



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA ST., N.W., SUITE 3100  
 ATLANTA, GEORGIA 30303

Report Nos. 50-327/81-40 and 50-328/81-49

Licensee: Tennessee Valley Authority  
 500A Chestnut Street Tower II  
 Chattanooga, TN 37401

Facility Name: Sequoyah Nuclear Plant

Docket Nos. 50-327 and 50-328

License Nos. DPR-77 and DPR-79

Inspection at the Sequoyah Site, near Soddy-Daisy, Tennessee

Inspector:	<u>Dale L. Andrews</u>	<u>2/3/82</u>
	D. L. Andrews	Date Signed
	<u>for Dale L. Andrews</u>	<u>2/3/82</u>
	R. R. Marston	Date Signed
	<u>for Dale L. Andrews</u>	<u>2/3/82</u>
	W. W. Stansberry	Date Signed
	<u>P. A. Taylor</u>	<u>2/3/82</u>
	P. A. Taylor	Date Signed
Approved by:	<u>Dale L. Andrews</u>	<u>2/3/82</u>
	for G. R. Jenkins, Section Chief, EPOS Division	Date Signed

SUMMARY

Inspection on December 17, 1981

Areas Inspected

This routine, announced inspection involved 126 inspector-hours on site in the area of a radiological emergency exercise.

Results

There were no violations or deviations identified in the area inspected.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*C. C. Mason, Plant Superintendent
- \*W. T. Cottle, Assistant Plant Superintendent (Operations)
- \*J. W. Doty, Assistant Plant Superintendent (Maintenance)
- J. McGriff, Assistant Plant Superintendent (Health and Safety)
- J. T. Crittenden, Chief, Public Safety Service
- L. Noble, Operations Supervisor
- \*W. W. Kinsey, Engineering Supervisor
- \*R. J. Kitts, Health Physics Supervisor
- \*C. E. Kent, Jr., OCH&S Health Physicist
- \*B. Marks, Project Engineer
- \*W. J. Milsap, OCH&S Health Physicist
- J. A. Thomas, Lt., Public Safety Service

Other licensee employees contacted included several craftsmen, technicians, operators and security force members.

#### NRC Resident Inspector

- \*E. J. Ford, Senior Resident Inspector
- S. L. Butler, Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on December 17, 1981 with those persons indicated in paragraph 1 above.

### 3. Licensee Action on Previous Inspection Findings

Not inspected.

### 4. Unresolved Items

Unresolved items were not identified during this inspection.

### 5. Exercise Scenario

The scenario for the radiological emergency exercise was reviewed in advance of the scheduled exercise to verify that the requirements of 10CFR-50.47(b)(14), 10CFR50, Appendix E, paragraph IV.F, and specific criteria of NUREG 0654, Section N.3 were met.

The exercise scenario was developed primarily to cover those functions of the onsite emergency organization which were not demonstrated during the exercise conducted July 7 and 8, 1981. The exercise started with the discovery and activation of an explosive device which caused equipment damage and personnel injury. This was the basis for the activation of the accountability and evacuation procedures.

A leak of reactor coolant in Unit 1 caused a liquid and gaseous release in the containment building, and a subsequent airborne release through the shield building vent. This exercise escalated to no higher than an ALERT condition. The scenario for this radiological emergency exercise when combined with the exercise conducted July 7 and 8, 1981, appears to meet the above requirements.

#### 6. Assignment of Responsibility

This area was observed to determine that primary responsibilities for emergency response by the licensee have been specifically established and that adequate staff is available to respond to an emergency as required by 10CFR50.47(b)(1), 10CFR50, Appendix E, paragraph IV.A, and specific criteria in NUREG 0654, Section II.A.

The inspectors verified that specific assignments had been made for the licensee's onsite emergency organization as specified in the TVA Radiological Emergency Plan for the Sequoyah Nuclear Station. The inspectors verified that there were adequate staff available to fulfill the emergency functions required by the plan.

Based on the above findings, items 50-327/81-26-01 and 50-328/81-33-01 are closed.

