Federal Emergency Management Agency
Region IV
3003 Chamblee-Tucker Rd
Atlanta, GA 30341

January 2, 2001

Mr. Luis A. Reyes
Regional Administrator - RII
Nuclear Regulatory Commission
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

Dear ~~Mr. Reyes~~ Luis:

Enclosed is the final exercise report for the Sequoyah Nuclear Power Plant that was conducted on October 4, 2000. This was a full-participation, plume exposure pathway exercise designed to evaluate the offsite radiological emergency response plans site-specific to the Sequoyah Nuclear Power Plant. This report addresses the evaluation of the plans and preparedness for the State of Tennessee and the counties within the 10-mile Emergency Planning Zone. The State of Tennessee, the Risk Counties of Hamilton and Bradley, and the Host County of Rhea participated in the exercise. The U. S. Army Corps of Engineers, U. S. Coast Guard, Nuclear Regulatory Commission, Department of Energy, Food and Drug Administration and the U. S. Department of Agriculture also participated in this exercise. The final exercise report was prepared by the Federal Emergency Management Agency Region IV staff.

This exercise was conducted in accordance with FEMA's policies and guidance for offsite preparedness exercises. All agreed upon objectives for the exercise were demonstrated. During this exercise no Deficiencies and one Area Requiring Corrective Action were identified. The resolution of two previously identified Areas Requiring Corrective Action was successfully demonstrated during the 1999 Watts Bar Exercise. One Area Requiring Corrective Action remains unresolved because Sequatchie County did not participate in this exercise. FEMA Region IV has received the State of Tennessee's proposed corrective actions and will monitor the progress of these actions. The State Response is in Section 4 of this report.

Based on the results of the October 4, 2000, exercise and FEMA's review of the State's Annual Letter of Certification for 1999 and 2000, the offsite radiological emergency response plans and preparedness for the State of Tennessee and the affected local jurisdictions, site-specific to the Sequoyah Nuclear Power Plant, can be implemented and are adequate to provide reasonable

assurance that appropriate measures can be taken offsite to protect the health and safety of the public in the event of a radiological emergency at the site. The Title 44 CFR, Part 350 approval of the offsite radiological emergency response plans and preparedness for the State of Tennessee site-specific to the Sequoyah Nuclear Power Plant, granted on August 7, 1980, will remain in effect.

Copies of this report will be forwarded to the State of Tennessee, FEMA Headquarters, and NRC Headquarters by my staff. If you have any questions, please contact Eddie Hickman at 770/220-5370.

Sincerely,

John B. Copenhaver
Regional Director

Enclosure

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Washington, DC 20555-0001

Final Exercise Report

Sequoyah Nuclear Power Plant

Licensee: **Tennessee Valley Authority**

Exercise Dates: **October 4, 2000**

Report Date: **January 2, 2001**

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION IV
3003 Chamblee-Tucker Road
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Final Exercise Report

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FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION IV
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I. EXECUTIVE SUMMARY

On October 4, 2000, the Federal Emergency Management Agency (FEMA), Region IV, conducted a full participation plume pathway exercise in the emergency planning zone (EPZ) around the Sequoyah Nuclear Power Plant. The purpose of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency. This exercise was conducted in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans (RERP) and procedures. This report contains the evaluation of the biennial exercise.

This was the twelfth Federally evaluated offsite preparedness exercise conducted for the Sequoyah Nuclear Power Plant. The qualifying emergency preparedness exercise was conducted in June 1980, and the previous exercise was conducted on November 4, 1998.

FEMA wishes to acknowledge the efforts of the many individuals who participated in this exercise. The State of Tennessee, the risk counties of Bradley and Hamilton and the host county of Rhea participated in the Sequoyah Exercise. Protecting the public health and safety is the full-time job of some of the exercise participants and an assigned responsibility for others. Others have willingly sought this responsibility by volunteering to provide vital emergency services to their communities.

Cooperation and teamwork of all the participants were evident during this exercise. The U. S. Army Corps of Engineers and the U. S. Coast Guard participated in their normal support roles at the Emergency Operations Center (EOC). These agencies assisted the State in determining the severity of the situation and in the determination of protective action recommendations for the exercise.

The State and local organizations, except where noted, demonstrated knowledge of their emergency response plans and procedures and successfully implemented them. No Deficiencies were found during this exercise. However, one Area Requiring Corrective Action (ARCA) was identified as a result of this exercise. The draft report had the ARCA assessed against Bradley County. However, after further review and discussion with the State, the ARCA was assessed against the State and not Bradley County. Two previously identified ARCAs were corrected during the 1999 Watts Bar exercise. The correction of one remaining ARCA from the 1998 exercise was not demonstrated because the host county did not participate during this exercise.

II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for offsite nuclear planning and response. FEMA's activities are conducted pursuant to Title 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

FEMA Title 44 CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of State and local government's radiological emergency planning and preparedness for commercial nuclear power plants. This approval is contingent, in part, on State and local government participation in joint exercises with licensees.

FEMA's responsibilities in radiological emergency planning for fixed nuclear facilities include the following:

- Taking the lead in offsite emergency planning and in the review and evaluation of radiological emergency response plans (RERP) and procedures developed by State and local governments;

- Determining whether such plans and procedures can be implemented on the basis of observation and evaluation of exercises of the plans and procedures conducted by State and local governments;

- Responding to requests by the NRC pursuant to the Memorandum of Understanding between the NRC and FEMA (Federal Register, Vol. 58, No.176, September 14, 1993).

- Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:

  - Department of Commerce
  - Nuclear Regulatory Commission
  - Environmental Protection Agency
  - Department of Energy
  - Department of Health and Human Services
  - Department of Transportation
  - Department of Agriculture
  - Department of the Interior, and
  - Food and Drug Administration

Representatives of these agencies serve on the FEMA Region IV Regional Assistance Committee (RAC), which is chaired by FEMA.

Formal submission of the Multi-Jurisdictional Radiological Response Plan (MJRERP) for the Sequoyah Nuclear Power Plant to FEMA Region IV by the State of Tennessee was made in May of 1980. Formal approval of the MJRERP was granted on August 7, 1980, under 44 CFR 350. A joint REP exercise was conducted on October 4, 2000, by FEMA Region IV to assess the capabilities of State and local emergency preparedness organizations in implementing their MJRERP and procedures to protect the public health and safety during a radiological emergency involving the Sequoyah Nuclear Power Plant. The purpose of this report is to present the results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

The findings presented in this report are from the evaluations of the Federal Evaluator team, with final determinations made by the Chief Evaluator and FEMA Region IV Regional Assistance Chairman and approved by the Regional Director. The criteria utilized in the FEMA evaluation process are contained in:

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980;

- FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991; and

- FEMA-REP-15, "Radiological Emergency Preparedness Exercise Evaluation Methodology," September 1991.

Section III of this report, entitled "Exercise Overview" presents basic information and data relevant to the exercise. This section of the report contains a description of the plume and ingestion pathway EPZs, a listing of all participating jurisdictions and functional entities evaluated and a tabular presentation of the time of actual occurrence of key exercise events and activities.

