WATTS BAR NUCLEAR PLANT

EXERCISE

FEDERAL EMERGENCY MANAGEMENT AGENCY

REGION IV

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REGION IV

Federal Emergency Management Agency
Region IV
1371 Peachtree Street, NE, Suite 700
Atlanta, GA 30309

WATTS BAR NUCLEAR PLANT

EXERCISE

Conducted - October 6-7, 1993

Draft Exercise Report - January 19, 1994

Final Exercise Report - August 11, 1994
(Revised May 3, 1995)

Utility: Tennessee Valley Authority
Plant Location: Spring City, Rhea County, Tennessee

Participating State and Local Governments:

State of Tennessee
McMinn County
Meigs County
Rhea County
Cumberland County
Roane County

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I. EXERCISE SUMMARY

This full participation plume exposure and ingestion pathway qualifying exercise was conducted on October 6-7, 1993, and was evaluated by 27 Federal evaluators representing 6 Federal agencies. The evaluation was based on FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991, and 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.

The Watts Bar Nuclear Plant is owned and operated by the Tennessee Valley Authority (TVA). The plant is located in Rhea County in southeast Tennessee, on the west shore of the Tennessee River, near the town of Spring City, Tennessee. This is approximately 50 miles north northeast of Chattanooga, and 54 miles southwest of Knoxville, Tennessee. Portions of Meigs, McMinn and Rhea Counties are within the 10-mile plume exposure pathway Emergency Planning Zone (EPZ). All or part of Anderson, Bledsoe, Blount, Bradley, Cumberland, Fentress, Grundy, Hamilton, Knox, Loudon, Marion, McMinn, Meigs, Monroe, Morgan, Overton, Polk, Putnam, Rhea, Roane, Sequatchie, Van Buren, Warren, and White Counties in Tennessee, Cherokee and Graham Counties in North Carolina, and Catoosa, Fannin, and Murray Counties in Georgia, lie within the 50-mile ingestion exposure pathway EPZ.

Two previous exercises have been conducted at this site in 1984 and 1985. The State of Tennessee is scheduled to formally submit plans for 44 CFR 350 approval. TVA expects the plant to be licensed in 1995.

This exercise included the following participants:

Tennessee Emergency Management Agency (TEMA)
Tennessee Division of Radiological Health (DRH)
Tennessee Valley Authority
Athens/McMinn County Emergency Management Agency
Meigs County Emergency Management Agency
Rhea County Emergency Management Agency
Crossville/Cumberland County Emergency Management Agency
Roane County Emergency Management Agency
Nuclear Regulatory Commission

All exercise objectives were demonstrated; however, one Deficiency was identified. A remedial drill was conducted on November 15, 1993, which successfully demonstrated that corrective actions had been taken which resolved the identified Deficiency. There were also 3 Areas Requiring Corrective Action (ARCA) and 30 Areas Recommended for Improvement (ARFI) identified, which are discussed in detail in Section II and listed in Sections III and IV of this report.

FEMA REGION IV
WATTS BAR PLUME PHASE EXERCISE TIME LINE
OCTOBER 6, 1993

EMERGENCY ACTION LEVEL	TIME DECLARED	LICENSEE PROTECTIVE ACTION RECOMMENDATION AND TIME	PROTECTIVE ACTION DECISION (BY STATE/LOCAL)	PROTECTIVE ACTION DECISION TIME	SIREN ACTIVATION TIME	EBS OR INSTRUCTION MESSAGE TIME
ALERT	9:44 a.m.	None				10:10 a.m.
SITE AREA EMERGENCY	10:41 a.m.	None	Activate PNS Evacuate schools McMinn Meigs Rhea	10:47 a.m. 11:00 a.m. 11:00 a.m. 10:50 a.m.	10:55 a.m.	11:30 a.m.
GENERAL EMERGENCY	12:40 p.m.	Evacuate 10-miles 360°	Evacuate 10-mile EPZ KI to Emergency workers and general public	12:58 p.m. 1:00 p.m.	1:09 p.m. (simulated)	WDOD - 1:06 p.m. WIVK - 1:35 p.m. (simulated) 2:00 p.m. (simulated)

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II. DETAILED DISCUSSION

State of Tennessee

State Emergency Operations Center

Tennessee's State Emergency Operations Center (SEOC) is located within the National Guard Armory complex at 3041 Sidco Drive in Nashville. Access to the facility was well controlled during the exercise. The facility operates 24 hours a day and serves as the State Warning Point. The SEOC is an excellent facility to support emergency operations. Large-scale maps of the 10-mile and 50-mile EPZ were posted along the front of the operations room. Maps were also available at each agency work station. The status boards were used to post significant events and weather data and were kept current. The emergency classification level (ECL) was prominently posted.

On the evening of October 5, 1993, TEMA demonstrated the capability to alert key personnel of an incident at the Watts Bar Nuclear Plant. The full staff alerting roster was used to notify State personnel. Key State officials were properly notified as to the situation and directed to be at their emergency assignment locations by 8:00 a.m. on October 6, 1993.

The SEOC communications center is capable of communicating with all counties, State agencies, TVA, and field locations by telephone, radio, pagers, facsimile, and satellite. All systems were demonstrated and functioned well during the exercise. SEOC staff expeditiously made required repairs and corrections during the exercise.

The emergency response staff at the SEOC were motivated and well trained to carry out their assigned duties. Key personnel from TEMA and DRH and the Governor's Press Secretary demonstrated a shift change during the exercise. The replacements were well briefed on the situation prior to assuming their assigned positions.

Protective action recommendations (PAR) were received from TVA through the Central Emergency Control Center (CECC) and discussed with the TVA technical representative in the SEOC. The TVA technical representative was knowledgeable of plant operations and actively participated in protective action discussions as a technical advisor. PARs were thoroughly discussed with all appropriate State and Federal agency representatives in the SEOC, including the risk county liaisons. Decisions were made with appropriate staff interaction.

According to TEMA procedures, the operability of the Prompt Notification System (PNS) for the public was silently tested at approximately 9:10 a.m. This consisted of an electrical test of the siren system, which revealed one inoperable siren, and direct contact with the common program control station (CPCS-1) station.

At 10:41 a.m., TVA contacted the SEOC indicating that a Site Area Emergency (SAE) had been declared. TVA did not recommend any protective action. At the SAE, McMinn, Meigs, and Rhea Counties relocated EPZ schools, in accordance with the State plan.

At 10:47 a.m., the SEOC made the decision to activate the State's PNS for the 10-mile EPZ to notify the public of the incident at Watts Bar. Protective actions were thoroughly discussed, and times for siren and Emergency Broadcast System (EBS) activation were announced and disseminated. This decision was based on plant status. Activation of the sirens was initiated from the State Communications Center in Nashville at 10:55 a.m. The EBS public notification message, prepared in support of the protective action decision (PAD) concerning school relocations, was released at 11:30 a.m. The execution of the alert and notification process required 43 minutes. (E.6.)

At 12:40 p.m., TVA notified the SEOC that a General Emergency (GE) had been declared. The initial notification was transmitted from TVA without PARs but was quickly superseded by two separate updates to the General Emergency declaration which provided PARs for State consideration. At 12:58 p.m., the decision was made and properly disseminated to evacuate all sectors within the
10-mile EPZ, thereby adopting the most recent PAR received by the SEOC from TVA. At 1:00 p.m., a subsequent decision was made authorizing emergency workers to ingest potassium iodide (KI) and authorizing distribution of KI to the general population in accordance with the State plan.

Superior Items:

1. TEMA leadership and staff.

2. State Communications Center and staff.

Deficiencies:

1. E.6. - The SEOC failed to complete the initial alert and notification sequence within 15 minutes.

NOTE: A remedial drill involving the SEOC and the CPCS-1 EBS station was conducted on November 15, 1993, which corrected the above Deficiency. Proper procedures were effected which provide reasonable assurance that protective measures can be taken offsite in the event of a radiological emergency. (Please see the October 19, 1994, letter to TEMA in the appendix regarding the deficiency and remedial drill.)

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Develop a larger selection of pre-recorded EBS messages, to support all protective action combinations and contingencies.

Dose Assessment - DRH staff demonstrated activation on the previous day. The dose assessment area is equipped with adequate telephones, computers, printers, and facsimile machines. There was a temporary field monitoring telephone problem that required a new line and telephone. Communication from the dose assessment staff to the CECC was adequate over ring-down lines. Notebooks with telephone numbers were available at each work station to locate needed contacts.

DRH staff demonstrated the capability to develop dose projections and assist in making appropriate PADs. The recommendations for evacuation were made on the basis of initial TVA recommendations and dose projections. PADs were made by TEMA's director considering recommendations from DRH. DRH based its decisions on plant conditions, meteorological data, and radiological release rates. TVA provided frequent and timely release rate data, meteorological information, and information on plant conditions.

The dose assessment staff used two computer applications to make dose projections and to estimate plume location. Monitoring data was available to dose assessment staff for comparison to the computer models. Typically, the total body dose rates from field data compared very well to the computer codes at TVA and at DRH. There was a lack of field data for iodine. Late in the exercise, a conversion factor was available from TVA converting gamma readings in the field to iodine numbers. Available field data required no corrections to the computer calculations. Data and calculations were periodically transmitted to the TEMA director. Field data was provided by both TVA and State field teams.

The radiological control officer (RCO) made recommendations to the TEMA director after discussions with the dose assessment staff. TVA made initial classifications based on plant conditions. PADs were then discussed between the RCO, the TEMA director, and others. Factors considered by the RCO included plant conditions, current ECL, meteorological conditions, current and projected dose estimates, field data, time of day, time needed to implement a recommendation, and release duration. KI was recommended for the emergency workers that would remain in Decatur.

The geographical areas were identified using field data supported with fly-over isodose maps. The field data initially consisted of exposure readings but was later supported by isotopic analyses from environmental samples (isotopic analyses of surface samples). The maps contained many sample locations that were adequate for most of the impacted area. There were additional requests for data from two areas. Data packets were provided at the beginning of each "Day." The packets included maps and data that would be expected to be available for that day. Dose assessments were made from isotopic laboratory data for the milk, water, leafy vegetable, and ground contamination ingestion pathways. The levels were correlated to protective and emergency action levels. Appropriate recommendations were made from the data regarding: sheltering of livestock, confiscation of milk for analysis, and further analysis of crop and garden data.

Preventative protective action guides (PAG) were estimated to have been exceeded at several locations (primarily in the milk pathway). Discussions with the TVA radiation control monitor, the agriculture and TEMA representatives, and the SEOC/TVA liaison were observed to gain concurrence on PADs. When necessary, refinements (adjustments for isotopic mix) to initial data were made to more realistically define areas for reentry. No restrictions were issued based on the first year exposure doses after the correction for the isotopic mix was calculated (848 Rem/h). Decisions were made to allow for controlled reentry into restricted areas to perform essential functions. The shift change occurred smoothly with all positions being staffed and effective transfer of information without interruption of functions.

DRH and the Department of Agriculture agencies continually coordinated efforts relating to what effects projected doses would have on ingestion pathway exposures. This coordination was effective because DRH personnel were deciphering exposed areas based on the annual monitoring and sample data. This was overlaid with agricultural information, i.e., dairy locations and food processing plants. The outcome was a coordinated product that supported sound recommendations to be made to the State director. Once the recommendations were made, EBS message #19 was revised to include most of these issues.

Superior Items:

1. The SEOC is an excellent facility and is adequately staffed in technical and support positions.

2. The TVA technical support staff positions functioned in concert with the RCO.

3. The computer tools available to the dose assessment staff were simple, easy to use, and provided appropriate calculations.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Availability of field team data for iodine releases should be improved. Very little emphasis was placed on defining the noble gas to iodine ratio even though the PADs were based on the iodine numbers.

2. Plume location was not displayed for the SEOC staff on any status board.

Central Emergency Control Center

TVA's CECC, located in Chattanooga, is an excellent facility with adequate space, communications systems, real time plant data, status boards, and other equipment necessary for effectively managing emergency operations.

TEMA dispatched one representative to the CECC to serve in a liaison capacity between the CECC and the SEOC. This action facilitated coordination between the State Emergency Director and the TVA Emergency Director. Additionally, during both the plume exposure and ingestion pathway phases of this exercise, the flow of technical information from the CECC to the SEOC was complete, accurate, and timely which enabled the State to perform independent accident analyses in an efficient manner.

The State representative at the CECC was well trained, knowledgeable, followed his procedures, and carried out his liaison responsibilities in a professional manner. Overall, the coordination between representatives of the State and TVA, both at the CECC and the SEOC, were outstanding.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Field Coordination Center

The Field Coordination Center (FCC) was located in the TEMA regional office in Alcoa, Tennessee. The FCC provided operational backup and support to the SEOC. It also serves as the alternate SEOC if relocation of the SEOC becomes necessary.

Security for the facility was sufficient. The facility was adequate for the approximately 28 emergency service coordinators from the various agencies. Equipment, including typewriters, copiers, facsimile machines, and computers, was adequate to meet the needs of the center. Copies of the current Tennessee multi-jurisdictional plan for Watts Bar were available for agency representatives.

The facility had excellent maps and displays. The single status board was promptly posted and effectively used to list major events. However, shelters, schools, monitoring points, and plume direction were not plotted on the maps.

The primary communication system was demonstrated. There were two dedicated telephone lines and one telephone for each agency. The FCC occasionally received incomplete information on PARs.

The staff and agency representatives were issued packets containing an FCC pass, KI tablets with instructions, a record card for exposure measurements and KI usage, and direct-reading and permanent-record dosimetry.

The director and assistant director coordinated the professional staff. Representatives effectively coordinated requests for assistance, and at frequent briefings, informed the FCC director of their needs, requests, and utilization of resources.

Superior Items:

1. The professionalism and cooperation of FCC personnel.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. A separate status board should be used to permanently post significant events and activities.

2. Continue to refine message logging by including the time messages are received and briefly summarizing them.

3. Congregate care, plume direction, monitoring points, and traffic control points (TCP) should be posted on maps or status boards.

4. Key FCC personnel should request more information when PARs are incomplete or vague.

Joint Information Center

The Joint Information Center (JIC) was located in the TVA Missionary Place Building in Chattanooga. The JIC was activated at 10:15 a.m., between the Alert and SAE declarations.

The facility is large, modern, and well equipped with excellent audio visual equipment, maps, and displays in both the TVA and State public information officer (PIO) work areas. The briefing auditorium was located downstairs in the same building.

The TVA JIC operational area was located across the lobby from the State operation. The State was well represented by the JIC manager, his assistant, the State spokesperson, a State and county liaison person (a new and helpful addition to the staff), several other dedicated State staff, and representatives from the three risk counties, McMinn, Rhea, and Meigs.

Excellent coordination among TVA, the State, and the risk counties was demonstrated through the meetings held just before each of the four media briefings conducted on Day 1 of the exercise and through all PIO activities on both days of the exercise.

The rumor control function was handled well by two TVA and two State staff members working together in a room adjacent to the State operational area. About 100 calls were responded to by the 4 staff members. All messages and emergency information were promptly made available to the rumor control staff. The staff brought rumor information considered harmful to the attention of the JIC manager and assisted in the squelching of several rumors.

