, Director
Division of Inspection

SUBJECT: AEC-WIDE INVENTORY OF TECHNICAL PERFORMANCE APPRAISAL PRACTICES

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Attached is copy of a report of the technical appraisal inventory performed at the San Francisco Operations Office. This completes the reports of the inventory of the technical appraisal practices of the field offices and Headquarters divisions included in this study. A summary report is in preparation.

Attachment:
Inventory Report of SAN

Addressees:
Assistant General Managers (1 each)
Heads of Divisions and Offices, HQ (1 each except BM, R, ID, MA, PNE, P - 3 each; RD - 7)
Managers of Field Offices (3 each)
Managers of Area Offices (2 each)

DOE/AL
REPOSITORY ALBA RECORDS Center North Vault, K-3
COLLECTION Consolidated Historical Files
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FY 1964

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ORGANIZATION & MANAGEMENT 17

SAN FRANCISCO OPERATIONS OFFICE

I. Summary of Findings

1. SAN Program

The San Francisco Operations Office is concerned with the administration of contracts in the reactor development, weapons, physical research, biology and medicine and plowshare programs. Technical responsibility for the weapons, physical research, biology and medicine, isotopes development, and Pluto section of the reactor development program has been retained in the Headquarters program divisions. SAN has responsibility for technical direction of the contracts (except Pluto) in the reactor development program and certain of the research and development contracts and agreements in the Plowshare program.

Principal SAN contractors are GE, CA, LRL, UCLA, UCMS and Stanford.

2. Program Management

Technical direction of the reactor program is provided by the Reactor Division. The Special Projects Division maintains technical direction over the work of several government agencies and Commission contractors (except LRL) in the Plowshare program. The Technical Services Division maintains cognizance over the remaining programs but does not have responsibility for the technical direction of these activities. The Directors of all three divisions report to the Assistant Manager for Technical Operations who has overall responsibility for the conduct of all technical appraisals.

3. Appraisal of Technical Performance

- a. Clarity with which responsibility for appraisal of technical performance is assigned. SAN 0701 assigns responsibility for appraisal. In the meantime, personnel of the Reactor Division have been informed through intraoffice memoranda of their responsibilities for appraising the technical performance of contractors under their jurisdiction. Similarly, the Special Projects Division is responsible for appraising programmatic performance under certain Plowshare research and development contracts and agreements administered by them. Although SAN does not have an assigned responsibility for the appraisal of the technical performance of LRL, each of the three program divisions has a requirement to keep SAN management informed of program status and significant problems associated with the laboratory programs.

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b. Principal appraisal devices.

- (1) Site visits
- (2) Review of reports
- (3) Contractor briefings
- (4) Coordination meetings
- (5) Budget analysis
- (6) Telephone contacts

c. Extent to which results of appraisal activities are recorded.

There is no systematic procedure presently in use in the SAN office to record the results of technical appraisal activities. Information gathered through visits, telephone calls and meetings is frequently but not always recorded in correspondence or memoranda to the files. Documentation tended to reflect program status or difficulties and, in a number of cases, included an evaluation of the contractor's performance.

d. Relative dependence upon appraisal devices. No uniform opinion was expressed by the SAN staff with respect to any single "best" appraisal device. It was generally concluded that site visits, budget analysis and the review of reports were the most useful devices.

e. Extent to which appraisal information is reported to higher levels in the chain of command. There has been no formal program for transmitting appraisal information to higher levels in the chain of command. However, the staffs of the three technical divisions were well aware of their responsibilities for keeping SAN management informed as to the technical performance of contractors. Particular problems in technical areas are reported to Headquarters through memoranda and, in addition, there are frequent telephone contacts and occasional visits to Headquarters at which time informally appraisal information is passed on to the Headquarter's counterparts.

f. Extent and frequency with which appraisal information is brought together into an overall evaluation of contractor performance.

Prior to the time of the inventory, SAN had been preparing annual reports containing a summary of the appraisal of the contractor's technical performance for the preceding year. The system has been recently revised and it is planned that appraisals of contractors' overall technical performance will be prepared every three years.

g. Extent to which criteria and other guides have been developed and put to use.

To date no specific criteria or guides have been issued with respect to overall technical performance. Efforts are now underway in the Reactor Division to develop a set of standards upon which to establish a uniform system of contractor appraisal.

