



Independent Assessment of the 2024 Full-participation Emergency Management Exercise at the Los Alamos National Laboratory

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Table of Contents

Acronyms.....	ii
Executive Summary	iii
1.0 Introduction.....	1
2.0 Methodology	1
3.0 Results.....	2
3.1 Emergency Operations System	2
3.2 Emergency Classification.....	4
3.3 Notifications and Communications.....	5
3.4 Protective Actions	6
3.5 Consequence Assessment.....	7
3.6 Offsite Response Interfaces.....	7
3.7 Exercise Design and Conduct	8
3.8 Finding Follow-up.....	9
4.0 Best Practices	11
5.0 Findings	12
6.0 Deficiencies	12
7.0 Opportunities for Improvement	12
Appendix A: Supplemental Information.....	A-1

Acronyms

CRAD	Criteria and Review Approach Document
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EAL	Emergency Action Level
EOC	Emergency Operations Center
EOS	Emergency Operations System
EOSC	Emergency Operations Support Center
EPHA	Emergency Planning Hazards Assessment
ERO	Emergency Response Organization
ETSC	Emergency Technical Support Center
FMT	Field Monitoring Team
HAZMAT	Hazardous Material
IC	Incident Commander
ICP	Incident Command Post
IRC	Incident Response Commander
IZ	Isolation Zone
JIC	Joint Information Center
LAFD	Los Alamos County Fire Department
LANL	Los Alamos National Laboratory
MRB	Management Review Board
NA-LA	National Nuclear Security Administration Los Alamos Field Office
NARAC	National Atmospheric Release Advisory Center
OE	Operational Emergency
OFI	Opportunity for Improvement
PA	Protective Action
PAR	Protective Action Recommendation
PIP	Pre-incident Plan
TA	Technical Area
TIA	Timely Initial Assessment
Triad	Triad National Security, LLC
WCATS	Waste Compliance and Tracking System

INDEPENDENT ASSESSMENT OF THE 2024 FULL-PARTICIPATION EMERGENCY MANAGEMENT EXERCISE AT THE LOS ALAMOS NATIONAL LABORATORY

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of the emergency management program during the 2024 full-participation exercise at the Los Alamos National Laboratory (LANL) from April to June 2024. This assessment evaluated the effectiveness of the management and operating contractor, Triad National Security, LLC (Triad), and the National Nuclear Security Administration Los Alamos Field Office (NA-LA) in managing and maintaining emergency response organization performance via the full-participation emergency management exercise conducted on May 22, 2024. This assessment was based on requirements documented in DOE Order 151.1D, *Comprehensive Emergency Management System*. EA assessed the performance of the emergency response organization at key decision-making locations to determine whether Triad responded effectively to a simulated Operational Emergency and took appropriate response measures to protect workers, responders, and the public.

EA identified the following strengths, including three best practices:

- Triad created an innovative animation video to initiate the simulated incident and shared the video with workers to enhance the overall realism of the exercise and provide significant information about the incident with minimal use of verbal injections. (Best Practice)
- Triad's live streaming of the press conference at the Joint Information Center was viewable in the emergency operations center, allowing feedback to be provided in real time to emergency operations center personnel. (Best Practice)
- Triad incorporated incident scene cameras to enable the exercise control cell to view the on-scene response to better monitor and maintain situational awareness of the exercise. (Best Practice)
- Triad designed and conducted a realistic full-participation exercise to evaluate emergency response capabilities.
- Triad employed the services of the Argonne National Laboratory's Exercise Training Network to effectively challenge its public information officers in the dissemination of emergency public information during briefings.
- Triad's consequence assessment activities provided accurate projections using incident conditions and supportive assessments throughout the emergency response.

EA also identified two weaknesses, as summarized below:

- Triad did not categorize the emergency within 15 minutes after incident identification, resulting in protective actions for LANL workers not being applied in a timely manner. (Finding)
- NA-LA, as the oversight authority, has not ensured that Triad and the Los Alamos County Fire Department plan and coordinate a common operating picture, situational awareness, and the dissemination of protective actions prior to establishing unified command, which delayed implementing protective actions for workers at the scene and downwind of the incident. (Finding)

In summary, Triad designed an adequate exercise which included three best practices that were identified by EA to test the emergency response organization's capabilities in a realistic, real-time environment. However, performance weaknesses in the response to the postulated incident warrant additional management attention. These include weaknesses related to maintaining situational awareness and

disseminating a common operating picture before unified command is established and the timeliness of incident classification. These weaknesses led to delays in implementing initial immediate protective actions for workers at the incident scene and downwind of the incident. Overall, the NA-LA and Triad emergency management program is capable of adequately responding to the hazards identified within its emergency planning hazards assessment. However, until the concerns identified in this report are addressed or effective mitigations are put in place, responses to incidents at LANL could present challenges to effective and timely response actions.

INDEPENDENT ASSESSMENT OF THE 2024 FULL-PARTICIPATION EMERGENCY MANAGEMENT EXERCISE AT THE LOS ALAMOS NATIONAL LABORATORY

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 2024 full-participation emergency management exercise at the Los Alamos National Laboratory (LANL). This assessment was conducted as part of a series of assessments of emergency management exercises and programs at DOE sites. Assessment activities were conducted from April to June 2024.

