Comanche Peak Nuclear Power Plant

Drill Report - 2007-11-06

Final Report - Radiological Emergency Preparedness (REP) Program

2007-12-03

Drill Report

Comanche Peak Nuclear Power Plant

Drill Date: 2007-11-06

Report Date: 2007-12-03

U.S. DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

REP Program

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Denton, TX 76209

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1. Executive Summary

On November 6, 2007, an out-of-sequence medical drill and a remedial drill were conducted for the Comanche Peak Nuclear Power Plant (CPNPP), located near Glen Rose, Texas. Personnel from the U.S. Department of Homeland Security/FEMA (DHS/FEMA) Region VI, evaluated all activities. The purpose of the drills was to assess the level of preparedness of local responders to react to a simulated radiological emergency at the CPNPP and to correct a deficiency identified during the August 29, 2007 biennial exercise.

Personnel from Granbury/Hood County Emergency Medical Services, Walls Regional Hospital, Hood County, and CPNPP participated in the drills. Evaluation Areas demonstrated included: Emergency Operations Management, Protective Action Decision Making, Protective Action Implementation, and Support Operations/Facilities. Cooperation and teamwork of all participants was evident during these drills, and DHS/FEMA Region VI wishes to acknowledge these efforts.

This report contains the final evaluation of the out-of-sequence drills. The participants demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. There were no Deficiencies and no Areas Requiring Corrective Action (ARCAs) identified during the drills. One planning issue was identified.

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2. Introduction

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all offsite nuclear power facility 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.

FEMA Rule 44 CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of 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, ensuring 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 of 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. Nuclear Regulatory Commission (NRC)
- U.S. Environmental Protection Agency (EPA)
- U.S. Department of Energy (DOE)
- U.S. Department of Health and Human Services (DHHS)

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- U.S. Department of Transportation (DOT)
- U.S. Department of Agriculture (USDA)
- U.S. Department of Interior (DOI)
- U.S. Food and Drug Administration (FDA)

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

The criteria 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);

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

Section III of this report entitled "Exercise Overview" presents basic information and data relevant to the exercise. This section contains a description of the emergency planning zone, a listing of all participating jurisdictions, which were evaluated, and a tabular presentation of the times of actual occurrence of key exercise events and activities.

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Section IV of this report, entitled "Exercise Evaluation and Results," presents basic information on the demonstration of applicable exercise criterion at each jurisdiction or functional entity in a jurisdiction-based format. This section also contains descriptions of all Deficiencies and ARCAs assessed during the exercise and recommended corrective actions, as well as descriptions of ARCAs assessed during previous exercises and the current status of each.

3. Drill Overview

This section contains data and basic information relevant to the November 6, 2007 drills, to test the offsite response capabilities in the area surrounding the Comanche Peak Nuclear Power Plant (CPNPP). This section of the report includes a description of the Emergency Planning Zone (EPZ), and a listing of all participating jurisdictions and functional entities that were evaluated.

3.1. EPZ Description

The area within 10 miles of CPNPP is located in the State of Texas within the confines of Hood and Somervell Counties. This area is referred to as the 10-mile Emergency Planning Zone (EPZ). Incorporated cities in Hood County within the EPZ include Granbury, located 9.9 miles north of CPNPP, and Tolar, located 9.9 miles northwest of CPNPP. The only incorporated city in Somervell County is Glen Rose, located 5.0 miles south of CPNPP. The rest of the EPZ consists of unincorporated farmland, rural housing developments, and recreation areas. Based on the 2000 census, the total population of the EPZ is 29,908.

The Santa Fe east-west railroad crosses the extreme northwestern portion of the EPZ through the cities of Tolar and Granbury. A spur of that railroad serves CPNPP and crosses the northwest quadrant of the EPZ from Tolar to CPNPP. Major highways within the EPZ are US 377, running east to west through Granbury and Tolar; US 67, running east to west through Glen Rose; and State Highway 144, running north to south from Granbury through Glen Rose to the southernmost point in the EPZ.

Public institutions, aside from schools and churches within the EPZ, include two hospitals, an amphitheater, an Expo Center, and Dinosaur Valley State Park. The EPZ is divided into 31 zones for the purpose of emergency response planning and implementation of protective actions.

3.2. Drill Participants

Agencies and organizations of the following jurisdictions participated in the Comanche Peak Nuclear Power Plant drill:

- Risk Jurisdictions
  - Hood County Emergency Operations Center

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Private Jurisdictions

- Walls Regional Hospital
- Granbury/Hood County Emergency Medical Services
- Comanche Peak Nuclear Power Plant

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4. Drill Evaluation and Results

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities which participated in the November 6, 2007 drills to test the offsite emergency response capabilities of state and local governments in the 10-mile Emergency Planning Zone (EPZ) surrounding the Comanche Peak Nuclear Power Plant (CPNPP).