II. Details

Introduction

The inventory was made in SAN during March 1963. The nature and purpose of the inventory were explained in a memorandum to the Manager, SAN, from the Director, Division of Inspection, dated February 25, 1963. On March 25, D. M. Frame and W. E. Kriegsman met with the Manager, the Deputy Manager and the Assistant Managers for Administration and Technical Operations of SAN to discuss the inventory in greater detail and to outline the approach which would be taken in the study. The stated approach was to place primary emphasis on surveying and documenting the formal methods by which SAN appraises contractor technical performance and secondarily to study and document the informal, or day-to-day appraisal activities. In this initial meeting the SAN representatives pointed out the organizational groups that are involved in the appraisal of contractor technical performance, and representatives of these groups were briefed on the inventory at a subsequent meeting.

In the course of the inventory the Inspection Division representatives interviewed the SAN personnel listed in Appendix A. They also reviewed a number of formal, annual contractor appraisal reports and various other documents relating to appraisal of contractor technical performance (visit reports, correspondence, etc.). These documents were produced from the SAN files by SAN representatives in the course of the interviews as examples of recorded appraisal information.

1. SAN Program

Reactor Program

Reactor Development activities administered by SAN include research and development in the Civilian Power, Euratom, advanced fuel and reactor concepts and the Pluto Ramjet programs. There is also construction activity in the Advanced Concepts (EBOR) and Pluto Programs. This diversified workload is carried out contractually by several large industrial organizations in California and Nevada as well as the Lawrence Radiation Laboratory whose primary role in the Reactor Program is technical direction and development of the Pluto nuclear ramjet propulsion concept.

In the Civilian Power Demonstration Reactor Program, SAN is administering the R&D aspects of the Consumers Power Company of Michigan boiling water reactor (GE) and the High Temperature Gas-cooled Reactor (GA) at Peach Bottom, Pennsylvania.

Other work, described below, includes R&D in nuclear superheat reactors, fast breeder reactors, thermionic conversion, general nuclear technology, R&D support for the Euratom Program, N.S.

Savannah fuel and materials development and some reactor safety studies. The Experimental Beryllium Oxide Reactor (EBOR) being developed by General Atomic and presently under construction at NRTS, is also administered by SAN.

A. Pluto

SAN's largest single reactor development effort is in the Pluto program being conducted at the Livermore Laboratory and the Nevada Test Site. This program is directed toward development of a flight type reactor for a nuclear ramjet engine designed to propel high speed, low altitude missiles. Testing of the Tory II-C reactor system in Nevada is scheduled to commence in the fall of 1963 in facilities now nearing completion. The scope of the program beyond FY 63 is presently undergoing detailed review. The long range future of the program is largely contingent upon DOD planning and decisions to be made late in FY 64. The AEC program to date has involved expenditures totaling about \$120 million, including facilities.

B. General Electric - APED

The Atomic Power Equipment Department (APED) of the General Electric Company is engaged in research and development projects involving the nuclear superheat concept and superheat fuel elements; fast ceramic reactor technology; Power Demonstration Program research and development; development of Core II and analysis of Core I of N.S. Savannah; fuel development research under the Joint U.S. - Euratom R&D Program; thermionic conversion, fuels and materials development, especially development of advanced fuel for boiling water reactors; and various small projects in reactor physics. In addition, irradiation of fuels and materials for various Commission programs are provided in the General Electric Test Reactor (GETR) and the Vallecitos Boiling Water Reactor (VBWR).

C. General Atomics

The General Atomics Division, General Dynamics Corporation, is currently conducting research and development detailed design, and equipment and fuel procurement and fabrication projects for the AEC under the power demonstration, civilian gas-cooled reactor, and advanced systems programs.

D. Other Research Program Contractors

Smaller research and development programs and engineering studies in the areas of civilian power reactors, satellite and small power sources, general reactor technology, and nuclear safety are being conducted by Advanced Technology

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Laboratories, Aerojet-General Corporation, U. S. Bureau of Mines, California Research Corporation, Geoscience Limited, Kaiser Engineers, Space Technology Laboratories, Stanford Research Institute, Stanford University and the University of California.

Plowshare Program

The Plowshare Program is directed towards developing and demonstrating the feasibility of the use of nuclear explosives for peaceful purposes. Potential uses range from canal construction and other large scale excavations, exploitation of petroleum and mineral resources, other mining applications, chemical processing to desalinization of water.

In addition to a substantial laboratory research and development effort, the Plowshare Program sponsors a program consisting of various excavation and scientific projects conducted by several other government agencies and contractors.

Physical Research Program

The Physical Research Program is carried out primarily at the Lawrence Radiation Laboratory (Berkeley and Livermore) and at Stanford University. About one-third of the LRL Physical Research Program is directed toward high energy physics utilizing the Bevatron and the 184-inch Cyclotron. LRL also carries on large programs in low energy physics, metallurgy, chemistry and controlled thermonuclear reactors. At Stanford, the program consists of high energy physics research and development related to the design and construction of a two-mile linear electron accelerator (SLAC). The first buildings on the accelerator site will be completed early in 1963 and the project is scheduled for completion in 1966.

