U.S. Department of Homeland Security
Region IV
3003 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

Final Exercise Report

Watts Bar Nuclear Plant

Licensee: **Tennessee Valley Authority**

Exercise Date: **November 5-6, 2003**

Report Date: **February 3, 2004**

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I. EXECUTIVE SUMMARY

On November 5 and 6,2003, the Federal Emergency Management Agency (FEMA), Region IV, conducted a full participation ingestion exposure pathway exercise for the emergency planning zone (EPZ) around the Watts Bar Nuclear Plant (WBN). The purpose of the exercise was to assess the level **of** State and local preparedness in responding to a radiological emergency. This exercise was held in accordance with FEMA's policies **and** guidance concerning the exercise of Tennessee's Multi-Jurisdictional Radiological Emergency Response Plan (MJRERP) and associated procedures.

The previous evaluated exercise at this site was November 7, 2001. Tennessee's MJRERP for WBN was approved under Title 44 Code of Federal Regulations (CFR) Part 350, on July **3,** 1997. The State of Tennessee, the Risk Counties of McMinn, Meigs, and Rhea and Roane County, a host county, participated in the exercise.

FEMA wishes to acknowledge the efforts **of** the many individuals from the State of Tennessee, and from the Counties of McMinn, Meigs, Rhea and Roane, who participated **in** this exercise. Protecting the public health and safety is the full-time job **of** some of the exercise participants and an assigned responsibility for others. Additionally, others have willingly sought this responsibility by volunteering their time and efforts to provide vital emergency services to their communities. Cooperation and teamwork of ail the participants were evident during this exercise.

Tennessee Emergency Management Agency (TEMA) is commended for its exceptional efforts in coordinating the exercise emergency response activities. FEMA also commends the Division **of** Radiological Health (DRII) for its excellent **use** of time and resources during this exercise.

The State and local organizations, except where noted in this report. demonstrated knowledge of their emergency response plans and procedures and successfully implemented them. No Deficiencies were identified. however, one Area Requiring Corrective Actions (ARCA) was identified concerning the content of the initial EAS message.

Three ARCAs were corrected during this exercise, those ARCAs concerned: 1) TEMA simultaneously communicating protective action decisions (PAD) to the counties and public; 2) McMinn County delayed taking action to support the evacuation order; and 3) evacuee monitors were not adequately trained at the Rome County Mass Care Shelter.

II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all offsite nuclear planning and response. FEMA's activities are conducted pursuant to Title *44* 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.

Title **44** CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of State and local governments' 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 RERPs 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 **ofthe** plans and procedures conducted by State and local governments;

- Responding to requests by the Nuclear Regulatory Commission (NRC) pursuant to the Memorandum oS Understanding between the NRC and FEMA **(Federal** Register, Vol. 58, No. 176, September 14, 1993); and

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

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

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

The Tennessee MJRERP for the Watts Bar Nuclear Plant was formally submitted to FEMA Region IV by the **State** of Tennessee on **April** 12, 1996. Title 44 CFR Part 350 **approval** was granted by **FEMA** on **July 3,** 1997.

A joint REP exercise was conducted on November 5 and 6,2003, by FEMA Region IV to assess the capabilities of State and local emergency preparedness organizations in implementing the MJRERP and related procedures to protect the public health and safety during a radiological emergency involving the WBN Plant. The purpose of this report is to present the exercise results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

The findings presented are based on the evaluations of the federal evaluator team with final determinations made by FEMA Region IV RAC Co-Chairperson and Chief Evaluator 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-"Exercise Evaluation Methodology," April 25, 2002

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 ingestion pathway EPZ, a listing of all participating jurisdictions and functional entities that were evaluated, and a tabular presentation of the t h e of actual occurrence of key exercise events.

Section IV of this report, entitled "Exercise Evaluation and Results," presents detailed information on the demonstration of applicable exercise Criteria at each jurisdiction or functional entity evaluated in an issues-only format. This section also contains: (1) description of the ARCA assessed during this exercise, recommended corrective actions. and the State of Tennessee's response, and (2) descriptions of ARCAs assessed during previous exercises and the status of the ORO's efforts to resolve them.

III. EXERCISE OVERVIEW

Contained in this section are data and basic information relevant to the November 5 and 6,2003, full participation ingestion exposure pathway exercise to test the offsite emergency response preparedness and capabilities in the area surrounding the Watts Bar Nuclear Plant. This section of the report includes a description of the ingestion pathway EPZ, a listing of all participating jurisdictions and functional entities which were evaluated, and a tabular presentation of the time of actual occurrence or acknowledgement of key exercise events and activities.

A. Plume Emergency Planning Zone Description

The plant site, consisting of approximately 1,800 acres, is located in Rhea County in southeastern Tennessee. The site is located on the west shore of the Tennessee River, approximately 50 miles north-northeast of Chattanooga, and 54 miles southwest of Knoxville. The Watts Bar Nuclear Plant is owned and operated by the Tennessee Valley Authority (TVA).

The 10-mile EPZ for the Watts Bar Nuclear Plant includes parts of McMinn, Meigs, and Rhea Counties. The land use within the 10-mile EPZ is predominately rural. The EPZ is divided into 5 large evacuation planning zones with subdivisions within those zones.

The 50-mile ingestion pathway EPZ includes all or portions of 22 counties. The land use consists mainly of rural areas with agricultural interests. The Southwestern and Northeastern counties are mainly urban and a large national forest is included in the Eastern Sector.

B. Exercise Participants

The following agencies, organizations, and units of government participated in the Watts Bar Nuclear Plant exercise on November 5 and 6, 2003.

STATE OF TENNESSEE

Department of Agriculture
Division of Forestry
Department of Environment and Conservation
Bureau of State Parks
Division of Air Pollution Control
Division of Radiological Health
Division of Solid Waste Management
Division of Water Pollution Control
Department of General Services
Department of Health
Department of Human Services

Department of Mental Health
Department of Military
Department of Safety
Department of Transportation
Tennessee Bureau of Investigation
Tennessee Emergency Management Agency
Tennessee Wildlife Resources Agency

FEDERAL AGENCIES

Food and Drug Administration
U. S. Coast Guard
U. S. Corps of Engineers

RISK JURISDICTIONS

McMinn County
Meigs County
mea county

HOST JURISDICTIONS

Roane County

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross

C. Exercise Timeline

Table 1, on the following page, presents the times at which key events and activities occurred during the Watts Bar Nuclear Plant exercise on November 5, 2003.