This assessment evaluated the effectiveness of the management and operating contractor, Triad National Security, LLC (Triad), and the National Nuclear Security Administration Los Alamos Field Office (NA-LA) programs in managing and maintaining emergency response organization (ERO) performance via the full-participation emergency management exercise conducted on May 22, 2024. This assessment also evaluated the effectiveness of the Los Alamos County Fire Department (LAFD) emergency response as defined in the NA-LA and Los Alamos County cooperative agreement (cooperative agreement DE-NA0004163). This assessment evaluated the performance of the ERO at key venues, including the incident command post (ICP), the emergency operations support center (EOSC), and the emergency operations center (EOC), with a focus on decision-making ERO positions, such as the incident commander (IC), emergency manager, and EOC emergency director. Issues identified during the exercise evaluations were further examined to determine possible causes, such as a lack of training or insufficient procedural guidance. This assessment was conducted in accordance with the *Plan for the Independent Assessment of the Emergency Management Exercise at the Los Alamos National Laboratory, April – June 2024*.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements 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 the order.

As identified in the assessment plan, this assessment considered requirements documented in DOE Order 151.1D, *Comprehensive Emergency Management System*. EA used the following sections of EA criteria review and approach document (CRAD) 33-09, Revision 0, *DOE Order 151.1D Emergency Management Program*: section 4.3, *Emergency Response Organization*; section 4.4, *Emergency Operations System*; section 4.6, *Offsite Response Interface*; section 4.7, *Emergency Classification*; section 4.8, *Protective Actions*; section 4.9, *Consequence Assessment*; section 4.11, *Notifications and Communications*; and section 4.15, *Exercises*.

EA examined key documents, such as the exercise package, exercise evaluation guides, emergency plans, checklists, procedures, and policies. EA also interviewed key personnel responsible for developing and executing the associated programs. EA observed the controller/evaluator pre-exercise brief, the exercise, and the post-exercise hotwashes and debrief activities, and walked down significant portions of the EOC, EOSC, and Technical Area (TA)-60 Building 17 (TA-60-0017) facilities, focusing on exercise response execution. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

EA conducted a previous assessment of emergency management at LANL in 2020 and reviewed the completion and effectiveness of corrective actions for the three EA findings identified in the previous assessment.

3.0 RESULTS

Triad designed and conducted a full-participation exercise to evaluate emergency response capabilities and multiple processes of key onsite ERO groups. Accordingly, the exercise focused on the use of appropriate plans, policies, and procedures, as well as the actions of ERO members involved in management, direction, and command and control functions. Triad conducted the exercise in response facilities that necessitated actions by facility workers and the site-level ERO and some simulated offsite participation. The postulated incident, based on an emergency planning hazards assessment (EPHA) scenario, involved a semi-truck striking a waste storage facility and a hoisting and rigging facility, resulting in an Operational Emergency (OE) classified as a General Emergency due to a hazardous material (HAZMAT) release of chlorine, hydrochloric acid, and diesel fuel and 14 casualties. LAFD responded to the incident, assumed initial IC duties, and provided rescue to severely injured employees and emergency medical service to all of the injured employees. The site on-duty emergency manager classified the incident while located at the EOSC and then arrived at the ICP 60 minutes after the initial incident as the LANL IC and established unified command. LAFD responded in accordance with the NA-LA cooperative agreement DE-NA0004163 for advance emergency medical, industrial fire suppression, rescue, and HAZMAT response.

3.1 Emergency Operations System

This portion of the assessment determined whether NA-LA's and Triad's emergency operations system (EOS) processes provide centralized collection, validation, analysis, and coordination of information related to a LANL incident response, and whether that information is used to obtain and maintain situational awareness and disseminate a common operating picture among response components to achieve a well-coordinated, well-understood, and effective response.

During the exercise, Triad and LAFD adequately obtained and maintained situational awareness and disseminated a common operating picture after the emergency manager established unified command with the LAFD IC at the ICP. Triad had adequate capabilities to collect incident information and provide expertise for incident analysis from a centralized and well-equipped EOC and EOSC. These capabilities supported consistency with the operational concepts of the National Incident Management System and eventually enabled the establishment of situational awareness and a common operating picture. The emergency manager assumed the role of LANL IC and established an effective unified command with the LAFD IC 60 minutes after the incident occurred. Unified command consisted of the emergency manager and leaders from the LAFD, Los Alamos Police Department, HAZMAT response team, and field monitoring team (FMT). Shortly afterwards, the emergency director declared the EOC operational and continued to adequately maintain situational awareness and disseminate a common operating picture and adequately coordinated with the Los Alamos County EOC and the Joint Information Center (JIC). In addition, Triad incorporated live streaming of a JIC press conference in the EOC. The use of live streaming is cited as a **Best Practice** because it allowed feedback to be provided in real time to the EOC cadre as to the effectiveness of the press releases developed in the EOC.

