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Report Nos.: 50-280/94-22 and 50-281/94-22

Licensee: Virginia Electric and Power Company
 Glen Allen, VA 23060

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry Power Station

Inspection Conducted: August 8-12, 1994

Inspector: A. Gooden 09-07-94
 A. Gooden Date Signed

Approved by: K. Barr 9/7/94
 K. Barr, Chief Date Signed
 Emergency Preparedness Section
 Radiological Protection and Emergency Preparedness Branch
 Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted to assess the operational readiness of the site emergency preparedness program in the following areas: training, key program changes (organizational, facility, equipment, etc.), independent audits, maintenance of emergency response equipment and facilities, Emergency Plan activations, and management control system for drills and exercises.

Results:

In the areas inspected, no violations or deviations were identified. However, two areas were discussed with the licensee for follow-up actions:

- Develop and implement strategies to improve the proficiency of dose assessment personnel (on-shift Rad Assessment Directors and Dose Assessment Team members) with the use of the Meteorological Information and Dose Assessment System known as "MIDAS" (Paragraph 5).
- Corrective actions to prevent a loss of the State/local ring-down phone system (Insta-phone) and/or capability to notify authorities within 15 minutes of an event (Paragraph 2).

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Positive aspects (strengths) of the licensee's program included:

- Independent audits, event assessments, and critiques were generally effective in the identification of issues and items requiring corrective actions and resolutions.
- Effective management control of the emergency planning program.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- G. Belongia, Instructor, Radiation Protection
- *W. Benthall, Supervisor, Licensing
- P. Blount, Health Physicist
- *A. Brown, Supervisor, Operations Training
- *J. Collins, Director, Nuclear Emergency Preparedness (Corporate)
- *J. Costello, Station Coordinator, Emergency Planning
- *M. Kansler, Station Manager
- *R. Kulp, Coordinator, Emergency Planning
- *H. McCallum, Supervisor, Operations Training
- *H. Moore, Shift Supervisor
- T. Ragland, Health Physics Shift Supervisor
- M. Small, Assistant Shift Supervisor
- *S. Wood, Senior Instructor, Nuclear Training

Other licensee employees contacted during this inspection included engineers, security force members, technicians, and administrative personnel.

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- *D. Tamai, NRC Intern
- *S. Tingen, Resident Inspector

*Attended exit interview

Abbreviations used throughout this report are listed in the last paragraph.

2. Emergency Plan and Implementing Procedures (82701)

This area was inspected to determine whether significant changes were made to the licensee's emergency preparedness program since the last inspection of this area (June 1993), to assess the impact of any such changes on the overall state of emergency preparedness at the facility, and verify that such changes were approved and distributed in accordance with licensee procedures and NRC requirements. Requirements applicable to this area are found in 10 CFR 50.47(b)(16), 10 CFR 50.54(q), Appendix E to 10 CFR Part 50, and the licensee's Emergency Plan.

The inspector reviewed the licensee's system for making changes to the SEP and the EIPs. Through selective review of applicable documents, the inspector confirmed that licensee management approved revisions to the SEP and EIPs, as required. Copies of the SEP and selective EIPs were examined at the TSC and LEOF, and were found to be current revisions. The inspector reviewed licensee letters transmitting EIP

revisions to the NRC for the period June 1993 through July 1994. The records disclosed that each of the EPIP revisions during that period had been transmitted to the NRC within 30 days of the implementation date, as required.

The version of the SEP in effect at the time of the current inspection was Revision 36. Since the aforementioned June 1993 inspection, the NRC had completed formal licensing reviews of Revisions 35 and 36. By letter dated August 16, 1993, the NRC approved changes incorporated as Revision 35. Regarding Revision 36 to the SEP, minor discrepancies were noted and discussed in a NRC letter to the licensee dated May 27, 1994. During this inspection, the inspector did not review the licensee's actions in resolving the discrepancies in that the resolution of these items would be addressed during the next Plan revision review process.

