



Emergency Preparedness Capability Assessment at the Y-12 National Security Complex

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Acronyms

CNS	Consolidated Nuclear Security, LLC
COR	City of Oak Ridge
DAT	Damage Assessment Team
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ECC	Emergency Control Center
ED	Emergency Director
EMInS	Emergency Management Information System
EMRT	Emergency Medical Response Team
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
EPHA	Emergency Planning Hazards Assessment
EPI	Emergency Public Information
ERO	Emergency Response Organization
FBI	Federal Bureau of Investigation
FDAR	Fire Department Alarm Room
FMT	Field Monitoring Team
FPE	Full Participation Exercise
HAZMAT	Hazardous Material
HSTC	Health and Safety Teams Coordinator
IC	Incident Commander
JIC	Joint Information Center
MC	Media Center
MMC	Methodist Medical Center of Oak Ridge
NARAC	National Atmospheric Release Advisory Center
NNSA	National Nuclear Security Administration
NPO	NNSA Production Office
OFI	Opportunity for Improvement
OHS	Occupational Health Services
OMT	Onsite Monitoring Team
OST	Office of Secure Transportation
PSD	Personnel Survey Depot
PSS	Plant Shift Superintendent
PWSS	Public Warning Siren System
RAP	Radiological Assistance Program
REAC/TS	Radiation Emergency Assistance Center/Training Site
RMCC	Regional Medical Communications Center
SNM	Special Nuclear Material
TEMA	Tennessee Emergency Management Agency
TSC	Technical Support Center
UT	University of Tennessee
YAMS	Y-12 Area Mapping System
Y-12	Y-12 National Security Complex

Emergency Preparedness Capability Assessment at the Y-12 National Security Complex September 28 to November 4, 2020

Summary

Scope

This assessment verified the readiness of the Y-12 National Security Complex (Y-12) emergency response capabilities, based on validations performed by Consolidated Nuclear Security, LLC (CNS), the Y-12 Management and Operating contractor, and National Nuclear Security Administration Production Office (NPO), from October 1, 2015, through September 30, 2020. Response capabilities were based on site-specific attributes, such as types and forms of hazardous materials, demographics, and geography, using a variety of deterministic analyses documented in emergency planning hazards assessments. In addition, the site-level exercise program was assessed in relationship to its effectiveness to validate specific emergency response capabilities. Due to impacts related to the COVID-19 pandemic, the Office of Enterprise Assessments performed this assessment remotely, and thus did not observe or evaluate responder proficiency at any venue or emergency response position.

Significant Results for Key Areas of Interest

Overall, CNS and NPO have developed and maintain adequate emergency response capabilities that generally provide the emergency response organization (ERO) with significant depth and capability. As verified in this report, the number of capabilities CNS validated is indicative of a mature emergency management program at Y-12.

ERO Cadres and Teams

CNS and NPO have adequately established and validated emergency response capabilities assigned to the Y-12 ERO, which is a composite force consisting of an integrated line and staff organization structure, based on the concept of a single site-level ERO that responds to all emergency incidents within the Y-12 boundary. CNS and NPO have adequately established and validated response capabilities for 17 specific cadres and teams responsible for initial and ongoing emergency response and mitigation within the Y-12 boundary.

Offsite Response Interfaces

CNS and NPO have adequately interfaced and coordinated with local, state, and Federal agencies and organizations responsible for offsite emergency response to supplement CNS capabilities. CNS and NPO have appropriately documented interrelationships with 19 local, state, and Federal organizations in formal plans, agreements, understandings, or other prearrangements for mutual assistance, which detail the emergency measures provided by offsite entities. CNS and NPO successfully validated and documented these offsite response capabilities in exercise after-action reports, over the previous five-year period, with two exceptions.

Response Facilities and Systems

Y-12 has 18 dedicated emergency response facilities and systems that CNS maintains in a constant state of readiness, in accordance with the Y-12 emergency plan, to ensure documented functional and physical characteristics. CNS validated readiness for all requisite Y-12 emergency response facilities and systems in after-action reports.

Best Practices and Findings

There were no best practices or findings identified as part of this assessment.

Follow-up Actions

No follow-up activities were identified.

Emergency Preparedness Capability Assessment at the Y-12 National Security Complex

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Emergency Management Assessments, within the independent Office of Enterprise Assessments (EA), assessed the adequacy of maintaining emergency preparedness capabilities at the Y-12 National Security Complex (Y-12). This assessment is part of a targeted review of emergency preparedness for high-hazard facilities within the DOE/National Nuclear Security Administration (NNSA). This targeted review evaluated the processes for identifying and maintaining emergency response capabilities in a state of readiness to protect the health and safety of workers and the public for any incident, whether natural or manmade, that requires response action beyond normal operations.

The scope of the assessment was in accordance with the *Plan for the Assessment of Emergency Preparedness Capability at the Y-12 National Security Complex*, October – November 2020, which used the site-level exercise program to validate the emergency response capabilities derived from NNSA Production Office (NPO) emergency planning hazards assessments (EPHAs). DOE Order 151.1D, *Comprehensive Emergency Management System*, identifies the functional emergency response requirements for DOE/NNSA sites. Consolidated Nuclear Security, LLC (CNS), as the Y-12 Management and Operating contractor, has determined the necessary site emergency response capabilities based on site-specific attributes, including types and forms of hazardous materials (HAZMAT), demographics, and geography. DOE Order 151.1D requires that DOE facilities prepare for incidents at the upper end of the consequence spectrum. Emergency response staff must plan for the protection of personnel, mitigation of potential HAZMAT releases, and establishment of appropriate short-term recovery actions.