Weapons Program

The Weapons Program is conducted at the Lawrence Radiation Laboratory at Livermore. The Laboratory, which is operated by the University of California, was established in 1952 as a weapons research and development laboratory to complement the work already underway at the Los Alamos Scientific Laboratory. The Laboratory's work in the Weapons Program now includes the following areas of effort: (1) Large Weapons Research; (2) Small Weapons Research; (3) Test Operations; (4) Weaponization; (5) Basic Nuclear Physics Research; and (6) Basic Chemistry Research. The major research machines now available to support the Laboratory's weapons research effort include a 90" Cyclotron, the two megawatt Livermore Pool Type Reactor and one of the largest computer complexes in the free

world. The Laboratory is also participating in the VELA program which is the Department of Defense Seismic Improvement Program and for this latter program the laboratory is currently providing the technical direction for Project Dribble, the series of underground nuclear tests to investigate seismic decoupling.

Biology and Medicine Program

The Biology and Medicine program is conducted at a number of West Coast universities. In particular, the Lawrence Radiation Laboratory at Berkeley and UCLA both carry on extensive Biology and Medicine programs with special emphasis on radiation therapy and the effects of radiation on biological systems. Programs for the improvement of radiation therapy for treatment of cancer and studies involving the effects of x-rays on animals are carried on at the University of California Medical School (San Francisco). Both LRL and UCLA have numerous studies of general biological processes underway making use of accelerators and/or isotopes as research tools. The long term somatic effects of radiation are under study at the University of California (Davis). A colony of dogs is being subjected to radiation of varying levels and the effects over the life span of the dogs are being studied.

Isotopes Development Program

Small contracts investigating special applications of radio-isotopes are carried out by some eight or ten commercial concerns and universities.

2. Program Management

Technical management of the contracts administered by SAN has been assigned to the Reactor Division, the Technical Services Division and the Special Projects Division. The assigned functions of these divisions differ somewhat due to the variation in assigned responsibility between the various technical programs. As noted below a number of Headquarters divisions have retained responsibility for the technical direction of contractors performing R&D in their particular areas of interest. For this reason the primary role of the Technical Services Division is to maintain cognizance of the technical programs rather than provide technical direction. The Reactor Division on the other hand has an assigned responsibility for technical direction in all reactor programs except Pluto, and the Special Projects Division has the responsibility for the technical direction of the work of several Plowshare contractors (except LRL) and participating government agencies. A summary of the management relationships was provided by members of the SAN staff and is summarized as follows:

Reactor Program

The Reactor Division has assumed responsibility for the technical direction of all of the reactor contractors except LRL. LRL's technical effort on Pluto is conducted under the direction of the Director, Division of Reactor Development, Headquarters, acting for the Assistant General Manager for Research and Development. DRD furnishes to SAN policy guidance and specific technical assistance on other reactor contracts.

Flowshare Program

Overall direction of the Flowshare Program, including the establishment of basic operating policies, is the responsibility of the Division of Peaceful Nuclear Explosives, Headquarters. SAN has been assigned specific responsibilities by DPNE which include: (1) centralized financial management of the overall program; (2) development of program guidance for budget formulation and preparation of the consolidated program budget; (3) development of the technical information program for Flowshare and other informational needs of the program; and (4) initiative action in program development activities including industrial participation. The primary technical direction of the program rests with LRL at Livermore and accordingly, the scientific program integral to the field projects and experiments are under their direction.

Physical Research Program

Technical direction of the physical research programs conducted principally at LRL in Berkeley and Livermore and at Stanford Laboratory is a responsibility of the Division of Research, Headquarters. SAN has responsibility for administration of all aspects of these contracts except technical direction.

Weapons Program

Program direction of the weapons research and development efforts at LRL is provided by the Division of Military Application, Headquarters. SAN has responsibility for administration of all aspects of these contracts except technical direction.

Biology and Medicine Program

Program direction of the biology and medicine program is provided by the Division of Biology and Medicine, Headquarters. SAN has responsibility for administration of all aspects of these contracts except technical direction.

Isotopes Development Program

Program direction for the isotopes development program is provided by the Division of Isotopes Development, Headquarters. SAN has responsibility for administration of all aspects of these contracts except technical direction.

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3. Appraisal of Technical Performance.