Section IV of this report, entitled "Exercise Evaluation and Results" presents summarized information on the demonstration of applicable exercise objectives at each jurisdiction or functional entity evaluated in a jurisdiction-based, issues-only format. This section also contains: (1) descriptions of all ARCAs assessed during this exercise, recommended corrective actions and the State and local governments' response, and (2) descriptions of ARCAs assessed during previous exercises and the status of the OROs' efforts to resolve them.

III. EXERCISE OVERVIEW

Contained in this section are data and basic information relevant to the October 4 2000 exercise to test the offsite emergency response capabilities in the area surrounding the Sequoyah Nuclear Power Plant.

A. EPZ Description

The Sequoyah Nuclear Power Plant, operated by the Tennessee Valley Authority (TVA), is located on the Tennessee River near the town of Soddy-Daisy in Hamilton County, Tennessee. Portions of Bradley and Hamilton Counties lie within the 10-mile EPZ. The major highways are Interstate 75 and Tennessee Highways 27 and 58. Land use is a mix of residential, business and agricultural. All or portions of the following counties lie within the 50-mile EPZ: Bledsoe, Bradley, Coffee, Cumberland, Franklin, Grundy, Hamilton, Loudon, McMinn, Marion, Meigs, Monroe, Polk, Rhea, Roane, Sequatchie, Van Buren, Warren, and White. There are approximately 24,000 persons within the 10-mile EPZ.

B. Exercise Participants

The following State agencies, organizations, and units of government participated in the Sequoyah Nuclear Power Plant exercise on October 4, 2000.

STATE OF TENNESSEE

Emergency Management Agency
Department of Environment and Conservation
Department of Safety
Department of Transportation
Department of Agriculture
Public Service Commission
Department of Tourist Development
Department of Health
Department of General Services
Wildlife Resource Agency

RISK JURISDICTIONS

Bradley County
Hamilton County

HOST JURISDICTION

Rhea County

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross (ARC)
Salvation Army
Radio Amateur Civil Emergency Service (RACES)
Amateur Radio Emergency Service (ARES)

C. Exercise Timeline

Table 1, on the following page, presents the time at which key events and activities occurred during the Sequoyah Nuclear Power Plant exercise on October 4, 2000. Also included are times that notifications were made to the participating jurisdiction or functional entities.

Table 1. Exercise Timeline

DATE AND SITE: October 4, 2000 - Sequoyah Nuclear Power Plant

Emergency Classification Level for Event	Time Declared	Time That Notification Was Received or Action Was Taken					
		SEOC	FCC	RMCC	JIC	BRADLEY COUNTY	HAMILTON COUNTY
Unusual Event							
Alert	0824	0829	0850	0850	0855	0835	0836
Site Area Emergency	0920	0925	0931	0925	0925	0930	0930
General Emergency	1050	1055	1103	1100	1105	1101	1102
Simulated Rad. Release Started	1105	1105			1117		
Simulated Rad. Release Terminated	1400						
Facility Declared Operational		0910	0920	0840	0916	0830	0838
Declaration of State of Emergency						Local 1030	
Exercise Terminated		1400					
Early Precautionary Actions: School Buses on standby		0905				0900	0842 – Tone Alert Radio 0844 - (School Daycare)
1st Protective Action Decision Activate Public Notification System		0900				0900	0900
1st Siren Activation		0903				0903	0903
1st EAS Message		0905				0905	0905
2nd Protective Action Decision: Relocation of Schools		0930				0930	0930
2nd Siren Activation		0932				0932	0932
2nd EAS Message		0935				0935	0935
3rd Protective Action Decision: **Evacuate:** Near Plant Area; Zones c and D **Shelter:** Zones A and B		1028				1028	1028
3rd Siren Activation		1032				1032	1032
3rd EAS Message		1032				1032	1032
4th Siren Activation		1105				1105	1105
4th EAS Message		1105				1105	1105
KI Administration Decision: Emergency Worker ordered to take KI		1003				1010	1003

IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities that participated in the October 4, 2000 exercise to test the offsite emergency response capabilities of State and local governments in the 10-mile EPZ around the Sequoyah Nuclear Power Plant.

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in exercise objectives contained in FEMA-REP-14, REP Exercise Manual, dated September 1991. Detailed information on the exercise objectives and the extent-of-play agreement used in this exercise are found in Appendix 3 of this report.

A. Summary Results of Exercise Evaluation - Table 2

The matrix presented in Table 2 on the following page presents the status of all objectives from FEMA-REP-14 scheduled for demonstration during this exercise by all participating jurisdictions and functional entities. Exercise objectives are listed by number and the demonstration status of those objectives is indicated by the use of the following letters:

M	-	Met (No Deficiency or ARCAs assessed and no unresolved ARCAs from prior exercises)
D	-	Deficiency assessed
A	-	ARCA(s) assessed or unresolved ARCA(s) from prior exercise(s)
N	-	Not Demonstrated (Reason explained in Subsection B)

Table 2. Summary Results of Exercise Evaluation

DATE AND SITE: October 4, 2000 – Sequoyah Nuclear Power Plant

Jurisdiction or Functional Entity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
STATE OF TENNESSEE																																	
SEOC	M	M	M	M					A	M	M		M	M									M										
Dose Assessment				M			M		M														M										
FCC		M	M	M										M																			
RMCC		M	M	M			M							M																			
Field Teams				M	M	M		M															M										
CECC		M	M	M																													
JIC		M		M								M	M																				
BRADLEY COUNTY																																	
Emergency Operations Center	M	M	M	M	M				M	M		M			M								M										
Protective Action for Schools																M																	
Emergency Worker Decon				M	M																	M											
HAMILTON COUNTY																																	
Emergency Operations Center	M	M	M	M	M				M	M	M				M		M						M										
Reception and Congregate Care					M													M	M														
Protective Action for Schools																M																	
Emergency Worker Decon				M	M																	M											
Traffic Control Points					M												M																
Backup Route Alerting					M					M																							
RHEA COUNTY																																	
Congregate Care																			M														

LEGEND: M = Met D = Deficiency A = ARCA

B. Status of Jurisdictions Evaluated

This subsection provides information on the evaluation of each participating jurisdiction and functional entity, in a jurisdiction based, issues only format. Presented below are the definitions of terms used in this subsection relative to objective demonstration status.

- **Met** - Listing of the demonstrated exercise objectives under which no Deficiencies or ARCAs were assessed during this exercise and under which no ARCAs assessed during prior exercises remain unresolved.

- **Deficiency** - Listing of the demonstrated exercise objectives under which one or more Deficiencies was assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.

- **Area Requiring Corrective Actions** - Listing of the demonstrated exercise objectives under which one or more ARCAs were assessed during the current exercise or ARCAs assessed during prior exercises that remain unresolved. Included is a description of the ARCAs assessed during this exercise and the recommended corrective action to be demonstrated before or during the next biennial exercise.

- **Not Demonstrated** - Listing of the exercise objectives, which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.

- **Prior ARCAs- Resolved** - Descriptions of ARCAs assessed during previous exercises which were resolved in this exercise and the corrective actions demonstrated.