Table 1. Exercise Timeline

DATE AND SITE: November 5, 2003 – Watts Bar Nuclear Plant

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received or Action Was Taken							
		SEOC	DOSE	RMCC	JIC	FCC	Mc MINN COUNTY	MEIGS COUNTY	RHEA COUNTY
Unusual Event									
Alert	0826	0841	0841	0859		0900	0901	0853	0858
Site Area Emergency	0944	0953	0953	0953	1005	0950	0954	0951	0957
General Emergency	1026	1032	1032	1039	1035	1039	1042	1040	1044
Simulated Rad. Release Started	1147	1145	1145	1116	1155		1304	1305	1259
Simulated Rad. Release Terminated	END EX								
Facility Declared Operational		0924	0924	0815	1000	0917	0802	0815	0800
Declaration of State of Emergency		1150	1150		1205	1157	1152	1150	1154
Exercise Terminated		1340	1340	1550	1340	1355	1343	1400	1350
Early Precautionary Actions: School Relocation						1011	0901	0940	0945
1st Protective Action Decision Public Notification	0927						0925	0925	0924
1st Siren Activation	0930						0930	0930	0930
1st EAS Message – 4	0931						0930	0930	0930
2nd Protective Action Decision Evacuate Zones: Near Site Area (A-1, B-1, C-1, D-1)	1003	1003	1003	1015		1010	1002	1003	1003
2nd Siren Activation	1005	1005	1005			1010	1005	1005	1005
2nd EAS Message – 5, 7, 22	1006	1006	1006			1010	1005	1005	1005
3rd Protective Action Decision Evacuate: Add Quadrants B and C Shelter: Quadrants A and D	1047	1047	1047			1103	1047	1047	1047
3rd Siren Activation	1055					1103	1055	1055	1055
3rd EAS Message	1056					1103	1055	1055	1055
KI Administration Field Teams Ingest Emergency Workers within 10-mile Ingest Public from Quadrants B and C	0945 1151 1200						1230	1215	1205

IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities, which participated in the November 5 and 6,2003 exercise to test the offsite emergency response capabilities of state and local governments in the IO-mile EPZ surrounding the Watts Bar Nuclear Plant.

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in exercise criteria contained in the REP "Exercise Evaluation Methodology," dated April 25,2002. Detailed information on the exercise criteria 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(s), presents the status of all FEMA-REP-Exercise Evaluation Methodology, which were scheduled for demonstration during this exercise by all participating jurisdictions. The exercise criterion are listed by number and the demonstration status of those criterion 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 of Exercise Evaluation

DATE AND SITE: November 5,2003 – Watts Bar Nuclear Plant

ELEMENT/Sub-Element	SEOC	DOSE	FCC	RMCC/ LAB	FMT	JIC	CECC	McMinn County	Meigs County	Rhea County	Roane County
1. EMERGENCY OPERATIONS MANAGEMENT											
1.a.1. Mobilization	M		M	M		M	M	M	M	M	
1.b.1. Facilities			M	M				M	M	M	
1.c.1. Direction and Control	M		M	M			M	M	M	M	
1.d.1. Communications Equipment	M		M	M	M		M	M	M	M	
1.e.1. Equipment & Supplies to Support Operations	M		M	M	M	M	M	M	M	M	M
2. PROTECTIVE ACTION DECISION MAKING											
2.a.1. Emergency Worker Exposure Control	M	M	M	M				M	M	M	
2.b.1. Rad Assessment & PARs & PADs Based on Available Info		M	M								
2.b.2. Rad Assessment and PARs and PADs for the General Public	M	M	M					M	M	M	
2.c.1. Protective Action Decisions for Special Populations								M	M	M	
2.d.1. Rad Assessment & Decision Making for Ingestion Exposure	M	M									
2.e.1. Rad Assessment & Decision Making for Relocation, Re-entry & Return	M	M									
3. PROTECTIVE ACTION IMPLEMENTATION											
3.a.1. Implementation of Emergency Worker Control	M			M	M			M	M	M	M
3.b.1. Implementation of KI Decisions					M			M	M	M	
3.c.1. Implementation of PADs for Special Populations								M	M	M	
3.c.2. Implementation of PADs for Schools									M		
3.d.1. Implementation of Traffic and Access Control								M	M	M	
3.d.2. Impediments to Evacuation and Traffic and Access Control								M	M	M	
3.e.1. Implementation of Ingestion Decisions Using Adequate Info	M	M									
3.e.2. Implementation of IP Decisions Showing Strategies and Instructional Materials	M	M									
3.f.1. Implementation of Relocation, Re-entry and Return Decisions	M										
4. FIELD MEASUREMENT and ANALYSIS											
4.a.1. Plume Phase Field Measurement & Analysis Equipment					M						
4.a.2. Plume Phase Field Measurement & Analysis Management					M						
4.a.3. Plume Phase Field Measurements & Analysis Procedures					M						
4.b.1. Post Plume Field Measurement & Analysis				M	M						
4.b.2. Laboratory Operations				M							
5. EMERGENCY NOTIFICATION & PUBLIC INFO											
5.a.1. Activation of Prompt Alert and Notification	A							M	M	M	
5.a.2. Activation of Prompt Alert and Notification 15-Minute (Fast Breaker)											
5.a.3. Activation of Prompt Alert and Notification Backup Alert and Notification								M	M	M	
5.b.1. Emergency Info and Instructions for the Public and the Media	M					M		M	M	M	
6. SUPPORT OPERATIONS/FACILITIES											
6.a.1. Monitoring and Decon of Evacuees and EWs and Registration of Evacuees											M
6.b.1. Monitoring and Decon of Emergency Worker Equipment											
6.c.1. Temporary Care of Evacuees											M
6.d.1. Transport and Treatment of Contaminated Injured Individuals											

LEGEND: M = Met D = Deficiency A = ARCA

B. Status of Jurisdictions Evaluated

This subsection provides information on the evaluation of each participating jurisdiction, in an issues only format. A brief summation of the demonstration has been included for each jurisdiction to provide perspective. Presented below is a definition of the terms used in this subsection relative to criterion demonstration status.

- **Met** - Listing of the demonstrated exercise criteria 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 criteria 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 criteria under which one or more ARCAs were assessed during the current exercise. Included is a description of the ARCA 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 criteria 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 previous exercises, which were not resolved in this exercise and the corrective actions demonstrated.

The following are definitions of the two types of exercise issues, which are 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 and **tracking** 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.

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.
- **Criterion Number - A** number, **alpha,** number combination corresponding to **the** criterion numbers **in** Exercise Evaluation Methodology.
- **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), in Nashville provided excellent direction and control to the State agencies and to the three risk counties. The use of the "Call Me" decision-ding line allowed all agencies to discuss issues and come to a consensus. The county liaisons kept the risk counties informed of the State's activities. Frequent briefings and staff feedback to the SEQC Director kept all agencies informed of current events. The Prompt Notification System (PNS) activation was timely and accurate. The Public Information Officer (PIO) staff did an excellent job of preparing the Emergency Alert System (EAS) messages and amending the broadcasts as necessary. However, the initial EAS message at 0931, did not in include a statement for the public to review emergency information in the Watts Bar calendar.

a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 3.a.1 and 5.b.1

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:**

Issue No.: 71-03-5.a.1-A-01

Condition: The initial EAS message sent out to the public at 0931, did not contain one of the required elements as listed in the Alert and Notification Final Federal Register Notice, dated September 12, 2001. The EAS message sent out did not include a "reference to Radiological Emergency Preparedness specific information (e.g. brochures and information in telephone boob) for use by the general public during an emergency."