#### 7. Onsite Emergency Organization

The licensee's onsite emergency organization was observed to determine that the responsibilities for emergency response are unambiguously defined, that adequate staffing is provided to insure initial facility accident response in key functional areas at all times, and that the interfaces among various onsite response activities and offsite support activities are specified as required by 10CFR50.47(b)(2), 10CFR50, Appendix E, paragraph IV.A, and specific criteria in NUREG 0654, Section II.B.

The inspectors noted that the initial and augmented onsite emergency organization was well defined and that adequate staff was available to fill key functional positions as described by Section 4 of the Sequoyah Radiological Emergency Plan. Offsite participation was limited to communications involving the Operations Duty Specialist at the Central Emergency Control Center (CECC) in Chattanooga.

Based on the above findings, items 50-327/81-26-02 and 50-328/81-33-02 are closed.

## 8. Emergency Classification System

This area was observed to determine that a standard emergency classification and action level scheme is in use by the nuclear facility licensee as required by 10CFR50.47(b)(4), 10CFR50, Appendix E, paragraph IV.C, and specific criteria in NUREG 0654, Section II.D.

The inspectors observed that the emergency classification system was in effect as stated in Section 5 of the Radiological Emergency Plan and in Implementing Procedures SQN-IP-1 through 5. The system appeared to be adequate for the classification of the simulated accident and the emergency procedures provided initial and continuing mitigating actions taken during the simulated emergency. The inspectors had no further questions in this area.

## 9. Notification Methods and Procedures

This area was observed to determine that procedures had been established for notification by the licensee of State and local response organizations and emergency personnel, and that the content of initial and followup messages to response organizations has been established as required by 10CFR-50.47(b)(5), 10CFR50, Appendix E, paragraph IV.D, and specific criteria in NUREG 0654, Section II.E.

The inspectors observed that notification methods and procedures have been established and were used to provide information to the Operations Duty Specialist. Since only the onsite organization was being exercised, the Operations Duty Specialist was not actually required to make the notifications. The inspectors had no further questions in this area.

## 10. Emergency Communications

The area was observed to determine that provisions exist for prompt communications among principal response organizations and emergency personnel as required by 10CFR50.47(b)(6), 10CFR50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.F.

Onsite communications were observed and were considered adequate. Offsite communications to the Operations Duty Specialist at the CECC in Chattanooga appeared to be adequate. The communications link between the CECC and offsite agencies was not activated during the exercise. Under the TVA concept of operations all communications from the Sequoyah Site are directed to the CECC, which in turn maintains offsite communications links with the appropriate State, local and Federal agencies. These offsite communications links were observed during the previous exercise. The inspectors had no further questions in this area.

## 11. Emergency Facilities and Equipment

This area was observed to determine that adequate emergency facilities and equipment to support an emergency response are provided and maintained as required by 10CFR50.47(b)(8), 10CFR50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.H.

### a. Technical Support Center (TSC)

The TV camera in the Control Room was not effective in providing information to the TSC. A licensee representative stated that an alternate method of providing Control Room parameters to the TSC would be implemented.

The status boards used in the TSC were inadequate. The licensee identified this problem during the exercise critique and stated that the boards would be upgraded.

An NRC representative discussed NRC workspace and equipment with a licensee representative. The licensee stated that a private room with a speaker phone and status boards will be provided for NRC personnel.

The above items will be reviewed during a subsequent inspection.

The open item concerning upgrading the TSC from a previous inspection (50-327/81-26-05; 50-328/81-33-05) remains open. Some improvement in the TSC has been accomplished; however, the arrangements for NRC space and equipment noted above have not been completed.

### b. Operations Support Center (OSC)

The individual designated to be in charge of the OSC operated in the ECC during the exercise. As a result, OSC accountability was difficult to determine and maintain. Three different persons were apparently dispatching teams without coordinating with each other. One individual in the OSC needs to be in charge (50-327/81-40-01; 50-328/81-49-01). Teams being dispatched were not briefed on radiological and other plant conditions before dispatch (50-327/81-40-02; 50-328/81-49-02). Bomb search teams did not appear to be familiar with bomb search techniques. The licensee identified this problem during the critique and stated that local police and military expertise would be used in this area. The inspector noted that the Plant procedures need to be revised to identify assistance available in this area. These above areas will be reviewed during a subsequent inspection.