Changes to the EIPs and Revision 36 of the SEP were primarily associated with the implementation of the revised federal guidance promulgated in EPA 400-R-92-001 (Manual of Protective Action Guides and Protective Actions for Nuclear Incidents) and 10 CFR Part 20. EPIP-3.03 entitled "Activation of Operational Support Center," was revised to reflect an organizational change involving the relocation of emergency maintenance personnel previously located in the TSC to the OSC. The inspector's review of these and other selected EPIP changes disclosed none that decreased the effectiveness of the licensee's emergency preparedness program or response capability.

The licensee's implementation of EPA-400 resulted in changes to the dose assessment default values for both the automated (MIDAS) and manual methods of dose projection. Consequently, the inspector requested for review documentation to show that the licensee had performed a validation and verification of MIDAS following the EPA-400 upgrade. In response, the licensee provided the following documentation for review: MIDAS EPA-400 upgrade "Site Acceptance Test;" MIDAS site testing summary; summary document detailing the results of a comparison between the manual and MIDAS default values; and a document comparing MIDAS/EPA-400 to NRC RASCAL Program (Version 2.0) and detailing the differences. The inspector determined that based on the beforementioned documentation, the licensee's performance in this area was effective in the implementation of the revised codes.

The inspector requested from the licensee contact documentation for declared emergencies and Plan implementations during the period June 1993 - August 1994. According to documentation, three event declarations occurred: August 17, 1993, August 21, 1993, and August 31, 1993. All three events were declared as NOUEs.

<u>Date</u>	<u>Event Time</u>	<u>Event Summary</u>
8/17/93	0635	Meteorological instrumentation lost due to an electrical service disruption (Condition 9, Tab A, EPIP-1.01).

8/21/93	0443	Unit 1 shutdown required by TSs as a result of a RCS leak on the "B" Steam Generator (Condition 4, Tab B, EPIP-1.01).
8/31/93	0610	Hurricane warning was issued for Surry County (Condition 8, Tab L, EPIP-1.01).

The licensee was both timely and correct in the event recognition and classification. With one exception, licensee actions in the area of offsite notifications was timely and in accordance with EPIP 2.01 "Notification Of State and Local Governments." The one exception involved notifications to State and local governments following the NOUE declaration on August 17, 1993, due to the loss of meteorological instrumentation. Notifications were delayed due to failure of the dedicated ringdown phone known as the "Insta-phone." According to licensee documentation (Shift Supervisor log, completed notification message form, and licensee Event Summary Report), the event was declared at 0635 hours. At 0640 hours, the Insta-phone was determined to be inoperable and EPIP-2.01 (Section 17a, steps 1-4) actions were implemented to contact State and each local EOC via regular telephone. Although Control Room personnel were prompt in initiating the backup means of notification (started at 0649 hours), approximately 32 minutes were required to complete the State and local notifications. The inspector discussed with licensee representatives from site and corporate emergency planning the root cause of the Insta-phone failure, and the status of back-up power to the emergency communications system. The inspector was informed that the Insta-phone failure was due to the loss of electrical service and failure of the back-up power system to operate. According to the licensee, the local communications company provides back-up power via a generator which is maintained and periodically tested by the local communications company. On August 23, 1994, the inspector discussed telephonically with licensee representatives actions to prevent future Insta-phone failures, or actions implemented to ensure timely notifications via back-up methodology. The licensee indicated the following: 1) The local communications company (GTE) maintains and periodically tests the generator; according to discussions with GTE, normally inoperable equipment is returned to service within three hours; and 2) Strategies for improving the timeliness of notifications via back-up means are being evaluated." The licensee further stated that a CT No. 2735 was assigned to document the cause of the Insta-phone failure and evaluate strategies for improving timeliness of notifications in the event of a loss of the Insta-phone system. No other concerns were noted in the areas of Plan implementation, activation, classification, and notification.

No violations or deviations were identified.

3. Emergency Facilities, Equipment, Instrumentation, and Supplies (82701)

This area was inspected to determine whether the licensee's ERFs and associated equipment, instrumentation, and supplies were maintained in a state of operational readiness, and to assess the impact of any changes in this area upon the emergency preparedness program. Requirements applicable to this area are found in 10 CFR 50.47(b)(8) and (9), 10 CFR 50.54(q), Section IV.E of Appendix E to 10 CFR Part 50, and the SEP.

