

Final After Action Report

Grand Gulf Nuclear Station

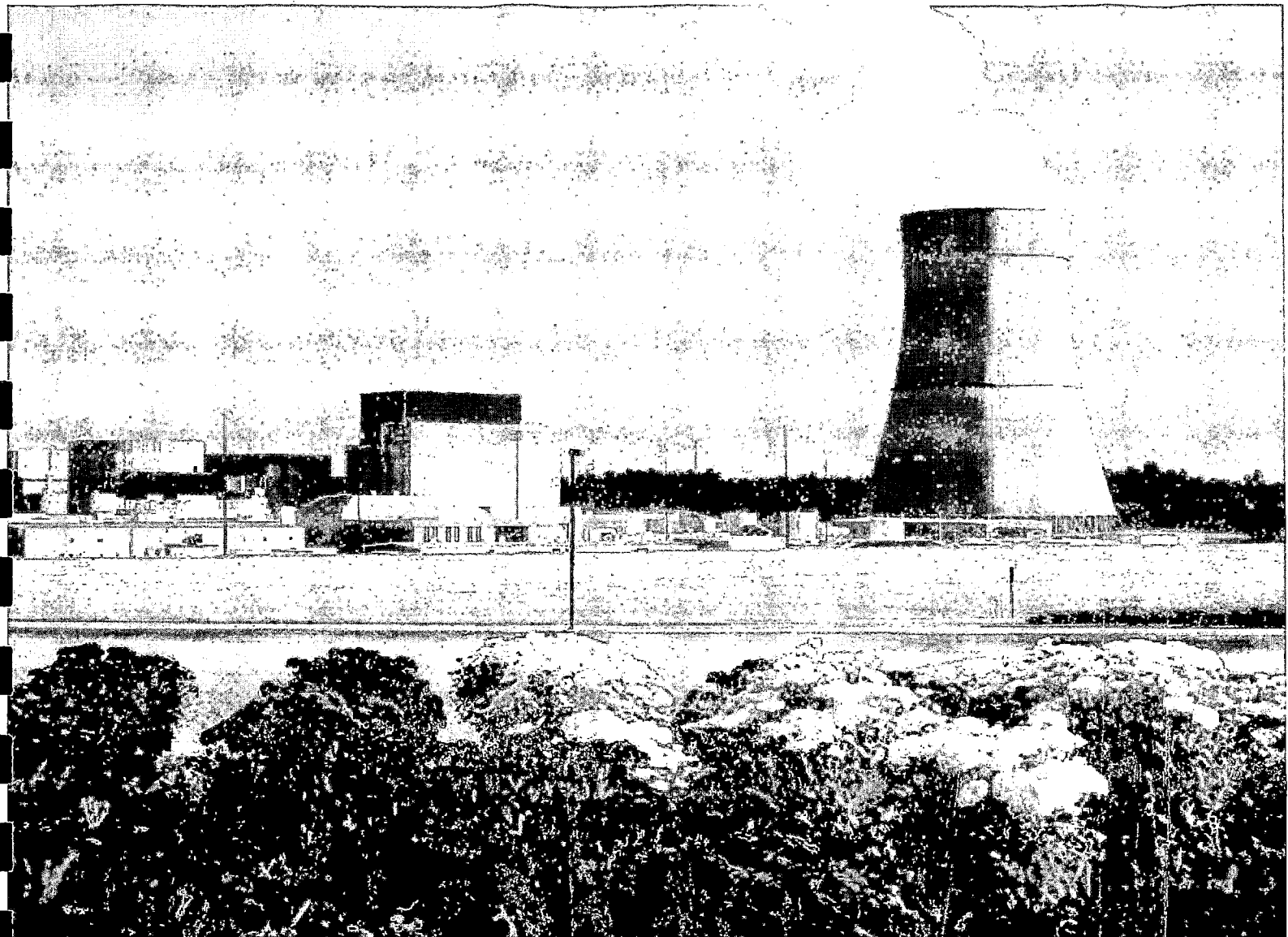
Radiological Emergency Preparedness Exercise

Exercise Date: March 13, 2019

March 16, 2020



FEMA



Final After Action Report

Grand Gulf Nuclear Station

Radiological Emergency Preparedness Exercise

Exercise Date: March 13, 2019

March 16, 2020



FEMA

This page is intentionally blank

Table of Contents

	Page
Table of Contents.....	3
Executive Summary.....	5
Section 1: Exercise Overview.....	7
1.1 Exercise Details	7
1.2 Exercise Planning Team Leadership	7
1.3 Participating Organizations	8
Section 2: Exercise Design Summary.....	11
2.1 Exercise Purpose and Design.....	11
2.2 Exercise Core Capabilities and Objectives	11
2.3 Exercise Scenario Summary	15
Section 3: Analysis of Capabilities.....	17
3.1 Exercise Evaluation and Results.....	17
3.2 Summary Results of Exercise Evaluation.....	17
3.3 Jurisdictional Summary Results of Exercise Evaluation	19
3.3.1 State of Mississippi.....	19
3.3.1.1 State Emergency Operations Center	19
3.3.1.2 Joint Information Center.....	21
3.3.2 Mississippi Department of Radiological Health.....	22
3.3.2.1 Department of Radiological Health / Dose Assessment.....	22
3.3.2.2 Field Team Management	25
3.3.2.3 Division of Radiological Health Field Team.....	29
3.3.2.4 Emergency Operations Facility Dose Assessment	32
3.3.3 Claiborne County.....	33
3.3.3.1 Emergency Operations Center.....	33
3.3.3.2 Emergency Worker and Decontamination.....	37
3.3.3.3 Traffic Control Point.....	38
3.3.4 Adams County	39
3.3.4.1 Emergency Operations Center.....	39
3.3.4.2 Reception Center and Congregate Care.....	40
3.3.5 Copiah County	41
3.3.5.1 Emergency Operations Center.....	41
3.3.5.2 Reception Center and Congregate Care.....	43
3.3.6 Hinds County	44
3.3.6.1 Emergency Operations Center.....	44
3.3.6.2 Reception Center and Congregate Care.....	45

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

3.3.7	Warren County.....	47
3.3.7.1	Emergency Operations Center.....	47
3.3.7.2	Reception Center and Congregate Care.....	48
3.3.7.3	Medical Drill: Vicksburg Fire Department & Ambulance Service.....	49
3.3.7.4	Medical Drill: The Merit Health River Region Medical Center.....	53
Section 4:	Conclusion.....	55
Appendix A:	Exercise Timeline.....	57
Appendix B:	Exercise Evaluators and Team Leaders.....	59
Appendix C:	Grand Gulf Extent of Play Agreement.....	61

Executive Summary

On March 13, 2019, the U.S. Department of Homeland Security/Federal Emergency Management Agency Region IV, Radiological Emergency Preparedness Program staff evaluated a full participation plume exercise for the Grand Gulf Nuclear Station.

The Grand Gulf Nuclear Station, operated by the Entergy Corporation is located in Claiborne County, 29 miles south of Vicksburg and seven miles north of Port Gibson. The 10-mile emergency planning zone encompasses portions of Claiborne County, Mississippi and Tensas Parish, Louisiana; it also includes a small-unpopulated portion of Warren County, Mississippi, which is managed by Claiborne County. FEMA Region VI issues a separate report on the evaluation of the Grand Gulf Nuclear Station exercise for Louisiana and Tensas Parish.

The evaluation of out of sequence activities during the weeks of February 14 and February 25, 2019 is included in this report. These activities included: traffic control interviews; reception centers; congregate care and sheltering; emergency worker decontamination; and a medical service drill. An evaluation of the demonstration for the correction of level 2 findings by the Mississippi State Department of Health on August 8, 2019 is also included in this report.

Federal Emergency Management Agency's overall objective of the exercise was to assess the level of State and local preparedness in coordinating and responding to a radiological emergency at the Grand Gulf Nuclear Station. The purpose of this report is to analyze exercise results, identify strengths to be maintained and built upon, identify potential areas for improvement, and support development of corrective actions.

This exercise was held in accordance with Federal Emergency Management Agency's policies and guidance concerning the exercise of State and local radiological emergency response plans and procedures. The evaluation team conducted this exercise using Homeland Security Exercise and Evaluation Program methodology. The previous Federal evaluated exercise was conducted on March 29, 2017. The qualifying joint emergency preparedness exercise was conducted on November 4-5, 1981.

Officials and representatives from the State of Mississippi; the risk county of Claiborne; the host counties of Adams, Copiah, Hinds and Warren; and numerous volunteers and other agencies participated in this exercise. These organizations demonstrated knowledge of their emergency response plans and procedures and implemented them

The Federal Emergency Management Agency did not identify any level 1 findings; however, five level 2 findings were identified.

Mississippi State Department of Health/Division of Radiological Health, finding 028-19-2.b.1-L2-01. Current and accurate information on plant and environmental conditions was not always available or used by Division of Radiological Health personnel when providing situational assessments and recommendations to decision makers. This finding was successfully resolved during the redemonstration on August 8, 2019;

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Mississippi State Department of Health/Division of Radiological Health, finding 028-19-3.a.1-L2-02. Radiological emergency response team members received radiation doses higher than necessary to perform tasks necessary to characterize the radiological plume. This finding was successfully resolved during the redemonstration on August 8, 2019;

Claiborne County, finding 028-19-5.b.1-L2-03. Claiborne County news releases were not observed to be coordinated with the Claiborne County Emergency Management Agency, the Mississippi Emergency Management Agency Emergency Operations Center, and the Joint Information Center. Nor were the news releases reviewed and approved by Claiborne County Emergency Management Agency Director prior to release to the public and news media;

Warren County, finding 028-19-3.a.1-L2-04. During the Medical Services Drill, the ambulance crew did not receive an emergency worker briefing prior to responding to a potentially contaminated patient;

Warren County, finding 028-19-6.d.1-L2-05. During the Medical Services Drill, the ambulance crew failed to implement proper contamination control processes. This led to the possible unnecessary spread of contamination onto the crew and patient.

During the 2017 exercise the Federal Emergency Management Agency identified three level 2 findings and two plan issues. During this exercise and August redemonstrations, findings 028-17-4.a.2-L2-03, 028-17-2.b.1-L2-02, and 028-17-5.b.1-L2-01; and issues 028-17-4.a.3-P-02 and 028-17-1.e.1-P-01 were resolved.

The Federal Emergency Management Agency will provide an Improvement Plan to the State of Mississippi that details the Strengths and Areas for Improvement observed during the exercise and explain the above findings in more depth. The Improvement Plan is published under a separate cover and classified "For Official Use Only" in compliance with Homeland Security Exercise and Evaluation Program standards.

The Federal Emergency Management Agency wishes to acknowledge the efforts of the many individuals who participated in the exercise and made it a success. The professionalism and teamwork of the participants was evident throughout all phases of the exercise.

Section 1: Exercise Overview

1.1 Exercise Details

Exercise Name

2019 Grand Gulf Nuclear Station Radiological Emergency Preparedness Exercise

Type of Exercise

Full-Scale Exercise

Exercise Date

March 13, 2019

Exercise Off-Scenario/Out-of-Sequence Dates

February 14, 25-28, 2019

Program

U.S. Department of Homeland Security, Federal Emergency Management Agency,
Radiological Emergency Preparedness Program

Mission

Response

Locations

Various, see Appendix C, extent-of-play agreement for exercise locations.

Scenario Type

Plume-Phase Radiological Emergency Preparedness Exercise

1.2 Exercise Planning Team Leadership

Robert Spence

South Section Chief

Federal Emergency Management Agency, Region IV

3003 Chamblee-Tucker Road

Atlanta, Georgia 30341

robert.spence@fema.dhs.gov

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Gerald McLemore
Emergency Management Specialist
Federal Emergency Management Agency, Region IV
3003 Chamblee-Tucker Road
Atlanta, Georgia 30341
gerald.mclemore@fema.dhs.gov

David Huttie
Deputy Administrator
Mississippi Emergency Management Agency
#1MEMA Drive
Pearl, Mississippi 39208
dhuttie@mema.ms.gov

Robert Goldsmith
Office of Radiological Emergency Preparedness
Mississippi Emergency Management Agency
#1MEMA Drive
Pearl, Mississippi 39208
rgoldsmith@mema.ms.gov

Karl Barber
Exercise Controller
Mississippi State Department of Health/Division of Radiological Health
570 E. Woodrow Wilson Dr.
Jackson, MS 39216
kbarber@msdh.ms.gov

1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the 2019 Grand Gulf Nuclear Station Radiological Emergency Preparedness Exercise.

State Jurisdictions:

- Mississippi Emergency Management Agency
- Mississippi State Department of Health, Division of Radiological Health
- Mississippi State Department of Health, State Health Officer
- Mississippi Department of Public Safety
- Mississippi Department of Transportation
- Mississippi Department of Agriculture and Commerce
- Mississippi Department of Environmental Quality
- Mississippi Department of Finance and Administration
- Mississippi Department of Human Services
- Mississippi Fire Marshal's Office

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Mississippi Association of Public Works
Mississippi Public Utilities Staff
Mississippi Military Department/National Guard
Mississippi Office of Homeland Security

Risk Jurisdiction:

Claiborne County

Claiborne County Emergency Management Agency
Claiborne County Board of Supervisors
Claiborne County Public Information Officer
Claiborne County Fire Department
Claiborne County Health Department
Claiborne County Hospital
Claiborne County Public Transportation
Claiborne County Road Department
Claiborne County Schools
Claiborne County Sheriff's Office
Claiborne County Welfare Department
Claiborne County Cooperative Service/Regional Coordinator
Port Gibson Mayor's Office
Port Gibson Police Department
Port Gibson Street Department
Hermanville Fire Department

Host Jurisdictions:

Adams County

Adams County Department of Emergency Management
Adams County Department of Human Services
Adams County Department of Health
Adams County Fire Department
City of Natchez Police Department
City of Natchez Fire Department
Natchez Regional Hospital
Natchez Fire and Rescue Department

Copiah County

Copiah County Emergency Management Agency
Copiah County Board of Supervisors
Copiah County Department of Transportation
Copiah County Fire Department
Copiah County Health Department
Copiah County Sheriff's Office
Crystal Springs Mayor's Office

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Hazlehurst Mayor's Office
Hazlehurst Emergency Medical Services
Hazlehurst Police Department
Hazlehurst School Districts

Hinds County

Hinds County Department of Emergency Management
Hinds County Emergency Operations Center
Hinds County Community College Police Department
Hinds County-Utica Volunteer Fire Department
Hinds County Public Works
Hinds County Public School District
Hinds County Health Department
Hinds County Sheriff's Office
Jackson Police Department
Jackson Fire Department
Raymond Fire Department
Clinton Police Department

Warren County

Warren County Department of Emergency Management
Warren County Volunteer Fire Department
Warren County Sheriff's Office
Warren County Police Department
Warren County Department of Human Services
Merit Health River Region Hospital
Vicksburg Police Department
Vicksburg Fire Department
Vicksburg Fire & Emergency Medical Services

Private Organizations:

Alcorn State University
American Red Cross, Southwest and Mississippi Region
Salvation Army
Entergy Incorporated
AMR Ambulance

Federal Agencies:

U.S. Coast Guard
U.S. Nuclear Regulatory Commission, Region IV

Section 2: Exercise Design Summary

2.1 Exercise Purpose and Design

The Federal Emergency Management Agency administers the Radiological Emergency Preparedness Program pursuant to the regulations found in Title 44 Code of Federal Regulations parts 350, 351, 352, 353 and 354. Title 44 Code of Federal Regulations part 350 codifies sixteen planning standards that form the basis for radiological emergency response planning for state, tribal, and local governments impacted by the emergency planning zones established for each nuclear power plant site in the United States. Nuclear Regulatory Commission regulations also codify the sixteen planning standards for the licensee. Title 44 Code of Federal Regulations part 350 sets forth the mechanisms for the formal review and approval of state, tribal, and local government radiological emergency response plans and procedures by the Federal Emergency Management Agency. One of the Radiological Emergency Preparedness Program cornerstones established by these regulations is the biennial exercise of offsite response capabilities. During these exercises, affected state, tribal, and local governments demonstrate their abilities to implement their plans and procedures to protect the health and safety of the public in the event of a radiological emergency at the nuclear plant.

The results of this exercise, together with review of the radiological emergency response plans, and verification of the periodic requirements set forth in NUREG-0654/FEMA-REP-1, along with supplements through the annual letter of certification and staff assistance visits, enabled the Federal Emergency Management Agency to provide a statement with the transmission of this final after action report to the United States Nuclear Regulatory Commission, that the affected state, tribal, and local plans and preparedness are: (1) adequate to protect the health and safety of the public living in the vicinity of the nuclear power facility by providing reasonable assurance that appropriate protective measures can be taken offsite in the event of a radiological emergency; and (2) capable of being implemented.

The State of Mississippi formally submitted the Radiological Emergency Response Plans for the Grand Gulf Nuclear Station to the Federal Emergency Management Agency, Region IV on May 22, 1981. The Federal Emergency Management Agency approved the plans pursuant to 44 Code of Federal Regulations 350 on June 23, 1983. The qualifying joint emergency preparedness exercise was conducted on November 4-5, 1981.

2.2 Exercise Core Capabilities and Objectives

Capabilities-based planning allows for exercise planning teams to develop exercise objectives and observe exercise outcomes through a framework of specific action items. Using the Homeland Security Exercise and Evaluation Program methodology, the exercise objectives meet the Radiological Emergency Preparedness Program requirements and encompass the programs emergency preparedness evaluation areas.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

The critical tasks to be demonstrated were negotiated with the State of Mississippi and the counties of Claiborne, Warren, Hinds, Adams, and Copiah. The core capabilities scheduled for demonstration during this exercise were:

Operational Coordination: Establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of Core Capabilities.

Operational Communications: Ensure the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.

Situational Assessment: Provide all decision makers with decision-relevant information regarding the nature and extent of hazards, any cascading effects, and status of response.

Public Information and Warning: Deliver coordinated, prompt, reliable, and actionable information to the whole community through the use of clear, consistent, accessible, and culturally and linguistically appropriate methods to effectively relay information regarding any threat or hazard and, as appropriate, the actions being taken and the assistance being made available.

Environmental Response/Health and Safety: Ensure the availability of guidance and resources to address all hazards including hazardous materials, acts of terrorism, and natural disasters in support of the responder operations and the affected communities.

On Scene Security, Protection and Law Enforcement: Ensure a safe and secure environment through law enforcement and related security and protection operations for people and communities located within the affected areas and also for response personnel performing lifesaving and life-sustaining operations.

Critical Transportation: Provide transportation (including infrastructure access and accessible transportation services) for response priority objectives, including the evacuation of people and animals, and the delivery of vital response personnel, equipment, and services into the affected areas.

Mass Care: Provide life-sustaining services to the affected population with a focus on hydration, feeding, and sheltering to those who have the most need, as well as support for reunifying families.

Public Health, Healthcare, and Emergency Medical Services: Provide lifesaving medical treatment via Emergency Medical Services and related operations and avoid additional disease and injury by providing targeted public health, medical and behavioral health support, and products to all affected populations.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

The Federal Emergency Management Agency radiological emergency preparedness objectives for this exercise were as follows:

Objective 1: Demonstrate the ability to provide direction and control and make protective action decisions through the state emergency operations centers; county emergency operations centers, and field activities by exercise play and discussion of plans and procedures.