### c. Emergency Control Center (ECC)

There were no status boards or trend displays available in the ECC. The licensee identified this problem in the critique. A licensee representative stated that because of the location of the ECC, in the

Control Room area, large status boards could not be used. The licensee is considering the use of small status and trend displays. This area will be reviewed during a subsequent inspection.

## 12. Accident Assessment

This area was observed to determine that adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use as required by 10CFR50.47(b)(9), 10CFR50, Appendix E, paragraph IV.B, and specific criteria in NUREG 0654, Section II.I.

Initial dose assessment by Control Room personnel appeared to be adequate to classify the emergency. Long term dose assessment was not observed since the Muscle Shoals Emergency Control Center (MSECC) was not activated. Dose assessment at MSECC was observed during the previous exercise (OIE Report No. 50-327/81-26; 50-328/81-33).

Post-accident samples were obtained within a reasonable time; however, the technicians appeared to be unfamiliar with the Sampling and Analysis Procedure (TI-66). The Health Physics Technicians accompanying the Sampling Team did not appear to be familiar with their responsibilities under the procedure (TI-66) in providing advice on radiation levels and dose commitments. There also did not appear to be any one individual in charge to make decisions for the team. In the lab, the shielding of the hood did not seem to be adequate for the radiation levels of the simulated sample. The above problems were identified by the licensee during the critique. A licensee representative stated that training and familiarization with the procedure would be provided for applicable personnel.

In-plant radiation monitoring was performed in a satisfactory manner. The inspectors had no further questions in this area.

The Offsite Monitoring Team was directed to monitor various locations on plant property outside the Protected Area. A ten minute delay was encountered at the security gate due to the need for a radiological clearance and material pass for the team's equipment. The licensee identified this problem during the critique and stated that it will be corrected. Sampling was done in accordance with procedure MSECC IP-9. Analysis of airborne particulate was also done in accordance with this procedure. Analysis of airborne iodine concentration was done in accordance with instructions printed on a worksheet. The iodine analysis should be made part of a procedure (50-327/81-40-03; 50-328/81-49-03). The weather was rainy and the monitoring team did not have any means of protecting the air sampler filters and cartridges from the rain. This could have caused considerable error in the evaluation of airborne radioactivity concentrations. A licensee representative stated that this matter would be looked into for possible methods of resolution (50-327/81-40-04; 50-328/81-49-04). The filter cutter used to cut a 2-inch circle out of the 4-inch particulate filters was unwieldy and difficult to handle. Techniques used

by team personnel to handle and cut the filters could result in contamination spread (50-327/81-40-05; 50-328/81-49-05). These areas will be reviewed during a subsequent inspection.

It was noted that instruments used by the monitoring team were in current calibration. Based on this finding, items 50-327/81-26-06 and 50-328/81-33-06 are closed.

### 13. Protective Responses

This area was observed to determine that guidelines for protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for emergency workers, including evacuation of nonessential personnel, are implemented promptly as required by 10CFR-50.47(b)(10) and specific criteria in NUREG 0654, Section II.J.

The accountability measures used in emergencies are specified in the Emergency Plan, paragraph 6.4.1, and Procedure IP-8. Provisions are made for a full accounting of all individuals onsite or identification of missing individuals within 30 minutes from declaration of an emergency. During the exercise, it took approximately one hour and forty-five minutes to account for all onsite personnel. The first total was done in 29 minutes with six persons unaccounted for. The discrepancy appeared to be due to the inability of the assembly area supervisors to provide an accurate and timely accountability. This problem was identified by the licensee during the critique. The licensee's corrective actions will be evaluated during a subsequent inspection.

The Central Alarm Station (CAS) is designated to coordinate the accountability and report the results to the Chief - Public Safety in the Control Center. Search and Rescue teams are used to locate individuals reported as missing. Personnel at assembly areas remained there until the all-clear was sounded, providing a means for maintaining continuing accountability. The inspectors had no further questions in this area.

### 14. Radiological Exposure Control

This area was observed to determine that means for controlling radiological exposures in an emergency are established and implemented for emergency workers and that they include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides as required by 10CFR50.47(b)(11) and specific criteria in NUREG 0654, Section II.K.