- **Prior ARCAs - Unresolved** - Descriptions of ARCAs assessed during prior exercises which were not resolved in this exercise. Included is the reason the ARCA remains unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise. The following are definitions of the two types of exercise issues which may be discussed in this report.

- A **Deficiency** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant."

- An **ARCA** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety."

FEMA has developed a standardized system for numbering exercise issues (Deficiencies and ARCAs). This system is used to achieve consistency in numbering exercise issues among FEMA Regions and site-specific exercise reports within each Region. It is also used to expedite tracking of exercise issues on a nationwide basis.

The identifying number for Deficiencies and ARCAs includes the following elements, with each element separated by a hyphen (-).

- **Plant Site Identifier** - A two-digit number corresponding to the Utility Billable Plant Site Codes.

- **Exercise Year** - The last two digits of the year the exercise was conducted.

- **Objective Number** - A two-digit number corresponding to the objective numbers in FEMA-REP-14.

- **Issue Classification Identifier** - (D = Deficiency, A = ARCA). Only Deficiencies and ARCAs are included in exercise reports.

- **Exercise Issue Identification Number** – A separate two (or three) digit indexing number assigned to each issue identified in the exercise.

1. STATE OF TENNESSEE

1.1 State Emergency Operations Center

The State Emergency Operations Center (SEOC) is located in the National Guard Armory Building in Nashville. The SEOC staff worked well as a team and established effective coordination with other State and Federal Agencies. Decision-making was centralized in the SEOC with the counties providing input and concurrence on protective action requirements. The SEOC Director had several briefings and encouraged staff and agency participation. However, when the Bradley County Executive decided to evacuate the 10-mile Emergency Planning Zone (EPZ) portion of Bradley County, the State should have stepped in and supported the county's actions.

a. **MET:** Objectives 1, 2, 3, 4, 10, 11, 13, 14 and 23

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:**

Issue No.: 58-00-09-A-01

Description: The Tennessee MJRERP states: "Since a radiological release may have multi-jurisdictional implications, the State will activate this emergency plan and control the response to the emergency at all levels." (Basic Plan, Section V.A.2.b, page BP-4). The plan also states the primary responsibility of responding to an emergency affecting the health and safety of residents of Bradley County rests with local government. The County Executive made the decision to order an evacuation of all residents in Bradley County within the 10-mile EPZ, which exceeded the decision of the Tennessee Emergency Management Agency (TEMA). The TEMA Director of Operations, when presented with this information failed to properly coordinate with the County. He did not assure that the additional evacuation area requested by the Bradley County was effectively communicated to the public, or, if the State had not concurred, taken the necessary steps to inform the county.

Recommendation: Review and revise as necessary the MJRERP to assure that the proper authorities are delineated. The ability of the County Executive to exceed the State decision for their County needs to be clearly delineated, as well as, the State's role in the County decision, and the procedures necessary to assure that those decisions are effectively communicated to the public.

Schedule of Corrective Actions: TEMA plans to conduct emergency action training for key individuals at State and local level. Training will involve TEMA

personnel having director of operation's responsibility, on call officers, and for Risk County Executives and Emergency Management Directors.

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:**

Issue No.: 58-98-03-A-01

Description: The decision to issue potassium iodide (KI) to emergency workers was made by the Department of Health at 1152. The standard procedure is for the SEOC County Liaisons to verbally communicate protective action decisions to the County EOCs and follow-up with hard copy instructions. In this instance, the message center faxed the message to the counties at 1222 without providing copies to the Chief of Operations and the SEOC County Liaisons. This led to a delay of approximately 1-hour before the KI ingestion order was implemented in the counties. (NUREG-0654, A.1.d and A.2.a)

Corrective Action Demonstrated: The decision to issue KI to emergency workers was made by the Department of Health. The SEOC County Liaisons communicated protective action decisions to the County EOCs in a timely manner. **(Demonstrated during Watts Bar exercise, November 17, 1999)**

f. **PRIOR ARCAs - UNRESOLVED:** NONE

1.2 Dose Assessment

The Tennessee Division of Radiological Health staff demonstrated the technical capability to direct and control the dose assessment operation in the SEOC. The technical capability to calculate dose projections and to develop protective actions recommendations (PARs) were demonstrated by a professional staff that also participated in the decision making process. The utility's liaisons were very helpful in interpreting plant conditions. The dose assessment staff performed their assigned duties in a very professional manner.

a. **MET:** Objectives 4, 7, 9 and 23

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.3 Field Coordination Center

The Field Coordination Center (FCC) is located at the Tennessee Air National Guard Armory in Chattanooga. This facility serves as the alternate SEOC and the coordination point for the field monitoring teams (FMT). The Director and Assistant Director were professional and provided effective leadership to the Emergency Services Coordinators (ESC) as decision makers and coordinators for each agency. The staff was competent, conscientious and cooperative. The staff coordinated consistently with the SEOC, promptly posted Emergency Classification Levels, protective action decisions (PADs) and other important events and developments. Message tracking and distribution was managed exceptionally well and periodic FCC briefings and ESC updates kept all FCC personnel abreast of current activities.

a. **MET:** Objectives 2, 3, 4 and 14

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs- RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.4 Radiological Monitoring Control Center

The Radiological Monitoring Control Center (RMCC) staff successfully demonstrated the ability to direct radiological field monitoring teams, exchange field team data with the Tennessee Valley Authority (TVA) field team coordinator, and promptly forward such data to the division of Radiological Health at the SEOC in Nashville. Six field-monitoring teams, four State monitoring teams and two TVA teams were capably directed by the RMCC. All personnel were knowledgeable and performed their duties in a professional manner.

a. **MET:** Objectives 2, 3, 4, 7 and 14

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.5 Radiological Field Monitoring Teams

The FMT had excellent communication equipment and had no difficulty in communicating with the RMCC Coordinator. The teams were equipped with the proper dosimetry and knew both their turn-back value and authorized maximum exposure limits. The teams demonstrated the appropriate use of equipment and procedures for determining the field radiation measurements, as well as measurement of airborne radioiodine concentration in the presence of noble gases. FMTs were very knowledgeable of monitoring procedures and were attentive to contamination control techniques.

a. **MET:** Objectives 4, 5, 6, 8 and 23

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 58-98-06-A-02

Description: FMT #4 checked their survey instruments with a dedicated check source prior to being dispatched. The Geiger Mueller (GM) probe of the Ludlum instrument gave a reading twice the value as shown on the card attached to the instrument at the time of calibration. Although different combinations of switch settings were used and the position of the radioactive check source was changed (turned over), the instrument did not function properly (NUREG-0654, I.8). The team used this instrument during the exercise. The measurement data gathered by the team would not be able to be used because of questions concerning its reliability.

