Independent Assessment of the Battelle Energy Alliance, LLC Management of Safety Issues at the Idaho National Laboratory Materials and Fuels Complex

May 2022

Office of Enterprise Assessments
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Acronyms

AAR	After-action Report
AHJ	Authority Having Jurisdiction
ASMT	Assessment (item identifier)
ATR	Advanced Test Reactor
BEA	Battelle Energy Alliance, LLC
BNA	Baseline Needs Assessment
CA	Corrective Action
CARB	Corrective Action Review Board
CFA	Central Facilities Area
CO	Condition Report (item identifier)
CONOPS	Conduct of Operations
CTR	Charter (item identifier)
DOE	U.S. Department of Energy
DOE-ID	DOE Idaho Operations Office
DU	Depleted Uranium
EA	Office of Enterprise Assessments
ECC	Emergency Control Center
ERO	Emergency Response Organization
FASB	Fuels and Applied Science Building
FCF	Fuel Conditioning Facility
GA	General Action
GDE	Guide (item identifier)
HFEF	Hot Fuel Examination Facility
HPI	Human Performance Improvement
IMCL	Irradiated Materials Characterization Laboratory
INL	Idaho National Laboratory
LCO	Limiting Condition of Operation
LOTO	Lockout/Tagout
LRD	Laboratory Requirements Document (item identifier)
LST	List (item identifier)
LTCA	Long-term Corrective Action
LWP	Laboratory-wide Procedure (item identifier)
MFC	Materials and Fuels Complex
MRM	Management Review Meeting
MTG	Mass Tracking System
NFPA	National Fire Protection Association
NQA	Nuclear Quality Assurance
NRAD	Neutron Radiography Reactor
OFI	Opportunity for Improvement
OMI	Operations Management Improvement
ORPS	Occurrence Reporting and Processing System
PDD	Program Description Document (item identifier)
PLN	Plan (item identifier)
SAC	Specific Administrative Control
SAR	Safety Analysis Report
SG	Suggestion (item identifier)
SLL	Significant Lesson Learned
SME	Subject Matter Expert
SSC	Structures, Systems, and Components

TREAT	Transient Reactor Test
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question

INDEPENDENT ASSESSMENT OF THE BATTELLE ENERGY ALLIANCE, LLC MANAGEMENT OF SAFETY ISSUES AT THE IDAHO NATIONAL LABORATORY MATERIALS AND FUELS COMPLEX

Executive Summary

The U.S. Department of Energy's Office of Enterprise Assessments (EA) conducted an independent assessment of the management of safety issues at the Materials and Fuels Complex and emergency management issues across Idaho National Laboratory from September 2021 to January 2022. This assessment evaluated Battelle Energy Alliance, LLC (BEA) management of issues associated with nuclear engineering, reactor operations, safety bases, criticality safety, conduct of operations, hazardous energy control, and emergency management since October 1, 2019.

Senior management engagement has been key to various elements of BEA's issues management. For example, BEA management elected to use its best, most rigorous issues management tools (e.g., root cause analyses and effectiveness reviews) to ensure resolution of some of the more complex safety issues at the Materials and Fuels Complex. EA identified BEA management's oversight of compensatory actions as a best practice.

However, EA identified four findings and several weaknesses that allow safety issues to persist. The findings warrant a high level of attention from BEA management.

- BEA has not adequately managed non-compliances and broad performance issues in a training and qualification program supporting nuclear work. During this assessment, BEA appropriately paused work while performing evaluations to ensure that nuclear facility safety was not adversely affected and to justify resumption of operations pending resolution of issues involving the potential for unqualified personnel performing nuclear work. However, BEA has not committed to determining the causes and corrective actions for the identified broad performance issues. (Finding)
- BEA did not categorize or under-categorized the significance of approximately 17% of the issues reviewed on the Materials and Fuels Complex and approximately 28% of the issues on emergency management, largely because of identifying some non-compliances as items for trending without resolving them, and not categorizing several emergency management issues. The appropriate categorization of issues invokes the required rigor and management, using a graded approach based on risk, to resolve issues. (Finding)
- BEA's previously identified weakness in trend identification continues, and several adverse trends in safety issues are incorrectly managed as optional improvement initiatives instead of being resolved as required. (Finding)
- BEA corrective actions are often not managed as required to ensure issue resolution. (Finding)
- BEA personnel did not enter recurring reactor control system faults for the Neutron Radiography Reactor and many emergency management issues into the BEA issues management system.
- BEA personnel assigned to manage issues sometimes implement BEA processes inadequately, causing issues to persist (and, in some cases, develop into adverse trends), not be corrected "promptly" as required, and be closed without adequate documentation.

In summary, BEA adequately manages most of its issues and has used its most rigorous tools to resolve some of its complex safety issues, but several significant weaknesses hamper resolution of issues. Until the concerns identified in this report are addressed or effective mitigations are implemented, some issues will go uncorrected, reducing the protections or layers of defense against potential worker and nuclear safety events and readiness for site-level emergencies.

INDEPENDENT ASSESSMENT OF THE BATTELLE ENERGY ALLIANCE, LLC MANAGEMENT OF SAFETY ISSUES AT THE IDAHO NATIONAL LABORATORY MATERIALS AND FUELS COMPLEX

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), assessed the Battelle Energy Alliance, LLC (BEA) management of issues associated with nuclear safety, hazardous energy control, and emergency management at the Materials and Fuels Complex (MFC) of the Idaho National Laboratory (INL). BEA has a single emergency response organization for INL, so EA assessed BEA's management of emergency management issues across INL. This assessment was conducted remotely due to pandemic restrictions, with interviews on November 8-19, 2021, and January 10-14, 2022.

In fiscal year 2019, EA identified issues management as a targeted review area. This assessment is the sixth review examining corrective action processes at DOE facilities. Results from these targeted reviews and from other EA assessments will be documented in a lessons-learned report that will contain EA's overall assessment on issues management across the DOE complex.

In accordance with the *Plan for the Independent Assessment of the Battelle Energy Alliance, LLC Management of Safety Issues at the Idaho National Laboratory Materials and Fuels Complex, September 2021*, this assessment evaluated BEA's management of issues associated with nuclear engineering, safety bases, criticality safety, reactor operations, conduct of operations (CONOPS), hazardous energy control, and emergency management since October 1, 2019.

The DOE Idaho Operations Office (DOE-ID) oversees BEA's management and operations at INL for the DOE Office of Nuclear Energy, including its management of safety issues at MFC.

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.

EA used Criterion 5 of Objective 1 and the criteria of Objective 3 of EA Criteria and Review Approach Document 30-01, Revision 1, *Contractor Assurance System* (CAS), February 15, 2018, to assess the flowdown and implementation of issues management requirements from DOE directives and the invoked national consensus standards.

EA examined key documents, such as procedures, quality assurance program descriptions, internal and external assessments, emergency exercise and event after-action reports, and 557 condition reports (identified by "CO" numbers) on issues, extent-of-condition reviews, causal analyses, corrective action plans, and effectiveness reviews. The reviewed issues included: (1) those BEA identified that could have a "highly significant" impact on safety, (2) a sample of issues BEA identified as having a less-significant impact on safety, and (3) conditions that BEA screened (transferred) to other management systems for consideration/resolution (e.g., "suggestions"). These reviews enabled EA to determine whether issues impacting nuclear safety, hazardous energy control, and emergency management are adequately identified, screened, and corrected, using a graded approach, to prevent recurrence.

EA interviewed BEA personnel responsible for individual issues and for implementation of the BEA issues management processes, as well as DOE field office managers and subject matter experts (SMEs) responsible for overseeing BEA's issues management and nuclear engineering, safety bases, criticality safety, reactor operations, CONOPS, hazardous energy control, and emergency management programs. In addition, EA assessment team members attended teleconferences that BEA used to: (1) review the categorization of issues; (2) review the status of corrective actions for issues; and (3) identify and discuss the status of efforts to correct trends impacting INL's mission at MFC.

The members of the EA assessment team, Quality Review Board, and management responsible for this assessment are listed in appendix A. EA's comments on individual issues are in appendix B.

There were no previous findings for follow-up addressed during this assessment.

3.0 RESULTS

In this section, results are grouped into the following functions for issues management: issue identification and categorization, issue resolution (including evaluations of the effectiveness of actions), and timeliness of actions and closure of issues.

3.1 Issue Identification and Categorization

The objective of this portion of the assessment was to examine whether issues and trends are identified and properly categorized to meet the requirements for issues management as described in BEA PDD-13000, *Quality Assurance Program Description*. For issues management, the BEA quality assurance program commits to DOE requirements and the American Society of Mechanical Engineers consensus standard Nuclear Quality Assurance (NQA)-1-2008 (with the NQA-1a-2009 addenda) and NQA-1-2017, *Quality Assurance Requirements for Nuclear Facility Applications*. These commitments are implemented per BEA LST-1118, *Quality Assurance Program Requirements Mapping*, and LWP-13840, *Issues Management*, using the definitions in LST-13030, *Quality Assurance Program Definitions and Acronyms*.

3.1.1 Issue Identification

BEA initiates and manages approximately 2,500 issues per year, approximately 1,000 of which apply to MFC, indicating an overall willingness to identify and enter issues into the BEA software suite, LabWay, as required by LWP-13840. Employees at all levels of the BEA organization identify issues at MFC, primarily during routine activities. BEA MFC managers stated that they routinely encourage employees to identify issues during daily interactions. The BEA emergency response organizations share issues identified during drills, facility walkdowns, management observations, internal assessments, exercises, and actual events via a quarterly newsletter, which also provides lessons learned, emergency response training or required reading, and relevant emergency management information. However, some issues are not being entered into LabWay as condition reports as required by LWP-13840 to ensure their resolution. Specifically:

- Sixty-two faults in the non-credited central control system of the Neutron Radiography Reactor (NRAD) (four of which resulted in reactor scrams) were not entered into LabWay, allowing deficiencies in this reactor control system to persist without being managed (resolved) per LWP-13840 and potentially impact performance of NRAD's mission. (See Nuclear Operations COs 2016-1812, 2016-1837, 2017-0202, and 2017-0207 in appendix B and **Deficiency D-BEA-1**.)

- The BEA emergency response organization did not enter condition reports for approximately 70 issues identified in its annual assessment reports, exercises, and event reports. These issues include personnel not following communication procedures, impacting emergency response; deficiencies in sirens, radios, and workstations impacting communications; and employees violating directions to take shelter during an actual event and to not take and post pictures on social media without authorization. Instead, general actions (GAs) were assigned to improve performance. Per LWP-13840, such issues (e.g., non-compliances and deficiencies) are to be managed with condition reports to ensure application of the rigor required to correct them. (See Emergency Management Assessments (ASMTs) 2019-0058, 2019-0096, 2019-0390, 2019-0621, 2020-0001, 2020-0608, and 2021-0180 and CO 2021-0915 in appendix B and **Deficiency D-BEA-2**.)

- Approximately half of the 89 observations in ASMT-2020-0156, *MFC DOE-STD-1070-94/DOE O 426.2 Objectives 1 – 8*, were incorrectly classified as suggestions (SGs), contrary to LWP-13840. As SGs, the associated non-compliances were incorrectly managed as optional improvement initiatives instead of issues that required corrective actions. (See CONOPS COs for ASMT-2020-0156 in appendix B and **Deficiency D-BEA-3**.)

  The following BEA documents may be contributing to the misclassification of issues as SGs in ASMT-2020-0156:

  - SGs are not defined in LST-13030 or section 6 of LWP-13730, *Performing Assessments and Assurance Activities*, to clearly distinguish them from issues requiring a CO per LWP-13840.

