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REGION II

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Report No.: 70-1113/99-05

Licensee: General Electric Company

Facility: Nuclear Energy Production

Location: Wilmington, NC 28402

Dates: August 9-13, 1999

Inspector: A. Gooden, Radiation Specialist

Approved By: E. McAlpine, Chief
Fuel Facilities Branch
Division of Nuclear Materials Safety

Enclosure

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EXECUTIVE SUMMARY

General Electric Company
NRC Inspection Report 70-1113/99-05

This routine unannounced inspection involved observation of work activities, a review of selected records, and interviews with plant personnel in the areas of emergency preparedness and radiation protection. The report entails one week of inspection effort by a regional-based radiation specialist.

Radiation Protection

- The licensee's exposure control program was adequate for evaluating and monitoring exposures to ensure that occupational exposures were less than 10 CFR 20 limits (Paragraphs 2.a.(3) and 2.b.(3)).
- The number of contamination cleanup requests decreased in calendar year (CY) 98 and thus far in CY 99 are trending down when compared to CY 97 (Paragraph 2.c.(3)).
- The licensee's corrective actions were not fully adequate in that training and testing records were not being updated in the computerized Radiological Data Management System (RDMS) database. Additional management attention was necessary to ensure that the respiratory protection certification program was properly implemented (Paragraph 2.d.(3)).

Emergency Preparedness

- The installation of the new weather station including an Internet address for remote interrogation of site weather data was considered a program enhancement (Paragraphs 3.a.(3) and 3.f.(3)).
- Emergency Procedures (EPs) lacked guidance on evacuation to prevent employees from evacuating into hazardous and/or toxic environments (Paragraph 3.b.(3)).
- The physical and administrative system for activating the emergency response organization (ERO) during off-hours was adequate; however, human errors contributed to poor performance during the fourth quarter of CY 98 and insufficient data was available for determining the adequacy of corrective actions (Paragraph 3.c.(3)).

Attachment:

Persons Contacted
Inspection Procedures
List of Items Opened, Closed, and Discussed
List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

This report covered a one week period. The CaF_2 stored in outdoor lagoons was in the process of being relocated to storage warehouses. Portions of the new integrated gadolinium shop dry recycle system were being installed. Pellet production, rod loading, bundle assembly, and uranium recovery continued operations at normal levels.

2. Radiation Protection (83822) (R1)

a. External Exposure Control (R1.04)

(1) Inspection Scope

The inspector reviewed licensee procedures to determine if the licensee's monitoring program was consistent with requirements in 10 CFR 20, and if controls were in place to maintain occupational dose as low as reasonably achievable (ALARA). Personnel exposure data was examined to determine if exposures were in compliance with 10 CFR Part 20 limits.

(2) Observations and Findings

Randomly selected personnel observed inside the radiation control area displayed dosimetry consistent with monitoring procedures and requirements in 10 CFR Part 20. Procedures contained action limits, and ALARA dose goals were established to ensure that exposures were less than the limits in 10 CFR Part 20.1201. The maximum assigned exposures for the Calendar Years (CYs) 97, 98, and thus far in 1999 were reviewed and a significant reduction was noted. The maximum assigned Total Effective Dose Equivalent (TEDE) in CY 98 was approximately 57 percent less than CY 97 (See Table 1 below). The licensee contact attributed the exposure reduction to the transfer in conversion process from Ammonium Diuranate (ADU) to the Dry Conversion Process (DCP).

Table 1. Annual Exposures

Year	Deep Dose Equivalent (DDE)	Shallow Dose Extremity (SDE)	Total Effective Dose Equivalent (TEDE)	Collective TEDE	Committed Effective Dose Equivalent (CEDE)
1997	0.66 rem	1.0 rem	2.93 rem	256 person-rem	2.88 rem
1998	0.67 rem	1.49 rem	1.25 rem	174 person-rem	1.11 rem
1999	*0.26 rem	*0.26 rem	*0.81 rem	*81 person rem	*0.81 rem

*NOTE: The maximum exposures were based on air sampling data as of August 9, 1999 and first quarter thermoluminescent dosimeter (TLD) results.

(3) Conclusions

Based on the exposure records and interviews, the inspector concluded that the licensee's exposure control program was adequate for evaluating and monitoring exposures to ensure that occupational exposures were less than 10 CFR 20 limits.

b. Internal Exposure Control (R1.05)

(1) Inspection Scope

The inspector reviewed controls for assessing internal exposure to verify that administrative and physical controls were in place to control occupational dose ALARA. Exposure data based on air sampling results were reviewed to determine if exposures were in compliance with 10 CFR Part 20 limits.