CNS emergency planners are required to preplan the means to acquire these necessary capabilities, if necessary, from external sources, such as surrounding communities, state authorities, and offsite DOE and national assets. In addition, this assessment verified CNS validation of emergency response capabilities related to hazards identified in its EPHAs. Some response capabilities deemed necessary for both low-probability and severe incidents would be a financial burden to maintain on site or could be rendered unavailable if such an incident occurred. Accordingly, preparation for such an incident requires the establishment of agreements with offsite entities that enable integration into the CNS emergency response.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which is implemented through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms “best practices, deficiencies, findings, and opportunities for improvement (OFIs)” as defined in DOE Order 227.1A.

As identified in the assessment plan, select aspects from EA Criteria and Review Approach Document 33-09, *DOE O 151.1D Emergency Management Program*, provided a focused set of assessment objectives, criteria, and approaches. In addition, this assessment evaluated site-specific emergency planning and documented performance demonstrations over the past five-year period and was not intended to represent

a full programmatic evaluation of the site's emergency management program. Due to DOE COVID-19 protocols, this assessment was conducted remotely with no onsite observations.

This assessment verified CNS's validation of Y-12 capabilities during scripted, scenario operations-based exercises that are designed to assess, evaluate, and improve performance in prevention, protection, mitigation, response, and recovery capabilities in a risk-free environment. Operations-based exercises test and validate policies, plans, procedures, training, equipment, and interagency agreements. DOE operations-based exercises include functional exercises, full-scale exercises, and full-participation exercises (FPEs).

The assessment team examined key documents, such as exercise after-action reports, exercise packages, plans, procedures, manuals, and analyses. The assessment team also conducted interviews of key personnel responsible for developing and executing the emergency management program. The members of the assessment team, the Quality Review Board, and management responsible for this assessment are listed in Appendix A.

3.0 RESULTS

The extent of emergency planning and preparedness required for the site directly corresponds to the types and scope of hazards present and the potential consequences of accidents or incidents, which identify the hazards and targets unique to specific facilities. NPO has approved 30 Y-12 EPHAs that provide the technical basis for emergency planning and preparedness. CNS used EPHA results to adequately identify and define appropriate personnel, resources, facilities, and systems-related capabilities in EMPO-500, *Y-12 National Security Complex Emergency Plan*, and ASM-IA-02-084 000 08, *Y-12 Fire Department Baseline Needs Assessment*. Importantly, the Y-12 emergency response organization (ERO) is a composite force consisting of an integrated line and staff organization structure, using a site-level ERO that responds to all emergency incidents within the Y-12 boundary. In addition, the roles of local, state, and Federal agencies and organizations responsible for supplementing onsite response capabilities are adequately documented in the *State of Tennessee Multi-Jurisdictional Emergency Response Plan for the U.S. Department of Energy Oak Ridge Reservation* or formal assistance agreements with individual response organizations and agencies.

CNS conducted an adequate number of operations-based exercises during the five-year period, from October 1, 2015, through September 30, 2020, using scenarios from the spectrum of potential operational emergencies identified in the EPHAs. CNS adequately postulated incidents at many of the Y-12 EPHA facilities and scenarios included the substances and material present at the site to test the integrated emergency response capabilities. Additionally, CNS appropriately conducted exercises with a severe event initiator, such as a tornado and lightning storm. CNS conducted two FPEs that included extensive participation by local, state, and Federal organizations. Further, CNS appropriately conducted exercises with postulated incidents involving an active assailant and an unplanned nuclear criticality. These scripted incidents were lower consequence and did not affect offsite areas and the public, but required an integrated ERO response. Finally, CNS formally evaluated one actual incident response, thereby validating response capabilities similar to an operations-based exercise.

Sections 3.1 through 3.3 discuss response capabilities specific to ERO cadres and teams, offsite response interfaces, and response facilities and systems, respectively. Y-12 has 17 unique response ERO cadres and teams, 19 offsite interfaces, and 18 dedicated response facilities or systems.

3.1 Emergency Response Organization Cadres and Teams

The objective of this portion of the assessment was to verify that CNS and NPO have established and validated the Y-12 ERO structure and its emergency response capabilities, as required by DOE Order 151.1D. In accordance with the order, an ERO must consist of personnel with capabilities and resources based on the all-hazards planning basis. The site is required to designate and train a primary and at least one alternate for each ERO position, excluding first responders in the field, to be available to implement the emergency management plan for initial and ongoing emergency response. In addition, a site must establish an effective first responder capability to mitigate all emergencies, including emergency medical, fire, HAZMAT, and applicable rescue emergencies as derived through the baseline needs assessment, hazard survey, and threat and hazard identification risk assessment. Finally, CNS is required to validate each capability over a five-year period.

Fire Department

CNS has established and maintains an adequate line organization fire department, based in Building 9710-2, which houses the fire department alarm room (FDAR) and most of the fire department response capabilities. A secondary fire department base is located in Building 2005. The fire department is principally an industrial fire service, capable of attacking urban-type fires within the Y-12 boundary. The fire department maintains specific capabilities for dealing with fires involving a number of hazardous substances and materials unique to the Y-12 mission. The fire department also maintains a very limited capability to address small brush and wildland fires. In addition to fire response, the Y-12 fire department maintains the capability to provide emergency medical services (EMS), limited rescue capabilities, and HAZMAT response. There are 95 personnel assigned to the fire department.