  - LWP-13730 repeatedly directs BEA assessment personnel to ensure that COs and SGs "are processed properly into the Issues Management process." However, SGs are not part of the LWP-13840 issues management process.

An important mechanism for identifying safety issues is the evaluation of performance information for discernable trends. BEA functional area leads for electrical safety and the lockout/tagout (LOTO) process analyze performance information (safety issues) and identify trends in their annual performance reviews and assessment reports but leads for the other functional areas assessed do not (see **OFI-BEA-1**). The MFC five-year operations management improvement (OMI) strategy effectively summarizes "the continuous improvement actions needed to improve effectiveness and efficiency of MFC's management systems" (i.e., to improve performance). However, EA identified that BEA has not entered several adverse trends (i.e., issues), including some identified in the OMI strategy as improvement initiatives, into LabWay as issues as required for "trend analysis" per DOE Order 226.1A, *Implementation of Department of Energy Oversight Policy*, as implemented at INL via LRD-13015, *Contractor Assurance System*, allowing adverse trends to persist. (See **Finding F-BEA-1**.) For example:

- The OMI strategy "describes the past and present state of [safety basis] implementation at MFC and provides suggestions for continued improvement." Also, per CO 2020-0764, BEA reviewed three technical safety requirement (TSR) violations associated with the implementation of criticality safety controls and took corrective actions. However, BEA has no other condition report in LabWay with corrective actions for the broader, ongoing adverse trend in violations of TSRs in facilities' safety bases. As discussed further in section 3.2, BEA's management of suggestions and improvement initiatives by means of GAs does not meet the DOE and NQA-1 requirements for ensuring issue resolution.

  Condition reports on specific TSR violations indicative of this adverse trend include COs 2019-2288, 2019-2435, 2020-0216, and 2021-0905, which reported failures in meeting credited criticality safety controls. COs 2020-0880 and 2020-0927 reported that other surveillance requirements (not associated with criticality safety) were not performed; for example, CO 2020-0880 reported that

surveillances had not been performed for 2.5 years for frequent radioactive material moves. Additionally, COs 2020-0950 and 2020-1763 reported that surveillance requirements had not been documented as required. (See CONOPS COs 2019-2288, 2019-2435, 2020-0216, 2021-0905, 2020-0880, 2020-0927, 2020-0950, 2020-1507, and 2020-1763 and Nuclear Operations CO 2020-0764 in appendix B and **Deficiency D-BEA-4** for additional details.) Not identifying and resolving this trend allows systemic weaknesses in TSR implementation to remain uncorrected, reducing the layers of defense against potential nuclear safety events.

- BEA noted configuration management was problematic six years ago and, as discussed in the OMI strategy, developed PLN-4656, *MFC Configuration Management Program Implementation Plan*, "to update or create (where none existed) essential drawings for the various facilities." Despite the actions set out in PLN-4656, BEA has continued to document numerous problems in configuration management at MFC since October 1, 2019. BEA does not have a condition report identifying this ongoing adverse trend in configuration management to ensure its resolution. (See COs 2019-2706, 2020-0558, 2020-1283, 2020-1521, 2021-0323, 2021-0383, 2021-0681, 2021-0766, 2021-0824, 2021-1072, 2021-1115, 2021-1132, and 2021-1438 in LabWay and **Deficiency D-BEA-5**.) Not identifying and resolving this trend allows systemic weaknesses in configuration management to persist that, if left uncorrected, can allow the configuration of credited structures, systems, and components (SSCs) to diverge from that required by a facility's safety basis for nuclear safety.

- Several items in LabWay document issues in drill or exercise conduct and control (i.e., GAs 2019-0837, 2019-0838, 2019-1038, 2019-1043, 2019-1640, 2020-0768, 2020-0896, and CO 2021-0915). However, the BEA emergency response organizations have not identified this adverse trend in performance or taken action to prevent additional drill or exercise issues attributable to inadequate planning, conduct, and control at the site or facility level. (See Emergency Management ASMTs 2019-0058, 2019-0096, 2020-0001, 2020-0608, 2021-0180 and CO 2021-0915 in appendix B and **Deficiency D-BEA-6**.) Not identifying and resolving this trend in drill and exercise conduct can, if uncorrected, degrade BEA's readiness for actual emergencies.

- In calendar year 2020, BEA issued six condition reports on engineering performance issues affecting the quality of nuclear work, but BEA engineering managers did not identify this adverse trend or take action to reduce the high rate of quality issues attributable to engineering performance (see COs 2020-1543, 2020-0265, 2020-0267, 2020-1018, 2020-1595, and 2020-0558 in LabWay). A probable correlation exists between these issues (especially COs 2020-1543 and 2020-1595) and broad performance issues in BEA's implementation of PDD-147, *MFC Nuclear and Radiological Facility Training Program*, discussed in sections 3.1.2, 3.2, and 3.3 of this report.

- In the following areas, EA also identified developing adverse trends or less-significant recurring issues with high incidence rates for which BEA functional area leads or lower-level line management has not developed a condition report to proactively identify and resolve the causes (see **OFI-BEA-1**):

    - Tagging and labeling of equipment (see COs 2020-1302, 2020-1834, 2021-1205, 2021-1437, and 2021-1438 in LabWay)
    - Holes in glovebox gloves and gauntlets (BEA management at MFC developed CO 2022-0030 following discussions with EA on its comments in CONOPS COs 2021-0818, 2021-0765, 2021-0763, 2021-0761, 2021-0644, 2021-0608, 2021-0585, 2021-0518, 2021-0458, and 2021-0448 in appendix B)
    - Procedural compliance (see CONOPS COs 2020-0092, 2020-0376, 2020-0437, 2020-0528, 2020-0927, 2020-0950, 2020-1016, 2020-1250, 2021-0076 and 2021-0240 in appendix B)
    - Nuclear material transfers (see CONOPS COs 2020-1574, 2021-0482, and 2021-0905 in appendix B)

- Radiological controls (see CONOPS COs 2019-1772, 2020-1069, 2020-1239, and 2020-1477 in appendix B)
- Work planning and control (see CONOPS COs 2020-0437, 2021-0240, 2020-1016, 2020-1069, 2021-0076, and 2021-0495 in appendix B)
- Pre-job briefings (see CONOPS COs 2020-0866, 2020-1341, 2020-1404, 2020-1437, and 2020-1683 in appendix B)
- Electrical panel obstructions (see Hazardous Energy Control COs 2019-2540 in appendix B and COs 2020-1568, 2020-0481, 2019-2756, 2019-2707, 2019-2660, 2019-2656, 2019-2624, 2019-2579, 2019-2546 in LabWay).

The following BEA practices may be contributing to BEA's inadequate identification of trends at MFC and by the emergency response organizations:

- BEA ASMT-2017-0332, *Contractor Assurance System Management Assessment*, ASMT-2019-0633, *Effectiveness of INL Contractor Assurance System Assessment*, CO 2017-1283, and CO 2017-2097 identified overall weaknesses in the identification of trends, and inadequate actions were taken to resolve these weaknesses. For example, in 2017, the vision and expectations for trending issues were emailed to senior managers, instead of taking more enduring actions to periodically share these topics. Similarly, CO 2017-1283 specified one-time training for performance assurance personnel, which has a less-enduring effect than periodic or continuing training and does not engage other functional area leads in trend identification (see **OFI-BEA-1**). Additionally, SGs from ASMT-2019-0633 to improve trending (i.e., SG 2019-0831, SG 2019-0836, and SG 2019-0837) have not been acknowledged by the BEA Performance Assurance Integration Lead since October 2019.

- Trend analysts in the BEA Performance Assurance group analyze condition reports for statistical variations across INL, not trends specifically within MFC. BEA does not assign trend analyst(s) to assist functional area leads and line management at MFC in identifying trends. Approximately 40% of BEA's identified issues are at MFC.

- During interviews, BEA managers said that trending of issues at MFC is limited to "cognitive trending" by MFC managers attending the MFC Management Review Meetings (MRMs). None of the line organizations (e.g., engineering, operations, maintenance) have assigned individuals the role for identifying trends.

- BEA's GDE-574, *Trend Coding and Analysis Guide*, has not been updated to provide guidance on event codes that BEA developed in 2017 to improve its trending.

- GDE-574 has a single program code for emergency management issues, so all emergency management issues are grouped (binned) together. Use of a single program code complicates the identification of trends in emergency management issues in specific areas (e.g., event notification, communications, and drill control). (See **OFI-BEA-2**.)

- The three BEA emergency management annual assessments that EA reviewed did not analyze entries in LabWay for trends.

- The latest revision of LWP-13840 deleted steps requiring adverse trends to be entered into LabWay as condition reports. In an interview, the BEA Issues Management and Process Safety Program Manager confirmed that adverse trends are issues, and that issues (including adverse trends) are required to be entered into LabWay as condition reports, despite the changes in the latest revision of LWP-13840. Additionally, GDE-574 states "If a Potential or Adverse Trend is identified, then initiate a Condition (CO) in LabWay."

- The Performance Improvement Working Group that BEA formed in February 2021 to improve its trending of MFC issues is still in its infancy. This group has been focused on developing a systematic approach for prioritizing mission risks discussed during MFC MRMs and has not attempted to improve processes for identifying trends.

3.1.2 Issue Categorization

Per LWP-13840, an issue screening team (or individual) assigns a significance level and a condition owner to valid issues in LabWay, which do not include duplicates and maintenance work orders that are tracked via another approved system. For emergency management issues, a screening team reviews issues identified during INL drills, exercises, self-assessments, or actual events, and assigns the significance level. At MFC, a performance assurance analyst screens issues daily, with the expectation in LWP-13840 that this analyst will engage "appropriate management and [SMEs] to evaluate, determine, and defend categorization decisions" as needed. Additionally, the MFC Corrective Action Review Board (CARB) reviews the assigned category for issues screened each month. The significance levels are Category A though Category D. Category A comprises highly significant issues, and Category D includes issues with "negligible-to-minimal risk or consequence" that are entered into LabWay for trending. LWP-13840 specifies more rigor for evaluating issues of greater significance and validating the effectiveness of corrective actions. For example, root cause analyses, extent-of-condition reviews, corrective actions to prevent recurrence, and effectiveness reviews are required for Category A issues.

BEA adequately categorizes most issues at MFC and most emergency management issues "based on significance and risk" as required by the graded approach of PDD-13000. For the 2,043 MFC condition reports entered into LabWay since October 1, 2019, BEA categorized 0.1% (3 out of 2,043) as Category A, 0.7% (14) as Category B, 71.9% (1469) as Category C, and 27.2% (555) as Category D. For the 46 condition reports on emergency management, BEA categorized none as Category A, 2% (1 out of 46) as Category B, 50% (23) as Category C, and 37% (17) as Category D. However, as discussed below, BEA under-categorized approximately 17% (86) of the 511 MFC condition reports reviewed and approximately 28% (13) of the 46 condition reports on emergency management. (See **Finding F-BEA-2**.) The rigor required to ensure that issues are adequately analyzed and corrected is not applied to issues that are under-categorized, often allowing the issues and/or their causes to persist.

- Numerous non-compliances and broad performance issues indicative of highly significant weaknesses in BEA's implementation of the "Systematic Approach to Training" in DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, as invoked by PDD-147, were under-categorized.