Radiological surveys were conducted and dosimetry was provided throughout the exercise. It was noted that teams dispatched from the OSC were not briefed on radiological conditions in the plant (paragraph 11.b), and the post-accident sampling team could have been overexposed due to a lack of guidance from the HP escort (paragraph 12). The inspectors had no further questions in this area.

#### 15. Medical and Public Health Support

This area was observed to determine that arrangements are made for medical services for contaminated injured individuals as required by 10CFR-50.47(b)(12), 10CFR50, Appendix E, paragraph IV.E and specific criteria in NUREG 0654, Section II.L.

The medical measures used in emergencies are specified in the Emergency Plan, paragraphs 6.5 and 7.1.7, and in Procedure IP-10. There appears to be no procedural guidance provided or actions to be taken by Public Safety, EMT, and Health Physics personnel to expedite the onsite evacuation of injured personnel. However, even without this guidance, the ambulance was able to leave the protected area without delay. The medical team appeared to be well-trained and effective at their job. The inspectors had no further questions in this area.

#### 16. Radiological Emergency Response Training

This area was observed to determine that radiological emergency response training is provided to those who may be called on to assist in an emergency as required by 10CFR50.47(b)(15), 10CFR50, Appendix E, paragraph IV.F, and specific criteria in NUREG 0654, Section II.O.

As discussed in the above paragraphs, there were several instances in which personnel of the emergency response organization did not appear to have a good understanding of their functional responsibilities within the organization. This appeared to be the result of inadequate training and some procedural deficiencies, primarily in the area of post accident sampling. These problems are discussed in paragraph 12.

#### 17. Followup on IE Bulletin 79-18

During the exercise, it was noted by the inspectors that the emergency alarm could not be heard in at least one area of the plant. Audibility of emergency alarms was discussed with licensee personnel. A licensee representative stated that since neither Unit was licensed at the time the Bulletin was issued, it was sent for information only. A survey had been performed within the plant and some areas were identified where the alarm could not be heard; however, the survey was conducted prior to full operation of both units. The licensee committed to perform another survey to identify and correct any identified problems (50-327/81-40-06; 50-328/81-49-06). This area will be reviewed during a subsequent inspection.

#### 18. Exercise Critique

The licensee's critique of the emergency exercise was observed to determine that deficiencies identified as a result of the exercise and weaknesses noted in the licensee's emergency response organization were formally



presented to licensee management for corrective actions as required by 10CFR50.47(b)(14), 10CFR50, Appendix E, paragraph IV.F, and specific criteria in NUREG 0654, Section II.N.

A formal TVA critique of the emergency exercise was held on December 17, 1981 with controllers, key exercise participants, licensee management and NRC personnel attending. Deficiencies and weaknesses in the emergency preparedness program, identified as a result of this exercise, were presented by licensee personnel during the critique. Followup of corrective actions for the TVA identified deficiencies and weaknesses will be accomplished through subsequent NRC inspections.

19. Report of Federal Evaluation Team

The report of deficiencies noted by the Federal Evaluation Team (Regional Assistance Committee and Federal Emergency Management Agency Region IV staff) concerning the activities of offsite agencies during the exercise held July 7-8, 1981, is included as an attachment to this report.

JUL 24 1981

Colonel Eugene P. Tanner  
State Director  
Tennessee Emergency Management Agency  
3041 Sidco Drive  
Nashville, Tennessee 37204

Dear Colonel Tanner:

The following deficiencies were noted during RAC IV/FEMA staff participation in an evaluation of the Sequoyah Nuclear Power Plant exercise July 7-8, 1981.

General Comments:

1. Time (CDT vs. EDT) caused problems throughout the exercise.
2. There was confusion on wind direction as it affects plume travel. A firm decision should be made on using wind direction "from" or "to" in future exercises.

Specific Comments:

1. Notification and Alerting of Staff

Adequate.

2. Notification and Alerting of the Public

The warning system utilized in this exercise did not meet the requirements of OES4.

3. External Communications Capability Between Sites

Communications break-downs with Bradley County during the exercise caused delays in message transmission.

There were several instances where messages were garbled in transmission causing figures to be reported in error and unit terms to be confused. Training should be conducted to familiarize both operations and communications personnel with the appropriate terminologies used in these operations.