Nevertheless, Triad and LAFD emergency management plans, procedures, and checklists do not adequately define a concept of operations for a LANL emergency response during an OE prior to the emergency manager establishing unified command with the LAFD IC. Most notably, the roles and responsibilities of the emergency manager and LAFD IC are not clearly defined for the initial response period, resulting in

three weaknesses specific to response effectiveness (discussed below). NA-LA has not ensured that Triad and LAFD have established procedures that prescribe : (1) obtaining and maintaining situational awareness and disseminating a common operating picture among response components prior to establishing unified command during an incident rising to the level of an OE; (2) issuing initial immediate protective actions (PAs) to LANL workers during this early period; and (3) defining EPHA facility hazards in the LAFD TA-60-0017 pre-incident plan (PIP) to adequately support an effective response. As a result, contrary to DOE Order 151.1D, attachment 3, paragraph 1.d, NA-LA, as the oversight authority, has not ensured that Triad and the Los Alamos County Fire Department plan and coordinate a common operating picture, situational awareness, and the dissemination of protective actions prior to establishing unified command. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) Consequently, the lack of a clear concept of operations for Triad and LAFD during the initial response period, before unified command is established, impacted the ability of the site incident response to adequately protect LANL workers. The following weaknesses in response effectiveness were identified:

- Contrary to DOE Order 151.1D, attachment 3, paragraphs 4.b.(6) and 11.b.(6), NA-LA has not ensured that Triad and LAFD have formal standard operating procedures and checklists to (1) establish communications and coordination with incident command, and to (2) obtain and maintain situational awareness and disseminate a common operating picture among response components and external partners prior to establishing unified command for an OE. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) Consequently, independent incident responses occurred during the exercise, and most importantly, the issuance of PAs to LANL workers was overlooked until the emergency manager classified the incident. Specifically, during the 60 minutes after the incident, the emergency manager and LAFD IC functioned relatively independently and did not share critical information related to the response, such as changing ICP locations, initial incident assessment and associated isolation zones (IZs), the PA zone (downwind area), PA implementation, and incident classification. In addition, before establishing unified command, the emergency manager and LAFD IC did not directly communicate with each other to gain an understanding of incident priorities and planned objectives, such as LANL worker PAs and addressing mass casualties. The LAFD responders communicated some of this information to the LAFD central dispatch center, which Triad has the ability to monitor, but no member of the Triad ERO captured critical information in these transmissions.
- Contrary to DOE Order 151.1D, attachment 4, paragraph 9, NA-LA has not ensured that the LAFD IC has formal authority to issue initial immediate PAs to affected LANL workers based on standard industry practices, or authority to provide this information to the emergency manager in order to issue PAs and then for the emergency manager to verify that the PAs are consistent with the technical planning basis within 15 minutes. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) Consequently, while under the purview of the LAFD IC, Triad and LAFD did not issue PAs (evacuate or shelter-in-place) to unprotected LANL workers in potentially hazardous atmospheres from the postulated chlorine release. Specifically, upon arrival at the incident scene at 0914 hours, the LAFD IC conducted an incident scene assessment confirming the chlorine release, established a 100-meter IZ, and directed the LAFD responders to use personal protective equipment inside this distance. The TA-60-0017 assembly area is located slightly outside this distance. At 0918 hours, the LAFD IC expanded the IZ to 1,000 meters and moved the ICP farther from the incident. The LAFD IC has the overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the scene. Importantly, the LAFD IC did not relay the initial and expanded IZ distance and required PAs to the LAFD responders, the LANL workers located at the assembly area and in the PA zone directly downwind of the release (TA-48, TA-60, and TA-64), and the emergency manager for implementation of onsite PAs for evacuation or shelter-in-place. In contrast, as a result of a wind shift, the LAFD IC immediately notified the Los Alamos County emergency manager to shelter-in-place Los Alamos County personnel. Additionally, DOE Order 151.1D requires that when a qualified IC issues initial immediate worker PAs at an EPHA facility, the

PAs must be verified to be consistent with the technical planning basis within 15 minutes, which did not occur.

- Contrary to cooperative agreement DE-NA0004163, goal 9, objective C.2, NA-LA has not ensured that LAFD has included the EPHA data in the TA-60-0017 PIP. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) Consequently, the LAFD IC established an oversized IZ based on a rail tank car-size container vs 40 lb. cylinder for the postulated chlorine release, which extended the IZ to 1,000 meters, well beyond the actual IZ of 155 meters listed in the EPHA. The IZ selected by the LAFD IC unnecessarily required evacuating large portions of the site and placing the Los Alamos town site in shelter-in-place PA. Specifically, the LAFD TA-60-0017 building PIP did not list the four EPHA facility materials and quantities that could result in airborne HAZMAT releases that would require classification of an OE. NA-LA is currently working with Triad to address the accuracy of PIPs but has a constraint of protecting sensitive information on NAFD systems.

Emergency Operations System Conclusions

The Triad EOS has the capability to collect incident information and provide needed expertise for incident analysis from centralized and well-equipped facilities. The EOC adequately interacted with offsite agencies and established adequate situational awareness and a common operating picture once unified command was established 60 minutes into the response. Additionally, Triad's use of live streaming was cited as a best practice. However, until the EM established unified command with the LAFD IC, LAFD and LANL ERO were responding to different understandings of the scale of chlorine release without communicating their responses. Contributing to this inconsistency is the fact that NA-LA has not ensured that the emergency plan, cooperative agreement DE-NA0004163, and associated implementing procedures adequately define the interface between Triad and LAFD during an OE prior to establishing unified incident command to achieve situational awareness and disseminate a common operating picture. Importantly, despite assessing the scene, the LAFD IC did not implement some critical actions, such as PAs for LANL workers, during the initial response.