Objective 2: Demonstrate the ability to provide protective action decisions affecting state and county emergency workers and public through exercise play and discussions of plans and procedures.

Objective 3: Demonstrate the ability to implement protective actions for state and county emergency workers and public through exercise demonstration.

Objective 4: Demonstrate the ability to perform plume-phase field measurements and analysis utilizing State field teams through exercise play and discussion of plans and procedures.

Objective 5: Demonstrate the ability to activate the prompt alert and notification system utilizing the prompt notification system and emergency alert system through exercise play.

Objective 6: Demonstrate the effectiveness of plans, policies, and procedures in the joint information center for joint (public and private sectors) emergency information communications.

Objective 7: Demonstrate the ability to monitor, decontaminate, register, and shelter evacuees and emergency workers.

Objective 8: Demonstrate the ability to provide dose projection and protective action decision making for the plume phase.

Objective 9: Demonstrate the ability to provide transport, monitoring, decontamination and medical services to contaminated injured patient.

The state of Mississippi radiological emergency program objectives for this exercise were as follows:

Objective 1: Demonstrate emergency operations management through mobilization, direction and control, communications processes and equipment and supplies to support emergency operations utilizing plans and procedures.

Objective 2: Demonstrate protective action decision making by employing emergency worker exposure control, dose assessment, protective action recommendations, protective action decisions, and consideration for the protection of persons with disabilities and access/functional needs for the emergency event in coordination with decision makers.

Objective 3: Demonstrate protective action implementation with implementation of emergency worker exposure control, implementation of a potassium iodide decision for institutionalized individuals and the public, implementation of protective actions for persons with disabilities and access/functional needs, and the implementation of traffic and access control as prescribed by plans and procedures.

Objective 4: Demonstrate field measurement and analyses by means of plume phase field measurements and analyses and post-plume phase field measurements and sampling as the situation dictates and in accordance with plans and procedures.

Objective 5: Demonstrate emergency notification/public information through activation of the prompt alert and notification system and emergency information and instructions for the public and media in relation to established plans and procedures.

Objective 6: Demonstrate support operations/facilities by means of monitoring, decontamination, and registration of evacuees, monitoring and decontamination of emergency workers and their equipment and vehicles, temporary care of evacuees and transportation and treatment of contaminated injured individuals in accordance with established guidelines.

Additionally, each capability is linked to several corresponding capability targets and critical tasks to provide additional detail. Specific targets and tasks are listed in the Exercise Evaluation Guides. The objectives align with the listed capabilities as indicated below:

- Objective 1: Core Capability – Operational Coordination, Operational Communications.
- Objective 2: Core Capabilities – Operational Coordination and Situational Assessment.
- Objective 3: Core Capability – Environmental Response/Safety and Health, On-Scene Security, Protection, and Law Enforcement, Critical Transportation, Mass Care, and Public Health, Healthcare, and Emergency Medical Services.
- Objective 4: Core Capabilities – Situational Assessment, Environmental Response/Safety and Health.
- Objective 5: Core Capabilities – Operational Coordination and Public Information and Warning.

- Objective 6: Core Capability – Public Information and Warning.
- Objective 7: Core Capability – Environmental Response/Safety and Health and Mass Care.
- Objective 8: Core Capability – Situational Assessment and Environmental Response/Safety and Health.
- Objective 9: Core Capability – Public Health, Healthcare, and Emergency Medical Services.

2.3 Exercise Scenario Summary

The following is a summary of the licensee's formal scenario submitted to the Federal Emergency Management Agency on December 13, 2019 and approved on February 7, 2019. The Scenario and supporting documents were adequate for the demonstration of the exercise objectives and associated technical criteria identified in the extent of play agreement.

Key Times	
0730	Exercise begins
0814	Notification of Unusual Event Emergency Classification Level declared
0848	Alert Emergency Classification Level declared
0954	Site Area Emergency Classification Level declared
0944	Radiological release begins
1141	General Emergency Classification Level declared
1347	Exercise terminated

The exercise begins at 0730. At 0800, a tornado passes through the switchyard, causing a reactor scram with not all controls rods inserting. Due to the scram, a small crack develops on the feedwater line. At 0803, Claiborne County Emergency Management is called to inspect the roadways. By 0825, an Unusual Event should be declared based on Emergency Action Level Sierra Uniform 1 for loss of offsite power. At 0830, Claiborne County Emergency Management informs the licensee that all roads are clear to the site.

At 0840, the diesel generator trips due to an oil leak and the feedwater leak rate increases. By 0855, an Alert should be declared based on Emergency Action Level Sierra Alpha 1 for the single power source failure. By approximately 0945, the Joint Information Center will become operational.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

At 1005, a Reactor Core Isolation Cooling steam leak occurs with failure of the isolation valves to close. A seal failure on the access door causes it to malfunction and an offsite radiological release begins from the auxiliary building through the Standby Gas Treatment system. By 1020, a Site Area Emergency should be declared based on Emergency Action Level Foxtrot Sierra 1 for the loss of two fission barriers.

At 1135, offsite field monitoring teams will detect the release with a magnitude greater than protective action guide beyond the site boundary, which is approximately at a half of a mile. By 1150, a General Emergency will be declared based on Emergency Action Level Alpha Golf 1.2 for doses greater than 1 rem total effective dose equivalent or 5 roentgen equivalent man thyroid committed dose equivalent beyond the site boundary. The criteria will be met for a rapidly progressing severe accident with resultant protective action recommendations to evacuate all sectors out to 2 miles and the downwind sectors of Alpha, Bravo, and Charlie out to 10 miles and consider use of potassium iodide. These sectors correspond to Protective Action Areas 1, 2 alphas, and 7 in Mississippi.

At 1215, the Operations crew will depressurize the reactor and the driving force for the release will be reduced. At 1240, the leak will be isolated, terminating the release. At 1300, the exercise will be terminated.

Meteorological conditions at the beginning of the exercise reflect the tornado conditions and are wind direction from 185 degrees, wind speed of 27 miles per hour, and stability class of "Delta". At 0850, the wind speed peaks at 40 miles per hour with a wind direction from 235 degrees. Meteorological conditions around the time of release indicate a wind speed of 7 miles per hour with a wind direction from 197 degrees with a "Delta" stability class. These conditions remain constant throughout the remainder of the exercise.

The dose projections indicate protective action guides are exceeded beyond the site boundary. Field team surveys will reach a maximum value of 43 milliroentgen during the exercise. Radioiodine is present in the field monitoring sample data. Dose projections indicated a projected thyroid dose greater than 5 roentgen equivalent man beyond the site boundary. Radioiodine levels in this scenario are sufficient to prompt discussion of potassium iodide for emergency workers and the general public.

Section 3: Analysis of Capabilities

3.1 Exercise Evaluation and Results

This section contains the results and findings of the evaluation of all jurisdictions and functional entities that participated in the March 13, 2019 plume pathway exercise and out-of-sequence activities of February 14 and February 25-28, 2019.

Each jurisdiction and functional entity were evaluated based on the demonstration of Core Capabilities, capability targets and critical tasks and the underlying radiological emergency preparedness criteria as delineated in the Federal Emergency Management Agency Radiological Emergency Preparedness Program Manual dated January 2016. Exercise criteria are listed by number, and the demonstration status of those criteria are indicated by the use of the following terms:

- M: Met (no unresolved level 1 or level 2 findings assessed and no unresolved findings from prior exercises)
- 1: Level 1 finding assessed
- 2: Level 2 finding assessed or an unresolved level 2 finding(s) from a prior exercise
- P: Plan issue
- N: Not demonstrated

3.2 Summary Results of Exercise Evaluation

The Homeland Security Exercise and Evaluation Program evaluation methodology is an analytical process used to assess the demonstration of specific capabilities during an exercise. A capability provides a means to perform one or more critical tasks under specified conditions and to specific performance standards. Core Capabilities form the foundation of the Federal Emergency Management Agency Region IV Radiological Emergency Preparedness Program evaluations. The Core Capability summaries below provide an overall combined assessment of state and local jurisdictions based upon their collective demonstrated performance as it relates to the specific Core Capability. Each jurisdiction's standalone capability summaries are listed in Section 3.3 of this report.

Operational Coordination: Key leadership personnel from the State of Mississippi and affected counties established and maintained a unified and coordinated operational structure. This enabled the unified command to provide effective and responsive direction and control over the incident. The decision-making process integrated critical stakeholders, enabling protective actions and subsequent decisions to be made in a timely manner. The Homeland Security Information Network video conference line provided a

platform for face-to-face discussions. This network allowed for real-time interface and enhanced the coordination between the different agencies. Placing a dedicated liaison from the Louisiana's Governor's Office of Homeland Security and Emergency Preparedness in the unified command may strengthen the response between the two states.

Critical Transportation: Government officials from Claiborne County demonstrated the ability to implement protective actions for the four schools located within the 10-mile emergency planning zone of the Grand Gulf Nuclear Station. The officials explained through interview the process and procedures for safeguarding students, staff, and faculty at these schools.

Situational Assessment: State dose assessment personnel exhibited challenges in performance while assessing radiological and plant conditions when providing protective action recommendations to decision makers. The specific challenges are further detailed in section 3 of this report. The decision makers were eventually provided with relevant information regarding assessed radiological and plant conditions. This information allowed the decision makers to make inquiries to understand the extent of the hazards and to make the appropriate protective action decisions.

Operational Communications: Multiple communications systems were demonstrated throughout the exercise. Primary and secondary systems along with web-based incident management software aided the multiple jurisdictions in Mississippi to maintain a unified operational response. These systems ensured the capacity for timely communications in support of a coordinated response without failure. Utilization of these systems were not demonstrated with the State of Louisiana.

Environmental Response/Health and Safety: State Radiological Health personnel demonstrated with significant challenges their ability to assess radiological and plant conditions and make recommendations and decisions. Challenges with field team procedures, field team management, and knowledge of radiological sampling and survey processes were observed. These problems lead to challenges in assessing radiological conditions and providing recommendations. Risk and host county emergency workers successfully demonstrated their ability to perform radiological monitoring and decontamination of emergency workers and evacuees during out-of-sequence activities.

Public Information and Warning: Alert and notification of the public was successfully achieved by simulated siren activation in conjunction with the activation of the emergency alert system. Supplemental news releases and formal media briefings in the joint information center provided detailed instructions on what protective actions the public needed to take. Some challenges exist with the Claiborne County news release approval and coordination process and are further detailed in section 3 of this report.

On Scene Security, Protection and Law Enforcement: Claiborne County law enforcement and road department emergency workers effectively demonstrated the ability to establish traffic and access control points in support of the Grand Gulf Nuclear Station. Their coordinated support of the precautionary and protective action decisions by the local emergency management directors followed established procedures.

Mass Care: Host Counties, Adams, Copiah, Hinds and Warren, demonstrated the ability to provide services and accommodations for evacuees during out-of-sequence activities. These activities included evacuee reception and registration of evacuees at designated facilities. Representatives from the Department of Human Resources and volunteers from the American Red Cross aided in the demonstrations.

Public Health, Healthcare, and Emergency Medical Services: During out of sequence activities, Vicksburg Fire Department Ambulance Service responders in conjunction with Merit Health River Region Medical Center staff demonstrated that they can transport and treat a contaminated injured individual. Some challenges were observed with the ambulance service with contamination control. Following established protocols, the Hospital staff demonstrated the capability to access, monitor, and decontaminate the patient without delay while treating his injuries and preventing cross contamination.

3.3 Jurisdictional Summary Results of Exercise Evaluation

3.3.1 State of Mississippi

3.3.1.1 State Emergency Operations Center

Operational Coordination Capability Summary: The Mississippi State Emergency Operations Center staff demonstrated the ability to mobilize, establish, and maintain a unified operational response to a simulated radiological incident at the Grand Gulf Nuclear Station. Coordination with supporting state agencies and Claiborne, Hinds, Adam, Copiah, and Warren counties was observed during the exercise. Available equipment and supplies were enough to support emergency operations. Communications were operational without fail as well.

The Mississippi State Warning Point staff received notifications of an emergency classification at the Grand Gulf Nuclear Station and quickly provided accurate information to both state and local offsite response organizations. The systems used to send and receive messages were efficient and effective. State emergency operations center support staff were mobilized using an electronic notification system that provided an accurate picture of available and responding personnel.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

The Operations Chief kept state emergency operations center personnel informed of the incident status by conducting frequent staff briefings. Protective action recommendations were provided from the licensee and verified by Mississippi State Department of Health, Division of Radiological Health staff. Other state, federal, and utility representatives participated in command meetings to provide guidance on protective actions including the use of potassium iodide. The Governor's Authorized Representative presented this information to all Mississippi stakeholders for consideration and concurrence in the protective action decisions. Responsible agencies worked together effectively to implement precautionary and protective measures for the public and emergency workers. Emergency operations center staff and leadership used plans and procedures to guide their response. This kept them on track and helped to avoid missing response actions. Senior leadership maintained a proactive approach to the response by consistently reviewing and discussing actions that would be taken if conditions worsened. Incident status and response actions were well coordinated with all Mississippi stakeholders.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.b.2.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Operational Communication: Mississippi Emergency Management Agency ensured timely communications in support of operations among the affected risk and host counties for the Grand Gulf Nuclear Station. Multiple communication systems were available and demonstrated during the exercise and no failures were observed. Coordinating actions with other stakeholders was primarily accomplished over the Homeland Security Information Network via video teleconference. Communication of response actions with the State of Louisiana and Texas Parish was observed in the Joint Information Center.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None

e. **Prior Level 2 Findings - Unresolved:** None

3.3.1.2 Joint Information Center

Public Information and Warning Capability Summary: The ability to provide coordinated emergency information and instructions to the public and media was demonstrated at the Mississippi Emergency Management Agency's Joint Information Center. Representatives from the States of Mississippi and Louisiana, Entergy, Claiborne County, and Tensas Parish were present. These representatives provided a unified effort by establishing a joint information system for delivery of emergency information to the public and media. The Mississippi Emergency Management Agency Director of External Affairs served as the lead spokesperson for the state and the public information officer served as the state's joint information center manager.

The joint information center is collocated with the state emergency operations center and served as the official dissemination point for information regarding the response to this emergency. Activation was accomplished in accordance with jurisdictional plans following the declaration of an Alert.

Message preparation, including emergency alert system and supplemental news releases, were consistent with information disseminated during news media briefings. Three formal media briefings were held and a total of three news releases were distributed during the exercise.

The rumor control function was performed by personnel from the utility and the state and operated in the confines of the joint information center. Rumors and trends were handled with a sense of urgency, though no trends were identified that warranted being brought to the attention of the external affairs director.

Ample space, redundant communications and sufficient equipment and supplies to support emergency operations were tested and used during the exercise. Primary and backup communications systems were fully functional and there were no failures during the exercise.

The combined effort of multiple agencies led to the successful demonstration of this core capability through the coordination, development, and dissemination of emergency public information. The successful demonstration of events fully met this critical task (criterion 5.b.1). Therefore, level 2 finding 028-17-5.b.1-L2-01 is resolved for the Mississippi Emergency Management Agency, Joint Information Center.

For this capability the following Radiological Emergency Preparedness criteria were MET:
1.a.1, 1.d.1, 1.e.1, 5.a.1, 5.b.1

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Finding – Resolved.**

Issue Number: 028-17-5.b.1-L2-01

Core Capability/Criterion: Public Information and Warning/5.b.1

Condition: Message development protocols were not completely followed by the Joint Information Center during the exercise, which could have confused the public regarding the actions they were to take.

Resolution: The combined public information effort of multiple agencies and levels of management led to the successful demonstration of this core capability through the coordination, development, and dissemination of emergency public information. Mississippi news releases were prepared by the Mississippi Emergency Management Agency public information officer and approved in the state emergency operations center following set protocols as outlined in the external affairs standard operating procedure.

- e. **Prior Level 2 Findings - Unresolved:** None

3.3.2 Mississippi Department of Radiological Health

3.3.2.1 Department of Radiological Health / Dose Assessment

Situational Assessment Capability Summary:

The Mississippi State Department of Health, Division of Radiological Health personnel demonstrated, with significant challenges, the ability to assess radiological and plant conditions and to provide protective action recommendations to decision makers in response to a radiological incident at the Grand Gulf Nuclear Station. Personnel arrived at the state emergency operations center when notified of the Alert. The Grand Gulf Nuclear Station maps were displayed on the walls and individual work stations were available for each person, including a computer, references, and office supplies. The state emergency operations center had sufficient equipment, communications, and supplies to support emergency operations.

Dose assessments were performed at the emergency operations facility and then verbally passed to the State Radiological Accident Assessment Officer at the state emergency operations center. The dose assessment team gathered the information for changing plant conditions to assess the radiological release. The dose assessment results compared closely with utility dose projections.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Based on the meteorological conditions, rapidly progressing event, degrading plant conditions, and the onset of a radiological release, the State Radiological Accident Assessment Officer recommended the evacuation of Mississippi populations two miles around and 10 miles downwind of the plant, prior to the General Emergency declaration and licensee protective action recommendations.

The State Radiological Accident Assessment Officer evaluated the subsequent dose assessments to validate the protective action recommendations and assess the potassium iodide ingestion for emergency workers. However, the current Food and Drug Administration guidance for emergency worker potassium iodide ingestion was not included in the plans or procedures. In addition, there was no method to document protective action recommendations or potassium iodide authorization from the State Health Officer.

Public doses were also calculated by the radiological assessment system for consequence analysis software on the five-source term runs. The Radiological Dose Assessment Coordinator received the results of dose assessments performed by Grand Gulf staff, entered the pertinent release and meteorological data into the radiological assessment system for consequence analysis software, and produced dose estimates within 15 minutes that agreed within a factor of 10 relative to those provided by the Grand Gulf staff. Although not warranted by the dose assessment calculations provided by the Mississippi Department of Health staff assigned to the emergency operations facility, the State Radiological Accident Assessment Officer (located in the state emergency operations center) recommended a precautionary evacuation of Areas 1, 7, 2A, and 2B at 1046, following the onset of the radioactive material release. At the time this recommendation was made in the state emergency operations center, the staff in the Grand Gulf emergency operations facility had not recommended any such protective actions and were not aware (at the time) that the State had made such a recommendation. The sequence of events did not fully meet the critical task (criterion 2.b.1). Therefore, level 2 finding 028-19-2.b.1-L2-01 is assigned to the dose activity at the state emergency operations center. This finding was later resolved during a limited redemonstration on August 8, 2019.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 2.b.2.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:**

Issue Number: 028-19-2.b.1-L2-01 Resolved

Core Capability/Criterion: Situational Assessment/2.b.1

Condition: Current and accurate information on plant and environmental conditions was not always available or used by Division of Radiological Health personnel when providing situational assessments and recommendations to decision makers.

Analysis: During the exercise, Division of Radiological Health personnel performed the following actions which, when taken together, resulted in incomplete information being provided to decision makers.

1. Radiological emergency response teams took unnecessary measurements and air samples while deployed in the plume. That resulted in a delay in obtaining, communicating, and analyzing the results of appropriate measurements and samples.
2. When field counting results of air samples were provided to Division of Radiological Health dose assessment personnel, they did not understand that only analysis of the silver zeolite cartridge (and not the charcoal cartridge) would provide useful information to characterize the plume.
3. Division of Radiological Health staff in the emergency operations facility used a *Dose Assessment Form* to convey radiological assessment data. This form was submitted to the state radiological accident assessment officer at the State Emergency Operations Center with several key items on the form incomplete.
4. When utility staff at the emergency operations facility announced that an action had been taken to mitigate the radiological release, this information was not promptly communicated by the emergency operations facility coordinator to the state radiological accident assessment officer. The state radiological accident assessment officer informed decision makers that radiological release was increasing when it had actually been mitigated.