CNS adequately validated its fire department capabilities during the five-year period. The fire department responded to 12 postulated HAZMAT or fire incident exercises and one actual HAZMAT incident. Additionally, the fire department successfully validated EMS response to simulated injuries during 13 exercises, which in some instances included transport to participating offsite medical centers. In most cases, CNS validated EMS capabilities in parallel with the HAZMAT, fire, or active assailant response capabilities.

Protective Force

The protective force provides Y-12 with personnel for site and facility access control and protection of site assets, including special response team personnel and canine teams. Agreements are in place with Federal, state, and local jurisdictions to provide additional personnel, equipment, and capabilities to Y-12's security response, if needed.

CNS adequately validated its protective force capabilities during the five-year period. During postulated HAZMAT incidents, protective force personnel supported the fire department response in 12 exercises that included access control. In addition, during two active assailant exercises, protective force personnel validated special response team capabilities.

Incident Command Cadre

CNS has adequately implemented command and control for an onsite incident scene, consistent with the National Incident Management System incident command system. The assignment of the role of incident commander (IC) depends upon the nature of the incident. If the incident is of a security nature, a trained and qualified protective force shift officer assumes the role of the IC. If the incident is of a non-security

nature, a trained and qualified fire department officer will assume the IC role. Additionally, representatives from Environmental Management, Radiological Control, Industrial Hygiene, and the affected facility assemble to support the IC.

CNS adequately validated its incident command cadre capabilities in 14 exercises during the five-year period. In the 14 exercises, protective force personnel adequately validated IC capabilities during two exercises and the fire department adequately validated IC capabilities during 12 exercises.

Emergency Control Center Cadre

CNS has adequately established and maintains an emergency control center (ECC) staff organization, which functions only during an emergency; this office and its personnel function as the Y-12 operations center when emergency conditions do not exist. During the early phases of an emergency, the operations center becomes the ECC and operations center personnel immediately assume ECC duties, with the responsible plant shift superintendent (PSS) assuming the duty of emergency director (ED). The ECC identifies emergency response cadres, issues initial protective actions, makes initial notifications, and performs incident categorization/classification. CNS has adequately staffed the ECC cadre with 12 personnel assigned to the cadre.

CNS adequately validated its ECC cadre capability in 18 exercises during the five-year period. In addition, EA issued a best practice in 2019 for this cadre's development and implementation of the Y-12 Area Mapping System (YAMS) tool to support timely protective action decision-making for affected buildings and offsite sectors that require protective actions.

Technical Support Center Cadre

CNS has adequately established and maintains a technical support center (TSC) staff organization that is responsible for emergency management operations, technical assessment, and tactical assessment of an onsite emergency incident. The TSC director may assume the duties of ED, subsequent to a turnover briefing and formalities of transfer, until the emergency operations center (EOC) director is ready to become the ED of the incident. Emergency response efforts and resources used within the Y-12 boundary, but outside of the incident scene, are under the control of the TSC. CNS has adequately staffed the TSC cadre with 114 personnel who fill 38 functional positions.

CNS adequately validated its TSC cadre capability in 18 exercises during the five-year period. In addition, EA issued a best practice in 2019 for this cadre's development and implementation of an automated process to track onsite injured personnel status, including a database interface supporting identification, tracking, and validation of injured personnel information.

Emergency Operations Center Cadre

CNS has adequately established and maintains an EOC staff organization that provides emergency management operations, consequence assessment, security and fire operations oversight, notification and reporting, recovery planning, field monitoring operations, external coordination and offsite liaison capabilities, and emergency public information (EPI). Emergency response efforts and resources used outside the Y-12 boundary are under the control of the EOC. CNS has adequately staffed the EOC cadre with 60 personnel who fill 20 functional positions.

CNS adequately validated its EOC cadre capability in 19 exercises during the five-year period. EA issued a best practice in 2019 detailing CNS development and coordination of extensive offsite planning that

enabled exceptional situational awareness, as validated during the FPE with Headquarters, state, and local agencies.

NNSA Production Office Emergency Oversight

NPO emergency oversight is appropriately included as part of the ERO and provides the final authority to commit NNSA resources, as approved by the NPO emergency oversight manager. The NPO emergency oversight manager is responsible for the release of incident information to the press or the public. Additionally, NPO assigns Facility Representatives to the TSC to monitor response operations. CNS and NPO adequately validated emergency oversight capabilities in 19 exercises during the five-year period.

Emergency Public Information Cadre

CNS and NPO have adequately established an EPI cadre that responds from two venues to disseminate information to the public during an emergency: an onsite media center (MC) and an offsite joint information center (JIC). The MC provides EPI during an Operational Emergency not requiring classification, Alert, and Site Area Emergency classifications. The General Emergency classification requires automatic activation of the JIC. However, the NPO manager of public affairs or NPO emergency oversight manager can activate the JIC during an Alert or Site Area Emergency, if determined to be necessary or if requested by the State of Tennessee. CNS and NPO have adequately staffed the EPI cadre with 36 personnel assigned to fill 12 functional positions.

CNS and NPO adequately validated the EPI cadre capabilities in 19 exercises during the five-year period. Y-12 activated the JIC cadre in 7 exercises and the MC cadre in 12 exercises. In addition, EA issued a best practice in 2019 for the cadre's development and implementation of an effective EPI process. Specifically, the process provides timely data and approvals of information for public release by the JIC, including the automated integration of the initial press release with the initial notification form, thereby ensuring that the two separate sources agree.