3.2 Emergency Classification

This portion of the assessment determined whether the Triad emergency manager, as the predetermined decision-maker, correctly classified the incident as promptly as possible, but no later than 15 minutes after incident identification, and no more than 30 minutes from initial discovery.

Triad has adequately established processes in its plans, procedures, and supporting systems for categorizing and classifying an OE, but the classification of the exercise scenario was not made promptly. The emergency manager's selection of the correct emergency action level (EAL), classifying the incident as a General Emergency, was based on the initial incident report from the scene and validating EAL indicators; however, the delay in classification was due to the emergency manager ascertaining the quantity of HAZMAT (chlorine) involved in the release first, inconsistent with ERO-EPIP-214, *Emergency Action Level Tables*. Classification of the incident occurred approximately 32 minutes after the initial identification and notification (phone call from the scene), and 35 minutes after initial discovery. The emergency manager requested the on-duty person in the Emergency Technical Support Center (ETSC) to assist in verifying that the selected EAL was correct while thinking that the chlorine release quantity must be known first. During follow-up interviews with ETSC staff, EAL writers confirmed that the amount of chlorine is not a key indicator for the EAL and validating the quantity of chlorine was not required; only the fact that a chlorine release had occurred in the damaged facility without a fire is required. Lastly, once the emergency manager identified the quantity of chlorine, classification occurred in approximately nine minutes. As a result, contrary to DOE Order 151.1D, attachment 3, paragraph 8.b, Triad did not categorize the OE as promptly as possible, or no later than 15

minutes after identification by the predetermined decision-maker for the categorization, in accordance with the emergency management plan, and no more than 30 minutes from initial discovery. (See **Finding F-Triad-1** and **OFI-Triad-1**.) Consequently, this resulted in predetermine PAs not being issued to LANL workers for more than 40 minutes after the initial incident.

Emergency Classification Conclusions

Overall, Triad's plans, procedures, and supporting systems include adequate processes for categorizing and classifying an OE as required. However, during the exercise, there was a delay by Triad in selecting the EAL as written, which caused the classification of the incident to be delayed beyond DOE Order 151.1D response time requirements, resulting in predetermined PAs not being issued to LANL workers for more than 40 minutes.

3.3 Notifications and Communications

This portion of the assessment determined whether Triad provided initial and follow-on notifications promptly, accurately, and effectively to all appropriate stakeholders, and whether the ERO maintained effective communications throughout the response.

Upon incident classification, Triad completed prompt notifications to the ERO and offsite agencies. The EOSC cadre made the required ERO notifications, including to the Los Alamos County consolidated dispatch center, protective force, facility operations director, and emergency manager, upon receiving the initial fire alarm. The EOSC adequately completed notifications and maintained communications as required, using an emergency information management system (Everbridge messaging system and computer-aided dispatch) to provide adequate situational awareness and a common operating picture to the ERO, on and offsite personnel, and stakeholders. Upon declaration of a General Emergency, the EOSC used ERO-FORM-009 to make offsite notifications (including to the DOE Headquarters Watch Office) within the timeframe required by DOE Order 151.1D; however, the patient information on the ERO-FORM-009 and known by the EOSC cadre at that time was incorrect and took more than 90 minutes to correct.

As previously discussed, the emergency manager did not effectively communicate with LAFD during the first 60 minutes, leading to delays in providing effective communications among on-scene responders, emergency managers, and response facilities. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) The emergency manager asked the EOSC operators for information about the incident in order to appropriately direct notifications to the LANL FMT/HAZMAT team and the ETSC. At the emergency manager's request, the EOSC fully activated continuity of operations and the EOC using the Everbridge messaging system. The EOSC cadre provided periodic updates to the emergency manager throughout the incident. After classification, the emergency manager directed the issuance of PAs to site personnel, and a protective action recommendation (PAR) was issued to shelter the community of Elk Ridge within the Los Alamos city limits. The emergency manager prioritized life safety when working with HAZMAT personnel throughout the incident and ensured that HAZMAT personnel donned appropriate personal protective equipment.

Notifications and Communications Conclusions

Overall, Triad adequately provided emergency notifications and communications throughout the incident response. Upon incident classification, Triad used adequate communication systems to promptly notify the ERO, most onsite personnel, and offsite agencies. Throughout the incident, the EOSC generally maintained appropriate situational awareness and facilitated communications as required by DOE Order 151.1D. However, the emergency manager did not effectively communicate with LAFD during the first

60 minutes, leading to delays in providing effective communications among on-scene responders, emergency managers, and response facilities.

3.4 Protective Actions

This portion of the assessment evaluated whether Triad correctly identified and implemented PAs to minimize the consequences of an emergency and to protect the health and safety of workers and the public.