Possible Cause:

1. The radiological emergency response team procedure provided insufficient detail on appropriate radiation measurements to take while traversing the plume.
2. The radiological emergency response team procedure called for taking two air samples in a given location—one using a silver zeolite cartridge and one using a charcoal cartridge.
3. Enough emphasis was not placed on completing the *Dose Assessment Form* and promptly forwarding information on changing plant conditions.

Reference:

1. State of Mississippi, Procedures for Radiological Emergency Response Team, Function Annex 17, Revision #13, January 20, 2019
2. NUREG-0654/FEMA REP-1; C.6;f;K.3.a;K.4
3. Mississippi Radiological Emergency Preparedness Plan, Revision 18, October 2018, Annex E

Effect:

1. The initial protective action decision to evacuate certain protective action areas in the emergency planning zone was made based on plant conditions. For this incident, no additional protective actions were necessary to protect the health and safety of the public. However, in an actual event, providing outdated, incomplete, or incorrect information to decision makers could result in proper protective actions not being taken.

Resolution:

1. Following the exercise, Division of Radiological Health personnel revised their procedures to provide appropriate detail on radiation measurements to be taken while traversing the plume, to modify the air sampling process to take only one sample with a silver zeolite cartridge, and to add checklists for the emergency operations facility coordinator and state radiological accident assessment officer to ensure appropriate information is shared in a timely manner.
2. Several days of training on the updated procedures were provided to Division of Radiological Health personnel and other Mississippi State Department of Health personnel who may respond to an incident at Grand Gulf.
3. During a limited redemonstration on August 8, 2019, personnel on two radiological emergency response teams successfully demonstrated the ability to take appropriate radiation measurements and air samples. Division of Radiological Health personnel also successfully demonstrated collecting, analyzing, and providing current and accurate information to decision makers.

3.3.2.2 Field Team Management

Environmental Response/Health & Safety Capability Summary: The Mississippi State Department of Health, Division of Radiological Health personnel demonstrated, with significant challenges, the ability to manage and control field teams to obtain sufficient information to help characterize the release and to control radiation exposure.

The Field Team Coordinator arrived at the State Emergency Operations Center after receiving an alert notification. The Grand Gulf Nuclear Station maps were displayed on the walls of the facility. However, the field team coordinator only had small five-mile and ten-mile maps located at the coordinator's work area for tracking field team locations and activities. These maps were too small to display team locations and track radiological survey activities. The field team coordinator had a radio for communicating with the field teams and did not experience any problems with communications throughout the exercise.

The field team coordinator provided the field teams with direction concerning sampling locations and driving directions. Although the coordinator was aware that the field teams were in the plume, the coordinator did not advise the teams to minimize time in the area or monitor the time they spent in the plume. This could result in field team members receiving unnecessary radiological exposure or even getting over exposed. Therefore, level 2 finding 028-19-3.a.1-L2-02 is assigned. The field team coordinator logged all radiological survey results and dosimeter readings from the field teams.

The field team coordinator and licensee's emergency operations facility coordinator worked together on where field teams should be located. However, when it was necessary for field teams to obtain air samples the field team coordinator and emergency operations coordinator did not know what type of air sample cartridge the field teams should use to collect the sample. Instead of inquiring with the Grand Gulf radiological staff the coordinator chose to have the field teams take air samples with both types of cartridges. Neither was sure what type should be used nor why a certain type of cartridge would be better than the other type. When asked which sample cartridge results they would use for determining the radiological content of the release they were not sure and provided the results of both samples for dose assessment without any clarification. The use of incorrect air sample data could result in erroneous protective action recommendations for the public. The sequence of events did not fully meet this Critical task (criterion 4.a.2). Therefore, the previous level 2 finding 028-17-4.a.2-L2-03 remains open.

During a limited redemonstration on August 8, 2019 both finding 028-19-3.a.1-L2-02 and finding 028-17-4.a.2-L2-03 were resolved.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 4.a.2.

a. Level 1 Finding: None

b. Level 2 Finding:

Issue Number: 028-19-3.a.1-L2-02 Resolved

Core Capability/Criterion: Environmental Response/Health and Safety/3.a.1

Condition: Radiological emergency response team members received radiation doses higher than necessary to perform tasks necessary to characterize the radiological plume.

Analysis: During the exercise, Division of Radiological Health personnel performed the following actions which, when taken together, resulted in radiological emergency response teams spending significant unnecessary time in the radiological plume. Team members also were not directed to ingest potassium iodide, resulting in higher thyroid radiation doses.

1. Radiological emergency response teams took unnecessary radiation measurements while traversing the plume. One team stopped frequently while traversing to obtain closed-window and open-window radiation measurements. While taking open- and closed-window readings at selected points (e.g. centerline, air sampling location) is important, stopping to take additional readings is not.
2. When directed to take air samples, radiological emergency response teams took one air sample using a silver zeolite cartridge and one using a charcoal cartridge. One team only had one operational air sample pump, resulting in the team waiting for the first sample to be completed before starting the second sample. For a nuclear power plant incident, taking an air sample using a charcoal cartridge in addition to one using a silver zeolite cartridge provides no additional useful information.
3. The radiological emergency response team coordinator occasionally spent long periods (greater than 30 minutes) without contacting a team.
4. Division of Radiological Health procedures only called for team members to ingest potassium iodide if projected thyroid doses were above 25 rem. Therefore, team members were not instructed to ingest potassium iodide. However, that dose level exceeds current Food and Drug Administration guidelines.

Possible Cause:

1. The radiological emergency response team procedure provided insufficient detail on appropriate radiation measurements to take while traversing the plume.
2. The radiological emergency response team procedure called for taking two air samples in a given location—one using a silver zeolite cartridge and one using a charcoal cartridge.
3. Division of Radiological Health procedures did not include a requirement for the radiological emergency response team coordinator to contact teams on a regular basis.
4. Division of Radiological Health procedures had not been updated to reflect current Food and Drug Administration guidelines.

Reference:

1. State of Mississippi, Procedures for Radiological Emergency Response Team, Function Annex 17, Revision #13, January 20, 2019
2. NUREG-0654/FEMA REP-1; C.1; H.12; I.7,8;11; J.10.a; K.3.a, b;K.4;
3. Mississippi Radiological Emergency Preparedness Plan, Revision 18, October 2018, Annex E.

Effect:

1. The members of the radiological emergency response teams received additional radiation doses while performing unnecessary tasks in the plume. Also, thyroid doses to team members could easily have been reduced by ingestion of potassium iodide. In the short term, higher doses could result in team members reaching administrative dose limits and therefore not being able to perform vital functions in characterizing the plume. In the longer term, higher doses could result in adverse health effects for some team members.

Resolution:

1. Following the exercise, Division of Radiological Health personnel revised their procedures to provide appropriate detail on radiation measurements to be taken while traversing the plume, to modify the air sampling process to take only one sample with a silver zeolite cartridge, and to ensure regular communication between the teams and the radiological emergency response team coordinator.
2. Several days of training on the updated procedures were provided to Division of Radiological Health personnel and other Mississippi State Department of Health personnel who may respond to an incident at Grand Gulf.
3. During a limited redemonstration on August 8, 2019, personnel on two radiological emergency response teams successfully demonstrated the ability to take appropriate radiation measurements and air samples. The teams maintained frequent contact with the radiological emergency response team coordinator.
4. The state health officer issued a letter authorizing radiological emergency response team members to ingest potassium iodide prior to deployment, regardless of the projected thyroid dose. Division of Radiological Health procedures were revised to instruct team members to ingest potassium iodide prior to deployment. During the redemonstration, team members ingested potassium iodide in accordance with the revised procedures.

c. **Not Demonstrated:** None

d. **Prior Level 2 Findings – Resolved:**

Issue Number: 028-17-4.a.2-L2-03

Core Capability/Criterion: Environmental Response/Health & Safety /4.a.2.

Condition: The Mississippi Radiological Emergency Response Team Coordinator failed to instruct the field teams to utilize a silver zeolite cartridge for obtaining an air sample. The Radiological Emergency Response Team Coordinator never instructed either field team to make an attempt to locate the centerline of the plume. The coordinator also allowed significant time to pass before finalizing airborne activity calculations and providing that data to dose assessment for confirmation of projected dose. The Radiological Emergency Response Team Coordinator was unprepared and

had little knowledge on how to perform the activity calculations on the Field Estimate of Airborne Activity Form. Shortly after the release, a field team conducted an air sample in the plume. That team was then sent to low background area to stage and await further instruction instead of obtaining more data or locating the centerline.

Resolution:

1. Following the exercise, Division of Radiological Health personnel revised their procedures to provide appropriate detail on radiation measurements to be taken while traversing the plume, to modify the air sampling process to take only one sample with a silver zeolite cartridge, and to ensure regular communication between the teams and the radiological emergency response team coordinator.
2. Several days of training on the updated procedures were provided to Division of Radiological Health personnel and other Mississippi State Department of Health personnel who may respond to an incident at Grand Gulf.
3. During a limited redemonstration on August 8, 2019, personnel on two radiological emergency response teams successfully demonstrated the ability to take appropriate radiation measurements and air samples. The teams maintained frequent contact with the radiological emergency response team coordinator.

e. **Prior Level 2 Findings – Unresolved:** None

3.3.2.3 Division of Radiological Health Field Team

Environmental Response/Health & Safety Capability Summary:

The Mississippi State Department of Health Division of Radiological Health Field Teams demonstrated with major challenges the ability to locate a plume using ambient radiation surveys and obtain air samples that would be used for dose assessment and protective action decisions in response to the Grand Gulf Nuclear Station.

Plan Issue 028-17-1.e.1-P-01 was corrected by providing appropriate and sufficient radiation survey and air monitoring equipment to support emergency operations.

Plan Issue 028-17-4.a.3-P-02 was partly corrected during the exercise but remained open due to incorrect methods for traversal of the plume and air sample collection. These planning issues were fully resolved during a limited redemonstration on August 8, 2019.

Procedures to alert, notify and mobilize emergency personnel were performed in a timely manner. For this exercise, field team staff were pre-positioned per the extent of play agreement from the field team facility.

At least two communication systems were available and operable for field team activities. The primary means of communications was by the Mississippi Wireless Information Network radios. The secondary means of communications was Global Star satellite phones and/or conventional cellular phones. All primary and backup methods of communications worked throughout the exercise

All field team members were issued appropriate dosimetry, potassium iodide and radiological survey instruments, along with procedures to manage their radiological exposure and monitor their reporting limit and administrative dose limits. All dosimetry and survey instruments were within calibration and successfully passed source check requirements. The teams received appropriate radiological and safety briefings prior to deployment.

The field teams were correctly positioned to accurately characterize the plume. Ambient radiation measurements were made and recorded at appropriate locations and air samples were collected. The procedural method to traverse the plume was not specified, therefore, both field team incorrectly took open and closed readings along the plume traverse. Additionally, both teams were requested to take two samples, charcoal and silver zeolite, at a sample location. This doubled the stay time for both the traversal and the air sample in the plume and resulted in unnecessary exposure to the field team workers. The sequence of events resulted in unnecessary doses to field team members and did not fully meet this Critical task (criterion 3.a.1). Therefore, level 2 finding 028-19-3.a.1-L2-02 is assigned under Field Team Management above. However, this finding was resolved during a limited redemonstration on August 8, 2019.

The field teams were moved to an appropriate low-background location to determine the amount of radioactivity that had been collected on the air samples. The procedure did not specify how to count the air filter media with a fixed geometry so that readings would be reproducible. This could result in inaccurate readings.

Transfer of samples for analysis was not specifically addressed in the procedure, nor were couriers identified to expedite the transfer of the air samples. This would result in extensive delays of air sampling results for decision makers.

The Field teams followed good practices to prevent cross contamination of samples and equipment. Dosimetry was read, recorded and transmitted every 30 minutes to the field team coordinator.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 4.a.3

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None
- f. **Prior Plan Issue – Resolved.**

Issue Number: 028-17-1.e.1-P-01**Core Capability/Criterion:** Environmental Response Health & Safety /1.e.1**Condition:** Radiation monitoring equipment was not appropriate or in sufficient supply to support emergency operations. Field monitoring teams were not sufficiently equipped to monitor radiation levels in a high gamma radiation field. The teams did not have backup supplies of calibrated low-level radiation survey instruments and calibrated/charged air pumps for collecting an air sample.**Resolution:** Appropriate dosimetry, potassium iodide and radiological survey instruments, along with procedures to manage their radiological exposure and monitor their reporting limit and administrative dose limits were successfully issued to field team personnel. Plan Issue 028-17-1.e.1-P-01 is corrected by providing appropriate and sufficient radiation survey and air monitoring equipment to support emergency operations.**Issue Number: 028-17-4.a.3-P-02****Core Capability/Criterion:** Environmental Response Health & Safety /4.a.3**Condition:** The Department of Radiological Health procedure needs revision to clarify methodology for air sampling to ensure that proper methodology is followed for collecting and analyzing a quality air sample to use for making dose assessment calculations and making protective actions for the public. Personnel also need to have additional training on air sample procedures and why certain steps are vital to taking a valid air sample.**Resolution:**

1. Following the exercise, Division of Radiological Health personnel revised their procedures to provide appropriate detail on radiation measurements to be taken while traversing the plume, to modify the air sampling process to take only one sample with a silver zeolite cartridge, and to ensure regular communication between the teams and the radiological emergency response team coordinator.
2. Several days of training on the updated procedures were provided to Division of Radiological Health personnel and other Mississippi State Department of Health personnel who may respond to an incident at Grand Gulf.
3. During a limited redemonstration on August 8, 2019, personnel on two radiological emergency response teams successfully demonstrated the ability to take appropriate radiation measurements and air samples. The teams maintained frequent contact with the radiological emergency response team coordinator.

g. Prior Plan Issue – Unresolved: None

3.3.2.4 Emergency Operations Facility Dose Assessment

Situational Assessment Summary:

The Mississippi Division of Radiological Health within the Department of Health demonstrated, with significant challenges, that it could activate and deploy dose assessment staff to the Grand Gulf Nuclear Station's emergency operations facility in a timely manner, perform timely and accurate dose assessment activities, and coordinate with the state emergency operations center. Voice communications equipment operated satisfactorily; however, the facsimile equipment was out of service. This necessitated a successful work-around where photos of documents that were to be faxed to the state emergency operations center were taken and sent via mobile phone.

Principal equipment used by the dose assessment staff consisted of a lap-top computer with dose calculation software loaded on it. The computer and the radiological assessment system for consequence analysis software worked satisfactorily to generate timely and accurate dose assessments.

Emergency worker doses were controlled through use of direct-reading dosimeters and a provision for the issuance of potassium iodide for thyroid protection. The dosimeters were read approximately every 30 minutes and reported to the Radiological Emergency Response Team Coordinator. No significant exposures were experienced. Thyroid dose calculations were performed on five occasions using the source-term-to-dose model contained in dose assessment software and on two occasions using the field-measurement-to-dose model contained in the same software. All estimates showed that the 25 R thyroid dose criterion used by the Mississippi Division of Radiological Health to recommend the use of potassium iodide for workers was not exceeded. There was some confusion based on the air sample results that would serve as input to the field-measurement-to-dose model. Both charcoal and silver zeolite were used in spite of it not being necessary or appropriate to do so. Both sample media were used because the state assessment staff did not appear to understand the difference between the two media; however, the results did not show that the threshold for potassium iodide use was exceeded. The delay of field team results caused by taking both charcoal and silver zeolite air samples contributed to the assignment of finding 028-19-2.b.1-L2-01 described in section 3.3.2.1 above. This delay, along with the use of the outdated 25 rem thyroid dose criterion also contributed to finding 028-19-3.a.1-L2-02 described in section 3.3.2.2 above.

The revised dose assessment procedure used by Division of Radiological Health staff required a comparison with the Grand Gulf dose calculations and to determine that the results were within a factor of 10 of each other. This was true in all five dose assessment comparisons. All dose assessments were completed by the Radiological Dose Assessment Coordinator within 15 minutes of receipt of the input parameter from the Grand Gulf dose assessor. Level 2 finding, 028-17-2.b.1-L2-02 is considered resolved, based on the accurate and timely dose assessments that were observed to be provided by

the emergency operations facility-based Division of Radiological Health staff to the state emergency operations center.

For this capability, the following Radiological Emergency Preparedness criterion were MET: 1.a.1; 1.d.1; 1.e.1, 2.b.1, 3.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved.**

Issue Number: 028-17-2.b.1-L2-02

Core Capability/Criterion: 6. Environmental Response Health & Safety /2.b.1

Condition: The State of Mississippi dose assessment team did not provide the state emergency operations center staff with accurate results in a timely manner.

Resolution: The finding was resolved, based on the accurate and timely dose assessments that were observed to be provided by the emergency operations facility-based Division of Radiological Health staff to the state emergency operations center. More specifically, the revised dose assessment procedure used by Division of Radiological Health staff required a comparison with the Grand Gulf dose calculations and to determine that the results were within a factor of 10.

- e. **Prior Level 2 Findings - Unresolved:** None

3.3.3 Claiborne County

3.3.3.1 Emergency Operations Center

Operational Coordination Capability Summary:

Claiborne County emergency management staff successfully demonstrated the ability to respond to a radiological emergency. The initial notification of a Notification of Unusual Event was received over the dedicated notification system in the communications room. The emergency manager further notified key personnel followed by the emergency operations center staff. The emergency operations center staff were capable of responding in a timely manner upon initial notification and rapidly assumed their duties. The director effectively gathered relevant emergency information and analyzed it with county officials. Suitable decisions were based on feedback and concurrence from county stakeholders. Periodic staff briefings kept the staff informed of emergency conditions and plant status. The briefings were followed by discussions with emergency operations center key staff to identify actions they were taking.

The emergency operations center had a robust means of communications, to include internet access, electronic mail, commercial land lines and cell phones. Backup communications also included a dedicated line to the plant, facsimile machines and satellite phones. An electronic incident management system was used to maintain situational awareness and track resource requests. Conference calls updating the status and discussions among the risk and host counties and State concerning protective actions were coordinated using dedicated video conferences.

The director and the emergency management staff were knowledgeable of the communication flow and ensuring everyone had situational awareness to complete their duties. The affected access/functional needs population were identified and relocated to a reception center through coordination with county public transit and the county emergency medical services. All staff members were knowledgeable and effectively used county plans to ensure the safety of the public and emergency workers.

Claiborne County emergency management staff demonstrated the capability to implement emergency worker exposure control. The capability included the issuance of appropriate dosimetry, potassium iodide, and usage procedures. Radiological exposure was managed for emergency workers in accordance with the plans and procedures. The Port Gibson Police Department demonstrated that appropriate traffic control was established and that accurate instructions were provided to traffic control personnel. Impediments on evacuating traffic routes were quickly identified. Re-routing was determined and conveyed to the public directly at the impediment site, by usage of fire lanes adjacent to the highway, until the impediment wreckage could be removed.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.d.1, 3.d.2.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Critical Transportation Capability Summary:

The Claiborne County School District followed current plans and procedures to effectively respond to an emergency at Grand Gulf Nuclear Station. Host locations for students were contacted early to alert them of a possible precautionary transfer of students to designated Reception Centers. Buses and personnel were put on alert and staged. At site area emergency, execution of the procedures was efficient in transferring the students. Parents were kept informed as to where, when, and how to pick up their children. Alcorn State University successfully described how they would evacuate students when the general

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

public evacuates. The Port Gibson Police Department implemented a transfer of jail inmates to an Adams County jail.