Each jurisdiction and functional entity was evaluated on its demonstration of criteria contained in exercise evaluation areas delineated in the Federal Register, Vol. 67, No. 80, “FEMA - Radiological Emergency Preparedness: Exercise Evaluation Methodology” (April 25, 2002). Detailed information on the exercise criteria and the extent of play agreements for this exercise are in Appendix 3 of this report.

4.1. Summary Results of Drill Evaluation

The matrix presented in Table 2 on the following page presents the status of all exercise criteria which were scheduled for demonstration during these drills at all participating jurisdictions and functional entities. Exercise criterion are listed by number and the demonstration status of those criterion are indicated by the use of the following letters:

M - Met (No Deficiency or ARCAs assessed and no unresolved ARCAs from prior exercise)

D - Deficiency assessed

A - ARCAs assessed or unresolved ARCAs from previous exercises

N - Not Demonstrated (Reason explained in subsection B)

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Table 1 - Summary of Drill Evaluation

DATE: 2007-11-06 SITE: Comanche Peak Nuclear Power Plant, TX A: ARCA, D: Deficiency, M: Met		Hood County EOC & T/ACP	Granbury/Hood Co. EMS	Walls Regional
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	M		
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

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4.2. Status of Jurisdictions Evaluated

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

•□Met - Listing of the demonstrated exercise evaluation area criteria under which no Deficiencies or Areas Requiring Corrective Action (ARCAs) were assessed during this exercise and under which no ARCAs assessed during prior exercises remain unresolved.

•□Deficiency - Listing of the demonstrated exercise evaluation area criteria under which one or more Deficiencies were assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.

•□Areas Requiring Corrective Action - Listing of the demonstrated exercise evaluation area criteria under which one or more ARCAs were assessed during the current exercise or ARCAs assessed during prior exercises remain unresolved. Included is a description of the ARCAs assessed during this exercise and the recommended corrective action to be demonstrated before or during the next biennial exercise.

•□Not Demonstrated - Listing of the exercise evaluation area criteria which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.

•□Prior Issues - Resolved - Description of ARCAs assessed during previous exercises that were resolved in this exercise and the corrective actions demonstrated.

•□Prior Issues - Unresolved - Description of ARCAs assessed during prior exercises that were not resolved during this exercise. Included is the reason the ARCAs remain unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

The following are definitions of two types of exercise issues that are discussed in this report.

•□A Deficiency is defined in the Interim REP Program Manual as "an observed or

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

•□An ARCA is defined in the Interim REP Program Manual as "an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety."

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

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

•□Plant Site Identifier – A two-digit number corresponding to the Utility Billable Plant Site Codes.

•□Exercise Year – The last two digits of the year the exercise was conducted.

•□Evaluation Area Criterion – A letter and number corresponding to the Evaluation Area criterion.

•□Issue Classification Identifier – (D = Deficiency, A = ARCA). Deficiencies and ARCAs are included in exercise reports.

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

4.2.1. Risk Jurisdictions

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4.2.1.1. Hood County Emergency Operations Center and Traffic/Access Control Point

Criterion 2.c.1: At 1330 the remedial drill began with a controller inject to the Hood County Emergency Management Coordinator, which showed Comanche Peak Nuclear Power Plant (CPNPP) at a General Emergency (GE) level. The Hood County Emergency Operations Center (EOC) was considered fully operational at the time, but for drill purposes, the Hood County Emergency Management Director, Law Enforcement, and Communications staff were the only positions represented, in addition to the Coordinator. Included with the controller inject that listed the plant status as GE was a recommendation from the CPNPP to evacuate Zones 4A, 4B, 1B, and 1A; shelter-in-place Zones 1C, 1D, 4E, and 2G. In agreement with the recommendation, the emergency management staff sent an EOC message form to dispatch, which initiated sounding of the sirens and broadcasting of the Code Red Emergency Alert System message at 1340. During the time of the initial controller inject to simulate the activation of the sirens and Code Red message, the EOC staff, specifically Law Enforcement, used several new resources to identify and address the possible needs of the special population within the zones. The first resource used was a newly designed Hood County Evacuation Route Zone map (letter size) with the number of special populations in each zone listed in the legend; this map will be updated on a quarterly basis. This map was also enlarged and posted on the wall of the EOC. From this map the Law Enforcement staff identified no special populations within the recommended evacuated zones. For follow-up purposes, the federal evaluator picked Zone 1D, which had 33 special needs citizens, for the staff to address. Once the special needs population for this zone was verified by the Law Enforcement staff, the Emergency Management Coordinator used their newly developed MS Excel spreadsheet to pull the detail information. This spreadsheet shows in-depth information for each special needs person within the zones and will be their primary source of information during a real event. The hard copy Special Needs file will be the official copy and used to update the MS Excel Spreadsheet that will be updated as needed. The last mail out to identify the special needs population was completed at the first of this year and is normally done on an annual basis. Newspaper articles and e-mailing are also used to get information concerning the special needs.

The entire Hood County EOC staff present during this drill demonstrated that they can successfully identify and address the special needs population using the newly developed products and working as a team.