Occupational Health Services

CNS has adequately established and maintains an Occupational Health Services (OHS) capability that staffs a full-time qualified cadre of physicians, nurses, and technical support personnel available to provide specialized medical support for Y-12 emergencies. In addition, OHS can activate an emergency medical response team (EMRT) to treat injured personnel and make arrangements for transport of injured personnel to area hospitals, while CNS activates the personnel survey depot (PSD) to provide support in a large-scale radiological contamination incident. CNS has adequately staffed the OHS with 20 personnel assigned to the cadre. CNS adequately validated OHS cadre capabilities in 13 exercises during the five-year period.

Emergency Medical Response Team

CNS has adequately established and maintains an EMRT staff organization that is activated when the safety and health of individuals are at risk from either HAZMAT releases or natural disasters. EMRT personnel represent the full gamut of expertise from OHS, Industrial Hygiene, and Radiological Control organizations. CNS has adequately staffed the EMRT with 19 personnel who fill 3 functional positions. CNS adequately validated EMRT cadre capabilities in 13 exercises during the five-year period.

Field Monitoring Team and Radiological Assistance Program Augmentation

CNS has adequately established and maintains a field monitoring team (FMT) staff organization to provide offsite HAZMAT monitoring. CNS has fully integrated the FMT with the offsite Radiological Assistance Program (RAP) team (discussed in Section 3.2). Additionally, CNS has integrated the FMT with field teams from the State of Tennessee in case of an offsite release. CNS has adequately staffed the FMT with 28 personnel assigned to the team, and adequately validated FMT cadre capabilities in six exercises during the five-year period. EA issued a best practice in 2019 for development and coordination of an effective field monitoring process. Specifically, CNS has developed tools to obtain and maintain situational awareness of multiple onsite and offsite monitoring teams by integrating real-time field monitoring data among the emergency management information system (EMInS) database, YAMS, and graphical information system.

Health and Safety Teams Coordinator

CNS has adequately established and maintains a health and safety teams coordinator (HSTC) staff organization that coordinates the various environmental, safety, and health disciplines during an incident. The HSTC maintains continuous communications with field elements and provides periodic reports to the TSC. CNS has adequately staffed the HSTC with eight personnel, and adequately validated HSTC capabilities in 18 exercises during the five-year period.

Onsite Monitoring Team

CNS has adequately established and maintains an onsite monitoring team (OMT) staff organization that performs real-time HAZMAT measurements, environmental assessments, biological monitoring, and contamination surveys. The OMT consists of personnel from Environmental, Radiological Control, and Industrial Hygiene organizations. CNS adequately staffed the OMT with 45 personnel assigned to the team, and adequately validated OMT capabilities in 12 exercises during the five-year period.

Personnel Survey Teams

CNS has adequately established and maintains personnel survey teams that provide data to the HSTC concerning initial personnel survey information and the identification of employees exceeding acceptable exposure levels. CNS has adequately staffed the personnel survey teams with 18 personnel assigned to the west personnel survey team and 12 assigned to the east personnel survey team. In addition, CNS adequately validated personnel survey team capabilities in four exercises during the five-year period.

Incident Scene Response Team

CNS has adequately established and maintains an incident scene response team staff organization that provides direct support and assistance to the IC during emergencies involving radiation releases or a criticality incident. CNS has adequately staffed the incident scene response team with 25 personnel assigned to the team. In addition, CNS adequately validated incident scene response team capabilities in five exercises during the five-year period.

Radiation Dosimetry Team

CNS has adequately established and maintains a radiation dosimetry team staff organization that performs preliminary dose assessments. CNS has adequately staffed the radiation dosimetry team with 10

personnel assigned to the team. CNS adequately validated its radiation dosimetry team cadre capabilities in four exercises during the five-year period.

Damage Assessment Team

CNS has adequately established and maintains a damage assessment team (DAT) staff organization that is responsible for post-emergency reentry and additions or refinements of recovery priorities. The DAT evaluates critical functions, including utilities and safety systems, accompanied by health and safety personnel to monitor the safety of the team. CNS has adequately staffed the DAT with six personnel assigned to the team. In addition, CNS adequately validated DAT capabilities in one exercise during the five-year period. EA issued a best practice in 2019 for the use of an automated damage assessment process and supporting tools to obtain and maintain situational awareness on multiple building damage assessments and to provide a response priority for each building based on strategic information.

Emergency Response Organization Cadres and Teams Conclusions

CNS and NPO adequately established and validated the capabilities of the Y-12 ERO. The ERO appropriately consists of those requisite skills and disciplines for adequate mitigation of emergency incidents identified in the 30 EPHAs, within the defined structure of Y-12 command and control. Importantly, CNS conducted an adequate number of operations-based exercises during the five-year period, from October 1, 2015, through September 30, 2020, using scenarios from the spectrum of potential operational emergencies identified in the EPHAs. The number of exercises conducted is indicative of a mature emergency exercise program. In addition, CNS adequately ensured that all ERO cadres and teams had the opportunity to demonstrate individual and team proficiency, in almost all cases during numerous exercises each year.

3.2 Offsite Response Interface Capabilities

The objective of this portion of the assessment was to verify that CNS and NPO have established and validated coordination and response capabilities with local, state, and Federal organizations that are responsible for emergency response or who may be used to supplement response capabilities based on hazards identified in the all-hazards planning basis, as required by DOE Order 151.1D.

DOE Headquarters Watch Office

CNS and NPO have adequately established and maintain an interface capability with the DOE Headquarters notification point, which is collocated with the Headquarters EOC. Upon receiving an event notification, the watch office duty officer notifies the appropriate personnel responsible for activating an NNSA emergency management team. CNS adequately validated watch office interface capabilities in four exercises during the five-year period. Additionally, CNS adequately validated watch office initial notification interface capabilities in 14 additional exercises during the five-year period.