Claiborne County School District successfully demonstrated communications with county, city, and school district officials. All systems operated in accordance with plans and procedures. Primary and backup communications systems were functional without failure. The Claiborne County School District could also call on other county resources should they have been needed.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1, 3.c.2.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Public Information and Warning Capability Summary:

Claiborne County public information staff successfully demonstrated the ability to perform primary alerting and notification to the public and backup route alerting following the failure of the primary alert and notification system. Multiple communications systems were available to support emergency operations and operated properly without failures.

A public information officer was mobilized to the Joint Information Center in accordance with the approved extent of play. Communication between emergency management staff and the public information officer was established early and maintained throughout the event to support emergency operations. All Claiborne county news releases were prepared by the public information officer and distributed from the Joint Information Center. Coordination of message releases with the director of emergency management was not observed. The sequence of events did not fully meet the Critical task (criterion 5.b.1). Therefore, level 2 finding 028-19-5.b.1-L2-05 was assigned.

The siren system was activated to alert the public in a timely manner following the coordinated decision between county and state officials to alert the public. Backup route alerting was promptly and successfully initiated upon detection of the failure of a siren. Route alerting teams were provided appropriate instructions, training, personal protective equipment, and field equipment to accomplish the route while managing emergency worker exposure control. Route alerting teams had access to radios and cell phones. Radio checks to confirm operability were conducted prior to beginning route alerting.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.d.1, 5.a.1, 5.a.3.

For this capability the following Radiological Emergency Preparedness criteria were not MET: 5.b.1.

a. Level 1 Finding: None

b. Level 2 Finding:

Issue Number: 028-19-5.b.1-L2-03

Core Capability/Criterion: Public Information and Warning/5.b.1

Condition: The Claiborne County public information officer improperly prepared and disseminated news releases from the Joint Information Center.

Analysis: The Claiborne County public information officer prepared and disseminated three news releases from the Joint Information Center without coordinating their content with Claiborne County Emergency Management officials. Claiborne County News Release #1 incorrectly stated school children were being transferred, requiring a corrected news release to be issued clarifying that schools were not in session for spring break. Claiborne County News Release #3, released at 1028, erroneously stated that a General Emergency had been declared by the utility at 1010 and the Emergency Alert System had been activated at 1024. The sections of the news release describing the actions the public were to take and identification of the Protective Action Areas that were ordered to evacuate or monitor and prepare were left blank. At the time Claiborne County News Release #3 was disseminated to the public and news media, the utility remained at Site Area Emergency (a General Emergency would not be declared until 1225) and the Emergency Alert System had not been activated. The Emergency Alert System was activated at 1045 based on a protective action decision made at 1030 to evacuate Protective Action Areas 1, 2a, 2b, and 7, and for all remaining areas to monitor and prepare. No corrected or subsequent news releases were prepared and disseminated by Claiborne County.

Possible Cause: The Claiborne County public information officer at the joint information center did not seek approval of the content of the news releases from the Claiborne County Emergency Management Director prior to issuing them to the news media and the public. The public information officer did not coordinate with the Mississippi Emergency Management Agency official in charge of the joint information center.

References:

1. Claiborne County Radiological Emergency Preparedness Plan, Revision 18, October 2018, Section H- Public Information, pages 24-25.
2. Mississippi Radiological Emergency Preparedness Plan, Revision 18, October 2018, Section I- Public Information, page 24
3. NUREG-0654/FEMA-REP-1, E.5, 7

Effect: The public received conflicting information from county and state officials. At 10:28 am the county stated that the nuclear plant was at a General Emergency classification level and did not provide any instructions for evacuation or other protective action. Near the same time the county new release was sent, the state reached a coordinated decision to activate the prompt alert and notification system to order the evacuation of some areas and monitor and prepare for all the others. The system was activated at 10:45 am. The public would have been confused as to the actual utility conditions and associated threat, and confused as to whether they should do nothing, evacuate, or monitor and prepare.

Recommendation:

1. Review and revise as necessary Claiborne County plans and procedures to ensure that all media releases are approved by the Claiborne County emergency management director or appropriate designee and consistent with the coordinated decisions reached by Claiborne County and State officials.
2. Ensure that all Claiborne County emergency information and instructions to the public and the news media are properly approved prior to release.

c. **Not Demonstrated:** None

d. **Prior Level 2 Findings – Resolved:** None

e. **Prior Level 2 Findings - Unresolved:** None

3.3.3.2 Emergency Worker and Decontamination**Environmental Response/Health and Safety Capability Summary:**

Monitoring and decontamination of emergency workers and their vehicles was successfully demonstrated by members of the Claiborne County Fire Department at the Hermanville Fire Station. Emergency workers at the station demonstrated they were sufficiently trained, and that their procedures and available resources were sufficient to ensure the safe monitoring and decontamination of emergency workers, their vehicles and equipment. Emergency workers received a safety briefing, exposure control guidance, and were issued personal and permanent-record dosimetry at the start of the demonstration. Radiological survey instruments were properly inspected and put into operation by those who were using them.

Emergency workers at the station demonstrated appropriate survey and decontamination techniques while processing both workers and vehicles and exhibited good team work during the drill. The success of drill validates that the county has the procedures and resources to accomplish monitoring and decontamination of emergency workers and their equipment.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.e.1, 3.a.1, 6.b.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.3.3 Traffic Control Point

On-Scene Security, Protection, and Law Enforcement Capability Summary:

The Port Gibson Police Department and Port Gibson Street Department demonstrated their ability to establish and maintain critical traffic/access control points in support of an emergency response to an incident at Grand Gulf Nuclear Station. Police officers and street department employees who were interviewed discussed their ability to establish traffic control, identify and resolve impediments to evacuation, manage radiological exposure to emergency workers, primary and alternate means of communications and provide accurate instructions to the evacuating public. All necessary equipment used in establishing traffic control points is maintained by the two departments. Additional traffic control point equipment needs would be coordinated with individual agencies or the emergency operations center as necessary.

The county radiological emergency control officer provided a briefing to the three law enforcement officers and four street department representatives that addressed radiological response operations, dosimeter use, required forms, and potassium iodide instructions. Impediments to evacuation would be cleared immediately by street department personnel. If impediment removal was outside of their ability, assistance would be requested and coordinated through the county emergency operations center. Other organizations available to assist with impediment removal would include additional county and state resources.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1, 1.e.1, 3.a.1, 3.d.1, 3.d.2.

- a. **Level 1 Finding:** None

- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.4 Adams County

3.3.4.1 Emergency Operations Center

Operational Coordination Capability Summary:

Personnel staffing the Adams County emergency operations center successfully demonstrated the ability to coordinate county activities in response to a radiological incident at the Grand Gulf Nuclear Station. The primary responsibility of Adams County was to establish and operate a reception center and shelters to assist evacuees from Claiborne County.

Following notification from the state warning point that an emergency had been declared at Grand Gulf, the Adams County Emergency Management Agency director promptly texted key staff members to respond. He also explained how the county's blast notification system could also be used to notify staff. The emergency operations center was fully staffed and operational in a timely manner.

The director ensured all staff members maintained accurate situational awareness through briefings, discussions, and monitoring of the coordination conference line. A video conferencing system was also displayed. Staff members were knowledgeable of their procedures and their respective organizational responsibilities during the response, and efficiently carried out their duties. The director and staff ensured that the reception center was operational in time to support evacuees. Staff also frequently discussed potential problems that could arise and brainstormed possible solutions. The director described emergency worker exposure control procedures for personnel staffing the reception center and explained the reporting process.

The emergency operations center had sufficient equipment, displays, and supplies to support the emergency response. Staff used cellular telephones, handheld radios, voice-over-internet-protocol telephones, email, and a web-based emergency management system to communicate with personnel outside of the emergency operations center.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 3.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None

- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.4.2 Reception Center and Congregate Care

Environmental Response/Health and Safety Capability Summary:

Emergency Services personnel and volunteers from Adams County successfully demonstrated their abilities to provide monitoring, decontamination and registration of evacuees at the Adams County Louis Gunning Community Safe Room in Natchez, Mississippi. Participating agencies included the Adams County Emergency Management Agency, Natchez Fire & Rescue, Kingston Volunteer Fire Department, and the Natchez Police Department.

The county reception center had sufficient space, resources, and trained personnel to provide for the evacuating public. The evacuees were able to easily maneuver the well-laid out reception center area with the assistance of attentive escorts. Facilities were set up and demonstrated as they would be in an actual emergency and in accordance with county plans and procedures. Operational checks of the radiological monitoring and survey instruments were properly completed, and personal dosimetry was issued.

Emergency workers were knowledgeable of exposure and contamination limits and the need to read their dosimeters frequently. Emergency workers in the decontamination stations were knowledgeable of how to place instruments into service and how to use them to perform surveys. Signage and plans were well placed in the decontamination areas to help emergency workers perform their tasks. Evacuees were processed through the primary and secondary screening at the monitoring station and decontaminated as applicable.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.e.1, 3.a.1, 6.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Mass Care Capability Summary:

Adams County, Mississippi Department of Human Services, and Department of Health personnel along with the Southwest Mississippi Chapter of the American Red Cross successfully demonstrated their ability to provide temporary care of evacuees in the event of a nuclear incident. The demonstration occurred at the Adams County Louis Gunning Community Safe Room in Natchez, Mississippi.

Under the guidance of the county emergency management staff, county employees and volunteers competently worked together as a team and demonstrated shared responsibilities in meeting the needs of evacuees. They were well-versed in the emergency plans and procedures and displayed positive attitudes to meet the physical and mental needs of evacuees. The community safe room is primarily used to temporarily shelter arriving evacuees after they have been monitored for radiological contamination and, if necessary, decontaminated. For this demonstration six people were processed into the mass care facility, which was well-equipped and staffed to successfully provide support. Agency leaders were knowledgeable and professional, and worked together as a team throughout the exercise.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1, 1.e.1, 3.b.1, 6.c.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.5 Copiah County**3.3.5.1 Emergency Operations Center**

Operational Coordination Capability Summary: Copiah County Emergency Management Agency successfully demonstrated their ability to manage emergency operations in support of Grand Gulf Nuclear Station. The Copiah County Emergency Management Agency Director and his staff operated in the emergency operations center which was co-located with the 911 Communications Center in Hazlehurst, Mississippi. The County effectively demonstrated the receiving and dissemination of notifications concerning Grand Gulf Nuclear Station emergency classification levels, and effectively demonstrated mobilization of emergency operations center staff, in a timely manner. The emergency operations center was activated at the appropriate time and level during the exercise.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Redundant communications capabilities were demonstrated using wireless internet email, specialized software, cellular phones, and landline phones. A crisis communication and mass notification tool for delivery of emergency event notifications was used to transmit emergency classification levels to the emergency operations center. Although each of these systems performed as expected, staff explained the ability to establish satellite communication to support internet and email should the cellular system fail or become overwhelmed. No communication failures were observed during the exercise.

The Copiah County emergency operations center had sufficient equipment to facilitate support operations. Dedicated computer monitors throughout the emergency operations center allowed for the simultaneous display of event logs, press releases, links to event documents and map libraries, protective action area maps, emergency chat logs, the Mississippi Emergency Management Agency situation room camera feed and other participating county emergency operations center camera feeds.

The Copiah County Emergency Management Director and his leadership staff were knowledgeable and worked effectively together. Both the deputy director and the administrative assistant effectively managed information and personnel allowing the director to focus on coordination and decision making. A Mississippi Emergency Management Agency Liaison also added value to the county's emergency operations by assisting in coordination and information gathering. The director attended all conference calls and involved his staff on each.

Copiah County leadership staff took appropriate steps to manage activation of their primary reception center in support of the Claiborne county evacuation order. Although not demonstrated, the director discussed that the county could conduct proper coordination with the State and other host counties to insure proper dosimetry and potassium iodide and survey equipment were available if needed.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 3.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.5.2 Reception Center and Congregate Care**Environmental Response/Health and Safety Capability Summary:**

Copiah county emergency management officials and supporting agencies successfully demonstrated the ability to perform radiological monitoring and decontamination of evacuees at the Joe L. Johnson Community Safe Room in Hazlehurst, Mississippi. The reception center had appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees. In the event of inclement weather (thunder, lightning, extreme cold/heat, and significant weather phenomena) that is not conducive to radiological decontamination, Copiah County Emergency Management has developed a process to ensure the safety and continued decontamination of evacuees. Participating agencies included the Copiah County Emergency Management, Copiah County Department of Human Services, the American Red Cross and Mississippi Emergency Management Agency.

Emergency workers received a safety and radiological briefing concerning equipment, potassium iodide distribution, dosimetry, preform 30-minute dosimeter checks, communication channels, no eating/drinking on posts, emergency workers relief/breaks, turn back value, and to practice contamination avoidance. Emergency workers wore appropriate protective clothing and dosimetry, were familiar with dosimeter reading and recording requirements, dose limits, and contamination limits. Workers properly set up and used their dosimetry, handheld instruments, portal monitors, gross decontamination, portal monitoring, personnel monitoring and individual decontamination stations. Individuals received a green "Not Contaminated" card once an individual was considered decontaminated. They demonstrated excellent monitoring techniques and decontamination methods.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.e.1., 3.a.1., 6.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Mass Care Services:

The ability of Copiah county to provide temporary care of evacuees/students from Claiborne county was successfully demonstrated by representatives of the Mississippi Department of Human Services. Mass care services were set up in accordance with county and American Red Cross shelter procedures. The facility had ample space and accommodations for the expected evacuee/student population.

The facility was sufficient to house evacuees, with adequate restroom and shower facilities, as well as a feeding area if necessary. The primary means of communication would be cell phones, with a radio issued by county emergency management as a backup means to communicate with incident command. The staff and volunteers were knowledgeable in their duties, forms, equipment and displayed a commendable dedication to the health and welfare of the public and demonstrated shared responsibilities in meeting the needs of evacuees.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1; 1.e.1, 3.b.1, 6.c.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.6 Hinds County

3.3.6.1 Emergency Operations Center

Operational Coordination Capability Summary:

During the Grand Gulf Nuclear Station Exercise the Hinds County Department of Emergency Management Director, Assistant Director and emergency operations center staff demonstrated their capability to respond effectively to an event at the Grand Gulf Nuclear Station. The director and his assistants demonstrated effective direction and control in the timely alert, notification and mobilization of personnel and support staff. The staff in the emergency operations center were well-trained and familiar with their roles and responsibilities. Their plans and procedures were up-to-date and complete. The County Emergency Management Director was proactive in demonstrating his expertise and experience, performing and coordinating with other agencies both within the emergency operations center and externally.

The emergency operations center had redundant means of communication including: a dedicated telephone line; Mississippi Wireless Information Network and a television conferencing system (Homeland Security Information Network) that operated successfully during the exercise. The dedicated telephone system was used to initially notify the county of the Alert Emergency Classification Level at Grand Gulf Nuclear Station and was used for

the other notifications throughout the exercise. Backup communications were provided by email, fax machine, cell phones and two-way radios. Hinds county was involved in calls that helped maintain situational awareness of what was occurring in the coordination of relief efforts that involved those living in the emergency planning zone.

Sufficient supplies, space and equipment were available. Space inside the facility was adequate for personnel who were assigned to operate from the facility. Map boards, information screens and lists of data were present, as were television monitors. All emergency support function staff had adequate communications (cell phones) and office supplies available at their work stations. Because Hinds was a host county, there was not a need for personnel inside the emergency operations center to wear dosimetry since they were outside the 10-mile emergency planning zone. There was enough dosimetry within calibration stored on-site that would be delivered to the county reception center for all emergency workers that would have been activated in the county. There was enough up-to-date potassium iodide stored at the County Health Department to ensure all emergency workers would have an adequate supply during an emergency. Consideration was given to resources that might have been impacted during this event and their replacement if necessary.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 3.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.6.2 Reception Center and Congregate Care

Environmental Response/Health and Safety Capability Summary:

Hinds county emergency management officials and supporting agencies successfully demonstrated the ability to perform radiological monitoring and decontamination of evacuees at the Hinds Community College campus reception and congregate care center in Utica, Mississippi. Participating agencies included the Hinds County Department of Emergency Management, Hinds County Sheriff's Office, Jackson Fire Department, and the Clinton Police Department.

Vehicles were routed on traffic-controlled streets to the site, and after driving through a gross decontamination shower the vehicles proceeded to a designated space for parking. Emergency workers then provided transportation to move evacuees from the parking area to the monitoring and decontamination areas. The designated walk paths were clearly

controlled using barriers and safety cones which followed a logical flow path and process that optimized the facility's layout. The reception center had the appropriate space as well as sufficient resources to include trained personnel to provide radiological monitoring, decontamination and registration of evacuees.

Emergency workers received a safety and radiological briefing before starting operations and were provided a Radiological Emergency Preparedness worker handbook as a reference, with dosimetry and reporting directions. Emergency workers wore appropriate protective clothing and dosimetry, were familiar with dosimeter reading and recording requirements, dose limits, and contamination limits. Workers properly set up and used their dosimetry, portal monitors and handheld instruments. They demonstrated good monitoring techniques and decontamination methods.

For this capability the following Radiological Emergency Preparedness criteria were MET:
1.e.1, 3.a.1, 6.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Mass Care Services Capability Summary:

The ability of Hinds county to provide temporary care of evacuees from Claiborne county was successfully demonstrated by representatives of the Southwest Mississippi Chapter of the American Red Cross, Mississippi Department of Human Services and Mississippi Department of Health. Mass care services were set up in accordance with county and American Red Cross shelter procedures. The facility had ample space and reasonable accommodations for the expected evacuee population.

The primary means of communication were cell phones, with a radio issued by county emergency management as a means to communicate with incident command. Potassium iodide was stored at the county health department and Hinds County Emergency Management Agency. The county health department held the stockpile for the general public and the county emergency management office held supplies for emergency workers. The staff and volunteers were knowledgeable in their duties and displayed a commendable dedication to the health and welfare of the public, worked together as a team, and demonstrated shared responsibilities in meeting the needs of evacuees.

For this capability the following Radiological Emergency Preparedness criteria were MET:
1.d.1, 1.e.1, 3.b.1, 6.c.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.7 Warren County

3.3.7.1 Emergency Operations Center

Operational Coordination Capability Summary:

Warren County emergency operations center staff successfully demonstrated the ability to support emergency radiological response in the event of an incident at Grand Gulf Nuclear Station. The director provided clear guidance and direction to the emergency operations center staff. He led periodic briefings as the situation dictated. The emergency operations center staff responded in a timely manner upon receipt of initial notification via a crisis communication and mass notification tool.

The emergency operations center had multiple means of communications, to include personal computer Internet access, electronic mail, commercial land lines, cell phones, and other hand-held electronic devices. Backup communications also included facsimile machines, low band 700 and 800 megahertz radios, and satellite phones. There were no communication failures during the event. An electronic incident management system was used to maintain situational awareness and track assistance requests.