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

a. MET: None
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. NOT DEMONSTRATED: None
e. PRIOR ISSUES - RESOLVED: 2.c.1.

ISSUE NO.: 14-07-2c1-D-02

ISSUE: The Hood County Emergency Operations Center (EOC) staff failed to identify mobility impaired, special needs, hearing impaired and/or transportation dependent individuals living in the recommended evacuated zones when the protective action decisions were made. A post-exercise review of the Special Assistance File found that there were special needs individuals living in the recommended evacuated zones that would have required assistance in evacuating.

CORRECTIVE ACTION DEMONSTRATED: During the remedial drill on 11/06/2007 the Hood County Emergency Management staff showed through their newly created map and spreadsheet, as well as their teamwork, to properly address the special needs population within the CPNPP EPZ.

f. PRIOR ISSUES - UNRESOLVED: None

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4.2.2. Private Jurisdictions

4.2.2.1. Granbury/Hood County Emergency Medical Service Inc.

Criterion 1.e.1: The Granbury/Hood County Emergency Medical Services (EMS) ambulance was fully equipped with adequate medical supplies required for emergency response. In addition, the crew carried a radiological kit on board the ambulance. Radiological supplies included:

3 electronic personal dosimeters (EPDs), Merlin Gerin DMC 100, calibrated on 1/24/07, due 01/24/08;
Serial numbers: 113272, 113368, 113186
Detailed paper instructions on the use of EPDs
Laminated instructions on dosimetry use, proper wear
3 thermoluminescent dosimeters (TLDs)

The radiological kit did not contain dosimetry logs for the crew to use when assigning the EPDs or for recording readings.

The Radiation Protection Technician used a Bicron HP-1787 Meter with an PGM HP-1788 Pancake Probe calibrated on 6/14/07, due 6/14/08. This equipment specifically reads counts per minute (cpm).

Potassium iodide tablets were not stored on the ambulance but would be made available to crew at the hospital or from the county emergency operations center, if ingestion was recommended.

The ambulance was equipped with a VHF radio and a cell phone as the primary means of communication. Crew members also carried personal cell phones that could be used if needed.

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Criterion 3.a.1: The utility maintains the radiological kit stored on board the ambulance. The crew members retrieved the kit, performed operational checks on the electronic personal dosimeters (EPDs), and properly donned the EPDs and thermoluminescent dosimeters (TLDs). Detailed instructions on the use and operation of the EPDs were included in the kit. The EPDs would alarm at 200 mR and the crew knew to call in for further instructions if their dosimeters sounded. No Dosimetry Issue Logs were included in the kits for use in assigning the dosimetry or for recording readings.

For this drill, a Radiation Protection Technician (RPT) was part of the field team that was sampling when one member of the team was hit by a vehicle (simulated). Therefore, all monitoring and contamination control measures for the victim and the ambulance crew were ably directed by the on-scene RPT. The crew wore double gloves and changed gloves when contaminated or as directed by the RPT. The RPT gave clear instructions to the crew on the handling and wrapping of the patient to avoid the spread of contamination. The RPT bagged all contaminated articles at the accident site for collection by the utility.

Since no Dosimetry Issue Logs were on board the ambulance, the RPT who monitored the crew and the ambulance prior to release for service stated that he would collect the dosimetry and log-in the crew's information on the hospital's log.

Criterion 6.d.1: On November 6, 2007, the Granbury/Hood County Emergency Medical Services (EMS) ambulance was dispatched by a simulated call from their county's 911 office which followed a call (also simulated) from the Comanche Peak Nuclear Power Plant (CPNPP) Control Room. The ambulance was dispatched to transport a CPNPP field team member who had been hit by a vehicle. The victim had been performing field sampling following a simulated release from the power plant, but the team had moved outside the contaminated area. The field team consisted of the worker doing sampling and a Radiation Protection Technician (RPT). The victim was suspected to be contaminated and had sustained injuries to the left leg with abrasions to various parts of the body. The ambulance crew consisted of a Paramedic and an Emergency Medical Technician (EMT). The ambulance and its crew and the field team were pre-staged in Byron Stewart Park near the hospital in Cleburne in order to expedite transport.

The crew members had already retrieved their dosimetry kit stored on the ambulance, performed operational checks on the electronic personal dosimeters (EPDs), and donned the EPDs and thermoluminescent dosimeters (TLDs) during the pre-staging. The EPDs would alarm at 200 mR and the crew knew to call in for further instructions if their dosimeters sounded.

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At 0930, the Controller provided the EMT extent of play Message #2 with instructions to call Wall's Regional Hospital and report that the ambulance would be en route with a radiologically contaminated male patient who had a broken left femur. The crew reported the patient's vital signs and an estimated time of arrival of 20 minutes.