The inspector toured the TSC, the OSC (both primary and alternate locations), and the LEOF. The inspector verified as operable the following equipment: Insta-phone, MIDAS computer, and SPDS terminal from the TSC; and the ERFCS terminal, MIDAS computer, and ENS phone in the LEOF. As part of the operational readiness review, the inspector requested an operability test of the emergency ventilation system for the LEOF. A permanently installed instrument (manometer) in the LEOF provided a differential pressure measurement in inches of water gauge. The acceptance criterion specified in the licensee's surveillance test for the emergency ventilation system was 0.05 inches; shortly after switching the ventilation system from the normal mode to the emergency mode the manometer reading rose to 0.15 inches indicating a positive pressure test that met the test acceptance criterion. Two additional tests that were observed by the inspector included the quarterly test of the ERDS capability to communicate plant data to NRC, and the bi-monthly silent test of the EWS siren system. No problems were noted. Selective examination of equipment and communications systems identified no inoperable or absent components, and indicated that an adequate state of operational readiness was being maintained for the ERFs.

The inspector reviewed the completed documentation for the following required surveillances that were performed during the period August 1993 - July 1994:

- Emergency Plan Radiation Instruments and Emergency Kits Inspection and Checks (performed monthly)
- Monthly Emergency Communications Test
- Quarterly Emergency Communications Test
- Early Warning System Polling Function Test (semi-monthly)
- Early Warning System Siren Activation Monitoring (quarterly)
- TSC and LEOF Ventilation System HEPA and Filter Test Documentation (annual)
- TSC Pressure Test (18 months or refueling)
- LEOF Pressurization Test (18 months or refueling)

- Emergency Warning System Alarm Test (weekly)
- Emergency Warning System Light Test (monthly)

The documentation indicated that the surveillances were performed at the required frequencies and identified problems were corrected expeditiously.

As a program improvement in the area of communications, since the last inspection, the licensee had procured a radio trunking system which provided additional communication channels for various emergency teams (fire brigade, damage control, rad protection, etc.) in an effort to alleviate communications cross-talk and/or competing communications during events or exercises.

The inspector reviewed the operational readiness of the EWS used for prompt alerting and notification of the 10-mile EPZ population. The system was comprised of 61 sirens. Licensee data provided to FEMA showed an overall siren availability of 99.6 percent in 1993. This availability factor included results of all siren testing for the year (viz., bimonthly silent tests, quarterly growl tests, and quarterly full-cycle tests). During the inspection, the inspector observed a silent test of the capability of the siren control system to transmit a polling signal to installed RTUs. The results from the test indicated that siren availability was 100 percent. No failures were reported.

Based upon ERF walk-downs, review of changes to the EIPs, inspection of selected emergency equipment and supplies, and discussions with licensee representatives, the inspector concluded that no degradation of ERF capabilities had occurred since June 1993.

No violations or deviations were identified.

4. Organization and Management Control (82701)

This area was inspected to determine the effects of any changes since the June 1993 inspection in the licensee's emergency organization and/or management control systems on the emergency preparedness program, and to verify that any such changes were properly factored into the SEP and EIPs. Requirements applicable to this area are found in 10 CFR 50.47(b)(1) and (16), Section IV.A of Appendix E to 10 CFR Part 50, and the SEP.

The organization and management of the emergency preparedness program were reviewed and discussed with licensee representatives. No changes in the site or corporate organization management or reporting chain had occurred. Site emergency planning reported directly to the Assistant Station Manager, Nuclear Safety and Licensing. Regarding the ERO, the most significant change involved the relocation of emergency maintenance personnel from the TSC to the OSC, and there were minor changes in the emergency organization involving personnel filling key positions as primaries in the TSC. However, personnel changes and relocation did not

result in a decrease in the number of available responders or provide impediments to the response capability. Further, when the assigned personnel training records were reviewed, personnel training was current and up to date. In view of the ERO changes, the inspector discussed with the licensee contact staffing and augmentation drills conducted since the last inspection and reviewed documentation for augmentation drills conducted March 24, 1994 and June 27, 1994. The referenced off-hour drills involved only notification of emergency responders and determination of their availability, and did not include actual reporting to the station. The drill results concluded that the licensee's onsite emergency organization could be augmented in accordance with Tables 5.1 and 5.2 of the Emergency Plan.