Warren County is a host county with the mission of providing a reception and congregate care center for the general public evacuating from at-risk areas. Warren County dosimetry is transported to the Warren Central High School reception center when the situation dictates. Dosimetry, monitoring equipment, and potassium iodide was verified with proper operational response during out of sequence activities on February 27, 2019. Warren County is outside of the 10-mile Protective Action Area, but prepared to issue appropriate dosimetry, potassium iodide, and manage radiological exposure in accordance with the plans and procedures for emergency workers. The knowledgeable and professional emergency operations center staff, composed of a variety of supporting county agencies, demonstrated their ability to plan and conduct emergency response actions to perform that mission.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 3.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None

- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.7.2 Reception Center and Congregate Care

Environmental Response/Health and Safety Capability Summary:

Warren County emergency management officials and the supporting emergency services, law enforcement, fire service, and emergency medical service agencies successfully demonstrated their ability to monitor, decontaminate, and register evacuees. Participating agencies included the Warren County Emergency Management, Warren County Emergency Services, Warren County Sheriff's Office, the Culkin, Fisher Ferry, Northeast Warren County Volunteer Fire Departments, and the Vicksburg Fire Department.

The Warren County reception center had the necessary space, sufficient equipment, and trained personnel to provide radiological monitoring, appropriate decontamination, and registration of evacuees in the event of a radiological emergency.

Operational checks of the radiological monitoring and survey instruments were properly completed, and personal dosimetry was issued in accordance with plans and procedures. Emergency workers were knowledgeable of potassium iodide, exposure and contamination limits and the need to read their dosimeters frequently. Emergency workers in the decontamination stations were knowledgeable of how to place instruments into service and how to use them to perform surveys. Signage and plans were well placed in the decontamination areas to help emergency workers perform their tasks.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.e.1, 3.a.1, 6.a.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

Mass Care Services Capability Summary:

Representatives from the Southwest Mississippi Chapter of the America Red Cross and Mississippi Department of Human Services successfully demonstrated the registration and temporary care of evacuees at the Warren County Central High School reception center. The facility had ample space and reasonable accommodations for its assigned purpose. The

personnel demonstrated their ability to confirm evacuee survey status, conduct evacuee registration and to establish and maintain a shelter to meet the congregate care needs of evacuees in the event of a nuclear incident. Service animals would be allowed within the facility in an area separate from the general population, with a pet relief area available outside with supervision of reception center staff.

The employees and volunteers were well-versed in the emergency plans and procedures and displayed positive attitudes to meet the physical and mental needs of evacuees. The equipment and supplies were sufficient and consistent with the assigned role. The facility was well laid-out, and although intended for only temporary care, could expand if necessary, to accommodate evacuees for several days. Agency leaders were knowledgeable and professional, and worked together as a team throughout the exercise.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1, 1.e.1, 3.b.1, 6.c.1.

- a. **Level 1 Finding:** None
- b. **Level 2 Finding:** None
- c. **Not Demonstrated:** None
- d. **Prior Level 2 Findings – Resolved:** None
- e. **Prior Level 2 Findings - Unresolved:** None

3.3.7.3 Medical Drill: Vicksburg Fire Department & Ambulance Service

Public Health, Healthcare, and Emergency Medical Services Capability Summary:

On February 27, 2019 Vicksburg Fire Department Ambulance Service responders demonstrated the ability to provide medical treatment and transportation to an injured, radiologically contaminated individual with challenges. Their pick up and transport of the radiologically contaminated patient were conducted in a manner that could potentially spread contamination.

Vicksburg Fire Department Ambulance Service leadership did not conduct an emergency worker briefing for the ambulance service crew members. The protective clothing worn by crew members consisted of coveralls, with foot covers attached; multiple layers of nitrile surgical gloves; and a facemask. The attached foot covers led to confusion when entering the ambulance in preparing for patient transport. The responders were knowledgeable of the operation of monitoring equipment and dosimetry. Dosimetry was worn in the correct place for dose recording, and the responders were aware of their administrative dose limits; however, the dosimetry was not read or recorded at intervals established by local procedures.

Ground cover was used to control the spread of contamination; however, glove changes were not performed at appropriate intervals. The handling and disposal of potentially contaminated materials was done in a manner that could enable cross contamination.

Inside the ambulance, the responders demonstrated the ability to provide medical care to a potentially contaminated patient. The responders demonstrated good teamwork and excellent communication.

For this capability the following Radiological Emergency Preparedness criteria were MET:
1.e.1.

a. **Level 1 Finding:** None

b. **Level 2 Finding:**

Issue Number: 028-19-3.a.1-L2-04

Core Capability/Criterion: Public Health, Healthcare & Emergency Medical Services/3.a.1

Condition: Vicksburg Fire Department Ambulance Service leadership did not fully provide emergency workers with the appropriate instructions on the use of direct-reading and permanent-record dosimetry, dosimeter chargers or potassium iodide.

Analysis: The Vicksburg Fire Department Ambulance crew did not demonstrate appropriate radiological exposure control measures. An emergency worker briefing was not provided to the crew members. Warren County Emergency Medical Services/Vicksburg Fire Department Procedure for Response to Radiological Emergencies (2013) checklists were not used by the crew members. The lack of a briefing meant that the following items were not discussed with the ambulance crew prior to dispatch: Potassium iodide was not provided, or its use discussed, use of personal protective equipment, direct-reading dosimeters, thermoluminescent dosimeters, and Ludlum Model 14C; call back and turn back values. Protective clothing worn, was inconsistent with procedures. The protective clothing consisted of coveralls, with foot covers attached; multiple layers of nitrile surgical gloves; and a facemask; the attached foot covers led to confusion when entering the ambulance in preparing for patient transport. During the demonstration, glove changes nor reading of direct-reading dosimeters were observed until the controller advised the workers. According to Warren County procedures, emergency workers are to read their direct-reading dosimeters every 30 minutes and record on their Exposure Control Card, which was not observed being used.

After patient transfer occurred at the hospital, the ambulance crew members were unaware of the next actions to take. The controller was required to pause exercise play and provide just-in-time training to direct the workers on monitoring of the ambulance and themselves. Further, when doffing his personal protective gear,

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

improper measures were observed, as the worker removed his arms from the suit rather than removing the tape and gloves first. This method is not a recognized standard within the Radiological Emergency Preparedness Program.

Possible Cause: Lack of an emergency worker briefing prior to preparing to respond to a potentially contaminated patient potentially contributed to emergency worker hazards and poor contamination avoidance measures by the emergency workers. It was verbalized by the controller that the emergency workers had "left training early" the day that training was provided. Improper training of the workers, coupled with the lack of an emergency worker briefing, could have attributed to the poor emergency worker exposure and contamination avoidance efforts demonstrated. A stand-alone extent of play agreement which specified "correction on the spot" was not integrated into the primary extent of play agreement between Federal Emergency Management Agency and the State. Excessive retraining during a graded event is conducive to negative training and reduced performance.

Reference:

1. Warren County Emergency Medical Services/Vicksburg Fire Department Procedure for Response to Radiological Emergencies.
2. NUREG-0654/FEMA-REP-1, F.2; H.10; K.3.a; K.5.a, b; L.1, 4.

Effect: Lack of an emergency worker briefing prior to response to the potentially contaminated patient directly affected the performance of the emergency workers. The offsite response organization's lack of a formal briefing omitted critical information such as appropriate dosimetry, potassium iodide, and procedures, as well as management of radiological exposure to the workers and the patient. Lack of information regarding potassium iodide and direct-reading dosimetry could directly affect the health and safety of the emergency workers, as potential exposure would not be monitored, and the guidelines for potassium iodide use would not be known.

Recommendation:

1. Review and revise current procedures as needed to include the use of an emergency worker briefing. Items for the briefing should include key aspects of radiological safety such as: contamination control/avoidance, radiation exposure to emergency workers, potassium iodide/issuance instructions, instructions for emergency workers after patient transfer, and donning/doffing procedures
2. Review and revise the annual training program to ensure that the crews are trained on the items contained in the briefing, so they are familiar with procedures and can properly execute their mission.

c. Level 2 Finding:

Issue Number: 028-19-6.d.1-L2-05

Core Capability/Criterion: Public Health, Healthcare & Emergency Medical Services/6.d.1

Condition: Activities conducted in a manner that could potentially spread contamination to a patient.

Analysis: The Vicksburg Fire Department Ambulance Service responders conducted activities in a manner that could potentially spread contamination to a patient. Upon arrival to the patient, one responder approached her, carrying the medical monitor/defibrillator and survey meter, and the medical equipment and meter were placed directly on the ground. Controller inject was necessary to advise the emergency workers to monitor the equipment prior to leaving the scene. One responder was aware of the need to monitor open wounds; however, he did not survey the entire patient for contamination in accordance with procedure. In preparing the patient for loading, the sheets were incorrectly placed on the backboard, which hindered proper cover of the patient. In attempting to cover the patient, a sheet that was directly on the ground was used to cover the patient. Again, controller interjection was necessary to correct the workers on proper contamination avoidance.

Possible Cause: Lack of an emergency worker briefing and just in time training prior to preparing to respond to a potentially contaminated patient potentially contributed to emergency worker hazards and poor contamination avoidance measures by the emergency workers.

Reference:

1. Warren County Emergency Medical Services/Vicksburg Fire Department Procedure for Response to Radiological Emergencies
2. NUREG-0654/FEMA-REP-1, F.2; H.10; K.a.3, K.4, K.5.a, b; L.1, 4

Effect: Poor contamination avoidance measures could directly affect the health and safety of the patient, as contamination could potentially be spread, and possibly delay urgent medical care for the patient.

Recommendation:

1. Current procedures should be updated to include the use of an emergency worker briefing. Items for consideration should include key aspects of radiological safety such as: contamination control/avoidance, radiation exposure to emergency workers, potassium iodide/issuance instructions, instructions for emergency workers after patient transfer, and donning/doffing procedures.
2. A more rigorous training program for emergency workers with State oversight and/or primarily conducted by Mississippi Emergency Management Agency, Radiological Emergency Preparedness Training. Additionally, updating written procedures to provide greater detail for contamination control/avoidance with additional practice demonstrations may be in order.

d. **Not Demonstrated:** None

e. **Prior Level 2 Findings – Resolved:** None

f. Prior Level 2 Findings - Unresolved: None**3.3.7.4 Medical Drill: The Merit Health River Region Medical Center**

The Merit Health River Region Medical Center staff successfully performed the core capability of public health, healthcare, and emergency medical services of a contaminated injured patient. The Merit Health River Region Medical Center had two operational communications systems available, sufficient equipment and personnel protective equipment to support emergency operations. Hospital staff were issued appropriate dosimetry and procedures to manage radiological exposure in accordance with their plan and procedures. The hospital staff read their dosimetry every 15 minutes and recorded their readings on their Dosimetry Issue Sheet. Based on the location of the medical center, potassium iodide would not be needed.

The medical center had sufficient space, adequate resources and trained personnel to monitor, decontaminate and provide medical services to contaminated individuals. There was a dedicated decontamination room attached to the Emergency Room area. Proper contamination control was performed. The instructions of the lead buffer zone nurse-in charge and a radiation accident patient treatment flow chart provided guidance for the personnel in the decontamination room. The Radiation Emergency Assistance Center/Training Site was contacted by telephone for additional guidance. Hospital staff followed procedures for donning and doffing personnel protective equipment, removing contaminated clothing from patients, decontaminating the wounds, contamination control of radiation emergency area and samples, and the proper use of their dosimetry and radiological instrumentation.

For this capability the following Radiological Emergency Preparedness criteria were MET: 1.d.1, 1.e.1, 3.b.1, 6.c.1.

- a. Level 1 Finding: None**
- b. Level 2 Finding: None**
- c. Not Demonstrated: None**
- d. Prior Level 2 Findings – Resolved: None**
- e. Prior Level 2 Findings - Unresolved: None**

[Faint, illegible text from the original document]

This page is intentionally blank

Section 4: Conclusion

Overall, the exercise was a success. Officials and representatives from the State of Mississippi; the risk county of Claiborne; the host counties of Adams, Copiah, Hinds and Warren; and numerous other organizations participated in the exercise. The cooperation and teamwork of the participants was evident throughout all phases of the exercise.

The Federal Emergency Management Agency identified a total of five new level 2 findings during this exercise, leaving one level 2 finding and one planning issue unresolved from the 2017 exercise. The Federal Emergency Management Agency in agreement with the Mississippi State Department of Health, Division of Radiological Health successfully resolved all outstanding level 2 findings and planning issues attributed to them during the redemonstrations on August 8, 2019.

The corrective actions of the remaining level 2 findings for Claiborne County and Warren County will occur during the 2021 Grand Gulf Exercise in accordance with the current program policy.

The Federal Emergency Management Agency wishes to acknowledge the efforts of the many individuals who participated and made this exercise a success. Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still, others have willingly sought this responsibility by volunteering to provide vital emergency services to their communities. State and local emergency response organizations demonstrated knowledge of their emergency response plans and procedures and successfully implemented them.

This page is intentionally blank

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Appendix A: Exercise Timeline

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Made or Action Was Taken									
		SEOC	JIC	DOSE	EOF	Field Team	Claiborne County	Adams County	Hinds County	Copiah County	Warren County
Unusual Event	0814	0825		0825	-		0824	0827	0827	0839	0827
Alert	0848	0859	0859	0859	-		0855	0857	0857	0857	0857
Site Area Emergency	0954	0956/ 1009	0959	0956	-		0957/ 1009	0956/ 1011	0956/ 1011	0956/ 1011	0956/ 1011
General Emergency	1141	1144/ 1157	1143	1144/ 1157	-		1144/ 1157	1144/ 1158	1144	1157	1144
Simulated Rad. Release Started	0944	1009	1041	1009	1009		1009	1033	1033	1033	1033
Simulated Rad. Release Terminated	1345	Ongoing	Ongoing	Ongoing	1201		Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Facility Declared Operational		0915	0945	0915	0901		1000	0910	1027	0907	0930
Declaration of State of Emergency	State	1022	1022	1022	-		-	-	-	-	-
	Local	-	-	-	-		1025	0957	0930	1011	1141
Exercise Terminated		1347	1347	1347	1252		1345	1346	1346	1346	1346
Early Precautionary Actions: Access and functional needs, nursing home, and hospital transfer Initial opening of Warren County RCCC		-	-	-	-		0935 1027	-	-	-	-
1 st Protective Action Decision: Evacuate: 1, 2a, 2b, 7 Monitor and Prepare: Remainder		1027	1041	1027	-		1030	1030	1030	1030	1030
1 st Siren Activation		1045	1045	1045	-		1045	1045	1045	1045	1045
1 st EAS Message: #1		1045	1045	1045	-		1045	1045	1045	1045	1045
2 nd Protective Action Decision: GE/No PAD change		1205	-	1205	-		1205	1205	1205	1205	1205
2 nd Siren Activation		1220	1220	1220	-		1220	1220	1220	1220	1220
2 nd EAS Message: #2		1225	1225	1225	-		1225	1225	1225	1225	1225
KI Administration Decision: EWs Ingest		1257/ 1305	-	1257/ 1305	-		1300*	1257	1257	1257	1257

This page is intentionally blank

Appendix B: Exercise Evaluators and Team Leaders**Regional Assistance Committee Chair:** Randall Hecht**Section Chief:** Robert Spence**Site Specialist:** Gerald McLemore

Location	Evaluation Team	Core Capabilities
Mississippi Emergency Management Agency		
MEMA SEOC	Matt Bradley Paul Nied	Operational Coordination Operational Communications
MEMA JIC	Tom Hegele Linda Gee/FEMARVI Taneeka Hollins / FEMA RI	Public Information and Warning
MEMA TCP (OOS)	FEMA	On Scene Security Protection
Mississippi Department of Radiological Health		
DRH SEOC Dose	Jill Leatherman	Situational Assessment
DRH EOF Dose	Tom Essig	Situational Assessment
DRH Laboratory	John Fill	
Field Team Management	Jim Harworth	Environmental Response/Health and Safety
DRH Field Team 1 DRH Field Team 2	Kent Tosch Debora Blunt	Environmental Response/Health and Safety
Claiborne County		
EOC	Glenda Bryson Deshun Lowery Henry Christensen	Operational Coordination
Backup Route Alerting	Glenda Bryson	Public Information and Warning
Schools	Glenda Bryson	Critical Transportation
EWD (OOS)	FEMA	Environmental Response/Health and Safety

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Location	Evaluation Team	Core Capabilities
TCP (OOS)	FEMA	On Scene Security Protection
Adams County		
EOC	John Fill Jim Greer	Operational Coordination
Reception Center / Congregate Care (OOS)	FEMA	Environmental Response/Health and Safety Mass Care Services
Copiah County		
EOC	Quintin Ivy Marynette Herndon	Operational Coordination
Reception Center / Congregate Care (OOS)	FEMA	Environmental Response/Health and Safety Mass Care Services
Hinds County		
EOC	Lorenzo Lewis Daniel Loomis	Operational Coordination
Reception Center / Congregate Care (OOS)	FEMA	Environmental Response/Health and Safety Mass Care Services
Warren County		
EOC	Michael Dolder Meg Swearingen Charles Williams (OJT)	Operational Coordination
Reception Center / Congregate Care (OOS)	FEMA	Environmental Response/Health and Safety Mass Care Services
MSD (OOS)	FEMA FEMA	Public Health, Healthcare & Emergency Medical Services

Appendix C: Grand Gulf Extent of Play Agreement

2019 PLUME PHASE FULL PARTICIPATION RADIOLOGICAL EMERGENCY PREPAREDNESS EXERCISE

All activities will be demonstrated fully in accordance with respective plans and procedures as they would be in an actual emergency (Federal Emergency Management Agency must receive these plans, guides and procedures no later than 60 days before the exercise). This Extent of Play agreement is written by exception. If it is not listed as an exception it will be demonstrated as described in the plans, standard operating guides and/or procedures. Any issue or discrepancy arising during exercise play may be re-demonstrated if allowed by the Radiological Assistance Chairman or as listed herein. This allowance may be granted if it is not disruptive to exercise play and is mutually agreed to by the Lead off-site response organization controller and Lead Federal Emergency Management Agency evaluator.

1. Core Capability: Operational Coordination – State Emergency Operations Center, Claiborne, Adams, Copiah, Hinds and Warren Counties

Definition: Establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of core capabilities.

1.1 Capability Target: Emergency Operations Management

Critical Task 1.1.1: Off-Site response organizations use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner (NUREG.0654 A.1.a, e; A.3, 4; C.1, 4, 6; D.4; E.1, 2; G.3.a.i H.3, 4; Criterion 1a1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate the capability to receive notification of an incident from the licensee; (2) verify the notification, (3) contact, alert, and mobilize key emergency personnel in a timely manner, (4) Responders must demonstrate the ability to receive and/or initiate notification to the licensees or other respective emergency management organizations of an incident in a timely manner when they receive information. (5) Demonstrate the ability to maintain and staff 24-hour operations. (6) Off-Site response organization must demonstrate the activation of facilities for immediate use by mobilized personnel upon their arrival-(7) The location and contact information for facilities included in the incident command must be available to all appropriate responding agencies and the nuclear power plant. (8) The ability to identify and request additional resources or identify compensatory measures must be demonstrated.