Corrective Action Demonstrated: All instruments were confirmed operational. Procedures included the identification of each side of the check source prior to being dispatched. **(Demonstrated during Watts Bar exercise, November 17, 1999)**

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.6 Central Emergency Control Center

The Central Emergency Control Center (CECC), located at the corporate offices in Chattanooga is an excellent facility for effectively managing and conducting emergency operations. Communications, coordination and the flow of technical information between the utility operator and the State officials, both at the CECC and the SEOC, were outstanding. The State official dispatched to the CECC was knowledgeable, well trained and carried out his responsibilities in a professional and efficient manner.

a. **MET:** Objectives 2, 3 and 4

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

1.7 Joint Information Center

The Joint Information Center (JIC) for the Sequoyah Nuclear Power Plant is located at the TVA Office Complex in Chattanooga. This facility provides a good environment in which to carry out all emergency news functions. The State of Tennessee, Bradley County, Hamilton County and TVA Public Information Officers (PIO) conducted five media briefings and issued press releases to inform the public about the incident and what protective actions they should take. Briefings and releases contained accurate, timely and up-to-date information. The Citizens Information Center/Rumor Control was established to handle inquiries from the public and media. TVA employees, staffing the Media Monitoring Center, monitored radio and television broadcasts for the dissemination of misinformation.

a. **MET:** Objectives 2, 4, 12 and 13

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2. RISK JURISDICTIONS

2.1 BRADLEY COUNTY

2.1.1 Emergency Operations Center

The Bradley County Emergency Operations Center (EOC) is co-located with the 911 center in Cleveland. It is an excellent facility. The Emergency Management Director provided regular updated briefings to the staff and received good feedback from the emergency support functions. The Staff was very professional, well prepared and promptly took the actions required during the exercise. The County Executive officer was present and participated in the decision making. Overall, it was a very good demonstration of the EOC capability.

a. **MET:** Objectives 1, 2, 3, 4, 5, 9, 10, 12, 15 and 23

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.2 Protective Action For Schools

Interviews at the Bradley County EOC with the Directors of Schools and Transportation revealed that these officials have a keen interest in protecting the students in Bradley County. They exhibited a thorough knowledge of their responsibilities. Four schools, one public and three private are within the 10-mile EPZ of Sequoyah Nuclear Power Plant.

a. **MET:** Objective 16

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.3 Emergency Worker Decontamination

Emergency worker monitoring and decontamination was demonstrated, out of sequence, at Bradley Central High School in Cleveland. Personnel from the Tennessee Department of Forestry, Cleveland Fire Department and Bradley County Health Department successfully demonstrated this activity by working together to form a cohesive team. An amateur radio operator supported this activity by providing backup communications.

a. **MET:** Objectives 4, 5 and 22

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2 HAMILTON COUNTY

2.2.1 Emergency Operations Center

The EOC is located inside the 911 Communication Center in Chattanooga. It is a modern, well equipped, state-of-the-art facility that is staffed with knowledgeable and enthusiastic individuals. Direction and control were exceptional with frequent briefings to the EOC Staff, directions to plan ahead and with constant reminders to adhere to the County's Plans. Especially noteworthy are the County's "Standard Operating Procedures" (SOP) for each of the functional areas, many of which contain a checklist. These are some of the most complete plans observed at the county level. Actions by the EOC staff members were appropriate and consistent with the County's Plans. The County Executive and County Executive Assistant visited the EOC during the exercise. Volunteer agencies in the EOC included the American Red Cross (ARC), the Salvation

Army, and six members of Radiological Amateur Civil Emergency Services (RACES). Personnel from the Hamilton County Rescue Squad were interviewed at the EOC concerning shelter activities. This activity was not on the exercise agenda and Hamilton County Emergency Management is commended for its initiative in going beyond what was expected.

a. **MET:** Objectives 1, 2, 3, 4, 5, 9, 10, 11, 15, 17 and 23

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.2 Reception and Congregate Care

Reception and congregate care demonstrations were evaluated at East Ridge High School and the Howard School of Academics and Technology. Both centers were staffed by well organized, knowledgeable and enthusiastic personnel from the Hamilton County Department of Public Health with support from the ARC, Department of Human Services, RACES, Amateur Radio Emergency Service (ARES) and students. The ARC managed and coordinated mass care activities at both centers. The Department of Public Health provided personnel for monitoring and decontamination of evacuees. All personnel were well trained and demonstrated procedures for monitoring, decontamination, registration and sheltering of evacuees.

a. **MET:** Objectives 5, 18 and 19

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.3 Protective Action for Schools

The capabilities and resources necessary to implement protective actions for schools within the plume pathway EPZ were demonstrated through interview and visits to 6 of the 21 schools located inside the EPZ. The Assistant Superintendent and Transportation Supervisor were interviewed in the EOC and the school principals, or their representatives, were interviewed at their respective schools. All the officials interviewed were thoroughly familiar with existing plans and their responsibilities in the event of an incident at the Sequoyah Plant. All participants demonstrated a sincere interest in the exercise and were very professional, making this an excellent demonstration..

a. **MET:** Objective 16

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.4 Emergency Worker Decontamination

Emergency worker vehicle monitoring and decontamination were demonstrated at the Ooltawah Middle School. Personnel from the State Division of Forestry, County Department of Public Health and volunteers from the Tri-Community Fire Rescue Squad and ARC carried out all procedures in a thorough and efficient manner. All personnel were provided the appropriate dosimetry and were knowledgeable of its use. The staffs were also knowledgeable of radiation exposure limits. Personnel from the Department of Public Health discussed all procedures and processes for personnel monitoring and decontamination with obvious knowledge and enthusiasm.

a. **MET:** Objectives 4, 5 and 22

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE
f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.5 Traffic Control Points

Two officers from the Sheriff's Department were interviewed in the EOC. Both officers were knowledgeable of their duties and responsibilities and had a thorough understanding of their personal dosimetry, turn-back values and the procedures for KI.

a. **MET:** Objectives 5 and 17

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.6 Backup Route Alerting

Backup route alerting was discussed in the EOC following the failure of sirens during the demonstration of Alert and Notification of the public. Two Officers from the Sheriff's Department were interviewed to determine their knowledge of roles and responsibilities. The officers had the County's SOPs which contained maps of the areas, a pre-scripted message to be read and detailed instructions on how to carry out their duties. Both officers were knowledgeable of personal dosimetry,

a. **MET:** Objectives 5 and 10

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

3. HOST JURISDICTION

3.1 RHEA COUNTY

3.1.1 Congregate Care

Rhea County demonstrated congregate care out-of-sequence at the Rhea County High School. This large complex has all appropriate features to accommodate the evacuees from Hamilton County. Agencies represented were the Departments of Health, Human Services and Education, Rescue, RACES and the Sheriff's Department. They would assist and support the ARC in shelter operations. All were prepared and motivated for their duties and responsibilities.

a. **MET:** Objective 19

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

4. SUMMARY OF AREAS REQUIRING CORRECTIVE ACTION

4.1 2000 ARCAs

4.1.1 58-00-09-A-01 SEOC

Description: The Tennessee MJRERP states: "Since a radiological release may have multi-jurisdictional implications, the State will activate this emergency plan and control the response to the emergency at all levels." (Basic Plan, Section V.A.2.b, page BP-4). The plan also states the primary responsibility of responding to an emergency affecting the health and safety of residents of Bradley County rests with local government. The County Executive made the decision to order an evacuation of all residents in Bradley County within the 10-mile EPZ, which exceeded the decision of the Tennessee Emergency Management Agency (TEMA). The TEMA Director of Operations, when presented with this information failed to properly coordinate with the County. He did not assure that the additional evacuation area requested by the Bradley County was effectively communicated to the public, or, if the State had not concurred, taken the necessary steps to inform the county.