Possible *Cause:* The reference to the emergency information in the calendar had been inadvertently excluded during the last revision to the EAS messages.

Reference: Alert and Notification Final Federal Register Notice, dated September 12, 2001.

Effect: The general public could have been better prepared for a possible evacuation using the information provided in the calendar.

Recommendation: Review and rewrite as necessary EAS messages to include a statement to review the emergency information found in the Watts Bar calendar.

Schedule of Corrective Actions: As was previously addressed in the preceding paragraph, revision of EAS messages are included in the 2003 SQN/WBN MJRERP per reference Alert and Notification Final Federal Register Notice, dated September 12,2081. The Tennessee Emergency Management Agency in

a. **MET:** Criteria 2.a.1, 2.b.1 and 2.b.2

b. **DEFICIENCY:** NONE

e. **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 Director effectively managed the Field Coordination Center (FCC), located at the TEMA East field office. He discussed protective actions with the SEOC, and promptly communicated decisions to the FCC staff. Periodic briefings were conducted and input was requested from all agencies present. The staff knew their responsibilities, effectively implemented them and coordinated among themselves when required. All EAS messages and news releases were read to the staff upon receipt.

a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1 and 2.b.2

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 RMCC effectively managed the four Department of Radiological Health Radiological Monitoring Field Teams. They obtained radiological field monitoring data from the terns and provided it to the SEOC dose assessment group. The experienced RMCC Staff's coordination with the TVA Liaison was excellent, and they successfully performed all assigned duties.

a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1 and 3.a.1

b. **DEFICIENCY:** NONE

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

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

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

1.7 Central Emergency Control Center

The Central Emergency Control Center (CECC), located in the TVA Corporate Office, Chattanooga, Tennessee, is an excellent facility from which all participating organizations can effectively manage ongoing emergency operations. Communications, coordination, and the flow of technical information between the utility operator and applicable State officials were exemplary. The State officials deployed to the CECC were well trained, knowledgeable and followed applicable procedures. They performed their respective responsibilities in an efficient and professional manner.

a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1 and 1.e.1

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

e **PRIOR ARCAs - UNRESOLVED:** NONE

2. RISK JURISDICTIONS

2.1 McMINN COUNTY

2.1.1 Emergency Operations Center

The Emergency Operations Center (EOC) Director maintained direction and control throughout the exercise. The staff, both paid and volunteer, were professional and performed all duties in an exemplary manner. Communications with personnel outside the EOC was maintained through several means including amateur radio services. When the County did not understand why the State made a decision to have emergency workers take potassium iodide (KI). The Director called the State and asked, thus prompting a conference call that clarified the decision for the counties.

a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 5.a.1, 5.a.3 and 5.b.1

b. **DEFICIENCY:** NONE

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

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

2.2 MEPGS COUNTY

2.2.1 Emergency Operations Center

The EOC has a well-trained professional *staff* supplemented by individual volunteers and members of the Retired Senior Volunteer Program (RSVP). The County Mayor and the Emergency Management Director competently directed and focused the staffs efforts. They involved the functional representatives in the information gathering, assessment, and decision-making process. Representatives from the **City** and County agencies were empowered with decision-ding authority and their performance not only reflected a detailed knowledge of their roles and missions, but a degree of pro-activeness rarely seen in county EOCs. The citizens **of** Meigs **County** are well served by this complement of concerned **City** and County officials and volunteers.

a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 5.a.1, 5.a.3 and 5.b.1

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 Traffic Control Points

The Meigs County Sheriff and members of the County Fire and Rescue **Squad** (FRS) participated in an interview on traffic and access control procedures at the EOC. The FRS team assists the **Sheriffs** deputies in staffing roadblocks to control traffic flow and conducting radiological monitoring at the location. The Sheriff and FRS team members **were** knowledgeable of TCP establishment and procedures. and were conversant on alternate evacuation routes. The FRS team **also** assists evacuees at shelter information points along the evacuation routes. The Sheriff would contact the Meigs County Road Department for assistance in removing impediments to traffic, erecting barricades and placing evacuation route signs *at* designated locations. All personnel were knowledgeable of their duties and radiological exposure control.

a. **MET:** Criteria 1.e.1, 3.a.1, 3.b.1, 3.d.1 and 3.d.2

b. **DEFICIENCY:** NONE

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

2.3.2 Traffic Control Points

The Rhea County Sheriffs Department, the County Highway Department, and the County **Fire** and Rescue **Squad** successfully demonstrated the capability **to** establish appropriate traffic and **access** control points. They were able to provide accurate instructions to traffic and access control personnel, and to assure that proper emergency information is provided to the evacuating public, such as the locations of reception/registration centers, evacuation routes, etc. **Two** Deputy Sheriffs and two Fire and **Rescue Squad** members **were** interviewed and were very knowledgeable of their duties concerning traffic and access control, the evacuation process, and radiological exposure control procedures. The County Highway Department representative was well aware of the Department's roles and responsibilities.

a. **MET:** Criteria 1.e.1, 3.a.1, 3.b.1, 3.d.1 and 3.d.2

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

e **PRIOR ARCAs - UNRESOLVED:** NONE

3. HOST JURISDICTION

3.1 ROANE COUNTY

3.1.1 Mass Care

The **Rome** County Health Department nurses, Harriman City Fire Department and the Knoxville Chapter of the American Red Cross (ARC) successfully demonstrated the processing and **care** of evacuees at the Harriman High School. **The** dire department personnel were very familiar with proper monitoring techniques, personal protective equipment and contamination control. The health nurses successfully conducted a walk-

Additional shelters were opened to accommodate the relocated residents. After further refinement of the ingestion zone from the Department of Energy (DOE) flyover data, an additional 6 zones were cleared for return ofresidents at 1031.
Day 3 activities commenced at 1035 with field teams defining the hot spots and collecting water, soil, vegetation and milk samples for processing. TVA announced at 1042, that they had secured from the General Emergency (GE) and downgraded to normal recovery operations. Access control points were a major topic of discussion to allow temporary re-entry to farms and utilities.