- a. Clarity with which responsibility for appraisal of technical performance is assigned. Responsibility for the appraisal of the technical performance of the contractors under the administration of SAN follows the assignment of responsibility for technical direction. In the case of the reactor program (except Pluto), where responsibility for technical direction has been assigned, SAN Reactor Division personnel understand, through oral instruction and intra-office memoranda that they have responsibility for technical appraisal. In addition job descriptions for these individuals clearly state that the evaluation of technical performance is an assigned function.

With respect to the other technical programs administered by SAN, the assignment of responsibility varies from nonexistent to a point where some degree of responsibility is assumed if not assigned. With respect, for example, to the technical performance of UCRL, a memorandum from Goodbread to Shute dated August 8, 1962, which transmitted the 1961 appraisal report stated:

"In view of the reorganization of August 1961 establishing Headquarters direct programmatic direction for the National Laboratories, no attempt has been made to evaluate the technical or programmatic aspects of the work performed under the contract. In some cases, the SAN staff has prepared brief reports covering the technical performance which are interesting. However, in view of the reorganization and lack of standards, comments in these areas are not very meaningful in the context of this summary report."

In the case of the Biology and Medicine, Physical Research, Isotopes Development and Plowshare programs, the Technical Services Division has a responsibility for informing the Headquarters divisions of "matters of significance" and the technical staff includes in the annual summaries some statements of appraisal of technical performance. For the Pluto program, information useful for appraisal purposes is gathered and forwarded to Headquarters by SAN as a service, but is not a formally assigned responsibility. SAN's responsibility in the Plowshare program results in the transmittal of program information, special reports, financial data, etc., to DPNE which can be used in the appraisal function of Headquarters as necessary.

b. Inventory of principal appraisal devices.

- (1) Site visits. With respect to the reactor program, site visits constitute a major portion of the staff's efforts. Individual staff members frequently visit the facilities of the principal contractors as is shown in the following table which provides an approximation of the number of visits made during FY 63.

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<u>Program</u>	<u>Major Contractors</u>	<u>No. of Visits</u>
Space Nuclear Propulsion	LRL, GE, GA	80
Civilian Power	GE, GA	100
Maritime Reactors	GE	12
General Reactor Research, Development & Engineering	GE, GA, ATL, AGN, STL, etc.	100

Information is gathered by the Technical Services Division with respect to the activities at LRL through informal visits. Until recently a technical staff member was assigned to the Livermore site on a permanent basis. Following the August 1961 realignment of program responsibilities, however, the need for continual staff representation at LRL was determined to be unnecessary and the employee was transferred to the Berkeley office. No particular record is maintained of the number of visits made to LRL but it was stated that frequent visits are made to the site.

Staff members of the Special Projects Division visit LRL, NV, NTS and the other government agencies and contractors involved in Plowshare program at the rate of about a total of 100 visits per year.

- (2) Review of reports. The contractors in the Reactor Program are required to submit routine periodic progress reports on monthly, quarterly or sometimes an annual basis. The reports vary depending upon the nature of the R&D effort but provide detailed information regarding the progress achieved during the reporting period. In addition to the progress reports, topical reports are also prepared by the contractors. These reports treat a specific subject in great detail and cover varying periods of time. Personnel of the Reactor Program stated that they review both the progress and topical reports in great detail. With respect to the Plowshare Program, those contractors receiving program guidance and technical direction from SAN are required to submit routine monthly progress reports. In addition, SAN receives progress and status reports from other program participants. On the basis of these reports and day-to-day awareness of the program, SAN prepares reports, studies and general memoranda concerning the status of the program and its financial character. Reports dealing with particular problems or problem areas receive, of course, greater attention. In addition, the contractors,

together with the Project Engineers, have established various progress reports in order to identify completion of certain milestone events and to identify the rate of expenditures of government funds.

- (3) Contractor briefings. A formal contractor briefing is held at SAN or at the contractor's site every three months. The purpose of this briefing is to provide an up-to-date report of the contractors program status as well as to provide a forum for discussing the technical problems which may have arisen during the preceeding quarter.
- (4) Coordination meeting. SAN is represented at the semi-annual coordination meetings called by DRD for the purpose of bringing together all Headquarters, field and contractor personnel involved in a major program area. At these meetings program status is discussed as well as broad program difficulties. The major purpose, however, is to provide an interchange of technical information among the various groups represented.
- (5) Budget analysis. Information on which to base judgements of contractor performance is derived through various budget review procedures. These involve comparison of new 189's with previously submitted ones, the midyear review process and an annual budget analysis conducted each September.
- (6) Telephone contacts. A number of members of the SAN staff stated that considerable information of a technical nature is obtained by them through frequent telephone contacts with these counterparts on the contractor's staff.
- (7) Plowshare Quarterly Program and Budget Reviews. On a quarterly basis, SAN conducts a Plowshare Program and Budget review with DPNE, LRL and NV in attendance. The purpose of the review is to discuss necessary program changes, formulate revised technical plans if needed, and develop new structuring of the financial plans for the fiscal year. Following these reviews, SAN prepares the Financial Planning Guidance memorandum which documents the proceedings of the Review and provides detailed guidance to all major participants.

c. Extent to which results of appraisal activities are recorded.