    - BEA ASMT-2020-0156 identified 44 non-compliances (findings) with the requirements of PDD-147 that are intended to ensure that personnel who perform nuclear work are appropriately trained and qualified. Despite the potential impact on nuclear safety due to inadequately trained and/or unqualified workers, these 44 findings were incorrectly categorized as issues with "negligible-to-minimal risk or consequence" for which "no corrective actions are required" – that is, they were screened as Category D issues, which is the lowest level defined in LWP-13840. However, non-compliances with these requirements are conditions adverse to quality that NQA-1 requires to be corrected, and PDD-13000 specifies that conditions adverse to quality are Category B or C issues. (See Nuclear Engineering CO 2020-0662 and CONOPS COs for ASMT-2020-0156 in appendix B.)

    - BEA ASMT-2020-0156 identified "that the following four [broad performance] issues contributed to the overall achievement rating [of Marginally Effective]: Missing Training Records, Outdated Job Analysis and/or Qualification Checklists, Weak Continuing Training

Programs, and a Weak Training Assessment Program." These four broad issues indicate highly significant weaknesses in the implementation of PDD-147 that meet the criterion in appendix D of LWP-13840 for a Category A issue (i.e., "a significant condition adverse to quality…that if uncorrected, could have a highly significant effect on safety or operability"). In May 2020, CO 2020-0765 was entered into LabWay to "evaluate the need for additional actions to address broader training performance issues that may not be resolved by fixing individual training issues" (i.e., the 44 findings in ASMT-2020-0156 discussed above).

However, CO 2020-0765 was incorrectly screened as a Category C issue. LWP-13840 does not require a causal analysis for a Category C issue, so none was performed for CO 2020-0765 to determine the cause(s) of the broad performance issues, and no additional corrective actions were developed to manage (resolve) these weaknesses in the implementation of PDD-147. Per the criteria in appendix D of LWP-13840, CO 2020-0765 should have been screened as a Category A issue to meet the NQA-1 requirements for determining the cause(s) and actions to preclude recurrence of these significant conditions adverse to quality. (See CONOPS CO 2020-0765 in appendix B.)

In response to a written notification from EA management discussed in section 3.2, in December 2021, BEA entered CO 2021-1941 to address the potential for unqualified workers performing nuclear work at MFC; this condition report was appropriately screened as Category A. In January 2022, BEA management recategorized CO 2021-1941 from a Category A to a Category B issue based on immediate actions taken by BEA and stated that BEA would "Conduct an apparent cause analysis (using the graded approach/checklist) focused on how the MFC training organization and MFC CARB did not identify and resolve delays in response to the 2020 training assessment" (i.e., ASMT-2020-0156). BEA did not reopen and recategorize CO 2020-0765 as a Category A issue, enter another condition report in LabWay, or commit as part of CO 2021-1941 to determine the causes and corrective actions for the broad performance issues identified in ASMT-2020-0156 that if uncorrected, could have a highly significant effect on safety or operability. (See **Finding F-BEA-3**.)

Weaknesses in the management of the non-compliances and broad performance issues discussed above are discussed in sections 3.2 and 3.3.

- Multiple failures of the same credited fire alarm system reported by COs 2019-1410, 2020-1124, and 2020-1713 were under-categorized as Category C issues for which causal analyses and extent-of-condition reviews are not required, and none were performed. However, per DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information*, facility managers are responsible for determining the causes and generic implications (i.e., the extent-of-condition) for reportable occurrences. Other examples of reportable events that were under-categorized as Category C issues are discussed in COs 2020-0818, 2020-0586, 2020-0201, 2020-1201, 2020-1717, and 2020-0938 in LabWay.

- Seven condition reports documenting scrams at NRAD due to faults in the non-credited central control system were screened as Category C issues, contrary to LST-13030. Specifically, the definition of "significant conditions" in LST-13030 includes "An unplanned event or failure of an SSC that led or could have led to a reactor trip or facility transient." Since scrams are reactor trips, these faults are significant conditions and Category A issues per LST-13030. (See Nuclear Operations COs 2016-1812, 2016-1837, 2017-0202, 2017-0207, 2019-0016, 2020-0955, and 2020-1556 in appendix B.)

- CO 2020-0125, regarding personnel exposure to a 480V uninsulated source while cutting conduit, was screened as a Category C issue despite the potential major impact to personnel safety and

contrary to the criteria in LWP-13840. Two other condition reports documenting the cutting of energized 480V conductors were appropriately screened as Category B issues.

- Per MFC-ADM-007, *MFC Protocol for Generating and Internalizing Lessons Learned*, a significant lesson learned (SLL) "is typically generated when repetitive or similar events occur at MFC within a short period of time, typically within a 6- to 12-month timeframe." Significant, adverse trends in performance that BEA MFC managers identified as SLLs were incorrectly screened as Category D issues. Per LWP-13840, issues are screened to Category D for trending, not for resolving adverse trends that commonly warrant an analysis to determine the cause(s) of the trend. (See CONOPS COs 2020-1477, 2020-1549, 2020-1725, 2021-0243, and 2021-1067 in appendix B.)

- Contrary to LWP-13840, the BEA emergency response organizations did not assign significance levels for five condition reports. (See Emergency Management COs 2019-0075, 2019-1897, 2019-2752, 2019-2753, and 2019-2755 in appendix B.)

- Additional examples of under-categorized issues are included in the EA comments in appendix B. (See Nuclear Engineering COs 2020-1018, 2021-0952, and 2021-1115; CONOPS COs 2020-0950, 2020-1250, 2020-1542, 2020-1543, 2020-1544, 2020-1683, and 2021-0220; Nuclear Operations CO 2019-1219; Hazardous Energy Control COs 2019-2291, 2019-2520, 2020-0695, 2020-0698, 2020-0701, 2020-0703, 2020-0544, 2020-1568, and 2020-1778; and Emergency Management COs 2019-2019, 2019-2330, 2019-2751, 2019-2466, 2021-0742, 2021-0743, and 2021-0744.)

The following BEA practices may be contributing to BEA's under-categorization of issues at MFC:

- Issues at MFC are screened (categorized) by a performance assurance analyst rather than a team that includes SMEs, such as functional area leads and representatives from Operations. (See **OFI-BEA-3**)

- The specific "significant conditions" set out in LST-13030 for Category A issues differ from the screening criteria in appendix D of LWP-13840. For example, LST-13030 defines "An unplanned event or failure of an SSC that led or could have led to a reactor trip or facility transient" as a Category A "significant issue," while LWP-13840 does not specifically discuss reactor trips but allows equipment issues that could lead to partial shutdown, delays, or research impacts to be screened as Category C issues.

- The criteria in appendix D of LWP-13840 provide guidance on how to screen (categorize) events that are required to be reported to DOE per DOE Order 232.2A, but Section 4.8 of LWP-13840 provides instructions on how to manage a reportable event as a Category C issue. LWP-13840 does not require determination of causes or generic implications for Category C issues. However, per DOE Order 232.2A, facility managers are responsible for determining the causes and generic implications for reportable occurrences. (See **Deficiency D-BEA-7**.) Not ensuring clear flowdown of DOE Order 232.2A requirements into LWP-13840 increases the likelihood that the causes and generic implications (i.e., the extent of the condition) of reportable events will persist.

Issue Identification and Categorization Conclusions

Overall, BEA employees demonstrate a willingness to identify and enter issues into LabWay. However, BEA personnel did not enter 62 recurring faults in the central control system of NRAD and approximately 70 emergency management issues into LabWay as issues. Previous BEA actions to resolve weaknesses in the identification of trends were inadequate, and several adverse trends at MFC are being managed as improvement initiatives rather than as issues for which LWP-13840 requires application of more rigor to ensure resolution.

Overall, BEA is adequately implementing a graded approach for emergency management issues and issues at MFC by categorizing most issues in accordance with PDD-13000. However, approximately 17% of the MFC condition reports reviewed and approximately 28% of the condition reports on emergency management were either not categorized or under-categorized, largely because conditions adverse to quality were under-categorized as Category D issues and condition reports on emergency management were not categorized.

3.2 Issue Resolution

The objective of this portion of the assessment was to verify that the issues management system includes structured processes, using a graded approach based on risk, for identifying the causes, extent, and corrective actions for issues and for reviewing the effectiveness of actions taken to ensure that issues are resolved.

LWP-13840 adequately sets minimum requirements for analyzing and resolving issues based on the assigned category. For example, Category A issues require root cause analyses, extent-of-condition reviews, corrective actions, and effectiveness reviews. Category B issues require apparent cause analyses, extent-of-condition reviews, and documentation of corrective action completion. Category C issues require descriptions of corrective actions taken or closure documentation. Category D issues have "negligible-to-minimal risk or consequence," are entered into LabWay for trending, and do not require any corrective action by the condition owner.

Per CTR-334, *INL Corrective Action Review Boards*, a board composed of BEA MFC managers "will gain assurance that the appropriate causes have been identified, extent-of-condition measures are adequate, and that corrective actions will mitigate or prevent recurrence" for issues with root or apparent cause analyses (typically, Category A and B issues). Although the MFC CARB did not review a causal analysis during this EA assessment, CARB members did thoroughly review the status of ongoing actions, including verifying the adequacy (e.g., continued implementation) of compensatory actions for issues with delayed corrective actions. (**Best Practice**)

Resolution of Training and Qualification Issues

Contrary to DOE Order 426.2, PDD-147, and NQA-1, BEA has not adequately managed the non-compliances and broad performance issues in implementation of the training and qualification program at MFC identified by BEA ASMT-2020-0156 (see **Finding F-BEA-3**).

During this assessment, the EA team found that BEA personnel (welders, pipefitters, fissionable material handlers, reactor operators, supervisors, engineers, and managers, including those certified by BEA management per DOE Order 426.2) had been allowed to continue to perform nuclear work for 18 months despite the numerous non-compliances and broad performance issues identified in ASMT-2020-0156 which question the adequacy of the qualifications and continuing training required of workers to maintain their qualifications. Per DOE Order 227.1A, the EA Director of Environmental, Safety, and Health Assessments provided the DOE-ID Manager on December 3, 2021, written notification of this "condition that presents an unacceptable immediate risk to workers, public health, or the environment" identifying the following associated with BEA's initial response to ASMT-2020-0156:

- Compensatory measures (e.g., suspending qualifications) were not identified and implemented for the personnel with the qualifications in question.

- The impact of work being performed by potentially unqualified personnel on the MFC facilities' safety bases was not evaluated.

- BEA did not determine the causes or develop a corrective action plan for the non-compliances with PDD-147 and the broad performance issues identified in ASMT-2020-0156.

The DOE-ID manager agreed the issues identified by BEA in ASMT-2020-0156 "warrant additional reviews and corrective actions but [disagreed] that this [condition] presents an unacceptable immediate risk to workers, public health, or the environment." Concurrently, BEA paused work while immediate actions specified in CO 2021-1941 were performed to ensure that nuclear facility safety was not adversely affected and to justify resumption of operations pending resolution of issues involving the potential for unqualified personnel performing nuclear work. EA identified the following concerns related to BEA's immediate actions:

- Many of the records that BEA reviewed to verify workers' qualifications were based on BEA-established qualification requirements and continuing training that assessment ASMT-2020-0156 identified as deficient.

- Seven condition reports indicate weaknesses in the MFC training and qualification program beyond those identified by ASMT-2020-0156 or reviews performed by BEA as part of its immediate actions in CO 2021-1941 to determine the scope or extent of the weaknesses in implementing PDD-147. (See CONOPS COs 2020-1016, 2020-1542, 2020-1543, 2020-1544, 2020-1574, and 2021-0409 in appendix B and CO 2020-1595 in LabWay.)

As of January 2022, BEA had not reopened and recategorized CO 2020-0765 as a Category A issue, entered another condition report in LabWay, or committed as part of CO 2021-1941 to determine the causes and corrective actions for the broad performance issues identified in ASMT-2020-0156.