(2) Observations and Findings

The inspector observed personnel conducting surveys for the presence of removable radioactive material and verification that air sampling locations were operational. Air sampling equipment examined was operational and contamination surveys were effective in the identification of fixed and/or removable radioactive material in the vicinity of workers. Procedures contained action limits which were set below federal limits to ensure personnel exposures did not exceed limits in 10 CFR 20. Exposures were frequently reviewed to determine if administrative limits were met so that appropriate actions were taken to preclude exceeding limits in 10 CFR Part 20. Table 1 above presents the maximum assigned exposure data for CYs 97, 98, and thus far in CY 99 (as of August). The maximum assigned CEDE for CY 98 was 1.11 rem, an approximately 61 percent reduction from CY 97 (2.88 rem), and was assigned to a worker in ceramics. Thus far in CY 99 (as of August) the estimated CEDE was 0.81 rem.

(3) Conclusions

Based on interviews and exposure records, the licensee's internal exposure control program was adequate for evaluating and monitoring personnel exposures. Administrative dose limits were established and assigned exposures were well below the regulatory limits.

c. Surveys (R 1.08)

(1) Inspection Scope

The contamination control survey program was reviewed to determine if surveys were effective in the identification of contamination and performed in accordance with procedures.

(2) Observations and Findings

The inspector accompanied a Radiation Protection Monitor during the performance of contamination surveys (rod load/grinder areas and press room) and observed both the collection and analysis of smear samples. The inspector requested a smear sample from a drinking water fountain location for verification that action limits were not exceeded. No problems were noted, and all results were within the allowable limits. Based on the review of contamination survey forms, the surveys were done in accordance with procedures, and when action limits were exceeded, a cleanup request was initiated. Documentation disclosed the number of cleanup requests resulting from surveys were reduced approximately 26 percent in CY 98 when compared to CY 97 requests.

(3) Conclusions

The contamination control survey program was effective in the identification of contamination and the presence of radioactive material. The observed surveys were consistent with procedures, and personnel performing surveys were attentive to details and activities associated with area operations and the associated ALARA concerns. The number of cleanup requests decreased in CY 98 and thus far in CY 99 requests are trending down when compared to CY 97.

d. Respiratory Protection (R1.06)

(1) Inspection Scope

Respiratory protection certification was reviewed to determine the adequacy of the licensee's corrective actions to previous examples where randomly selected individuals had expired respiratory certification.

(2) Observations and Findings

Based on details from the Radiological Data Management System (RDMS), several examples were found where respiratory protection certification (training or mask-fit tests) had expired and individuals were overdue. In response to this observation, the licensee conducted a detailed review of this matter and provided the inspector with results which disclosed one individual had expired training. The remaining examples of overdue were due to administrative errors resulting from incorrect training requirements entered into the RDMS and lack of documentation to support training attendance. During the previous inspection of this area (See Inspection Report No. 70-1113/99-001), the licensee discussed actions to ensure that personnel respiratory certification be maintained current. The inspector determined that improvements were made when compared to the last audit; however, the licensee's corrective actions were not fully adequate and additional management attention was necessary to ensure that the respiratory protection program was administratively properly implemented. The licensee stated that additional actions yet to be determined would fully resolve the inconsistencies that were noted. The inspector indicated that the corrective actions to ensure the proper

implementation of the respiratory protection program would be tracked as inspector followup item (IFI) 70-1113/99-05-01.

(3) Conclusions

The licensee's corrective actions were not fully adequate in that training and testing records were not being updated in the computerized RDMS database. Additional management attention was necessary to ensure that the respiratory protection certification program was properly implemented.

e. Followup On Previously Identified Issues (R1.12)

(1) Inspection Scope

The inspector reviewed the actions taken by the licensee to correct a previous issue to verify that the corrective actions were adequate and had been completed.

(2) Observations and Findings

(Closed) IFI 70-1113/99-01-01: Verify that air representativeness re-evaluation and corrective actions are consistent with guidance in RG 8.25.

According to the documentation, a re-evaluation was completed during February 1999 and the results met the acceptance criteria in NRC Regulatory Guide 8.25 "(Air Sampling In The Workplace)."

(3) Conclusion

Based on the results from the study, this item was closed.

3. Emergency Preparedness (88050) (F3)

a. Review of Program Changes (F3.01)

(1) Inspection Scope

Changes to the licensee's Radiological Contingency and Emergency Plan (RC&EP), procedures, organization, facilities, and equipment were reviewed to assess the impact on the effectiveness of the program. To verify that changes met commitments, license conditions, and were provided to NRC in accordance with 10 CFR 70.32(I).

