



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W.
ATLANTA, GEORGIA 30323

OCT 30 1989

Report No.: 70-1113/89-12

Licensee: General Electric Company
Wilmington, NC 28401

Docket No.: 70-1113

License No.: SNM-1097

Facility Name: General Electric Company

Inspection Conducted: September 26-29, 1989

Inspector: *[Signature]*
D. Kasnick, Fuel Facility Inspector

10/27/89
Date Signed

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

10/27/89
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of management organization and controls, training, criticality safety, and operations review. Followup on one allegation was performed.

Results:

Wilmington Safety Review Committee meetings, training, records, criticality safety analyses, and quarterly criticality safety audits met regulatory requirements and otherwise appeared adequate. Preparatory measures for high winds appeared adequate. False criticality alarms due to lightning storms and related modifications to the alarm system appear to be being handled responsibly. An allegation related to the criticality alarm system, while substantiated, does not justify safety concern since adequate compensatory measures were being provided.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *B. Beane, Manager, FMO Maintenance
- *B. Bentley, Manager, Fuel Production
- *G. Bowman, Senior Program Manager, Nuclear Safety Engineering
- R. Foleck, Senior Specialist, Licensing Engineering
- G. Frye, Automatic Equipment Assembler
- *S. Murray, Senior Nuclear Safety Engineer
- *R. Pace, Manager, Powder Production
- *W. Peters, Principle Engineer
- M. Prosser, Senior Engineer/Technical Leader, Instrumentation
- J. Still, Engineer, Plant Engineering and Maintenance
- *J. Taylor, Senior Nuclear Safety Engineer
- *D. Teachey, "A" Operator
- *C. Vaughan, Manager, Regulatory Compliance
- S. Watkins, Automatic Equipment Assembler
- *T. Winslow, Manager, Licensing and Nuclear Materials Management

*Attended exit interview

2. Wilmington Safety Review Committee Activity (88005)

The inspector reviewed the functions and responsibilities of the Wilmington Safety Review Committee (WSRC) with GE representatives and reviewed GE documentation associated with WSRC meetings. GE procedure P/P40-1 "Wilmington Safety Review Committee," Revision 8, dated October 23, 1987, establishes the WSRC and designates more than five senior members of the GE technical staff as committee members. The inspector reviewed WSRC meeting minutes dated November 23, 1988 and May 9, 1989. Minutes for a meeting held on September 21, 1989 had not yet been prepared. The minutes reflected the WSRC's review of nuclear and industrial safety items and the tracking of these items to completion. The frequency at which WSRC meetings are occurring is consistent with the license requirement of four meetings each calendar year with no more than 180 days between consecutive meetings. WSRC meeting minutes are distributed to the GE Wilmington facility management and to affected section level managers. All areas inspected regarding the WSRC, as described above, were in compliance with Paragraph 2.3.1 of the license application.

No violations or deviations were identified.

3. Training (88010)

Paragraph 2.6 of the license application requires that employees complete formal nuclear safety training prior to being allowed unescorted access to controlled areas. Additionally, the license application requires retraining every two years. The inspector discussed the nuclear safety training program with a GE representative and inspected employee training records. The inspector also viewed a video tape of the July 1989 annual training lecture and noted that the results of the recent ALARA inspection were addressed.

No violations or deviations were identified.

4. Nuclear Criticality Safety (88005, 88015, 88020)

- a. The inspector reviewed two recently documented criticality safety analyses and discussed them with a GE representative. One analysis addressed a dewatering centrifuge scrubber and the other addressed a roof scrubber. Both analyses had received an independent review as required by Paragraph 2.5.2.1 of the licensee application. Both analyses were performed so as to determine fuel processing limits and any further nuclear safety requirements for fuel processing and handling operations so as to comply with the Double Contingency Principle as is required by Paragraph 4.1.1 of the license application.

No violations or deviations were identified.

- b. The inspector reviewed quarterly nuclear safety audit reports which are required by Paragraph 2.8.1 of the license application for the first and second quarter audits. The third quarter audit was in process. The findings noted in the reports were not violations of NRC requirements and it appeared that they were being addressed and resolved in a timely manner. The audit report had been distributed to required management personnel. Inspection items for these audits come from a random selection of Nuclear Safety Requirement which have been defined for fuel processing operations.