Regarding changes to the offsite support emergency organization, the inspector was informed that a change in management personnel included the interim assignment of a James City County Emergency Medical Services Coordinator.

As a management tool to ensure key elements of the Emergency Plan are being tested (during exercise and drills), requirements are detailed in an administrative procedure and implemented via an exercise matrix. The referenced matrix was developed for a 12 month period to include documentation of any drill performed during the prescribed period. According to a licensee representative, the referenced system was implemented during calendar year 1990. The inspector reviewed the exercise matrix for the period 1990-1994, and details found in the six-year Surry Exercise Plan, and determined that the licensee's administrative program was effective in ensuring that those Plan elements delineated in NRC Inspection Module 82302 were being satisfied. The details of the aforementioned program are described in a Virginia Power Corporate Department Procedure EPCP-006 entitled "Drill and Exercise Program Manual."

As a management tool for ensuring the completion of corrective action for identified problems in emergency preparedness, the EPMS listing was used to track open items for the licensee's two nuclear stations as well as for the corporate emergency preparedness program.

No violations or deviations were identified in this programmatic area.

5. Training (82701)

This area was inspected to determine whether the licensee's key emergency response personnel were properly trained and understood their emergency responsibilities. Requirements applicable to this area are contained in 10 CFR 50.47(b)(2) and (15), Section IV.E of Appendix E to 10 CFR Part 50, and the SEP.

The inspector reviewed the description (in the Emergency Plan) of the training program and the Nuclear Power Station Emergency Preparedness Training Program Guide. Lesson plans for Station Emergency Manager, Emergency Technical Director, Radiological Assessment Director, and

Chemistry (HRSS) Team were reviewed. Lesson plans were detailed, including lessons learned details from exercises and industry events. The inspector also noted the lesson plans included changes reflecting EPA-400 details and revised 10 CFR Part 20 (e.g. TEDE, CDE, DAC, emergency worker limits, etc). Based on these reviews and interviews with training personnel, the inspector determined that the licensee maintained a formal training program.

To assess the effectiveness of the emergency response training program, the inspector interviewed five individuals assigned to the ERO in key roles. Two individuals were SRO qualified (SS and Assistant SS) in positions designated as interim SEM. The remaining three individuals were designated as RAD, RAC, or Dose Assessment Team. Specific areas of interviews included emergency classification, offsite notifications, PARs, site evacuation, emergency worker dose limits, and dose projection. Interviewees designated as interim SEM were presented accident scenarios that required event classification, and asked to respond as appropriate, including the basis for their decision-making. Additionally, interviewees were given an accident sequence for a General Emergency to assess the effectiveness of training and familiarity with procedures governing PAR formulation. The interviews with personnel assigned dose assessment responsibility involved a demonstration of timeliness and capability to run MIDAS to obtain predetermined dose rate projections for the 10 mile-EPZ following a SGTR accident. As an additional assessment tool, all interviewees were questioned regarding the emergency worker exposure limits and exposure limits for administering KI. The scenarios and dose projection data were reviewed and validated by the licensee's Training Department personnel. The inspector delineated the guidelines for the interview at the outset, including the "open book" nature of the evaluation. A representative of the licensee's Training Department and site Emergency Preparedness staff were present during each of the interviews to allow for confirmation and firsthand understanding of observations. The SS and Assistant SS were judged to have demonstrated comprehensive understanding of the SEM duties and responsibilities in the event of an emergency. With one exception, all emergency classifications and PARs were timely and correct. The one exception involved the Assistant SS's error in the upgrading of accident scenario No. 1 classification from an Alert to a SAE when additional details were provided. Scenario No.1 was properly classified as an Alert based on Tab B-3 (Reactor Coolant Event) of EPIP-1.01, "Emergency Manager Controlling Procedure." However, when additional details were later provided regarding plant conditions (e.g. increases in charging flow, pressurizer level rapidly decreasing, elevated radiation monitor reading etc.), interviewee incorrectly upgraded the event from an Alert to a SAE based on Tab G-1 (Loss of Secondary Coolant) of EPIP-1.01, "Emergency Manager Controlling Procedure." Following the interview, the Assistant SS was questioned regarding the scenario to ascertain whether a full understanding of the scenario event was realized. It was determined that he had not considered the additional details as relevant to plant conditions in Scenario No. 1, but instead considered the details as a separate set of scenario conditions. During further discussions with members of the

