South Texas Project
Medical Services Drill

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Executive Summary

On August 31, 2023, the Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), Region 6, evaluated the Matagorda Regional Medical Center and Matagorda County Emergency Medical Services for the South Texas Project, located near Wadsworth, Texas.

During the medical services drill, FEMA assessed the ability of state and local officials to implement plans and procedures to protect the public in the event of a radiological incident. This drill is part of the FEMA Radiological Emergency Preparedness Program. This program ensures that adequate capabilities exist to prevent, protect against, mitigate the effects of, respond to, and recover from incidents involving commercial nuclear power plants. This drill implemented the revised NUREG 0654/FEMA-REP-1, Rev. 1 document and the 2016 Radiological Emergency Preparedness Program Manual (RPM).

This report contains the final written evaluation of the drill. The state and local organizations demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. There were no Level 1 Findings, Level 2 Findings, or Plan Issues identified.

Section 1: Exercise Overview

Name	2023 South Texas Project Medical Services Drill
Dates	August 31, 2023
Purpose	The purpose of the medical services drill was to assess the level of preparedness of offsite response organizations to respond to a simulated radiological emergency.
Mission Area(s)	Protection Response
Core Capabilities	Operational Coordination Environmental Response/Health and Safety Public Health, Health Care, and Emergency Medical Services Screening, Search and Detection
Objectives	Emergency Operations Management Exposure Control Operate
Threat or Hazard	Release of radiological materials from a commercial nuclear power plant.
Scenario	This drill required coordinated decisions of offsite response organizations (OROs) to address a radiological hazard from an emergency at the South Texas Project (STP). The OROs demonstrated the implementation of protective actions to preserve health and safety of the public due to a potential or actual offsite release of radioactive materials from STP.
Participating Organizations	A complete list of participating agencies and organizations is attached in Appendix A.

Section 2: Analysis of Capabilities

2.1 Summary Results of Assessment

Table 1 below lists the assessment areas, criteria, selected core capabilities, and status of each capability target evaluated.

Each jurisdiction and functional entity were evaluated based on the demonstration of core capabilities and capability targets. The demonstration status of the capability targets is indicated using the following terms:

- **Met (M):** The jurisdiction or functional entity performed all activities under the objective/capability target to the level required per the work plan and/or the extent of play agreement, with no Level 1 or Level 2 Findings evaluated under that objective/capability target during the current activity and no unresolved prior Level 2 Finding(s).
- **Level 1 Finding (L1):** An observed or identified inadequacy of organizational performance during an assessment activity that could cause a determination 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.
- **Level 2 Finding (L2):** An observed or identified inadequacy of organizational performance during an assessment activity that is not considered, by itself, to adversely impact public health and safety.
- **Plan Issue (P):** An observed or identified inadequacy in the OROs emergency plan/implementing procedures, rather than in that of the OROs performance.
- **Not Demonstrated (N):** For a justifiable reason, the jurisdiction or functional entity did not perform assessment activities under the objective/capability target as specified in the extent of play agreement.
- **Not Applicable (N/A):** The objective/capability target does not apply to the jurisdiction.

Table 1. Summary Results of Criteria

Venue	Criterion	Core Capabilities	Status
Assessment Area 1: Emergency Operations Management			
Matagorda Regional Medical Center	1.e.1	Environmental Response/Health and Safety	M
Matagorda County EMS	1.e.1	Environmental Response/Health and Safety	M
Assessment Area 3: Protective Action Implementation			
Matagorda Regional Medical Center	3.a.1	Operational Coordination, Environmental Response/Health and Safety	M
Matagorda County EMS	3.a.1	Operational Coordination, Environmental Response/Health and Safety	M
Assessment Area 6: Support Operations/Facilities			
Matagorda Regional Medical Center	6.d.1	Public Health, Health Care, and Emergency Medical Services; Screening, Search and Detection	M
Matagorda County EMS	6.d.1	Public Health, Health Care, and Emergency Medical Services; Screening, Search and Detection	M

2.2 Results of Exercise Evaluation

Matagorda Regional Medical Center

Assessment Area 1: Emergency Management Operations
Criterion 1.e.1: Equipment and Supplies to Support Operations

Assessment Area 3: Protective Action Implementation
Criterion 3.a.1: Implementation of Emergency Worker Exposure Control