DOE Headquarters EOC

CNS and NPO have adequately established and maintain interface capabilities with the DOE Headquarters EOC, which is located in the Forrestal Building in Washington, D.C. A backup EOC is located in Germantown, Maryland. Both facilities can communicate with Y-12 via telephone, the emergency communications network, EMInS, facsimile, and video teleconferencing. The performance criteria used by NPO, CNS, and Headquarters to assess the adequacy of the interface consisted of sending initial and follow-on notifications, establishing an automated EMInS link, and maintaining a telephone

liaison. CNS adequately validated the Headquarters EOC interface capability in three exercises during the five-year period.

Tennessee Emergency Management Agency

CNS and NPO have adequately established and maintain interface capabilities with the Tennessee Emergency Management Agency (TEMA), which maintains authority for state-wide emergency preparedness, response, recovery, and mitigation of emergencies. TEMA operates the state watch point for all notifications from Y-12. TEMA also activates and manages the State of Tennessee EOC to communicate with Y-12 and coordinates offsite responses to an emergency, including coordinating support or mutual aid requests with Federal, state, and local agencies. When activated for a declared emergency, a TEMA representative supports the Y-12 EOC. CNS adequately validated the TEMA representative interface capability and the notification process with the TEMA watch point in 18 and 14 exercises, respectively, during the five-year period.

State of Tennessee EOC

CNS and NPO have adequately established and maintain interface capabilities with the State of Tennessee EOC organizations with emergency response or control responsibilities relevant to Y-12. The State of Tennessee details its response capabilities, such as the State of Tennessee EOC, in the *State of Tennessee Multi-Jurisdictional Emergency Response Plan for the U.S. Department of Energy Oak Ridge Reservation* and includes protocols for CNS and NPO to communicate to the State recommended protective actions for the public and event-specific information based on approved EPHAs. In addition, NPO and CNS document coordination with the State of Tennessee and the counties and local governments [Anderson, Roane, Knox, and Loudon Counties and the City of Oak Ridge (COR)], in the *Emergency Management Coordination Agreement*. CNS adequately validated the State EOC interface capabilities in two exercises during the five-year period.

National Atmospheric Release Advisory Center

CNS and NPO have adequately established and maintain interface capabilities with NNSA's Atmospheric Release Advisory Capability for assessment of HAZMAT released into the atmosphere. Lawrence Livermore National Laboratory operates the Atmospheric Release Advisory Capability at the National Atmospheric Release Advisory Center (NARAC). NARAC's mission is to provide timely and accurate real-time assessment advisories to emergency managers for rapid decision-making during an emergency response involving a nuclear, radiological or chemical release. CNS adequately validated these interface capabilities in 18 exercises during the five-year period.

Radiological Assistance Program

CNS and NPO have adequately established and maintain interface capabilities with NNSA's RAP, which provides a first response resource in assessing an emergency incident and advising decision makers on further steps to take to evaluate and minimize the hazards of a radiological incident. RAP provides resources (e.g., trained personnel and equipment) to monitor radiological hazards. NNSA implements RAP regionally CNS manages Region 2, with coordination between the emergency response elements of state, local, and Federal agencies. CNS adequately validated the RAP interface capability in two exercises during the five-year period.

Radiation Emergency Assistance Center/Training Site

CNS and NPO have adequately established and maintain interface capabilities with NNSA's Radiation Emergency Assistance Center/Training Site (REAC/TS), which provides a multipurpose facility for handling victims of radiation emergencies along with other types of physical injuries. Oak Ridge Institute for Science and Education operates REAC/TS, which is located in the Methodist Medical Center of Oak Ridge (MMC), Tennessee. CNS adequately validated the REAC/TS interface capability in two exercises during the five-year period.

U.S. Army, 717th Ordnance Detachment

CNS and NPO have adequately established an interface capability with the U.S. Army, 717th Ordnance Detachment in Fort Campbell, Kentucky, for explosive ordnance disposal (EOD) support. A formal memorandum of agreement with the U.S. Army authorizes the Y-12 PSS, NPO representatives, or Y-12 security officials to request support. However, CNS has not validated this interface capability during the five-year period. (See **Deficiency D-CNS-1** and **OFI-CNS-1**.) (see Knox County for related information)

Federal Bureau of Investigation

CNS and NPO have adequately established and maintain interface capabilities with the Federal Bureau of Investigation (FBI) for response to any terrorist or weapons of mass destruction incident at Y-12. CNS and NPO have integrated a response by the FBI into the Y-12 ERO structure and concept of operation. An initial FBI response to Y-12 includes personnel from the Knoxville office and, if needed, additional response personnel from other regional offices and the Critical Incident Response Group. CNS adequately validated FBI interface capabilities in two exercises during the five-year period.

Office of Secure Transportation, Host Site

CNS and NPO have adequately established and maintain interface capabilities with the Office of Secure Transportation (OST), in accordance with DOE Order 151.1D. As a host site, CNS and NPO coordinate, communicate, and integrate applicable aspects of emergency planning, preparedness, and readiness with OST into a workable process to effectively manage and control an OST event scene inside the Y-12 boundary. CNS and NPO appropriately include OST hazards in the site emergency management program.

CNS has not validated the OST host site interface during the five-year period. CNS conducted an exercise in June 2016 that included OST participation; however, the exercise did not fully test the host site interface with OST. CNS had planned to conduct an OST host site exercise in July 2020; however, CNS and OST postponed the exercise until 2021 due to the COVID-19 pandemic. (See **Deficiency D-CNS-1** and **OFI-CNS-2**.)