Off-Site response organization exception: Agreed

Critical Task 1.1.2: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Communications capabilities are managed in support of emergency operations (NUREG.0654 F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 181

Performance Measure: (1) Off-Site response organization must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring teams, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible Off-Site response organization must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations. (4) Off-Site response organizations must ensure that a coordinated communication link for fixed and mobile medical support facilities exists.

Off-Site response organizations exception: Agreed

Critical Task I.1.3: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. (3) At locations where traffic and access control personnel are deployed, appropriate equipment (e.g., vehicles, barriers, traffic cones, and signs) must be available. (4) Responsible Off-Site response organizations must demonstrate the capability to maintain inventories of potassium iodide sufficient for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams (e.g., civil news media) (b) institutionalized individuals and (c) members of the general public, (5) The plans/procedures must include the forms to be used for documenting emergency worker ingestion of potassium iodide. (6) Off-Site response organizations physical inspection at the storage location(s) or through documentation of quantities of dosimetry and potassium iodide available and storage locations(s) will be confirmed by current inventory submitted during the exercise, provided in the annual letter of certification submission; and/or verified during an Staff Assistance Visit. (7) Off-Site response organizations must demonstrate the capability to maintain inventories of appropriate direct-reading and permanent-record dosimeters in sufficient quantities for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams. (8) Appropriate direct-reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the Off-Site response organization's plans/procedures. (9) All monitoring instruments must be inspected, and operationally checked before each use. Instruments must be calibrated in accordance with the manufacturer's recommendations. (10) A label indicating such calibration must be on each instrument. (11) In addition, instruments being used to measure activity must have a sticker-affixed to their sides indicating the effective range of the readings. The range of readings documentation specifies the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source. (12) In areas where portal monitors are

used, the Off-Site response organizations must set up and operationally check the monitor(s). The monitor(s) must conform to the standards set forth in the *Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response*, FEMA.REP.21 (March 1995) or in accordance with the manufacturer's recommendations.

Off-Site response organizations exception: Agreed.

1.2 Capability Target: Precautionary and/or Protective Action Decision Making

Critical Task 1.2.1: Key personnel with leadership roles for the off-site response organizations provide direction and control to that part of the overall response effort for which they are responsible (NUREG.0654 A.1.d; A.2.a, b; A.3; C.4, 6; Criterion 1c1). Radiological Program Manual Pg. 181

Performance Measure: (1) Leadership personnel must demonstrate the ability to carry out the essential management functions of the response effort (e.g., keeping staff informed through periodic briefings and/or other means, coordinating with other Off-Site response organizations, and ensuring completion of requirements and requests.) (2) Leadership must demonstrate the ability to prioritize resource tasking and replace/supplement resources (e.g., through memorandum of understanding or other agreements) when faced with competing demands for finite resources. Any resources identified through letter of agreement/memorandum of understanding must be on the off-site response organization's mobilization list, so they may be contacted during an incident if needed.

Off-Site response organizations exception: Agreed

Critical Task 1.2.2: Off-Site response organizations use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including the use of potassium iodide, is in place for emergency workers including provisions to authorize radiation exposure in excess of administrative limits or protection action guides (NUREG.0654 C.6; F; K.3.a; K.4 Criterion 2a1). Radiological Program Manual Pg. 184-185

Performance Measure: (1) Off-Site response organizations authorized to send emergency workers into the plume exposure pathway emergency planning zone must demonstrate a capability to comply with emergency worker exposure limits based on their emergency plans/procedures. (2) Off-Site response organizations must also demonstrate the capability to make decisions concerning authorization of exposure levels in excess of pre-authorized levels and the number of emergency workers receiving radiation doses above pre-authorized levels. (3) This would include providing potassium iodide and dosimetry in a timely manner to emergency workers dispatched onsite to support plant incident assessment and mitigating actions, in accordance with respective plans/procedures.

Off-Site response organizations exception: Agreed

Critical Task 1.2.3: A decision-making process involving consideration of appropriate factors and necessary coordination is used to make protection action decisions for the general public (including the recommendation for the use of potassium iodide, if off-site response organizations policy) (NUREG.0654 A.3; C.4; 6; D.4; J.9; J.10.e.f; m Criterion 2b2). Radiological Program Manual Pg. 185

Performance Measure: (1) Off-Site response organizations must have the capability to make both initial and subsequent precautionary and/or protective action decisions in a timely manner appropriate to the incident, based on information from the licensee, assessment of plant status and potential or actual releases, other available information related to the incident, input from appropriate off-site response organizations authorities (e.g., incident command), and protection action recommendations from the utility and off-site response organizations staff. (2) In addition, a subsequent or alternate precautionary and/or protective action decision may be appropriate if various conditions (e.g., an hostile action based incident, weather, release timing and magnitude) pose undue risk to an evacuation or if evacuation may disrupt the efforts to respond to a hostile action. (3) Off-Site response organizations must demonstrate the ability to obtain supplemental resources (e.g., mutual aid) necessary to implement a precautionary and/or protective action decision if local law enforcement, fire service, hazardous material, and emergency medical resources are used to augment response to the nuclear power plant site or other key infrastructure. (4) If the off-site response organizations has determined that potassium iodide will be used as a protective measure for the general public under offsite plans/procedures, then it must demonstrate the capability to make decisions on the distribution and administration of potassium iodide to supplement sheltering and evacuation. This decision must be based on the off-site response organization's plans/procedures or projected thyroid dose compared with the established protection action guide for potassium iodide administration. The potassium iodide decision-making process must involve close coordination with appropriate assessment and decision-making staff. (5) If more than one off-site response organizations is involved in decision making, all appropriate Off-Site response organizations must communicate and coordinate precautionary and/or protective action decisions with each other. (6) In addition, decisions must be coordinated/communicated with incident command. Off-Site response organizations must demonstrate the capability to communicate the results of decisions to all the affected locations.

Off-Site response organizations exception: Agreed

Critical Task 1.2.4: Protective action decisions are made, as appropriate, for groups of persons with disabilities and access/functional needs (NUREG.0654 D.4; J.9; J.10.d, e; Criterion 2c1). Radiological Program Manual Pg. 186

Performance Measures: (1) Usually it is appropriate to implement evacuation in areas where doses are projected to exceed the lower end of the range of protection action guides, except for incidents where there is a high-risk environmental condition or where high-risk groups (e.g., the immobile or infirm) are involved. (2) In these cases, factors that must be considered include weather conditions, shelter availability, availability of transportation assets, risk of evacuation versus risk from the avoided dose, and precautionary school evacuations. In addition, decisions

must be coordinated/communicated with the incident command. In situations where an institutionalized population cannot be evacuated, the off-site response organizations must consider use of potassium iodide. (3) Off-Site response organizations must demonstrate the capability to alert and notify all public school systems/districts of emergency conditions that are expected to or may necessitate protective actions for students. Demonstration requires that the Off-Site response organizations actually contact public school systems/districts during the exercise. (4) Off-Site response organizations must demonstrate how the decision-making process takes those with disabilities and access/functional needs (e.g., nursing homes, correctional facilities, licensed-day cares, mobility-impaired individuals, and transportation-dependent individuals) into account.

Off-Site response organizations exception: Agreed.

1.3 Capability Target: Protective Action Implementation

Critical Task 1.3.1: Off-Site response organizations issue appropriate dosimetry, potassium iodide, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/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. Off-Site response organizations maintain appropriate record-keeping of the administration of potassium iodide to emergency workers (NUREG.0654 J.10.e, K.3.a, b, K.4; Criterion 3a1). Radiological Program Manual Pg. 189-190.

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent-record dosimetry, dosimeter chargers, potassium iodide, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of total effective dose equivalent and maximum exposure limits, for those emergency workers involved in lifesaving activities, contained in the off-site response organization's plans/procedures. (2) Each emergency worker must have basic knowledge of radiation exposure limits as specified in the off-site response organization's plans/procedures. If supplemental resources are used, they must be provided with just-in-time training to ensure basic knowledge of radiation exposure control. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control. (3) During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. (4) Off-Site response organizations must demonstrate the actions described in the plans/procedures by determining whether to replace the worker, authorize the worker to incur additional exposures, or take other actions. (5) If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge. (6) Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and can share a direct read dosimeter. Each team member must still have and maintain his or her own permanent-record

dosimetry. (7) Off-Site response organizations must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response. (8) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide to emergency workers consistent with decisions made. Off-Site response organizations must have the capability to develop and maintain lists of emergency workers who have ingested potassium iodide, including documentation of the date(s) and time(s) they did so. (9) Emergency workers must demonstrate basic knowledge of procedures for using potassium iodide. If exercise play does not require emergency workers to consume potassium iodide, evaluators must interview at least two workers to determine their knowledge.

Off-Site response organizations exception: Agreed

Critical Task 1.3.2: potassium iodide and appropriate instructions are available if a decision to recommend use of potassium iodide is made. Appropriate record-keeping of the administration of potassium iodide for institutionalized individuals and the general public is maintained (NUREG.0654 J.10.e, f; Criterion 3b1). Radiological Program Manual Pg. 190

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to make potassium iodide available to institutionalized individuals and, where provided for in their plans/procedures, to members of the general public. (2) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide consistent with decisions made. (3) Off-Site response organizations must have the capability to develop and maintain lists of institutionalized individuals who have ingested potassium iodide, including documentation of the date(s) and time(s) they were instructed to ingest potassium iodide. Off-Site response organizations must demonstrate the capability to formulate and disseminate instructions on using potassium iodide for those advised to take it. (4) If a recommendation is made for the general public to take potassium iodide, appropriate information must be provided to the public by the means of notification specified in the off-site response organization's plans/procedures.

Off-Site response organizations exception: Agreed

Critical Task 1.3.3: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel (NUREG.0654 A.3; C.1, 4; J.10.g, j; Criterion 3d1) Radiological Program Manual Pg. 191-192

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to select, establish, and staff appropriate traffic and access control points consistent with current conditions and protection action decisions (e.g., evacuating, sheltering, and relocation) in a timely manner. (2) Off-Site response organizations must demonstrate the capability to provide instructions to traffic and access control staff on actions to take when modifications in protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled. (3) Traffic and access control staff must demonstrate accurate knowledge of their roles and responsibilities, including verifying emergency worker identification and access

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

authorization to the affected areas. (4) In instances where off-site response organizations lack authority necessary to control access by certain types of traffic (e.g., rail, water, and air traffic), they must demonstrate the capability to contact the State or Federal agencies that have the needed authority.

Off-site response organizations exceptions: Agreed

Critical Task 1.3.4: Impediments to evacuation are identified and resolved (NUREG.0654 J.10.k; Criterion 3d2). Radiological Program Manual Pg. 192

Performance Measures: (1) off-site response organizations must demonstrate the capability to identify and take appropriate actions concerning impediments to evacuations. (2) The impediment must remain in place during the evacuation long enough that rerouting of traffic is required and (3) must also result in demonstration of decision-making and coordination with the Joint information Center to communicate the alternate route to evacuees.

Off-site response organizations exception: Agreed

2. Core Capability: Critical Transportation – Claiborne County

Definition: Provide transportation (including infrastructure access and accessible transportation services) for response priority objectives, including the evacuation of people and animals, and the delivery of vital response personnel, equipment, and services into the affected areas.

2.1. Capability Target: Protective Action Implementation

Critical Task 2.1.1: off-site response organizations/School officials implement protective actions for schools (NUREG.0654 J.10.c, d, e, g; Criterion 3c2). Radiological Program Manual Pg. 191

Performance Measure: (1) School systems/districts (these include public and private schools, kindergartens, and preschools) must demonstrate the ability to implement precautionary and/or protective action decisions for students. (2) Each school system/district within the 10-mile emergency planning zone must demonstrate implementation of protective actions. At least one school per affected system/ district must participate in the demonstration. (3) Which protective action is implemented (evacuation to reception centers, relocation to host schools, cancel the school day, early dismissal, shelter in place), all activities to coordinate and complete the process should be evaluated. (4) School personnel including decision-making officials (e.g., schools' superintendent/principals and transportation director/bus dispatchers) and at least one bus driver (and the bus driver's escort, if applicable) must be available to demonstrate knowledge of their role(s) in the evacuation of school children. (5) Communications capabilities between school officials and the buses, if required by the plans/procedures, must be verified. (6) Officials of the school system(s) must demonstrate the capability to develop and provide timely information to Off-Site response organizations/parents for use in messages to parents, the general public, and the media on the status of protective actions for schools.

Off-Site response organizations exception: Agreed

3. Core Capability: Situational Assessment – Dose Assessment, Emergency Operations Facility

Definition: Provide all decision makers with decision-relevant information regarding the nature and extent of the hazard, any cascading effects, and the status of the response.

3.1. Capability Target: Precautionary and/or Protective Action Decision Making

Critical Task 3.1.1: Off-Site response organizations use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including the use of potassium iodide, is in place for emergency workers, including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. (NUREG.0654/FEMA REP.1, C.6; f; K.3.a; K.4; Criterion 2.a.1). Radiological Program Manual Pg. 184

Performance Measures: (1) Off-Site response organizations authorized to send emergency workers into the plume exposure pathway emergency planning zone must demonstrate a capability to comply with emergency worker exposure limits based on their emergency plans/procedures. (2) Off-Site response organizations must also demonstrate the capability to make decisions concerning authorization of exposure levels in excess of pre-authorized levels and the number of emergency workers receiving radiation doses above pre-authorized levels. (3) This would include providing potassium iodide and dosimetry in a timely manner to emergency workers dispatched onsite to support plant incident assessment and mitigating actions, in accordance with respective plans/procedures.

Off-Site response organizations exception: Agreed

Critical Task 3.1.2: Appropriate protective action recommendations (protection action recommendations) are based on available information on plant conditions, field monitoring data, and licensee and off-site response organizations dose projections, as well as knowledge of onsite and offsite environmental conditions. (NUREG.0654/FEMA.REP.1, I.10 and Supplement 3; Criterion 2.b.1) Radiological Program Manual Pg. 184-185

Performance Measures: (1) The off-site response organizations must demonstrate the capability to use the appropriate means described in the plans/procedures to develop protection action recommendations for decision-makers based on available information and recommendations provided by the licensee, as well as field monitoring data if available. Workers must also consider any release and meteorological data provided by the licensee. (2) The off-site response organizations must demonstrate a reliable capability to independently validate dose projections. The types of calculations to be demonstrated depend on the data available and the need for assessments to support the protection action recommendations must be appropriate to the scenario. In all cases, calculation of projected dose must be demonstrated.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Projected doses must be related to quantities and units of the protection action guide to which they will be compared. (3) Protection action recommendations must be promptly transmitted to decision-makers in a prearranged format. (4) When the licensee and off-site response organizations projected doses differ by more than a factor of 10, the off-site response organizations and licensee must determine the source of the difference by discussing input data and assumptions, using different models, or exploring possible reasons. Resolution of these differences must be incorporated into the protection action recommendations if timely and appropriate. (5) The off-site response organizations must demonstrate the capability to use any additional data to refine projected doses and exposure rates and revise the associated protection action recommendations.

Requires correction:

Condition: (028.17.2.b.1-L2,02) The State of Mississippi dose assessment team did not provide the State Emergency Operations Center staff with accurate results in a timely manner.

Off-Site response organizations exception: Agreed

4. Core Capability: Operational Communications – State Emergency Operations Center, Field Teams, Laboratory, Emergency Operations Facility, Claiborne, Adams, Copiah, Hinds and Warren Counties

Definition: Establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of core capabilities.

4.1 Capability Target: Emergency Operations Management

Critical Task 4.1.1: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations (NUREG.0654, F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring team's, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible off-site response organizations must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations. (4) Off-Site response organizations must ensure that a coordinated communication link for fixed and mobile medical support facilities exists.

Off-Site response organizations exception: Agreed

5. Core Capability: Public Information and Warning – Joint information Center/Joint information System and Claiborne County

Definition: Deliver coordinated, prompt, reliable, and actionable information to the whole community through the use of clear, consistent, accessible, and culturally and linguistically appropriate methods to effectively relay information regarding any threat or hazard and, as appropriate, the actions being taken and the assistance being made available.

5.1 Capability Target: Emergency Notification and Public Information

Critical Task 5.1.1: Off-Site response organizations use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner (NUREG.0654 A.1.a, e; A.3, 4; C.1, 4, 6; D.4; E.1, 2; G.3.a; H.3, 4; Criterion 1a1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate the capability (2) contact, alert, and mobilize key emergency personnel in a timely manner, (3) Demonstrate the ability to maintain and staff 24-hour operations. (4) Off-Site response organizations must demonstrate the activation of facilities for immediate use by mobilized personnel upon their arrival. (5) The location and contact information for facilities included in the incident command must be available to all appropriate responding agencies and the nuclear power plant. (6) The ability to identify and request additional resources or identify compensatory measures must be demonstrated.

Off-Site response organizations exception: Agreed

Critical Task 5.1.2: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations (NUREG.0654 F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring team's, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible off-site response organizations must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations.

Off-Site response organizations exception: Agreed

Critical Task 5.1.3: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans; (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role.

Off-Site response organizations exception: Agreed

Critical Task 5.1.4: Impediments to evacuation are identified and resolved (NUREG.0654 J.10.k; Criterion 3d2). Radiological Program Manual Pg. 192

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to identify and take appropriate actions concerning impediments to evacuations. (2) The impediment must remain in place during the evacuation long enough that re-routing of traffic is required and (3) must also result in demonstration of decision-making and coordination with the Joint Information Center to communicate the alternate route to evacuees.

Off-Site response organizations exception: Agreed

Critical Task 5.1.5: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. The initial instructional message to the public must include as a minimum the elements required by current Federal Emergency Management Agency Radiological Emergency Preparedness Guidance (Timely: The responsible off-site response organizations personnel/representatives demonstrate actions to disseminate the appropriate information/instructions with a sense of urgency and without undue delay) (NUREG.0654 E.5, 6, 7; Criterion 5a1). Radiological Program Manual Pg. 198-199

Performance Measure: (1) Responsible off-site response organizations must demonstrate the capability to sequentially provide an alert signal followed by an initial instructional message to populated areas throughout the 10-mile plume exposure pathway emergency planning zone. Following the decision to activate the alert and notification system, (2) Off-Site response organizations must complete system activation for primary alert/notification and disseminate the information/instructions in a timely manner. For exercise purposes, timely is defined as "with a sense of urgency and without undue delay." (3) Procedures to broadcast the message must be fully demonstrated as they would in an actual emergency up to the point of transmission. Broadcast of the message(s) or test message(s) is not required. The procedures must be demonstrated up to the point of actual activation. The alert signal activation should be simulated, not performed. Evaluations of emergency alert system broadcast stations may also be accomplished through Staff Assistance Visits. (4) The capability of the primary notification system to broadcast an instructional message on a 24-hour basis must be verified during an interview with appropriate personnel from the primary notification system, including verification of provisions for backup power or an alternate station. (5) The initial message must include at a minimum the following elements:

- Identification of the off-site response organizations responsible and the official with authority for providing the alert signal and instructional message;
- Identification of the commercial nuclear power plant and a statement that an emergency exists there;
- Reference to REP-specific emergency information (e.g., brochures, calendars, and/or information in telephone books) for use by the general public during an emergency; and
- A closing statement asking that the affected and potentially affected population stay tuned for additional information, or that the population tune to another station for additional information.