The four media briefings were well conducted. Technical language was avoided and appropriate information was presented by spokespersons from TVA, the State, and the risk counties. The mastheads of some news releases did not clearly indicate origin, number, date, and time. Spokespersons did not refer to the available 10-mile EPZ maps when discussing sectors and evacuation routes. Mock media representatives, provided by TVA and a local college, asked provocative and aggressive questions which were answered adequately by the spokespersons.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Spokespersons at media briefings should refer to map displays when discussing EPZ sectors and evacuation routes.

2. Improve mastheads of news releases and messages so that the origin, number, date, and time of release are clear.

Radiological Laboratory

The State Radiological Laboratory had been notified of the incident at the Watts Bar site during the plume or emergency phase of the exercise. The laboratory staff, three individuals, had prepared the facility to receive environmental samples on the morning of Day 2 of the exercise. A receiving area was prepared with removable covering to allow easy decontamination. A "hot-line" was established whereby all externally contaminated samples were held on the "hot side" and only externally clean sample were allowed in the remainder or clean side of the laboratory. The laboratory staff stated that no samples reading greater than 1 mR/hr at contact would be processed by this facility. Because of this restriction, no personal dosimetry was issued to the staff. No provision for the use of personal dosimetry could be located in the plan or laboratory procedures.

In accordance with exercise agreements, the laboratory demonstrated processing of samples out-of-sequence with the remainder of the exercise. A sample of each of the following types of environmental media was pre-positioned at the laboratory: water, milk, vegetation (forage), soil, (particulate filter, and iodine cartridge.) The samples were monitored with a thin window beta-gamma pancake type G-M probe. This instrument is calibrated annually and is the only instrument available. The outer plastic bags were smeared to determine the presence of external contamination. The various samples were transferred to standardized counting geometries, if necessary. The soil, particulate filter, and iodine cartridge were wrapped in clean plastic and counted as received. Other samples were taken from their shipping bags and transferred to their

respective counting geometries. During this transfer, contamination would have been spread over the surface of the "hot" hood and onto the surface of the clean bags, which were then taken to the clean side of the laboratory. This spread of contamination had the potential of contaminating the remainder of the laboratory and rendering the facility unusable until decontaminated. (I.8.) (After the samples were placed in the counting geometries, they were counted on either a Ge(Li) or pure Ge gamma detector. The spectra collected were analyzed by a computer based system. The laboratory staff had adjusted the normal counting times associated with environmental samples to shorter times which were more appropriate to emergency samples.)

After reviewing the results, laboratory staff manually transferred the various measured nuclide concentrations to the laboratory analysis sheets. A facsimile machine was available to transfer the results to the SEOC or other locations having a facsimile machine. All other communication was by commercial telephone. The samples would be archived in a separate room until the laboratory was given instructions on their disposal.

Deficiencies: None

Areas Requiring Corrective Action:

1. I.8. - Develop a procedure to assist staff in the proper method of maintaining contamination control.

Areas Recommended for Improvement:

1. Provide an additional instrument for use in monitoring arriving samples.

2. Investigate the possibility of changing the computer software in order to produce a suitable result directly.

Radiological Monitoring Control Center

DRH demonstrated its capability in directing and controlling the BRH field monitoring teams. DRH and the TVA representatives in the Radiological Monitoring Control Center (RMCC), in Alcoa, who were involved in directing the TVA field monitoring teams, demonstrated excellent coordination and teamwork.

Communications between the RMCC and the SEOC were never delayed even though the primary telephone was malfunctioning for 1 1/2 hours. The backup system proved to be adequate, with no delay in information exchange. Regular updates of changing weather and wind conditions were promptly noted and used to update and re-direct field teams. Field teams were consistently kept up-to-date on current plant conditions and weather changes.

A DRH representative in the FCC kept the RMCC staff informed of State actions as well as events at the plant. The current ECL was not posted in the RMCC.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Post the current ECL in the RMCC.

Radiological Field Monitoring Teams

Field Monitoring Team 1 - The two DRH representatives and one Public Service Commission (PSC) officer who comprised Team 1 were alerted and arrived at the RMCC in Alcoa from their Knoxville office at 8:00 a.m.. One DRH representative was the team captain who performed radiation monitoring while the other was the navigator and air sampling analyst. The PSC officer followed the monitoring team van in his squad car. Upon arrival at the RMCC, the team checked out all equipment and radiation monitoring instruments. All instruments had a calibration sticker and each was within the proper calibration date.

Dosimetry for all field activities was provided by the TEMA representative at the RMCC. Each packet had two direct-reading dosimeters (0-200 mR and 0-20 R); information sheet; thermoluminescent dosimeter (TLD); record-keeping card, and KI tablets. The team had an EPZ map with all pre-selected locations, a copy of all their procedures for a radiation incident, and their own TLD, film badge, and direct-reading dosimeters. Initial dosimeter readings, as well as all subsequent exposure readings, were recorded. The team simulated taking KI before leaving the RMCC for the assigned field area.

The RMCC field team coordinator briefed the team before deployment to its first sampling location. A SAE notification was received while the team was in transit. The RMCC field team coordinator updated the team on plant status and meteorological conditions throughout the exercise. During deployment within the EPZ, radiation meter readings were taken and promptly called into the RMCC field team coordinator. The communications system between the field team and the RMCC worked well. Team members were aware of the established exposure limits. The team used good health physics practices during associated radiation monitoring activities.

Air samples for particulates and iodine radioactivity were taken at two locations using established procedures and good radiation safety practices. Samples were bagged, labeled properly, and taken to the sample collection point at the RMCC in Alcoa. There was a discrepancy in the value for Iodine 131 concentration given by the controller and the concentration value calculated from the controller raw data and sampler volume and Sodium Iodine detector efficiency so that the $1x10^{-7}$ μCi/cc concentration could not be measured in the field. (H.10.)

The team returned to the RMCC, and a shift change was simulated by the RMCC field team coordinator. Two new teams deployed the next day as part of the ingestion pathway exercise.

Deficiencies: None

Areas Requiring Corrective Action:

1. H.10. - The calibration factor for Sodium Iodide needs to be revised to reflect the proper units (μCi/cc) to calculate the correct I^{131} concentration from field sampling and measurement so as to be able to measure $1x10^{-7}$ μCi/cc in the field.

Areas Recommended for Improvement:

1. Install a speaker near the hood of the van in order to hear the radio while outside the van.

2. Update all required procedures in the field monitoring team manual, "Emergency Response Procedures for a Radiation Incident."

Field Monitoring Team 2 - The State Radiological Field Monitoring Team 2 was mobilized at the Blount County Emergency Operations Center (EOC) and TEMA facility in Alcoa, Tennessee, at the Alert ECL. Field team members consisted of two State radiological health workers well trained in field monitoring and sampling procedures as well as in the use of radiological instrumentation. The team also consisted of a PSC officer who followed the monitoring team van in his squad car. Team 2 was activated promptly through the mobilization of the above personnel. Operational checks of dosimeter chargers and recording of the dosimeter readings were completed before dispatching of the team. All sampling equipment and monitoring instruments were given operational and calibration checks. All instruments were currently calibrated and operational. The team personnel were issued two direct-reading dosimeters (0-200 mR, 0-20 R) along with a TLD. The KI was also issued with the dosimetry packet (a bottle of 14 KI tablets, expiration date September 1996).

The field team communications consisted of a hand-held portable radio tied in to numerous repeaters strategically located in the area. Backup communication was located in the PSC squad car. Both were demonstrated, and good communications were maintained throughout the exercise.

The team was properly briefed at the EOC before being dispatched to sampling and monitoring points at 10:30 a.m. The team traversed the area as instructed by the RMCC and obtained readings at the requested locations in accordance with the monitoring procedures. The instruments were covered with plastic bags and readings were logged along with location, time, date, and name. Specifics were promptly reported to the RMCC coordinator. An air sample was obtained at 2:16 p.m. using the proper flow rates and sampling time. The sample was then removed to a low-background area and counted. Correct procedures were followed throughout the sampling. The sampling data was promptly reported to the RMCC field team coordinator. The capability to maintain staffing on a continuous 24-hour basis was demonstrated by an actual shift change. The incoming shift was adequately briefed by the outgoing shift on the current status of the emergency. An updated personnel roster was also provided at this time.

Superior Items:

1. Radiological field team members were extremely knowledgeable in performing their responsibilities concerning both instrumentation and procedures.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Field Monitoring Team 3 -Field team members met at the TEMA Regional Office, Alcoa, Tennessee. The team included a team captain, driver/assistant, and a PSC officer. All equipment, including the radios, was checked in accordance with procedures. The team was briefed and dispatched to the first monitoring point after being advised to take KI.

The team made ambient radiation measurements en route and at designated points as requested by the radiation monitoring coordinator. A particulate and airborne radioiodine sample was taken at one sampling point. All instruments used were within the one year calibration period, including the air sampling pump. Each team member wore a 0-200 mR and 0-20 R direct-reading dosimeter and a TLD. The PSC officer wore a 0-200 mR dosimeter and TLD. The team read their dosimeters and reported readings at each monitoring point. The team members were knowledgeable concerning their radiation exposure and exposure limits as well as reporting requirements. Radio communications were loud and clear from all locations.

A particulate air filter and radioiodine sample cartridge were turned in at the RMCC for transport to the laboratory in Nashville.

A roster of personnel for two shifts was provided, and shift change procedures were discussed.

Superior Items:

1. Communications, including reporting procedures.

2. Team cooperation.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Assemble air sampling equipment in advance of entering plume.

2. Move quickly out of plume for sample counting and identification.

3. Issue PSC officer a high-range dosimeter and include his exposure reading with all call-in reports.

Field Monitoring Team 4 - The State Radiological field sampling Team 4 was mobilized at the Blount County EOC and TEMA facility in Alcoa, Tennessee, at 8:00 a.m. The team members consisted of two State radiological health personnel, the agriculture representative, and the PSC officer who escorted the field sampling van (in his squad car). The team was activated promptly. The sampling team members were issued the proper dosimetry and were issued a

dosimeter charger before being dispatched from the Blount County EOC. Equipment included a TLD and direct-reading dosimeters (0-200 mR and 0-20 R) as well as a 14-pill bottle of KI with an expiration date of September 1996. The team was properly briefed on meteorological as well as radiological conditions.

All survey equipment functioned properly and was currently calibrated. The instruments and probes were protected by plastic bags. The team used portable radios as the primary means of communication. The backup communications consisted of a hand-held portable radio in the PSC squad car. There were no communication problems observed.

The team personnel used a check list to inventory the sampling equipment and supplies. There was no missing equipment. The team was dispatched to the Edna Lawson Dairy farm at Ten Mile, Tennessee, at 11:10 a.m.

The team arrived at the farm at 12:30 p.m. Within one hour, milk, water, soil, and vegetation samples were collected, recorded, bagged, labeled, and monitored. The RMCC was notified that the samples were en route to the RMCC for delivery to the van. The sampling team was knowledgeable and efficient in the completion of their assignment. They were particularly careful to prevent the spread of contamination while obtaining the above samples and while transporting them to the RMCC.

Superior Items:

1. The team members were very efficient and knowledgeable in the performance of their duties.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Field Monitoring Team 5 - Ingestion pathway procedures for collection and transportation of post emergency samples were demonstrated by Team 5. Team members from the Tennessee DRH, Agriculture Department, and PSC met at the TEMA Regional Office (RMCC) in Alcoa, Tennessee. The team participated in a briefing at the RMCC, checked equipment, and were dispatched to collect milk, cattle drinking water, vegetation, and soil at sampling point 5. Samples were collected, double bagged and labeled in accordance with procedures, and delivered to the RMCC collection point. Milk sampling procedures were demonstrated except for dipping into the bulk tank.

Contamination control techniques were thoroughly discussed and emphasized by the team. Each team member was issued direct-reading dosimeters and a TLD. A record was made of the direct-reading dosimeter readings for each person. All instruments and radio equipment functioned properly. Calibration dates on all instruments were current.

A 10-mile checkout procedure was discussed, including decontamination plans and procedures.

Superior Items:

1. Cooperation and contamination control.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Boat Ramps/Public Access

Seven boat ramps and one ferry landing were checked for signs which informed the public what to do if the sirens were activated. All had appropriate signs, and all were in good condition. Evacuation routes were well marked.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Provide written procedures for implementing river clearance activities for both the Coast Guard and the Tennessee Wildlife Resources Agency, which are charged with this task.

2. Conduct an actual river clearance during the next exercise.

EBS Station

On October 5, 1993, representatives from FEMA and TEMA visited radio station WIVK in Knoxville, which is the CPCS-1 for the northern portion of the Watts Bar EPZ. Station personnel were knowledgeable of EBS procedures and have written instructions available for any new personnel who might be in the broadcast booth. The station can broadcast live from the SEOC or Rhea County or can record messages and broadcast them later.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

McMinn County

Emergency Operations Center

The ability to fully alert, mobilize, and activate personnel for both facility and field-based emergency functions, was adequately demonstrated at the Athens/McMinn EOC. Alert and mobilization of the EOC staff was accomplished efficiently and promptly. The response organization was notified via dedicated telephone by the State of Tennessee. All essential emergency operations were performed at the facility.

The Alert was received at 10:00 a.m. There was no need to verify ECL calls since all calls were received on the dedicated line from the SEOC. The SAE was declared at 10:41 a.m. and received at 10:50 a.m.; and the General Emergency was declared at 12:40 p.m. and received at 12:54 p.m.

At 10:00 a.m., the organization began alerting and mobilizing personnel by telephone using current and accurate personnel telephone rosters. Rosters were available for each shift. Personnel began arriving at the EOC at 10:00 a.m., and the EOC was staffed with key personnel at 10:12 a.m. All positions required by the current plans were filled during this exercise.

The EOC is located in the City Hall in Athens, Tennessee. It is more than adequate to support emergency operations with appropriate space, furnishings, equipment, lighting, restrooms, ventilation, and backup power. Equipment included a satellite down-link for viewing transmissions from the SEOC.

Maps and displays in the EOC were complete and excellent, providing all summary and tracking information necessary for decision making. Status boards were available, prominently displayed, and promptly posted with current and accurate information. Posting occurred within 10 minutes of the receipt of information. The organization's emergency plan was available at the facility for review and was frequently referenced by exercise participants. Access to the facility was controlled by police officers who established a registration desk at the entrance to the EOC.

The ability to direct and control emergency operations was fully demonstrated at the Athens/McMinn EOC. The emergency management director was effectively in charge of the EOC. A shift change was conducted during this exercise. Both persons who fulfilled the role of the emergency manager were very effective.

The EOC staff, led by the emergency management director demonstrated a thorough knowledge of emergency operations, requirements, and procedures, enabling the organization to carry out its functions and activities in accordance with its plans and procedures. The director held frequent briefings to ensure that all present were knowledgeable regarding the status of events, issued instructions to the staff on adherence to the plan and provided leadership in decision making while involving the staff and elected officials in discussions before making decisions. The emergency management director asked that each staff member at the EOC provide briefings on the status of events related to their organization, and encouraged their interaction and communication with each other.

The ability to communicate with all appropriate emergency personnel at facilities and in the field were adequately demonstrated. Communications equipment, systems and procedures at the Athens/McMinn EOC were excellent. Communication systems were available and operated properly. Communication links were established with all appropriate locations.

Thirty-four telephone lines and instruments were available in the EOC, all of which have conferencing capability, and two additional dedicated telephone lines for direct contact with TVA and with the SEOC. The telephone systems are the primary system, and radio and facsimile machines serve as the backup. Two facsimile machines provided hard-copy while Radio Amateur Civil Emergency Services (RACES) and Amateur Radio Emergency Services (ARES) operators and equipment provided the facility with redundancies in case of failure of one or more radio systems.

All incoming and outgoing communications were appropriately logged, duplicated, and passed to the EOC staff for action or information. Frequent reviews of action status were held to ensure that no required actions or responses were overlooked.

McMinn County staff, after the SAE ECL was declared, followed their plans and procedures and evacuated the one school (E. K. Baker) located within the 10-mile EPZ. These students were bused (simulated) to the Central High School shelter. The remaining PADs were made at the State level. Sirens were actually sounded at 10:55 a.m. McMinn County was notified that three of the sirens in their county failed to sound. Backup route alerting was fully discussed at the county EOC. Sheriff's deputies then went to the area to investigate and believe that a power failure caused the malfunction. The siren sounding and issuance of EBS messages was handled by the State.

Instructions were received for emergency workers within the 10-mile EPZ to take KI. The McMinn County EOC staff immediately notified their emergency workers in the field to take KI. Shortly thereafter, instructions were received for the evacuees from the 10-mile EPZ located in shelters to take KI.

Through an interview with the county health department staff and inspection of available KI at the EOC, it appears that sufficient KI is available for emergency workers. KI for the general public is stored at the regional health office in Chattanooga. The KI inspected had an expiration date of September 1996.

McMinn County staff demonstrated the capability and resources necessary to implement appropriate protective actions for the special populations. The special needs list has not been recently updated. It contained approximately 26 people who need assistance of some kind during evacuation.

The McMinn County staff demonstrated the capability to maintain staffing on a continuous, 24-hour basis through an actual shift change. This shift change took place successfully with both directors demonstrating excellent knowledge of emergency response roles and functions. The outgoing director thoroughly briefed all staff and the incoming director without interruption in EOC operations.

During the ingestion phase of the exercise, McMinn County staffed their EOC with the director, deputy director, radiological defense officer, communications officer, PIO, security, controller, and State liaison officer. The staff participated in the ingestion phase by responding to inquiries from the State and plotting the ingestion plume. Also, the PIO issued a press release to the JIC concerning the McMinn County farmers' being able to return to their farms. The staff also listened to several briefings held over closed circuit television.

There were no participants from the Department of Agriculture at the county EOC; the director stated he is going to add an agriculture position to the EOC staff and have that person participate in future exercises since McMinn County is a farming area.

Superior Items:

1. Excellent leadership demonstrated by both directors.

2. The working relationship between the McMinn County EOC staff.

3. The EOC.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Add an agriculture position to the EOC staffing plan.

2. The special needs list should be updated using the "needs cards" already on hand.

Other Activities

Traffic Control Points - The ability to fully alert, mobilize, and activate personnel for TCPs, travel assist teams (TAT), and shelter information points (SIP) was adequately demonstrated by the Athens/McMinn EOC.

Mobilization of the traffic teams was accomplished efficiently and promptly. All teams were in place within 15 minutes of being dispatched by telephone and pagers. Current and accurate telephone rosters were used in making the alert and mobilization calls.

Pre-positioning was in accordance with the pre-exercise agreement. All essential emergency operations were performed by personnel at each of the required locations in accordance with plans and procedures and the extent-of-play agreement.

The following personnel and resources were mobilized to demonstrate the TCP, TAT, and SIP activities:

TCP - Eight fire department personnel from the Idlewild and Clearwater Fire Departments, with two pieces of fire apparatus, and two police officers with patrol vehicles;

TAT - Two highway department personnel, with one truck and equipment, to assist motorists;

SIP - Two Athens police officers with one patrol vehicle and three members of the McMinn rescue squad with one rescue vehicle.

The ability to communicate with all appropriate emergency personnel at TCPs, TATs, and SIPs was adequately demonstrated.

Communications equipment, systems, and procedures for communications between personnel involved in field activities and the Athens/McMinn EOC were excellent. The communications resources utilized for these activities included: mobile radios mounted in all vehicles; hand-held portable radios; and pagers for police and fire personnel.

The radio repeater system carrying the emergency channel 145.31 megahertz (MHz), is mounted on Star Mountain, approximately 15 miles east of Etowah, giving the hand-held portables a radius of approximately 75 miles. This repeater has a battery backup that will last 48 hours. The backup repeater, on channel 145.15 MHz, is mounted on Nopone Knob in Meigs County, (approximately 30 miles north-west of Athens). Several significant events were communicated to the traffic teams by the EOC during the demonstration of their functions, and the teams each communicated with the EOC using the radios.

The capability to continuously monitor and control radiation exposure to emergency workers was adequately demonstrated by the TCP, TAT, and SIP teams. The Athens/McMinn radiological officer conducted a thorough radiological briefing of the traffic teams and issued each team member all appropriate dosimetry and KI. TLDs were issued to each emergency worker. Each worker was also issued one direct-reading dosimeter with a range of 0-20 R, a record card, and instructions. A record was made of the serial numbers of dosimeters assigned to each emergency worker. Dosimeters were zeroed, and the initial readings for each dosimeter were recorded on a standard record chart, which was provided for each emergency worker.

The traffic team members were knowledgeable about dosimetry and the control of emergency worker exposure. Emergency workers who demonstrated this objective at this location included the TCP, TAT, and the SIP teams. Dosimeters were read at 15-minute intervals by those within the EPZ, and readings were recorded on individual record charts. Those outside the EPZ read their dosimeters and recorded readings at 30-minute intervals. All instruments had been inspected for electrical leakage in May 1993. This was in compliance with the plan. Each emergency team had access to a dosimeter charger and the charger had been checked for proper operation on October 5, 1993. Emergency workers were briefed regarding the potential need to take KI for thyroid blocking and on the maximum authorized exposure limit.

TCP, TAT, and SIP team members were knowledgeable of plans and procedures related to their assigned functions, protective actions, placement of traffic barriers, the location of reception centers, and the emergency worker decontamination center.

Adequate equipment was available for the establishment of TCPs. The TAT had resources available to assist motorists, e.g., gasoline, diesel fuel, water, and jumper cables. The SIP team was equipped to provide evacuees with maps and directions to the appropriate reception centers or to the emergency worker decontamination center.

TCP personnel did not respond to traffic impediments but were aware of whom to contact to request resources for handling traffic impediments.

All activities described in the demonstration criteria for this objective were carried out in accordance with the plan and procedures.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. It is recommended that the TCP on Tennessee Highway 30 at the McMinn/Meigs County line be moved to another point on Highway 30 approximately 2.7 miles east of its present location. This will place the TCP outside the EPZ and near the Idlewild Fire Department.

Emergency Worker Monitoring/Decontamination - The monitoring and decontamination of emergency workers and vehicles was properly demonstrated at the Athens Fire Department Station #2 near Highway 11 in Athens. Appropriate equipment, supplies, logistics, and procedures were demonstrated by the trained personnel from the State Division of Forestry and the McMinn County Fire and Rescue Department.

The facility was activated by the county EOC at the General Emergency and was operational in less than an hour. The primary communication medium was radio with telephone backup. All communication was with the county EOC and was prompt and reliable. Adequate staff to sustain this operation was present. All staff were equipped with the proper dosimetry and had been trained regarding its use. All recordkeeping was done according to the approved plan and related procedures.

Both workers and vehicles were properly monitored for contamination using a CDV-700 6B with a GM probe. All instruments were recently calibrated and operated properly. All appropriate information was recorded on standard forms. The physical plant, while small, was adequate for this purpose and was superbly organized.

Superior Items:

1. Contamination control was outstanding and all personnel exhibited superior knowledge of their responsibilities.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

School Evacuation - The capability and resources necessary to evacuate the school children from the single McMinn County school, located within the 10-mile EPZ, was successfully demonstrated through interviews with the school principal, the County School Superintendent, and the county transportation representative. The E. K. Baker Elementary School, consisting of 350 students and 18 staff, would be evacuated to the McMinn County Central High School in Etowah using buses.

At the Alert stage of the emergency the principal was advised of the situation and the bus drivers were ordered by the county EOC to report to the school with their buses. The telephone was the primary method of communication between the school and the drivers, but both radio and telephone were used to communicate between the EOC and the school. While the buses were not equipped with radios, a sheriff's escort car did have radio communication with the county EOC. At the SAE the decision to evacuate the school was made at the county EOC and immediately relayed by radio to the school principal.

The principal, in turn, advised the teachers to organize the students, load them on prescribed buses, and travel with them to the host school. Students and parents had been previously notified regarding the location of the host school. EBS messages were used to notify the parents of the school evacuation, and were the parents allowed to pick up their children at the time of evacuation. All students were carefully accounted for using the attendance books. Standard procedures for evacuation were available at both the county EOC and the school, and all personnel were familiar with these procedures.

All drivers and the escort deputy were knowledgeable about the routes to travel. These emergency workers were also supplied with appropriate dosimetry and were trained regarding the use and purpose of this equipment. All dosimetry was properly inspected and calibrated. All recordkeeping was done according to the approved plan and related procedures. The procedures for school evacuation were clear and concise.

Superior Items:

1. All responsible personnel exhibited superior knowledge of their responsibilities.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Reception and Congregate Care - McMinn County demonstrated reception and congregate care capabilities at the Central High School in Etowah, Tennessee. Six students served as mock evacuees and were monitored and registered into the shelter. Decontamination procedures were discussed, and a walk-through was accomplished.

The school complex is large and is comprised of several circular (pod-type) buildings. The form and arrangement of the buildings would facilitate the separation of contaminated from non-contaminated individuals. It was apparent that much planning had been accomplished by the responsible organizations, and adequate space had been allotted for each activity.

Emergency workers at this location are considered to be Category 3 workers. They wore low-range, direct-reading dosimeters and had means for recording data. Sheriff's deputies had TLDs in addition to the dosimeters. Personnel were unsure of procedures, however, and were unfamiliar with reading intervals, and turnback values. They agreed that more training in this area would be beneficial.

Monitoring was done by McMinn County Health Department personnel utilizing CDV-700s with headsets, plastic-covered probes, and with the beta shield open. There were four monitors present, and monitoring took approximately a minute and a half to two minutes per evacuee. Forms were on hand for recording exposure data, and a procedure for hand stamps had been developed for insuring that evacuees entering the congregate care center had been monitored,

and if necessary, decontaminated. Since school was in session during this exercise, the extent-of-play was kept to a minimum. Adequate supplies, such as rolls of paper, plastic-lined garbage cans, soaps, clothing, rubber gloves, and paper suits, were on hand. It was evident that personnel had been adequately trained and were familiar with plans for accomplishing the monitoring process and the separation of contaminated individuals.

Following the monitoring process, evacuees would be directed to the registration area where McMinn County Department of Human Services personnel filled out standard shelter registration forms. American Red Cross (ARC) personnel were present and displayed shelter supplies such as cots, blankets, comfort kits, trash bags, and office supplies. A first aid station had been set up, and the nurse-in-charge had a good understanding of her role and responsibilities. Arrangements had been made to handle handicapped evacuees.

Enthusiasm of players was excellent. Players interviewed indicated that they felt the demonstration would have been more meaningful if they could have actually put up signs, roped off areas, and set up supplies. However, they understood that school was in session and that this placed restraints on the demonstration. Overall, this was a good exercise, and McMinn County demonstrated that it has the ability to protect the population.

Superior Items:

1. Participation of the various agencies.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Refresher training for monitoring personnel.

Meigs County

Emergency Operations Center

The Meigs County EOC is located within the 10-mile EPZ in the City of Decatur, which is approximately seven miles from the Watts Bar Nuclear Power Plant. Space in the EOC is limited; however, the furnishings, lighting, restrooms, and ventilation are adequate. Backup electrical power is provided by a generator capable of providing power for the entire EOC. Equipment necessary to support emergency operations included telephones, typewriters, two copiers, and two facsimile machines. The EOC also had television and commercial radios available to monitor EBS and news broadcasts.

Displays and maps were prominently posted in the EOC depicting the EPZ, weather and Ingestion Pathway information, evacuation routes, TCP locations, and population by sectors. ECL signs were utilized and changed at appropriate times.

A status board was available and updated promptly following receipt of significant information. Messages were efficiently handled and copies were distributed to appropriate participants. Access to the facility was effectively controlled by law enforcement personnel, and each person entering and leaving the EOC signed the security log.

The EOC had 16 commercial telephone lines, one dedicated telephone line, and two facsimile machines. Radio capability included the county police and fire networks, local government radio, local emergency management, and TEMA systems. Tone alert radios are located in all county schools. Some units are assigned to volunteer emergency workers and law enforcement personnel. Communications capability was adequately demonstrated to all appropriate locations and organizations.

At 8:15 a.m., the staff began to arrive at the Meigs County EOC, and the director declared the facility activated at 8:35 a.m. All county, city, and State representatives were active for the duration of the exercise and their professionalism and commitment were evident. Each of the organizations was provided a copy of the Watts Bar plan.

At 10:00 a.m., the EOC received notification of the Alert status via the SEOC ringdown line. All emergency workers were advised to report to their designated locations, in accordance with the plan, and to stand by. At 10:34 a.m., the four Meigs County schools were placed on alert, and the bus drivers were instructed to report to their duty stations.

At 11:00 a.m., actions were taken for schools to evacuate to appropriate paired schools in neighboring counties. In addition, action was taken to evacuate the Decatur Nursing Home. This was completed by 12:30 p.m.

A shift change for the director's position, in accordance with the extent-of-play agreement, was successfully demonstrated at 11:25 a.m.

At 12:54 p.m., the General Emergency status was received and at 1:10 p.m., Meigs County was informed that the decision had been made to evacuate all the population in the 10-mile EPZ, including the sectors in Meigs County. In addition to the general population, specific transportation arrangements were made for the 17 transportation dependent individuals.

Since the Meigs County EOC is within the 10-mile EPZ, a coordinated decision with the SEOC was made at 1:10 p.m. to shelter the Meigs County EOC staff in-place. KI was issued (simulated), and it was agreed that State Radiological Health personnel would deploy to the EOC site to monitor radiation levels.

The authorization to issue KI to emergency workers was received, and this information was relayed through numerous means to the appropriate workers. While all emergency workers were adequately notified of the availability of KI in accordance with the plan, plan improvements could improve the efficiency of this notification by reducing redundancies. Recommendations to the general public for the use of KI were broadcast over EBS.

The director effectively coordinated decision making with the SEOC and protective actions with Meigs County. Periodic briefings were held to keep the EOC staff fully informed. The Meigs County Executive was active in all aspects of emergency operations and provided excellent leadership.

For subsequent exercise play on Day 2, the Meigs County EOC was staffed with essential staff only. The 9:00 a.m. briefing was monitored, and the EOC staff began preliminary planning for public reentry. At 10:55 a.m., updated radiological information was received by facsimile. Although the information was color-coded originally, it was illegible in a black and white format; appropriate calls for additional information were made. At 11:25 a.m., a point of entry for dairy and cattle farmers was requested. This was provided at 11:50 a.m. Appropriate coordination with the SEOC and JIC continued through the play of Days 2, 3, and 4, with the authorized return of all evacuees.

Superior Items:

1. Teamwork, coordination, and enthusiasm at all levels.

2. Access control, displays, and message-handling.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. It is recommended that either WDOD or WIVK be monitored following a siren activation to assure familiarity with information broadcast to the public.

2. Consideration should be given to relocating the EOC outside the EPZ.

Other Activities

School Evacuation - Plans and procedures for the implementation of protective actions for schools were evaluated by interviews with school officials. The Meigs County superintendent of schools was interviewed at the county EOC and the principal of Meigs County High School was interviewed at the school. Both of these school officials are knowledgeable of established procedures for the protection of students and displayed a keen interest in this activity.

Meigs County High, Fairview Elementary, Ten Mile Elementary and Decatur Elementary Schools are the four Meigs County schools located within the 10-mile EPZ. Cedar Valley Headstart is a preschool that holds classes at Ten Mile Elementary School and is not county funded and has its own transportation. The preschool would receive emergency notification from the principal of Ten Mile Elementary School.

School evacuation was the protective action demonstrated and this occurred at SAE. School protection decisions are made by the county superintendent of schools based on information provided by the EOC. Buses are dispatched to affected schools at the Alert. The Sheriff's Department will dispatch at least one deputy to each school to provide security and traffic control. The deputies at the schools will escort the buses to the outer limits of the EPZ and arrange for the host county to provide escorts to the host schools. Once the buses are outside the EPZ, the initial escorting deputy will read his dosimeter and report the results to the Meigs County Radiological Officer. School buses in Meigs County are county owned and are under the control of the county school superintendent.

Students from the four evacuated Meigs County schools will be sheltered at host schools outside the 10-mile EPZ until they are picked up by parents, guardians, or other authorized persons. Each student household has been provided a letter explaining procedures for safeguarding school children in the event of an accident at Watts Bar. This letter provides adequate information to parents to assure them of their children's safety. Additional school information is contained in the utility calendar issued yearly to households around Watts Bar.

Pre-scripted EBS messages have been developed that also provide school protection information.

Superior Items:

1. Knowledge of plans and procedures for implementing protective actions for schools exhibited by the superintendent and the principal at Meigs County High School.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Traffic Control Points - Traffic control and evacuee assistance in Meigs County is a joint effort of the Sheriff's and Highway Departments and the Decatur Police Department, coordinated by the sheriff at the EOC. Since the exercise occurred during a normal duty day, many of the emergency workers were at their posts. Others were called in via pager, radio/scanner, and/or telephone; all were in place early in the SAE phase.

Each emergency worker came to the EOC to be issued individual packets with a TLD, TEMA 1 (0-20 R) dosimeter, KI, and an instruction/record card. Functional groups received kits with a charger, CDV-700 and 715 detectors, headset and batteries, and TLDs and dosimeters. Inventory records indicate more than adequate quantities.

Immediately after declaration of General Emergency, teams were dispatched to demonstrate four of the county's eight manned TCPs: TCP 28 by the Sheriff's Department; TCP 50 by Decatur Police; and TCPs 35 and 54 by fire/rescue, which also provided radiation monitors at each location. At TCP 35, the team also demonstrated a SIP and the highway department demonstrated a TAT. All vehicles had radios, allowing communications with the EOC, Emergency Medical Services (EMS), and law enforcement dispatchers.

All personnel had excellent knowledge of their duties and responsibilities, were highly motivated, and had been trained recently in radiation exposure control. Authorization for these missions was 5 R, when each emergency worker would contact the EOC or supervisor. If necessary, emergency workers could incur 75 R on life-saving missions. Approximately 30 emergency workers have received radiological training and 12 are trained as monitors.

SIP teams would have maps and evacuation route information to assist evacuees. Published instructions appropriate for TCP 54 conflict with signs posted at this point and directions from TCP 28 do not include the more expeditious routing.

Two TATs would patrol the main evacuation routes to provide assistance with fuel, oil, water, emergency starts, and towing, as appropriate. A third team would be at the highway department in Decatur for dispatch, if required. The highway department would also provide barricades for the 25 unmanned roadblocks throughout the county.

All activities were in accord with the county plan and procedures. Meigs County fully demonstrated the capability of providing traffic control and assistance to the populace during an evacuation.

Superior Items:

1. Knowledge, motivation, and training of emergency workers.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Review evacuation routing instructions to ensure that the most expeditious routes are identified.

2. Consider placement of radiological equipment at functional agencies for direct issue to emergency workers.

Rhea County

Emergency Operations Center

Although relatively small, the Rhea County EOC had adequate space and was well-equipped. Communications capability was excellent in all respects, including redundancy. The EOC is located approximately 1/2 mile inside the 10-mile EPZ. The county director would relocate his operations to the county courthouse in Dayton, Tennessee, if necessary. The courthouse is adequately served by commercial telephone, and hand-held radio equipment is available to provide an immediate communications capability. Almost all EOC furnishings are of the fold-up type and are easily transportable. No diminution of direction and control capability would be experienced in a relocation of the EOC.

Mobilization of personnel was efficiently accomplished by telephone using current rosters and directories. As agreed, 24-hour staffing capability was demonstrated by a change in EOC directors.

Direction and control functions were adequately demonstrated; however, there were no routine situation briefings and no requirement for participating response agencies to periodically brief the county director and other agencies' representatives. Implementation of protective actions, including those for special needs populations, was carried out thoroughly.

KI was provided to emergency workers as part of their protective equipment kit. Instruction cards were included. KI for the general populace was stored at shelters in host areas. At one time KI was distributed upon request to the public; however, it is estimated that no more than 5 percent of the public has KI in hand. County officials were aware of KI stock quantities and locations.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Develop written procedures for effecting the relocation of the EOC to the Rhea County Courthouse in Dayton.

2. Provide for routine situation briefings by the county director and response agency briefings as part of the EOC operational procedure.

Other Activities

School Evacuation - The capability and resources necessary to implement protective actions for school children within the 10-mile EPZ was demonstrated by interviews with the Rhea County School Superintendent at the EOC and the principals of Rhea County High School and the Spring City Elementary School at each respective school. The EOC and each school had written emergency plans and procedures. All officials interviewed were knowledgeable of the evacuation procedures.

The superintendent received initial notification at the Alert classification. He arrived at the EOC within 20 minutes of receiving the calls and immediately notified each of the affected schools to be on standby and notified the supervisor of school transportation to call all bus drivers and have them report to their respective schools. In accord with the local plan, the two schools in the 10-mile EPZ (Rhea County High and Spring City Elementary) were notified by telephone to evacuate at SAE. Evacuation (simulated) was accomplished with the use of 18 school buses at Spring City Elementary and 12 buses at Rhea County High School. The buses would be routed to the host school, Cumberland County High School, for Spring City Elementary, and Soddy Daisy High School for Rhea County High School, by convoy with law enforcement officers in the lead and follow cars to provide dosimetry and communications capability for the convoy. Students at Rhea County High School must register their cars at the beginning of the school year, giving the school a record of student drivers. Procedures at this school dictate that students do not leave the parking lot until all buses have left.

The following procedure would be followed in an evacuation: The student cars would follow the buses to the host school. Parents would be informed where to pick up their children by the brochure sent to all residents in the 10-mile EPZ, through information in the student handbook, and by EBS messages. The county plan provides for school buses to be used as transportation for the general public. If school buses are needed the bus drivers would be classified as emergency workers and would require training in the use of dosimetry.

Superior Items:

1. Knowledge and cooperation of school officials.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement:

1. Analyze public transportation needs to ascertain the need for school buses. If they are needed, train the bus drivers, and equip them with the required dosimetry.

Emergency Worker Monitoring/Decontamination - Appropriate equipment, supplies, procedures, and facilities were demonstrated in the monitoring and decontamination of emergency workers and vehicles at the Dayton Elementary School. The Rhea County Health Department was responsible for overall coordination of this activity. The Division of Forestry performed monitoring and decontamination of vehicles, and the Dayton Volunteer Fire and Rescue conducted monitoring of personnel. The parking area for monitoring and decontamination of vehicles was very large, allowing adequate space for separation of clean and contaminated vehicles. An appropriate traffic flow pattern was established for monitoring and decontamination and proper techniques were demonstrated in the monitoring and decontamination of the vehicle.

The gym area of the school provided adequate space for monitoring and decontamination of emergency workers. Separate showers for males and females were available. An appropriate flow pattern was established (simulated) from the initial monitoring station, where monitoring technique was adequately demonstrated by the Dayton Fire and Rescue personnel, to the shower area where bags and containers were available for contaminated clothing and valuables.

The second monitoring station was situated outside the shower to monitor personnel after the decontamination process. If clean, personnel would be provided clean clothes and directed to the gym area. If still contaminated, personnel would be sent through the shower again. If unable to decontaminate, personnel would be directed to a medical facility. All staff members were knowledgeable in their assignment as well as in the use of dosimetry and KI. Each staff member was provided a dosimetry kit containing one TLD, one 0-20 R dosimeter, KI, and instructions in the use of both. They were knowledgeable of their exposure limits and recordkeeping requirements.

RACES was the primary method of communications; also available were fire and police radio, telephones, and Division of Forestry radio. All activities demonstrated were in accord with the local plan and procedures.

Superior Items:

1. Knowledge and cooperation of the staff.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Traffic Control Points - Two staffed TCPs and a SIP at which a TAT truck was demonstrated were established along U. S. 27 in Rhea County. The TCPs were inside the 10-mile EPZ, and the SIP was outside.

In the more heavily populated portion of Rhea County lying within the EPZ, the county staffs the road blocks which prevent northbound access to U. S. 27. In the less populated (more northerly) portion of the county, access is controlled by means of sawhorse barricades only. Two of the three TCPs that would actually be staffed were demonstrated during the exercise. The first of these, TCP 17 at the intersection of U. S. 27 and Smyrna Lane near Evensville, was staffed by three members of the Spring City Fire Department and a Sheriff's Department deputy. The fire and rescue personnel would direct traffic while the deputy provided security and additional communication capabilities, as needed. All westbound traffic was to be directed south onto U. S. 27 and eastbound traffic prohibited.

The same staffing arrangement (but in this case with two fire and rescue personnel from the Evensville Fire Department) was found at TCP 20, at the intersection of Whites Flat Road and U. S. 27 in Evensville. Again, eastbound traffic was to be prohibited and west bound traffic turned South onto U. S. 27.

The SIP at the intersection of business route U. S. 27 and Tennessee Highway 30 in Dayton, outside the 10-mile EPZ, served three purposes. It directed westbound traffic on Highway 30 onto southbound 27, provided information on shelter location in Hamilton County, and served as a staging point for a county Highway Department TAT vehicle. Three Dayton fire and rescue personnel, a sheriff's patrolman, and a county highway department employee staffed this location. The TAT vehicle was equipped according to the county plan and standard operating procedures (SOP). All personnel interviewed had a thorough knowledge of their responsibilities and procedures.

Procedure manuals were available at all locations. 0-20 R direct-reading dosimeters, TLDs, dose record cards, and dosimeter chargers had been issued to all teams, and all staff had received instruction in their use, including turnback values. All activities were conducted in accordance with the Rhea County plan and the respective response agency SOPs.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Cumberland County

Reception and Congregate Care

Cumberland County is a host county for the Watts Bar Nuclear Plant. The county EOC is located in the law enforcement center in Crossville, which is 27 air miles from the plant. The mission of Cumberland County is to receive school evacuees as well as the general population from Sectors A-4 and A-7 in Rhea County.

Upon Alert notification, the director, utilizing a current call-down list, notified the Cumberland County High School, ARC, county health department, and law enforcement to standby for possible activation of the reception center and congregate care center.

The primary communication system for the EOC is commercial telephone with backup cellular telephone, a county radio system, and RACES. All systems were demonstrated without delay or malfunctions.

Cumberland County emergency workers were issued kits which included, one CDV-700 survey meter, one CDV-742, 0-20 R direct-reading dosimeter, TLD, KI, dosimeter charger, gloves, and plastic-covering for the CDV-700 probe. The emergency workers are required to read their direct-reading dosimeters at least every 30 minutes. Should the readings exceed allowable limits, the emergency workers knew they were to contact the radiological defense officer. If the dosimeter should read 5 R they are to be replaced by another individual. They would then be monitored and decontaminated, if necessary, before being reassigned. The CDV-700 was inspected in April 1993.

At SAE, the director instructed that the reception center and congregate center be opened and staffed in preparation to receive evacuees. The expected evacuees would be 1,004 school children from Rhea County. These students would be bused to the Cumberland County High School and assigned to classrooms with a teacher for each group to await pickup by parents or guardians. The students are to be relocated before any release, and monitoring would not normally be required. However, if necessary, the EOC has 14 trained monitors for this purpose, and the students could be monitored and decontaminated at the high school gym.

Monitoring and decontamination of the individuals is done by the health department along with the Crossville Fire Department at the high school gym. Sufficient showers and supplies for male and female evacuees were available and adequate.

The evacuees were directed into the shelter, which was managed by the ARC. Upon entering the congregate care center, the evacuees were registered and briefed on accommodations of the facility. Sheriff's Department deputies provided directions outside the shelter and security inside. About 1,000 evacuees were expected from Sectors A-4 and A-7 in Rhea County. Monitors required an average of 2.5 minutes each to monitor six simulated evacuees.

RACES provided backup communications for the center. The ARC has a commitment from Cellular One to furnish additional telephones should they be needed at the shelter.

Should there be an overflow of evacuees at the high school, the ARC is prepared to open and staff an additional shelter at the Martin Middle School, which is located across the highway from the Cumberland County High School, with a shelter capacity of 933.

Superior Items:

1. The coordination and cooperation between agencies.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Roane County

Congregate Care

The Roane County congregate care facility, colocated with the reception, monitoring, and decontamination facility in the Roane County High School in Kingston, adequately demonstrated, through interview, the ability to mobilize personnel, communicate with all appropriate locations, and provide adequate resources to support congregate care operations. Mobilization of emergency personnel begins at the SAE when the facility opens to accept evacuated students from a paired sister school in Meigs County. The facility also accepts evacuees from designated sectors in Meigs County.

The shelter is managed by the ARC, supported by personnel from all responding agencies. The facility, which expects to shelter approximately 650 persons, can accommodate up to 1,000 persons and utilizes the open areas in and around the high school gym. Food distribution centers and the cafeteria are located in this area. Board of Education personnel will provide initial building and food services support until relieved by volunteers from the ARC and Department of Human Services. Restroom facilities, supplies, and sleeping needs either are stored at the high school or are readily available. A nurse provides medical and first aid assistance. Various areas of the high schools can be utilized for special needs persons such as the sick, children, or elderly. Counselors, social workers, child care personnel, and general assistance staff are available to meet evacuees' needs. Personnel and supplies are available for registering and tracking evacuees entering the facility.

Adequate communications systems are available. RACES provides the primary link to other facilities and field support locations within a 150 mile radius. In addition, responding emergency agencies supply their own communication devices.

Cellular telephones also are available for general use. The facility is in the process of installing a public telephone for use by evacuees.

Superior Items:

1. Support by volunteers.

2. ARC and human services personnel.

Deficiencies: None

Areas Requiring Corrective Action: None

Areas Recommended for Improvement: None

Reception Center

The reception center, colocated with the congregate care facility in the Roane County High School, adequately demonstrated, through interview, the ability to mobilize personnel, communicate with all appropriate locations, and control radiation exposure to emergency workers. This facility, through procedures, equipment, and personnel, demonstrated radiological monitoring, decontamination, and registration of evacuees.

All radiation monitoring personnel were equipped with a TLD and both a 0-20 R and 0-500 mR direct-reading dosimeter which had been inspected for electrical leakage within the last 6 months. A record was made of assigned instruments. All personnel had access to a properly operating dosimeter charger and were knowledgeable of forms and procedures.

The Roane County Health Department is responsible for supervising the monitoring, decontamination, and registration of evacuees. Adequate space was available to perform all required functions. Traffic flow patterns have been established to separate contaminated and non-contaminated persons. After monitoring, "clean" individuals are directed to the congregate care facility colocated in the high school. Contaminated persons are moved along protected walkways to decontamination areas located in the women's and men's locker rooms. Ample supplies, monitors, and equipment are available for controlled decontamination and re-monitoring in each area. Health department staff are available to initiate all required documentation including recording name, location of contamination, and final decontamination result for individuals. Separate exits exist in both locker rooms to allow "clean" persons to progress to the congregate care facility.

Seven monitors were initially present for the exercise; however, some monitors were called to attend to real world situations. Four CDV-700 and two CDV-715 survey meters with accompanying earphones were available. These instruments were checked against a supply source for proper operation. Potentially contaminated individuals were monitored at an average rate of one person every 2 1/2 minutes. Procedures were in place to transport individuals with fixed contamination to the Baptist Hospital in Roane County. Monitors were well trained and

procedures for monitoring evacuees were accomplished in accordance with the Roane County Health Department's SOPs. However, these SOPs differed from requirements found in the Roane County Implementing Procedures (RCIP), MJRERP Volume 2, and the health department procedures outlined in the MJRERP Volume 1, Annex E. Further, the RCIP indicate (page FF-57) that this facility, in addition to monitoring evacuees, will also monitor vehicles and provide an isolated secured area until vehicles can be decontaminated.

Survey instruments for vehicle monitoring were available. However, the Roane County SOPs indicate that vehicles arriving at mass care shelters will not be monitored or decontaminated. Therefore, no Roane County procedures have been developed to perform either monitoring or decontamination of vehicles at this or any other reception center in the county. Also, no plan reference could be located tasking an agency with the decontamination of vehicles belonging to the general public evacuees. (J.12.)

Deficiencies: None

Areas Requiring Corrective Action:

1. J.12. - SOPs should be rewritten and personnel trained in new procedures.

Areas Recommended for Improvement: None

III. SUMMARY LISTING OF INADEQUACIES

Facility or Activity	NUREG Criterion	Corrective Action	Scheduled Date of Completion
		Deficiencies	
SEOC	E.6.	The SEOC failed to complete the initial alert and notification sequence within 15 minutes.	11/15/93
		Areas Requiring Corrective Action	
Radiological Laboratory	I.8.	Develop a procedure to assist staff in the proper method of maintaining contamination control.	
Radiological Field Monitoring Teams	H.10.	The calibration factor for Sodium Iodide needs to be revised to reflect the proper units (μCi/cc) to calculate the correct I^{131} concentration from field sampling and measurement so as to be able to measure $1x10^{-7}$ μCi/cc in the field.	
Roane County	J.12.	SOPs should be rewritten and personnel trained in new procedures.	

IV. SUMMARY LISTING OF AREAS RECOMMENDED FOR IMPROVEMENT

Facility or Activity	Areas Recommended for Improvement
SEOC	1. Develop a larger selection of pre-recorded EBS messages, to support all protective action combinations and contingencies.
	2. Availability of field team data for iodine releases should be improved. Very little emphasis was placed on defining the noble gas to iodine ratio even though the PADs were based on the iodine numbers.
	3. Plume location was not displayed for the SEOC staff on any status board.
FCC	1. A separate status board should be used to permanently post significant events and activities.
	2. Continue to refine message logging by including the time messages are received and briefly summarizing them.
	3. Congregate care, plume direction, monitoring points, and traffic control points (TCP) should be posted on maps or status boards.
	4. Key FCC personnel should request more information when PARs are incomplete or vague.
JIC	1. Spokespersons at media briefings should refer to map displays when discussing EPZ sectors and evacuation routes.
	2. Improve mastheads of news releases and messages so that the origin, number, date, and time of release are clear.

Facility or Activity	Areas Recommended for Improvement
Radiological Laboratory	1. Provide an additional instrument for use in monitoring arriving samples.
	2. Investigate the possibility of changing the computer software in order to produce a suitable result directly.
RMCC	1. Post the current ECL in the RMCC.
Radiological Field Monitoring Teams	1. Install a speaker near the hood of the van in order to hear the radio while outside the van.
	2. Update all required procedures in the field monitoring team manual, "Emergency Response Procedures for a Radiation Incident."
	3. Assemble air sampling equipment in advance of entering plume.
	4. Move quickly out of plume for sample counting and identification.
	5. Issue PSC officer a high-range dosimeter and include his exposure reading with all call-in reports.
Boat Ramps/ Public Access	1. Provide written procedures for implementing river clearance activities for both the Coast Guard and the Tennessee Wildlife Resources Agency, which are charged with this task.
	2. Conduct an actual river clearance during the next exercise.

Facility or Activity	Areas Recommended for Improvement
McMinn County	1. Add an agriculture position to the EOC staffing plan.
	2. The special needs list should be updated using the "needs cards" already on hand.
	3. It is recommended that the TCP on Tennessee Highway 30 at the McMinn/Meigs County line be moved to another point on Highway 30 approximately 2.7 miles east of its present location. This will place the TCP outside the EPZ and near the Idlewild Fire Department.
	4. Refresher training for monitoring personnel.
Meigs County	1. It is recommended that either WDOD or WIVK be monitored following a siren activation to assure familiarity with information broadcast to the public.
	2. Consideration should be given to relocating the EOC outside the EPZ.
	3. Review evacuation routing instructions to assure that the most expeditious routes are identified.
	4. Consider placement of radiological equipment at functional agencies for direct issue to emergency workers.
Rhea County	1. Develop written procedures for effecting the relocation of the EOC to the Rhea County Courthouse in Dayton.
	2. Provide for routine situation briefings by the county director and response agency briefings as part of the EOC operational procedure.
	3. Analyze public transportation needs to ascertain the need for school buses. If they are needed, train the bus drivers, and equip them with the required dosimetry.

V. APPENDICES

A. Federal Evaluator Assignments
Watts Bar Exercise

B. Status of Watts Bar Exercise Objectives

C. Watts Bar Exercise Objectives and
Extent-of-Play Agreement

D. Watts Bar Exercise Scenario

E. Letter dated October 19, 1993, from Glenn C. Woodard to Lacy E. Suiter concerning the Deficiency determined during the Watts Bar Exercise.

APPENDIX A

FEDERAL EVALUATOR ASSIGNMENTS
WATTS BAR EXERCISE

October 6-7, 1993

CHIEF EVALUATOR AND RAC CHAIRMAN
John Heard (FEMA)

CENTRAL EMERGENCY CONTROL CENTER (CECC)
Bob Trojanowski (NRC)

STATE EMERGENCY OPERATIONS CENTER (SEOC), Nashville

Conrad Burnside (FEMA)	
Larry Robertson (FEMA)	
Ron Graham (USDA)	EOC/Ingestion Pathway
Mark Robinson (DOE)	Dose Assessment
Joe Keller (FEMA)	RAC Chairman's Advisor

RADIOLOGICAL LABORATORY
Joe Keller (FEMA)

FIELD COORDINATION CENTER (FCC), Alcoa
Robert Perdue (FEMA)

RADIOLOGICAL MONITORING COORDINATION CENTER (RMCC), Alcoa
Jon Richards (EPA)

JOINT INFORMATION CENTER, Chattanooga
Tom Hawkins (FEMA)
Dana Cessna (FEMA)

RADIOLOGICAL FIELD MONITORING TEAMS - Plume
Neil Gaeta (FEMA)
Carl Hunkler (FEMA)
Gerald Jacobson (FEMA)

RADIOLOGICAL FIELD MONITORING TEAMS - Ingestion
Neil Gaeta (FEMA)
Carl Hunkler (FEMA)
Gerald Jacobson (FEMA)

MCMINN COUNTY	
Al Lookabaugh (FEMA)	EOC
Kevin Flynn (FEMA)	School, Emer. Worker Decon.
Carl McCoy (FEMA)	TCP, SIP, TAT
Virginia Baker (FEMA)	Reception/Congregate Care
MEIGS COUNTY	
Mary Lynne Miller (FEMA)	EOC
Al Hall (FEMA)	School
Wayne Waddell (FEMA)	TCP, SIP, TAT
RHEA COUNTY	
Don Hammonds (FEMA)	EOC
Chris Saricks (FEMA)	TCP, SIP, TAT
Tom Carroll (FEMA)	School, Emer. Worker Decon.
CUMBERLAND COUNTY	
Josh Moore (FEMA)	Reception/Congregate Care
ROANE COUNTY	
Sandra Bailey (FEMA)	Reception/Congregate Care
MOBILE EVALUATORS	
Bernie Gunnels (DOT)	Public Access, River Warning
FEDERAL OBSERVER	
Paul Wagner (EPA)	

APPENDIX B Status of Watts Bar Exercise Objectives

OBJECTIVE	STATE EM	RAD HEALTH	McMinn	Meigs	Rhea	Cumberland	Roane
1. Mobilization of emergency personnel	1993	1993	1993	1993	1993		
2. Adequacy of facilities and displays	1993	1993	1993	1993	1993		
3. Direction and control of emergency	1993	1993	1993	1993	1993		
4. Communicate with all appropriate locations	1993	1993	1993	1993	1993	1993	1993
5. Control emergency worker exposure		1993	1993	1993	1993	1993	1993
6. Demonstrate equipment and procedures to measure radiation in the field		1993					
7. Dose projection		1993					
8. Measurement of radio-iodine and particulates		1993 ARCA					
9. Plume protective action decision making	1993	1993					
10. Alert and notification	1993 Def.[1]						
11. Public instructions and emergency information	1993						
12. Emergency information - media	1993						
13. Emergency information - rumor control	1993						
14. Use of KI		1993					
15. Implementation of protective actions - special populations			1993	1993	1993		
16. Protective actions for schools			1993	1993	1993		
17. Traffic and access control			1993	1993	1993		

[1] The correction of the Deficiency was demonstrated during November 15, 1993 remedial drill.

OBJECTIVE	STATE EM	RAD HEALTH	McMinn	Meigs	Rhea	Cumberland	Roane
18. Reception center - monitoring, decontamination and registration			1993			1993	1993 ARCA
19. Congregate care			1993			1993	1993
20. Medical services - transportation							
21. Medical services - facilities							
22. Emergency worker decontamination			1993		1993		
23. Other assistance							
24. Post-emergency sampling		1993					
25. Laboratory operations		1993 ARCA					
26. Project dosage via ingestion pathway		1993					
27. Implementation of ingestion protective actions	1993	1993					
28. Relocation, re-entry, and return - decision making	1993	1993					
29. Relocation, re-entry, and return - implementation	1993		1993	1993	1993		
30. Continuous, 24-hour staffing	1993	1993	1993	1993	1993		
31. Offsite support for the evacuation of onsite personnel							
32. Unannounced exercise or drill							
33. Off-hours exercise or drill							

TENNESSEE EMERGENCY MANAGEMENT AGENCY
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NASHVILLE, TENNESSEE 37204-1502
(615) 252-3300

August 18, 1993

Mr. John Heard
Federal Emergency Management Agency, Region IV
1371 Peachtree Street, NE, Suite 700
Atlanta, Georgia 30309

RE: State of Tennessee Goals and Objectives, WBN 93 Exercise

Dear Mr. Heard:

Enclosed herewith is a copy of the Goals and Objectives of the State of Tennessee that were submitted on July 8, 1993, and are to be demonstrated during the Watts Bar Nuclear Plant exercise to be held during the week of October 4, 1993. This will be a two-day exercise and will include activities in both the 10 Mile EPZ and the 50 Mile IPZ.

Included in the list of objectives is a revised extent-of-play covering most of the individual objectives. Since unforeseen circumstances can alter the best laid plans, this extent-of-play must be considered flexible and subject to changes by agreement between FEMA and TEMA prior to the exercise. Otherwise, all objectives identified for demonstration will conform to the requirements in FEMA REP-14.

If you have any comments, suggestions, or questions concerning these aims, please contact Matt McKnight or Jack Bixler in the Fixed Nuclear Planning Branch of TEMA.

Sincerely,

Lacy E. Suiter
Director.

Enclosure

1993 WATTS BAR NUCLEAR PLANT EXERCISE

STATE OF TENNESSEE GOALS AND OBJECTIVES

A full participation exercise will be conducted during the week of October 4, 1993 for the purpose of demonstrating an integrated radiological emergency response capability for the Watts Bar Nuclear Plant. In addition to demonstrating the State and local emergency response capabilities in the 10 mile plume exposure pathway, this exercise will also include a demonstration of the protective measures that would occur in the 50 mile ingestion pathway.

Both the State of Tennessee and the Tennessee Valley Authority have prepared separate lists of 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 for the Watts Bar Nuclear Plant. 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 WBN REP and REP implementing procedures to guide and protect the general public through the issuance of protective action recommendations as appropriate.

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

3. To identify emergency response capabilities that are 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 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; however, the need to demonstrate these objectives is determined by scenario events.

Group C objectives, numbered 23 thru 33, need only to be demonstrated once every six years.

EXTENT-OF-PLAY (EOP):

In addition to the listed objectives, this document lists the extent-of-play to which each objective will be demonstrated.

1. MOBILIZATION OF EMERGENCY PERSONNEL

   Demonstrate the ability to fully alert and mobilize personnel for all emergency facilities and field operations.

   EOP: State staff will not be pre-positioned. However, staff will be in the vicinity of the FCC/RMCC in Alcoa and the JIC in Chattanooga. Local EOC staffs and response personnel will be notified and activated in accordance with their respective implementing procedures.

2. FACILITIES - EQUIPMENT, DISPLAYS, AND WORK ENVIRONMENT

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

   EOP: All EOCs (State and Risk County) will be activated and fully operational.

3. DIRECTION AND CONTROL

   Demonstrate the ability to direct and control emergency operations.

   EOP: Personnel involved in direction and control will be on duty throughout the exercise. However, due to limited involvement in ingestion pathway activities, the local EOCs will be only partially staffed on "Day Two."

4. COMMUNICATIONS

   Demonstrate the ability to communicate with all appropriate organizations and field personnel.

   EOP: Primary and backup communications systems will be demonstrated at all facilities.

5. EMERGENCY WORKER EXPOSURE CONTROL

   Demonstrate the ability to continuously monitor and control radiation exposure to emergency personnel.

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 containing at least one permanent-record dosimeter (TLD) and one direct-reading dosimeter with a range capable of measuring radiation exposure of at least 20 R and a minimum exposure of .5 R. Emergency workers have been trained in matters concerning exposure control techniques, limits of exposure, and turn-back values.

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 the laboratory. Three field teams (two at a minimum) will be in the field for plume exposure activities and another two teams will take part in ingestion pathway activities.

7. PLUME DOSE PROJECTION

Demonstrate the ability to project dosage to the public via the plume exposure pathway, based on plant status and field data.

EOP: These activities are carried out at the SEOC in Nashville by Division of Radiological Health dose assessment personnel who coordinate all decisions with the SEOC Director and TVA personnel at the CECC in Chattanooga. This activity 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} (0.0000001) microcurie 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 ability to make timely and appropriate protective action decisions.

EOP: See Objective 7.

10. ALERT AND NOTIFICATION

Demonstrate the ability to alert and notify the public within the 10 Mile EPZ and begin dissemination of instructional messages within 15 minutes of each decision by appropriate State or local officials.

EOP: The WBN PNS sirens are tested on the first Wednesday of each month. Since this exercise coincides with the regular test date, the sirens will be actually sounded at least once during the exercise activities on the first day. It is understood that all alert and notification sequences will be timed, but only the **INITIAL** sequence will be timed for evaluation whether or not a protective action is involved. If the System Status Monitor indicates the failure of one or more sirens, backup route alerting will be simulated. However, personnel at the local EOCs will demonstrate the method that would be employed in an actual emergency. The EBS will be activated simultaneously with the PNS and a special test message will be broadcast. As scenario events require, additional EBS messages will be developed and copies provided to appropriate agencies and to the evaluators.

11. PUBLIC INSTRUCTIONS AND EMERGENCY INFORMATION

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

EOP: After the initial activation of the EBS and broadcast of the special test message, subsequent broadcast of emergency instruction messages will be simulated. Taped messages that contain emergency instructions are available to the EBS Coordinator at the SEOC and include familiar landmarks that delineates the geographic areas in the 10 Mile EPZ that are covered by the protective action instructions.

12. EMERGENCY INFORMATION - MEDIA

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

EOP: The JIC will be fully staffed and operational for both days of the exercise.

13. EMERGENCY INFORMATION - RUMOR CONTROL

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

EOP: Rumor control is a joint function of 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 over the EBS simultaneously with activation of the JIC and periodically thereafter. In order to properly demonstrate this objective, at least six (6) calls per hour will be made to each rumor control staff member. This rate of calls will be continued until it is sufficiently demonstrated that the staff can recognize and squelch a harmful rumor.

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

Demonstrate the ability and resources to implement 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 will make all decisions concerning the administration of KI to emergency workers 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 to shelters will be simulated.

15. IMPLEMENTATION OF PROTECTIVE ACTIONS -- SPECIAL POPULATIONS

Demonstrate the ability 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 identify persons in need of special assistance and provide destination and mode of transportation for these individuals.

16. IMPLEMENTATION OF PROTECTIVE ACTIONS -- SCHOOLS

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

EOP: There are eight schools in the 10 Mile EPZ (McMinn 1, Meigs 4, and Rhea 3). School personnel will be available at the local EOCs in the three counties for consultation prior to an evaluator visiting one school in each county for discussions with the school principals concerning relocation procedures for the students.

17. TRAFFIC AND ACCESS CONTROL

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

EOP: Traffic Control Points (TCP), Shelter Information Points (SIP), and Traffic Assist Teams (TAT) will be demonstrated according to the following schedule:

McMinn County, 1 TCP, 1 SIP, and 1 TAT
Meigs County, 3 TCPs, 1 SIP, and 1 TAT
Rhea County, 2 TCPs, 1 SIP, and 1 TAT

18. RECEPTION CENTER - MONITORING, DECONTAMINATION, AND REGISTRATION

Demonstrate the adequacy of procedures, facilities, equipment, and personnel for the radiological monitoring, decontamination, and registration of evacuees.

EOP: Registration, monitoring, decontamination, and congregate care will be demonstrated at three locations; one each in McMinn, Cumberland, and Roane Counties. Each shelter will be fully staffed with trained personnel. At least six (6) mock evacuees will be monitored at each shelter and a walk-through of decontamination procedures will be demonstrated for the evaluators. Schools will be in session during the exercise, and demonstrations of sheltering activities must be held to a minimum to lessen the disruption of regular school activities. However, all staff will be on hand for interrogation by the evaluators.

19. CONGREGATE CARE

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

EOP: See Objective 18.

20. MEDICAL SERVICES -- TRANSPORTATION

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

EOP: This objective will be demonstrated during a medical drill to be held at a time and place to be determined later.

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 decontamination of emergency workers, equipment, vehicles, and materials, and for the disposal of contaminated waste.

EOP: Due to the unavailability of an adequate facility located outside the 10 Mile EPZ in Meigs County, State and local emergency workers in Meigs County are required to go to McMinn County for decontamination when necessary. Therefore, only McMinn and Rhea counties will establish and demonstrate Emergency Worker/Vehicle Decontamination Points for State as well as county emergency workers.

23. SUPPLEMENTARY ASSISTANCE (FEDERAL/OTHER)

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

24. POST-EMERGENCY SAMPLING

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

EOP: Samples (water, soil, and crop/forage vegetation) will be collected and transported to a central collection point and readied for shipment to the laboratory in Nashville. Actual transport of the samples to Nashville will be simulated. However, the laboratory evaluator will observe the simulated arrival, handling, and analysis of pre-positioned samples.

Real-time demands of travel and time required for sampling, require that this activity be played out-of-sequence. The RMCC and DRH/TDA field teams will demonstrate this activity on the second day of the exercise while other EOCs are involved in scenario events.

DRH/TDA field teams will obtain and package soil, water and crop vegetation samples as they would in an actual emergency. Milk sampling will be demonstrated by visiting a specified dairy and simulate the taking of milk by explaining the procedure.

25. LABORATORY OPERATIONS

Demonstrate lab operations and procedures for measuring and analyzing samples.

EOP: See objective 24.

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: See Objective 7.

27. INGESTION EXPOSURE PATHWAY -- PROTECTIVE ACTION IMPLEMENTATION

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

EOP: See Objective 7.

28. RELOCATION, REENTRY, AND RETURN -- DECISION MAKING

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

EOP: Demonstration of this objective will be illustrated through group discussions.

29. RELOCATION, REENTRY, AND RETURN -- IMPLEMENTATION

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

EOP: When a decision is made to allow return to an evacuated area, the SEOC will notify the local EOCs and provide geographic descriptions of the area(s) cleared for return and of any areas still under exclusion orders.

30. CONTINUOUS, 24-HOUR STAFFING

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

EOP: Key staff members at the SEOC (SEOC Director, Emergency Information Director, DRH Director), the Directors of McMinn, Meigs, and Rhea county EOCs, and Field Monitoring Teams will demonstrate a shift change no later than the end of "Day One," the mid-point of the exercise.

31. OFFSITE SUPPORT FOR THE EVACUATION OF ONSITE PERSONNEL

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

EOP: If a call requesting assistance is received by a local EOC all response will be simulated.

TENNESSEE EMERGENCY MANAGEMENT AGENCY
EMERGENCY OPERATIONS CENTER
MILITARY DEPARTMENT OF TENNESSEE
3041 SIDCO DRIVE, P.O. BOX 41502
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August 10, 1993

Mr. John Heard
Federal Emergency Management Agency, Region IV
1371 Peachtree Street, NE
Suite 700
Atlanta, GA 30309

Re: Offsite Response Narrative -- WBN 93 Exercise

Dear Mr. Heard:

Enclosed herewith is our submittal of the Offsite Response Narrative (Scenario) for the 1993 Watts Bar Nuclear Plant exercise to be held on October 6-7, 1993. This exercise will take place over two days, beginning at approximately 0900 EDT each day, and will cover both the 10 Mile EPZ and the 50 Mile IPZ. Enclosed also is TVA's scenario and radiological data to be submitted to the scenario review contractor.

In order to limit the number of evaluators required for this exercise, the FNF staff is in the process of arranging outside activities to allow one evaluator to review several different activities over the two day period. This will require some activities to be played out of sequence, but we feel it will not detract from the demonstration of the exercise objectives. As soon as the schedule is finalized, we will forward copies to your office for approval and to allow you to assign evaluators accordingly.

If you have any questions concerning this submittal, please contact Matt McKnight or Jack Bixler in the FNF Planning Branch of TEMA.

Sincerely,

Lacy E. Suiter
Director

WATTS BAR NUCLEAR PLANT

1993 EXERCISE

OCTOBER 6 - 7, 1993

OFFSITE RESPONSE NARRATIVE

This exercise will extend over a two (2) day period. The events that occur in the postulated accident described in the plant scenario necessitate the activation of the Tennessee Multi-Jurisdictional Radiological Emergency Response Plan (MJRERP) for the Watts Bar Nuclear Plant. Beginning at approximately 0900 EDT on October 6, 1993, the State and local governments will demonstrate their ability to effectively protect the public within the 10 Mile EPZ from the affects of an accidental radiological release from the Watts Bar Nuclear Plant that exceeds EPA Protective Action Guides. During the course of the second day of the exercise (October 7), players will perform tasks and make protective action decisions that would most likely occur on subsequent days up to and including the fourth day following the onset of the accident and release to the environment. It will be determined on the first day of the exercise that radioactive deposition occurred beyond the 10 mile EPZ. Activities that would take place on days 2 and 3 will be simulated insofar as actual sampling is concerned. However, field monitoring data and sample (milk, soil, vegetation) analysis results that theoretically would have been obtained on "Day Two" and "Day Three", will be inserted into the play on the second day of the exercise. This will require the assessment team/decision makers to arrive at reentry and return decisions in the EPZ, and further, determine if any areas in the 50 mile IPZ are unsafe for habitation and/or where restrictions on the consumption of human foods or animal feeds should be initiated or relaxed if imposed previously.

Due to the severity of the postulated accident that drives the activities in this scenario, the time line indicated herein may vary from the actual initiation of events. This is brought about by the fact that the plant Emergency Action Levels (EALs) for declaring Emergency Classification Levels (ECLs) are judgment calls, and the Site Emergency Director (SED) may elect to declare or elevate an ECL at an earlier time than indicated. Controllers should study the insertion time of each control message, and be sure that the proper ECL is announced before introducing it into the play of the exercise.

****** EXERCISE -- DAY "ONE" ******

OCTOBER 6, 1993

EVENT DAY "ONE" -- 0900 EDT

NOTE: All times indicated herein are approximate and are based on Eastern Daylight Time.

INITIAL PLANT CONDITIONS:

UNIT 1:

The plant is operating at the end of cycle three at fifty-five percent power and slowly decreasing, and is in its one-hundred eighth day of continuous power generation at or near 100% power. The unit is at 120 Effective Full Power Days (EFPD) of a 450 EFPD cycle.

The plant is shutting down at 2% per minute to refill the Reactor Coolant Pump (RCP) oil reservoir. The RCP has been experiencing above average vibration that has been attributed to low oil in reservoir.

During startup 5-10 fuel pins out of the 50,952 fuel pins in the core were damaged in the first 11 days of the cycle (about 0.01-0.02%). TVA suspects that this damage was done by a loose part in the primary system left during the last refueling outage. The conclusion of a loose part is based on acoustic monitor information, but no additional damage has been indicated for the last 97 days.

Reactor Coolant Conditions are:

Boron concentrations of 850 parts per million

I-131 equivalent concentration at 2.3e2 uC/gm with a total activity of 2.89 uCi/gm.

Some tramp uranium is present as a residual from previously leaking fuel.

The following equipment is out of service for repairs:

None

UNIT 2:

Under construction

Refueling Water Storage Tank (RWST) is empty and unavailable due to sandblasting and repainting of the inside of the tank.

Primary Water Storage Tank (PWST) is empty and unavailable due to sandblasting and painting of the inside of the tank.

Condensate Storage Tank (CST) is empty and unavailable due to sandblasting and painting of the inside of the tank.

WEATHER:

A front is slipping southward through Tennessee this morning bringing light rain showers and cooler temperatures. Skies will be mostly cloudy today with a chance of lingering showers. A high temperature in the mid 80's is expected. Winds should be light to moderate from a northwest to northeast direction.

SPECIAL NOTICE:

Westinghouse plants have recently had an unusually large quantity of leaking fuel, including Watts Bar on the last start-up. Westinghouse Fuel Division is currently evaluating the possible causes and has asked TVA to carefully inspect the fuel at the next refueling outage to assist in this effort. TVA loaded seventy-two fuel bundles during the last refueling outage that are covered by this notice.

0900 to 0930 EDT

The exercise begins with the reactor power reduced. Around five minutes into the exercise (0905 EDT), there is a report of a Nuclear Security vehicle near the Condensate Demineralizer Building with fire coming from the engine compartment. Fire Operations responds and extinguishes the fire within about 10 minutes without incident. By fifteen minutes into the incident (0915 EDT), fire operations reports that there is no additional threat from the vehicle fire but the vehicle is substantially damaged. About twenty minutes into the event (0920 EDT) the unit reaches 20% power and, as planned, the Reactor Coolant Pump (RCP) that circulates through Steam Generator (SG) #2 is removed from service to allow filling of the oil reservoir. Immediately after the RCP is removed from service, the instrument that controls secondary side water flow to the same SG fails full closed resulting in low water level in SG #2. The flow transient in loop #2 also shakes loose the resting stray parts and causes loose part damage to one steam generator tube and the associated leakage from the primary system into the steam generator.

Due to the flow transient in the SG and/or the low water level in the SG, the reactor will trip around twenty-two minutes (0922 EDT) into the sequence. Shortly thereafter the leakage through the one damaged steam generator tube is greater than the capacity of the one Centrifugal Charging Pump (CCP) normally in service so a second pump is initiated. The starting of the second CCP constitutes an **ALERT**

based on Emergency Action Level (EAL) 1.2 item 2: *Non isolable Reactor Coolant System (RCS) leak greater than the capacity of one charging pump in the normal charging alignment*. Due to the continuing primary system leakage, pressure in the SG increases quickly to the point where the pressure relief valves on the SG open to protect the SG integrity.

Around a half-hour into the sequence (0930 EDT), Operators declare an **ALERT** and proceed to follow their Emergency Instructions to stabilize the reactor; isolate the steam line and the feedwater line for the leaking SG; and reduce reactor pressure to less than the pressure in the faulted SG. Simultaneously with the stabilization efforts by the control room personnel, the Shift Operations Supervisor (SOS) will notify the Operations Duty Specialist (ODS) at TVA's Central Emergency Control Center (CECC) of the declaration of the **ALERT**.

STATE RESPONSE:

The State's response will begin when the Tennessee Emergency Management Agency (TEMA) Operations Officer (OO) is notified by the ODS that an **ALERT** has been declared at the plant. After the call is verified by a return call to the ODS, the TEMA OO notifies the Director of TEMA, and, using the notification checklist as set out in TEMA Operations SOPs and the WBN MJRERP (Annex "B"), notifies (and places on standby) the appropriate State and local agencies and personnel for this Emergency Classification Level (ECL).

Upon receiving notification and arriving at the State Emergency Operations Center (SEOC), if not already there, the Director of TEMA may partially activate the SEOC and instruct the TEMA OO to notify certain personnel to report immediately. When this action is taken, the TEMA Director assumes the position of SEOC Director.

Other discretionary actions that the Director may take are:

1. Activation of the Prompt Notification System (PNS):

   The PNS is composed of three parts; 1) 98 fixed sirens, that are capable of emitting a warning signal of at least 60 db throughout the entire 10 Mile EPZ; 2) the Emergency Broadcast System (EBS); and, 3) the NOAA Weather Radio System.

   If the SEOC Director elects to activate the PNS at this time, this initial activation of the siren system will be simulated. However, the EBS and NOAA Weather Radio will be requested to activate the systems and place all stations on standby and instruct them to monitor the network for further information.

2. Limited activation of the State Field Coordination Center (FCC) and the Radiological Monitoring Control Center (RMCC), including Division of Radiological Health field monitoring teams. The State Joint Information Center (JIC) Director will closely monitor media interest, and if activation of the JIC is indicated, will coordinate with the TVA JIC Director in activation of the facility.

LOCAL RESPONSE:

The Directors of the McMinn, Meigs, and Rhea County Emergency Management Agencies are notified, and they in turn should notify their respective County Executives and Mayors of municipalities within the 10 mile EPZ. In addition, essential response staff and volunteers are notified and placed on standby. The County EOCs may be selectively manned at this time if the Directors so desire.

For the play of this exercise, it is assumed that schools are in session and students are present. Therefore, the McMinn, Meigs, and Rhea County EOC Directors will initiate their notification procedures (simulated) to the school bus drivers assigned to all schools in the 10 Mile EPZ. These drivers would be notified to report to their assigned schools and stand by for further instructions.

0930 to 1020 EDT -- under ALERT

STATE AND LOCAL RESPONSE ACTIVITIES:

Contact between the CECC and the SEOC is maintained, and the SEOC Director is continuously updated on the situation by the CECC. He consults with DRH and other essential staff at the SEOC to assess the situation and determine if actions taken, insofar as alerting and/or mobilization of personnel is concerned, are sufficient and if any protective actions for the public should be initiated. The fact that no significant release to the environment has occurred will probably preclude any further actions other than continuing to mobilize, or place on standby, essential response personnel to ensure that they will be on hand or readily available should plant conditions worsen.

The SEOC maintains contact with the Risk County EOCs and keeps the EM Directors apprised of conditions as they are reported to the SEOC. Like the SEOC, the local Directors continue to mobilize essential personnel and place others on standby status.

PLANT CONDITIONS:

Efforts to reduce pressure in the faulted SG are successful, and when the SG pressure is sufficiently low, the SG safety relief valve will close and the release of reactor coolant

to the environment through the SG will cease. These actions proceed normally except that the currently operating 1A-A CCP fails due to a 6.9 kV breaker failure at around fifty minutes into the incident (0950 EDT).

1020 to 1035 -- SITE AREA EMERGENCY

One hour and twenty minutes (1020 EDT) into the incident, a spring that holds the pressure safety relief valve closed breaks and the safety valve on the ruptured SG fails full open. The steam from the broken valve is released directly to the outside from the valve vault room. Some of the steam released from the valve vault room is drawn into the nearby Auxiliary Building (AB) ventilation intakes causing increased airborne radioactivity and dose rates in the AB. Within about fifteen minutes (1035 EDT) a **SITE AREA EMERGENCY** is declared based on the faulted steam generator releasing directly to the environment (EAL 1.2 item 3: *Steam generator tube rupture that results in a safety injection actuation;* and EAL 1.3 item 3: *Containment isolation is incomplete and a release path to the environment exists*). The Site Emergency Director (SED) will notify the CECC of the ECL upgrade.

Shortly after detection of the failed safety valve and declaration of the **SITE AREA EMERGENCY**, an Auxiliary Unit Operator (AUO) was dispatched to investigate the problem with the failed valve and try to close it. Upon starting up the ladder to the safety valve, the AUO slips and falls. The AUO is in full protective clothing and Self-Contained Breathing Apparatus (SCBA) and is unconscious in a contaminated area. The medical emergency response team will respond to the injury and perform rescue and on-scene medical support to the injured worker. The AUO is transported to a local hospital as quickly as possible for treatment of several injuries, none of which are thought to be life threatening.

STATE RESPONSE:

When SITE AREA EMERGENCY is declared, the CECC will notify the SEOC Director of the upgrade in the ECL. The SEOC Director will order the full activation of the SEOC, FCC, RMCC , and JIC if he has not previously done so. The TEMA OO, using the notification checklist for this ECL will notify all persons, agencies, departments and/or organizations that have a role in the response. Those persons assigned to the SEOC and other State field EOCs will report immediately to their assigned post. (In cases where an agency or department has numerous personnel involved in the response, contact will be made with a designated individual who will initiate a pyramiding system of phone calls to notify all personnel in their respective organizations and place on standby, or instruct them to report to their assigned duty stations.)

DRH and TVA field monitoring team members will be instructed to assemble at the RMCC for instructions. They will be dispatched from there to various locations as the situation requires. When in place, the field monitoring teams will provide offsite monitoring data to the RMCC. This data is provided by the RMCC to both the DRH assessment team at the SEOC and TVA's team at the CECC, and a joint assessment is made. TVA will make protective action recommendations for the public if in their opinion protective actions are justified. However, if no recommendations are forthcoming from TVA, and if after a close study of plant conditions by DRH and the Director of the SEOC, it is determined that a radiological release beyond the plant boundary may be imminent, a unilateral decision may be made to either order "sheltering-in-place" for residents of the "Near Plant Area" or to request that the Governor declare a "State of Emergency" and order the evacuation of the area which is comprised of Sectors A-1, B-1, C-1, and D-1.

After being notified of the SITE AREA EMERGENCY, and if a decision was made to recommend protective actions for the public, the Director of TEMA will notify the McMinn, Meigs, and Rhea County EOCs and coordinate the activation of the Prompt Notification System (PNS) sirens. Due to the fact that these exercise activities coincide with the date and approximate time for the monthly test of the siren system, the sirens will be <u>actually</u> sounded for this activation. The EBS and NOAA radio networks, having been placed on standby status at the ALERT stage, will be requested to broadcast a "Test Alert" message. <u>All</u> subsequent activations of the PNS (sirens, EBS, and NOAA) will be simulated. The Tennessee Department of Agriculture (TDA) assesses the probability of the need to protect dairy animals and milk processing plants and if deemed necessary will coordinate with the EBS Coordinator at the SEOC and personnel at the JIC in the release of "get ready" instructions to the agricultural community.

Simultaneously with activation of the PNS, the Tennessee Wildlife Resources Agency and the U.S. Coast Guard and volunteers will dispatch personnel in boats with loudspeakers to warn commercial and civilian river traffic, fishermen, and those persons in parks and recreation areas along the river who may not be familiar with the purpose of the sirens. The U.S. Corps of Engineers will be requested to close the Chickamauga and Fort Loudoun Dam locks; the Federal Aviation Administration will be requested to restrict air traffic over the EPZ; and Norfolk and Southern Railway will be instructed to stop all rail traffic approaching the area.

Communication is maintained between the SEOC and the CECC, and the SEOC and local EOCs. TVA provides continuous updates to the EOC and current information is provided to the local EOCs; briefings are conducted in the EOCs to keep

personnel apprised of the situation and give an opportunity for each department head to review the actions taken and determine if they are sufficient or if mobilization of emergency personnel should be accelerated to cope with a worsening situation. Mobilization of essential State personnel continues; State liaison personnel and PIOs report to their assigned local EOCs and the CECC; other State personnel who may become involved in field activities are instructed to report to their assignment, or remain on standby. As the JIC becomes operational, press conferences and news releases will be used as a means to keep the media and the general public informed of conditions at the plant and to provide other information concerning the safety of the citizens in the area.

LOCAL RESPONSE:

Upon receiving notification of the ECL upgrade to SITE AREA EMERGENCY, the McMinn, Meigs, and Rhea County EOC Directors fully activate the county EOCs. All day care centers in the EPZ are notified by telephone and schools in the EPZ are notified by tone-alert radio to immediately transport all students to the previously determined paired schools. The principals of those schools that are paired with endangered schools will be notified to prepare for the arrival of the students. Host county EM Directors (Cumberland, Hamilton, and Roane) will be notified by the SEOC and in turn will notify the principals of the paired schools in their counties to prepare for the incoming students. Upon arrival at the EOC, department heads position staff and equipment as required. The Sheriffs notify and coordinate all necessary support personnel and resources (municipal police, THP, fire, rescue squads, etc.). If an evacuation has been ordered, the Sheriffs will dispatch personnel to strategic points on controlled evacuation routes for traffic control and additional personnel will be dispatched to establish security around the affected area. Traffic Assist Teams (TATs) are notified and placed on standby. The ARC, local Human Services Department personnel, and radiological monitoring and decontamination teams are notified to be ready to open additional shelters on a moments notice.

Mobilization and positioning of response personnel continues at the State and local levels. Communication and information exchange is maintained between all organizations. Press briefings are held at the JIC and any emergency instructions to the public are broadcast over the EBS.

SHIFT CHANGE FOR KEY OFFICIALS:

In order to demonstrate the ability to maintain staffing of key officials on a 24-hour basis, the following officials will be replaced by a second shift:

SEOC: Director
Radiological Control Officer
Emergency Information Director

JIC: State JIC Director

McMinn County EOC: Director

Meigs County EOC: Director

Rhea County EOC: Director

The replacements for these personnel will report to the various facilities at approximately 1100 EDT and will be individually briefed by the person they are replacing prior to assuming the duties of the position. Those being replaced will be relieved of exercise duties until activities begin on the second day, at which time they will assume their original positions.

1035 to 1130 EDT -- under SAE

PLANT CONDITIONS:

Around two hours into the incident, an unrelated event occurs when the Unit 1 Condensate Storage Tank (CST) level suddenly drops to zero due to a failed level instrument. Fifteen minutes later (1115 EDT) operators receive a Seal Water Injection Filter Delta-P high alarm and an AUO should be dispatched to align the alternate filter. This is unrelated to the emergency events, the filter simply reached the end of its normal service life.

Two and one-half hours into the incident (1130 EDT), the TVA Fuels Division in Chattanooga receives an urgent message from Westinghouse that they have discovered that a supplier manufacturing defect has lead to an unknown extent of damage to the top nozzle assembly processes. The potential result is the total failure of the hold-down spring and resultant loose parts and damage to the removable top nozzle disconnect areas. Westinghouse indicates that much of the fuel added in the last outage may be affected (seventy-two potential bundles of the entire core of one-hundred ninety three bundles). Westinghouse is developing inspection methods and acceptance criteria and suggests that all Westinghouse plants carefully inspect the top nozzle assembly during the next refueling outage.

1140 EDT -- under SAE

Around two hours and forty minutes (1140 EDT) into the incident, the "A" train of the Emergency Gas Treatment System (EGTS) fails due to a seized fan shaft bearing. The loss of this train of the EGTS potentially affects the

ability to maintain a negative pressure in the annulus. The annulus completely surrounds the containment and separates it from the auxiliary building. The negative pressure in the annulus normally prevents any leakage from containment from reaching the auxiliary building.

1200 to 1300 EDT -- under SAE

Shortly after 1200 EDT, and again from 1215 to 1220 EDT, the loose parts again break loose from where they are resting and circulate through the primary system causing additional fuel damage. The loose parts also cause a large number of the fuel assembly top nozzles to come apart releasing more loose parts into the RCS, which in turn causes more fuel damage. The RCS acoustic monitor detects the noise of parts circulating through the system and alarms in the control room indicate the loose part activity.

Substantial core damage begins at this time as demonstrated by increases in the main steam line monitors and the containment monitors from the increased activity inside the piping. The fuel, now without the restraint of the top nozzles, are shearing off. About sixty of the seventy-six recently loaded fuel assemblies are damaged in this manner (thirty percent of the entire core). An AUO may be dispatched to verify the loose parts alarms by listening to the audible indicator. Loose parts are again detected at about three hours and twenty five minutes into the incident (1325 EDT) and confirmed by the AUO.

Four hours into the incident (1300 EDT), TVA environmental monitoring vans performing site boundary surveys identify an Iodine 131 concentration of 1.5E-6 uCi/cc at the Exclusion Area Boundary in a sample collected twenty minutes earlier and analyzed. The operators should declare a **GENERAL EMERGENCY** due to radiological releases (EAL 7.1 item 2: *Exclusion Area Boundary dose resulting from actual or imminent release of gaseous radioactivity that exceeds 1000 mr Total Body or 5000 mr child thyroid for the actual or projected duration of the release.*

STATE RESPONSE:

When the SEOC is notified by the CECC of the **GENERAL EMERGENCY** declaration, the information is immediately passed on to the risk counties. If the evacuation of the "Near Plant Area" (Sectors A-1, B-1, C-1, and D-1) did not occur at the SAE classification, TVA will most likely make that recommendation at this time and further recommend that residents in downwind sectors from the plant be sheltered in place. If, after consultation with TVA's Dose Assessment Team, DRH feels that the recommended protective actions are sufficient, DRH will advise the director of the SEOC and the recommended protective actions will be initiated. However, after considering the worsening plant conditions, especially

the substantial core damage, and the possibility of a major release, the State may exercise its option of taking more stringent action.

DRH and TVA study the need for further evacuation and/or sheltering in other areas of the EPZ and continue to assess field monitoring results and make appropriate recommendations. Plume tracking commences and field teams are dispatched to selected areas and report to the RMCC at 15 minute intervals. TDA continues to monitor the situation and issues instructions to the agricultural community as required.

The JIC continues to provide the media with information regarding conditions at the Plant, evacuation status, and other public information.

LOCAL RESPONSE:

The McMinn, Meigs, and Rhea County EM Directors proceed with implementing the evacuation plans for the affected sectors. All local responders are activated or remain on standby. The Sheriff dispatches personnel to man critical roadblocks, assist in an orderly evacuation along controlled routes, and provide security to the evacuated area. If additional personnel are required, the Sheriff will coordinate the request for, and assignment of the additional responders from other organizations (THP, municipal police, rescue squads, etc.). The McMinn, Meigs, and Rhea County Radiological Officers begin the distribution of monitoring kits to the shelters, manned roadblocks, and SIPs. They also notify designated personnel to set up predesignated Emergency Worker/Vehicle Decontamination Points at specified locations. Traffic Assist Teams (TATs) will be dispatched to predetermined locations along the evacuation routes to assist motorists where necessary. The County Road Departments, assisted by TDOT personnel and equipment, set up road barricades at predetermined locations in the affected area.

The American Red Cross (ARC) mans shelters as needed, and begins their evacuee locator service. The ARC staff is assisted by personnel of the Department of Human Services and other volunteer organizations. Shelter Information Points (SIPs) are established at predetermined points on the controlled evacuation routes to direct those evacuees needing assistance to the appropriate shelter. The EMS simulates transportation of non-ambulatory evacuees in need of transportation and responds to any accident or incident requiring transportation of injured victims.

Simultaneously with the extended evacuation, the local EM officials would dispatch additional personnel to insure a smooth traffic flow, request assistance from the State and other agencies where required, review the system of roadblocks and security measures previously established and

initiate actions to provide protection for the expanded area. Additional shelters would be opened as needed.

1300 -- 1500 EDT under GENERAL EMERGENCY

PLANT CONDITIONS:

Plant personnel continue efforts to terminate the release and repair the plant systems needed for long term reactor stability.

STATE AND LOCAL RESPONSE:

While attempts were being made at the Plant to repair the malfunctioning equipment and control the release, communications between the CECC and SEOC and between the SEOC and local EOCs were maintained, with information and updates being shared by all responsible authorities. The public and media were continuously given updates at the JIC. The SEOC continued to coordinate with local EOC officials in the provision of personnel and equipment support as required. State and TVA Field Monitoring Teams continued plume tracking, and the monitoring data received was plotted and assessed by TVA and DRH in an attempt to determine the actual location of the plume footprint and any "hot spots" in the affected area.

1500 EDT -- under GENERAL EMERGENCY

WEATHER CONDITIONS:

Field personnel identify an area of rain northeast of the plant around eight to twelve miles from the plant, but no sampling is conducted at that time due to the dose rates in the plume.

PLANT CONDITIONS:

Plant personnel will be successful in stopping the release either by gagging the broken safety valve or reducing reactor pressure to less than one-hundred psi which will result in insufficient pressure to push material out of the faulted SG. This will leave the containment intact and all key plant systems stable. Efforts will be made to achieve absolute isolation of the damaged pressure relief valve using remotely controlled robots to weld the piping closed.

STATE RESPONSE:

DRH and TVA field monitoring teams begin post-accident sampling and monitoring throughout the affected downwind sectors. Background radiation measurements are performed to determine areas where safe reentry is possible.

Monitoring data indicates that plume deposition occurred beyond the 10 mile EPZ and reached into some of the surrounding counties. All indications are that deposition has occurred over a wide area and the limited number of State and TVA monitoring teams indicate that assistance will be needed to properly assess the problem. If monitoring assistance has not been requested from FEMA at this time, DRH should initiate steps to request that the FRERP and FRMAC be activated, and request that DOE begin aerial monitoring activities as soon as possible.

TDA and DRH begin extensive sampling of dairy farms and milk processing plants in the affected area and continue to assess the need for protective actions for dairy cattle. Additionally, samples of vegetation, soil, water, and crops are taken for laboratory analysis.

STATE FIELD MONITORING TEAM REPLACEMENT:

In order to demonstrate the 24-hour capability of DRH field monitoring teams, the teams that have been involved in the exercise during the preceding period will be replaced by new teams. The teams being replaced will fully brief the replacing teams on what has transpired during their tour of duty, placing special emphasis on the extent of contamination and the affected areas. Following the briefing all teams will be dismissed until the beginning of activities on the second day of the exercise, at which time the second group of teams will assume monitoring responsibilities.

SUSPENSION OF DAY "ONE" ACTIVITIES:

Following several hours of recovery operations after cessation of the release, exercise activities are put on "hold" until 0900 EDT the following day. All workers are relieved of duty and essential communications and response functions are placed on standby until that time.

POST SUSPENSION ACTIVITIES:

In the afternoon and evening of "Day One", TVA and State environmental monitoring teams followed the plume northeastward from the site toward Oak Ridge and tracked the dispersal of the plume. By 1830 EDT the plume had reached Harriman and Kingston. Around 2000 EDT, the plume was entering Oak Ridge and around 2200 EDT was exiting the area. The plume was tracked to approximately 50 miles from the site where the maximum concentration was 1.1E-11 uCi/cc. The decision was made to terminate the plume tracking and begin to quantify the dose rates from contamination nearer the site. At around 2300 EDT, the vans began a general sweep of areas north to east of the plant working their way in from the 50 mile radius.

****** EXERCISE -- DAY "TWO" ******

OCTOBER 7, 1993

All State and local EOCs will be staffed by essential personnel. All roadblocks and security measures established at the beginning of the evacuation will be maintained or repositioned as necessary by local officials. The JIC will be operational to keep the public and media informed of any decisions to allow reentry or return and to disseminate any protective action instructions that should be initiated, maintained, or relaxed.

Field monitoring teams continue to track and define the "footprint" of the plume. Those areas that were not under the plume and were evacuated as a precautionary measure will be given first priority for return of evacuees. If no contamination is detected the residents will be permitted to return to their homes. Any area that is cleared for return will be described by specific geographic boundaries, and roadblocks will be relocated to prevent entry into those areas where entry is still prohibited. Notification to the public of the decision to allow reentry to care for property or livestock or permanent return into certain areas will be disseminated through the JIC, announced over the EBS, and the information given out at appropriate shelters.

Event Day "Two" will begin with a briefing to all locations, via closed circuit television, from a central location. The information provided will include data from field team monitoring results on Day "One" and maps indicating radiological deposition. Approximately 2 - 3 hours will be allowed for decision making at all locations except the RMCC.

Following this briefing, the RMCC and DRH/TDA field teams will begin out-of-sequence play. This is necessary because of the real-time demands of travel and sample taking to various locations during Ingestion Pathway field team play. Therefore, the RMCC will immediately receive the Event Day "Three" briefing and acquired data, followed by a Event Day "Four" briefing along with acquired data. The RMCC play will begin with decisions being made for the dispatch and dispersal of field teams.

The 2 - 3 hour decision making period for Event Day "Two" at the other EOCs will be followed by a break. When all agencies agree, a briefing for Event Day "Three" will be given to all centers except the RMCC along with distribution of data acquired on Day "Two" that includes maps of deposition and ambient monitoring and sampling locations, plus isotopic data now being received from the laboratories. Following this briefing, time will be allowed for the play of Day "Three" decision making. This should be about 2 - 3 hours

as before. In addition to other decisions, this "Event Day" will include consideration of assignments of field teams to various dairies and farms for sample taking on what would be Event Day "Four". The fact that the RMCC and field teams are involved in out-of-sequence play will preclude the necessity of sampling decisions at these locations being acted upon at the RMCC.

Actual play of Day "Four" will be limited to the RMCC and DRH/TDA field teams.

EVENT DAY "TWO" -- 0900 EDT:

PLANT CONDITIONS:

Reactor Operators continue to cool the damaged core without incident using the Residual Heat Removal System (RHRS). Currently, the reactor is at a temperature of 235 ^{o}F and a pressure of 200 psi and stable. TVA and Westinghouse core damage experts continue to work on quantifying the exact damage to the core and formulate a plan as to when and how to open the vessel and remove the damaged fuel. No further actions are planned for the next 30 days to allow for decay of the short-lived fission products and the associated reduction in dose rates. During this wait, TVA will be planning which task must be performed and how best to perform these necessary operations with the minimum radiation exposure to the employees.

Radioactive releases from the site are insignificant as all routine gaseous and liquid discharges have been suspended except for building ventilation and there was no major accumulation of radioiodines on the charcoal filters to be releasing their noble gas decay products. Radiation levels inside the Auxiliary Building are steadily decreasing as ventilation slowly dilutes the existing airborne radioactive material as well as the reduction due to settling of particulates. Arrangements have been made for robots to be used to provide permanent repairs to the steam generator safety relief valve.

Numerous onsite radiological surveys are being performed to properly identify and isolate contamination areas and areas with high radiation levels. The site continues to recover damaged or out-of-service equipment on systems that are not affected by the increased radioactive material in the Reactor Coolant or are critical to stable operations (such as redundant cooling capability). The site also began to provide permanent repairs to equipment that had been partially repaired during the exercise in order to have the system available.

1.	Centrifugal Charging Pump 1A-A	Replacing damaged motor control center

2.	Steam generator Safety valve	Fortifying the safety gag using a pipe over both the valve and the gag and welded to the valve piping, providing complete isolation.

STATE RESPONSE:

The data provided during the briefing will be studied and a determination made if any persons need to be relocated from contaminated areas, or if any evacuated persons can be allowed to return to their homes permanently. Decisions will also be made concerning areas where reentry will be allowed for persons to care for property and/or livestock.

EVENT DAY "THREE" -- 0900 EDT

PLANT CONDITIONS:

Reactor operators continue to cool the damaged core without incident using the RHRS. Currently the reactor is still at a temperature of 235 ^{o}F and a pressure of 200 psi and stable. Radioactive releases from the site continue to be insignificant as all routine gaseous and liquid discharges have been suspended except for building ventilation. Radiation levels inside the AB are still steadily decreasing as ventilation continues to dilute the existing airborne radioactive material as well as the reduction due to settling of particulates. Robots have been used to provide permanent repairs to the steam generator safety relief valve by welding a cap onto the end of the relief valve piping thereby guaranteeing no possible release via this valve.

Numerous additional onsite radiological surveys are being performed to properly identify and isolate contamination areas and areas with high radiation levels. Decontamination of the minimally contaminated areas has begun and should continue for the next 10 or 20 days. The site has recovered all the damaged or out-of-service equipment on systems that are critical to stable operations (such as redundant cooling capability).

1.	Centrifugal Charging Pump 1A-A	Repaired
2.	Steam Generator Safety Valve	Isolated

To further quantify the levels of offsite deposition, environmental monitoring field teams continued to monitor dose rates both at previously monitored locations and additional points added, based on the monitoring conducted on Day "Two. During Day "Two", all four teams collected dose rate readings at all assigned locations. Teams collected some soil and vegetation samples at points determined by the RMCC.

STATE RESPONSE:

The play will be similar to the play of Day "Two" in that continual study and assessments of acquired data will be made and decisions arrived at on reentry, return, or relocation of citizens in the area.

EVENT DAY "FOUR" -- 0900 EDT

Reactor operators continue to cool the damaged core without incident using the RHRS. Currently, the reactor is still at a temperature of 235 ^{o}F and pressure of 200 psi and stable. TVA and Westinghouse core damage experts continue to work on quantifying the exact damage to the core and formulate a plan as to when and how to open the vessel and remove the damaged core. No further actions are planned for the next 30 days to allow for decay of the short-lived fission products and the associated reduction in dose rates. During this wait, TVA will be planning which task must be performed and how best to perform these necessary operations with the minimum radiation exposure to the employees.

In order to demonstrate the effectiveness of the sample collection and transport system; the ability of the state laboratory to analyze samples and relay the results to the proper authorities; and the capability of the assessment teams and decision makers, environmental sample taking, transportation, and sample analysis will run concurrently on the second day of the exercise (Event Day "Four" in this scenario).

The sample collection procedures, transportation, and laboratory analysis will be conducted on a "real time" basis. Field teams will collect milk samples and deliver them to the sample staging area at the Tennessee National Guard Armory in the affected county. The samples will then be picked up by a courier and taken to the sample collection point at the RMCC where samples from different counties will be accumulated for equal distribution to available laboratories. Transportation of the samples to the state laboratory in Nashville will be simulated.

The capabilities of the testing/assessment/decision making process will be demonstrated during a compressed time situation running concurrently with the "real time" activitiesof the field teams and couriers, i.e., the controller at the laboratory will have pre-positioned samples and predetermined analysis results that will be given to laboratory personnel upon completion of the sample tests. This information will then be relayed by laboratory personnel to the assessment team at the SEOC at times specified by the controller. Thus, the decision makers will have sufficient information to arrive at the proper conclusion regarding PAGs for the public.

EXERCISE TERMINATION:

A definite time for termination of the exercise depends on several factors, not the least of which is the time required for movement of samples through the collection, transport, and analysis procedures. Therefore, the exercise will not be terminated until all required tasks that would lead to a PAG decision are completed and all exercise objectives are demonstrated.

Federal Emergency Management Agency
Region IV
1371 Peachtree Street, NE, Suite 700
Atlanta, GA 30309

R4-NT

October 19, 1993

Mr. Lacy E. Suiter, Director
Tennessee Emergency Management Agency
Emergency Operations Center
3041 Sidco Drive
Nashville, TN 37204-1502

Dear Mr. Suiter:

The evaluation of the October 6-7, 1993, Watts Bar Nuclear Plant exercise revealed a Deficiency regarding the public alert and notification process. The FEMA Radiological Emergency Preparedness Exercise Manual (FEMA-REP-14), September 1991, defines a Deficiency 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. It further states, under Objective 10, that failure by responsible off-site response organizations (OROs) to complete the initial alert and notification sequence within 15 minutes will result in the identification of a Deficiency.

The following Deficiency has been identified for the Tennessee, State Emergency Operations Center (SEOC) under Objective 10, FEMA-REP-14 (NUREG-0654/FEMA-REP-1, Rev. 1., reference is provided in parentheses at the conclusion of the description).

At 10:41 AM, the Tennessee Valley Authority notified the State of Tennessee that a Site Area Emergency (SAE) had been declared at the Watts Bar Nuclear Plant, indicating a worsening condition at the plant over its earlier Alert declaration made at 9:44 AM. The SAE notification included no protective action recommendations. At 10:47 AM, the decision to activate the State's Prompt Notification System for the 10-mile Emergency Planning Zone was made at the SEOC. This decision was based on the status at the plant. Activation of the sirens was initiated from the State Communications Center in Nashville at 10:55 AM and lasted four minutes. The Emergency Broadcast System (EBS) notification message prepared in support of the protective action decision concerning school relocations was released at 11:30 AM. The execution of the alert and notification process took 43 minutes. (E.6.)

As discussed at the October 8, 1993, Participants' Critique, the following schedule of remedial actions and dates was established:

All plan or procedural changes required to correct the noted Deficiency will be submitted to the FEMA IV Regional Office by November 5, 1993.

A remedial drill will be conducted on November 15, 1993, at the TEMA SEOC.

To begin the drill, the FEMA evaluators will randomly select a protective action from those described in the plan. The appropriate EBS message will be selected and modified, as needed, sirens will be activated (or simulated by a silent test), and the EBS message will be transmitted to the CPCS-1 radio station. The amount of time consumed between the decision to activate the system and the completion of the message transmission from the SEOC to the radio station should be within the required 15-minute time period. FEMA-REP-14 Demonstration Criterion 1 for Objective 10: Alert and Notification, pages D.10-1 through D.10-4, will apply to the conduct and evaluation of the remedial drill.

Should you have questions, please contact John Heard at 404/853-4468.

Sincerely,

Glenn C. Woodard, Chief
Natural and Technological
Hazards Division

pink

June 12, 1995

Tennessee Valley Authority
ATTN: Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: FEMA FINAL REPORT FOR THE OCTOBER 6-7, 1993, JOINT EXERCISE OF OFFSITE RADIOLOGICAL EMERGENCY RESPONSE PLANS FOR THE WATTS BAR NUCLEAR STATION

Gentlemen:

Enclosed is the final report dated May 22, 1995, from the Federal Emergency Management Agency (FEMA) discussing their findings of the joint exercise of offsite radiological emergency response plans for the Watts Bar Nuclear Station conducted on October 6-7, 1993.

One Deficiency was identified involving the inability of the State of Tennessee failing to demonstrate the capability to provide both an alert signal and an initial instructional message to the populated areas throughout the 10-mile plume EPZ within 15 minutes of the decision to activate the alert and notification system to implement a protective action decision. This Deficiency was corrected during a remedial exercise conducted on November 15, 1993. Also identified were three Areas Requiring Corrective Actions (ARCAs). A detailed description of the ARCAs is included in the enclosed FEMA exercise report.

We encourage you to work closely with the State in resolving this deficiency. If you have any questions, please contact K. P. Barr at 404-331-0335.

Sincerely,

Original Signed by:

Johns P. Jaudon, Deputy Director
TVA Construction
Division of Reactor Projects

Docket Nos. 50-390, 50-391
License Nos. CPPR-91, CPPR-92

Enclosure: (See page 2)

Enclosure: FEMA Letter dated May 22, 1995

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June 12, 1995

Tennessee Valley Authority
ATTN: Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: FEMA FINAL REPORT FOR THE OCTOBER 6-7, 1993, JOINT EXERCISE OF OFFSITE RADIOLOGICAL EMERGENCY RESPONSE PLANS FOR THE WATTS BAR NUCLEAR STATION

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Johns P. Jaudon, Deputy Director
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Enclosure: FEMA Letter dated May 22, 1995

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