4. EOC Facility

The Bradley County EOC needs improvements in space, ventilation, and communications.

#### 5. EOC Internal Communications and Displays

Improvements in plotting procedures, message handling and logging are needed. Bells on some phones were disconnected in the FCC causing calls to be missed when flashing lights were not noticed.

The FCC status boards were not updated to reflect the current situation as of 8:00 a.m. 7/8 when the exercise resumed.

The plume was not plotted on the FCC maps.

#### 6. Adequacy of Staffing

Recommend a review of staffing over a sustained period.

#### 7. Facility Access/Control

The functions of security and dosimetry should be separated.

#### 8. Support by Responsible Elected or Appointed Officials

Adequate.

#### 9. Direction and Control

Two members of the tripartite operated from the CECC which limited their ability to function by removing them from immediate and direct contact with their support staff and thus hampered the Direction and Control function of the State EOC.

There was a lack of information exchange between Hamilton and Bradley County EOC's and the State EOC in Nashville. Coordination between the State EOC and the FCC was lacking at times. Delays were experienced in implementing decisions because of limited information.

Direction and control of monitoring teams needs improvement in these areas:

- a. Pre-assignment briefings were not complete in that expected exposure rates, types of release, plant conditions, mission exposure limits and recommended protective measures were not discussed.
- b. Monitors did not refer to nor follow SOP's.
- c. Backup monitoring teams were not assigned to assist teams following the plume.
- d. Assigned monitoring team identification numbers did not follow the SOP.

#### 10. Coordination

The State EOC/FCC relationship and functions should be better defined. At times information by-passed the FCC as it went from State to local governments.

## 11. Emergency Plans

Adequate.

## 12. Public Information

The FCC did not receive press releases from the CECC or the State EOC. There were no arrangements made for press briefings at the FCC.

## 13. Accident Assessment

Radiological teams were not instructed nor did any teams conduct monitoring en route to pre-designated monitoring points.

Team members were not asked for personal exposures during missions.

TVA and Rad Health used different population dose projection models which created a significant difference in projected exposures offsite. Field monitoring data was not used for verification of projections.

Use of Public Service Commission personnel as members of monitoring teams was good. This capability and trained resource can be immediately utilized when needed and should be further explored.

## 14. Protective Actions

Reasons for evacuation and sheltering decisions were not made clear to field locations.

Shelter personnel should be aware of decontamination procedures. Plans should be developed for implementation of decontamination as a protective action for shelterees.

Evacuation was ordered for some areas where monitoring teams were reporting background readings only.

## 15. Exposure Control

The decision to administer potassium iodide was not explained satisfactorily at all field locations.

Decontamination stations and procedures to be followed for personnel and emergency vehicle decontamination were not established during the exercise.

## 16. Recovery and Re-entry

Much work and planning remains to be done in the areas of recovery and re-entry.

## 17. Adequacy of the Scenario to Test the Plan

Deviation from the scenario caused much confusion for exercise observers and staff alike.

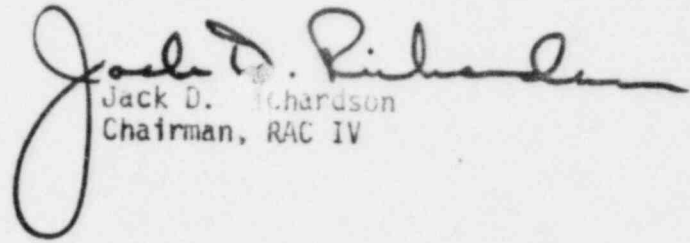
18. Benefits of the Exercise to Participants

Self critique brought out benefits of exercise to the participants.

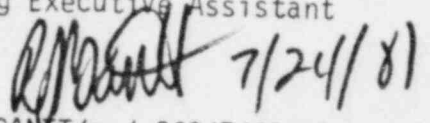
19. Capability of Observed Jurisdiction to Execute Plans

Adequate.

Sincerely,

  
Jack D. Richardson  
Chairman, RAC IV

cc:  
PP (yellow) ✓  
CF  
RD  
Gantt  
Acting Executive Assistant

  
7/24/81

PP/RJGAMT/np/x363/7/23/81

READING FILE FEMA IV