DOE Oak Ridge Office of Environmental Management and University of Tennessee-Battelle

CNS and NPO have adequately established and maintain interface capabilities with the DOE Oak Ridge Office of Environmental Management and the University of Tennessee (UT)-Battelle to provide mutual aid fire protection assistance, consistent with the availability of response resources, when requested. CNS documents the arrangement with UT-Battelle in the *Mutual Aid Fire Protection Agreement between Consolidated Nuclear Security, LLC and UT-Battelle*. Additionally, a formal memorandum of understanding documents coordination for wildland firefighting between the DOE Oak Ridge Office of Environmental Management; NPO; and the State of Tennessee, Department of Agriculture, Division of

Forestry. CNS has adequately validated mutual aid fire protection assistance in two exercises and the wildland firefighting interface capabilities in one exercise during the five-year period.

Anderson County

CNS and NPO have adequately established and maintain interface capabilities with the Anderson County Sheriff's Department for security support and law enforcement while protecting special nuclear material (SNM) and other national security assets, people, equipment, and property. CNS adequately validated the Anderson County interface capabilities in two exercises during the five-year period.

City of Oak Ridge

CNS and NPO have adequately established and maintain interface capabilities with the COR for fire and police support. A memorandum of understanding with the COR Police Department provides for security support and law enforcement while protecting SNM and other national security assets, people, equipment, and property. In addition, a formal mutual aid agreement provides fire protection assistance capabilities among NPO, the COR, and the DOE Oak Ridge National Laboratory Site Office. Furthermore, CNS and the COR have issued an *Emergency Response Plan Between the Y-12 National Security Complex and the City of Oak Ridge* that provides a formal supplemental agreement for fire and police support, including protocols for the COR to sound the Y-12 public warning siren system (PWSS). CNS adequately validated COR interface capabilities and COR initial notification capabilities in 4 and 14 exercises, respectively, during the five-year period.

Roane County

CNS and NPO have adequately established and maintain interface capabilities with the Roane County Sheriff's Department for security support and law enforcement for the protection of SNM and other national security assets, people, equipment, and property. Similarly, CNS and NPO maintain an interface capability with the Roane County Emergency Communications District 911 Center for communications support. CNS adequately validated Roane County interface capabilities in two exercises during the five-year period.

Knox County

CNS and NPO have adequately established and maintain interface capabilities with the Knox County Sheriff's Department for security support and law enforcement assistance for the protection of SNM and other national security assets, people, equipment, and property. Similarly, CNS and NPO maintain an interface capability with the Knox County Sheriff's Department EOD unit. CNS adequately validated Knox County interface capabilities in two exercises during the five-year period. Additionally, a Knox County EOD unit responded to an actual event during the five-year period.

Loudon County

CNS and NPO have adequately established and maintain interface capabilities with the Loudon County Sheriff's Department for security support and law enforcement while protecting SNM and other national security assets, people, equipment, and property, as well as an interface capability with the Loudon County Emergency Communications District 911 Center for communications support. CNS adequately validated Loudon County interface capabilities in two exercises during the five-year period.

Methodist Medical Center of Oak Ridge

CNS and NPO have adequately established and maintain interface capabilities with MMC through a formal memorandum of understanding for the transport, acceptance, and treatment of radiologically or chemically contaminated or potentially contaminated, injured patients from Y-12. MMC is the closest major hospital in the Oak Ridge area and is the primary hospital that treats persons injured in a Y-12 incident. During radiological incidents, REAC/TS supports the MMC. If a mass-casualty incident occurs, MMC coordinates with other area hospitals to transfer and subsequently treat patients based on the type of injury and the capabilities of the area hospitals. CNS adequately validated MMC interface capabilities in four exercises during the five-year period.

University of Tennessee Medical Center

CNS and NPO have adequately established and maintain interface capabilities with the UT Medical Center for the transport, acceptance, and treatment of radiologically or chemically contaminated or potentially contaminated, injured patients from Y-12. The UT Medical Center, located in Knoxville, Tennessee, is the closest Level 1 trauma center to Y-12 and is accessible by ambulance and the UT LIFESTAR medical helicopter. CNS adequately validated UT Medical Center interface capabilities in one exercise during the five-year period.

Regional Medical Communications Center

CNS and NPO have adequately established and maintain regional EMS capabilities, including a 16-county agreement, *MAA for Emergency Ambulance Service, East Tennessee Region*, requiring agencies to coordinate patient transport to medical facilities through the Regional Medical Communications Center (RMCC). CNS adequately validated RMCC interface capabilities in two exercises during the five-year period.

Offsite Response Interface Capabilities Conclusions

CNS and NPO have adequately interfaced and coordinated with local, state, and Federal agencies and with organizations responsible for offsite emergency response to protect the public, responders, and workers, and to minimize impact to property and the environment. Interrelationships with local, state, and Federal organizations are appropriately prearranged and documented in formal plans, agreements, understandings, or other prearrangements for mutual assistance detailing emergency measures provided by non-Y-12 entities. Significantly, CNS and NPO have effectively established protocols described in the *State of Tennessee Multi-Jurisdictional Emergency Response Plan for the U.S. Department of Energy Oak Ridge Reservation* to communicate recommended protective actions for the public and event-specific information based on approved EPHAs.

CNS adequately validated 17 out of 19 offsite response interface capabilities during the five-year period, with focus on validating initial notification points and consequence assessment support, and receiving support from key offsite organizations, such as the COR and TEMA. Several exercises also validated more specialized response interfaces, including capabilities provided by counties, the UT Medical Center, MMC, RMCC, DOE Headquarters EOC, and the FBI. However, CNS has not validated its integrated response capability with the U.S. Army, 717th Ordnance Detachment, and OST.