Triad identified and implemented the correct PAs after incident classification. Upon receiving a high-flow fire suppression alarm, caused by the crash damage, facility personnel evacuated 100 meters away to an upwind assembly area and monitored the nearby windsock. Meanwhile, eight minutes after incident classification, the emergency manager directed the transmittal of the predetermined PAs linked to the EAL for a 40-pound chlorine release. The personnel at the assembly area received the PA message by text four minutes later and left the area nine minutes after receiving the message. The PA message evacuated a 155-meter-radius IZ and placed downwind personnel within a 668-meter downwind protective action zone in shelter-in-place PAs in accordance with the EAL. Triad also transmitted a PAR to shelter in place to the Elk Ridge community as an advisory action. Later, following a wind shift, the ETSC coordinator and EOC cadre reviewed the associated consequences and correctly determined that no additional onsite PAs were necessary. The wind shift did affect the Los Alamos County Eco Station and the Elk Ridge community, so a PAR to shelter in place was warranted in those areas; however, Triad had already provided the PAR with the initial notification. The PAs remained in place until air-monitoring surveys for chlorine confirmed that there were no detectable quantities.

Independent of and before Triad identified PAs, LAFD developed extremely conservative PAs while enroute to the scene for use in protecting LAFD responders and the public. LAFD, unfamiliar with the quantity of chlorine in the facility and without the PIP inventory, developed PAs by assuming a release of a rail-tank-car quantity of chlorine. (See **Finding F-NA-LA-1** and **OFI-NA-LA-1**.) LAFD analyzed the chlorine release using an *Emergency Response Guidebook*-based program that established an IZ that was initially applied for the protection of LAFD responders and, after a wind shift, applied for the protection of the public. This resulted in a 1,000-meter radius IZ and, when the wind shifted, sheltering in place for the population of Los Alamos County. LAFD relocated twice in selecting an ICP because of the large IZ. LAFD did not communicate PAs to LANL workers or the LANL ERO. Likewise, the emergency manager did not contact LAFD per ERO-EIP-100, *LANL Incident Commander*, to identify and complete specified actions or to make any PA adjustments based on LAFD PAs prior to leaving the EOSC.

Protective Actions Conclusions

Triad identified and implemented the correct PAs after incident classification. After incident classification, personnel at the assembly area received the Triad pre-determined PAs and evacuated the area 21 minutes after classification. Separately, LAFD established a much larger area under PA that was initially only applied to LAFD responders and, after a wind shift, to the public, independent of Triad PA activities until unified command was established. The combination of Triad and LAFD actions, including the aforementioned 32-minute delay in selecting the EAL, left personnel unprotected at the assembly area in the IZ for nearly 53 minutes from the time the chlorine release occurred.

3.5 Consequence Assessment

This portion of the assessment determined whether Triad's consequence assessment activities provided a conservative timely initial assessment (TIA), accurate projections using incident conditions, and supportive assessments throughout the emergency.

Consequence assessment personnel, prior to incident classification, provided an accurate and conservative TIA using the National Atmospheric Release Advisory Center (NARAC) dispersion-modeling program. Upon notification of a chlorine release, the ETSC coordinator, located at Building TA-59-3, telephoned the EOSC to gather initial information and initiate the TIA. The TIA was based on a 40-pound source term of chlorine, which is the facility quantity limit and serves as the basis for the facility chlorine EAL. At Building TA-69-3, an accurate plume plot was developed using the exercise injected weather, with winds from north to south, for the time of the release. The results indicated that the EAL PAs were adequate because they extended beyond the calculated TIA projection.

The ETSC staff provided timely and accurate continuous ongoing assessments. After the ETSC was staffed, the ETSC reviewed the Waste Compliance and Tracking System (WCATS) waste inventory records to determine the actual quantity of chlorine in the facility and to identify other HAZMAT that may have been in the inventory. The ERO had also previously confirmed that the semi-truck was empty. The WCATS reported the 40-pound chlorine quantity, which was the only material in the facility at the time that warranted an EPHA. Additionally, the ETSC staff accurately modeled the release of the hydrochloric acid that was in the WCATS inventory report and ensured that the chlorine release was the bounding incident. After exercise controllers injected a wind shift, from south to north, the ETSC staff performed a conservative plume plot, within the capability of the NARAC program. The results of NARAC program modeling were provided to the FMT/HAZMAT team for developing an air survey plan. Other continuous ongoing assessments included the verification of the correct EAL in use and debunking an inaccurate report that there was one 55-gallon drum and two 35-gallon drums of chlorine in Building TA-60-0017.

Consequence Assessment Conclusions

Triad's consequence assessment activities provided a conservative TIA, accurate projections using incident conditions, and supportive assessments throughout the emergency. The TIA was properly based on the worst-case quantity of chlorine and canned meteorology. Continuous ongoing assessments included accurate EAL verification, dispersion modeling of hydrochloric acid, a second conservative chlorine dispersion projection following a wind shift, and confirmation that no additional HAZMAT was involved. Consequence assessment information was promptly made available to the appropriate personnel.

3.6 Offsite Response Interfaces

This portion of the assessment evaluated the effectiveness of Triad and NA-LA in establishing and maintaining interfaces with local, state, tribal, and Federal organizations responsible for emergency response.

Currently, Triad is transitioning the EOC offsite liaison position from the planning section to the command staff in the primary EOC, with the position being staffed by LANL Government Affairs department personnel. For this exercise, the offsite liaison remained in the planning section. When the EOC was activated, the offsite liaison immediately reported to the EOC, logged into WebEOC® (Web-based Emergency Operations Center Software), started obtaining situational awareness, and assisted the planning section chief. The offsite liaison (or other EOC positions) notified, either actually or

simulated, the Defense Nuclear Facilities Safety Board, the Environmental Management Los Alamos Field Office, the Los Alamos County Emergency Manager, DOE Headquarters, and four of the five Native American pueblos.