The RPT briefed the ambulance crew on the accident, injuries, and the contamination levels he had found on the patient. He advised the crew to change gloves like they would if handling a patient with blood-borne contamination. The Parademic assessed the patient's condition and gathered preliminary medical information and history from the patient. The EMT cut away the patient's protective clothing and properly rolled under the contaminated coveralls containing any spread of contamination. The RPT continually monitored the patient and the crew and directed glove changes as necessary to eliminate the spread of contamination. After the protective clothing was cut away, the RPT confirmed contamination on the hands of the patient. The EMT

retrieved bags from the ambulance and covered the victim's hands and tightened the bags around the victim's forearms to prevent any spread of contamination during transport. The patient was rolled onto a backboard that was covered with 2 blankets, and the patient was wrapped up and belted on the backboard with his head secured to prevent movement pending further medical evaluation. The patient was placed on the gurney and then into the ambulance at 1000. The RPT checked the crew's hands before they got back into the ambulance and had them change gloves again. The RPT collected all trash at the scene, including trash that had been placed just inside the treatment area of the ambulance by the crew; he bagged and sealed the trash, and deposited it in the ambulance for disposal with the contaminated items at the hospital. The RPT surveyed the area where the trash had been placed in the ambulance, but no contamination was found. The ambulance left the park at 1003. Medical care took precedence over monitoring, decontamination, and contamination control.

At 1010 the ambulance arrived at the hospital. The Paramedic and RPT briefed the receiving staff on the patient's condition and radiological contamination, and the patient was transferred to a hospital gurney and moved into the emergency department for treatment. The field team RPT remained with the patient throughout treatment while the RPT who reported to the hospital stayed to survey the ambulance and crew. The crew was asked to remain inside the barriers in the secured ambulance arrival area. The RPT demonstrated monitoring by performing a full body frisk of the Paramedic and his equipment. The RPT would collect the dosimetry and log in the readings on the hospital's Dosimetry Issue Log since that form was missing from the ambulance's radiological kit.

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After clearing the crew, the RPT demonstrated and further explained by interview the monitoring process for the gurney; the outside of the ambulance including the bumper, doors, and handles; the treatment area of the ambulance; and the interior of the ambulance's cab. By using smears, direct frisking, and monitoring, the RPT determined that the ambulance and crew were free of contamination and could be released for service. All contaminated materials were bagged and sealed, and the RPT remove the bag for disposal by the plant.

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: None
c. DEFICIENCY: None

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

4.2.2.2. Walls Regional Hospital

Criterion 1.e.1: Walls Regional Hospital improved its ability to treat a radiologically injured patient by moving its Radiological Emergency Area (REA) to a spacious room with its own outside entrance that prevents contamination of the hospital's normal Emergency Room (ER) entrance. The room was large enough to comfortably hold the patient and several staff.

The REA is next to the ER supply room that contained a red cart with emergency supplies. Included in the supplies were anti-contamination clothing, thermoluminescent dosimeters (TLDs), plastic sheeting, a security rope and display signs. A storage building just outside the ER contained trash cans designated for contaminated material and stanchions with bungee cord to make a roped-off entrance from ambulance to REA. Also stored there were signs that identified to on-lookers that a drill was in process and that the area behind the stanchions could be contaminated.

Signs from the cart were posted at the REA. Those signs included donning and doffing instructions for protective clothing as well as instructions for anyone nearing the REA to stop for frisking.

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There was no shortage of supplies; extra gloves and anti-contamination clothing were available if needed.

Dosimetry for the hospital staff is provided by the Comanche Peak Nuclear Power Plant (CPNPP), and it was also staged for issuance on the emergency cart with the supplies noted above. Fourteen permanent record TLDs were available for issue. The supply cart also contained 12 MGP DMC-100 electronic dosimeters. The electronic dosimeters had been calibrated on 1-24-2007.

Four survey meters were available at the hospital; two Bicron HP 1787 survey meters with Bicron PGM HP-1788 pancake probes (calibrated on 6-14-2007) that measure counts per minute (cpm) and two Thermo Surveyor 50s with Thermo HP-3008 pancake probes (calibrated on 9-9-2006) that read mR/Hr. These instruments were

supplemented by survey instruments brought to the hospital by responding Radiation Protection Technicians (RPTs) from CPNPP. All survey meters were operationally checked with a 1.0 µCi Cs-137 source and those that were used had a range of reading sticker affixed to the instrument.

Criterion 3.a.1: Prior to the patient arrival, the buffer zone nurse ensured that personnel entering the radiological emergency area (REA) were issued a thermoluminescent dosimeter (TLD) and an electronic personal dosimeter (EPD). Once the checks were completed the initial reading was recorded on the Personnel Dosimetry Log for tracking and measuring the adsorbed dose during the medical treatment. Setup procedures were available and used by the buffer zone nurse to operationally check each EPD. The EPDs worn by the REA and buffer nursing staff were pre-set to alarm at the allowable dose limit of 200 mR. Following the end of the drill (through a separate interview), the buffer zone nurse thoroughly explained what steps would be taken if the EPD alarmed. It was also stated in the interview that only the supervisor, who will be directed by the Texas Department of State Health Services (DSHS), will give permission to exceed the allowable dose during an emergency situation.