3.3 Response Facilities and Systems

The objective of this portion of the assessment was to determine and validate the provision of adequate emergency facilities and systems commensurate with the associated hazards and threats identified in the all-hazards planning basis. In addition, sites such as the Y-12 must establish and maintain capabilities for an EOC, alternate EOC, and JIC, as well as supporting equipment, as required by DOE Order 151.1.D. Furthermore, other important emergency response facilities and systems identified by CNS and NPO were assessed.

Emergency Operations Center

CNS adequately established and maintains its primary EOC at Building K-1650 in the East Tennessee Technology Park. Accessible on a 24-hour basis, the EOC is the primary facility for coordinating emergency response and mitigation activities with offsite state, local, and Federal agencies and organizations. In addition, the EOC interfaces with the JIC to implement EPI protocols and procedures. The facility is equipped with both secure and non-secure information management systems. CNS adequately validated the EOC capabilities in 18 exercises during the five-year period.

Alternate Emergency Operations Center

CNS has adequately established and maintains an alternate EOC in Building 9105 capable of supporting EOC functions. CNS adequately validated the alternate EOC capabilities in one exercise during the five-year period.

Technical Support Center

CNS has adequately established and maintains a TSC in Building 9706-2, adjacent to the ECC. The facility is equipped with both secure and non-secure information management and communication systems to connect with the EOC. CNS adequately validated the TSC capabilities in 16 exercises during the five-year period.

Alternate Technical Support Center

CNS has adequately established and maintains an alternate TSC in Building K-1650 capable of supporting all TSC functions, including emergency response and reentry operations. CNS adequately validated alternate TSC capabilities in two exercises during the five-year period.

Emergency Control Center

CNS has adequately established and maintains an ECC for surveillance and control of operational processes, to manage and conduct initial incident assessment and mitigation, and to direct initial protective actions. The ECC, located in Building 9706-2, is staffed on a continuous basis for day-to-day site operation and coordination. In the event of an emergency, the Y-12 PSS activates the TSC and EOC cadres, as appropriate, to manage response and recovery activities. CNS adequately validated the ECC capabilities in 17 exercises during the five-year period.

Alternate Emergency Control Center

CNS has adequately established and maintains an alternate ECC in Building 9737, which has the capabilities to control the Y-12 emergency notification system and significant communication equipment

(e.g., telephones, cell phones, and radios). CNS has concluded that it is unlikely that the same incident affects both the primary and alternate ECCs. If an incident occurred that rendered both Buildings 9706-2 and 9737 uninhabitable, the ECC staff would relocate to a safe location in their vehicle (e.g., the South Ridge) and would maintain radio contact with the onsite IC. CNS adequately validated the alternate ECC capabilities in one exercise during the five-year period; however, CNS has not validated its mobile ECC capability.

Media Center and Joint Information Center

CNS has adequately established and maintains two venues used to disseminate information to the public: an onsite MC and an offsite JIC. The MC, located in the Y-12 New Hope Center, provides workspace for NPO and CNS EPI staff and a briefing area for the media. Audiovisual support and sound amplification are available in the briefing area. NPO and CNS adequately validated the MC capabilities in 12 exercises during the five-year period. The JIC, located outside the Y-12 five-mile emergency planning zone in Powell, Tennessee, provides workspace for NPO and CNS personnel, interfacing organization personnel (e.g., state, city, and counties), and news media representatives. In the event of a General Emergency, the designated spokesperson in the JIC distributes information. NPO and CNS adequately validated JIC capabilities in seven exercises during the five-year period.

Medical Facility

CNS has adequately established and maintains a medical facility located in the north wing of the Jack Case Center. The medical facility is the primary location for triage, treatment, and disposition of employees injured and contaminated or exposed to HAZMAT. This facility has the necessary equipment and supplies for emergency first aid of persons exposed to hazardous or radioactive material requiring decontamination. CNS adequately validated the medical facility capabilities in 11 exercises during the five-year period.

Personnel Survey Depot

CNS has adequately established and maintains a PSD in Building 9723-28 as the primary point for decontamination of non-injured employees in the event of a large-scale radiological contamination incident. This facility is equipped with showers and decontamination equipment and supplies. CNS also uses the PSD as the backup facility for triage, treatment, decontamination, and disposition of employees upon declaration that the medical facility is unsafe. Provisions exist for onsite emergency medical treatment of injured workers, including the ability to treat personnel exposed to HAZMAT. Procedures are in place for rapid evaluation of the severity of contamination and exposure as well as decontamination, as appropriate, before or after leaving the site. CNS adequately validated the PSD capabilities in four exercises during the five-year period.

Fire Department Alarm Room

CNS has adequately established and maintains a primary FDAR in Building 9710-2 and an alternate FDAR in Building 9706-2. CNS adequately validated the FDAR capabilities in 14 exercises and the alternate FDAR capabilities in 1 exercise during the five-year period.

Health and Safety Team Coordinator Dispatch

CNS has adequately established and maintains an HSTC dispatch in Building 9105. The facility is equipped with OMT resources and information management and communication systems to connect with

the TSC and field responders. The alternate HSTC dispatch is located in Building 9115. CNS adequately validated HSTC capabilities in 16 exercises and alternate HSTC capabilities in 2 exercises during the five-year period.