Critiques and Fact Findings for Abnormal Events

EA observed that critiques and fact findings (the initial investigations of abnormal operational events) at MFC were generally adequate in notifying and engaging cognizant personnel. Additionally, documentation in condition reports for electrical safety and LOTO issues demonstrated that BEA generally conducts effective critiques and fact findings. Critiques and fact findings, which are not required for Category C issues, were conducted for all Category B and all but two Category C LOTO and electrical exposure incidents at MFC. However, contrary to LWP-13840, step 4.4.5.1 and appendix C, the appropriate SMEs – Authorities Having Jurisdiction (AHJs) per National Fire Protection Association (NFPA) codes 70®, *National Electrical Code*®, and 70E®, *Standard for Electrical Safety in the Workplace*® – who are needed to help reconstruct and understand the event were not included in critiques and fact findings for four of 12 electrical safety issues involving exposure to energized electrical components at MFC. (See Hazardous Energy Control COs 2021-1770, 2021-1427, 2020-1907, and 2019-1776 in appendix B, **Deficiency D-BEA-8**, and **OFI-BEA-4**.)

Causal Analysis

BEA performed root cause analyses for the three Category A issues identified since October 1, 2019, and elected to perform a root cause analysis for CO 2020-1095, a Category B issue. The analyses for COs 2019-1772 and 2019-0196 identified root causes, enabling BEA to develop corrective actions to prevent recurrence. However, contrary to LWP-13840 and NQA-1, the analyses for COs 2020-0866 and 2020-1095 did not address all the problems or their causes, leading to the small, depleted uranium fire in the Fuel Conditioning Facility (FCF) and to personnel drilling into a live 480V conductor, respectively. (See CONOPS COs 2019-1772, 2019-0196, and 2020-0866 and Hazardous Energy Control CO 2020-1095 in appendix B, and **Deficiency D-BEA-9**.) These incomplete causal analyses limit the effectiveness of the

corresponding extent-of-cause evaluations and corrective actions, allowing some of the causes of these nuclear and personnel safety issues to persist.

Corrective Actions

Per LWP-13840, corrective actions "rectify" issues, while GAs are "Routine or general task assignments used to close Category D conditions, or other tasks/actions used to support higher category conditions." Appendix F of LWP-13840 "outlines the expectations for documentation used to document/demonstrate that a corrective action has been correctly completed" (i.e., has corrected the issue). LWP-13840 provides no expectations or requirements for GAs. Additionally, the BEA issues management index (metrics) monitors the timeliness of corrective actions, but not GAs. Contrary to LWP-13840, actions to correct or "rectify" emergency management issues and issues at MFC are often entered into LabWay as GAs instead of corrective actions, so the actions needed to "rectify" issues are inadequately managed and may be considered optional. (See **Finding F-BEA-4**.) For example:

- Actions established in the spring of 2020 to resolve 44 findings (non-compliances) in ASMT-2020-0156 were incorrectly designated GAs (see CONOPS COs for ASMT-2020-0156 in appendix B).

- Actions in the OMI strategy addressing adverse trends (issues) are GAs (e.g., see CONOPS CO 2020-1507 in appendix B).

- Approximately 55% (70 of 139) of the GAs assigned to the BEA emergency response organizations are required to be corrective actions per LWP-13840 (see Emergency Management COs 2019-1607, 2019-2019, 2019-2751 through 2755, and 2020-0938; and ASMTs 2019-0057, 2019-0058, 2019-0096, 2019-0390, 2019-0621, and 2019-0256 in appendix B).

- The actions BEA managers established for all five SLLs that were developed were incorrectly designated GAs (see CONOPS COs 2020-1477, 2020-1549, 2020-1725, 2021-0243, and 2021-1067 in appendix B).

- Actions to revise procedures to resolve issues were changed to GAs rather than keeping the corrective actions open until the revisions were completed (see Hazardous Energy Control COs 2020-1778 and 2021-0491 in appendix B).

- Comments in appendix B for Nuclear Engineering COs 2021-0952 and 2021-1089 provide additional examples.

The under-categorization of issues discussed in section 3.1.2 may be contributing to **Finding F-BEA-4** since Category D issues can be closed with GAs. Additionally, some BEA condition owners have GAs for performing evaluations to determine what actions to take, rather than conducting a causal analysis to determine cause(s) and corrective actions. (See **OFI-BEA-5**.)

BEA managers take adequate actions to manage (resolve) most issues at MFC. For example, in addition to using the LWP-13840 processes, BEA established its Pyrophoric and Reactive Material Management Working Group to share lessons learned and monitor corrective actions addressing a trend, as well as systemic issues related to small fires from pyrophoric materials at MFC. However, inadequate action was taken to correct approximately 7% (40 of 557) of the reviewed condition reports. (See **Deficiency D-BEA-10**.) For example:

- The action to incorporate the basis for a TSR in an administrative control was closed to a suggested document change labeled as an "editorial change, typo, etc." which does not fully capture why the

change was necessary. Additionally, a deficient description of the basis of a TSR is a condition adverse to quality. NQA-1 requires conditions adverse to quality to be corrected. (See Nuclear Operations CO 2021-0415 in appendix B.)

- For some issues, condition owners generate an action to have an evaluation performed, but neglect to take follow-on action(s) to ensure that the issue is corrected. For example, for some issues, the only action is to revise a procedure based on an evaluation of that procedure embedded in the action statement. If the evaluation determines that no revision to the procedure is necessary or if no evaluation is completed, no action is taken to correct the issue. In at least one case, no evaluation was performed, and the condition report was closed with no actions taken. (See Nuclear Engineering COs 2020-0586 and 2021-0952, Nuclear Operations CO 2021-0577, CONOPS COs 2020-0437, 2021-0820, 2021-1099, and 2020-1250, and Hazardous Energy Control COs 2020-1778 and 2021-0491 in appendix B.)

- Condition owners for some issues use less-robust and/or less-enduring corrective actions, such as one-time briefings, required reading, lessons-learned reports and newsletters, rather than taking more robust and enduring actions, such as correcting training or procedures or implementing standing orders. (See CONOPS COs 2019-2284, 2020-0437, 2020-0468, 2020-1203, 2020-1341, 2020-1404, 2020-1437, 2020-1542, 2020-1543, 2020-1544, and 2020-1574 in appendix B.)

- Additional information on inadequate corrective actions taken by BEA is included in comments in appendix B. (See Nuclear Engineering COs 2019-2671 and 2020-1018; CONOPS COs 2020-0031, 2020-0092, 2020-0765, 2020-1215, 2020-1069, 2020-1763, 2021-0409, 2021-0482, 2021-0533, 2021-0617, and 2021-0726; Hazardous Energy Control COs 2021-0100, 2020-1095, and 2020-1480; and Emergency Management COs 2020-0188, 2021-0735, and 2021-0915 and GA 2019-1349 in appendix B.)

Effectiveness Reviews

LWP-13840 requires effectiveness reviews to be performed per LWP-13730. LWP-13730 provides adequate guidance and requirements to "validate whether the corrective actions adequately address associated causes and will preclude recurrence (or the likelihood of recurrence) of issues" and to perform interim effectiveness reviews "to evaluate if the corrective actions are achieving the desired outcomes… partway through the execution of a corrective action plan, rather than waiting until all actions are complete." However, BEA has performed only four effectiveness reviews, since LWP-13840 requires them only for Category A issues. Additionally, Table 1 of LWP-13840 states "No," relative to effectiveness reviews for Category B issues, whereas condition owners are specifically given the option to use other issues management tools identified in Table 1 (e.g., extent-of-condition reviews are listed as "Optional" for Category C issues). (See **OFI-BEA-6**.) Three of the four effectiveness reviews were adequate, and the other simply observed one work activity to determine the effectiveness of the corrective actions. (See CONOPS CO 2020-0866 in appendix B.)

Issue Resolution Conclusions

Overall, BEA is adequately implementing its graded, structured approach for issue resolution and taking adequate action to resolve most issues. BEA management at MFC monitors and directs, as needed, the resolution of significant issues and the overall performance of its issues management program. However, BEA managers did not adequately manage non-compliances and highly significant weaknesses that were identified in May 2020 in its implementation of PDD-147. In December 2021, BEA paused work while evaluations were performed to ensure that nuclear facility safety was not adversely affected and to justify resumption of operations pending resolution of issues involving the potential for unqualified personnel performing nuclear work. However, BEA does not have a condition report committed to determining the

causes and corrective actions for the broad performance issues, or highly significant weaknesses, in its implementation of PDD-147. Additionally, actions to correct or "rectify" emergency management issues and issues at MFC are often not entered into LabWay as corrective actions, contrary to LWP-13840. Instead, BEA condition owners have used GAs, which do not meet the rigorous requirements for ensuring issue resolution. Inadequate action was taken to correct approximately 7% of the reviewed condition reports.

3.3 Timeliness and Closure

The objective of this portion of the assessment was to verify that planned corrective actions are completed in a timely manner and that closure is adequately documented.

Timeliness of Issue Closure

The BEA issues management index (metrics) for October 2021 identifies that across BEA, 42.25% of corrective actions, excluding long-term corrective actions (LTCAs), have planned due dates exceeding the BEA goal of 180 days after discovery, whereas that percentage is 61.2% for MFC. Additionally, this index states: "The primary contributor to the improvement in the overall index for October was Cause Analysis Timeliness, which moved into the green for the first time in 3 years… The primary performance improvement opportunity continues to be timeliness of issues response." BEA appropriately segregates LTCAs (e.g., design changes to a facility and effectiveness reviews) to discount them from timeliness metrics so other action is needed to improve timeliness. (See **OFI-BEA-7**.)

Most emergency management issues and safety issues at MFC are resolved in a timely manner. However, BEA did not "develop and implement *corrective actions*…and *general actions*…in a timely manner" for approximately 8% (40 of 511) of the safety issues reviewed at MFC or approximately 13% of the emergency management issues (10 of the 46 condition reports and 14 of the 139 GAs that were reviewed) to "promptly…correct conditions" per LWP-13840 and PDD-13000, respectively. (See **Deficiency D-BEA-11**.) For example:

- Twenty-three of the findings (non-compliances) identified by ASMT-2020-0156 in May 2020 remain open more than 20 months after the assessment was issued.

- Despite actions taken per PLN-4656, resolution of several nuclear engineering issues was delayed while updating drawings to incorporate field changes and corrective actions. These delays limit the effectiveness of corrective actions and create challenges to the configuration management process. (See Nuclear Engineering COs 2019-1410, 2020-1713, and 2020-1438 in appendix B and **OFI-BEA-8**.)

- CO 2020-0227 reported a potential safety concern about gloveboxes in the Irradiated Materials Characterization Laboratory (IMCL). The issue was open for more than 584 days.

- CO 2020-0336 reported unusual pressure transients and a rise in oxygen levels in a glovebox. This issue was open for more than 564 days.

- CO 2021-0128 reported mismanagement of potentially pyrophoric samples at IMCL and was open for more than 228 days.

- The apparent cause analysis for CO 2019-2063 took 6 months, and issue closure took 13 months. The hazardous energy was isolated the day after the event.