No violations or deviations were identified.

- c. The inspector had an extensive discussion with a Senior Nuclear Safety Engineer regarding changes and modifications being made to a GE criticality safety computer code. Validation of modifications and changes to this GE code is almost complete.

No violations or deviations were identified.

5. High Winds Preparation (88020)

The inspector discussed with several GE representatives the preparatory measures that were taken in anticipation of high winds from the hurricane which recently struck the southeastern coast of the United States. Discussions indicated that all actions taken were in accordance with GE's NRC approved emergency plan and their implementing procedures. The inspector stated that actions taken appeared adequate and that further more detailed followup on this subject would probably be performed by an NRC Emergency Preparedness inspector.

No violations or deviations were identified.

6. Criticality Warning System: False Alarms; Modifications; Allegation Followup (88005, 88015, 88020, 90014)

The inspector discussed, with several GE representatives, problems that GE has been experiencing with their Criticality Warning System (CWS). The outdoor portion of the system has been falsely alarming when lightning storms are nearby and as a result of other electrical transients.

The Eberline CWS was modified in early 1989. The reason for this initial modification was to centrally locate DAMs (Data Acquisition Modules) and, more specifically, to then provide weather protective housing for the DAMs. During the upgrade the four outside DAMs were relocated to a central point in the electrical substation northwest of FMOX. Since this relocation, electrical storms have damaged both the detectors and the DAMs and maintaining an adequate system has strained maintenance resources. One major problem appears to be that the longer signal lines (the detectors to the DAMs) are more susceptible to electrical pulses from lightning. The vendor, for subsequent modification designed and built electronic boards that will protect the DAMs and the detectors from electromagnetic pulses created during a lightning storm and GE is still in the process of installing them.

During these repair periods, RM-16 detectors have been hooked up to the DAMs in a fail-safe mode as a backup criticality system, with one RM-16 per DAM and connected to the local alarm for the DAM. This local alarm, in addition to sounding a corresponding local horn, would be detected in the Radiation Protection office. This type of backup coverage is addressed in GE procedure No. NSI 0-4.0, "Nuclear Safety Instrumentation", Rev. 26 dated 9/13/89, Appendix C, "Instructions for Inspection of the Criticality Warning System", and in a subordinate I&C computer data based procedure. These procedures include requirements for source checking the detectors.

Due to the frequent occurrence of lightning storms earlier this year, on 6/26/89 the manager of Regulatory Compliance called a meeting of key GE Wilmington personnel to discuss previous false alarms, previous lightning damage to the system, difficulties related to working "bugs" (related to modifications) out of the system, and the risk of further lightning induced

false alarms and system damage while modifications were still on-going. This meeting resulted in a decision, while the design modification were being made, to protect the outside CWS electronics and detectors and reduce further damage that would delay the return of the outside CWSs to normal operating status. In order to prevent lightning damage and still maintain CWS coverage, temporary procedures were implemented to disconnect the CWS detectors in case of an imminent thunderstorm and hook up the RM-16s. This procedure was used from 6/30/89 until 7/7/89 when NSE discontinued the practice based on lightning protection progress.

The inspector addressed this entire subject with several cognizant GE representatives, including an interview with the two electronics technicians who were involved with the modification work and the system protective measures discussed above. Both of these technicians stated that at no time was there a failure to provide backup detection coverage as described above; i.e. procedures were followed.

In addition to followup on GE's CWS regarding false alarm frequency and system modifications, NRC had also received an allegation regarding the CWS. The allegation, as Region II received it, stated that the alleged "was concerned that General Electric was disconnecting the criticality alarm system detectors and circuit boards whenever an electrical storm approached the plant. General Electric was doing this to prevent false alarms and to protect the equipment." Based on the above described investigation the inspector concluded that the allegation is substantiated in that GE was indeed disconnecting the criticality alarm system detectors and circuit boards whenever an electrical storm approached the plant and was doing this to prevent false alarms and to protect the equipment. However, as discussed above, they were also providing backup detection coverage and therefore there is no safety concern. This item is closed.

7. Exit Interview

The inspection scope and results were summarized on September 29, 1989, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results described above. Although reviewed during this inspection, proprietary information is not contained in this report. Dissenting comments were not received from the licensee.