licensee's Training Department, the interviewee agreed that his answer was incorrect and the event upgrade from the Alert to SAE was inappropriate. The inspector discussed this matter with members of the Operations Training staff and the Emergency Preparedness staff to determine what course of actions would be appropriate in light of the walkthrough results. In response, the licensee indicated that the interviewee would be provided additional scenarios for classification to determine interviewee's capability in recognizing and properly classifying events. On August 11, 1994, the Assistant SS was presented several scenarios by the licensee's Operations Training staff for review and classification. According to Training Staff results, no problems were noted. All events were appropriately classified. Based upon the interviewee's prompt and appropriate response on August 10, 1994, to initial conditions presented in Scenarios Nos. 1 and 2, including correct PARs, and no problems were identified during the event classifications on August 11, 1994 (presented by Operations Training staff), the inspector's concerns in the area of event classification was considered resolved and no followup action was planned. Regarding the dose projection walkthroughs, two issues were noted by both the NRC and licensee observers:

- Two of three interviewees experienced delays in obtaining results. During one interview, approximately 35 minutes were required from the scenario start time until completion of results.
- During the manual data entry of Delta T value (presented in °C), personnel failed to convert °C to °F which resulted in an erroneous stability class and projection results. All interviewees were observed making the referenced entry without converting.

With the exception of the two issues noted above, dose projection personnel were knowledgeable of their role and responsibility in the areas of exposure limits, PARs, and changes which resulted from the implementation of EPA-400 and 10 CFR Part 20. In response to the above noted issues, the licensee issued CT No. 2732 to evaluate strategies and implement measures for improving the proficiency of on-shift RADs and Dose Assessment Team members with use of MIDAS. Regarding the Delta T conversion, the licensee representative indicated that the data entry procedural steps would be changed to reflect direct entry of the stability class (i.e. A-F) rather than converting from °C to °F to avoid potential errors in stability class. The capability for direct input of the stability class into the MIDAS model was not previously implemented by site personnel.

Emergency response training records were reviewed for randomly selected individuals assigned to the ERO (SEM, ETD, OSC Director, RAD, RAC, Dose Assessment Team Leader, and State/Local Communicator) to verify that individuals received training in accordance with the Plan and Nuclear Power Station Emergency Preparedness Training Program Guide. No problems were noted.

No violations or deviations were identified.

6. Independent and Internal Reviews/Audits (82701)

This area was inspected to determine whether the licensee had performed an independent review or audit of the emergency preparedness program, and reviewed the effectiveness of the corrective action system for deficiencies and weaknesses identified during exercises and drills. Requirements applicable to this area are found in 10 CFR 50.54(t) and the SEP.

The inspector reviewed documentation resulting from two independent audits conducted by the licensee's QA organization during the period April 5-29, 1993 (documented in Report No. 93-06), and March 25 - April 28, 1994 (documented in Report No. 94-05). Both audits were company-wide audits which examined the emergency response capability for both of the licensee's nuclear stations and the corporate office. The audit team for Audit Report No. C94-05 was comprised of personnel from the licensee's organization in addition to three technical specialists from another southeastern utility. According to audit results, no findings or deficiencies were identified during the April 1993 audit. However, Audit Report No. 94-05 identified three findings. The inspector was informed by a member of the QA staff that the referenced items remained open at the time of the inspection. The audits appeared to have been detailed, comprehensive, and effective in assessing Emergency Plan implementation. The Audit results also indicated an effective interface had been established with offsite officials. The independent audits were considered a program strength.