- Additional examples of untimely resolution of safety issues provided in appendix B include: Nuclear Engineering COs 2019-2160, 2020-0593, and 2020-0662; Nuclear Operations CO 2020-0764; Hazardous Energy Control COs 2020-0529, 2020-0544, 2020-1664, 2019-2638, 2019-2291, and 2020-1175; and Emergency Management COs 2018-1276, 2019-1607, 2019-1897, 2019-2019, 2019-2037, 2019-2330, 2019-2754, 2020-0188, 2020-0363, and 2021-0915 and GAs 2019-1032, 2019-1033, 2019-1034, 2019-1038, 2019-1039, 2019-1040, 2019-1324, 2019-1325, 2019-1326, 2019-1328, 2019-1665, 2019-1667, 2019-1668, 2019-1669, 2020-0768, and 2020-0896).

Documentation of Issue Closure

Appendix F of LWP-13840 provides detailed expectations and requirements for documenting the resolution of Category A and B issues. Category C and D issues can be closed with a description of actions taken. Per LWP-13840, performance assurance personnel review documentation submitted for closure. Accordingly, the resolution of most issues is adequately documented, but more than 6% (36 of 557) of the issues reviewed had inadequate closure documentation. (See **Deficiency D-BEA-12**.) For example:

- Condition reports were closed in LabWay on a promise of future actions (e.g., issues closed, or transferred, to work orders that were not completed). Closure based on an open work request or order or a subcontractor's corrective action plan does not provide evidence that the required corrective action was accomplished. NQA-1 states: "Completion of corrective actions shall be verified." (See Nuclear Engineering CO 2020-1657, Nuclear Operations COs 2020-0118 and 2021-0415, and Hazardous Energy Control COs 2021-0491 and 2020-1471 in appendix B.)

- Condition reports were closed without critique or fact-finding reports attached. (See Hazardous Energy Control COs 2021-0491 and 2021-0854 in appendix B.)

- Additional examples are included in comments in appendix B. (See Nuclear Engineering COs 2020-0160, 2020-0586, and 2020-1018; Nuclear Operations COs 2020-1254 and 2021-0282; Hazardous Energy Control COs 2020-0125, 2020-1471, and 2020-1778; CONOPS COs 2020-1215, 2020-0468, 2020-0437, 2020-1069, 2020-1574, and 2021-0076; and Emergency Management COs 2019-0075, 2019-1897, 2019-1991, 2019-1996, 2019-2037, 2019-2330, 2019-2751, 2019-2752, 2019-2753, 2019-2755, 2020-1464, 2020-1465, 2020-1467, 2020-1620, 2020-0938, and 2021-0735.)

The following BEA practices may be contributing to inadequate closure documentation for some issues:

- The BEA emergency response organizations did not meet the DOE Order 151.1C, *Comprehensive Emergency Management System*, requirements for effectiveness reviews and verification and validation processes for corrective actions while this revision was contractually invoked at INL. Instead, the BEA emergency response organizations used the less-rigorous closure requirements of LWP-13840. Not until June 2021 did BEA transition its readiness assurance program element to the latest revision, DOE Order 151.1D, which changed the DOE requirements for effectiveness reviews and verification and validation of corrective actions for non-defense nuclear facilities at MFC to be consistent with the requirements of LWP-13840.

- Per LWP-13840, performance assurance personnel close Category C issues as the "Closure Reviewer" without requiring a review by the condition owner to verify that adequate corrective actions have been documented or described.

- Appendix F of LWP-13840 allows condition owners to "Reference the work request or work order number for the equipment repair" as evidence of corrective action closure, without specifying that the

work request or order must be completed. Open work requests and orders do not provide evidence that the work was completed or ensure that it will be completed; the work request or work order may be delayed or cancelled outside of the issues management system without assignment of other actions to correct the issue.

Timeliness and Closure Conclusions

Most emergency management issues and safety issues at MFC are resolved in a timely manner. However, BEA did not "promptly…correct conditions" for approximately 8% and 13% of the reviewed MFC and emergency management issues, respectively. Overall, adequate documentation is added to the record to support issue closure. However, more than 6% of the reviewed issues were closed with inadequate documentation despite the required reviews of closure documentation by BEA performance assurance personnel.

4.0 BEST PRACTICES

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

- BEA managers (other than the condition owners) at MFC verify the adequacy and continued implementation of compensatory actions for issues when corrective actions are delayed.

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.

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Finding F-BEA-1: BEA does not capture MFC "program and performance deficiencies (individually and collectively)" in its issues management system for trend analysis. (DOE Order 226.1A, attachment 1, paragraph 2.b.(3)(a) and LRD-13015, paragraph 3.1.2.D)

Finding F-BEA-2: BEA has not appropriately categorized some of its issues "based on significance and risk." In some cases, under-categorization of issues resulted in the issues management requirements of NQA-1 for issues, or conditions adverse to quality, affecting nuclear safety to not be met. (PDD-13000, section 6.16.1; LST-13030, section 3.0 definition of "significant condition;" LWP-13840, appendix D; and NQA-1, requirement 16)

Finding F-BEA-3: BEA has not adequately managed (resolved) non-compliances and broad issues (i.e., significant conditions adverse to quality) identified in ASMT-2020-0156 to ensure that the required "Systematic Approach to Training" is adequately

implemented and nuclear facility safety at MFC is not adversely affected. (DOE Order 426.2, PDD-147, and NQA-1, requirement 16)

Finding F-BEA-4: BEA condition owners often enter actions to correct or "rectify" issues as GAs in LabWay instead of as corrective actions as required. (LWP-13840, steps 4.7.1.2, 4.8.1.3, 4.9.4.4, and 4.10.4.4 and the definition of a "corrective action" in section 6 of LWP-13840 and LST-13030)

6.0 DEFICIENCIES

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

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Deficiency D-BEA-1: BEA personnel have not initiated condition reports in LabWay for a recurring fault in the non-credited central control system of NRAD. (LWP-13840, step 4.2.1)

Deficiency D-BEA-2: BEA emergency management personnel do not initiate condition reports in LabWay for many of the issues identified in its annual assessment reports, exercises, and event reports. (LWP-13840, step 4.2.1)

Deficiency D-BEA-3: BEA personnel incorrectly classified 44 non-compliances identified in ASMT-2020-0156 as suggestions instead of initiating condition reports in LabWay as required to resolve these non-compliances. (LWP-13730, step 4.5.4 and LWP-13840, step 4.2.1)

Deficiency D-BEA-4: BEA personnel have not initiated a condition report with corrective actions in LabWay for ongoing TSR violations at MFC. (LWP-13840, step 4.2.1 and LST-13030)

Deficiency D-BEA-5: BEA personnel have not initiated a condition report in LabWay for an adverse trend in configuration management issues at MFC. (LWP-13840, step 4.2.1)

Deficiency D-BEA-6: BEA emergency management personnel have not initiated a condition report in LabWay for an adverse trend in drill or exercise issues attributable to inadequate planning, conduct, and control at the site or facility level. (LWP-13840, step 4.2.1)

Deficiency D-BEA-7: LWP-13840 does not adequately implement the requirement in section 4.b. of attachment 1 of DOE Order 232.2A that facility managers must determine causes, generic implications, and corrective actions for reportable occurrences. Section 4.8 of LWP-13840 provides direction for managing reportable occurrences as Category C issues, a category for which none of these are required. (DOE Order 232.2A, attachment 1, section 4.b)

Deficiency D-BEA-8: BEA did not include the appropriate SMEs (NFPA 70® and NFPA 70E® AHJs) in critiques and fact-finding investigations at MFC to help reconstruct

and understand hazardous energy control issues. (LWP-13840, steps 4.4.4.1 and 4.4.5.1)

Deficiency D-BEA-9: BEA did not identify all the problems (or their causes and corrective actions) that led to the small, depleted-uranium fire in FCF (CO 2020-0866) and to personnel drilling into a live 480V conductor (CO 2020-1095), allowing some of the causes of these nuclear and personnel safety issues to persist. (LWP-13840, steps 4.9.2.1 and 4.10.2.1 and NQA-1, requirement 16)

Deficiency D-BEA-10: Some actions entered by BEA condition owners do not adequately correct or "rectify" issues. (LWP-13840, steps 4.7.1.2, 4.8.1.3, 4.9.4.4, and 4.10.4.4)

Deficiency D-BEA-11: BEA condition owners did not "develop and implement *corrective actions* …and *general actions*…in a timely manner" for some safety issues to "promptly…correct conditions." (LWP-13840, appendix A; PDD-13000, section 6.16; and NQA-1, requirement 16)

Deficiency D-BEA-12: BEA closed some condition reports that did not meet BEA's documentation requirements for closure. (LWP-13840, appendix F and NQA-1, requirement 16)

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified eight 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-BEA-1: Consider increasing the role of functional area leads in assessing performance and identifying trends, improvements, and corrective actions (e.g., having functional area leads annually assess overall performance, monitor condition reports for trends, and periodically report key performance metrics).

OFI-BEA-2: Consider redefining the program code for emergency management to provide multiple codes (bins) for trending.

OFI-BEA-3: Consider expanding the screening "team" at MFC to include leads (or representatives) from Operations and functional areas providing safety.

OFI-BEA-4: Consider involving NFPA 70® and 70E® AHJs in issue screening (categorization), causal analyses, corrective action development, and closure review of hazardous energy control and electrical safety issues to ensure technical accuracy and improve electrical safety.

OFI-BEA-5: Consider disallowing the use of GAs and/or SGs in LWP-13840.

OFI-BEA-6: Consider revising LWP-13840 to require the condition owner of Category B issues to consider performing an effectiveness review and one or more interim effectiveness reviews for issues with LTCAs or corrective actions that are delayed. LWP-13840 currently requires interim assessments and effectiveness reviews only for Category A issues.

OFI-BEA-7: Consider revising LWP-13840 to require the condition owner's manager to approve corrective action due dates (including due dates for LTCAs and extensions) greater than the BEA goal of 180 days.

OFI-BEA-8: Consider developing performance metrics and goals for updating drawings to improve the management (timeliness) of condition report and corrective action closure and to limit challenges to the configuration management process.

Appendix A
Supplemental Information

Dates of Assessment

Remote Assessment: September 2021 – January 2022

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
Kevin M. Witt, Director, Office of Nuclear Safety and Environmental Assessments
Charles C. Kreager, Director, Office of Worker Safety and Health Assessments
Jack E. Winston, Director, Office of Emergency Management Assessments
Joseph J. Waring, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
Kevin G. Kilp, Chair
Charles C. Kreager
Robert J. Hailstone
Michael A. Kilpatrick

EA Site Lead for Idaho National Laboratory

Ronald G. Bostic

EA Assessors

Joseph E. Probst – Lead
Sarah C. R. Gately
Thomas M. Wirgau
Terrance Jackson
Charles R. Allen
Frank A. Inzirillo
Daryl D. Magers
Robert (Tony) A. Hass

Appendix B
Comments on Individual Condition Reports and General Actions

An assessment team from the U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted a detailed review of 557 condition reports (COs): reviewing 156 nuclear engineering issues, 90 nuclear operations issues (i.e., safety basis, criticality safety, and reactor operations issues), 93 hazardous energy control issues, 172 conduct of operations (CONOPS) issues, and all 46 COs entered for emergency management issues. EA comments on individual issues are documented in this appendix. The significance level assigned by Battelle Energy Alliance, LLC (BEA) for each CO is in parentheses and precedes the comment(s). The significance levels are Category A through Category D, with Category A assigned for significant issues and Category D for issues with "negligible-to-minimal risk or consequence" entered into LabWay for trending.

Note: LWP-13840, *Issues Management*, sets out BEA's requirements for timeliness of issue closure, categorization of issues, and the function of COs and corrective actions (CAs) in ensuring that issues are addressed. EA's comments on timeliness, categorization/screening, and identification of COs and CAs are based on the PDD-13000, *Quality Assurance Program Description*, and LWP-13840 requirements and LST-13030, *Quality Assurance Program Definitions and Acronyms*.

