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REGION II
101 MARIETTA STREET, N.W.
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Report Nos.: 50-259/93-15, 50-260/93-15, and 50-296/93-15

Licensee: Tennessee Valley Authority

Docket Nos.: 50-259, 50-260, 50-296 License Nos.: DPR-33, DPR-52, DPR-68

Facility Name: Browns Ferry Nuclear Plant

Inspection Conducted: April 12-16, 1993

Inspectors: James L. Kreh 4-27-93
J. L. Kreh, Radiation Specialist Date Signed

William M. Sarton Jr 5-4-93
W. M. Sarton, Senior Radiation Specialist Date Signed

Approved by: K. P. Barr 5-4-93
K. P. 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, and included selective review of the following programmatic areas: (1) Radiological Emergency Plan and associated implementing procedures; (2) facilities, equipment, instrumentation, and supplies; (3) organization and management control systems; (4) training; (5) independent and internal audits and reviews; and (6) shift staffing and augmentation.

Results:

In the areas inspected, no violations or deviations were identified. The licensee's emergency preparedness program and response capability were being maintained in a fully adequate state of operational readiness. Program strengths included overall management of the emergency planning effort, emergency response training of Shift Operations Supervisors, maintenance of emergency response facilities and equipment, and the strategy for maintaining the capability to augment the emergency response organization during off-hours. Two areas for improvement were brought to the attention of management during the exit interview: (1) upgrading of lesson plans for the training of nonlicensed personnel in emergency response (discussed in detail in Paragraph 5), and (2) evaluating the need to define minimum staffing levels for the Technical Support Center and Operations Support Center (Paragraph 7).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*T. Adkins, Program Manager, Emergency Preparedness (Chattanooga)
B. Booher, Assistant Shift Operations Supervisor
*J. Bynum, Vice President, Nuclear Operations
A. Champion, Operations Instructor
J. Cole, Systems Engineer
*J. Corey, Radiological Control Manager
*T. Cornelius, Emergency Preparedness Planning Manager
*A. Feltman, Project Engineer, Emergency Preparedness
*C. Jackson, Engineering Aide
S. Kane, Licensing Engineer
*R. Kitts, Manager, Emergency Preparedness (Chattanooga)
J. Lamb, Shift Operations Supervisor
*E. Ridgell, Manager, Compliance/Licensing (Acting)
S. Rudge, Site Support Manager
*T. Rupert, Engineering and Modifications Manager
*P. Salas, Site Licensing Manager
J. Shaw, Balance-of-Plant Systems Supervisor
J. Wallace, Compliance Engineer, Site Licensing
*O. Zeringue, Site Vice President

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

Nuclear Regulatory Commission

*J. Munday, Resident Inspector
*R. Musser, Resident Inspector
*C. Patterson, Senior Resident Inspector
*G. Schnebli, Resident Inspector

*Attended exit interview on April 16, 1993

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 in the licensee's emergency preparedness program since August 1991 (the date of the last such inspection of this area), to assess the impact of any such changes on the overall state of emergency preparedness at the facility, and to determine whether the licensee's actions in response to actual emergencies were in accordance with the Radiological Emergency Plan (a generic document which also addresses the

licensee's other nuclear power reactors) and associated implementing procedures for the Browns Ferry facility. 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 REP.

The inspector reviewed the licensee's system for making changes to the REP and the EPIPs. Through selective review of applicable documents, the inspector confirmed that licensee management approved revisions to the REP and EPIPs, as required. Copies of the REP, EPIPs, and the Emergency Notification Telephone Directory (latest quarterly revision dated March 25, 1993) were selectively examined at the Units 1 & 2 CR, TSC, and OSC, and were found to be current revisions.

The version of the REP in effect at the time of the current inspection was Revision 11. Since the aforementioned August 1991 inspection, the NRC has completed formal licensing reviews of Revisions 8, 9, 10, and 11. The licensee was previously informed in writing that the NRC has taken no exception to any of the changes applicable to Browns Ferry which were made in those revisions. The inspector's review of the referenced changes concluded that none was significant.