The buffer zone nurse made sure the staff read their dosimeters, 4-5 times during the drill, as per the procedures to take readings at 30 minute intervals. The dosimetry for all the personnel involved was collected, read, and the final readings were recorded on the appropriate forms.

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During the closeout and exit demonstration the REA nursing staff returned all TLDs and EPDs to the buffer zone nurse, but not before being surveyed by the RPT for contamination.

Criterion 6.d.1: On November 6, 2007 a Medical Services Drill was held at the Walls Regional Hospital for treatment of a contaminated injured man from the Comanche Peak Nuclear Power Plant (CPNPP).

At 0920, a call was received on a normal telephone land line in the hospital emergency room from the CPNPP regarding the accident. An Emergency Room (ER) nurse briefed the ER head nurse with the info received which included: one possible contaminated patient; utility requested activation of the Radiological Emergency Area (REA); CPNPP Radiological Protection Technician (RPT) en route to hospital; and dispatched ambulance would call in with patient updates and estimated time of arrival (ETA).

At 0922, “Code Orange” was announced over the hospital loud speaker which alerted the staff of a radiological incident. Immediately the radiological staff proceeded to set-up the REA located in the emergency department. The equipment was stored in two locations, one was a storage room inside the hospital down the hallway from the ER and the other was a storage shed right outside the ER entrance.

Outside there were two hospital employees, maintenance engineers, that set-up the ambulance receiving area with stanchions, bungee cords, “contamination area,” “drill in progress,” and “keep out” signs. A corridor was set-up with the stanchions and bungee cords starting at the ambulance driveway area and continuing to the REA entrance, providing a designated path for movement of the patient from the ambulance to the treatment room. These two staff members remained outside and provided security until the drill was terminated, the area was secured, and they were released according to the plans and procedures.

The radiological equipment supply cart was retrieved from the ER supply storage room which required access via a combination key pad for security purposes. The supply room also had an outside access door; they moved the cart via the outside walkway to the REA, 20-25 feet away, which also had an outside entrance allowing for receipt of a contaminated patient without interfering with the normal emergency room access. The REA was stocked with the necessary medical equipment and supplies needed to treat the patient. Two large yellow trash cans with plastic liners for contaminated trash were retrieved from the storage shed; one was placed in the REA and the other was in the buffer zone area. Radiological treatment and safety procedures posters were placed throughout the treatment area.

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At 0930, an update call was received from the ambulance that provided the following information: patient vitals indicating he was in stable condition, possible contamination, possible left leg fracture, and estimated ETA of 20 minutes.

The doctor and nursing staff donned their personal protective equipment (PPE) which consisted of the Orex® suits, plastic aprons, booties, double surgical gloves (different colors), and they were issued their dosimetry by the buffer zone nurse who used the dosimetry log sheet for tracking purposes. The staff, however, did not don their cap or protective face mask as stated in their procedures. This issue was brought up to the lead controller, but the drill play was not stopped. This item was also brought up during the hotwash meeting between the Federal evaluators and the hospital staff. All dosimetry was checked and zeroed out by each individual (using the procedure card

instructions), indicating they were knowledgeable on radiological safety procedures.

Upon arrival at the hospital, the plant RPT reviewed the dosimetry and contamination control procedures with the doctor and nursing staff. In addition to checking the contamination control procedures, the RPT completed an additional response source check before using the survey meter again. This RPT would remain in the buffer zone area to assist throughout the drill. At 0950, the set-up of the REA and the ambulance receiving areas were complete and the ER staff was ready to receive the patient. The RPT completed a second walk-through of the outside setup to reassure the setup was completed properly.

At 1010, the ambulance arrived at the hospital. The patient was rolled out into the receiving area, and the crew and RPT briefed the hospital RPT, doctor and nursing staff on the patient's condition and radiological status. It was determined that the patient did not have open wounds or life threatening injures and the doctor would remain in the buffer zone area; if needed she would enter the REA. Two nurses and the ambulance RPT accompanied the patient in the REA and conducted an initial medical assessment confirming that they could proceed with the decontamination process.

Throughout the treatment of the patient, there was good interaction between the REA nurses, doctor, buffer zone nurse and RPTs. The REA nurses were aware of the need to maintain good contamination control while at the same time ensuring proper medical care for the patient. The doctor interjected several times, asking the REA nurses to check the patient's vitals, injuries and pain comfort levels, and pain medication was administered twice during the treatment. The buffer zone nurse checked if a portable x-ray machine was needed, and it was decided after discussion with the REA nurses and doctor that the patient would be moved to radiology for x-ray after decontamination had been completed.

The contamination on the patient's hands and forearms had been smartly wrapped in plastic bags with ties by the ambulance crew. The nurses placed a orange plastic liner around the left hand and forearm to prepare for decontamination efforts. The RPT monitored the left and right hand and forearm and confirmed 10,000 – 12,000 cpm. They used wet cotton wipes to remove the contamination. After the first and second attempts, using the wipes, the contamination levels were down to 1,000 cpm. After two additional attempts, the contamination was removed. During the decontamination process, the RPT had one of the REA nurses collect a used swipe so that it could later be further analyzed for a qualitative bioassay. They used the same process to remove

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the contamination from the right hand and forearm. The nurses changed their gloves often and were careful to discard tools and materials that had come in contact with the patient.