Assessment Area 6: Support Operations/Facilities
Criterion 6.d.1: Transportation and Treatment of Contaminated Injured Individuals

In summary, the status of DHS/FEMA capability targets for this location are as follows:

a. MET: 1.e.1, 3.a.1, 6.d.1
b. LEVEL 1 FINDING: None
c. LEVEL 2 FINDING: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

Matagorda County Emergency Medical Services

Assessment Area 1: Emergency Management Operations
Criterion 1.e.1: Equipment and Supplies to Support Operations

Assessment Area 3: Protective Action Implementation
Criterion 3.a.1: Implementation of Emergency Worker Exposure Control

Assessment Area 6: Support Operations/Facilities
Criterion 6.d.1: Transportation and Treatment of Contaminated Injured Individuals

In summary, the status of DHS/FEMA capability targets for this location are as follows:

a. MET: 1.e.1, 3.a.1, 6.d.1
b. LEVEL 1 FINDING: None
c. LEVEL 2 FINDING: None

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

Appendix A: Participating Organizations

Participating Organizations

State Organizations
Texas Department of State Health Services
Risk Jurisdictions
Matagorda County
Private Organizations
Matagorda Regional Medical Center
Matagorda County Emergency Medical Services
South Texas Project

Appendix B: Planning and Evaluation Team

Planning Team

Planners		
Title/Position	Name	Agency
Regional Assistance Committee Chair	Oscar Martinez	FEMA Region 6
Federal Planning Team Lead Senior Site Specialist	Timothy Pflieger	FEMA Region 6
State Planning Team Lead Emergency Planner	Vanessa Danese	DSHS
Licensee Planning Team Lead Emergency Response Specialist Consultant/Planner	Stacia Taylor	STP

Evaluation Team

Team Leaders and Evaluators		
Venue/Location	Evaluation Team	Agency
Matagorda Regional Medical Center	Timothy Pflieger * Melisa Ogrodnik	FEMA Region 6 FEMA Region 6
Matagorda County Emergency Medical Services	Misty Chance	FEMA Region 6
* Team Leader		

Appendix C: Acronyms and Abbreviations

Acronym	Description
BZ	Buffer Zone
CPM	Counts Per Minute
DSHS	Department of State Health Services
DHS	Department of Homeland Security
DRD	Direct Reading Dosimeter
FEMA	Federal Emergency Management Agency
KI	Potassium Iodide
MCEMS	Matagorda County Emergency Medical Services
MRMC	Matagorda Regional Medical Center
ORO	Offsite Response Organizations
PPE	Personal Protective Equipment
PRD	Permanent Record Dosimeter
REA	Radiation Emergency Area
RO	Radiological Officer
RPM	Radiological Emergency Preparedness Program Manual
STP	South Texas Project
TLD	Thermoluminescent Dosimeter

Appendix D: Extent of Play Agreement and Scenario

Exercise Evaluation Areas and Extent of Play Agreement

The Evaluation Areas applicable to this exercise are taken from the Federal Emergency Management Agency (FEMA) Evaluation Area Criterion for Medical Exercises. The extent of play follows the criterion in these documents. Any exception to the Evaluation Area is noted with the Evaluation Area and extent of play.

Successful demonstration of this exercise criterion will satisfy the requirements for the following HSEEP Core Capabilities as per the FEMA REP Program Manual dated January 2016, Part IV.H: Integration of REP Demonstration Criteria and Core Capabilities.

EVALUATION AREA 1.e.1 – EQUIPMENT, MAPS, DISPLAYS, MONITORING INSTRUMENTS, DOSIMETRY, POTASSIUM IODIDE (KI), AND OTHER SUPPLIES ARE SUFFICIENT TO SUPPORT EMERGENCY OPERATIONS. (NUREG-0654/FEMA-REP-1, H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b)

CORE CAPABILITY: Environmental Response/Health and Safety

OBJECTIVE: MRMC and MCEMS demonstrate that supplies, equipment, displays, and personal protective equipment are available for ensuring responder health and safety.

OBJECTIVE: Verify that instruments are operationally checked before use.

OBJECTIVE: Verify that instruments are calibrated in accordance with manufacturers recommendations, and that there is a label indicating calibration on each instrument.

OBJECTIVE: Sufficient quantities of appropriate electronic personal dosimeters (EPDs) and permanent record dosimetry (PRDs) are available for issuance to all categories of emergency workers deployed by each facility.