An unusually large number of offsite agencies surround the LANL site, requiring interaction during an OE declaration at LANL. These offsite agencies include one state office of emergency management, four medical centers, four offices within the county of Los Alamos, two counties other than Los Alamos, five Native American pueblos, and six Federal agencies. In general, Triad emergency management documents adequately describe the offsite response interfaces required during an emergency in annex G of EM-PLAN-100, *Los Alamos National Laboratory Emergency Management Plan*, and supporting documents.

Triad and NA-LA are effectively managing the offsite response interface aspect of the emergency management program. Triad conducted a self-assessment of offsite response interface requirements in September 2023 that identified two deficiencies and three improvement areas. Additionally, NA-LA's September 2023 annual assessment of Triad's emergency management program cited Triad with a finding for not providing requisite information from EPHA analyses to appropriate county and state agencies. Triad has developed corrective action plans for these deficiencies and finding, and the correction action plans are expected to be completed in October 2024. Identification of these issues by Triad and NA-LA demonstrate a healthy self-critical culture by the contractor and effective oversight by the field office. Also, recognizing the unusually large number of offsite agencies, Triad indicated that it is in the process of hiring a full-time interface program coordinator with the responsibility to prepare offsite stakeholders for response to disasters and emergency incidents at LANL, including supporting the development and conduct of EOC training and offsite agency orientations and briefings.

Offsite Response Interfaces Conclusions

Triad and NA-LA are effectively managing the offsite response interface aspect of the emergency management program. Triad and NA-LA have adequately identified needed improvements, and Triad has developed corrective action plans to resolve the issues. Most notably, Triad has begun the process of hiring a full-time interface program coordinator to coordinate with the numerous offsite agencies surrounding LANL.

3.7 Exercise Design and Conduct

This portion of the assessment evaluated the ability of the Triad exercise program to validate emergency response capabilities and test and validate emergency plans and procedures for hazards identified in the EPHAs.

Triad effectively maintains several documents that control the design, conduct, and evaluation of emergency management exercises, such as EMD-PLAN-120, *Exercise Program Plan*, EMD-FORM-272, *Exercise Planning Checklist*, and exercise evaluation guides. In accordance with these procedures, Triad conducted hotwashes at all venues immediately after the exercise and a controller/evaluator debrief the next day. At the end of data collection for this assessment, Triad was in the process of analyzing the exercise, drafting an exercise after-action report, and entering self-identified issues into its issues management system.

Triad designed and conducted the full-participation exercise effectively, ensuring the validation and testing of response capabilities and emergency plans and procedures. Triad designed a complex EPHA-based scenario with 14 casualties, a HAZMAT release, and a wind shift that challenged its emergency response capabilities and resources. The Los Alamos County Office of Emergency Management activated its EOC and participated in the exercise by receiving incident status reports and

simulating or discussing its actions relative to the reports. Triad also used an innovative inject to initiate the exercise by providing the facility workers with an animation video of the semi-truck crashing into the building and releasing a cloud of yellowish-green gas. The creation and use of the animation video for initiating the incident is cited as a **Best Practice** because it provided the workers with significant information about the incident with minimal use of verbal injections. In addition, Triad incorporated incident scene cameras to enable the simulation cell to view the on-scene response. This arrangement is cited as a **Best Practice** because it provided the exercise control cell with significant information about the incident scene activities. Finally, Triad employed the services of Argonne National Laboratory's Exercise Training Network to effectively challenge its public information officers and JIC during the exercise.

Although Triad designed a complex EPHA-based full-participation exercise, some issues detracted from the effectiveness of the exercise, resulting in some capabilities not being effectively tested by the exercise (see **OFI-Triad-2**), as evidenced by the following:

- Exercise planners from the LAFD did not provide the Triad exercise planning team adequate information on required simulations; nor, did the Triad exercise planning team apply enough attention to detail to ensure adequate simulation by the LAFD.
- The inability of LAFD to create exercise patient care reports or simulate their creation in its electronic patient system and the inadequate planning for this condition prevented the EOC from correctly validating the number and condition of the casualties.
- Despite being a full-participation exercise:
 - Only the NARAC dispersion-modeling program was used by ETSC personnel; NARAC personnel did not participate in the exercise as designed.
 - Triad simulated contacting four Native American pueblos but did not actually perform this activity.
 - Triad did not evaluate the offsite response interface objective due to an administrative error.

Most notably, because of a misunderstanding and no protective force personnel at the incident command post, protective force personnel responded to the incident scene thinking that the incident was real. This action demonstrated poor communications and execution of this portion of the exercise.

Exercise Design and Conduct Conclusions

Triad designed a complex EPHA-based full-participation exercise that challenged its capabilities and resources and involved offsite agencies, such as the Los Alamos County Office of Emergency Management, LAFD, and police. Triad designed, conducted, and evaluated the exercise in accordance with its plans, procedures, and checklists. Additionally, Triad's use of an innovative animation video to initiate the event and incorporation of incident scene cameras were cited as best practices. However, a lack of detailed planning on required simulations and the inability to create exercise patient care reports resulted in some unrealistic emergency response actions and the inability to validate the number of casualties. Finally, some offsite agencies did not participate as designed, and some members of the protective force were not aware of the exercise.