The State agencies, county reps and Radiological Health effectively coordinated their activities and made timely decisions for the residents affected by the release. All activities were thoroughly thought through and implemented. The SEOC staff was extremely proactive in the decision-making process for ingestion issues.

a. **MET:** Criteria 2.d.1, 2.e.1, 3.e.1, 3.e.2 and 3.f.1

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

4.1.2 State Radiological Laboratory

The Tennessee Department ofthe Environment and Conservation Radiochemistry Lab is equipped with the survey instrumentation, laboratory equipment, and supplies necessary to sufficiently analyze field samples in a timely and efficient manner. Through an interview, the manager of the Radiochemistry Laboratory demonstrated his managerial style in directing personnel in the accomplishment of laboratory operations. The laboratory personnel were very professional and displayed knowledge of their plans and operational procedures. Through an interview, they explained the general laboratory and personal exposure control procedures. All criteria were successfully demonstrated.

a. **MET:** Criteria 1.e.1, 3.a.1 and 4.c.1

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

5. SUMMARY OF AREAS REQUIRING GOWRECIVE ACTION

5.1 2003 ARCAs ASSESSED

5.1.I 71-03-5.a.1-A-01
State of Tennessee
SEOC

Condition: The initial **EAS** message sent out **to** the public at **0931**, did **not** contain **one** of the required elements as listed in the Alert and Notification Final Federal Register Notice, dated September 12,2001. The EAS **message** sent out did ***not*** include a "reference to Radiological Emergency Preparedness specific information (e.g. brochures and information in telephone **books)** for use by the genera! public during an emergency."

Possible Cause: The reference to the emergency information **in the** calendar had been inadvertently excluded during the last revision **to** the messages.

Reference: Alert and Notification **Final** Federal Register Notice, dated September 12, 2001.

Effect: The general public could have been better prepared for a possible evacuation using the information provided in **the** calendar.

Recommendation: Review and rewrite as necessary EAS messages to include a statement to review the emergency information found in the Watts Bar calendar.

Schedule of Corrective Actions: As was previously addressed in the preceding paragraph, revision of EAS messages are included in the 2003 SQN/WBN MJRERP per reference Alert and Notification Final Federal Register Notice, dated September 12, 2001. The Tennessee Emergency Management Agency in concert with local governments and The Tennessee Valley Authority has a very aggressive training and plan distribution program. Enclosure # 3 *is*

5.2.2 71-01-63-A-02
McMinn County EOC

Description: At 1055, the TEMA liaison at the McMinn County EOC began receiving the message from the SEOC directing the evacuation of the near plant area (2-4 mile radius) and all of quadrants C and D. The receipt of this message was completed at 1058. However, EOC management and staff were unaware that they were to be supporting an evacuation directed by the State. The Declaration at approximately 1203 prompted McMinn County to implement its actions to support the evacuation that was in process.

Corrective Action Demonstrated: The State and Counties discussed directly all protective action recommendations and decisions on this "Call Me" line. Once the decision was made, McMinn County immediately implemented them. However, when a confusing message was received concerning the ingestion of KI by both emergency workers and the evacuating public, the Emergency Director called the State, arranged for a conference call and received clarification regarding the decision and then promptly implemented the action.

5.2.3 71-81-88-A-03
Rome County Mass Case Shelter

Description: The radiological monitors at the Roane County Mass Care Shelter did not how the contamination action level. so they would not know when to send an evacuee to be decontaminated or allowed to go to the mass care area. They also did not cover the survey probe or wear gloves and booties as specified in their implementing procedures. The implementing procedures also state that the radiological monitors will be issued a dosimeter with a range of 0-20R. They were issued a 0-200R dosimeter.

Corrective Action Demonstrated: The Rome County Mass Care Shelter was successfully demonstrated at Harriman High School. All participants were knowledgeable of their personnel dosimetry,

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 Crass
ARCA	Area Requiring Corrective Action
APD	Athens Police Department
CECC	Central Emergency Control Center
CFR	Code of Federal Regulations
CVFD	Clearwater Volunteer Fire Department
DHS	Department of Homeland Security
DHHS	Department of Health and Human Services
DIL	Derived Intervention Levels
DOC	Department of Commerce
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DRD	Direct Reading Dosimeter
DRH	Division of Radiological Health
EAS	Emergency Alert System
ECL	Emergency Classification Level
EMA	Emergency Management Agency
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ESC	Emergency Services Coordinator
EWD	Emergency Worker Decontamination
FAA	Federal Aviation Administration
FCC	Field Coordination Center
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
FNF	Fixed Nuclear Facility
FR	Federal Register
FRS	Fire and Rescue Squad
GE	General Emergency
ICF	ICF Consulting, Inc.

JIC	Joint Information Center
KI	Potassium Iodide
mR	milliroentgen
MJRERP	Multi-Jurisdictional Radiological Emergency 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
R	Roentgen
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RCO	Radiation Control Officer
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
RMCC	Radiological Monitoring Control Center
RSVP	Retired Senior Volunteer Program
SEOC	State Emergency Operations Center
SIP	Shelter Information Point
TCP	Traffic Control Point
TEMA	Tennessee Emergency Management Agency
TVA	Tennessee Valley Authority
USDA	U.S. Department of Agriculture
WBN	Watts Bar Nuclear Plant

APPENDIX 2

EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the Watts Bar Nuclear Plant exercise on November 5 and 6, 2003. The organization represented by each evaluator is indicated by the following abbreviations:

DHS/FEMA	- Department of Homeland Security/ Federal Emergency Management Agency
ICF	- ICF Incorporated
NRC	- Nuclear Regulatory Commission

Lawrence A Robertson — **Co-RAC Chairman**

EVALUATION SITE	EVALUATOR	ORGANIZATION
Chief Evaluator	Tom Reynolds	DHS/FEMA
STATE OF TENNESSEE		
SEOC	Torn Reynolds	DHS/FEMA
	Joseph Canoles	DHS/FEMA
RMCC	Deborah Blunt	ICF
Field Coordination Center	Larry Robertson	DHS/FEMA
Dose Assessment	Harry Harrison	ICF
Radiological FMTs	Keith Earnshaw	ICF
	Hollis Barry	ICF
	Thomas Brown	ICF
	Edward Wojnas	ICE
Joint Information Center	Robert Perdue	DHS/FEMA
	Dan Inman	ICF
Central Emergency Control Center	Robert Trojanowski	NRC
MCMINN COUNTY		
Emergency Operations Center	Helen Wilgus	DHS/FEMA
	Beth Massey	DHS/FEMA
	Rosemary Samsel	ICF

Traffic Control Points	Beth Massey	DHS/FEMA
MEIGS COUNTY		
Emergency Operations Center	Bill Larrabee Pat 'Tennrio	DHS/FEMA DHS/FEMA
Traffic Control Points	Pat Tenorio	DHS/FEMA
RHEA COUNTY		
Emergency Operations Center	Stan Copeland Henry Christiansan	DHS/FEMA ICF
Traffic Control Points	Henry Christiansan	ICF
INGESTION PHASE – DAY 2		
Emergency Operations Center	Torn Reynolds Joseph Canoles	DHS/FEMA DHS/FEMA
State Radiological Laboratory	Thomas Brown	ICF
Dose Assessment	Harry Harrison	ICF
Radiological FMTs	Deborah Blunt Keith Earnshaw	ICF ICF
Advisors	Tom Trout	**FDA**

APPENDIX 3

EXERCISE CRITERIA AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise criteria, which were scheduled for demonstration in the Watts Bar Nuclear Plant exercise on November 5, 2003 and the extent-of-play agreement approved by **FEMA** Region IV.