EXTENT OF PLAY

Demonstration of this evaluation area will be in accordance to plans and procedures.

Correction on the spot is requested.

Demonstration Criterion will be met during an in-person assessment.

Administration of KI will not be demonstrated.

EVALUATION AREA 3.a.1 – IMPLEMEMTATION OF EMERGENCY WORKER EXPOSURE CONTROL – OROS ISSUE APPROPRIATE DOSIMETRY, KI, AND PROCEDURES, AND MANAGE RADIOLOGICAL EXPOSURE TO EMERGENCY WORKERS IN ACCORDANCE WITH THE PLANS/PROCEDURES. (NUREG-0654/FEMA-REP-1, J.10.e; K.3.a, b; K.4)

CORE CAPABILITY: Operational Coordination

OBJECTIVE: MRMC and MCEMS will issue appropriate dosimetry and procedures and manage radiological exposure.

CORE CAPABILITY: Environmental Response/Health and Safety

OBJECTIVE: Emergency workers will periodically and at the end of each mission read their dosimetry and record the readings on the appropriate exposure record or chart.

EXTENT OF PLAY

If Potassium Iodide (KI) is not recommended, administration and record-keeping of KI can be demonstrated by interview. An interview will be conducted on the knowledge of KI, where to obtain it, who authorizes it, and record keeping. Ingestion of KI will not occur.

Demonstration Criterion will be met during an in-person assessment.

Correction on the spot is permitted with issues related to dosimetry use, reading dosimetry, alarm set points and record keeping.

EVALUATION AREA 6.d.1 – TRANSPORTATION AND TREATMENT OF CONTAMINATED INJURED INDIVIDUALS (NUREG-0654/FEMA-REP-1, F.2; H.10; K.5.a, b; L.1, 4)

CORE CAPABILITY: Public Health, Health Care, and Emergency Medical Services

OBJECTIVE: MRMC and MCEMS demonstrate that they have adequate space, resources, and trained personnel to provide transport and medical services to contaminated, injured individuals.

CORE CAPABILITY: Screening, Search and Detection

OBJECTIVE: MRMC and MCEMS demonstrate that they can provide monitoring and decontamination to contaminated, injured individuals.

EXTENT OF PLAY

The patient will be staged at the Palacios Ambulance Barn (1510 4th Street Palacios, Texas 77465) until the ambulance arrives. This location is simulating the Palacios Reception Center.

Monitoring and decontamination of the Radiation Emergency Area in order to place the room back into full service will be demonstrated through interview.

Correction on the spot is permitted with issues related to the adequacy of vehicles, equipment, and procedures, decontamination techniques, cross contamination issues for personnel transporting and treating contaminated injured or exposed individuals. Correction on the spot is requested.

Narrative Summary and Event Timeline

An Alert is declared by STP based on the failure of the reactor to automatically shut down; however, a manual shutdown was successful. Matagorda County Sheriff Dispatch contacts the Emergency Operations Center (EOC) emergency workers to respond immediately to the EOC. The Radiological Director and the Matagorda County Hospital District representative are included in this call-out.

Conditions further degrade at the Station, and a Site Area Emergency is declared by STP due to a loss of both fuel clad and the reactor coolant system. The County and Station officials discuss the potential need to open a Reception Center to receive the evacuated non-essential Station employees for monitoring. It is determined the Palacios Reception Center will be opened as a precautionary measure. The Radiological Director and the Matagorda County Office of Emergency Management (MCOEM) Coordinator request the Environmental Health Department, DSHS, and MCOEM staff respond and activate the Reception Center.

County and Station officials discuss the potential need to send Station employees to the Reception Center for monitoring and decontamination purposes. The Station determines this is not required and Station non-essential employees will be evacuated to their homes. County officials decide to continue the activation of the Reception Center as a precautionary measure.

Conditions continue to degrade, and the Station declares a General Emergency based on the loss of all three fission product barriers with a release of radioactive material via the main steam line. A Protective Action Recommendation is communicated to the Emergency Director, and the decision is made by the county to evacuate all residents 10-miles down-wind of the plant. Eventually, plant personnel are successful in ending the offsite radiological release.

A Matagorda County Emergency Worker (MC Sheriff's Officer) is directing traffic at the Reception Center when a member of the general public arriving at the Reception Center prior to driving thru a radiation plume fails to control his speed and comes in contact with the officer. The officer is knocked down which causes a laceration on the right forearm and a large bump on the head. She appears disoriented and in pain.

