



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report No.: 70-1113/94-05

Licensee: General Electric Company
Wilmington, NC 28402

Docket No.: 70-1113

License No.: SNM-1097

Facility Name: General Electric Company

Inspection Conducted: May 9-13, 1994

Inspector: E. J. McAlpine
G. L. Troup, Sr. Fuel Facility Project Inspector

6/2/94
Date Signed

Approved by: E. J. McAlpine
E. J. McAlpine, Chief
Radiation Safety Projects Section
Nuclear Materials Safety and Safeguards Branch
Division of Radiation Safety and Safeguards

6/2/94
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of management controls, nuclear criticality safety, facility operations, surveillance testing, and facility modifications and changes. In addition, previous inspection findings were reviewed.

Results:

Within the scope of the inspection, no violations or deviations were identified. One new item for review during future inspections was identified (IFI 94-05-01, paragraph 8.d).

The licensee has developed modification programs for two waste streams in conversion. Once these are complete, a separate project will be initiated to remove slab tanks.

The licensee has initiated actions to dispose of accumulations of waste which are not recoverable, and has initiated actions to better control organic wastes which are awaiting processing. A plan has also been developed for the reduction of current accumulations of waste as well as the generation of new accumulations.

Continued actions are in progress to up-grade operating procedures and nuclear criticality safety computer programs.

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REPORT DETAILS

1. Persons Contacted

- *D. Brown, Team Leader, Environmental Processes
- *M. Chilton, Manager, Chemical Product Line
- *D. Dowker, Team Leader, Operations Support
- *R. Foleck, Sr. Specialist, Licensing Engineering
- *T. Hauser, Manager, Environmental Health & Safety & Nuclear Quality Assurance
- *J. Huffer, Engineer, Criticality Safety Engineering
- *B. Kaiser, Manager, Fuel Fabrication Product Line
- *M. Lamb, Engineer, Uranium Recovery Process
- A. Lehmann, Principal Engineer, Environmental Processes
- *D. McCaughey, Manager, Configuration Management
- R. McGowan, Manufacturing Engineer, Operations Support
- *S. Murray, Manager, Radiation Safety
- *G. Smith, Team Leader, Fuel Manufacturing Operation Maintenance Support
- *H. Strickler, Manager, Environmental Protection & Industrial Safety
- *J. Taylor, Principal Engineer, Criticality Safety Engineering
- *F. Welfare, Manager, Criticality Safety Engineering
- *P. Winslow, Manager, Emergency Preparedness, Security, Material Control & Accountability

Other licensee employees contacted included engineers, Area Coordinators, operators, technicians and maintenance personnel.

*Denotes those present at the exit interview on May 13, 1994.

2. Nuclear Criticality Safety (88015)

- a. Chapter 4 of the license application defines the licensee's program for nuclear criticality safety. In this chapter, the acceptable computer codes for use in nuclear safety calculations are reviewed. The licensee has been converting the computer codes which had been used on the minicomputer to a format which can be used on microcomputers. The code GEKENO had previously been approved for use in the microcomputer form (Inspection Report 70-1113/93-06, paragraph 4). A licensee representative informed the inspector that the code GEMER was in the process of being converted.
- b. Policy/Procedure (P/P) 120-13 defines the program for defining and generating new or changes to computer programs. The inspector verified that a Software Service Request (SSR) had been prepared and approved, and that both the Software Engineer and the Software Owner (Manager, Criticality Safety Engineering) had approved a Test Plan for the microprocessor version of GEMER on March 18, 1994. The Test Plan specifies the plan for the conversion and covers the necessary steps to validate the rewritten code in accordance with ANSI/ANS-10.4, "Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry" and ANS-8.11/N16.9, "American National

Standard for Validation of Computational Methods for Nuclear Criticality Safety." The plan includes very specific acceptance criteria for the validation. Once the validation is complete, P/P 120-13 specifies requirements for documentation and training before the code can be placed in use.

- c. The conversion of GEMER to the microprocessor version is on-going and will be reviewed as the process continues.

Within the scope of the inspection, no violations or deviations were identified.