The next step was to check the patient's back for abrasions and contamination. They were careful to roll over the patient on his right side, avoiding further injury to the fractured left leg. The clothing was cut off the patient to remove any contaminated material. The RPT monitored the patient and confirmed 3000 cpm on the right shoulder area. He worked with the nurses to cut away the shirt in such a manner as to avoid cross-contamination. Again, the nurses used wet cotton wipes to remove the contamination. The REA nurses showed proper decontamination technique by wiping toward the contamination protecting the clean area from further contamination. The RPT cautioned against rolling the clothing back up next to uncontaminated areas on the patient's body when removing clothing, sheets/blankets and the backboard.

The nurses changed their gloves after touching the patient or his clothing throughout the physical exam and decontamination process. The RPT provided good information on the contamination levels and the location of the contaminated areas. The RPT conducted a complete body survey on the patient who was found free of contamination. The doctor and REA nurses concurred that the patient be transferred from the REA to a normal treatment area where further medical evaluation, including x-rays could continue. The RPT performed a survey of the gurney with a Masslin® wipe of the floor and determined they were free of contamination. The buffer zone nurse rolled out a white Herculite floor covering into the REA, and a second gurney was brought in to provide for transfer of the patient. The buffer zone nurse ensured that no one stepped across the clean path and made sure that appropriate glove changes took place to prevent cross-contamination during transfer. The patient was transferred onto the clean stretcher and removed from the REA.

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One of REA nurses demonstrated removal of the PPE clothing. The nurse followed the undressing procedure as per the plan and was assisted in the process by both of the RPTs from the plant. An Emergency Room Outpatient Record was completed indicating symptoms, vital signs, and treatment of the patient.

Following patient transfer and completion of the REA staff exiting procedures, a detailed discussion was held with the RPT on how the decontamination area would be restored to normal access. The RPT demonstrated thorough knowledge in the procedures for controlling the contaminated waste and in conducting the necessary surveys to restore

the area for normal use. It was noted at this time that the rope barrier separating the buffer zone from the REA was left hanging for a long period of time. The RPT responded that he would not have let anyone leave the REA without frisking them and finally the RPTs would survey each other.

The buffer zone nurse, from the beginning of the drill to the end, maintained good medical and radiological contamination records of the patient, as well as, the personnel dosimetry log records. These records were provided by the buffer zone nurse to the evaluation team following the duration of the drill.

At 1110, the drill was terminated.

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

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APPENDIX 1

ACRONYMS AND ABBREVIATIONS

CPNPP	Comanche Peak Nuclear Power Plant
DHS-FEMA	Department of Homeland Security-Federal Emergency Management Agency
DRD	Direct Reading Dosimeter
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ER	Emergency Room
GE	General Emergency
NRC	Nuclear Regulatory Commission
RAC	Regional Assistance Committee
REA	Radiological Emergency Area
REP	Radiological Emergency Preparedness
RPT	Radiological Protection Technician
TLD	Thermoluminescent Dosimeter

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APPENDIX 2

DRILL EVALUATORS AND TEAM LEADERS

DATE: 2007-11-06, SITE: Comanche Peak Nuclear Power Plant, TX

LOCATION	EVALUATOR	AGENCY
Hood County Emergency Operations Center and Traffic/Access Control Point	*Chad Johnston	DHS/FEMA
Granbury/Hood County Emergency Medical Service Inc.	*Marilyn Boots	DHS/FEMA
Walls Regional Hospital	Bill Bischof Chad Johnston *Elsa Lopez	DHS/FEMA DHS/FEMA DHS/FEMA
* Team Leader		

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APPENDIX 3

Evaluation Areas, Extent of Plays, Scenarios and Timelines

WALLS REGIONAL HOSPITAL
MS-1 HOSPITAL DRILL
NOVEMBER 6, 2007

1.0 Introduction

This drill will verify that the Walls Regional Hospital Radiological Emergency Area and personnel assigned to care for contaminated injured patients can meet FEMA MS-1 requirements. The drill will also verify that the Granbury*Hood County EMS Ambulance personnel can interface with the MS-1 hospital.

2.0 FEMA Evaluation Criteria

1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI) and other supplies are sufficient to support emergency operations. (NUREG-0654, H., J.10.a.b.e.f.j.k., 11, K.3.a.)

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 dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.)

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

3.0 Guidelines

The following guidelines have been developed to instruct drill participants of the extent of play required to fulfill the drill evaluation criteria.

1. Drill lead controller is responsible for conducting the drill per the drill package.

2. Controllers will be assigned as needed to ensure the completion of drill objectives.

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3. This is a FEMA evaluated drill. Therefore, prompting is not permitted.