Recommendation: Review and revise as necessary the MJRERP to assure that the proper authorities are delineated. The ability of the County Executive to exceed the State decision for their County needs to be clearly delineated, as well as, the State's role in the County decision, and the procedures necessary to assure that those decisions are effectively communicated to the public.

Schedule of Corrective Actions: TEMA plans to conduct emergency action training for key individuals at State and local level. Training will involve TEMA personnel having director of operation's responsibility, on call officers, and for Risk County Executives and Emergency Management Directors.

4.2 1999 Prior ARCAs – Resolved

4.2.1 58-98-03-A-01 SEOC

Description: The decision to issue KI to emergency workers was made by the Department of Health at 1152. The standard procedure is for the SEOC County Liaisons to verbally communicate protective action decisions to the County EOCs and follow-up with hard copy instructions. In this instance, the message center faxed the message to the counties at 1222 without providing copies to the Chief of Operations and the SEOC County Liaisons. This led to a delay of approximately 1-hour before the KI ingestion order was implemented in the counties. (NUREG-0654, A.1.d and A.2.a)

Corrective Action Demonstrated: The decision to issue KI to emergency workers was made by the Department of Health. The SEOC County Liaisons communicated protective action decisions to the County EOCs in a timely manner. **(Demonstrated during Watts Bar exercise, November 17, 1999).**

4.2.2 58-98-06-A-02 FMT

Description: FMT #4 checked their survey instruments with a dedicated check source prior to being dispatched. The GM probe of the Ludlum instrument gave a reading twice the value as shown on the card attached to the instrument at the time of calibration. Although different combinations of switch settings were used and the position of the radioactive check source was changed (turned over), the instrument did not function properly (NUREG-0654, I.8). The team used this instrument during the exercise. The measurement data gathered by the team would not be able to be used because of questions concerning its reliability.

Corrective Action Demonstrated: All instruments were confirmed operational. Procedures included the identification of each side of the check source prior to being dispatched. **Demonstrated during Watts Bar exercise, November 17, 1999)**

4.3 1998 Prior ARCA – Unresolved

4.3.1 58-98-18-A-03 Sequatchie Co. EWD

Description: Personnel from the Sequatchie County Fire Department performed the initial monitoring of the evacuees. The monitor did not appropriately follow County procedures for radiological monitoring (Sequatchie County Implementing Procedures, Sequatchie County Health Department, Revision 4, July 1998, pg. EE-16, Section VIII.H.) He did not cover the probe or wear gloves while monitoring. He also did not check the feet, front and back of the evacuees. He moved the probe too rapidly over the area he surveyed.

The set-up of the decontamination area for evacuees requires both contaminated and clean evacuees to traverse a narrow entry hall that makes the separation of clean and contaminated evacuees very difficult, and may cause decontaminated evacuees to step into contaminated area.

Reason ARCA Unresolved: Sequatchie County did not participate in this exercise.

Recommendation: Provide training to emergency workers decontamination personnel.

Schedule of Corrective Actions: TEMA is working with county officials to schedule and conduct training.

APPENDIX 1

ACRONYMS AND ABBREVIATIONS

The following is a list of the acronyms and abbreviations, which may have been used in this report.

ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARES	Amateur Radio Emergency Service
CCC	Congregate Care Center
CECC	Central Emergency Control Center
CFR	Code of Federal Regulations
CIC	Citizen's Information Center
DHHS	Department of Health and Human Services
DOC	Department of Commerce
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DRH	Division of Radiological Health
EAS	Emergency Alert System
EBS	Emergency Broadcast System
ECL	Emergency Classification Level
EEM	Exercise Evaluation Methodology
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ESC	Emergency Support Coordinator
EW	Emergency Worker
FAA	Federal Aviation Administration
FCC	Field Coordination Center
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
GE	General Emergency
GM	Geiger Mueller
IP	Implementing Procedure

JIC	Joint Information Center
KI	Potassium Iodide
MJRERP	Multi-Jurisdictional Radiological Response Plan
NRC	Nuclear Regulatory Commission
NUREG-0654	NUREG-0654/FEMA-REP-1, Rev. 1, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, November 1980*
ORO	Offsite Response Organization
PAD	Protective Action Decision
PAR	Protective Action Recommendation
PIO	Public Information Officer
PNS	Public Notification System
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RC	Relocation Center
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
RMC	Radiological Monitoring Coordinator
RMCC	Radiological Monitoring Control Center
SAE	Site Area Emergency
SC	Sample Coordinator
SEOC	State Emergency Operations Center
SIP	Shelter Information Point
SOP	Standard Operating Procedures
SQN	Sequoyah Nuclear Power Plant
TAT	Traffic Assistance Team
TEMA	Tennessee Emergency Management Agency
TVA	Tennessee Valley Authority
USDA	U.S. Department of Agriculture

APPENDIX 2

EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the Sequoyah Nuclear Power Plant exercise on October 4, 2000. The organization represented by each evaluator is abbreviated below.

ANL	-	Argonne National Laboratory
FDA	-	Food and Drug Administration
FEMA	-	Federal Emergency Management Agency
NRC	-	Nuclear Regulatory Commission
USDA	-	US Department of Agriculture

EVALUATION SITE	EVALUATOR	ORGANIZATION
CHIEF EVALUATOR	Eddie Hickman	FEMA
STATE OF TENNESSEE		
State Emergency Operations Center	Eddie Hickman	FEMA
	Robert Perdue	FEMA
	Tom Trout	FDA
Central Emergency Control Center	Robert Trojanowski	NRC
Forward Coordinating Center	Don Cornell	FEMA
Radiological Monitoring Control Center	Bernie Hannah	ANL
Dose Assessment	Eddie Fuente	ANL
Field Radiological Monitoring Team #1	George Goforth	ANL
Field Radiological Monitoring Team #2	Bill Serrano	ANL
Field Radiological Monitoring Team #3	Neal Gaeta	ANL
Field Radiological Monitoring Team #4	Lori Thomas	USDA
Joint Information Center	Sandra Bailey	ANL
	Jim Sutch	ANL

EVALUATION SITE	EVALUATOR	ORGANIZATION
BRADLEY COUNTY		
Emergency Operations Center	Tom Reynolds	FEMA
Protective Action for Schools	Al Hall	ANL
Emergency Worker Decontamination	Al Hall	ANL
HAMILTON COUNTY		
Emergency Operations Center	Joseph Canoles	FEMA
Traffic Control Points	Joseph Canoles	FEMA
Back-up Route Alerting	Joseph Canoles	FEMA
Mass Care Shelter	Tom Carroll Helen Wilgus	ANL FEMA
Protective Action for Schools	Dave Moffet Josh Moore	ANL ANL
Emergency Worker Decontamination	Tom Carroll Helen Wilgus	ANL FEMA
RHEA COUNTY		
Mass Care Shelter	Wayne Waddell	ANL

APPENDIX 3

EXERCISE OBJECTIVES AND EXTENT-OF-PLAY AGREEMENT

This appendix contains the exercise objectives scheduled for demonstration in the Sequoyah Nuclear Power Plant exercise on October 4, 2000 and the extent-of-play agreement approved by FEMA Region IV.