3.8 Finding Follow-up

This portion of the assessment determined whether corrective actions were effective for the three findings identified in EA report *Emergency Management Assessment at the Los Alamos National Laboratory, August 2020*.

EA assessed a LANL functional exercise in 2020 and identified three findings that were assigned to Triad. The associated Triad after-action report identified issues similar to the EA findings. In response to these issues, Triad developed corrective action plans for each of the EA findings by using applicable corrective actions from the similar issues identified in the after-action report. The document that identified the applicable corrective actions for each EA finding was then submitted to NA-LA as a corrective action plan for approval on October 1, 2020, and was subsequently approved on February 2, 2021; revisions to the NA-LA-approved corrective action plan were made when additional corrective actions were identified during verification and validation. All identified corrective actions for the three EA findings have been closed by Triad, but the verification and validation of the closed corrective actions to address 2020 EA Finding F-TRIAD-2 had not been completed at the time of this assessment, thereby resulting in two of the three EA findings being closed. The results of EA's review of the completed corrective actions, closure evidence, and verification and validation documentation for the three findings are described below:

2020 EA Finding F-TRIAD-1: This finding identified that Triad did not provide accurate and effective initial notifications to all appropriate stakeholders (DOE Order 151.1D, attachment 3, paragraph 11). Upon receiving the finding, Triad identified and implemented compensatory actions that included modifying responder procedures and checklists to address the validation of incident information. Affected personnel were briefed on the changes, and casual analyses and an extent-of-condition review were conducted before identifying corrective actions to address the finding. Triad then identified applicable corrective actions from three similar Triad-identified issues to address the EA finding. Corrective actions to prevent recurrence included updating ERO-EPIP-100, *LANL Incident Commander*, and FROG-260, *Field Response Operating Guidelines: Incident Commander*, to include a step to require an independent validation of the listed information pertaining to the incident to ensure that the information is accurate prior to distributing incident notifications. Additionally, Triad developed and implemented an incident response commander (IRC, now known as the emergency manager) training plan and revised the IRC and EOSC qualification standards to require IRCs and EOSC operators to demonstrate proficiency in validating and reporting information received during an emergency. The effectiveness of completed corrective actions was verified/validated using drills and exercises, including the LANL 2022 full-participation exercise. Upon completion of all corrective actions, verifications/validations, and required effectiveness reviews, Triad presented closure evidence to the emergency management organization's Management Review Board (MRB) for evaluation, and the board concurred with closure of the issue. As demonstrated in exercises since the issue was closed, the completed corrective actions adequately addressed the finding.

2020 EA Finding F-TRIAD-2: This finding identified that Triad did not demonstrate an effective capability to identify and implement pre-determined onsite PAs and offsite PARs to protect the health and safety of workers and the public (DOE Order 151.D, attachment 3, paragraph 9). Triad identified and implemented compensatory actions to address the issue, including modifying responder procedures to address PAs and offsite PARs; briefed the affected personnel on the procedure changes; and conducted analyses and an extent-of-condition review before developing corrective actions to address the finding. Triad then identified applicable corrective actions from four similar Triad-identified issues to address the EA finding. Corrective actions to prevent recurrence included updating applicable procedures for ICs pertaining to identifying and implementing PAs, and also revising some EAL tables to accurately identify PA sectors. The effectiveness of completed initial corrective actions were verified/validated using drills and exercises, including the LANL 2022 full-participation exercise, but the completed corrective actions were determined to be only partially effective, resulting in the development of additional corrective actions. The additional corrective actions have been completed, and the exercise observed during this current assessment was used to verify/validate the additional corrective actions as part of closure evidence. Even though corrective actions are complete, verification/validation and MRB concurrence for closure have not yet occurred; as such, this finding was still open at the conclusion of the assessment.

2020 EA Finding F-TRIAD-3: This finding identified that Triad did not demonstrate an effective EOS that validates and coordinates incident information to establish and maintain situational awareness and a common operating picture among response components (DOE Order 151.1D, attachment 3, paragraph 4). Triad identified and implemented the same compensatory actions as those for 2020 EA Finding F-TRIAD-1, including modifying responder procedures and checklists to add steps involving information validation and response action notifications for various responders to ensure enhanced situational awareness. Triad then conducted casual analyses and an extent-of-condition review before identifying the appropriate corrective actions to address the finding. After completing the casual analysis, Triad identified applicable corrective actions from a similar Triad-identified issue to address the EA finding. Corrective actions to prevent recurrence included some of the corrective actions used for 2020 EA Finding F-TRIAD-1, including ensuring that IRCs and EOSCs demonstrate proficiency in validating and sharing accurate information with emergency responders to develop a common operating picture. The effectiveness of completed corrective actions was verified/validated using drills and exercises, including the LANL 2022 full-participation exercise. Upon completion of all corrective actions, verifications/validations, and required effectiveness reviews, Triad presented closure evidence to the MRB for evaluation, and the board concurred with closure of the issue. As demonstrated in previous exercises since the issue was closed, when the EOS is activated at the declaration of an OE, the completed corrective actions adequately addressed the finding. However, as described in section 3.1, weaknesses occurred during the exercise concerning the interface between the emergency manager and LAFD prior to establishing unified command and the OE declaration, similar to the weaknesses related to the interface noted in the 2020 EA assessment report. (See **Finding F-NA-LA-1.**)

Finding Follow-up Conclusions

Triad completed all corrective actions to address the three previous EA findings. The completed corrective actions for 2020 EA Finding F-TRIAD-1 adequately addressed the finding as demonstrated in exercises since the issue was closed. All corrective actions for 2020 EA Finding F-TRIAD-2 have been completed, but it is still awaiting validation and verification and MRB concurrence for closure of the issue. The completed corrective actions for 2020 EA Finding F-TRIAD-3 adequately addressed the identified issue once emergency classification occurred; however, there are persistent weaknesses in the interface between the emergency manager and LAFD related to obtaining and maintaining situational awareness and disseminating a common operating picture among response components.