4. On-the-spot corrections are allowed in accordance with Recommended Initiative 1.5-Correct Issues Immediately (March 31, 2000)

5. The controllers should allow free-play. However, free-play will be stopped under the following conditions:

   a. if the action taken would prevent a drill evaluation criterion from being met or is outside the scope of the drill.

   b. if the actions are judged to be unsafe or leading to violations of the law.

   c. if the actions would degrade systems or equipment, or degrade response to a real emergency.

6. If an actual emergency occurs, the drill will be terminated.

7. All radio and telephone communications will begin and end with **THIS IS A DRILL.**

8. All signs and postings at the hospital should be marked either **FOR TRAINING USE ONLY** or **DRILL IN PROGRESS.**

4.0 Extent of Play

These guidelines define the extent of play required to meet an objective and identify planned simulations.

Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI) and other supplies are sufficient to support emergency operations. (NUREG-0654, H., J.10.a.b.e.f.j.k., 11, K.3.a.)

No exceptions are requested.

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 dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.)

No exceptions are requested.

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

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K.5.a.b., L.1., 4.)

The Granbury*Hood County EMS ambulance and the Radiation Protection Technicians from CPNPP will pre-stage at Buddy Stewart Park in Cleburne.

All decontamination will be demonstrated to the extent necessary to satisfy evaluator concerns. All medical procedures will be simulated except for decontamination of wounds and or abrasions.

All contamination levels will be via controller inject. Free play of this activity is not permitted.

5.0 Participants

This drill will require the participation of the following agencies:

Walls Regional Hospital Emergency Room Staff
Walls Regional Hospital Support Staff as needed
Granbury*Hood County EMS Ambulance Personnel
(2) Radiation Protection Technicians from CPNPP

6.0 Controller and Role Players

A minimum of four (4) controllers will be required for this drill.

One (1) role player victim will be required for this drill

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7.0 Initial Conditions

During the response to an accident at CPNPP with a release of radioactive material to the atmosphere, a radiation protection technician on a field team was struck by a passing vehicle and injured. The area in which they were collecting field samples is not contaminated; however, the team has been in some contaminated areas. The Granbury*Hood County EMS Ambulance has been dispatched to pick up and transport the injured person. The victim is conscious and complaining of pain and a lack of mobility in the left leg as well as suffering bruises to hands, arms and torso.

8.0 Narrative Summary

The ambulance arrives at the scene and after evaluating the patient transports same to Walls Regional Hospital. The ambulance communicates patient data and the fact that the patient is possibly contaminated.

Walls Regional Hospital is contacted and activates their Radiation Emergency Area (REA). The victim is transported to Walls Regional Hospital via the

Granbury*Hood County EMS Ambulance. According to CPNPP procedure and Walls Regional Hospital procedures, a Radiation Protection Technician was dispatched to the hospital ahead of the ambulance and another is accompanying the victim in the ambulance.

9.0 Time Line

0900 Drill begins (Notification to Walls Regional Hospital received from CPNPP).

0930 RP Tech arrives at Walls Regional Hospital

0945 Ambulance arrives at Walls Regional Hospital

1015 Drill terminates

1030 Critique

1200 Activities Concluded

10.0 Facility Addresses

Buddy Stewart Park
Located West of Walls Regional Hospital at the juncture of the service road with US-67 on the far West side of Cleburne.

Walls Regional Hospital
201 Walls Drive
Cleburne, TX 76031

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MS-1 Hospital Drill November 6, 2007
MESSAGE 1

TIME: 0900

FROM: CPSES Control Room

TO: Walls Regional Hospital Emergency Room

TEXT:

THIS IS A DRILL!

THIS IS THE COMANCHE PEAK STEAM ELECTRIC STATION CONTROL ROOM. A POSSIBLE CONTAMINATED INJURED PATIENT IS BEING TRANSPORTED TO YOUR FACILITY BY GRANBURY*HOOD COUNTY EMS.

THE PATIENT IS LIKELY, REPEAT, LIKELY RADIOLOGICALLY CONTAMINATED. PLEASE ACTIVATE YOUR RADIATION EMERGENCY AREA FOR RECEIPT OF THE PATIENT.

MY CALL BACK NUMBER IS 817-559-4360.

THE AMBULANCE WILL CONTACT YOUR FACILITY WHEN EN-ROUTE. A RADIOLOGICAL PROTECTION TECHNICIAN IS EN-ROUTE TO THE HOSPITAL TO ASSIST YOU WITH PREPARATION FOR RECEIPT OF THE PATIENT. ANOTHER IS ACCOMPANYING THE PATIENT.

PLEASE GIVE ME YOUR NAME FOR THE LOG.

THANK YOU.

THIS IS A DRILL.

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MS-1 Hospital Drill November 6, 2007

MESSAGE 2

TIME: 0910

FROM: Granbury*Hood County EMS Ambulance
TO: Walls Regional Hospital Emergency Room

TEXT:

THIS IS A DRILL!