A. Exercise Objectives

B. Extent-of-Play Agreement

The Extent-of-Play Agreement on the following pages was submitted by Tennessee and was approved by FEMA Region IV

2000 SEQUOYAH NUCLEAR PLANT EXERCISE

STATE OF TENNESSEE GOALS AND OBJECTIVES

IN THE

10-MILE PLUME EXPOSURE PATHWAY

(INCLUDES EXTENT-OF-PLAY)

A full participation exercise will be conducted during the week of October 2, 2000 for the purpose of demonstrating an integrated radiological emergency response capability for the Sequoyah Nuclear Plant (SQN). The exercise will be a one-day event lasting approximately eight hours, and will cover the response capabilities and requirements of the State, local governments, and TVA in the 10-Mile Plume Exposure Pathway.

Both the State of Tennessee and the Tennessee Valley Authority have prepared individual goals and objectives that pertain to their respective obligations. However, both lists reflect the necessary interactions of the entities involved as set forth in the Multi-Jurisdictional Radiological Emergency Response Plan (MJRERP) for SQN. The list of goals and objectives that will guide the state and local governments are enumerated below, and have been written in accordance with FEMA –REP-14, "Radiological Emergency Preparedness Exercise Manual."

EXERCISE GOALS:

State and local government goals for this exercise are as follows:

1. To allow state and local offsite personnel to test and practice their response capability, in accordance with the SQN MJRERP and local government implementing procedures, to guide and protect the general public through the issuance of protective action recommendations as appropriate.

2. To ensure that any inadequacies will be noted and recommended improvements corrected and/or implemented.

3. To identify emergency response capabilities that is in need of improvement or revision.

EXERCISE OBJECTIVES:

The following exercise objectives are set out in FEMA-REP-14 and REP-15. They are divided into three groups:

Group A objectives, numbered 1 thru 13, are "core objectives" and must be demonstrated by those organizations designated in the SQN MJRERP as responsible for the specific emergency function addressed in a given objective. These objectives must be demonstrated during each biennial exercise.

Group B objectives, numbered 14 thru 22 should also be demonstrated during each biennial exercise by some organizations. However, scenario events and the exercise play determine the specific participating organizations.

Group C objectives, numbered 23 thru 33 should be demonstrated at least once every six years but are not required during this exercise.

EXTENT – OF – PLAY (EOP):

EOP refers to the degree that actions taken by State and local response organizations to exercise events will conform to those actions that would be taken under the SQN MJRERP in an actual emergency. In instances where these actions are to be simulated, it is so noted in the EOP following each objective.

1. MOBILIZATION OF EMERGENCY PERSONNEL:

Demonstrate the capability to fully alert and mobilize personnel for both emergency facilities and field operations. Demonstrate the capability to activate and staff emergency facilities for emergency operations.

EOP: All personnel assigned to the SEOC, FCC, RMCC, JIC and Risk County (Bradley and Hamilton) EOCs will be pre-positioned. However, the EMA Directors in each county will demonstrate their procedures and ability to alert and mobilize the EOC staffs. DRH field monitoring teams will be positioned at the RMCC and dispatched as scenario events dictate. Notification to adjacent states will be demonstrated at the SEOC in accordance with the appropriate notification checklist as contained in the SQN MJRERP.

2. FACILITIES – EQUIPMENT, DISPLAYS, AND WORK ENVIRONMENT:

Demonstrate the adequacy of facilities, equipment, displays and other materials to support emergency operations.

EOP: The SEOC, FCC, RMCC, JIC, CECC, and Risk County EOCs (Bradley and Hamilton) will be activated and fully operational during the course of the exercise

3. DIRECTION AND CONTROL:

Demonstrate the capability to direct and control emergency operations.

EOP: Personnel involved in direction and control at all EOCs will be on duty throughout the exercise.

4. COMMUNICATIONS:

Demonstrate the capability to communicate with all appropriate emergency personnel at facilities and in the field.

EOP: Primary and backup communication systems will be demonstrated at all facilities. The communication network between DRH field teams and the RMCC and between the RMCC and the SEOC and CECC will be evaluated at the RMCC.

5. EMERGENCY WORKER EXPOSURE CONTROL:

Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.

EOP: All emergency workers with assignments in the 10-Mile EPZ and those involved in radiological monitoring and/or decontamination are issued Emergency Worker Dosimetry Kits. They contain a thermoluminescent dosimeter (TLD), one direct-reading pocket dosimeter with a range capable of measuring radiation exposure of 0 to 20R, one course (14 tablets) of potassium iodide (KI) and one Daily Radiation Exposure Record card. All emergency workers have been trained in

matters concerning exposure control techniques, limits of exposure, and turn-back values. Four emergency workers in each of the risk counties (Bradley and Hamilton) will be available (see Objectives 10 and 17) at their respective EOCs to demonstrate appropriate recording of dosimetry readings and knowledge of actions to take when reaching certain thresholds, especially if the established turn-back value (2.5 R [5 R TEDE]) is met or exceeded.

6. FIELD RADIATION MONITORING – AMBIENT RADIATION MONITORING:

Demonstrate the appropriate use of equipment and procedures for determining field radiation measurements.

EOP: Each field team will obtain at least one air sample with a minimum sample volume of 10 cubic feet. The particulate filter and absorber media cartridge will be bagged, labeled and transported to a collection point for simulated transport to a laboratory. As set out in Objective 1 EOP, four (4) field-monitoring teams will be evaluated in accordance with REP 15. Other teams may be participating while on a training drill, but all teams will be under the direction of the RMCC at all times. Field monitoring data will be injected by controllers supporting the exercise, and will be transmitted by the teams to the RMCC over the normal communications network (portable hand-held radios). Cellular telephones are used as a back-up communication system.

7. PLUME DOSE PROJECTION:

Demonstrate the capability to develop dose projections and protective action recommendations regarding evacuation and sheltering.

EOP: DRH personnel at the SEOC and their counterpart TVA personnel at the CECC carry out dose assessment jointly. Projections are based on plant data provided by TVA and field radiation measurements relayed through the RMCC from field environmental monitoring teams. Radiological data will be inserted into play by controller injects to the field teams (see Objective 6). The data will then be sent to the RMCC. RMCC involvement in this activity will be evaluated, as will communication links and monitoring data requests generated either by the SEOC, TVA, or the RMCC, all of which are supportive of the dose assessment process. The ability of dose assessment personnel to project dosage to the public and arrive at a consensus protective action recommendation will be evaluated at the SEOC.

8. FIELD RADIOLOGICAL MONITORING – AIRBORNE RADIOIODINE AND PARTICULATE ACTIVITY MONITORING:

Demonstrate the appropriate use of equipment and procedures for the measurement of airborne radioiodine concentrations as low as 10^{-7} (.0000001) micro curies per cubic centimeter in the presence of noble gases and obtain samples of particulate activity in the airborne plume.