Nuclear Engineering COs	
CO Number	Comment
2019-1410	(Category C) This item documented loss of power to a fire alarm panel that resulted in subsequent failure of several other panels. This event recurred two other times (see COs 2020-1124 and 2020-1713 in LabWay). Although the power loss and subsequent additional failures were not predicted as a result of ongoing maintenance activities, this event was not reported as required by DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information* (ORPS). The two recurrences were. This CO remains open more than two years later, representing a timeliness issue. No causal analysis was documented.
2020-1124	(Category C) See 2019-1410 above. This event was reported per DOE Order 232.2A but was screened as a Category C issue. No causal analysis was performed as required by DOE Order 232.2A.
2020-1713	(Category C) See 2019-1410 above. This event was reported per DOE Order 232.2A but was screened as a Category C issue. No causal analysis was performed as required by DOE Order 232.2A. This CO remains open, representing a timeliness issue.
2019-2671	(Category D) A bolt could not be tightened on a radioactive material container. An extent-of-condition review indicated that similar conditions existed on 56 containers. An evaluation was performed to justify use of the containers with some bolts not tightened, but no CAs were planned or taken to correct the problem bolts.
2020-0160	(Category C) An inadequacy was identified in a calculation supporting a safety analysis report (SAR). Following questions by EA regarding the adequacy of the potential inadequate safety analysis (PISA) Reasonability Form attached to the CO, BEA discovered that portions of the form had been deleted in the attached copy. BEA generated CO 2021-1958 in LabWay to document this issue.
2020-0586	(Category C) Signal loss between a fire alarm panel and the fire alarm center occurred on two occasions. CA 2020-0621 states that an evaluation was performed as documented in an attached email. However, no evaluation is attached, and no evidence of any evaluation was found. This CO was closed with no further actions.

2020-0593	(Category C) This item reported that procedure LWP-6500 contains information that is no longer valid and requires updating. The single CA remains open 18 months after it was identified, representing a timeliness issue. This CA is designated as a long-term corrective action (LTCA), with no justification meeting the criteria for LTCAs.
2020-0662	(Category D) Training records could not be found for 30% of Materials and Fuels Complex (MFC) Engineering personnel. This item remains open 18 months after the initial identification and is part of the larger training deficiencies identified in this report. It reflects compliance issues with DOE training requirements, as well as timeliness and categorization issues.
2021-1115	(Category C) Document Control is making minor changes to engineering documents after they are signed and, in some cases, stamped by a Certified Professional Engineer (PE). This CO documents that some actions by Document Control violate Idaho state law for PE certification of engineering documents. No CAs had been identified more than three months after initiation. This is an issue in record integrity and is under-categorized.
2019-2160	(Category C) Add signs on new manholes. CA 2019-1312 lacks sufficient evidence or description that the proposed CA was accomplished. CA 2019-1311 remains open two years after initiation, representing a timeliness issue.
2020-1438	(Category C) Guidance is needed for updating electrical drawings to show how outlets are supplied power. This CO was not designated as an LTCA and was not resolved in a timely manner; it was more than 13 months old during the EA assessment.
2020-1018	(Category C) Inadequate overpressure protection resulted from failure to follow the modification control procedure. Several facilities were affected. Findings from extent-of-condition reviews were not adequately addressed for some facilities. Inadequate documentation was provided to validate completion of CAs. Given the significance of this issue and the breadth of the problem, it should have been screened as a Category B issue per LWP-13840.
2020-1657	(Category C) This item reported that storage cabinets needed to be anchored to keep them from tipping over and blocking exits in a seismic event. Contrary to LWP-13840, this CO was closed, or transferred, to an open work order request (i.e., a promise of future work).
2021-0952	(Category D) The Irradiated Materials Characterization Laboratory's (IMCLs) main high efficiency particulate air (HEPA) filter bank is not anchored to the floor as required. The CA called for an engineering evaluation. This issue is under-categorized, since PDD-13000 requires a condition adverse to quality to be at least a Category C issue.
2021-1089	(Category D) Need to evaluate rod up/down limits per the system design description. This issue inappropriately designated an action to "rectify the issue" as a general action (GA) instead of a CA as required by LWP-13840.

Nuclear Operations COs	
CO Number	Comment
2021-0415	(Category C) This item reported that the bases for two limiting conditions for operation (LCOs) in technical safety requirement (TSR)-404 incorrectly described the requirements in Administrative Control 5.404.1. This item was closed, or transferred, to an approved suggestion to revise TSR-404 labeled as an "editorial change, typo, etc.," which does not fully capture why the change was necessary (i.e., to correct the description). LWP-13840 requires Category C issues to be corrected before being closed. Suggestions are not part of the issue resolution process in LWP-13840.
2020-0118	(Category C) This item reported that the Fuel Conditioning Facility's (FCFs) argon cell ram seals were degraded, resulting in increased accumulator cycle time; however, the leak rate was significantly below the limit for operability. The operability determination concluded that the system was operable but degraded. No CA was created. Instead, a maintenance work request was entered, and the CO was closed on the basis of an open work request, contrary to appendix F of LWP-13840.
2020-0764	(Category C) This item was a rollup review of the three TSR violations resulting from implementation and execution problems in criticality controls. Of the ten CAs identified in the CO, one of them, CA 2020-0485, to revise Nuclear Facility Manager training, had been open for more than 18 months at the time of the assessment and had been extended four times. This is both a timeliness issue and a training issue.
2019-1219	(Category C) This item captured an observation from a readiness review that SAR-406 did not fully capture the changes to Neutron Radiography Reactor (NRAD) cask operations. The SAR describes the NRAD cask as being used for core changeout, and the new activities would use the cask more frequently. This issue was screened as a Category C issue; however, the CA will take a full three years to complete because of the changes needed in the SAR, including obtaining DOE Idaho Operations Office (DOE-ID) approval. The effort needed to address this observation should have prompted a higher categorization to determine why this change to the SAR was not identified until the readiness review.
2021-0577	(Category C) This was one of several COs that capture comments from the EA review of specific administrative controls (SACs) in 2021. BEA responded in writing to the comments. This item, and several others, do not accurately capture the comment response from BEA. In this case, BEA responded to EA comment #12 by stating that BEA plans to add clarity to the SAR chapter 2 discussion. However, the CO action is to "Evaluate adding clarity," which could result in no action.
2021-0282	(Category C) This item reported that a year and a half earlier, Fluor Idaho, LLC (Fluor Idaho), the contractor for the Idaho Cleanup Project through calendar year 2021, had revised its documentation for the canisters stored at the Radioactive Scrap and Waste Facility operated by BEA, but BEA had not reviewed those changes for adequacy. One of the CAs, CA 2021-0424, was for BEA staff to identify, with Fluor Idaho staff, all the drawings that would require BEA review if changed. The closure evidence for this item was an email from Fluor Idaho stating that the action was complete, not a list of affected drawings.

2020-1254	(Category C) This item is a contractor readiness assessment pre-start finding that the design, construction, and testing of the Dry Transfer Cubicle Cask Insert (DTCCI) Overpack Adapter per EJ-2694 needs an unreviewed safety question (USQ) review of the Hot Fuel Examination Facility (HFEF) and inter-facility transport SARs, and that Advanced Test Reactor (ATR) staff need to be contacted to see whether the ATR SAR needs review. The completed USQs were attached as closure evidence, but they do not discuss the ATR SAR, nor is there documentation that ATR staff confirmed that no USQ was needed. Additionally, this item was incorrectly screened as a Category C issue and thus did not require a causal analysis, so no reason why this USQ was not performed before the readiness review was determined.
2021-1327	(Category D) This item reported a torn glovebox glove at the Analytical Lab; the glove was replaced as an immediate action. The event occurred on August 3, 2021, but the LabWay item was not written until August 18, 2021, two weeks later. No explanation was provided.
2019-0016	(Category C) This item reported that NRAD experienced an automatic reactor scram while operators were performing control rod reactivity worth measurements at low power (250W vs full power operation of 250kW). Per procedure, the range selector switch was in manual, which set the reactor scram setpoint to 275W. A causal analysis conducted as part of the fact finding restated the problem as the cause (i.e., the nuclear instrument channel deviation was close to the scram setpoint, resulting in scram). The issue was screened as a Category C issue, contrary to LST-13030, which defines a "reactor trip" as a significant condition and states that significant conditions are Category A issues. As a Category C issue, a more thorough root causal analysis was not completed for this item.
2016-1812 2016-1837 2017-0202 2017-0207	(Category C) These four LabWay items documented NRAD scrams caused by a timeout of the central control system-user interface terminal watchdog timing circuit. The watchdog scram occurs when the watchdog timing circuit detects a loss of communication for more than seven seconds. The central control system and user interface terminal are not safety significant systems, nor are they relied upon for defense-in-depth. The two scrams associated with these four COs were spurious, and there was no actual loss of communication, as determined by playback. After the second occurrence, the response procedure was revised so that operators would not make LabWay entries unless there was an actual loss of communication, even if there was a scram. BEA staff continued to monitor the situation and eventually recorded eight total scrams, including two that were for an actual loss of communication (see entry for CO 2020-0955 and CO 2020-1556 below). Additionally, there were 58 other instances where the watchdog scram signal came in while the reactor was not operating. Neither the repeated faults nor the scrams were documented in LabWay, nor were they elevated as a trend, and the scrams were not managed as Category A issues per LST-13030.
2020-0955 2020-1556	(Category C) These two items documented NRAD scrams caused by a timeout of the central control system-user interface terminal watchdog timing circuit, resulting in actual loss of communication. The watchdog scram occurs when the watchdog timing circuit detects a loss of communication for more than seven seconds. The central control system and user interface terminal are not safety significant systems, nor are they relied upon for defense-in-depth. The two scrams associated with these COs were caused by an actual loss of communication as determined by playback, unlike the six previous scrams (see COs 2016-1812, 2016-1837, 2017-0202, and 2017-0207 above). However, these COs were also screened as Category C issues, despite the increased significance of the issue and contrary to LST-13030.

Hazardous Energy Control COs	
CO Number	Comment
2021-1770	(Category C) This item reported an Amphenol power supply that was not wired correctly, exposing energized 120V male prongs when unplugged. The critique did not identify that modification of the equipment should have triggered a non-Nationally Recognized Testing Laboratory inspection, which would have prevented this issue. Contrary to LWP-13840, step 4.4.5.1 and appendix C, this critique did not include appropriate subject matter experts (SMEs) – National Fire Protection Association (NFPA) 70® and NFPA 70E® Authorities Having Jurisdiction (AHJs) – to help reconstruct and understand the hazardous energy event.
2021-1427	(Category C) This item reported an electrical flash in the FCF's manipulator repair enclosure when a metallic tape contacted 120V plug prongs. Contrary to LWP-13840, step 4.4.5.1 and appendix C, the NFPA 70® and NFPA 70E® electrical safety SMEs were not involved in the critique.
2021-1161	(Category C) This item reported exposed 120V conductors discovered in the Admin Building TR-65 turnaround office. An inappropriate program code assigned to this issue may inhibit the identification of trends.
2021-0854	(Category C) This item reported missing work group representative signatures from a lockout/tagout (LOTO) permit. Contrary to step 4.11.1 of LWP-13840, the CO states that a fact finding was scheduled, but no fact-finding document was attached.
2021-0491	(Category C) This item reported a loss of control of LOTO lock keys, possibly allowing an uncontrolled hazardous energy source. Contrary to step 4.11.1 of LWP-13840, the condition report and ORPS reports state that a critique was conducted on March 30, 2021, but no critique document was attached. Additionally, a CA was created to review lessons learned for the LOTO procedure and identify needed updates. The CA identified weaknesses in the LOTO procedure, but no documentation of a draft or final procedure was included. The CA was closed, and action to change to the LOTO procedure was entered as a GA, contrary to LWP-13840, which requires actions to rectify issues to be managed as CAs.
2021-0100	(Category C) This item reported inadequate verification of training for LOTO Escorted Personnel. An Immediate Lessons Learned was generated, which stated that LOTO training has been an issue several times at MFC. Contrary to LWP-13840, step 4.8.1.3, no actions were added to address the recurring training trend.
2020-1568 2020-0703 2020-0701 2020-0698 2020-0695 2020-0544 2019-2520	(Category D) These seven CO items were recognized as issues that presented a moderate risk to personnel injury (i.e., occupational illness or injury requiring medical attention or restrictions). Contrary to LWP-13840, these items were screened as Category D issues despite being adverse conditions that presented a risk to personnel.
2020-1907	(Category C) This item reported a spark on a 4-inch pneumatic transfer switch when the manipulator finger contacted an exposed 120V switch in the Met Box at the HFEF. Contrary to LWP-13840, step 4.4.5.1 and appendix C, the NFPA 70® and NFPA 70E® electrical safety SMEs were not involved in the critique for the grounding evaluation and exposure assessment. CAs were closed without the concurrence of the electrical SMEs. Consideration should be given to involving electrical SMEs in CA development and closure reviews.