- (1) Review of reports. There has been no formal record maintained by the SAN staff of the review of the reports transmitted by the various reactor contractors. Nevertheless, when serious deficiencies have been noted in the reports, the deficiencies are called to the attention of the contractor by letter.

- (2) Meetings and visits. Meetings with contractor personnel and visits to the contractors facilities are recorded in one of two forms. Either a memorandum is prepared for the signature of the Director of the Reactor Division and addressed to Headquarters and to the contractor which reflects commitments made, decisions reached or the corrective action which will be required or a memorandum is prepared to the files merely documenting the salient points discussed by the SAN representatives. An examination of the files showed that memorandum reports were prepared for many trips and meetings. The memoranda were normally confined to findings of fact but, in a number of instances, contained statements of appraisal.
- (3) Telephone log. Most of the individuals contacted maintained a telephone log containing a brief statement of the substance of any conversation with contractor personnel. These telephone logs provided information upon which the individuals concerned could render appraisal judgements but did not, in and of themselves, provide a written record of appraisal judgements.
- d. Relative dependence upon appraisal devices. The individuals interviewed in connection with this review varied considerably in their opinions of the relative importance of the various appraisal devices. It was the opinion, however, of all the individuals that three devices, namely, site visits, the budget review process and report review constituted the major sources of information regarding contractor performance. It was observed by two individuals that since most of the reactor contracts involve fundamental research or development, the preparation of reports is probably as important a characteristic as any other, and for this reason they base much of their appraisal on the reports received at SAN.
- e. Extent to which appraisal information is reported to higher levels in the chain of command. Appraisal information is furnished Headquarters by means of memoranda, telephone calls or visits according to the SAN staff members interviewed. The memoranda generally are concerned with specific problems or problem areas and report the findings of SAN's investigation. The memoranda reporting the results of these investigations normally contain statements evaluating the contractors technical performance. The frequent telephone contacts and occasional visits to Headquarters involve the transmission of informal appraisal information to the Headquarters counterparts of the SAN staff members. The staffs of the three technical divisions were well aware of their responsibilities for keeping SAN management informed as to the performance of contractors. An example of reporting to Headquarters occurs in SAN's assigned Plowshare duties involving the review of total project plans (including later changes) which result in formal recommendations to DPNE.

- f. Extent and frequency with which appraisal information is brought together into an overall evaluation of contractor performance. In the past, summary appraisals of contractors' overall performance have been prepared by the SAN office on an annual basis. It is now intended that formal appraisals will be prepared on a three year basis with each one of the major contractors thus completely covered at least once within the term of the contract.
- g. Extent to which criteria and other guides have been developed and put to use. There are at present no formal guides in the SAN office for use in the preparation of technical appraisal reports. Guidance, however, is being prepared within the Reactor and Special Projects Divisions and it is anticipated that this will be available during the next appraisal cycle.

Criteria upon which the performance of the SAN contractors was judged were reported to be the following:

- (1) The quality of the technical reports as well as the timeliness of the submission of the reports.
- (2) Schedule compliance.
- (3) The ability to estimate costs and predict expenditure rates.
- (4) The results or technology developed as a result of the research effort.

APPENDIX A

SAN PERSONNEL CONTACTED IN TECHNICAL APPRAISAL SURVEY

E. C. Shute, Manager

Charles F. Schank, Deputy Manager

Paul M. Goodbread, Assistant Manager for Administration

Russell H. Ball, Assistant Manager for Technical Operations

W. H. Brummett, Jr., Director, Contracts Division

Lt. Col. John B. Radcliffe, Director, Reactor Division

Carl V. Backlund, Deputy Director, Reactor Division

John P. Holliday, Project Engineer

Robert D. DeWitt, Project Engineer

Fred W. Hunton, Project Engineer

John F. Philip, Director, Special Projects Division

R. W. Hughey, Director, Technical Services Division

Fred J. Clark, Jr., Senior Project Engineer

Loren J. Beaufait, Chief, Health and Safety Branch