EOP: See Objective 6.

9. PLUME PROTECTIVE ACTION DECISION MAKING:

Demonstrate the capability to make timely and appropriate protective action decisions (PAD).

EOP: When plant conditions dictate, TVA recommends protective actions to the SEOC. The DRH Director considers these recommendations jointly with his dose assessment personnel, the SEOC Director, risk county officials, and other informed personnel. Once a protective action decision is made, the public is notified and implementation is coordinated through the appropriate local governments. This activity will be evaluated at the SEOC.

10. ALERT AND NOTIFICATION:

Demonstrate the capability to alert and notify the public within the 10-mile plume pathway emergency planning zone (EPZ) and disseminate instructional messages to the public on the basis of decisions by appropriate State or local officials.

EOP: In order to avoid alarming the residents of the 10-Mile EPZ, all activation of the Prompt Notification System (PNS) sirens will be simulated. The Emergency Alert System (EAS) will be activated simultaneously with the initial simulation of the PNS siren activation and a test message (EAS Message #1) will be broadcast (see Objective 11 EOP reference subsequent EAS messages). The initial activation will involve a silent test of the sirens and if the System Status Monitor (SSM) indicates the failure of one or more sirens to activate, backup route alerting will be simulated. In any case, at least two emergency workers who would be involved in this activity will be dispatched (in sequence with scenario events) to the Bradley and Hamilton County EOCs. These EWs will be available for interviews to demonstrate the method that would be used in an actual emergency through discussion of routes and procedures.

11. PUBLIC INSTRUCTIONS AND EMERGENCY INFORMATION:

Demonstrate the capability to coordinate the formulation and dissemination of accurate information and instructions to the public.

EOP: After the initial activation of the EAS and broadcast of the special test message (see Objective 10 EOP), subsequent contact with the EAS control station and the broadcast of emergency instruction messages will be simulated.

12. EMERGENCY INFORMATION – MEDIA:

Demonstrate the capability to coordinate the development and dissemination of clear, accurate, and timely information to the news media.

EOP: The JIC will be fully staffed upon its activation and will be operational during the course of the exercise.

13. EMERGENCY INFORMATION – RUMOR CONTROL:

Demonstrate the capability to establish and operate rumor control in a coordinated and timely fashion.

EOP: Rumor Control is a sub-unit of the JIC, staffed by both State and TVA personnel, and operates as a "Citizens Information Center" in an area provided at the JIC. Telephone numbers for concerned citizens to call will be broadcast (simulated) over the EAS simultaneously with activation of the JIC and periodically thereafter. In order to demonstrate this objective adequately, callers impersonating concerned citizens will introduce rumors into the play of the exercise.

14. IMPLEMENTATION OF PROTECTIVE ACTIONS – USE OF KI FOR EMERGENCY WORKERS, INSTITUTIONALIZED PERSONS AND THE GENERAL PUBLIC:

Demonstrate the capability and resources to implement potassium iodide (KI) protective actions for emergency workers, institutionalized persons, and the general public.

EOP: The Chief Medical Officer for the Tennessee Department of Health is located at the SEOC and, after consultation with DRH, will make all decisions concerning the administration of KI to emergency workers, institutionalized persons and the general public. When a decision is made, instructions will be relayed through the local EOCs and if the general population is included, distribution of KI to shelters will be simulated.

AREA REQUIRING CORRECTIVE ACTION (ARCA):

15. IMPLEMENTATION OF PROTECTIVE ACTIONS – SPECIAL POPULATIONS:

Demonstrate the capability and resources necessary to implement appropriate protective actions for special populations.

EOP: Local EMA Directors maintain lists of the special needs population and the resources needed and available for an evacuation. When requested, local directors will provide the list to the evaluator. The list includes the individual names, assistance required, and the agency or individual who is assigned the responsibility of providing the special needs.

16. IMPLEMENTATION OF PROTECTIVE ACTIONS – SCHOOLS:

Demonstrate the capability and resources necessary to implement protective actions for school children within the plume EPZ.

EOP: There are 22 schools located within the 10-Mile EPZ (Bradley – 1 and Hamilton – 21). The county school superintendents and transportation supervisors or a designee will be available at their respective EOCs for consultation/interviews by evaluators. Following these interviews, an evaluator will visit six of these schools in Hamilton County for the purpose of interviewing the principal concerning his knowledge of the relocation plans and procedures:

NOTE: Due to travel time from one location to another, these interviews will be conducted out-of-sequence with exercise events. A time schedule will be provided at the evaluator briefing prior to ED.

17. TRAFFIC AND ACCESS CONTROL:

Demonstrate the organizational capability and resources necessary to control evacuation traffic flow and to control access to evacuated and sheltered areas.

EOP: Deployment of traffic and access control personnel will be simulated. However, at least two emergency workers who would perform these duties will be interviewed for evaluation at the local EOCs. This activity will be in sequence with the scenario, i.e., at the point when a roadblock or access point would be established, the EWs will be dispatched to the EOC rather than to a location in the field. The interview will cover such points as knowledge of their roles and responsibilities, personal dosimetry, turn-back values and KI procedures.

18. RECEPTION CENTER – MONITORING, DECONTAMINATION, AND REGISTRATION:

EOP: There are no "Reception Centers" per se in the SQN MJRERP. According to the definitions in FEMA REP 14, the Relocation Center/Congregate Care Center activities are combined and designated as "Mass Care Shelters." (See Objective 19.)

19. CONGREGATE CARE:

Demonstrate the adequacy of the equipment, supplies, personnel, and procedures for congregate care of evacuees.

EOP: Congregate care will be demonstrated at three (3) locations:

Hamilton County:

1. East Ridge High School

2. Howard School of Academics and Technology

Rhea County:

3. Rhea County High School

Each shelter will be staffed with trained personnel, and at least six (6) mock evacuees will be monitored at each shelter. A walk-through of decontamination procedures will be conducted for the evaluators. Schools will be in session during the exercise, therefore, demonstrations of monitoring, decontamination, and sheltering activities must be held to a minimum to lessen the disruption of regular school activities. However, the staff will be on hand for interrogation by evaluators.

NOTE: These events will occur out-of-sequence with exercise events. A time schedule will be provided at the evaluator briefing prior to ED.

20. MEDICAL SERVICES – TRANSPORTATION:

Demonstrate the adequacy of vehicles, equipment, procedures, and personnel for transporting contaminated, injured, or exposed individuals.

EOP: Demonstration not required; previously accomplished during MS-1 Drills at Bradley and Roane Counties.

21. MEDICAL SERVICES – FACILITIES:

Demonstrate the adequacy of the equipment, procedures, supplies, and personnel of medical facilities responsible for treatment of contaminated, injured, or exposed individuals.

EOP: See Objective 20.

22. EMERGENCY WORKERS, EQUIPMENT, AND VEHICLES – MONITORING AND DECONTAMINATION:

Demonstrate the adequacy of procedures for monitoring and decontamination of emergency workers, equipment, and vehicles.