Emergency Management Information System and Y-12 Area Mapping System

CNS has adequately established and maintains EMInS and YAMS as the primary information management systems to provide orderly collection and dissemination of information during an emergency. EMInS uses computer and video equipment integrated by software in a distributed workstation configuration to gather, store, and display relevant information. EMInS connects workstations in the ECC, TSC, EOC, JIC, and HSTC dispatch, as well as several offsite agencies, including the State of Tennessee and DOE Headquarters. Furthermore, CNS organized EMInS data into summary charts providing succinct information to onsite and offsite responders. In addition, using YAMS, CNS integrated numerous EMInS databases with graphical outputs using graphical information system maps. CNS adequately validated the EMInS and YAMS capabilities in 18 exercises during the five-year period.

Paging System

CNS has adequately established and maintains an automated paging system for activating the ERO cadre. The personal computer-based system provides an interface with the contracted paging service provider. The paging service provider implemented several levels of backup, including allowing Y-12 direct access to the transmitters covering the Y-12 area. CNS adequately validated the paging system capabilities in 17 exercises during the five-year period.

Personnel Accountability Systems

CNS and NPO have adequately established and maintain personnel accountability systems for Y-12 buildings/facilities. One facility uses an automated personnel accountability system that includes electronic badge scanning to assist in meeting the CNS requirement for completion of accountability within 30 to 45 minutes from the time of recognition of an emergency. Most low-hazard buildings, such as office buildings (e.g., Jack Case Center), use a negative accountability system, whereby designated individuals search each work area upon evacuation to ensure that no persons remain in the building. Further, CNS assigns each qualified onsite building/facility under the purview of the Y-12 facility emergency program to specific assembly stations. Assembly stations are located throughout the site to ensure that no buildings or facilities are located at unreasonable distance from requisite servicing assembly stations. Each station contains ring-down telephones connecting that station to the ECC. CNS adequately validated the personnel accountability systems in 13 exercises during the five-year period.

Criticality Accident Alarm System

CNS has adequately established and maintains personnel protective action capabilities using the criticality accident alarm system (CAAS) to detect and annunciate a criticality accident using the emergency notification system. CAAS is composed of individual detectors that operate independently, except where intentionally interlocked with other facilities. CNS adequately validated the CAAS capabilities to initiate personnel protective actions in four exercises during the five-year period.

Meteorological Monitoring System

CNS has adequately established and maintains a meteorological monitoring system with two fully instrumented meteorological monitoring towers and a Doppler Sonic Detection and Ranging unit strategically located around Y-12. Instrumentation monitors wind speed and direction, ambient and delta temperatures, relative humidity, barometric pressure, solar radiation, and rainfall. Wind speed and direction are also monitored on a tower at Building 9984-A. CNS adequately validated the meteorological monitoring system capabilities in 12 exercises during the five-year period.

Public Warning Siren System

CNS has adequately established and maintains an offsite PWSS to alert the public that protective actions are necessary. The State of Tennessee uses a coordinated emergency alert system to inform the public of specific protective actions. The State of Tennessee and NPO define the overall use and capabilities of the PWSS in *The State of Tennessee Multi-Jurisdictional Emergency Response Plan for the U.S. Department of Energy Oak Ridge Reservation*. CNS adequately validated the PWSS response capabilities in four exercises during the five-year period.

Response Facilities and Systems Conclusions

CNS has adequately established, maintains, and validated appropriate emergency response facilities and systems in a constant state of readiness that enables effective emergency response. CNS maintains dedicated facilities and systems in accordance with the Y-12 emergency plan. In addition, CNS appropriately focused validation of capabilities on primary facilities and systems, including the ECC, TSC, EOC, EMInS/YAMS, and paging system used during any activation of the ERO. Furthermore, CNS adequately validated all alternate facilities and the PSD capabilities during the five-year period. Notably, the primary EOC is outside the Y-12 boundary and five-mile emergency planning zone and not adversely affected by any of the Y-12 HAZMAT release incidents that may render onsite command centers (ECC and TSC) uninhabitable or inaccessible.

4.0 BEST PRACTICES

There were no best practices identified as part of this assessment.

5.0 FINDINGS

There were no findings identified as part of this assessment.

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Consolidated Nuclear Security, LLC

Deficiency D-CNS-1: CNS did not validate response interface capabilities with the U.S. Army, 717th Ordnance Detachment in Fort Campbell, Kentucky, for EOD support, and with OST related to the integration of applicable aspects of emergency response for an event scene inside the Y-12 boundary. (DOE Order 151.1D, Attachment 4, Paragraph 15)

7.0 OPPORTUNITIES FOR IMPROVEMENT

The assessment team identified two OFIs to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

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OFI-CNS-1: Consider ensuring an effective EOD emergency response interface capability by:

- Determining whether the agreement with the U.S. Army, 717th Ordnance Detachment in Fort Campbell, Kentucky, will be retained to support Y-12 for disposal of explosive ordnance.
- Validating the capability by conducting an exercise with an ordnance component that uses the capability with the Army once every five years, if NPO retains the agreement.

OFI-CNS-2: Consider ensuring that an effective interface is established and validated as an OST host site by:

- Obtaining the latest revision of the OST *Concept of Operations between NNSA Host Sites and the Office of Secure Transportation* and, if necessary, updating Y-12 plans and procedures to be consistent with the OST concept of operations
- Training the Y-12 ERO, as necessary, to the revised procedures
- Conducting an OST-focused exercise once every five years to validate Y-12 host site capability.

Appendix A Supplemental Information

Dates of Assessment

Remote Assessment: September 28 to November 4, 2020

Office of Enterprise Assessments (EA) Management

Nathan H. Martin, Director, Office of Enterprise Assessments
John E. Dupuy, Deputy Director, Office of Enterprise Assessments
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