A. Exercise Criteria

The specific radiological emergency preparedness criteria, which were to be demonstrated, have been consolidated with the extent-of-play for this event and are explained in Subsection B.

B. Extent-of-Play Agreement

The extent-of-play agreement was submitted **by** the State of Tennessee and approved **by** **FEMA** Region IV. The extent-of-play agreement includes any significant modification or change in the level of demonstration of each exercise criterion listed as referred to in Subsection **A** of **this** appendix.

THE STATE OF TENNESSEE
TENNESSEE EMERGENCY MANAGEMENT AGENCY
EMERGENCY OPERATIONS CENTER
MILITARY DEPARTMENT OF TENNESSEE
3041 SIDCO DRIVE. P.O. BOX 41502
NASHVILLE, TENNESSEE 37204-1502
(615) 741-0001

2003 WATTS BAR NUCLEAR PLANT

GRADED EVALUATION

STATE OF TENNESSEE

PLUME EXPOSURE AND INGESTION PATHWAY ZONES

COALS, CRITERIA, AND EXTENT-OF-PLAY

A full participation exercise will be conducted during the **week** of November **5 - 6,2003** for the purpose of demonstrating an integrated radiological emergency response **capability** for the **Watts** Bar Nuclear Plant (WBN). The exercise **will be** a two-day event (approx. 8 hrs. per day), encompassing response capabilities and requirements of the State, local governments, and **the** Tennessee Valley Authority (TVA) in both the Emergency Planning Zone (EPZ)/Plume Exposure Zone and Ingestion Pathway Zone (IPZ).

The State **of** Tennessee and Tennessee Valley Authority have prepared **goals** addressing respective obligations. Both reflect the necessary interactions between the State and local governments **as** well as the utility as set forth in the Mutti-Jurisdictional Radiological Emergency Response Plan (MJRERP) for the Watts Bar Nuclear Plant. The six evaluation areas **coupled** with specific criteria to accomplish the following goals have been written in accordance with the Federal Emergency Management Agency (FEMA) **Federal** Register Notice, "Radiological **Emergency** Preparedness: Exercise Evaluation Methodology."

STATE AND LOCAL GOVERNMENT EXERCISE GOALS:

State and local government goals for this exercise are:

1. Test as well as evaluate the Watts Bat Nuclear **Plant** Multi-jurisdictional Radiological Emergency Response Plan concurrently with local government implementing procedures

2. Demonstrate and **assess** the continued viability **of the** integrated radiological emergency response effort though state and local government offsite personnel implementing response actions in accordance with established guidance

3. Ensure the safety of the general public through **the** issuance **of** protective action recommendations, **as** appropriate.

as required during exercise Day **2** to facilitate compress time for Days 3, 4, arid 5 of the scenario.

1.b. Facilities

Criterion 1.b.1: Facilities are sufficient to support the emergency response (NUREG-0654, **H.3.)**

METHODOLOGY GUIDELINES – Responsible OROs should demonstrate the availability of facilities that support the accomplishment of emergency operations. Facilities must be set up based on the OROs plans and procedures and demonstrated as they would be used in an actual emergency.

STATE EXTENT-OF-PLAY – The SEOC, FCC, RMCC, JIC, and **Risk** County EOCs (McMinn, Meigs and Rhea) will be set up in accordance with established plans and procedures and remain fully operational during the course of the exercise. The JIC will terminate operations at the close of Day 1 and the FCC and Risk County EOCs will be minimally staffed for Bay **2.** Since the SEOC and JIC facilities were previously evaluated; i.e., Baselined during Sequoyah 2002, and no changes have been made to them, only the FCC/RMCC and Risk County EOCs will be evaluated (See Definitions, "Baseline").

1.c. Direction and Control

Criterion 1.c.1: Key personnel with leadership **roles *for*** the ORO provide direction and control to that part of the overall response effort for which they are responsibte (NUREG-0654, A.1.d; A.2.a, b.)

METHODOLOGY GUIDELINES – Leadership personnel should demonstrate the ability to carry out essential functions of the response effort, for example keeping the staff informed through periodic briefings and/or other means, coordinating with other appropriate OROs, and ensuring completion of requirements and requests.

STATE EXTENT-OF-PLAY – The SEBC Director will assume primary responsibility for direction and control; working in concert with the FCC, JIC, and **Risk** County EOC Directors.

AREAS REQUIRING CORRECTIVE **ACTION**

70-01-03-A-01 (State Emergency Operations Center) – **At** 1055, the State activated sirens and the EAS to inform the public of the decision to evacuate the near plant area (A1, B1, C1, and D1) and all of quadrants C and D. Simultaneously, the protective Action Decision **(PAD)** was communicated to the McMinn, Meigs, and Rhea County Emergency Operations Centers (EOC) to implement their actions to support the evacuation. The counties did not have enough time to implement protective actions before the public began to evacuate.

authorize radiation exposure in excess of administrative limits or protective action guides (NUREG-0654, **K.4;** J.10.e, f.)

METHODOLOGY GUIDELINES – OROs authorized to send emergency workers into the plume exposure pathway EPZ should demonstrate:

a. **A** capability to meet the criterion based on their emergency plans and procedures
b. the capability to make decisions concerning the authorization of exposure levels in excess of pre-authorized levels...
c. the capability to make decisions on the distribution and administration of **KI** as a protective measure

STATE EXTENT-QP-PLAY – Demonstration will be scenario driven and accomplished by appropriate staff in the SEOC. (See Criterion 2.b.2, STATE EXTENT OF PLAY)

2.b. Radiological assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency:

Criterion 2.b.1: Appropriate protective action recommendations are based on available information and plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of on-site and off-site environmental conditions (NUREG-0654, I.8, 10 and Supplement **3.)**

METHODOLOGY GUIDELINES – OROs should demonstrate the capability to use appropriate means, described in the pian and/or procedures, to develop protective action recommendations (PAR) for decision-makers based on available information and recommendations from the licensee and field monitoring data, if available.

STATE EXTENT-OF-PLAY – Demonstration will be scenario driven and accomplished by appropriate staff in the SEOC, RMCC, and GECC Division of Radiological Health (DRH) personnel at **the** SEOC, in concert with TVA counterparts in the CECC, will perform dose assessment and independently validate dose projections Radiological data for the field teams will be inserted by Controller injects and sent to the SEOC via the RMCC Projections will be based on plant data provided by TVA and field radiation measurements

Criterion 2.b.2: A decision-making process involving consideration of appropriate factors and necessary coordination is used to make protective action decisions (PAD) for the general public (including the recommendation for the use of KI, if ORO policy (NUREG-0654, J.9, 10.f, m.)