2020-1778	(Category C) This item reported an adverse trend of LOTO violations at MFC. The action to perform a human performance improvement (HPI) investigation was closed based on an email stating that all HPI recommendations will be closed by the LOTO committee during the LOTO procedure rewrite. The CA was closed, and the LOTO procedure rewrite was tracked by means of GAs, contrary to LWP-13840, which requires actions to rectify issues to be managed as CAs. Additionally, an inappropriate program code was assigned to this issue, possibly inhibiting the identification of trends.
2020-1664	(Category C) This item reported 480V exposed conductors attached to "spare" breakers in MFC-701. This issue was open for more than seven months and was not resolved in a timely manner.
2020-1480	(Category C) This item reported that the process of developing and performing a LOTO was hindered because multiple drawings were not marked as essential. Compensatory actions were used, including multiple reviews of LOTO isolation points by multiple groups to complete the LOTO planning. However, contrary to LWP-13840, step 4.8.1.3, no actions were added to correct the drawing markings.
2020-1471	(Category B) This item reported a subcontractor contacting an energized 480V cable during excavating activities. This issue was closed based on a plan submitted with a promise of future actions and CAs that lacked objective evidence or description of actions taken, contrary to LWP-13840, appendix F. Additionally, an inappropriate program code was assigned to this issue, possibly inhibiting the identification of trends.
2020-1175	(Category C) This item reported a LOTO procedure non-compliance. CAs were generated to resolve the issue by conducting safety briefings with authorized employees, but this issue was open for more than four months and was not resolved in a timely manner.
2020-1095	(Category B) This item reported that a live 480V conductor was contacted during drilling of the concrete ceiling of the Radioactive Liquid Waste Treatment Facility to install anchors. The issue was only assigned program code WM01.07; *Work Execution/ Procedure Compliance*, possibly inhibiting the identification of trends in electrical safety. BEA elected to perform a root cause analysis of this event, even though LWP-13840 requires only an apparent cause analysis for Category B issues. BEA stated that the root cause was: "The work scope was performed without invoking the subsurface investigation process, which is described in MCP-1388," *Subsurface Investigations, Excavations, and Surface Penetrations*, which does not adequately address several problems leading to this event. Specifically, the personnel supporting or performing this evolution: • Misunderstood the meaning of the anomaly markings on the concrete • Drilled outside the boundaries of subsurface investigation area • Did not recognize the limitations associated with subsurface techniques • Performed work (cutting rebar) that was not identified as a work activity in the work control documents. As a result, the extent of cause and CAs did not ensure that all the problems (or their causes) leading to this personnel safety issue were resolved, allowing them to persist. Consideration should be given to involving electrical SMEs in apparent or root cause analysis, CA development, and closure reviews. This issue is one of the indications of an ongoing, adverse trend in procedural compliance and pre-job briefings.

2020-0529	(Category C) This item reported that a terminal strip inside a junction box with exposed conductors became energized during a site shelter or evacuation alarm. Maintenance work request 2020-1569 indicates that work order 00191717 to modify the J-box cover in MFC-752 is in the planning phase. This issue has been open for more than nine months and is not being resolved in a timely manner.
2020-0125	(Category C) This item reported an energized 480V welding circuit conduit cut during dismantlement and decommissioning operations by an INL contractor. Contrary to LWP-13840, appendix D, this issue was incorrectly categorized and should have been a Category B issue due to potential major impacts and to be consistent with two other COs documenting cutting of energized 480V conductors. Additionally, contrary to LWP-13840, appendix F, CA 2020-0116 was closed based on an e-mail stating that all actions were closed, without providing the required signatures on the removal recovery plan. This issue is one of the indications of an ongoing, adverse trend in procedural compliance and pre-job briefings.
2019-2638	(Category C) This item reported an administrative error involving subcontractor training for a LOTO in FCF. This issue was open for more than six months and was not resolved in a timely manner.
2019-2540	(Category C) This item reported an electrical panel obstruction. In an effort to rectify the issue, a CA was generated to remove materials in front of the electrical panel. Following this issue, nine additional panel obstructions were identified (see COs 2020-1568, 2020-0481, 2019-2756, 2019-2707, 2019-2660, 2019-2656, 2019-2624, 2019-2579, and 2019-2546 in LabWay). Contrary to LWP-13840, the responsible personnel did not review similar or previously identified electrical panel obstruction issues that indicated an adverse trend. The CA did not correct the cause of the trend and failed to rectify the issue.
2019-2291	(Category D) This item reported a loose cover that could be dislodged by the manipulator arm, exposing electrical connections. This issue was open for 13 months and was not resolved in a timely manner. Additionally, contrary to LWP-13840, appendix D, this issue should have been a Category C issue to document the potential moderate risk and to be consistent with two other COs documenting manipulator arm contact with energized 120V conductors.
2019-2063	(Category B) This item reported exposed casting furnace electrical connections. The apparent causal analysis took 6 months and issue closure took 13 months. This issue was not resolved in a timely manner.
2019-1776	(Category C) This item reported exposed 120V wires discovered in a junction box during maintenance. Contrary to LWP-13840, step 4.4.5.1 and appendix C, the NFPA 70® and NFPA 70E® electrical safety SMEs were not involved in the critique.

CONOPS COs	
CO Number	Comment
2019-1772	(Category A) This item reported that two individuals contaminated during a routine sample inventory at the MFC Radiochemistry Laboratory were released from a radiological buffer area, after radiological control personnel incorrectly concluded that the contamination was naturally occurring radon. The CAs to prevent recurrence were appropriate. Effectiveness reviews were correctly completed and timely.

2019-0196	(Category A) A mill tipped over while being relocated in the FCF. During the move, one of the casters flipped from under the mill, causing the load to shift and the mill to tip over. The CAs to prevent recurrence were appropriate. Interim effectiveness reviews were appropriately used, because some CAs required additional time for completion. A final effectiveness review is scheduled to review effectiveness when the remaining actions have been implemented.
2019-2284	(Category C) Over the period of several shifts, operators at HFEF were observed adding argon to the main cell at approximately two-hour intervals. The system is designed for automatic operation. Contrary to LWP-13840, Table 1, Note d, there were no actions to address this behavior or to review the procedure for limitations on manual operations.
2019-2288	(Category B) When accessing material storage locations, operators exceeded the number of storage tubes with fissionable material that could be simultaneously open, thereby violating SAC 5.412.3 in TSR-412. This issue is one of the indications of an ongoing, adverse trend in TSR violations and procedural compliance.
2019-2435	(Category B) When unloading and repackaging two UNC-2600 packages in the Material Security and Consolidation Facility, operators created a situation where more than 350g of U-235 was cumulatively out of approved storage and resulted in a non-compliance with TSR/SAR-416. This issue is one of the indications of an ongoing, adverse trend in TSR violations and procedural compliance.
2020-0216	(Category B) During the transfer of a high-assay, low enriched uranium (HALEU) regulus, the bottom of a plastic container holding a regulus failed. The regulus was required to be in a sealed container per the criticality control requirement, and the situation resulted in a violation of the criticality safety control requirements at FCF. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0031	(Category C) This item at FCF reported that a removable wrist joint in a remote-operated manipulator was improperly installed after maintenance. Contrary to LWP-13840, Table 1, Note d, there were no actions to address the adequacy of the procedures used or the worker behaviors that may have contributed to the error. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0092	(Category C) This item reported that only three of eight irradiated steel samples sent from the Electron Microscope Laboratory to HFEF arrived. CAs were written to verify the location of the missing samples and coach the supervisor. Contrary to LWP-13840, Table 1, Note d, there was no action to address procedure adequacy. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0227	(Category C) This item reported a potential safety concern regarding the use of gloveboxes in IMCL in that a user may unknowingly use the glovebox while it is in an alert or alarm condition. During this EA assessment, the action to address this condition was open and 584 days old. The action has been extended five times.
2020-0336	(Category C) This item documented experimenters working in the High Density Fuels glovebox at EFF reported unusual transients related to the glovebox pressure control and a rise in glovebox oxygen levels. During this EA assessment, actions to close this CO had been open for 564 days.
2020-0376	(Category C) Operations personnel failed to follow procedures while attempting to override interlocks associated with recovering the Argon Cell Ram System and the Platen Safety Restraint System at FCF. Personnel failed to contact the system engineer, shift supervisor, and nuclear facility manager. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.

2020-0437	(Category C) This item reported the incorrect casting of nuclear fuel pins using feedstocks of the wrong (lower) enrichment in the Fuels and Applied Science Building (FASB). The FASB is categorized as a hazard category 3 nuclear facility, so the amount of fissionable nuclear material within FASB is maintained below the limit for nuclear criticality. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event. The only CA was to send the pins to a lab to verify their enrichment, with the commitment to: "Based on the results of the evaluation generate additional actions to address the conclusions from that activity." No CAs addressed why the wrong feedstock was used. Also, the item was closed after receipt of the lab results, with no additional actions or discussion of the "conclusions from that activity." This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0468	(Category D) This item reported that caution tags are written to "do what is necessary to get the job done." This item was corrected on the spot. Contrary to appendix D of LWP-13840, this event should have been screened as a Category C issue, given the need for CAs to address standards. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0528	(Category C) This item reported that the Transient Reactor Test (TREAT) core was re-configured to support a different test vehicle. After the core change, the section of the procedure that would have adjusted the nuclear instrument detector positions was not completed. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-0597 2020-0598 2020-0599 2020-0601 2020-0602 2020-0613 2020-0614 2020-0615 2020-0620 2020-0621 2020-0622 2020-0623 2020-0624 2020-0625 2020-0626 2020-0639 2020-0640 2020-0641 2020-0642 2020-0644 2020-0645 2020-0646 2020-0647 2020-0648	Assessment (ASMT)-2020-0156, *MFC DOE-STD-1070-94/DOE O 426.2 Objectives 1 – 8* (Category D) These COs reported 44 findings (violations) in the implementation of PDD-147, *MFC Nuclear and Radiological Facility Training Program* identified by ASMT-2020-0156, *MFC DOE-STD-1070-94/DOE O 426.2 Objectives 1 – 8*. All 44 of these findings were incorrectly screened as Category D issues for further trending. No immediate or compensatory actions (e.g., suspension of qualifications and evaluations of past work by potentially unqualified workers) were taken to ensure nuclear safety. Additionally, 44 of the 89 observations in ASMT-2020-0156 were incorrectly classified as SGs in LabWay as they require actions to correct a non-compliance and thus should have been entered into LabWay as issues per LWP-13840. The SGs that should have been entered as COs are: 2020-0208, 2020-0209, 2020-0212, 2020-0213, 2020-0214, 2020-0216, 2020-0217, 2020-0218, 2020-0221, 2020-0222, 2020-0223, 2020-0230, 2020-0232, 2020-0236, 2020-0237, 2020-0238, 2020-0245, 2020-0246, 2020-0247, 2020-0249, 2020-0250, 2020-0251, 2020-0252, 2020-0253, 2020-0257, 2020-0258, 2020-0259, 2020-0263, 2020-0264, 2020-0265, 2020-0270, 2020-0278, 2020-0280, 2020-0283, 2020-0285, 2020-0289, 2020-0290, 2020-0291, 2020-0292, 2020-0304, 2020-0307, 2020-0308, and 2020-0309.