3. Waste Management (88015, 88020)

- a. The licensee has accumulated radioactive waste as the result of normal operations. Some of this waste is classified as "dry combustible waste" which will be processed through the incinerator, and ash from the incinerator (which contains recoverable amounts of uranium). Other categories of waste include "burial" (materials which are ready for shipment to a low-level waste disposal facility), in-process scrap material (material from various stages of the process which can be recycled through the uranium recovery process) and spent solvent (organic material from the Solvent Extraction process which contains residual uranium as well as lubricating oils which contain residual uranium). The inspector reviewed the accumulations of such materials with the cognizant managers and discussed the projected processing to reduce the volume of waste on the site.
- b. The licensee had an inventory of scrap materials which had residual uranium contamination. These materials were evaluated for possible recovery. Subsequently, it was determined that the recovery was not cost effective and the materials were processed by volume reduction and sent for disposal.
- c. The spent solvents represent a hazard for organic contamination of the soil or ground water in the event of a container failure or leakage. A project had been developed to move the spent solvents into a controlled storage facility, which would protect the containers from the weather and provide controlled conditions to contain a possible leak. Facility Change Request (FCR) #94.0238 for the storage of solvent drums in a protective environment had been approved for "install at risk" on April 28, 1994 while the nuclear criticality safety analysis was being completed.
- d. The inspector toured the proposed storage facility with a licensee representative. The floor, which consisted of several concrete slabs, had the area around the slab seals roughed ("scrabbled") and then coated with a sealant and a curb (with the seams sealed) erected all around the proposed storage area. The representative informed the inspector that the floor would be cleaned and then coated, and the approved storage areas marked with painted areas

on the coating. The storage area was also provided with a ramp over the curb to permit the entry and exit of drums while maintaining the integrity of the curb.

- e. On May 13, 1994, the inspector reviewed the approved nuclear criticality safety analysis for the storage of the drums, and discussed the analysis with the analyst. Computational methods used were in accordance with the license and a qualified second party had reviewed and concurred with the analysis. The analysis confirmed that the storage proposed in the FCR was acceptable. The inspector stated that the actual storage facility would be reviewed in a future inspection.
- f. An additional project being undertaken by the licensee to reduce the volume of waste being stored on site is the processing of Secondary Nitrate Waste solids for disposal. These wastes have been accumulated on the basis that the residual uranium could be recovered. Licensee representatives informed the inspector that it had been determined that these materials could best be handled by disposal and that a contract had been established for the solidification and disposal of these materials. The analysis for the disposal project had not been completed, but the basic concept was reviewed by the inspector. The licensee is also developing a measurement system to assay the containers and confirm previous quantity measurements. The confirmation is necessary to assure that each container of solidified waste conforms to the quantity limits for the disposal facility. This will be reviewed in future inspections.
- g. In addition, the licensee has prepared a plan for the reduction of waste materials on the site ("1994 Plan for Reduction of Scrap on Pads", dated April 29, 1994). This plan addresses the present situation of waste as well as addressing actions which will reduce the rate of accumulation of wastes (as well as possible implementation costs). These steps will be reviewed as part of future inspections.

Within the scope of the inspection, no violations or deviations were identified.

4. Configuration Management (88005, 88020, 88025)

- a. A continuing issue since the May 29, 1991 incident (refer to Inspection Report 70-1113/91-03 and NUREG-1450) is the matter of configuration management. Configuration management refers to the process whereby a manager has established that the current design is correctly reflected on the process drawings, procedures and related documents, and that any changes or modifications are properly documented and recorded on these documents. Prior to the restart of the waste systems and the Solvent Extraction system (Inspection Reports 70-1113/91-03 and 70-1113/91-06), one of the

principal issues was to assure that the Process & Instrumentation Diagrams (P&IDs) and associated documents reflected the physical (actual) conditions of the systems.

- b. An individual has been designated as "Manager, Configuration Management", who will ultimately be responsible for a "Configuration Management Team." The initial effort is to establish a "baseline" for drawings, procedures, technical reports, etc. and then assuring that these documents represent the existing conditions of the systems. Once the baseline is established, a program will be established which assures that, as changes are made, the appropriate documents are promptly revised. This will assure that P&IDs, Operating Procedures, Technical Reports, Functional Test Instructions (FTIs) and other related documents reflect the revised system configuration.
- c. A licensee representative advised the inspector that a P/P was being developed which would define the actual process to accomplish the Configuration Process. After reviewing the program, the inspector noted that the establishment of the baseline program would be very intensive but the result would be very beneficial. Implementation of the configuration management program will be reviewed in future inspections.

Within the scope of the inspection, no violations or deviations were identified.

5. Facility Changes and Modifications (88015, 88020, 88025)

The inspector discussed the status of two systems modifications in the conversion area. Both changes have concepts developed and P&IDs is the process of being finalized. The inspector discussed the proposed schedules for both projects, which should be finished by the end of the calendar year. Once the modification to the Fluoride Waste system is completed, the slab tanks will be removed from service. A separate project will be initiated to remove the slab tanks. The progress of both modifications will be reviewed during future inspections.