(2) Observations and Findings

Since the last inspection of this area (August 1998), two revisions were made to the RC&EP dated January 13, 1999 (Revision 6), and Revision 7 dated April 27, 1999. The changes were reviewed and determined to have no impact on the effectiveness of the RC&EP.

Regarding equipment changes, the most significant was that involving the installation of a new meteorological system with the capability for measuring wind speeds in excess of 100 miles per hour (mph). The upgrade to the onsite meteorological capability was considered a program change that enhanced the effectiveness of the licensee's onsite assessment capability during both emergencies and non-emergencies (involving severe weather). The licensee's onsite meteorological station data was one of nine stations included in the New Hanover County and North Carolina Department of Emergency Management live weather data web site.

(3) Conclusions

Based on RC&EP review and a discussion with the emergency preparedness contact, changes since the last inspection were primarily administrative and resulted in no impact on the effectiveness of the response program. The installation of the new weather station including an Internet address for remote interrogation of site weather data was considered a program enhancement.

b. Plan and Implementing Procedures (F3.02)

(1) Inspection Scope

Select implementing procedures were reviewed to determine if procedures were revised since the last inspection, and the adequacy of procedures in the implementation of the RC&EP.

(2) Observations and Findings

Nine (9) procedures were designated by the licensee as Emergency Procedures (EP) for implementing the requirements of the RC&EP. The procedures were as follows:

1) Bomb Threat, 2) Environmental-Chemical/Toxic Hazards, 3) Communications (External), 4) Security Compromise, 5) Criticality, 6) Fire and Explosion, 7) Radiological, 8) Severe Weather, and 9) Transportation. According to documentation and an interview with the Manager, Site Security and Emergency Preparedness (MSSEP), each of the before-mentioned EPs were revised since the last inspection. The inspector compared the superseded copy of select procedures to the current version and determined that the changes were strictly administrative involving titles and/or event coordination. During the procedures review, the inspector noted that with the exception of the Radiological EP, the EPs lacked guidance on evacuation to ensure that site personnel were not evacuated into a hazardous environment in transit to the staging area for accountability reporting. The licensee contact acknowledged the lack of details and indicated that during the next EP review and update, guidance would be included.

(3) Conclusions

The EPs selected for review were consistent with details contained in the Plan and appeared to adequately implement the Plan. EPs lacked guidance on evacuation to prevent employees from evacuating into hazardous and/or toxic environments.

c. Training and Staffing of Emergency Organization (F3.03)

(1) Inspection Scope

Determine if emergency response training was provided to key Emergency Response Organization (ERO) personnel in accordance with Section 7.2 of the RC&EP. Review the adequacy of the licensee's notification system for activation and staffing of the Emergency Control Center (ECC) during off-hours.

(2) Observations and Findings

The inspector requested for review the training syllabus and documentation to show that ERO personnel assigned to the current ERO roster received training in accordance with the Plan. The Emergency Plan training syllabus, provided generic rather than position specific ERO training. According to the licensee contact, position specific training is provided during periodic drills and exercises. All personnel assigned to the current roster was trained in accordance with the Plan, and had participated in either a drill or actual event.

The licensee's notification system for activating the ERO during off-hours was reviewed for adequacy in ensuring appropriate staffing during an emergency. During off-hours, ERO personnel are contacted by security personnel via pager and/or telephone. The inspector discussed with the licensee and reviewed pager drill documentation covering the period November 12, 1998, through June 22, 1999. During the fourth quarter CY 98 drill (December 20, 1998), poor results were obtained due to failure by security personnel to contact the position alternates in the event the primary failed to respond to pager and/or phone call. Corrective actions included providing additional training to Security personnel and subsequent drill(s).

(3) Conclusions

Based on interviews, discussions, and documentation, the inspector determined that the physical and administrative system for activating the ERO during off-hours was adequate; however, human errors contributed to poor performance during the fourth quarter of CY 98 and insufficient data was available for determining the adequacy of subsequent corrective actions.

d. Emergency Equipment and Facilities (F3.06)

(1) Inspection Scope

The ECC, emergency response equipment, instrumentation, and supplies were inspected to determine if maintained in a state of operational readiness.