The Environmental Health Director requests the Monitoring and Decontamination Supervisor to contact the Matagorda County EOC for an ambulance. The ambulance unit located in Palacios is on a call-out and not available (simulated), resulting in a unit from Bay City being dispatched (unit will be pre-staged in Palacios). When the Matagorda County EMTs arrive, they evaluate medical conditions and determine the individual needs to be transported to an offsite medical facility, as the laceration on her right forearm is bleeding and her head is bruising/swollen. The EMTs contact the Matagorda Regional Medical Center Emergency Room that a potential

contaminated patient is being transported to the hospital. Palacios Community Medical Center is on drive by status which requires transport to MRMC.

A Matagorda County radiological monitor located at the Reception Center is assigned to monitoring the injured Matagorda County Emergency Worker.

Once surveyed by radiological monitor, the injured Matagorda County Emergency Worker is found to have 500 - 1000 cpm ($\beta\gamma$) on clothing and exposed skin (refer to Figure 10.0-1.) If the patient's contaminated clothing is removed, skin contamination remains (refer to Figure 10.0-2.).

Upon arrival of the ambulance, the radiological monitor/EMT provides a briefing to Matagorda County Emergency Medical Services (MCEMS) crew regarding the patient's condition. A Reception Center Matagorda County radiological monitor accompanies the patient and provides radiological information and contamination control. Matagorda County requests two additional monitors. These individuals are called out and directed to report to the MRMC. DSHS is providing a radiological operations support specialist to provide assistance to the hospital as needed.

In route, the hospital is appraised of the patient's physical and radiological condition.

Upon hospital arrival, the Reception Center radiological monitor and ambulance attendants brief the emergency room staff. Upon completion of the briefing, the attendants turn the injured patient over to emergency room staff care. The Reception Center radiological monitor who travels with the ambulance stays with the vehicle to monitor, and decontaminate, if required. Prior to the release of the ambulance, the Reception Center radiological monitor will survey the crew and their equipment.

The hospital staff provides initial treatment and decontamination. Medical treatment will take priority over contamination. Decontamination techniques will be demonstrated. Once the patient is stabilized, treated, and decontaminated, the patient will be transferred out of the Radiological Emergency Area (REA) using recognized transfer techniques for standard admittance to the hospital.

Once the patient is transferred, the hospital staff inside the REA will appropriately doff their protective clothing ensuring control of contamination.

TIME	SEQUENCE OF EVENTS	MESSAGE NUMBER
8:30	Initial conditions established.	1
8:35	The telephone cell implements storyboard information.	2
	CONTROLLER NOTE Communications with offsite for support will be made to Matagorda County Emergency Medical Services (MCEMS).	
8:40	The Matagorda County EOC (simulated phone cell) contacts Matagorda County Emergency Medical Services (MCEMS) at (979) 323-9020 and requests they respond to the Palacios Reception Center.	3
	CONTROLLER NOTE For more information on the injured Emergency Worker vital signs, refer to Table 10.0-2, Patient Performance Paths. For more information on the injured Emergency Worker radiological conditions, refer to Figures 10.0-1, Patient's Contamination-with Clothing, and 10.0-2, Patient's Skin Contamination.	
8:45	Matagorda Regional Medical Center directs the patient to MRMC for treatment, as PCMC is on drive by status. Ambulance arrives on scene.	4 & 5
9:00-9:15		

TIME	SEQUENCE OF EVENTS	MESSAGE NUMBER
9:30	*MCEMS contacts MRMC with known patient information including contamination levels.*	6
9:45	*MCEMS arrives at MRMC with the patient.*	
9:45	Patient is met by medical staff at the unloading area for medical briefing, initial treatment, and decontamination.	
9:50	Stabilization and decontamination of patient begins.	

CONTROLLER NOTE

For more information on patient contamination, refer to Table 10.0-1, Patient's Skin Contamination After Decontamination.

10:10	Matagorda County Emergency Medical Services personnel, vehicle, and equipment are monitored, decontaminated as needed, and released.	
10:25	Patient decontamination is complete.	
10:30	Patient is moved from REA for final treatment and hospital admittance. Hospital personnel exit decontamination room.	
10:35	Medical Exercise is terminated.	7
11:00	Critique begins.	

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