(6) If route alerting is demonstrated as a primary method of alert and notification, it must be done in accordance with the off-site response organization's plans/procedures. Off-Site response organizations must demonstrate the capability to accomplish the primary route alerting in a timely manner (not subject to specific time requirements). At least one route needs to be demonstrated and evaluated. The selected route(s) must vary from exercise to exercise. However, the most difficult route(s) must be demonstrated no less than once every eight years.

(7) All alert and notification activities along the route(s) must be simulated (i.e., the message that would actually be used is read for the evaluator, but not actually broadcast). (8) Actual testing of the mobile public address system will be conducted at an agreed-upon location.

Off-Site response organizations exception: Agreed

Critical Task 5.1.6: Backup alert and notification of the public is completed within a reasonable time following the detection by the off-site response organizations of a failure of the primary alert and notification system (NUREG.0654-E.6; Appendix 3.B.2.c; Criterion 5a3). Radiological Program Manual Pg. 199

Performance Measure: (1) Backup alert and notification procedures that could be implemented in multiple stages must be structured such that the population closest to the plant (e.g., within 2 miles) is alerted and notified first. The populations farther away and downwind of any potential radiological release would be covered sequentially (e.g., 2 to 5 miles, followed by downwind 5 to 10 miles, and finally the remaining population as directed by authorities). (2) Although circumstances may not allow this for all situations, Federal Emergency Management Agency and the NRC recommend that off-site response organizations and operators attempt to establish backup means that will reach those in the plume exposure pathway emergency planning zone within a reasonable time of failure of the primary alert and notification system, with a recommended goal of 45 minutes. (3) The backup alert message must, at a minimum, include: (a) a statement that an emergency exists at the plant and (b) instructions regarding where to obtain additional information. When backup route alerting is demonstrated, only one route needs to be selected and demonstrated. All alert and notification activities along the route(s) must be simulated (i.e., the message that would actually be used is read for the evaluator, but not actually broadcast), as negotiated in the extent of play. (4) Actual testing of the mobile public address system will be conducted at an agreed-upon location.

Off-Site response organizations exception: Agreed

Critical Task 5.1.7: Ensure off-site response organizations provide accurate emergency information and instructions to the public and the news media in a timely manner (The responsible off-site response organizations personnel/representatives demonstrate actions to disseminate the appropriate information/instructions with a sense of urgency and without undue delay) (NUREG.0654 E.5, 7; G.3.a; G.4.a, c; Criterion **5b1**). Radiological Program Manual Pg. 200-201.

Performance Measure: (1) The responsible off-site response organizations personnel/representatives must demonstrate actions to provide emergency information and instructions to the public and media in a timely manner following the initial alert and notification (not subject to specific time requirements). For exercise purposes, timely is defined as "with a sense of urgency and without undue delay." Message elements: (2) The off-site response organizations must ensure that emergency information and instructions are consistent with protection action decisions made by appropriate officials. (3) The emergency information must contain all necessary and applicable instructions (e.g., evacuation instructions, evacuation routes, reception center locations, what to take when evacuating, shelter-in-place instructions, information concerning protective actions for schools and persons with disabilities, and access/functional needs, and public inquiry hotline telephone number) to assist the public in carrying out the protection action decisions provided (4) The off-site response organizations must also be prepared to disclose and explain the emergency classification level of the incident. At a minimum, this information must be included in media briefings and/or media releases. (5) Off-Site response organizations must demonstrate the capability to use language that is clear and understandable to the public within both the plume and ingestion exposure pathway emergency planning zones. (6) This includes demonstration of the capability to use familiar landmarks and boundaries to describe protective action areas. (7) The emergency information must be all-inclusive by including the four items specified under exercise Demonstration Criterion 5.a.1 and previously identified protective action areas that are still valid, as well as new areas. (8) Information about any rerouting of evacuation routes due to impediments should also be included. (9) The Off-Site response organizations must demonstrate the capability to ensure that emergency information that is no longer valid is rescinded and not repeated by broadcast media. (10) Off-Site response organizations must demonstrate the capability to ensure that current emergency information is repeated at pre-established intervals in accordance with the plans/procedures. (11) Off-Site response organizations must demonstrate the capability to develop emergency information in a non-English language when required by the plans/procedures. Media information: (12) Off-Site response organizations must demonstrate the capability to provide timely, accurate, concise, and coordinated information to the news media for subsequent dissemination to the public. (13) This would include demonstration of the capability to conduct timely and pertinent media briefings and distribute media releases as the incident warrants. (14) The off-site response organizations must demonstrate the capability to respond appropriately to inquiries from the news media. (15) All information presented in media briefings and releases must be consistent with protection action decisions and other emergency information provided to the public. (16) Copies of pertinent emergency information (e.g., emergency alert system messages and media releases) and media information kits must be available for dissemination to the media. Public Inquiry (17) Off-Site response organizations must demonstrate that an effective system is in place for dealing with calls received via the

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

public inquiry hotline. (18) Hotline staff must demonstrate the capability to provide or obtain accurate information for callers or refer them to an appropriate information source. (19) Information from the hotline staff, including information that corrects false or inaccurate information when trends are noted, must be included, as appropriate, in emergency information provided to the public, media briefings, and/or media releases.

Requires correction:

Condition: (028.17.5.b.1-L2.01) Message preparation, including emergency alert system and supplemental news releases, were in conflict between the State and Claiborne County. Established protocols for the Executive Director (or his designee) and the Director of External Affairs both approving messaging was not observed. These messages did not adequately relay the protective action decisions of the State and County leadership. Particularly, the initial Emergency Alert Message issued a "Monitor and Prepare" order and the fourth supplementary news release modified the order to "Shelter in Place." During media briefings, the State Lead Public Information Officer did not fully explain the protective actions of "Monitor and Prepare," "Shelter in Place," and "Evacuate" as it pertains to what the public should do to comply with these actions. The geographical boundaries provided to the public in press releases were in sync with the safety calendar, however, they did not meet the intent of the leadership's protective action decision to evacuate only to the 5-mile boundary of the Protective Action Area.

Off-Site response organizations exception: Agreed

6. Core Capability: Environmental Response/Health and Safety – Dose Assessment, Field Teams, Laboratory, emergency operations facility, Claiborne, Adams, Copiah, Hinds and Warren Counties

Definition: Conduct appropriate measures to ensure the protection of the health and safety of the public and workers, as well as the environment, from all-hazards in support of responder operations and the affected communities.

Out-of-Sequence Scheduled Activities				
LOCATION	ACTIVITY	MONTH	DATE	TIME
Copiah County	RCCC	Feb	14 th	6:00 PM – 10:00 PM
Hinds County	RCCC	Feb	25 th	6:00 PM – 10:00 PM
Claiborne County	EWD	Feb	26 th	9:00 AM – 12:00 PM
Claiborne County	TCP / A3	Feb	26 th	2:00 PM – 3:00 PM
Adams County	RCCC	Feb	26 th	6:00 PM – 10:00 PM
Warren County	MSD	Feb	27 th	8:00 AM – 1:00 PM
Warren County	RCCC	Feb	27 th	6:00 PM – 10:00 PM
MEMA	SAV	Feb	28 th	9:00 AM – 10:00 AM
MSDH/DRH	SAV	Feb	28 th	10:30 AM – 11:00 AM

6.1 Capability Target: Field Measurement and Analysis

Critical Task 6.1.1: Off-Site response organizations use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner (NUREG.0654 A.1.a, e; A.3, 4; C.1, 4, 6; D.4; E.1, 2; G.a.3; H.3, 4; Criterion 1a1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate the capability to, (2) contact, alert, and mobilize key emergency personnel in a timely manner, (3) Demonstrate the ability to maintain and staff 24-hour operations. (4) Off-Site response organizations must demonstrate the activation of facilities for immediate use by mobilized personnel upon their arrival. (5) The location and contact information for facilities included in the incident command must be available to all appropriate responding agencies and the nuclear power plant. (6) The ability to identify and request additional resources or identify compensatory measures must be demonstrated.

Off-Site response organizations exception: Agreed

Critical Task 6.1.2: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations (NUREG.0654 F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 181

Performance Measure: (1) Off-Site response organizations must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring teams, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible off-site response organizations must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations.

Off-Site response organizations exception: Agreed

Critical Task 6.1.3: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. (3) Responsible off-site response organizations must demonstrate the capability to maintain inventories of potassium iodide sufficient for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams (e.g., civil news media) (b) members of the general public, (4) The

plans/procedures must include the forms to be used for documenting emergency worker ingestion of potassium iodide. (5) Off-Site response organizations physical inspection at the storage location(s) or through documentation of quantities of dosimetry and potassium iodide available and storage locations(s) will be confirmed by current inventory submitted during the exercise, provided in the annual letter of certification submission, and/or verified during a Staff Assistance Visit. (6) Off-Site response organizations must demonstrate the capability to maintain inventories of appropriate direct read and permanent-record dosimeters in sufficient quantities for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams. (7) Appropriate direct-reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the off-site response organization's plans/procedures. (8) All monitoring instruments must be inspected, and operationally checked before each use. Instruments must be calibrated in accordance with the manufacturer's recommendations. (9) A label indicating such calibration must be on each instrument. (10) In addition, instruments being used to measure activity must have a sticker-affixed to their sides indicating the effective range of the readings. The range of readings documentation specifies the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source. (11) In areas where portal monitors are used, the off-site response organizations must set up and operationally check the monitor(s). The monitor(s) must conform to the standards set forth in the Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response, FEMA.REP.21 (March 1995) or in accordance with the manufacturer's recommendations.

Recommended for correction:

Condition: (028.17.1.e.1.P.01) Radiation monitoring equipment was not appropriate or in sufficient supply to support emergency operations. Field monitoring teams were not sufficiently equipped to monitor radiation levels in a high gamma radiation field. The teams did not have backup supplies of calibrated low-level radiation survey instruments and calibrated/charged air pumps for collecting an air sample.

Off-Site response organizations exception: Agreed

Critical Task 6.1.4: Off-Site response organizations issue appropriate dosimetry, potassium iodide, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/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. Off-Site response organizations maintain appropriate record-keeping of the administration of potassium iodide to emergency workers (NUREG.0654 K.3.a, b, K.4; Criterion 3a1). Radiological Program Manual Pg. 189

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent-record dosimetry, dosimeter chargers, potassium iodide, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of total effective

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

dose equivalent and maximum exposure limits, for those emergency workers involved in lifesaving activities, contained in the off-site response organization's plans/procedures. (2) Each emergency worker must have basic knowledge of radiation exposure limits as specified in the off-site response organization's plans/procedures. If supplemental resources are used, they must be provided with just-in-time training to ensure basic knowledge of radiation exposure control. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control. (3) During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. (4) Off-Site response organizations must demonstrate the actions described in the plans/procedures by determining whether to replace the worker, authorize the worker to incur additional exposures, or take other actions. (5) If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge. (6) Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and can share a direct read dosimeter. Each team member must still have and maintain his or her own permanent-record dosimetry. (7) Off-Site response organizations must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response. (8) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide to emergency workers consistent with decisions made. Off-Site response organizations must have the capability to develop and maintain lists of emergency workers who have ingested potassium iodide, including documentation of the date(s) and time(s) they did so. (9) Emergency workers must demonstrate basic knowledge of procedures for using potassium iodide. If exercise play does not require emergency workers to consume potassium iodide, evaluators must interview at least two workers to determine their knowledge.

Off-Site response organizations exception: Agreed

Critical Task 6.1.5: Field teams (two or more) are managed to obtain sufficient information to help characterize the release and to control radiation exposure (NUREG C.1; H.12; I.7, 8, 11; J.10.a; Criterion 4a2). Radiological Program Manual Pg. 195

Performance Measure: (1) Responsible off-site response organizations must demonstrate the capability to brief field monitoring teams on predicted plume location and direction, plume travel speed, and exposure control procedures before deployment. (2) Teams must be directed to take measurements at such locations and times as necessary to provide sufficient information to characterize the plume and its impacts. If the responsibility for obtaining peak measurements in the plume has been accepted by licensee field monitoring teams, with concurrence from off-site response organizations, there is no requirement for these measurements to be repeated by off-site response organizations monitoring teams. (3) If the licensee field monitoring teams do not obtain peak measurements in the plume, it is the off-site response organization's decision as to whether peak measurements are necessary to sufficiently characterize the plume. (4) The sharing and coordination of plume measurement information among all field monitoring teams (licensee, Federal, and off-site response organizations) is essential.

Requires correction:

Condition: (028-17-4.a.2-L2.03) The Mississippi Radiological Emergency Response Team Coordinator failed to instruct the field teams to utilize a silver zeolite cartridge for obtaining an air sample. The Radiological Emergency Response Team Coordinator never instructed either field team to make an attempt to locate the centerline of the plume. The coordinator also allowed significant time to pass before finalizing airborne activity calculations and providing that data to dose assessment for confirmation of projected dose. The Radiological Emergency Response Team Coordinator was unprepared and had little knowledge on how to perform the activity calculations on the Field Estimate of Airborne Activity Form. Shortly after the release, a field team conducted an air sample in the plume. That team was then sent to low background area to stage and await further instruction instead of obtaining more data or locating the centerline.

Off-Site response organizations exception: Agreed

Critical Task 6.1.6: Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low-background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media (NUREG C.1; I.8; 9; H.12; J.10.a; Criterion 4a3). Radiological Program Manual Pg. 195.

Performance Measure: (1) Two or more field monitoring teams must demonstrate the capability to make and report measurements of ambient radiation to the field team coordinator, dose assessment team, or other appropriate authority. (2) Field monitoring teams must also demonstrate the capability to obtain an air sample for measurement of airborne radioiodine and particulates, and to provide the appropriate authority with field data pertaining to measurement. (3) If samples have radioactivity significantly above background, the authority must consider the need for expedited laboratory analyses of these samples. (4) Coordination concerning transfer of samples, including a chain-of-custody form(s), to a radiological laboratory(ies) must be demonstrated. (5) O ROs must share data in a timely manner with all other appropriate off-site response organizations. All methodology, including contamination control, instrumentation, preparation of samples, and a chain-of-custody form(s) for transfer to a laboratory(ies), will be in accordance with the off-site response organization's plans/procedures.

Recommended for correction:

Condition: (028.17.4.a.3.P.02) The Department of Radiological Health procedure needs revision to clarify methodology for air sampling to ensure that proper methodology is followed for collecting and analyzing a quality air sample to use for making dose assessment calculations and making protective actions for the public. Personnel also need to have additional training on air sample procedures and why certain steps are vital to taking a valid air sample.

Off-Site response organizations exception: Agreed

Critical Task 6.1.7: The laboratory is capable of performing required radiological analyses to support protection action decisions (NUREG.0654 C.1; 3; J.11; Criterion 4c1), Radiological Program Manual Pg. 197

Performance Measure: (1) The laboratory staff must demonstrate the capability to follow appropriate procedures for receiving samples, including logging information, preventing contamination of the laboratory(ies), preventing buildup of background radiation due to stored samples, preventing cross contamination of samples, preserving samples that may spoil (e.g., milk), and keeping track of sample identity. (2) In addition, the laboratory staff must demonstrate the capability to prepare samples for conducting measurements. (3) The laboratory(ies) must be appropriately equipped to provide, upon request, timely analyses of media of sufficient quality and sensitivity to support assessments and decisions anticipated in the off-site response organization's plans/procedures. (4) The laboratory instrument calibrations must be traceable to standards provided by the National Institute of Standards and Technology. Laboratory methods used to analyze typical radionuclides released in a reactor incident must be as described in the plans/procedures. New or revised methods may be used to analyze atypical radionuclide releases (e.g., transuranic or as a result of a terrorist incident) or if warranted by incident circumstances. Analysis may require resources beyond those of the off-site response organizations. (5) The laboratory staff must be qualified in radio analytical techniques and contamination control procedures.

Off-Site response organizations exception: Agreed

6.2 Capability Target: Support Operations and Facilities

Critical Task 6.2.1: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. (3) Responsible off-site response organizations must demonstrate the capability to maintain inventories of potassium iodide sufficient for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams (e.g., civil news media) (b) institutionalized individuals and (c) members of the general public, (4) The plans/procedures must include the forms to be used for documenting emergency worker ingestion of potassium iodide. (5) Off-Site response organizations must demonstrate the capability to maintain inventories of appropriate direct read and permanent- record dosimeters in sufficient quantities for use by: (a) emergency workers, ancillary groups as identified in plans or specialized response teams. (6) Appropriate direct-

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the off-site response organization's plans/procedures. (7) All monitoring instruments must be inspected, and operationally checked before each use. Instruments must be calibrated in accordance with the manufacturer's recommendations. (8) A label indicating such calibration must be on each instrument. (9) In addition, instruments being used to measure activity must have a sticker-affixed to their sides indicating the effective range of the readings. The range of readings documentation specifies the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source. (10) In areas where portal monitors are used, the off-site response organizations must set up and operationally check the monitor(s). The monitor(s) must conform to the standards set forth in the Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response, FEMA.REP.21 (March 1995) or in accordance with the manufacturer's recommendations.

Off-Site response organizations exception: Agreed

Critical Task 6.2.2: Off-Site response organizations issue appropriate dosimetry, potassium iodide, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/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. Off-Site response organizations maintain appropriate record-keeping of the administration of potassium iodide to emergency workers (NUREG.0654 K.3.a, b, K.4; Criterion 3a1). Radiological Program Manual Pg. 189

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent-record dosimetry, dosimeter chargers, potassium iodide, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of total effective dose equivalent and maximum exposure limits, for those emergency workers involved in lifesaving activities, contained in the off-site response organization's plans/procedures. (2) Each emergency worker must have basic knowledge of radiation exposure limits as specified in the off-site response organization's plans/procedures. If supplemental resources are used, they must be provided with just-in-time training to ensure basic knowledge of radiation exposure control. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control. (3) During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. (4) Off-Site response organizations must demonstrate the actions described in the plans/procedures by determining whether to replace the worker, authorize the worker to incur additional exposures, or take other actions. (5) If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge. (6) Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and can share a direct read dosimeter. Each team member must still have and maintain his or her own permanent-record

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

dosimetry. (7) Off-Site response organizations must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response. (8) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide to emergency workers consistent with decisions made. Off-Site response organizations must have the capability to develop and maintain lists of emergency workers who have ingested potassium iodide, including documentation of the date(s) and time(s) they did so. (9) Emergency workers must demonstrate basic knowledge of procedures for using potassium iodide. If exercise play does not require emergency workers to consume potassium iodide, evaluators must interview at least two workers to determine their knowledge.