Revisions to the EPIPs since August 1991 were selectively reviewed and discussed with the EPPM. Various minor modifications were made to upgrade and/or clarify the EPIPs during this period. In Revision 12 of EPIP-7, "Activation and Operation of the Operations Support Center (OSC)", a position of Materials Coordinator was added to the OSC organization. Although this position was not specified by the REP, the licensee had identified through drills and exercises that having an individual to provide and coordinate material support resources at the OSC would be operationally beneficial. A generic change to EPIP-2 through EPIP-5 involved "human-factoring" the form (Attachment 1) used to transmit information regarding an emergency declaration to the ODS. 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.

REP Section 16.5 delineated the offsite support organizations with which the licensee maintained letters of agreement regarding the provision of services during an emergency response. Although the REP did not stipulate the frequency with which these agreements would be renewed (exception: annual updates with local law enforcement agencies), an internal corporate procedure (EPIL-7) specified that agreements with hospitals and ambulance services would be updated in writing every three years, and that agreements with fire and medical organizations would be verbally reconfirmed on an annual basis. The inspector determined from review of the current letters of agreement and the documentation of the specified verbal confirmations that the licensee was maintaining agreements with offsite support organizations as required by the REP and internal procedures.

The inspector reviewed all licensee records regarding the transmittal of EPIP revisions to the NRC and other copyholders since August 1991. The records verified that each EPIP revision during that period had been transmitted to the NRC within 30 days of the implementation date, as required.

The licensee conducted the required annual review of EALs by means of a March 10, 1992 letter to the State of Alabama forwarding information on the three EALs (designated as FU5, HU10, and HA10) which had been changed since the 1991 annual review. A letter dated March 13, 1992 expressed the State's concurrence in these changes.

No emergency declarations were made for the Browns Ferry Nuclear Plant since August 30, 1991.

No violations or deviations were identified in this programmatic area.

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 REP.

The inspector toured the onsite ERFs, which included the Units 1 & 2 CR, Unit 3 CR, TSC, OSC, and LRC. Selective examination of emergency equipment, supplies, and communications systems located in these facilities identified no inoperable or absent components, and indicated that the licensee was maintaining these program elements at a satisfactory level of operational readiness for responding to an emergency.

In the CR, the licensee had recently installed a direct-ringdown telephone for notifications to the ODS in Chattanooga, TN (notifications of emergency declarations are relayed by the ODS to the State and counties). The capability to expeditiously notify the ODS was further enhanced by the addition of a facsimile machine for transmitting the information on the notification form.

The TSC (described in Section A.3.1 of the REP) was located in the Control Bay between the two separated CRs and was relatively small, although the layout, with numerous modifications during the past several years, made efficient use of the available space. No significant modifications were made to the TSC since the August 1991 inspection, based on observations by the inspector and statements by the EPPM.

The TSC shared a ventilation envelope with the two CRs. The entire emergency ventilation system for this area, known as the CREV system, was being replaced during the refueling outage which was in progress at the time of the inspection. The new CREV system was needed because of an identified problem with a high volume of unfiltered in-leakage (about 3700 cfm) in the old system. The new system was designed to produce a positive pressure of $\geq$ 0.125 inch water gauge. Operation of the new CREV system with respect to the TSC will be reviewed during future inspections.

The inspector selectively reviewed the documentation of required surveillances that were performed quarterly (with additional monthly communications tests) in accordance with EPIP-17, "Emergency Equipment and Supplies", on dedicated emergency response provisions located in or near the ERFs. Records were reviewed for the period from the second quarter of 1992 through the first quarter of 1993, and disclosed that the subject equipment was being properly maintained in a state of operational readiness. The monthly and quarterly EPIP-17 surveillances had been performed at the required frequencies, and the documentation indicated that identified problems were corrected expeditiously. The licensee's program for maintenance and inventory of ERFs and associated emergency equipment was very thorough, and was judged to be a strength in the emergency preparedness program.