THIS IS GRANBURY*HOOD COUNTY EMS EN-ROUTE WITH A MALE PATIENT APPROXIMATELY 30 YEARS OF AGE WITH A BROKEN LEFT FEMOR, BRUISES AND ABRASIONS. THIS PATIENT IS ALSO RADIOLOGICALLY CONTAMINATED.

PATIENT VITAL SIGNS ARE AS FOLLOWS:
BP = 135/90
Respiration = 30
Pulse = 115
Conscious / Reactive

OUR ETA IS 20 MINUTES.

THIS IS A DRILL!

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REMEDIAL DRILL
RELATING TO DEFICIENCY ASSESSED AGAINST HOOD COUNTY DURING REP EXERCISE CONDUCTED ON AUGUST 29, 2007
November 6, 2007

1.0 Introduction

This drill will verify that the Hood County Emergency Response Organization can effectively implement Protective Action Decisions (PAD's) for Special Populations..

2.0 FEMA Evaluation Criteria

2.c.1: Protective action decisions are made, as appropriate, for special population groups. (NUREG-0654, J.9; J.10.d,e.)

3.0 Guidelines

The following guidelines have been developed to instruct drill participants of the extent of play required to fulfill the drill evaluation criteria.

1. Drill lead controller is responsible for conducting the drill per the drill package.

2. Controllers will be assigned as needed to ensure the completion of drill objectives.

3. This is a FEMA evaluated drill. Therefore, prompting is not permitted.

4. On-the-spot corrections are allowed in accordance with Recommended Initiative 1.5-Correct Issues Immediately (March 31, 2000)

5. The controllers should allow free-play. However, free-play will be stopped under the following conditions:

   a. if the action taken would prevent a drill evaluation criterion from being met or is outside the scope of the drill.

   b. if the actions are judged to be unsafe or leading to violations of the law.

   c. if the actions would degrade systems or equipment, or degrade response to a real emergency.

6. If an actual emergency occurs, the drill will be terminated.

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7. All radio and telephone communications will begin and end with **THIS IS A DRILL.**

4.0 Extent of Play

These guidelines define the extent of play required to meet an objective and identify planned simulations.

Criterion 2.c.1: Protective actions for special needs individuals will be considered at the Hood County EOC. However, actual demonstration of protective actions will not be performed. Hood County EOC staff will demonstrate this evaluation area through discussion and showing the evaluator a roster of special needs individuals in the part of Hood County contained in the 10-mile emergency planning zone . (NUREG-0654, J.9; J.10.d,e.)

5.0 Participants

This drill will require the participation of the following individuals:

Hood County Emergency Management Director
Hood County Emergency Management Coordinator
Hood County Law Enforcement
Hood County Communications

6.0 Controller and Role Players

One (1) controller will be required for this drill.

7.0 Initial Conditions

During a declared emergency at Comanche Peak (A General Emergency), the Hood County EOC has received a recommendation from the plant to evacuate Zones 4A, 4B, 1B and 1A.

8.0 Narrative Summary

The EOC is assumed to be fully staffed and the incident at Comanche Peak has been ongoing for a period of time. The event has now escalated to a General Emergency. A Controller inject (Notification Message Form) to the Hood County EOC will initiate the drill (see message 1 attached). The EOC Staff will determine and simulate contacting the special needs populations identified within the affected zones. The EOC Staff will then, via discussion, answer any questions that the evaluator may have.

9.0 Time Line

1330 Drill begins with Notification Message Form delivered to the EOC

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Communications Staff Member.

1400 Drill terminates

10.0 Facility Addresses

Hood County EOC

400 North Gordon
Granbury, TX 76048

Point of Contact: Roger Deeds

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ATTACHMENT 1

MESSAGE 1

TO: Hood County EOC

FROM: Comanche Peak

TIME: 1330

THIS IS A DRILL!

SEE ATTACHED NOTIFICATION MESSAGE FORM

THIS IS A DRILL

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APPENDIX 5

PLANNING ISSUES

1. Walls Regional Hospital

ISSUE NO.: 14-07-6d1-P-01

CONDITION: The doctor and nursing staff donned their personal protective equipment (PPE) which consisted of the Orex® suits, plastic aprons, booties, double surgical gloves (different colors) and were issued their dosimetry by the buffer zone nurse who used the dosimetry log sheet for tracking purposes. The staff, however, did not don their cap or protective face mask as stated in their procedures. In discussions following the drill, it was identified that hospital protocols had been changed to no longer require the use of the cap and protective face mask.

POSSIBLE CAUSE: Procedure had not been updated to reflect current hospital protocol.

REFERENCE: NUREG 0654, L.1; Walls Regional Hospital, Handling of Radiation Accident Patients at Support Hospitals, Attachment 1.

EFFECT: Errors in dressing out may result in cross contamination to the responders.

RECOMMENDATION: Revise the plan to follow current medical protocols. Review training and procedures to ensure that the staff is aware of the personal protective clothing requirements.

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