Off-Site response organizations exception: Agreed

Critical Task 6.2.3: The reception center facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees (NUREG:0654 A.3; C.4; J.10.h; J.12; Criterion 6a1). Radiological Program Manual Pg. 202.203

Performance Measure: (1) Radiological monitoring, decontamination, and registration facilities for evacuees must be set up and demonstrated as they would be in an actual emergency. (2) Off-Site response organizations conducting this demonstration must have (a) one-third of the resources (e.g., monitoring teams/instrumentation/portal monitors) available at the facility(ies) as necessary to monitor (b) 20 percent of the population within a 12-hour period. (c) This would include adequate space for evacuees' vehicles. (3) Availability of resources can be demonstrated with valid documentation (e.g., memorandum of understanding/letter of agreement, etc.) reflecting how necessary equipment would be procured for the location. (4) Plans/procedures must indicate provisions for service animals. (5) Before using monitoring instrument(s), the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation. (6) Staff responsible for the radiological monitoring of evacuees must demonstrate the capability to attain and sustain, within about 12 hours, a monitoring productivity rate per hour needed to monitor the 20 percent emergency planning zone population planning base. Adams County estimated evacuees is 3710; Covich County estimated evacuees is: 4029; Hinds County estimated evacuees is: 851; and Warren County estimated evacuees is: 1859. (7) The monitoring productivity rate per hour is the number of evacuees that can be monitored, per hour, by the total complement of monitors using an appropriate procedure. Adams County productivity rate per one monitors per hour is 309; Covich County productivity rate per one monitors per hour is: 336; Hinds County productivity rate per one monitors per hour is: 71; and Warren County productivity rate per one monitors per hour is: 155; (8) For demonstration of monitoring, decontamination, and registration capabilities, a minimum of six evacuees must be monitored per station using equipment and procedures specified in the plans/ procedures. (9) The monitoring sequences for the first six simulated evacuees per monitoring team will be timed by the evaluators to determine whether the 12-hour requirement can be met. (10) Off-Site response organizations must demonstrate the capability to register evacuees upon completion of the monitoring and decontamination activities. (11) The activities for recording radiological monitoring and, if necessary, decontamination must include establishing a registration record consisting of the (a) evacuee's name, (b) address, (c) results of monitoring, and (d) time of

decontamination (if any), or as otherwise designated in the plan and/or procedures. Audio recorders, camcorders, or written records are all acceptable means for registration. (12) Monitoring activities shall not be simulated. (13) Monitoring personnel must explain use of trigger/action levels for determining the need for decontamination. (14) They must also explain the procedures for referring any evacuees who cannot be adequately decontaminated for assessment and follow-up in accordance with the off-site response organization's plans/procedures. All activities must be based on the off-site response organization's plans/procedures and completed as they would be in an actual emergency. Decontamination of evacuees may be simulated and conducted by interview. (15) Provisions for separate showering and same-sex decontamination must be demonstrated or explained. (16) The staff must demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs, and appropriate means (e.g., partitions, roped-off areas) to separate uncontaminated from potentially contaminated areas. (17) Provisions must also exist to (a) separate contaminated and uncontaminated evacuees, (b) provide changes of clothing for those with contaminated clothing, and (c) store contaminated clothing and personal belongings to prevent further contamination of evacuees or facilities. (18) In addition, for any evacuee found to be contaminated, procedures must be discussed concerning handling of potential contamination of vehicles and personal belongings. Waste water from decontamination operations does not need to be collected. (19) Individuals who have completed monitoring and decontamination if needed, must have the means (e.g., hand stamp, sticker, bracelet, form, etc.) indicating that (a) they, and their service animals and vehicles, where applicable, have been monitored, cleared, and found to have no contamination or (b) contamination below the trigger/action level or (c) have been placed in a secure area until they can be monitored and decontaminated, if necessary. In accordance with plans/procedures, individuals found to be clean after monitoring do not need to have their vehicle monitored. These individuals do not require confirmation that their vehicle is free from contamination prior to entering the congregate care areas. (20) However, those individuals who are found to be contaminated and are then decontaminated will have their vehicles (a) held in a secure area or (b) monitored and decontaminated (if applicable) and do require confirmation that their vehicle is being (c) held in a secure area or (d) free from contamination prior to entering the congregate care areas.

Off-Site response organizations exception: Agreed

Critical Task 6.2.4: The facility/off-site response organizations has adequate procedures and resources to accomplish monitoring and decontamination of emergency workers and their equipment and vehicles (NUREG.0654 K.5.a, b; Criterion 6b1). Radiological Program Manual Pg. 203.204

Performance Measure: (1) The monitoring staff must demonstrate the capability to monitor emergency worker personnel and their equipment and vehicles for contamination in accordance with the off-site response organization's plans/procedures. Specific attention must be given to equipment, including any vehicles that were in contact with contamination. (2) The monitoring staff must demonstrate the capability to make decisions on the need for decontamination of personnel, equipment, and vehicles based on trigger/action levels and procedures stated in the off-site response organizations plans/procedures. Monitoring of emergency workers does not

have to meet the 12-hour requirement. (3) However, appropriate monitoring procedures must be demonstrated for a minimum of two emergency workers and their equipment and vehicles. (4) Before using monitoring instrument(s), the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation. (5) The area to be used for monitoring and decontamination must be set up as it would be in an actual emergency, with all route markings, instrumentation, record keeping, and contamination control measures in place. (6) Monitoring procedures must be demonstrated for a minimum of one vehicle. It is generally not necessary to monitor the entire surface of vehicles. (7) However, the capability to monitor areas such as radiator grills, bumpers, wheel wells, tires, and door handles must be demonstrated. (8) Interior surfaces of vehicles that were in contact with contaminated individuals must also be checked. Decontamination of emergency workers may be simulated and conducted via interview. (9) Provisions for separate showering and same-sex decontamination must be demonstrated or explained. (10) The staff must demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs, and appropriate means (e.g., partitions, roped-off areas) to separate uncontaminated from potentially contaminated areas. (11) Provisions must also exist to separate contaminated and uncontaminated individuals where applicable, provide changes of clothing for those with contaminated clothing, and store contaminated clothing and personal belongings to prevent further contamination of emergency workers or facilities. (12) Off-Site response organizations must demonstrate the capability to register emergency workers upon completion of the monitoring and decontamination activities. The activities for recording radiological monitoring and if necessary, decontamination must include establishing a registration record consisting of the (a) emergency worker's name, (b) address, (c) results of monitoring, and (d) time of decontamination (if any), or as otherwise designated in the plans/procedures. Audio recorders, camcorders, or written records are all acceptable means for registration. Monitoring activities shall not be simulated. (13) Monitoring personnel must explain use of trigger/action levels for determining the need for decontamination. (14) They must also explain the procedures for referring any emergency workers who cannot be adequately decontaminated for assessment and follow-up in accordance with the off-site response organization's plans/procedures. Decontamination capabilities and provisions for vehicles and equipment that cannot be successfully decontaminated may be simulated and conducted by interview. Waste water from decontamination operations does not need to be collected.

Off-Site response organizations exception: Agreed

7. Core Capability: On-Scene Security, Protection, and Law Enforcement – Claiborne County

Definition: Ensure a safe and secure environment through law enforcement and related security and protection operations for people and communities located within affected areas and also for response personnel engaged in lifesaving and life-sustaining operations.

7.1 Capability Target: Protective Action Implementation

Critical Task 7.1.1: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

Communications capabilities are managed in support of emergency operations (NUREG.0654 F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 180

Performance Measure: (1) Off-Site response organizations must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring teams, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible off-site response organizations must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations.

Off-Site response organizations exception: Agreed

Critical Task 7.1.2: Equipment (to include communications), maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. (3) At locations where traffic and access control personnel are deployed, appropriate equipment (e.g., vehicles, barriers, traffic cones, and signs) must be available. (4) The plans/procedures must include the forms to be used for documenting emergency worker ingestion of potassium iodide. (5) Appropriate direct-reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the off-site response organization's plans/procedures.

Off-Site response organizations exception: Agreed

Critical Task 7.1.3: Off-Site response organizations issue appropriate dosimetry, potassium iodide, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/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. Off-Site response organizations maintain appropriate record-keeping of the administration of potassium iodide to emergency workers (NUREG.0654 K.3.a, b, K.4; Criterion 3a1). Radiological Program Manual Pg. 189

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent-record dosimetry, dosimeter chargers, potassium iodide, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of total effective dose equivalent and maximum exposure limits, for those emergency workers involved in

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

lifesaving activities, contained in the off-site response organization's plans/procedures. (2) Each emergency worker must have basic knowledge of radiation exposure limits as specified in the off-site response organization's plans/procedures. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control. (3) During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. (4) If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge. (5) Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and can share a direct read dosimeter. Each team member must still have and maintain his or her own permanent-record dosimetry. (6) Off-Site response organizations must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response. (7) Emergency workers must demonstrate basic knowledge of procedures for using potassium iodide. If exercise play does not require emergency workers to consume potassium iodide, evaluators must interview at least two workers to determine their knowledge.

Off-Site response organizations exception: Agreed

Critical Task 7.1.4: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel (NUREG.0654 A.3; C.1, 4; J.10.g, j; Criterion 3d1). Radiological Program Manual Pg. 191.192

Risk County: An out of sequence County Traffic Control Point demonstration will be conducted on Feb 26th, 2019, 2:00 PM – 3:00 PM. Claiborne County traffic control point A3 (Rodney Road at City Limits) will be demonstrated on location.

Risk County: Traffic control point coordination and deployment will be discussed in relation to the exercise scenario.

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to establish, and staff appropriate traffic and access control points consistent with current conditions and protection action decisions (e.g., evacuating, sheltering, and relocation) in a timely manner. (2) Traffic and access control staff must demonstrate accurate knowledge of their roles and responsibilities, including verifying emergency worker identification and access authorization to the affected areas.

Off-Site response organizations exception: Agreed

Critical Task 7.1.5: Impediments to evacuation are identified and resolved (NUREG.0654 J.10.k; Criterion 3d2). Radiological Program Manual Pg. 192

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to identify and take appropriate actions concerning impediments to evacuations. (2) The impediment must remain in place during the evacuation long enough that re-routing of traffic is required.

Off-Site response organizations exception: Agreed

8. Core Capability: Mass Care Services – Adams, Copiah, Hinds and Warren Counties

Definition: Provide life-sustaining and human services to the affected population, to include hydration, feeding, sheltering, temporary housing, evacuee support, reunification, and distribution of emergency supplies.

8.1 Capability Target: Support Operations and Facilities

Critical Task 8.1.1: At least 2 communications systems are available, at least 1 operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations (NUREG.0654 F.1, 2; Criterion 1d1). Radiological Program Manual Pg. 181

Performance Measure: (1) Off-Site response organizations must demonstrate that a primary system and at least one backup system are fully functional. (2) All facilities, field monitoring teams, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. (3) Responsible Off-Site response organizations must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations.

Off-Site response organizations exception: Agreed

Critical Task 8.1.2: Equipment (to include communications), maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role.

Off-Site response organizations exception: Agreed

Critical Task 8.1.3: potassium iodide and appropriate instructions are made available in case a decision to recommend use of potassium iodide is made. Appropriate record keeping of the

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

administration of potassium iodide for institutionalized individuals and the general public is maintained (NUREG.0654 J.10.e, f; Criterion 3b1). Radiological Program Manual Pg. 190

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to make potassium iodide available to institutionalized individuals and, where provided for in their plans/procedures, to members of the general public. (2) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide consistent with decisions made. (3) Off-Site response organizations must have the capability to develop and maintain lists of institutionalized individuals who have ingested potassium iodide, including documentation of the date(s) and time(s) they were instructed to ingest potassium iodide. Off-Site response organizations must demonstrate the capability to formulate and disseminate instructions on using potassium iodide for those advised to take it. (4) If a recommendation is made for the general public to take potassium iodide, appropriate information must be provided to the public by the means of notification specified in the off-site response organization's plans/procedures.

Off-Site response organizations exception: Agreed

Critical Task 8.1.4: Managers of congregate care facilities demonstrate that the centers have resources to provide services and accommodations consistent with planning guidelines. Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate before entering congregate care facilities (NUREG.0654; J.10.h; J.12; Criterion 6c1). Radiological Program Manual Pg. 204

Performance Measure: (1) Off-Site response organizations must plan for a sufficient number of congregate care centers in host/support jurisdictions based on their all-hazard sheltering experience and what is historically relevant for that particular area. In this simulation, it is not necessary to set up operations as they would be in an actual emergency. Alternatively, (2) capabilities may be demonstrated by setting up stations for various services and providing those services to simulated evacuees. Given the substantial differences between demonstration and simulation of this criterion, exercise demonstration expectations must be clearly specified in Extent-of-Play Agreements. Congregate care staff must also (3) demonstrate the capability to ensure that (a) evacuees, service animals, and vehicles have been monitored for contamination, (b) decontaminated as appropriate, and (c) registered before entering the facility. (4) Individuals arriving at congregate care facilities must have means (e.g., hand stamp, sticker, bracelet, form, etc.) indicating that they, and their service animals and vehicles, where applicable, have been (a) placed in a secured area or (b) monitored, cleared, and found to have no contamination or (c) contamination below the trigger/action level. In accordance with plans/procedures, individuals found to be clean after monitoring do not need to have their vehicle monitored. These individuals do not need confirmation that their vehicle is free from contamination prior to entering the congregate care areas. (5) However, those individuals who are found to be contaminated and are then decontaminated will have their vehicles held in a secure area until they can be monitored and decontaminated (if applicable) and do need confirmation that their vehicle is being held in a secure area or free from contamination prior to entering the congregate care areas. This capability may be determined through an interview process. If operations at the

center are demonstrated, material that would be difficult or expensive to transport (e.g., cots, blankets, sundries, and large-scale food supplies) need not be physically available at the facility(ies). (6) However, availability of such items must be verified by providing the evaluator a list of sources with locations and estimates of quantities.

Off-Site response organizations exception: Agreed

9. Core Capability: Public Health, Healthcare, and Emergency Medical Services – Warren County

Definition: Provide lifesaving medical treatment via Emergency Medical Services and related operations and avoid additional disease and injury by providing targeted public health, medical and behavioral health support, and products to all affected populations.

9.1 Capability Target: Support Operations and Facilities

Critical Task 9.1.1: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide, and other supplies are sufficient to support emergency operations (NUREG.0654 H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11; 12; K.3.a; K.5.b; Criterion 1e1). Radiological Program Manual Pg. 182

Performance Measure: (1) A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the off-site response organization's emergency operations plans. (2) For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. (3) The plans/procedures must include the forms to be used for documenting emergency worker ingestion of potassium iodide. (4) Off-Site response organizations must demonstrate the capability to maintain inventories of appropriate direct read and permanent- record dosimeters in sufficient quantities for use by emergency workers, ancillary groups as identified in plans or specialized response teams. (5) Appropriate direct-reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the off-site response organization's plans/procedures. (6) All monitoring instruments must be inspected, and operationally checked before each use. Instruments must be calibrated in accordance with the manufacturer's recommendations. (7) A label indicating such calibration must be on each instrument. (8) In addition, instruments being used to measure activity must have a sticker-affixed to their sides indicating the effective range of the readings. The range of readings documentation specifies the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source. (9) In areas where portal monitors are used, the off-site response organizations must set up and operationally check the monitor(s). The monitor(s) must conform to the standards set forth in the *Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response*, FEMA.REP.21 (March 1995) or in accordance with the manufacturer's recommendations.

Off-site response organizations exception: Agreed

Critical Task 9.1.2: Off-Site response organizations issue appropriate dosimetry, potassium iodide, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/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. Off-Site response organizations maintain appropriate record-keeping of the administration of potassium iodide to emergency workers (NUREG.0654 K.3.a, b, K.4; Criterion 3a1). Radiological Program Manual Pg. 189

Performance Measures: (1) Off-Site response organizations must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent-record dosimetry, dosimeter chargers, potassium iodide, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of total effective dose equivalent and maximum exposure limits, for those emergency workers involved in lifesaving activities, contained in the off-site response organization's plans/procedures. (2) Each emergency worker must have basic knowledge of radiation exposure limits as specified in the off-site response organization's plans/procedures. If supplemental resources are used, they must be provided with just-in-time training to ensure basic knowledge of radiation exposure control. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control. (3) During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. (4) Off-Site response organizations must demonstrate the actions described in the plans/procedures by determining whether to replace the worker, authorize the worker to incur additional exposures, or take other actions. (5) If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge. (6) Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and can share a direct read dosimeter. Each team member must still have and maintain his or her own permanent-record dosimetry. (7) Off-Site response organizations must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response. (8) Off-Site response organizations must demonstrate the capability to accomplish distribution of potassium iodide to emergency workers consistent with decisions made. Off-Site response organizations must have the capability to develop and maintain lists of emergency workers who have ingested potassium iodide, including documentation of the date(s) and time(s) they did so. (9) Emergency workers must demonstrate basic knowledge of procedures for using potassium iodide. If exercise play does not require emergency workers to consume potassium iodide, evaluators must interview at least two workers to determine their knowledge.

Off-Site response organizations exception: Agreed

Critical Task 9.1.3: The facility/off-site response organizations has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

medical services to contaminated injured individuals (NUREG.0654 F.2; H.10; K.5.a, b; L.1, 4; Criterion 6d1). Radiological Program Manual Pg. 204.205

Performance Measure: (1) All hospitals listed in the plan as medical services hospitals must be evaluated, with a transportation provider, every 2 years. (2) Additional transportation providers will be rotated through the drills in the 8-year exercise cycle. For ambulance providers who do not participate in an evaluated drill during the two-year cycle, training will be provided. This training will be documented in the annual letter of certification. (3) Monitoring, decontamination, and contamination control efforts must not delay urgent medical care for the victim. (4) Off-Site response organizations must demonstrate the capability to monitor/decontaminate and transport contaminated, injured individuals to medical facilities. (5) An ambulance must be used for response to the victim. However, to avoid taking an ambulance out of service for an extended time, Off-Site response organizations may use any vehicle (e.g., car, truck, or van) to transport the victim to the medical facility. It is allowable for an ambulance to demonstrate up to the point of departure for the medical facility and then have a non-specialized vehicle transport the "victim(s)" to the medical facility. This option is used in areas where removing an ambulance from service to drive a great distance (over an hour) for a drill would not be in the best interests of the community. (6) Normal communications between the ambulance/dispatcher and the receiving medical facility must be demonstrated. If a substitute vehicle is used for transport to the medical facility, this communication must occur before releasing the ambulance from the drill. This communication would include reporting radiation monitoring results, if available. (7) In addition, the ambulance crew must demonstrate, by interview, knowledge of where the ambulance and crew would be monitored and decontaminated, if required, or whom to contact for such information. (8) Monitoring of the victim may be performed before transport or en route, or may be deferred to the medical facility. (9) Contaminated injured individuals transported to medical facilities are monitored as soon as possible to assure that everyone (ambulance and medical facility) is aware of the medical and radiological status of the individual(s). (10) However, if an ambulance defers monitoring to the medical facility, then the ambulance crew presumes that the patient(s) is contaminated and demonstrate appropriate contamination controls until the patient(s) is monitored. (11) Before using monitoring instruments, the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation. (12) All monitoring activities must be completed as they would be in an actual emergency. (13) Appropriate contamination control measures must be demonstrated before and during transport and at the receiving medical facility. (14) The medical facility must demonstrate the capability to activate and set up a radiological emergency area for treatment. (15) Medical facilities are expected to have at least one trained physician and one trained nurse to perform and supervise treatment of contaminated injured individuals. (16) Equipment and supplies must be available for treatment of contaminated injured individuals.

Radiological Emergency Preparedness Program

After Action Report

2019 Grand Gulf Nuclear Station

(17) The medical facility must demonstrate the capability to (a) make decisions on the need for decontamination of the individual, (b) follow appropriate decontamination procedures, and (d) maintain records of all survey measurements and samples taken. (18) All procedures for collection and analysis of samples and decontamination of the individual must be demonstrated or described to the evaluator. Waste water from decontamination operations must be handled according to facility plans/procedures.

Off-Site response organizations exception: Agreed