During the ongoing Unit 2/Cycle 6 refueling outage, the licensee was upgrading the PA and alarm system in accordance with a commitment made to the NRC in the Nuclear Performance Plan for Browns Ferry. This issue originated with NRC Bulletin 79-18, and was also discussed in NRC Inspection Reports Nos. 50-259, 50-260, 50-296/85-52 and /87-18 prior to the licensee's referenced commitment. Operation of the upgraded system will be reviewed and observed during the annual emergency response exercise planned for November 1993.

The inspector reviewed the operational readiness of the Prompt Notification System, which was described in REP Appendix A. The system included 100 fixed sirens and numerous tone-alert radios at institutional locations within the 10-mile EPZ around Browns Ferry. Licensee data provided to FEMA showed an overall siren availability of 99.3% in 1992. This availability factor included results of all siren testing for the year (viz., biweekly silent tests, quarterly growl tests, and monthly full-cycle tests). According to information obtained from the computerized siren feedback system, the siren system experienced no more than two failures during any of the monthly full-cycle tests; four of these tests yielded 100% siren operability. The inspector reviewed documentation of the preventive maintenance program for the sirens, which was performed in accordance with Quality Assurance Procedure No. DS-62.90, "Inspection, Service, and Maintenance of the Prompt Notification System at Browns Ferry." These records indicated that problems, where identified, were promptly corrected.

Based upon ERF walk-downs, review of changes to the EPIPs, inspection of selected emergency equipment and supplies, and statements by licensee representatives, the inspector concluded that no degradation of ERF capabilities had occurred since August 1991.

No violations or deviations were identified in this programmatic area.

4. Organization and Management Control (82701)

This area was inspected to determine the effects of any changes since the August 1991 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 REP and EPIPs. 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 REP.

The organization and management of the emergency preparedness program were reviewed and discussed with licensee representatives. No changes in the site or corporate organization had occurred which affected the management or reporting chain for the emergency preparedness program.

The inspector discussed the status of offsite interfaces with the EPC. No significant problems existed with these interfaces, according to the EPPM. The most recent independent audit (see Paragraph 6) supported this statement. It is noted here for the record that changes in management personnel for offsite support agencies since the August 1991 inspection included a new Director of the Department of Public Health for the State of Alabama as well as a new Director of that department's Division of Radiation Control.

The licensee's Chattanooga corporate office and all of its nuclear power plants used a computer-based network known as AMOS to track open items and issues in emergency preparedness, such as audit findings and drill/exercise critique findings. The system was also used to track recurring surveillances and other required tasks. A review of AMOS open items showed that the system was appropriately detailed, and indicated for each item the responsible organization 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 determined that the following NRC Information Notices applicable to emergency planning were received by the licensee since August 1991 and distributed to cognizant personnel, and that corrective actions, as appropriate, were completed or scheduled:

- IN No. 91-72: Issuance of a Revision to the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents

- IN No. 91-77: Shift Staffing at Nuclear Power Plants

- IN No. 92-08: Revised Protective Action Guidance for Nuclear Incidents
- IN No. 92-32: Problems Identified With Emergency Ventilation Systems for Near-Site (Within 10 Miles) Emergency Operations Facilities and Technical Support Centers
- IN No. 92-38: Implementation Date for the Revision to the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
- IN No. 92-62: Emergency Response Information Requirements for Radioactive Material Shipments
- IN No. 93-07: Classification of Transportation Emergencies

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 REP.