Within the scope of the inspection, no violations or deviations were identified.

6. Operations (88020, 88025)

- a. During the inspection, the inspector toured various plant areas to observe conditions and operations in progress. Items observed including storage of materials in authorized locations, enrichment of materials in accordance with posted limits, proper storage containers for flammable liquids and general plant housekeeping. The inspector also noted that fire extinguishers were current on the monthly inspections, and that the extinguishers and fire hoses were unobstructed.

- b. The inspector reviewed logs and discussed the performance of periodic inspections and tests with shift personnel. The licensee has developed a computer program to track the shift inspections and data recording, including those required by nuclear safety or radiation safety. At the beginning of the shift, the Area Coordinator gets a print-out of what must be done that shift. After the operators take the readings and do the checks, the results are entered into the data base. Any item which is not completed remains open on the list and tells the supervisor that it needs to be completed. The information can be recalled to look for trends. Functional tests (FTIs) are tracked in a different system used for maintenance scheduling (MIPVAX). Each week, the Area Coordinator receives a print-out of the FTIs that are due that week. Once the test is completed, the completion is logged into the system, which then schedules it again for the next period.
- c. The inspector also reviewed the results of the monthly samples and inspection of V-103 for possible accumulations (PROD 80.77). The results for each month in 1994 did not show the presence of any organic carry-over from the Solvent Extraction system. Weekly checks of the Aqueous Waste tanks (V-290, -291) were also negative.

Within the scope of the inspection, no violations or deviations were identified.

7. Procedures and Training (88005, 88010, 88020)

- a. The licensee is in the process of converting from Process Requirements and Operator Documents (PRODs) to Operating Procedures (OPs). Whereas the PRODs contained all requirements for a system or piece of equipment, the OPs will be more specialized as far as the scope and will have separate procedures for the control room and floor operators, where reasonable and practical. Part I, Chapter 2, Section 2.7.1 of the license application permits the use of both PRODs and OPs.
- b. A P/P (P/P 10-09) has been prepared for the Operating Procedures. This P/P is currently in the review and approval cycle. Chemical Product Line Section Administrative Routine (SAR) 350-10 defines the scope of OPs, and Appendix A of the SAR is a Style Guide for procedure writers. Actual procedure writing is being performed by operators with review by the Area engineer and review/validation by other shift operators. Discussions with involved personnel indicated strong support for the format and the operator involvement in the writing. Implementation of the first of the new OPs is scheduled after the inventory shutdown.
- c. The licensee is conducting various training classes for personnel. A new class involves how to read and understand P&IDs. The class requires that students take a P&ID and walk down part of the

system to compare it with what is shown on the P&ID. This is becoming a popular course with demand for space increasing, according to the Team Leader.

Within the scope of the inspection, no violations or deviations were identified.

8. Follow-up on Previous Inspection Findings (88005, 88015, 88020)
- a. (Open) Corrective Actions on Outside Criticality Safety Audit (IFI 94-03-02)

Part I, Chapter 2, Section 2.8.3 of the license application requires that audit of the nuclear criticality safety program be conducted every two years by an outside group. The audit was conducted in October, 1993. Three findings were identified which required action by the licensee. During the conduct of the inspection documented in Inspection Report 70-1113/94-03 the audit report was reviewed but the corrective actions had not been completed. Three of the audit findings were reviewed to determine that corrective actions had been completed as scheduled or were in progress.

- (1) Standardization of Moderation Control Area Signs

New, standardized signs for moderation control areas in the conversion area were installed. The signs had not yet been installed in other areas but the basic signs have been developed.

- (2) Evaluation of Concrete Separating UNH (sic) Slab Tanks

This issue related to the use of a specific type of concrete in the nuclear criticality safety evaluation but a lack of data showing that possible variations in the hydrogen content of the concrete. The evaluation of this item is still on-going because of the efforts to establish the hydrogen content of the concrete. The licensee is attempting to get a contract to perform evaluations of the actual hydrogen content of the installed concrete.

The inspector discussed the use of the tanks while the evaluation is in progress with the cognizant manager and reviewed the original nuclear criticality safety analysis for the tanks. Under the existing operating conditions, the analysis showed that the margin of safety was sufficiently below the operating limits that variations in the concrete would not result in exceeding the normal operating effective neutron multiplication factor. The inspector had no further questions about the continued use of the tanks while the evaluation is still in progress.