METHODOLOGY GUIDELINES – OROs should demonstrate the capability to make initial PADs in a timely manner appropriate to the situation, based on notification from the licensee, assessment of plant status and releases, and PARs from the utility and ORO staff.

STATE EXTENT-OF-PLAY – Demonstration of this process by appropriate staff in the State Emergency Operations Center will he scenario driven and based on field data. SEOC staff will demonstrate Ingestion Pathway timely precautionary actions to protect food and water supplies, or to minimize exposure to potentially contaminated water and food, in accurdance with their respective plans and procedures Affected local OROs will be kept appraised of protective action decisions. Assessment of the radiological analysis of representative samples of food, water and other ingestible substances from potentially impacted areas, the characterization of the release/s from the facility, and the extent of areas potentially impacted by the release will be demonstrated through discussion

2.e. Radiological Assessment and Decision-Making Concerning Relocation, Re-entry, and Return:

Criterion 2.e.1: Timely relocation, re-entry, and return decisions are made and coordinated as appropriate, based on assessments **of** the radiological conditions and criteria in the ORO's plan and/or procedures **(NUREG-0654,** A.1.b; 1.10; M.1.)

METHODOLOGY GUIDELINES – **(Relocation)** OROs should demonstrate the capability to estimate integrated dose in contaminated areas and to compare these estimates with PAGs, apply decision criteria for relocation of those individuals in the general public who have not been evacuated but where projected doses are in excess of relocation **PAGs,** and control access to evacuated and restricted areas. **(Re-entry)** Decisions should be made regarding the location of control points and policies regarding access and exposure control for emergency workers and members of the general public who need to enter the evacuated area temporarily to perform specific tasks or missions **(Return)** Decisions are to be based on environmental data and political boundaries or physical/geographical features, which allow identification of the boundaries of areas to which members of the general public may return

STATE EXTENT-OF-PLAY – Demonstration of this process by appropriate staff group discussions in the State Emergency Operations Center will be scenario driven and based on field/projected data Demonstrate the capability to estimate integrated dose in contaminated areas and to compare these estimates with **PAGs,** applying decision criteria for relocation of those individuals in the general public who Rave not been evacuated but where projected doses are En excess of relocation PAGs and control access to evacuated and restricted areas Relocation decisions will be made fur members of the evacuated public who lived in areas that have residual radiation levels in excess of the **PAGs** Return to evacuated area/s decisions **will** be relayed to the affected local EOC/s and the JIC **A** geographic description of the cleared area/s **will** accompany the notification/s

Evaluation Area 3 – Protective Action Implementation

3.a. Implementation of Emergency Worker Exposure Control:

METHODOLOGY GUIDELINES – OROs should demonstrate the capability to alert and notify (for example, provide protective action recommendations and emergency information and instructions) special populations (hospitals, nursing homes, correctional facilities, mobility impaired individuals, transportation dependent, etc.). OROs should demonstrate the capability to provide for the needs of special populations in accordance with the ORO's plans and procedures. Contact with special populations, reception centers, and transportation providers may be actual or simulated.

STATE EXTENT-OF-PLAY – Demonstration of this process by appropriate staff in the SEOC and local EOCs will be scenario driven and based on projected contamination exposure levels. Decisions will be coordinated through affected local EOCs for understanding and implementation. (See Subparagraph 2.c.1) Implementation of protective actions and contact with the special populations/reception centers will be simulated however, procedural discussions between appropriate staff in the State/Risk County EOCs and the evaluators will be conducted.

Criterion 3.c.2: OROs/school officials implement protective actions for schools (NUREG-0654, J.10.c, d, g)

METHODOLOGY GUIDELINES – Public school systems/districts shall demonstrate the ability to implement protective action decisions for students At least one school in each affected school system or district, as appropriate, needs to demonstrate the implementation of protective actions

STATE EXTENT-OF-PLAY – County school superintendents and transportation supervisors or designees will be available at respective EOCs for interviews by evaluators. For the purpose of ascertaining staff knowledge of relocation plans and procedures, an out-of-scenario sequence interview with the following school principal/staff will be conducted, but contact by telephone with the school will occur on Exercise Day 1

ENDANGERED SCHOOL	LOCATON	DATE
Meigs North Elementary	Meigs North Elementary 22015 State Hwy 58 North Decatur, TN 37322	September 29, 2003

3.d. Implementation of Traffic and Access Control:

Criterion 3.d.1: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel (NUREG-0654, J.10.g, j)

METHODOLOGY GUIDELINES – OROs should demonstrate the capability to select, establish, and staff appropriate traffic and access control points, consistent

the evaluators. **A** list of teams and members identified for evaluation will be provided.

Criterion 3.e.2: Appropriate measures, strategies, and pre-printed instructional material are developed for implementing protective action decisions for contaminated water, food products, milk, and agricultural production (NUREG-0654, E.5, 7, J.9, 11.)

METHODOLOGY GUIDELINES – OROs should demonstrate by formulation of protective action information for the general public and food producers and processors. This includes either pre-distributed public information material in the IPZ or the capability for the rapid distribution of appropriate pre-printed and/or camera-ready information and instructions to pre-determined individuals and businesses. OROs should demonstrate the capability to control, restrict, or prevent distribution of contaminated food by commercial sectors

STATE EXTENT-OF-PLAY – Demonstration of this process by appropriate staff in the SEBC and local EOCs will be scenario driven and based on projected exposure. Demonstration of the capability to control, restrict or prevent distribution of contaminated food by commercial sectors should be clearly coordinated however, actual comniunications with food producers will be simulated.

3. f. Implementation of Relocation, Re-entry, and Return Decisions:

Criterion 3.f I: Decisions regarding controlled re-entry of emergency workers and relocation and return of the public are coordinated with appropriate organizations and implemented (NUREG-0654, M 1, 3)

METHODOLOGY GUIDELINES – **(Relocation)** OROs should demonstrate the capability to coordinate and implement decisions concerning relocation of individuals, not previously evacuated, to an area where radiological contamination will not expose the general public to doses that exceed the relacation **PAGs. (Re-entry)** OROs should demonstrate **the** capability to control re-entry and exit of individuals who need to temporarily re-enter the restricted area, to protect them from unnecessary radiation exposure and for exit of vehicles and other equipment to control the spread of contamination outside the restricted area. **(Return)** OROs should demonstrate the capability to implement policies concerning return of members of the public to areas that were evacuated during the plume phase. OROs should demonstrate the capability to identify and prioritize services and facilities that require restoration within a few days. and to identify the procedures and resources for their restoration

STATE EXTENT-OF-PLAY – Demonstration of this process by appropriate staff in the SEOC and local **EOCs** will be scenario driven and based on projected/reported contamination levels. Appropriate staff, through discussions with evaluator/s will demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas having residua! radiation levels

STATE EXTENT-OF-PLAY – (See Subparagraph 4.a.1.) **All** field teams will be under the direction of the RMCC.