(2) Observations and Findings

The inspector reviewed the shelf-life for Level A protective clothing, observed an inventory and operability check of survey instruments, dosimeters, full face respirators,

and the meteorological system. Level A clothing was within shelf-life, and survey instruments had current calibration stickers, and responded properly to a radioactive source check. The meteorological system was operational and provided the licensee with necessary data for assessing areas of impact following an airborne release of material. In addition to operability checks, documentation was reviewed which showed that periodic testing and surveillance of ECC equipment was performed at the required intervals. The most significant equipment change since the August 1998 inspection was the replacement of the previous meteorological system which resulted in a program enhancement.

(3) Conclusions

Testing and surveillance was performed at the required intervals for randomly selected ECC equipment, and the meteorological system. The licensee's installation of a new meteorological system with the capability for measuring wind speeds in excess of 100 mph was an enhancement to the onsite assessment capability during both emergencies and non-emergencies.

e. Followup On Previously Identified Issues (F3.07)

(1) Inspection Scope

The inspector reviewed the actions taken by the licensee to correct previous issues to verify that the corrective actions were adequate and had been completed.

(2) Observations and Findings

- (Open) IFI 98-04-01: Formalize the training program into a procedure for implementation of the RC&EP training requirements.

Improvements were made since the last inspection to include a training syllabus and drill participation tracking for each member of the ERO. However, the details associated with training requirements for each position to the ERO, lesson plan(s), and frequency for retraining had not been incorporated procedurally. Consequently, this item remains open pending the additional corrective actions.

- (Closed) IFI 98-04-03: Review root cause for respiratory cartridge failure and verify adequate corrective actions.

The licensee attributed the root cause as an inadequate testing procedure and potential problems with the cartridge testing equipment. In response, the operating procedure for performing the test was revised and new testing equipment had been ordered to replace the existing equipment. The licensee's actions were considered appropriate for closure.

(3) Conclusions

The corrective actions were appropriate for closure of IFI 98-04-03, and IFI 98-04-01 remains open pending additional corrective actions.

4. Exit Interview

The inspection scope and results were summarized on August 13, 1999, with those persons indicated in the Attachment. The inspector described the areas inspected and discussed the need for additional management attention to the respiratory protection program implementation. Although proprietary documents and processes were occasionally reviewed during this inspection, the proprietary nature of these documents or processes has been deleted from this report. No dissenting comments were received from the licensee.

ATTACHMENT

1. LIST OF PERSONS CONTACTED

Licensee

*D. Barbour, Team Leader, Radiation Protection
*D. Brown, Team Leader, Environmental Project
*D. Dowker, Manager, Chemical Product Line
*T. Draffen, Manager, Dry Conversion Project
*P. Godwin, Coordinator, Fire Safety and Emergency Response
T. Johnson, Monitor, Radiation Protection
*R. Keenan, Manager, Site Security and Emergency Preparedness
*G. Luciano, Team Leader, Fuel Support and Waste Treatment
*A. Mabry, Program Manager, Radiation Safety
*R. Martyn, Manager, Material Control and Accounting
S. Murray, Manager, Facility Licensing
*R. Pace, Manager, Facilities
*L. Paulson, Manager, Nuclear Safety
*H. Shaver, Senior Engineer, Radiological Safety
*H. Strickler, Manager, Site Environmental Health and Safety

Other licensee employees contacted included engineers, technicians, production staff, security, and office personnel.

*Attended exit meeting

2. INSPECTION PROCEDURES USED

IP 83822 Radiation Protection
IP 88050 Emergency Preparedness

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-1113/98-04-01	Open	IFI - Formalize the training program into a procedure for implementation of the RC&EP training requirements (Paragraph 3.e.(2)).
70-1113/98-04-03	Closed	IFI - Review root cause for respiratory cartridge failure and verify adequate corrective actions (Paragraph 3.e.(2)).

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-1113/99-01-01	Closed	IFI - Verify that air representativeness re-evaluation and corrective actions are consistent with guidance in RG 8.25 (Paragraph 2.e.(2)).
70-1113/99-05-01	Open	IFI - Verify corrective actions to ensure the proper implementation of the respiratory protection program (Paragraph 2.d.(2)).

4. List Of Acronyms Used

ADU	Ammonium Diuranate
ALARA	As Low As Reasonably Achievable
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulation
CY	Calendar Year
DCP	Dry Conversion Process
DDE	Deep Dose Equivalent
ECC	Emergency Control Center
EP	Emergency Procedures
ERO	Emergency Response Organization
IFI	Inspector Followup Item
mph	Miles Per Hour
MSSEP	Manager, Site Security and Emergency Preparedness
RC&EP	Radiological Contingency and Emergency Plan
RDMS	Radiological Data Management System
SDE	Shallow Dose Equivalent
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter