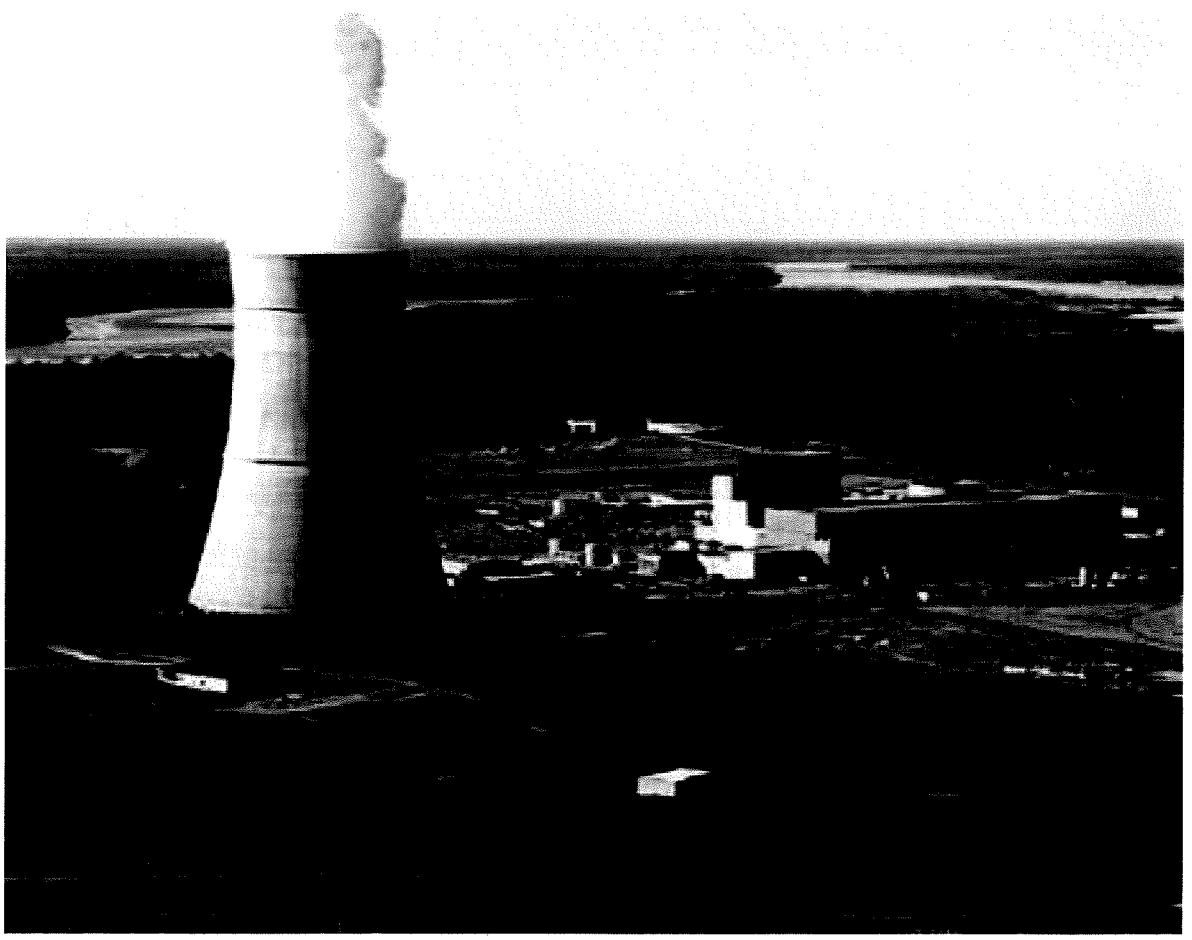
Grand Gulf Nuclear Station

Drill Report - 2008-11-20
Final Report - Radiological Emergency Preparedness (REP) Program
2008-12-19

FEMA



FEMA

Drill Report

Grand Gulf Nuclear Station

Drill Date: 2008-11-20

Report Date: 2008-12-19

U.S. DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

REP Program

800 North Loop 288

Denton, TX 76209

Table of Contents

1. Executive Summary

On November 20, 2008, an out-of-sequence medical drill was conducted for the Grand Gulf Nuclear Station (GGNS). The Louisiana portion of the GGNS medical drill was evaluated by the U.S. Department of Homeland Security/FEMA (DHS/FEMA) Region VI. The purpose of the drill was to assess the level of preparedness of local responders to react to a simulated radiological emergency at GGNS. The previous medical drill at this site was conducted on December 6, 2006. The previous plume exercise was conducted on December 19, 2007.

Personnel from the State of Louisiana, Tensas Parish, Grand Gulf Nuclear Station, Northeast Louisiana Ambulance Service, and Riverland Medical Center participated in the drill. Cooperation and teamwork of all the participants was evident during the drill, and DHS-FEMA wishes to acknowledge these efforts.

This report contains the final evaluation of the out-of-sequence drill. The participants demonstrated knowledge of their emergency response plans and procedures and adequately demonstrated them. There were no Deficiencies, three Areas Requiring Corrective Action (ARCA) that were corrected on the spot, and one Plan Issue identified during the drill.

2. Introduction

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead responsibility for all off-site nuclear planning and response. The FEMA activities are conducted pursuant to 44 CFR 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

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

FEMA's responsibilities in Fixed Nuclear Facility Radiological Emergency Response Planning include:

Taking the lead in off-site emergency response planning and in the review and evaluation of state and local government emergency plans, ensureing that the plans meet the federal criteria set forth in NUREG-0654/FEMA REP-1, Rev. 1 (November 1980);

Determining whether the state and local emergency response plans can be implemented on the basis of observation and evaluation of an exercise conducted by the appropriate emergency response jurisdictions.

Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (Federal Register, Vol. 58, No. 176, September 14, 1993); and

Coordinating the activities volunteer organizations and other involved Federal agencies. Representatives of these agencies, listed below, serve as members of the Regional Assistance Committee (RAC), which is chaired by FEMA.

- U.S. Department of Commerce
- U.S. Nuclear Regulatory Commission- U.S. Environmental Protection Agency

- U.S. Department of Energy
- U.S. Department of Health and Human Services
- U.S. Department of Homeland Security - FEMA
- U.S. Department of Transportation
- U.S. Department of Agriculture
- U.S. Department of the Interior
- U.S. Food and Drug Administration.

The findings presented in this report are based on the evaluations of the federal evaluation team's assessment of the participants' response to a simulated radiological incident at the Grand Gulf Nuclear Station that affected the offsite population. The RAC Chair made the final classification of any identified issues.

The critria used in the evaluation process are contained in:

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

Interim REP Program Manual, including the Radiological Emergency Preparedness Exercise Evaluation Methodology (August 2002).

Section III of this report, entitled "Drill Overview," presents basic information and data relevant to the drill. This section of the report contains a description of the Emergency Planning Zone (EPZ), a listing of all participating jurisdictions and functional entities that were evaluated, and a tabular presentation of the time of actual occurrence of key drill events and activities.

Section IV of this report, entitled "Drill Evaluation and Results," presents detailed information on the demonstration of applicable evaluation areas at each jurisdiction or functional entity. If applicable, this section also contains: (1) descriptions of all Deficiencies and ARCAs assessed during the drill and recommended corrective actions and (2) descriptions of unresolved ARCAs assessed during previous exercises and the status of the ORO's efforts to resolve them.

3. Drill Overview

This section contains data and basic information relevant to the November 20, 2008, medical drill to test the offsite response capabilities in the area surrounding the Grand Gulf Nuclear Station (GGNS). This section of the report includes a description of the Emergency Planning Zone and a listing of all participating jurisdictions and functional entities that were evaluated.

3.1. EPZ Description

The area within the Grand Gulf Nuclear Station (GGNS) Emergency Planning Zone (EPZ) involves both the State of Louisiana and the State of Mississippi. The most prominent natural feature in the EPZ is the Mississippi River, which runs from the north to the southwest and defines the border between Louisiana and Mississippi. The GGNS EPZ involves Tensas Parish in Louisiana and Claiborne County in Mississippi.

The only incorporated city within 10 miles of GGNS is Port Gibson, Mississippi; however, the EPZ extends more than 10 miles from the site to include the towns of Newellton and St. Joseph in Louisiana and Alcorn State University in Mississippi. The Grand Gulf Military Park borders the nuclear station site boundary to the north. The small community of Grand Gulf is 1 1/2 miles north of the nuclear station, and Lake Bruin State Park in Louisiana is approximately 10 miles west of the site.

The population of the entire EPZ is 15,126 persons (combined resident and transient populations), most of whom live in Port Gibson and Alcorn State University in Mississippi, and St. Joseph and Newellton in Louisiana. With the exception of schools and churches, there are few other special facilities. There is one hospital, two nursing homes, and three incarceration facilities.

The major roadways in the Louisiana portion of the EPZ include U.S. Highway 65 and LA Highways 128 and 605. In Mississippi, the major roadways are U.S. Highway 61, MS Highways 18, 547, and the Natchez Trace Parkway, which is a part of the National Park Service.

The GGNS EPZ is divided into 16 Protective Action Areas (PAA) defined by geographical boundaries for the purpose of emergency response planning and the implementation of protective actions. The only PAAs in Louisiana are numbered 8

through 12 on the EPZ map.

3.2. Drill Participants

Agencies and organizations of the following jurisdictions participated in the Grand Gulf Nuclear Station drill:

- Risk Jurisdictions
  - Tensas Parish
- Private Jurisdictions
  - Grand Gulf Nuclear Station
  - Riverland Medical Center
  - Northeast Louisiana Ambulance Service

4. Drill Evaluation and Results

4.1. Summary Results of Drill Evaluation

Table 1 - Summary of Drill Evaluation

DATE: 2008-11-20 SITE: Grand Gulf Nuclear Station, MS A: ARCA, D: Deficiency, M: Met		NEAS	RMC
Emergency Operations Management			
Mobilization	1a1		
Facilities	1b1		
Direction and Control	1c1		
Communications Equipment	1d1		
Equip & Supplies to support operations	1e1	M	M
Protective Action Decision Making			
Emergency Worker Exposure Control	2a1		
Radiological Assessment and PARs	2b1		
Decisions for the Plume Phase -PADs	2b2		
PADs for protection of special populations	2c1		
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1		
Rad Assessment and Decision making concerning Relocation, Reentry, and Return	2e1		
Protective Action Implementation			
Implementation of emergency worker exposure control	3a1	M	M
Implementation of KI decision	3b1		
Implementation of protective actions for special populations - EOCs	3c1		
Implementation of protective actions for Schools	3c2		
Implementation of traffic and access control	3d1		
Impediments to evacuation are identified and resolved	3d2		
Implementation of ingestion pathway decisions - availability/use of info	3e1		
Materials for Ingestion Pathway PADs are available	3e2		
Implementation of relocation, re-entry, and return decisions.	3f1		
Field Measurement and Analysis			
Adequate Equipment for Plume Phase Field Measurements	4a1		
Field Teams obtain sufficient information	4a2		
Field Teams Manage Sample Collection Appropriately	4a3		
Post plume phase field measurements and sampling	4b1		
Laboratory operations	4c1		
Emergency Notification and Public Info			
Activation of the prompt alert and notification system	5a1		
Activation of the prompt alert and notification system - Fast Breaker	5a2		
Activation of the prompt alert and notification system - Exception areas	5a3		
Emergency information and instructions for the public and the media	5b1		
Support Operations/Facilities			
Mon / decon of evacuees and emergency workers, and registration of evacuees	6a1		
Mon / decon of emergency worker equipment	6b1		
Temporary care of evacuees	6c1		
Transportation and treatment of contaminated injured individuals	6d1	M	M

4.2. Status of Jurisdictions Evaluated

4.2.1. Support Jurisdictions

4.2.1.1. Riverland Medical Center

Criterion 1.e.1:
Riverland Medical Center had adequate equipment and supplies to treat a radioactively contaminated injured patient. Following is a list of equipment and supplies kept in a designated storage area:

Air filter for vents
Masking tape and plastic tarps for floors
Decontamination hose and table
Step-off pad
Radiation Signs, barrier tape and stanchions
Decontamination procedures
Protective Clothing, donning/doffing instructions
Labeled radiation waste containers
Protective coveralls, booties and latex gloves
Procedural forms
Medical supplies and sample collection kit
10 pocket dosimeters (calibration due date of Nov. 2009) with high range of 0-1500 mR
10 pocket dosimeters (calibration due date of Nov. 2009) with low range of 0-500 mR
RAM GAM survey meter 0.1 mR/h to 999 mR/h (calibration due date Feb. 2009)
Extra batteries
2 Ludlum 12 rate meters (calibration due date April 2009)
Bio hazard bags
Coleman lantern mantle as check source for meter operational checks
REA procedure sheets for contamination control, survey equipment and frisker
Reac/ts radiation treatment flow chart

There were no shortage of necessary supplies or equipment observed during the drill.

Criterion 3.a.1:
On November 20, 2008 the Riverland Medical Center Hospital participated in a medical services drill. The drill began at approximately 0835 with a call from the Tensas Parish EOC. At 0843, the staff began donning protective clothing. Protective clothing included plastic booties, Tyvek suits, double gloves with the inner pair taped to the sleeve of the Tyvek suit, a splash apron, masks and hair covers. Dosimetry was also part of the Personnel Protective Equipment (PPE) provided and consisted of a low range direct read dosimeter (DRD) (0 – 500mR) as well as a high range DRD (0 – 1.5 R), which were worn on the outside of the suit. In addition, a thermoluminescent dosimeter (TLD) and ring badge were worn beneath the suit and glove. The buffer zone nurse was responsible for recording dosimeter readings and directing replacement of staff should their readings rise above 3/4 of the range on the dosimeter, in this case it would be 375mR on their low range scale.

At 1000, the buffer zone nurse reminded everyone in the room to change gloves and check their dosimeters. The dosimeter readings were recorded on the Dosimetry Issue Sheet. This process continued every fifteen minutes throughout the course of the drill. In addition, the buffer zone nurse provided direction to the staff in the REA regarding contaminated items and avoiding cross-contamination.

Criterion 6.d.1:
On November 20, 2008 the Riverland Medical Center Hospital participated in a medical services drill. The drill began at approximately 0835 with a call from the Tensas Parish EOC. Upon receiving the call, the hospital announced a code orange and requested maintenance to begin set up of the Radiation Emergency Area (REA). The buffer zone and treatment nurses began zeroing dosimeters and recording serial numbers on the appropriate form.

At 0843, the staff began donning protective clothing. Protective clothing included plastic booties, Tyvek suits, double gloves with the inner pair taped to the sleeve of the Tyvek suit, a splash apron, masks and hair covers. Dosimetry was also part of the Personnel Protective Equipment (PPE) provided and consisted of a low range direct read dosimeter (DRD) (0 – 500mR) as well as a high range DRD (0 – 1.5 R), which were worn on the outside of the suit. In addition, a thermoluminescent dosimeter (TLD) and ring badge were worn beneath the suit or glove. The buffer zone nurse was responsible for recording dosimeter readings and directing replacement of staff should their readings rise above 375mR on their low range scales.

While the team was dressing, the maintenance staff was setting up the REA. Set up of the REA included floor covering over the entire room with different colors to indicate the buffer zone (green) and the REA (yellow). Several procedural postings were also placed on the walls providing information on survey meter operation, donning and doffing of PPE, and patient treatment. Drapes were placed over fixed equipment that could not be removed from the room. Two large trash containers were placed in the REA with appropriate labels for radioactive waste. There were also two containers available to catch contaminated liquid during decontamination. An air filter was placed over the air vent and a step-off pad was placed at the boundary of the buffer zone and REA. Barriers with radiation signs were placed between the REA and buffer zone area as well as between the buffer zone and the clean area. Ropes were set up to prevent anyone from entering the controlled areas. These ropes extended from the REA to the ambulance bay. The maintenance crew set up ropes, stanchions and signs to caution the public away from the ambulance bay. REA set up was completed by 0854.

At 0915, the staff in the REA requested information on the patient be provided as it became available. In addition, they recognized the need for additional equipment for patient treatment that was not available in the room and were able to get the equipment prior to patient arrival.

At 0940, the ambulance crew called the hospital with patient information. The information provided in the call included an injury to the abdomen and a hot spot on the wrist. The nurse took the information and inadvertently disconnected the call before all the information was conveyed. As a result of the premature disconnection of the call, the REA staff did not have all of the information regarding patient condition, nor did they have an estimated time of arrival. At 0950, the EMS called to report that they had arrived at the hospital with the contaminated injured patient.

The patient was transferred from the ambulance to the hospital staff and additional information on patient condition and areas of contamination were provided. By 0955, the patient was in the REA for assessment, treatment, and decontamination. The staff was very professional and gave immediate attention to the medical care of the patient. While the patient was being assessed, the REA monitor performed a survey for contamination. A correction was made with the monitor as she had the meter set on a scale that was too high for the meter to detect the presence of low levels of radiation. After some training from the controller, the monitor resumed her survey of the patient. The technique used by the monitor was very inconsistent, sometimes moving too fast or

positioning the monitor too far from the surface of the patient and correction was provided by team members when this occurred.

At 1000, the buffer zone nurse reminded everyone in the room to change gloves and check their dosimeters. The dosimeter readings were recorded on the Dosimetry Issue Sheet. This process continued every fifteen minutes throughout the course of the drill. In addition, the buffer zone nurse provided direction to the staff in the REA regarding contaminated items and avoiding cross-contamination.

The staff in the REA finished medical assessment of the patient's medical condition and requested necessary x-rays to determine the patient to be stable. Once the patient was determined to be stable, the staff began to take samples of each of the areas where there was an obvious wound including the forehead, wrist, and abdomen. Each sample was placed in a sample bag with a label. A splint was placed on the wrist to stabilize it.

The staff then began working on the laceration on the patient's forehead. A survey was taken of the forehead and showed a reading of 1800cpm. The REA monitor was never observed taking a background reading and there was no documentation of the background reading on any forms or note pages. To address this item, the monitor was asked how she would know what normal readings were to determine when a reading was elevated. The REA monitor was unable to provide an answer, so additional training was provided to her on the proper way to perform an operation check and take an initial background reading. Once the correction was completed, the area around the wound was covered in absorbent pads and the wound was irrigated thoroughly with saline and blotted dry. The REA monitor surveyed the area again and found that the reading remained at 400 cpm. Each reading was recorded by the buffer zone nurse on the Patient Survey Form. The staff began a second attempt to decontaminate the wound using wipes and saline. Surveying of the area showed contamination still present. At this time, the staff called REAC/TS for advice, in accordance with their procedures. REAC/TS advised the wound be closed and samples be provided to them for further assessment. The wound was sutured and bandaged.

The staff then turned their attention to the patient's wrist. The splint was removed from the patient's wrist and the area was cleaned with wipes and surveyed for contamination. The meter reading of the area was 1500 cpm. The staff then irrigated the area with saline and surveyed again. Following the second decontamination attempt, the area was found to be clean. The staff then placed the splint back on the wrist of the patient. At this time a second correction took place to address the potential contamination of the

patient by using a splint that was possibly contaminated. The staff discussed this with the controller and understood that a new clean splint should be used following the decontamination of the area.

The last area of contamination, the abdomen, was decontaminated using wet wipes and re-surveyed for contamination. The area was found to be clean. At this point, the REA monitor conducted a full survey of the patient again. During the full patient survey, the patient was rolled over so that the back could also be surveyed. The backboard was removed from the table and set aside in the REA for survey and decontamination if necessary. The patient was cleared following the full body monitoring. A clean plastic floor cover was rolled over the flooring in the REA for the clean patient to use when leaving the REA.

One member of the REA staff demonstrated doffing of PPE. The person was provided direction from the buffer zone nurse and buffer zone monitor using the signs posted on the wall of the REA. The person was asked to step onto the step off pad and was fully monitored by the buffer zone monitor using good technique of one inch from the surface at a rate of about one inch per second. All dosimetry was returned to the buffer zone nurse who logged final readings on the Dosimetry Issue Sheet. The buffer zone nurse was then interviewed about the actions to take when returning the room to normal use. She was able to describe the process and indicated that all drapes would be removed, contaminated waste would be removed by the utility and the entire room would be surveyed to assure there was no contamination.

The drill was terminated at 1100.

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 6.d.1.
b. AREAS REQUIRING CORRECTIVE ACTION: 6.d.1, 6.d.1.

ISSUE NO.: 28-08-6d1-A-04

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

CONDITION: The REA monitor did not use proper survey technique in

monitoring the patient. The meter was set on the wrong scale when beginning the survey; the monitor moved too quickly and held the probe too far from the surface of the patient. In addition, the REA monitor did not take initial background readings and therefore would not be able to accurately determine when an area was contaminated above background levels in accordance with procedures.

POSSIBLE CAUSE: The REA monitor may not have been sufficiently trained and did not refer to procedures or wall postings for proper operation of the meter.

REFERENCE: NUREG-0654 criterion L.1

EFFECT: The REA monitor could have missed areas of contamination on the patient allowing contamination to spread to other persons and parts of the hospital causing unnecessary exposures.

CORRECTIVE ACTION DEMONSTRATED: Training was provided to the monitor on proper technique via procedures posted on the wall. The monitor was also coached on the way to obtain a background reading and method to calculate contamination levels in accordance with procedures.

ISSUE NO.: 28-08-6d1-A-05

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

CONDITION: The nurse placed a splint on the patient's wrist before the area was decontaminated. The splint was removed for decontamination, but the same splint was used following decontamination of the wrist.

POSSIBLE CAUSE: The nurse did not follow procedures for contamination control.

REFERENCE: NUREG-0654 criterion L.1

EFFECT: This would have contaminated an area previously decontaminated and may have spread contamination to other persons and areas of the hospital leading to unnecessary exposures.

CORRECTIVE ACTION DEMONSTRATED: Additional training was provided on procedures for preventing spread of contamination.

c. DEFICIENCY: None
d. NOT DEMONSTRATED: None
e. PRIOR ISSUES - RESOLVED: None
f. PRIOR ISSUES - UNRESOLVED: None

4.2.2. Private Jurisdictions

4.2.2.1. Northeast Louisiana Ambulance Service

Criterion 1.e.1:
The Northeast Louisiana Ambulance Service was pre-staged in the parking lot behind the Riverland Medical Center in Ferriday, Louisiana. The ambulance carries radiological kits and protective clothing. The kits contained the following items:

- Tensas Parish Office of Emergency Preparedness (TPOEP) EMS/Ambulance Procedure for Response to Radiological Emergencies, dtd 11/6/2002;
- EMT/Ambulance procedure check lists;
- 2 CDV 700 survey meters with a headseat and probe, plastic baggies and rubber bands to cover the probe. Meters were calibrated in 11/2008 by GOHSEP and operationally checked before use;
- 2 Direct reading dosimeters, DRDs, CDV-730, 0-20R, calibrated on 7/17/2008;
- 2 Direct reading dosimeters, DRDs, Arrow Tech, 0-200mR, calibrated on 7/17/2008 and exposure control forms;
- Dosimeter Charger and batteries;
- 2 utility thermoluminescent dosimeters (TLDs), simulated. Changed out yearly and current inventory is kept at the TPOEP Emergency Operations Center
- Potassium Iodide (KI) Tablets, blister packs of 14 with an expiration date of 04/2011;
- KI notification and consent form.

Other items used for the drill included booties, mask, gloves and masking tape; Caution Radioactive Material yellow signs for roping off contaminated area and radioactive waste disposal bags.

The ambulance was equipped with a VHF radio and the crew members carried cell phones as back-up communications. The ambulance had all the necessary medical supplies and equipment for treatment of a contaminated injured patient. In addition, they had the necessary materials (sheets) to drape the ambulance and an area on the ground next to the victim for their equipment and contamination control.

The cell phone was successfully used to communicate with the medical center for patient updates and ETA.

Criterion 3.a.1:
The ambulance with two EMTs received a call (simulated) from the Tensas Parish Office of Homeland Security/Emergency Preparedness (TPOEP) and a second call from a Highway Patrolman responding to an auto accident. The Patrolman reported a single potentially contaminated accident victim with trauma and bleeding. The EMTs immediately started checking and donning their dosimetry and protective clothing. The ambulance crew would not have an Entergy HP to assist in the ambulance for the drill. The scenario simulated an auto accident of an evacuee hitting a highway patrolman at a traffic control point.

Both EMTs started reviewing the emergency worker safety procedures for wearing, reading and recording dosimetry information (every 30 minutes), maximum exposure limits, turnback values (1R) and general radiation exposure control. One of the EMTs had some difficulty with zeroing out the direct reading dosimeters (DRDs) and required some assistance from the Entergy HP (drill controller). The HP determined that the dosimeter could not be zeroed out and instructed the EMT to make an entry on the exposure form of 0.5R as a starting point.

They donned their dosimetry, Low-range (0-200mR) and High-range (0-20R), gloves and booties. First set of gloves and booties were taped to clothing and a mask was available if needed. Exposure control forms were completed and initial dosimetry readings were recorded. All documents and dosimetry would be turned in to the TPOEP or the Entergy HP at the end of the drill. The EMTs knew to contact the TPOEP for guidance on exposure limits and radiation questions in general.

At 0840, the ambulance received a call from the TPOEP; they proceeded to the scene of the accident. Upon arrival, they quickly laid sheets on the ground for their medical equipment and started a patient assessment.

At 0912, the ambulance arrived at the hospital which had been set up to receive the contaminated injured patient at the designated entrance. A tarp laid out on the ground; roping and signs indicated a restricted area.

Upon arrival at the hospital, the EMTs checked their dosimetry and recorded the reading. The hospital radiological monitoring technician had a Ludlum Model 12 survey meter with a pancake probe covered with a plastic bag. The technician frisked one of the EMTs and successfully conducted a survey of the ambulance. At 1002, the hospital technician had completed (simulated) the final survey of the ambulance. No contamination was found in the ambulance or the EMTs.

If a hospital technician were not available to survey the ambulance or frisk the EMTs, the ambulance crew were trained to perform this process. Finally, the EMTs would record dosimetry final reading and turn them into the TPOEP or utility.

Criterion 6.d.1:
The ambulance received a call (simulated) from the Tensas Parish Office of Homeland Security/Emergency Preparedness (TPOEP) and a second call from a Highway Patrolman responding to an auto accident. The Patrolman reported a single potentially contaminated accident victim with trauma and bleeding.

The procedures were verbalized for draping the ambulance for contamination control, treatment and transportation of the patient to the Riverland Medical Center. Sheets would be taped on the inside of the box, including the floor and back doors. Radioactive waste disposal bags were used for contaminated materials/waste. The ambulance was equipped with up to date equipment and medical supplies for treatment of the patient. The EMTs had a CDV-700 survey meter for monitoring the patient and contamination control during the trip to the hospital. The EMTs knew that medical care took priority over contamination control.

At 0840, the ambulance received a call from the TPOEP; they proceeded to the scene of the accident. Upon arrival, they quickly laid sheets on the ground for their medical equipment and conducted a patient assessment. The first EMT surveyed the victim with

the CDV-700 and confirmed contamination on the right wrist/chest area only. The first EMT made sure to inform his partner who would be treating the victim. As per the scenario the victim also had contamination in the forehead/wound area and the abdomen which was not identified during the survey. During the survey, the first EMT surveyed around the forehead/wound area and the contamination was in the wound. The abdomen was covered by clothing and the contamination was not detected.

The second EMT started a head to toe exam, asking the victim if she had any pain or tenderness. He was only aware of one area of contamination and when he examined the abdomen area he inadvertently spread the contamination and was unable to remove the outer gloves which had also been taped to his clothing and contributed to the spread of the contamination. The controller (Entergy HP) stopped the drill and conducted training on contamination control, proper donning and changing of gloves. The EMT started over and was able to complete the initial medical assessment without spreading contamination and effectively changing his outer gloves as needed.

During the exam the forehead wound was dressed with bandages, a c-spine collar was placed on the patient and she was wrapped in a sheet and moved to the back board which was also covered with a sheet for contamination control. The patient was secured to the gurney and loaded onto the ambulance.

The EMTs made sure to remove their outer booties and gloves disposing of them appropriately in the radioative waste disposal bag taped to the inside of the ambulance door. The EMT treating the victim took vitals (blood pressure, pulse, etc.) and simulated an IV. At 0938, he called the hospital with the patient report and ETA. Before the EMT could finish providing critical information, the nurse inadvertently hung up. He was unable to communicate that the patient had a laceration on the forehead and the ambulance ETA. At 0948, a second patient status call was made to the hospital.

At 0949, the ambulance arrived at the Riverland Medical Center which had been set up to receive the contaminated injured patient at the designated entrance. The patient was off loaded from the ambulance and transferred to the hospital gurney. The EMTs briefed the hospital staff on the patient medical condition and contamination status.

Both the hospital technician and the EMTs are trained to conduct swipe surveys of the ambulance and whole body frisks. The hospital technician conducted the ambulance survey and a whole body frisk on one of the EMTs. If at any time contamination was found, the EMTs had a copy of the plan/procedures with contact numbers and reporting

procedures.

Finally the EMTs would record their final readings and turn in their dosimetry to the TPOEP Radiological Defense Officer or Decontamination Center supervisor. The ambulance and EMTs were released for service at 1002.

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 6.d.1.
b. AREAS REQUIRING CORRECTIVE ACTION: 6.d.1.

ISSUE NO.: 28-08-6d1-A-02

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

CONDITION: The first EMT surveyed the victim for contamination, he detected contamination on the right wrist/chest area but the contamination on the abdomen (per the scenario) was covered by clothing and not detected. The second EMT started a head to toe exam, asking the victim if she had any pain or tenderness. The EMT was only aware of one area of contamination, on the wrist/chest area, and when he examined the abdomen area he inadvertently spread the contamination by not changing out his gloves. In addition, the outer gloves had been taped to his clothing making them difficult to remove.

POSSIBLE CAUSE: Insufficient training.

REFERENCE: NUREG-0654, K.3.a., 3.b; Tensas Parish Office of Emergency Preparedness, Emergency Medical Services (EMS)/Ambulance Procedure for Response to Radiological Emergencies, Revision 1, Nov. 13, 2006.

EFFECT: Contamination was spread on the victim and remained on the EMT's gloves potentially transferring it to the ambulance and other equipment.

CORRECTIVE ACTION DEMONSTRATED: The controller (Entergy HP)

stopped the drill and conducted some training on contamination control, proper donning and changing of gloves. The EMT started over and was able to complete the initial medical assessment without spreading contamination and effectively changing his outer gloves as needed.

c. DEFICIENCY: None
d. NOT DEMONSTRATED: None
e. PRIOR ISSUES - RESOLVED: None
f. PRIOR ISSUES - UNRESOLVED: None

APPENDIX 1

ACRONYMS AND ABBREVIATIONS

ARCA	Areas Requiring Corrective Action
EMS	Emergency Medical Services
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
GGNS	Grand Gulf Nuclear Station
NRC	Nuclear Regulatory Commission
PAA	Protective Action Areas
PPE	Personnel Protective Equipment
RAC	Regional Assistance Committee
REA	Radiation Emergency Area
REP	Radiological Emergency Preparedness

APPENDIX 2

DRILL EVALUATORS AND TEAM LEADERS

DATE: 2008-11-20, SITE: Grand Gulf Nuclear Station, MS

LOCATION	EVALUATOR	AGENCY
Riverland Medical Center	Bill Bischof *Nan Calhoun	DHS/FEMA DHS/FEMA
Northeast Louisiana Ambulance Service	*Elsa Lopez	DHS/FEMA
* Team Leader		

APPENDIX 3

STATE OF LOUISIANA / GRAND GULF NUCLEAR STATION
2008 MEDICAL RESPONSE DRILL
November 20, 2008

Participants:
RIVERLAND MEDICAL CENTER
AND
NORTHEAST LOUISIANA
AMBULANCE SERVICE

Prepared By: _____ / _____.
Name Date

Reviewed By: _____ / _____.
Name Date

Approved By: _____ / _____.
Name Date

EXTENT OF PLAY

DRILL OBJECTIVES

Sub-element 1.e – Equipment and Supplies to Support Operations

Sub-element 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operation. (NUREG-0654, H.7, 10; J.10.a, b, e J.11; K.3.a)

Locations

Riverland Medical Center and Northeast Louisiana Ambulance, Ferriday, Louisiana.

Extent of Play

None

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

Sub-element 3.a – Implementation of Emergency Worker Exposure Control

Criterion 3.a.1: The OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers in accordance with the plans and procedures. Emergency workers periodically and at the end of each mission read their dosimeter and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.a, b)

Locations

Riverland Medical Center and Northeast Louisiana Ambulance, Ferriday, Louisiana.

Extent of Play

Ambulance and hospital crew will be able to discuss with evaluator their procedure on the use, distribution, and appropriate record-keeping process.

execution of appropriate plans and procedures. It is recognized that situations may arise that could limit the organizations in the exact execution of these plans and procedures.

3. **In the event of an unanticipated situation, OROs are permitted to exercise flexibility in the implementation of their plans and procedures in order to successfully achieve the objective of protection of public health and safety and protection of the environment.**

4. **As a statement of fact, no ORO will deliberately deviate from its plans and procedures with the intent of avoiding responsibility.**

References:

As indicated in the Extent-of-Play Agreement, the State of Louisiana requests the option to correct issues immediately as defined in FEMA Policy Paper, Strategic Review Steering Committee, Initiative 1.5, Correct Issues Immediately, effective March 31, 2000, signed by Kay C. Goss, CEM, Associate Director for Preparedness, Training and Exercises. Acceptable evaluation areas for on-the-spot correction are clearly indicated in the extent of play portion under each evaluation area. Acceptable activities for on the spot correction are clearly indicated in the extent of play portion under each objective.

PRECAUTIONS

When conducting a medical drill it is especially important that controllers/observers be aware of drill player actions at all times, and prevent any actions that may injure the patient. **No** actual X-rays, surgical procedures, starting of IV's, drawing blood samples, etc. should be allowed. If you are unsure of what is being done, or feel that the patient might be in danger, halt the procedure and contact the lead controller. It is recommended that you brief drill players on this and recommend that they inform controllers/observers of any procedures about to be performed.

DRILL PARTICIPANT BRIEFING AND PLAYER GUIDELINES

Drill participants will be briefed during the training session conducted prior to the drill.

All players should be briefed on the following information:

1. Maintain a serious attitude throughout the drill.
2. Exhibit courtesy and professionalism at all times
3. Teamwork and communication is essential.
4. Inform controllers/observers of your intended actions. This will allow them to prevent any actions that should be simulated.
5. **NO** actual surgical procedures, X-rays, blood samples, etc. will be done. If, for example, an IV is needed, you would announce to the controller; "I will start an IV now." The controller should tell you to simulate the IV, and then you tape the tubing to the arm without inserting the needle.
6. Use **This Is A Drill** in all communications, especially radio and telephone conversations.

APPENDIX 4

STATE OF LOUISIANA / GRAND GULF NUCLEAR STATION
2008 MEDICAL RESPONSE DRILL
November 20, 2008

Participants:
RIVERLAND MEDICAL CENTER
AND
NORTHEAST LOUISIANA
AMBULANCE SERVICE

Prepared By: _____ / _____.
Name Date

Reviewed By: _____ / _____.
Name Date

Approved By: _____ / _____.
Name Date

TABLE OF CONTENTS

SCHEDULE OF EVENTS

Drill Starts (GGNS Alert)	8:30am
Accident Reported	9:00 am
Patient Arrives at Hospital (Approximate)	9:30 am
Drill Terminates (Approximate)	12:00 noon
Player Critique	12:00 noon
Evaluator Comments	12:30 pm

INITIAL CONDITIONS

Grand Gulf Nuclear Station has declared a General Emergency based on Offsite Radiation Monitoring Team reports. An evacuation of all people within five miles of Grand Gulf has commenced. Since the wind direction is from 90 Degrees (blowing into the West) zone 12 is being evacuated to Tallulah and Ferriday, and many areas within five miles of the plant are expected to be contaminated.

A car evacuating south on Highway 65 hits a highway patrolman at a traffic control point on Highway. The driver, the only occupant of the car, is uninjured. The Highway patrolman suffered the following injuries:

- Blunt trauma to the abdomen, a broken right wrist, a minor blow to the head with a small laceration with moderate bleeding.

NOTE

The accident scene will be set up in back of Riverland Medical Center to prevent the ambulance from leaving it's service area. Once the patient is loaded on the ambulance, play will stop for approximately 15 minutes to simulate the travel time between the accident scene on highway 61 and Ferriday.

SCENARIO

PRIOR TO ACCIDENT

Initial call will be placed from the Tensas Parish Office of Homeland Security / Emergency Preparedness to the Northeast Louisiana Ambulance (EMS), which in turn will contact the hospital (Riverland Medical Center).

Due to events in progress, the ambulance crew and hospital should begin preparations for the transport/treatment of the contaminated individual. The hospital preparations are identified in the section on *Hospital, Prior to Patient Arrival* below.

The ambulance crew's demonstration should include the following:

1. Protective clothing, and dosimetry for EMS personnel expected to respond into the 5 mile EPZ.
2. Minimize contamination of the ambulance (i.e., drapes over equipment, sheets over stretcher).

ACCIDENT SCENE

Another call will be placed from the Highway Patrolman responding to the accident. (simulated by Tensas Parish Office of Homeland Security/Emergency Preparedness) to Northeast Louisiana Ambulance (EMS), which in turn will contact the hospital.

The Highway Patrolman will report that there is one injured, with trauma and moderate bleeding. The airbag has deployed, and there is a possibility of spinal injury. The victim is stable. The patrolman will also report that contamination was detected inside the car, but he is not sure how much.

Expected Actions:

As soon as the EMS receives the call, it will immediately notify the hospital.

Ambulance Crew:

For the purposes of this drill, Northeast Louisiana Ambulance will be the first to arrive on the scene. Due to events in progress, EMS responders should assume the victim is potentially contaminated and take the appropriate precautions. The ambulance crew's demonstration should include the following:

1. Conduct a quick assessment of the patient's status.
2. Conduct a quick survey of the accident scene to verify the presence of contamination above background.
3. Minimize contamination of EMS equipment used at scene (Avoid placing equipment on bare ground unless some type of protective ground covering is used.)
4. The ambulance crew will perform background checks of the area (measured in mR/hr) around the victim; if time and victim's conditions permit, the crew will perform a survey of the patient for detecting the presence of radioactive contamination. All other radiation survey measurements of the patient will be deferred to the hospital.

Upon examining the patient, the ambulance crew finds a blunt trauma (bruising) to the abdomen, a broken right wrist and a small laceration with moderate bleeding on the victim's forehead. Vital signs should be taken, (all vital signs are as found), the wound should be bandaged, the wrist should be splinted and the ribs should be stabilized as necessary. The patient should be removed from the area.

The hospital should be informed as soon as possible of the transport of a potentially contaminated patient. In addition, vitals and a brief explanation of treatment administered should be given.

During transport the patient should be observed and vital signs retaken (All vital signs are as found). All information should be relayed to the hospital.

HOSPITAL (PRIOR TO PATIENT ARRIVAL)

Expected Actions:

Emergency Room Charge Nurse:

When notified of the transport of a contaminated patient to Riverland Medical Center, the ER Charge Nurse should complete the ER Charge Nurse Checklist, (Attachment III of the hospital procedure,) and complete the normal ER forms. The ER Charge Nurse will contact hospital personnel as necessary to assemble the response team.

Maintenance Department:

When contacted the Maintenance Department should set up the Radiation Emergency Area (REA) in accordance with Attachment I and II of the hospital procedure.

Buffer Zone Nurse:

When assigned, the person performing this task should complete the Buffer Zone Nurse checklist, Attachment V of the hospital procedure. In brief, the Buffer Zone Nurse should gather supplies and verify instrument operability. After the REA team is assigned, the Buffer Zone Nurse will issue dosimetry and assist in the preparation of the staff for entry into the REA. During treatment, the Buffer Zone Nurse should control the flow of material and personnel into and out of the REA, ensuring that anything leaving the area is properly surveyed. All contaminated material should be properly packaged and labeled.

Radiation Emergency Area Monitor:

The REA Monitor should survey the patient as necessary and document the results on Attachment IV of the hospital procedure. Proper contamination control, surveying and ALARA techniques should be exhibited by the REA Monitor.

HOSPITAL (PATIENT ARRIVAL)

Expected Actions

The REA team should meet the ambulance crew in the loading dock area with a clean stretcher. The team should receive a turnover on the patients status and move the patient to the clean stretcher. The patient should be wrapped in a sheet to prevent the spread of contamination and transported to the REA. The ambulance crew and their stretcher will remain with the ambulance. Ambulance personnel will monitor and decontaminate themselves and the ambulance. Ambulance decon may be deferred to a vehicle decontamination center.