4.0 BEST PRACTICES

Best practices are safety-related practices, techniques, processes, or program attributes observed during an assessment that may merit consideration by other DOE and contractor organizations for implementation. The following best practices were identified as part of this assessment:

- Live streaming of the JIC press conference in the EOC allowed feedback to be shared in real time.
- The creation and use of the animation video to initiate the exercise provided the workers with significant information about the incident with minimal use of verbal injections.
- The use of scene cameras enabled the simulation cell to view the on-scene response.

5.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement corrective action plans for findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, to manage the corrective actions and track them to completion.

Triad National Security, LLC

Finding F-Triad-1: Triad did not categorize the OE as promptly as possible, but no later than 15 minutes after identification by the predetermined decision-maker for the categorization, in accordance with the emergency management plan, but no more than 30 minutes from initial discovery. (DOE Order 151.1D, att. 3, par. 8.b)

National Nuclear Security Administration Los Alamos Field Office

Finding F-NA-LA-1: NA-LA, as the oversight authority, has not ensured that Triad and the Los Alamos County Fire Department plan and coordinate a common operating picture, situational awareness, and the dissemination of protective actions prior to establishing unified command. (DOE Order 151.1D, att. 3, par. 1.d)

- NA-LA has not ensured that Triad and LAFD have formal standard operating procedures and checklists to (1) establish communications and coordination with incident command, and to (2) obtain and maintain situational awareness and disseminate a common operating picture among response components and external partners prior to establishing unified command for an OE. (DOE Order 151.1D, att. 3, pars. 4.b.(6) and 11.b.(6))
- NA-LA has not ensured that the LAFD IC has formal authority to issue initial immediate PAs to affected LANL workers based on standard industry practices, or authority to provide this information to the emergency manager in order to issue PAs and verify that they are consistent with the technical planning basis within 15 minutes. (DOE Order 151.1D, att. 4, par. 9)
- NA-LA has not ensured that LAFD has included the EPHA data in the PIPs. (Cooperative agreement DE-NA0004163, goal 9, objective C.2)

6.0 DEFICIENCIES

No deficiencies were identified during this assessment.

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs shown below 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.

Triad National Security, LLC

OFI-Triad-1: Consider improving the integration of EALs and the classification procedure by:

- Revising EALs with the necessary instructions to properly implement classification
- Adding clarifying instructions to EALs, discerning EAL indicators and EPHA information
- Providing additional training to emergency managers on the EAL selection process
- Developing a process that allows for direct collaboration between an emergency manager and the LAFD IC prior to classification.

OFI-Triad-2: Consider improving the design and conduct of emergency management exercises by:

- Focusing closely on the simulation of resources and capabilities of all participants that would be used in a real-world scenario but unavailable during an exercise.
- Including appropriate injects or contingency injects to ensure that all planned offsite agencies participate as designed.
- Ensuring all required personnel, including security personnel, participate and are present at the unified incident command post.

National Nuclear Security Administration Los Alamos Field Office

OFI-NA-LA-1: NA-LA, as the oversight authority, should consider ensuring Triad and LAFD accomplish the following recommended actions to strengthen site-specific emergency plans, emergency plan implementing procedures, checklists, and other command media by adding and implementing requirements for:

- Analyzing the field operations and ERO information flow dynamics to define the critical paths of key information and to identify expected actions for achieving and maintaining situational awareness among all teams.
- Adapting an information flow structure that assigns specific responsibility for each key information set, including responsibility for verifying and validating essential incident information collected in defined information systems or other response records.
- Establishing feedback loops to the issuing decision-maker to confirm key tasks completion.
- Incorporating guidance on the use of information management tools and resources to flow down requirements into the emergency plan, cooperative agreement DE-NA0004163, implementing procedures, and response checklists.
- Integrating EPHA hazards into PIPs.

Appendix A Supplemental Information

Dates of Assessment

April 30 to June 13, 2024

Office of Enterprise Assessments (EA) Management

John E. Dupuy, Director, Office of Enterprise Assessments
William F. West, Deputy Director, Office of Enterprise Assessments
Kevin G. Kilp, Director, Office of Environment, Safety and Health Assessments
David A. Young, Deputy Director, Office of Environment, Safety and Health Assessments
Thomas E. Sowinski, Director, Office of Nuclear Safety and Environmental Assessments
Kimberly G. Nelson, Director, Office of Worker Safety and Health Assessments
Jack E. Winston, Director, Office of Emergency Management Assessments
Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
Kevin G. Kilp, Chair
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