The training program for ERO personnel, as delineated in Section 15 of the REP, was implemented by means of corporate procedure TRN-30, entitled "Radiological Emergency Preparedness Training" (Revision 1, dated September 17, 1991). TRN-30 contained a matrix which specified the specific training requirements for each ERO position at the Browns Ferry facility. The inspector conducted a review to determine whether individuals were being trained in accordance with TRN-30. Names of 14 individuals designated for key positions in the ERO were selected from the "REP Duty List" for the period April 14-21, 1993, and their computer-based training records were reviewed against TRN-30 requirements. This review disclosed no discrepancies. The inspector also reviewed the licensee's training objectives and lesson plans used to qualify and requalify individuals for four key ERO positions. The inspector noted that the lesson plans could be difficult to instruct from because of incomplete instructor reference notes and a general lack of appropriate detail. The objectives associated with the SED lesson plan, for example, were coherent and suggested a logical instructional approach. However, the details of the lesson plan did not fully support those lesson objectives. Discussion with the EPPM revealed that upgrading of the ERO lesson plans was a previously defined goal of the emergency preparedness program for calendar year 1992. The licensee agreed to track fulfillment of this goal under AMOS Item No. 001737-00.

In an effort to gauge the effectiveness of the emergency response training program, the inspector conducted a combined interview with a Shift Operations Supervisor and a Shift Technical Advisor. The SOS was the position designated as interim SED. The STA was available to assist the SOS in response to an emergency, and served in such an advisory capacity during the interview. The purpose of this interview process was to ascertain the SOS's understanding of emergency classification, offsite notifications, protective action recommendations (PARs), site evacuation, emergency worker dose limits, and nondelegable responsibilities of the SED. The 75-minute interview began with technical questions relating to the duties, responsibilities, and functions of the SOS during an emergency situation, and then presented six accident scenarios that required event classification and PAR formulation, as appropriate. The inspector delineated the guidelines for the interview at the outset, including the "open book" nature of the evaluation. The EPPM was present during each of the interviews to allow for confirmation and firsthand understanding of observations. The SOS and STA together were judged to have demonstrated comprehensive understanding of the SED duties and responsibilities in the event of an emergency. All emergency classifications and PARs were timely and correct. No problems were identified during this interview.

The inspector reviewed the licensee's assessment and documentation of ERO performance during the nine emergency response training drills conducted since September 1, 1991. Some of these drills were not specifically required by the REP, but rather were conducted in order to ensure maintenance of an adequate level of ERO response capability in the event of an actual emergency. The documentation of each drill included a list of objectives, scenario, summary of drill events, and critique items. The inspector determined that the drill critiques identified substantive issues for corrective action and that the licensee was either monitoring the status and progress of such planned corrective actions (via AMOS) or had completed same. The inspector reviewed the critique records for indications of repetitive performance problems during the period in question. No adverse trends were identified. This schedule of training drills suggested a high level of dedication of the licensee's resources to maintaining and improving emergency response capabilities, and was considered indicative of plant management's commitment to the emergency preparedness program.

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 audit of the emergency preparedness program, and whether the emergency planning staff had conducted a review of the REP and the EPIPs. Requirements applicable to this area are found in 10 CFR 50.54(t) and the REP.

The inspector reviewed documentation of the independent audit of the emergency preparedness program for 1992. This audit was conducted by the licensee's Nuclear Quality Audit and Evaluation group during the period June 8 - July 7, 1992. The review was documented in Audit Report SSA92202, "Emergency Preparedness and Meteorological Monitoring", dated July 14, 1992. The audit examined the emergency response capability for the licensee's Sequoyah and Browns Ferry plants and the corporate office. The assessment did not identify any items requiring corrective action. Separate letters dated August 18, 1992 to the State of Alabama Emergency Management Agency and the Department of Public Health transmitted that portion of the subject audit report which addressed the evaluation of licensee interfaces with offsite support organizations.

Section 16 of the REP required an annual review of that document and the EPIPs. The most recent annual internal review of the REP was completed on December 30, 1992, according to licensee documentation. This review identified minor problems which were corrected in subsequent revisions to the REP and EPIPs.

No violations or deviations were identified in this programmatic area.