(3) Define the margin of safety

The established completion date for this item has not been reached. The inspector discussed the actions being taken with cognizant personnel but the corrective action has not been completed.

b. (Closed) Follow-up on Injury Investigation Report (IFI 94-03-03)

On February 16, 1994, a maintenance mechanic was injured while working on a filter in the Chemical Conversion waste area. The licensee had established an investigation team to review the incident.

The inspector reviewed Unusual Incident Report ChPL-9408, which was the resulting report of the team critique of the incident. The result of the investigation identified several deficiencies, the principal findings being that, although there exists a procedure for "Lock, Tag and Try" (Safety, Health and Fire Protection Manual Procedure 302), the procedure is more applicable to electrical systems than piping systems. A new procedure was written and issued in the Safety, Health and Fire Protection Manual, #323- "Line Breaking", which establishes minimum requirements for breaking or working on "any line, connected fitting, valve, pump or vessel." In addition to specifying requirements for opening or breaking the line, the procedure also specifies the requirements to be completed before the job is "done" (e.g., return to service).

The investigation report also addressed other deficiencies in communications and the actions to address the deficiencies.

c. (Closed) Management Control for the DCS and Other Systems

A P/P (Policy/Procedure) has been prepared for computer systems (P/P 120-13) had been issued for computer systems but this was more relevant to data processing systems. The licensee had determined that a separate document specific for control systems (such as Distributed Control Systems- DCS and Programmable Logic Controllers - PLCs) was needed.

P/P 120-15 had been prepared to address the specific requirements for DCS and PLCs. During the inspection period, all necessary concurrences were obtained. The procedure will be issued.

d. (New) Review Independent Audit Report and Findings for Radiation Safety Audit

Part I, Chapter 2, Section 2.8.3 of the license application requires that an external radiation safety be conducted every two years. The licensee had requested NRC concurrence to delay this audit from 1993 until 1994 because the new requirements of

10 CFR 20 became effective on January 1, 1994 (refer to Inspection Report 70-1113/93-11, paragraph 4.d). It was more meaningful to have the audit performed on the newly revised and implemented programs rather than on programs which were about to be revised. The NRC had concurred with this action provided that the next audit be completed by the end of 1996.

Licensee representatives informed the inspector that the audit had been conducted during the period May 3-6. The report and findings had not been received at the time of this inspection. The inspector informed licensee management that the report, findings and corrective actions would be reviewed during a subsequent inspection. This will be tracked as Inspector Follow-up Item 94-05-01.

Within the scope of the inspection, no violations or deviations were identified.

9. Information Notices (INs) (88020, 88055)

- a. IN 94-31 dealt with failures of Wilco fire hose nozzles at test pressures below the rated operating pressure. This IN was issued by the Office of Nuclear Reactor Regulation and was distributed to power reactors with an operating license or construction permit. Region II sent copies of this IN to all fuel facilities in the region because of the potential applicability to those facilities.

The inspector discussed this IN with the cognizant personnel. They had reviewed the IN and determined that the particular nozzle was not used at the site. While "plastic" nozzles are used on the site, no problems have been encountered with the nozzles. However, they will maintain oversight of them for any problems.

- b. IN 94-23 forwarded an Environmental Protection Agency notice on waste minimization programs as they relate to mixed waste or hazardous wastes. The inspector verified that this IN had been received and forwarded to responsible managers for review.

A licensee representative discussed the IN with the inspector. In November, 1993 the "Pollution Prevention Plan" was approved by the General Manager, Nuclear Energy Production. This Plan implements General Electric Corporate Policy 20.3, "Health, Safety and Environmental Protection", the U.S. Environmental Protection Agency regulations and the North Carolina Resource Conservation and Recovery Act. The plan specifies requirements for reduction, elimination and recycle of waste streams to reduce potential risks.

Within the scope of the inspection, no violations or deviations were identified.

10. Exit Interview (30703)

On May 13, 1994, the scope of the inspection and the findings were discussed with those persons identified in Paragraph 1.

One new Inspector Follow-up Item (94-06-01, paragraph 8.d) was identified for further review of the external audit report and findings of the radiation safety program.

The inspector also discussed the reasons for keeping IFI 94-03-02 open (paragraph 8.a), and stated that IFI 94-03-03 was closed.

No dissenting comments were stated by licensee representatives concerning the inspector's findings and comments.

Although proprietary documents were reviewed during the inspection, the proprietary nature of the documents has been deleted from this report.