Criterion 4.a.3: Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams must move to an appropriate low background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media (NUREG-0654, I.9)

METHODOLOGY GUIDELINES – Field teams should demonstrate the capability to report measurements and field data pertaining to the measurement of airborne radioiodine and particulates and ambient radiation to the field team coordinator, dose assessment, or other appropriate authority. OROs should use Federal resources as identified in the FRERP, and other resources (for example, compacts, utility, nuclear insurers, etc.), if available.

STATE EXTENT-OF-PLAY – Four **(4)** field-monitoring teams **will** be evaluated. 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. Field monitoring data will be injected by controllers supporting the exercise, and be transmitted by the teams to the RMCC over the normal communications network (portable hand-held radios). Cellular telephones will be utilized for back-up communications.

4.b. Post Plume Phase Field Measurements and Sampling:

Criterion 4 b 1 Field teams will demonstrate the capability to make appropriate measurements and to collect appropriate samples (e g , food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making (NUREG-0654, I 8, J 11)

METHODOLOGY GUIDELINES - Field teams should demonstrate the capability to take measurements and samples, at such times and locations as directed, to enable an adequate assessment of the ingestion pathway and to support re-entry, relocation, and return decisions Ingestions pathway samples should be secured from agricultural products and water Samples in support of relocation and return should be secured from soil, vegetation, and other surfaces in areas that received radioactive ground deposition

STATE EXTENT-OF-PLAY – Two **(2)** field teams will visit specified dairies and explain the procedure while simulating the taking of a milk sample Each field team will demonstrate the capability to make appropriate measurements and to collect appropriate samples (e g , food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making Samples (water, soil, and crop/forage vegetation) will be collected and transported to a central collection point and readied for shipment to a laboratory Actual transport

available to discuss the routes and procedures that would be utilized in an actual emergency situation.

Criterion 5.a.2: Reserved at this time. **(NUREG-8654)**

Criterion 5.a.3: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized off-site emergency officials to notify the public of an emergency situation. Backup alert and notification of the public **is** completed within **45** minutes following the detection by the ORO of a failure of the primary alert and notification system (NUREG-0654, E.6, Appendix 3.B.2.c.)

METHODOLOGY GUIDELINES – ORQs with FEMA approved exception areas (identified in the approved Alert and Notification System Design Report) 5-10 miles from the nuclear power plant should demonstrate the capability to accomplish primary alerting and notification of the exception area(s) within 45 minutes following the initial decision authorized offsite emergency officials to notify the public of an emergency situation.

STATE EXTENT-OF-PLAY – Not Applicable

5.b. Emergency Information and Instructions for the Public and the Media:

Criterion 5.b.1: OROs provide accurate emergency information and instructions to the public and the news media in a timely manner **(NUREG-0654,** E.5, 7; G.3.a, 4.c.)

METHODOLOGY GUIDELINES – Subsequent emergency information and instructions should be provided to the public **and** the media in a timely manner **(will** not be subject to specific time requirements). OROs should demonstrate that an effective system is in place for dealing with calls to the public inquiry hotiine. OROs should ensure that emergency information and instructions are consistent with protective action decisions made by appropriate officials. **Also,** OROs should demonstrate that a system exists for rapid dissemination of ingestion pathway information to pre-determined individuals and businesses in accordance with the ORO's plans and/or procedures.

STATE EXTENT-OF-PLAY – Emergency Instructions/information will originate from **the** SEOC prior to JIC activation; after activation, information will be disseminated from the JIC (Day 1 Only) while emergency instructions **will** continue to be disseminated from the SEOC via the EAS (SEOC will be responsible **for** both information and instructions on Day 2). Appropriate SEOC staff will be available to discuss with evaluators other means of rapid information dissemination; i.e., agricultural, etc.).

accordance with the (ORO's) plans and procedures. The monitoring staff should demonstrate the capability to make decisions on the need for decontamination of equipment, including vehicles, based on guidance levels and procedures stated in the plan and procedures. The area to be used for monitoring and decontamination should be set up as it would be in an actual emergency with all route markings, instrumentation, record keeping and contamination control measures in place. Monitoring procedures should be demonstrated for a minimum of one vehicle.

STATE EXTENT-OF-PLAY – Not applicable

6 c. Temporary Care of Evacuees:

Criterion A c.1 Managers of congregate care facilities will demonstrate that the centers have resources to provide services and accommodations consistent with American Red Cross planning guidelines Managers demonstrate the procedures through discussion to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate prior to entering congregate care facilities (NUREG-0654, J 10 h, 12)

METHODOLOGY GUIDELINES – Congregate care staff should also demonstrate the capability to ensure that evacuees have been monitored for contamination, have been decontaminated as appropriate, and have been registered before entering the facility

STATE EXTENT-OF-PLAY – Congregate care will be demonstrated, out-of-scenario sequence, at the following location The shelter will be staffed with trained personnel, and at least six (6) monitoring demonstrations will be accomplished **A** walk-through of decontamination procedures will be conducted for the evaluators School may be in session so dernonstrations of monitoring, decontamination, and sheltering activities should he held to a minimum in order to lessen disruption of regular school activities However, the staff will be available for interviews by evaluator/s (See 6 a 1, METHODOLOGY GUIDELINES and NOTE)

SHELTER	LOCATON	DATE
**Harriman High School	920 N Roane Street Harriman, TN 37748	TBD

** Denotes Baseline

6.d. Transportation and Treatment of Contaminated Injured Individuals:

Criterion 6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals (NUREG-0654, F.2; H.10; K.5.a, b; L.1, **4.)**

METHODOLOGY GUIDELINES – OROs should demonstrate the capability to transport contaminated injured individuals to medical facilities. ***An*** ambulance

of Total Effective Dose Equivalent) and maximum exposure limits (for those emergency workers involved in life saving activities) contained in the ORO's plans and procedures.

Embargo Area – **A** designated area subject to legal prohibition on agricultural commerce.

Timely – Responsible ORO personnel/representatives demonstrate actions to disseminate the appropriate information/instructions with a sense of urgency and without undue delay.

APPENDIX 4

EXERCISE SCENARIO

This appendix contains a summary of the simulated sequence of events (Exercise Scenario), which was used as the basis for invoking emergency response actions by OROs in the Watts Bar Nuclear Plant exercise on November 5 and 6,2003.

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

WATTS BW NUCLEAR PLANT (WBN) 2003 NRC/FEMA GRADED EXERCISE
SCENARIO NARRATIVE DAY 1
CONFIDENTIAL
Rev. Date: 9/04/03

INITIAL CONDITIONS:
UNIT-1:

- 100%power for the last 200 days. The core is at EOL. The Boron concentration is 6 ppm.
- 1B Centrifugal Charging pump (CCP) is O.O.S. for repairs.
- **240** TPBARs have been in the core since the last outage.

UNIT-2:

- As is.