EOP: Emergency Worker/Vehicle Decontamination Points will be demonstrated at Ooltewah Middle School in Hamilton County and Bradley Central High School in Bradley County. One EW and vehicle will be monitored at each site, and all activities will be conducted out-of-sequence with scenario events.

23. SUPPLEMENTARY ASSISTANCE (FEDERAL/OTHER):

Demonstrate the capability to identify the need for external assistance and to request such assistance from Federal or other support organizations.

EOP: This objective will be demonstrated and evaluated at the SEOC.

24. POST-EMERGENCY SAMPLING:

Demonstrate the use of equipment and procedures for collection and transport of ingestion samples.

EOP: Demonstration not required.

25. LABORATORY OPERATIONS

Demonstrate lab operations and procedures for measuring and analyzing samples.

EOP: Demonstration not required.

26. INGESTION EXPOSURE PATHWAY – DOSE PROJECTION AND PROTECTIVE ACTION DECISION MAKING:

Demonstrate the ability to project dosage to the public for ingestion pathway exposure and determine protective measures.

EOP: Demonstration not required.

27. INGESTION EXPOSURE PATHWAY – PROTECTIVE ACTION IMPLEMENTATION:

Demonstrate the ability to implement both preventive and emergency protective actions for the ingestion pathway hazards.

EOP: Demonstration not required.

28. RELOCATION, REENTRY, AND RETURN – DECISION MAKING:

Demonstrate the ability to determine appropriate measures for controlled reentry and return.

EOP: Demonstration not required.

29. RELOCATION, REENTRY, AND RETURN – IMPLEMENTATION:

Demonstrate the ability to implement appropriate measures for controlled reentry and return.

EOP: Demonstration not required.

30. CONTINUOUS, 24-HOUR STAFFING:

Demonstrate the capability to maintain staffing on a continuous, 24-hour basis through an actual shift change.

EOP: Demonstration not required.

31. OFFSITE SUPPORT FOR THE EVACUATION OF ONSITE PERSONNEL:

Demonstrate the capability to provide offsite support for the evacuation of onsite personnel.

EOP: Demonstration not required.

32. UNANNOUNCED EXERCISE OR DRILL:

Demonstrate the capability to carry out emergency response functions in an unannounced exercise or drill.

EOP: Demonstration not required.

33. OFF-HOURS EXERCISE OR DRILL:

Demonstrate the capability to carry out emergency response functions during an off-hours exercise or drill.

EOP: Demonstration not required.

APPENDIX 4

EXERCISE SCENARIO

This appendix contains a summary of the simulated sequence of events used as the basis for invoking emergency response actions by OROs in the Sequoyah Nuclear Power Plant exercise on October 4, 2000.

This exercise scenario was submitted by the State of Tennessee and approved by FEMA Region IV.

SQN 2000 Graded Exercise
October 4, 2000

SCENARIO - Narrative Summary

The exercise begins with the unit cooling down. When 0.SO.74-1- Section 5.5 - Step 6 is reached that will open 74-1 and 74-2, the RHR suction relief valve 74-505 will fail full open ❶ (around T=0:05). After a few minutes, the PRT will rupture and containment pressure will increase slightly. The ice condenser will suppress the pressure and maintain containment well below 1.51 psi (Phase A). When operators attempt to close 74-1, the valve will nor respond due to an operator failure ❷. The operators will also attempt to close the 74-2 valve and the MOV will not respond due to mechanical binding ❸.

An ***ALERT*** will be declared under EAL 1.2.2 within 15 minutes of (1) the sharp decrease in the pressurizer level and (2) indications of increasing pressure in containment with inability of a CCP to maintain level. The 1BB CCP will run unloaded around T=0:30 due to low injection pressure and high flow and, due to running unloaded, the pump shaft will shear ❹.

At around T=1:10, the 6.9kV Shutdown Board 1A-A fails on a differential fault ❺. This eliminates the 1A-A CS pump, the 1A-A CCP, the 1A-A SI pump, and the 1A-A RHR pump. When the CCPs are lost, the saturation margin is also lost. Accumulators #1 and #3 are lost when the isolation valves are failed in the closed position by the loss of the Shutdown Board.

With the above losses and RHR 1BB unable to align to another suction source because of the inability to isolate from the RCS pressure, no pumps are available to inject to the RCS. With no water being injected, the water level continues to drop due to the continued leakage through the relief valve.

With one air return fan inoperable from power loss, when the ice condenser is depleted the containment pressure will begin increasing and will reach 2.81 psig. When containment reaches 2.81 psig (phase B), Containment Spray will attempt to start but the 1BB pump will trip on a wiring ground in the termination box ❻. The phase B coupled with the loss of 1AA CS from the loss of power and the loss of 1BB CS from the wiring problem constitute a Potential Loss of containment under EAL 1.3.2. The combination of EAL 1.2.2(Loss). and 1.3.2(Potential) will result in the declaration of a ***Site Area Emergency*** somewhere around T=1:30.

The water level continues to decrease due to the open 74-1 and 74-2 valves until around T=3:00 when the piping near 1-FCV-63-93 fails ❼. When attempted, valve 1-FCV-63-93 won't close ❽. Rad Monitors in the Auxiliary Building indicate high radiation levels outside containment but may not indicate a High Energy Line Break due to the cooler temperature of the RCS water. Around T=3:15, containment radiation monitors increase to greater than 30 Rem/hr ❾ indicating fuel damage has occurred. EALs 1.1.4P, 1.1.5L, 1.2.2L, 1.2.2P, 1.2.4L, 1.3.2P are then met and a ***General Emergency*** will be declared based on two barriers lost (1.1 and 1.2) and one barrier potentially lost (1.3).

The steam in the Pipe Chase causes the ABGTS filters to clog ⑩ and fail after about 15 minutes of operations, leaving the effluent stream essentially untreated.

When the 1BB SI is repaired or the 1AA Shutdown Board is repaired, the core may be cooled and the release terminated. Closure of 1-FCV-63-93 will also terminate the release. This will conclude the exercise.

Significance of Key Events

1. 1-FCV-74-505 failing open is the basis of the RCS LOCA which is the basis of the ALERT.
2. 1-FCV-74-1 failing open is the basis of the containment bypass and part of the major release pathway.
3. 1-FCV-74-2 failing open is the basis of the containment bypass and part of the major release pathway.
4. CCP 1BB failure is included to reduce ECCS injection.
5. 6.9kV Shutdown Board 1AA failure is included to reduce ECCS injection. This failure takes half of all ECCS equipment.
6. CS 1BB failure is to increase containment pressure and when phase B is reached, becomes the basis (along with CS 1AA failed due to power) for upgrade to a SAE.
7. Piping failure near 1-FCV-63-93 is the basis for containment bypass and the release to the building.
8. Failure to be able to close 1-FCV-63-93 is to continue the release. If this valve is closed, the release will be terminated.
9. 1-RM-90-273/274 in excess of 30 R/hr is to demonstrate fuel damage and provides the basis for the escalation to the General Emergency.
10. ABGTS failure to filter is to increase the I131 fraction of the release and to support the necessary offsite monitoring results.