7. Shift Staffing and Augmentation (82205)

The inspector reviewed the site emergency organization as delineated in Section A.2 and Figure A-1 of the REP. Although the licensee has been generally successful in achieving full (or nearly full) staffing of the TSC and OSC within 60 minutes during drills and exercises (see discussion below), the inspector noted that the licensee's designated staffing plan for these ERFs exceeded what was specified in NRC guidance. Discussions between the EPPM and the inspector on this subject disclosed that the licensee had no formal definition of the minimum staffing required for activating the TSC and OSC. Instead, the SED would be expected to exercise professional judgment to determine whether sufficient personnel were present to adequately operate the TSC and OSC in the event of adverse weather or other factors that might preclude timely staffing of the ERFs. The EPPM agreed that defining minimum staffing required for activation of the TSC and OSC would be desirable in order to reduce the possibility of confusion during the early phase of an emergency response. The licensee agreed to track the consideration of this matter under AMOS Item No. 001738-00.

The inspector reviewed the licensee's management strategy for ensuring compliance with the Emergency Plan requirements addressing the planning standard of 10 CFR 50.47(b)(2), which specifies that "timely augmentation of response capabilities is available." The applicable requirements were contained in Appendix A to the REP, and specified that the onsite ERO was to be augmented with additional emergency response personnel within 60 minutes. In addition to day-shift drills involving staff augmentation (i.e., staffing of the TSC and OSC during practice drills as discussed in Paragraph 5), the licensee conducted five unannounced, off-hour staff augmentation drills since the August 1991 inspection (one of these was a component of the November 4, 1992 annual

exercise). In these drills, employees were required to actually travel to the site and activate the ERFs. In the first of these, conducted on December 6, 1991, nine positions in the ERO were not filled in a timely manner, which was not considered successful. Additional training and management emphasis with respect to this activity produced overall successful results in the four 1992 augmentation drills.

In addition to the augmentation drills described above, the licensee was conducting monthly off-hour pager/telephone notification tests (no travel to the plant) to survey the availability of persons to staff the TSC and OSC. The records of these tests showed a very high level of response, indicating good signal coverage for the system and consistent use by assignees. In most of the monthly tests since March 1992 (the extent of record retention), there were only 0-2 nonrespondents out of approximately 38 individuals on the REP Duty List. Also, an announced pager test was conducted each Wednesday morning following the weekly Duty List "turnover". The EPPM indicated that strong management support was provided for follow-up to determine on a case-by-case basis why individuals did not respond to pager call-outs and to implement action to prevent recurrence.

The program of tests described above in this paragraph constituted a management control system which was not required by the REP. As a result of frequent use and tests of the strategy for shift augmentation in the event of an emergency, the licensee was afforded a high level of confidence that personnel would be available to staff ERFs during off-hours in accordance with REP commitments. This area was determined to be an emergency preparedness program strength.

No violations or deviations were identified in this programmatic area.

8. Exit Interview

The inspection scope and results were summarized on April 16, 1993, with those persons indicated in Paragraph 1. The inspector described the areas reviewed and discussed the inspection results in detail, including the two areas for improvement which are listed in the "Summary" section of this report. Although proprietary information was reviewed during this inspection, none is contained in this report.

9. Abbreviations Used in This Report

AMOS	Activities Management and Oversight System
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CR	Control Room
CREV	Control Room Emergency Ventilation
EAL	Emergency Action Level
EPA	Environmental Protection Agency
EPIL	Emergency Preparedness Instruction Letter
EPIP	Emergency Plan Implementing Procedure

EPPM	Emergency Preparedness Planning Manager
EPZ	Emergency Planning Zone
ERF	Emergency Response Facility
ERO	Emergency Response Organization
FEMA	Federal Emergency Management Agency
IN	Information Notice
NRC	Nuclear Regulatory Commission
ODS	Operations Duty Supervisor
OSC	Operations Support Center
PA	public address
PAR	Protective Action Recommendation
REP	Radiological Emergency Plan
SED	Site Emergency Director
STA	Shift Technical Advisor
TSC	Technical Support Center