The licensee's emergency preparedness staff utilized a computer-based tracking system known as EPMS to track open items and issues in emergency preparedness, such as audit findings and drill/exercise critique findings. A review of the EPMS print-out showed that the system was appropriately detailed, and indicated for each item the responsible individual and a due date for completion. The licensee was effectively using this tracking system as a management tool for ensuring the completion of corrective action for identified problems in emergency preparedness. The inspector reviewed the critique records from the December 1993 NRC evaluated exercise and a "licensee only" training exercise conducted April 1994. The documentation of each drill or exercise included a list of objectives, scenario, summary of events, and critique items. The inspector determined that the critiques identified substantive issues for corrective actions and that the licensee was either monitoring the status and progress of such planned corrective actions (via EPMS) or had completed same.

No violations or deviations were identified.

7. Licensee Action on Previous Inspection Findings (92904)

(Closed) EW 50-280, 281/93-28-01: Failure to perform offsite dose assessment activities in a manner to develop appropriate PARs.

The inspector reviewed the licensee's response (dated February 18, 1994) to the NRC Inspection Report (dated January 7, 1994), and determined that the corrective actions were completed in accordance with the licensee's commitments. Although the licensee's ERO performance in this area was not observed during the inspection, the extensive procedural changes and interviews with personnel assigned responsibility for PARs indicated that the corrective actions were adequate for closure.

8. Exit Interview

The inspection scope and results were summarized on August 12, 1994, with those persons indicated in Paragraph 1. The inspector stated no violations or deviations were identified. The inspector also discussed the need to assure reliable Insta-phone communications (Paragraph 2) and accurate dose assessment projections (Paragraph 5). Licensee management was informed that an EW from a previous inspection was considered closed, as discussed above in Paragraph 7. Although proprietary information was reviewed during this inspection, none is contained in this report.

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference</u>
50-280, 281/93-28-01	Closed	EW - Failure to perform offsite dose assessment activities in a manner to develop appropriate PARs (Paragraph 7).

9. Abbreviations Used in This Report

CDE	Committed Dose Equivalent
CT	Commitment Tracking
DAC	Derived Air Concentration
Delta T	Delta Temperature
ENS	Emergency Notification System
EOC	Emergency Operation Center
EPA	Environmental Protection Agency
EPCP	Emergency Preparedness Corporate Procedure
EPIP	Emergency Plan Implementing Procedure
EPMS	Emergency Preparedness Management System
EPZ	Emergency Planning Zone
ERDS	Emergency Response Data System
ERF	Emergency Response Facility
ERFCS	Emergency Response Facility Computer System
ERO	Emergency Response Organization
ETD	Emergency Technical Director
EW	Exercise Weakness
EWS	Early Warning System

FEMA	Federal Emergency Management Agency
HEPA	High Efficiency Particulate Air
HRSS	High Radiation Sampling System
KI	Potassium Iodide
LEOF	Local Emergency Operations Facility
MIDAS	Meteorological Information and Dose Assessment System
NOUE	Notification of Unusual Event
NRC	Nuclear Regulatory Commission
OSC	Operational Support Center
PAR	Protective Action Recommendation
QA	Quality Assurance
RAC	Radiological Assessment Coordinator
RAD	Radiological Assessment Director
RCS	Reactor Coolant System
RTU	Radio Transmitter Unit
SAE	Site Area Emergency
SEM	Station Emergency Manager
SEP	Surry Emergency Plan
SGTR	Steam Generator Tube Rupture
SPDS	Safety Parameter Display System
SRO	Senior Reactor Operator
SS	Shift Supervisor
TS	Technical Specification
TEDE	Total Effective Dose Equivalent
TSC	Technical Support Center
°C	Degrees Celsius
°F	Degrees Fahrenheit