The REA team should examine the patient immediately. They should assess the patient's condition and x-ray to clear the c-spine and to determine if the right wrist and ribs are broken.

NOTE: X-Rays should be SIMULATED.

The patient should then be thoroughly surveyed, samples should be taken and areas decontaminated starting with wounds first.

The hospital staff should contact REAC/TS for advice for the forehead lacerations, which cannot be decontaminated without invasive procedures. These wounds should be bandaged or simulated stitched after decon/sampling.

The patient should be thoroughly surveyed, decontaminated and admitted for observation.

SAMPLES SHOULD BE TAKEN, including:

1. Swabs from nose and mouth.
2. Skin wipes.
3. Samples from open wounds.
4. All samples should be properly handled and labeled in accordance with hospital procedures.

Decontamination and Surveys

Decontamination should include the following aspects:

1. Thorough and frequent surveys.
2. Constant changing of contaminated gloves.
3. Minimization of splashing during irrigation.
4. Decon from areas of low contamination to high contamination.
5. Collection of dressings or imbedded material from wounds for later analysis.
6. A final survey.

All personnel and equipment exiting the REA should be thoroughly surveyed. In addition hospital personnel will survey the patient transport routes, as soon as possible after transport, and restore access. The Ambulance Crew will survey themselves and the ambulance.

Terminating the Drill

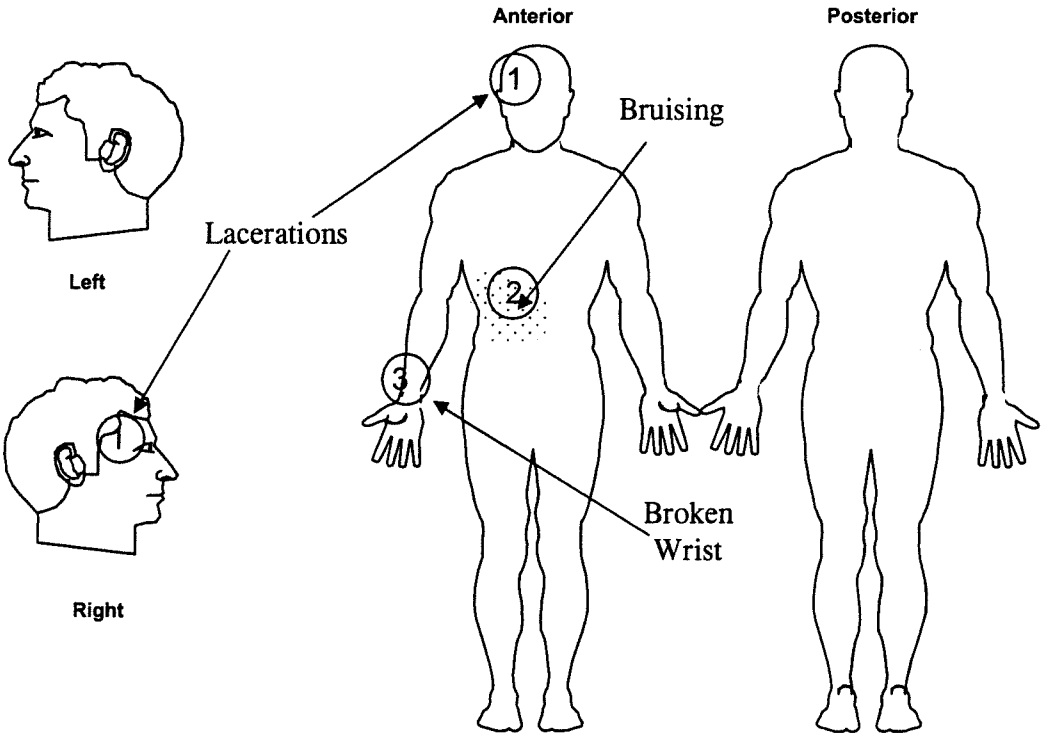
Once the patient has been decontaminated and is ready for admission the drill may be terminated. One REA staff member will demonstrate exit procedures.

NOTE:

The *hospital staff* will use both **mR/hr** and **CPM** for radiation measurements. (Monitoring of the patient will be in mR/hr, while contamination surveys will be in CPM.)

The only radiation measurements procedurally required from the *ambulance crew* would be a background check of the area measured in **mR/hr**.

Patient Contamination Levels



Area	Type of Contamination *	Time	Size of Area	CPM Before Decon	CPM Decon	Decon Methods Used
1	Wound		1 %	1500	500	
2	External		3 %	3500	Bkgd	
3	External		2 %	2500	Bkgd	
			%			
			%			
			%			
			%			
			%			

NOTE: * - External, Wound or Orifice

Drill Observation Form

Evaluator:_____

State observations on this page, in chronological order or occurrence. Indicate when, who, what, and where for each occurrence. Indicate late entries on form with a "L/E→".

Time	Observation

APPENDIX 5

PLANNING ISSUES

1. Riverland Medical Center

ISSUE NO.: 28-08-3a1-P-03

CONDITION: The Hospital Emergency Department Management of Radiation Accidents Procedure, Attachment VI, Radiation Survey Instruments and Dosimetry, should be updated to reflect the dosimetry currently provided to hospital staff for radiological emergencies. Attachment VI lists a Low-range Pocket Dosimeter (0-200 mR) and a High-range Pocket Dosimeter (0-200R), neither of which were issued to Emergency Workers. Emergency Workers were issued a Low-range Pocket Dosimeter (0-500mR) and a High-range Pocket Dosimeter (0-1.5R).

POSSIBLE CAUSE: This discrepancy may have been due to oversight on updating the procedure when dosimetry was updated.

REFERENCE: NUREG-0654, K.3.a

EFFECT: Plans are not consistent with the actual dosimetry being used by Emergency Workers. This may lead to exposure control confusion that could impact the safety of Emergency Workers.

RECOMMENDATION: Revise procedures to accurately reflect low-range and high-range dosimetry being used.