COMMON:

EVENTS: Note: Times are in scenario elapsed time (hr: min). While the Scenario has certain EALs listed which the SED is expected to make declaration of the emergency classifications (ALERT, SAE, GE), it is possible that the SED may declare an emergency classification based on judgment or some other set of EALs which the Scenario did not expect. If any of these situations arise the Controllers must be ready to evaluate the accuracy and timeliness of these unexpected emergency declarations.

At fifteen minutes **(T=00:15)** into the exercise, a RCS leak occurs on the U-1 loop 3 hot leg equivalent to about .015% of a full break. This exceeds the capacity of one charging pump in normal alignment.

At about twenty **five** minutes (T=00:25) Operations should trip the reactor and initiate an SI.

At about forty minutes **(T=00:40)** into the exercise, an ALERT should be declared based on EAL 1.2.2P (Non isolatable RCS **leak** exceeding the capacity of one CCP in the normal alignment).

At about **fifty** minutes (T=00:50) into the exercise. phase "B" occurs when the Containment pressure exceeds 2.81 psig. The 1B **Containment** Spray (CS) pump motor trips out **upon** start up. About nine minutes later when the Air return fans *are* to start, the "A' fan fails **to** start.

At about one hour thirty minutes **(T=01:30)** into **the** exercise, the RCS leak on U-1 loop 3 hot leg increases to about 30% ***of*** a complete severance. EAL 1.2.2L conditions **are** met. Some fuel clad and TPBARs are damaged due to rapid depressurization and thermal **shock.** The accident monitors 1-RM-90-273, 274 exceed their EAL 1.1.5 values **in** about 10 minutes.

At about **one** hour forty-five minutes (T=01:45) into the exercise, when sump recirculation is required for ECCS pump operation due **to** low RWST level. none of the sump suction valves (1-FCV-63-72, 73) will open. If Operations attempts to align the **EA** CS pump lo refill the RWST from **the** containment sump then valves 72-503 and 72-502 will be very difficult to open.

At about one hour fifty-five minutes **(T=01:55)** into the exercise. a SAE should be declared based on **EAL** 1.1.5L (Valid reading greater than 59 R/hr on I-RE-90-273 and 274) and EAL 1.2.2L (RCS leak results in loss of subcooling (< 65°F indicated)).

At about two hours five minutes (T=02:05) into the exercise, the reactor RVLIS has lowered to < 33%.

At about **two** hours **thirty** minutes **(T=02:30)** into the exercise. the 1A CCP motor trips.

At about three **hours (T=03:00)** into the exercise, after the core exit thermocouples read 1050°F (< 1% fuel over temperature **occurs)** then **the** valves 72-503 and 72-502 will be opened and Operations may begin to transfer water from the Containment Sump **to** the **RWST.** When this transfer occurs. a release of radioactivity to the environment occurs From the RWST vent. Additionally, a leak of this sump water begins to occur in the pipe chase from **the** orifice OR-72-1000. About 60 gpm is spraying into the pipe chase.

At about **three** hours five minutes **(T=03:05)** into the exercise. when the cold water quenches the hot fuel, clad failures occur due to thermal **shock.** The containment Accident monitors exceed their EAL 1.3.5 **values.**

WATTS BAR NUCLEAR PLANT (WBN) 2003 NRC/FEMA GRADED EXERCISE
SCENARIO NARRATIVE DAY 2(11/06/03)
CONFIDENTIAL
Rev. Bate: 9/5/03

During the afternoon on 11/05/2003 while WBN Operators were keeping the core covered with the IB RHR pump on rump recirculation, the pressure inside containment continued to rise due to the depletion of the ice. At about 14:30, before the coolant temperature was below the boiling point of water. the IB RHR pump motor began to experience bearing vibration that became so severe that the motor tripped. Operations had not been able to start the 1A RHR pump due to the inability to open the sump suction valve 1-FCV-63-72. Operations tried to align the 1A RHR pump so that it could take suction from the open sump line but the valve 1-FCV-74-21 which had been closed for sump recirculation would not open remotely. The radiation levels in the room were too high to send any one in to try to manually open the valve. The fuel became uncovered and incore thermocouples exceeded 1200°F. The site implemented their Severe Accident Management Guidelines (SAMG).

At about 15:30 the incore thermocouples had exceeded 2200°F. Due to the increasing containment pressure from hydrogen burning and continued hydrogen production without the availability of Containment Spray, SCG-2 of the SAMG indicated that to ensure the overall containment integrity that venting was necessary. At 15:35 venting of containment began into the annulus through EGTS to the Shield building exhaust. Release rates for noble gases reached 2E+7μC/sec out the Shield building exhaust to the environment.

At about 16:50 Operations and maintenance managed to repair the 1B CS pump motor which allowed Operations to begin to transfer water from the sump to the RWST again and reflooding of the Vessel began again. Containment reached safe conditions at 17:00 and venting was terminated. With the RWST refilled and the core recovered the containment was sprayed for several minutes to reduce any further adverse containment conditions. Some building flood alarms began to some in due to the leak in the pipe chase from the CS recirculation line to the RWST. Late in the evening, WBN plant personnel managed to open 1-FCV-63-72 and begin sump recirculation with the 1A RHR pump. the RWST was injected into Containment in order to reduce radiation levels around the site.

Based on projected doses for the Sweetwater area and adverse weather conditions the State decided to administer Potassium Iodide to the people of Sweetwater and shelter them until the plume Rad passed.

The leading edge of the plume was detected by State monitoring teams on 11/05/2003 in the Sweetwater vicinity at 17:45 readings varied from 100 μR/hr to 900 μR/hr until 19:45 when an increase was observed. The measured radiation level in the Sweetwater area reached a maximum of 8 mR/hr around 2010. Some air samples were taken at that time that indicated maximum I131 concentrations of 6.0E-8 μC/cc. From 19:45 to about 20:45 a light rain was reported by environmental monitoring teams in Sweetwater. The trailing edge of the plume left the Eastern part of Sweetwater about 2100. Radiation levels were less than 1000 μR/hr in most of the Sweetwater area except for the area where rain had occurred. In that area some readings were as high as 1000-3000 μR/hr.

The State environmental monitoring teams continued to track the plume until 2400 where at a distance of about 50 miles E from WBN the plume crossed into the Great Smoky Mountain National Park South of Maryville Tn.

During the early to late evening of 11/05/2003, approximately 20 soil samples and additional radiation readings from ground contamination were taken within the 10 mile radius of the plant by TVA monitoring teams and in the Sweetwater vicinity by State environmental monitoring teams after the release had stopped and the plume had passed out of the areas to be surveyed.

The DOE had arrived in the late evening of 11/05/2003 and began performing an aerial survey out to a 50 mile radius from WBN. They indicated that their aerial survey data should be analyzed and a report available later today.

Data analysis and Decision making for Day 2 will be given 2 hours before proceeding to Day 3 activities.

Note: Controller will provide Day 2 sample results in a spread sheet format.