2020-0649 2020-0651 2020-0652 2020-0653 2020-0654 2020-0655 2020-0656 2020-0657 2020-0658 2020-0659 2020-0660 2020-0661 2020-0662 2020-0663 2020-0664 2020-0665 2020-0666 2020-0667 2020-0668 2020-0669	These findings, and other non-compliances incorrectly classified as SGs, are conditions adverse to quality. Per PDD-13000, conditions adverse to quality are Category B or C issues. Per American Society of Mechanical Engineers consensus standard Nuclear Quality Assurance (NQA)-1, conditions adverse to quality are required to be corrected "as soon as practicable." These 44 findings have not been resolved in a timely manner; 23 of the findings remain open more than 20 months after the assessment was issued.
2020-0765	(Category C) BEA ASMT-2020-0156 identified "that the following four [broad training performance] issues contributed to the overall achievement rating [of Marginally Effective]: Missing Training Records, Outdated Job Analysis and/or Qualification Checklists, Weak Continuing Training Programs, and a Weak Training Assessment Program." This item was entered into LabWay to "evaluate the need for additional actions to address broader training performance issues that may not be resolved by fixing individual training issues." These four broad training performance issues indicate highly significant weaknesses in BEA's implementation of the "Systematic Approach to Training" in DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, as invoked by PDD-147 as discussed below: • Four of the 44 findings identified workers that had not completed the required qualification program for positions or roles they were filling. • Nine findings identified: (1) discrepancies between qualification requirements and job tasks and/or (2) job task analyses that had not been reviewed in more than three years. ASMT-20202-0156 stated "task lists are not being updated and this has been an (sic) on going issue in past assessments." • Fifteen findings identified that inadequate or no continuing training was provided to workers to maintain the required skills or knowledge for nuclear worker qualifications. • Eleven findings identified that worker qualification records could not be retrieved during the conduct of ASMT-2020-0156. • CO 2020-0668 identified "MFC does not have a formal process/method for systematically evaluating training effectiveness and its relation to on-the-job performance…"

	• CO 2020-0669 identified "MFC has not completed a comprehensive evaluation of DOE-STD-1070-94, *Criteria for Evaluation of Nuclear Facility Training Programs*, objectives 1,2,5, and 8 every 2 years per PDD 147 section 4.1. … DOE Order 426.2, (sic) requires a DOE STD 1070 evaluation of all 8 objectives every 3 years. PDD 147 commits to a full 1070 evaluation every 2 years. For Objectives 1,2, and 8 it has been nearly 5 years since an assessment and for objective 5 it has been 3 1/2 years since an evaluation." Per DOE Order 426.2, "The Systematic Approach to Training…is designed to ensure that these personnel have the requisite knowledge, skills and abilities to properly perform work in accordance with the safety basis" so at least the broad training performance issues discussed in the first three bullets above individually meet the criterion in appendix D of LWP-13840 for a Category A issue (i.e., "A significant condition adverse to quality…that if uncorrected, could have a highly significant effect on safety or operability"). However, contrary to LWP-13840, CO 2020-0765 was screened as a Category C issue. BEA did not perform an analysis to determine the causes of the findings or any of the broad training performance issues, and no CAs were taken for this item. Per NQA-1, "In the case of a significant condition adverse to quality, the cause of the condition shall be determined and corrective action taken to preclude recurrence."
2020-0880	(Category B) This item identified that two TSR surveillances were missed in the IMCL. Contrary to LWP-13840, appendix E, the resulting CAs (CAs 2020-0671 and 0678) each include multiple actions.
2020-0866	(Category A) This item reported a small, localized depleted-uranium (DU) fire in the FCF. BEA stated that the cause of this event was "The work control applied for unwrapping depleted uranium in the Suited Entry Repair Area (SERA) lacked multiple aspects including hazard identification and mitigation for the potential of a fire hazard from small fragments of DU rapidly oxidizing." This statement does not adequately address several problems leading to this event. Specifically: • This evolution was infrequently performed and was being executed by an individual who had never been in the SERA before and had never participated in any capacity in a DU material move. • The individual also could not recognize the difference between the expected size and shape of the material in the container and what was actually there. • In addition, despite the individual's lack of experience, a process referred to as List 468, "Performer Controlled Activity," was used to allow the activity to be performed without a detailed work document. Because of these problems, the extent-of-cause review and the CAs did not ensure that all the problems (or their causes) leading to this nuclear safety issue were resolved, allowing them to persist. Also, the effectiveness review observed only one activity, which was a re-performance of the activity that caused the DU fire. This issue is one of the indications of an ongoing, adverse trend in pre-job briefings.
2020-0927	(Category C) This item reported a DOE-ID identified finding that the FCF failed to enter LCO/SAC 3.403.5 upon discovery of exposed pyrophoric material outside of the argon cell. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.

2020-0950	(Category C) This item reported that DOE-ID identified that IMCL failed to properly document the facility's surveillance requirements for radioactive material handling control for 2.5 years. Per LWP-13840, appendix D, this item should have been screened as a Category B issue. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-1016	(Category C) This item reported that maintenance was performed on equipment outside the description in the work order. Specifically, maintenance was performed on an uninterruptible power supply that was not covered by a work order. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-1066	(Category C) This item reported an adverse trend of late notifications to DOE. Contrary to GDE-574, *Trend Coding and Analysis Guide*, section 4.3, this item was closed without verifying that the trend was resolved.
2020-1069	(Category C) This item reported a deficiency in that research work was performed outside the boundaries of the work control documents. One of the two examples resulted in a radiological contamination of the researcher. This CO was closed on the basis that "management was notified. Close to trending," without documenting or describing the CAs taken. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-1203	(Category C) DOE-ID reported a failure to document actions performed in response to an alarm at IMCL. Contrary to LWP-13840, item 4.8.3.2, CAs did not address all aspects of the event. There was no action to address the deficiencies or a potential negative trend in log keeping.
2020-1215	(Category C) This item reported that the management periodic reviews of the required reading binder by Utilities Infrastructure and Support staff were not completed. Also, three managers and one operator had not completed their required reading. Contrary to the requirements of LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event. Although the immediate actions state that program expectations will be re-enforced, there was no action to implement re-enforcing expectations.
2020-1239	(Category C) A DOE-ID finding noted that four recent events at MFC had resulted in contamination outside of radiological areas. One of the identified issues had no recorded CO, and the identified actions were not captured as CAs. Contrary to LWP-13840, Table 1, Note b, there was no assessment of this trend or an effectiveness review prior to CO closure.
2020-1250	(Category C) This item reported that the FCF Argon Cell pressure increased to a positive differential pressure for approximately 25 minutes. Per LWP-13840, appendix D, this item should have been screened as a Category B issue. The CAs from a human performance review for procedure revisions were closed by stating that no revisions were needed. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2020-1341 2020-1404 2020-1437	(Category D 1341&1404 and Category C 1437) These items reported multiple shortcomings in the conduct of pre-job briefings. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event. In two instances, the shortcoming was corrected on the spot. In the third, it was covered as an agenda topic in a staff meeting. No negative trend in pre-job briefings was identified in a BEA condition report. However, these issues are part of an ongoing, adverse trend in pre-job briefings.

2020-1477	(Category D) This item reported Significant Lessons Learned (SLL) 2020-001: *Inadequate Radiological Controls, Worker Behaviors and Practices*. Contrary to the requirements of LWP-13840, appendix D, and given the broader, related significant issues identified by BEA MFC operations leadership during interviews, this item should have been screened as a Category B issue.
2020-1507	(Category D) This item reported that several events have occurred at various MFC facilities that have not met expectations for conduct of operations. These events have involved TSR compliance, LOTO, and response to abnormal conditions. Contrary to LWP-13840, appendix D, and given the broader significant issues identified by MFC operations leadership during interviews, this item should have been screened as a Category B issue. Additionally, actions to rectify these issues were incorrectly designated as GAs. Per LWP-13840, CAs are required to rectify issues.
2020-1542 2020-1543 2020-1544	(Category D) These items reported that managers at TREAT approving work orders and planners and engineers involved in work order development do not understand quality level parts or methods of their control. Although the CO stated that training was not adequate, there were no actions to address the lack of training. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event.
2020-1549	(Category D) This item reported SLL 2020-002: *Subcontractor Performance and Electrical Safety During Construction and Demolition Activities*. Contrary to LWP-13840, appendix D, and given the broader significant issues identified by operations leadership, this item should have been screened as a Category B issue.
2020-1574	(Category C) This item reported that several minor mistakes with the mass tracking system (MTG) operations had resulted in delays, requiring software change requests to correct the errors. An immediate action to develop training had no CA to track the development or conduct of the training. The CO closure had no documentation addressing the training, and subsequently CO 2021-0482 (below) reported the same issue. In addition, contrary to LWP-13840, appendix E, CA 2021-0402 contained multiple actions.
2020-1683	(Category D) This item reported that workers had not been thoroughly briefed on all aspects of the task for the transfer of hazardous waste. This issue is one of the indications of an ongoing, adverse trend in pre-job briefings.
2020-1725	(Category D) This item reported SLL 2020-003: *Lockout/Tagout Events Indicate a Need for Immediate Improvement*. Contrary to LWP-13840, appendix D, and given the broader significant issues identified by MFC operations leadership, this item should have been screened as a Category B issue.
2020-1763	(Category C) This item reported that surveillance requirement for the Fuel Manufacturing Facility had not been documented. An incorrect form caused an error that resulted in the missed surveillance. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event. Although the identified cause was the document change process, there was no action to correct that process. Action was closed based on a staff discussion (an impromptu "tailgate" discussion).
2021-0076	(Category C) This item reported a DOE-ID identified finding that workers deviated from approved work control documents when installing a temporary ventilation system. Contrary to LWP-13840, appendix F, CA closures lacked the details necessary to describe the actions completed. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.

2021-0128	(Category C) This item reported that the IMCL received potentially pyrophoric samples from the FCF fuel cycle glovebox for characterization and investigation. IMCL does not have work control or hazard mitigations for unpacking and handling pyrophoric materials. During this EA assessment, actions addressing necessary procedure changes had been open for 228 days.
2021-0220	(Category C) This item reported potential weaknesses/vulnerabilities in transfers of pyrophoric material at MFC. Per LWP-13840, appendix D, this item should have been screened as a Category B issue. In addition, contrary to the requirements of LWP-13840, appendix E, CA 2021-0300 has multiple actions.
2021-0240	(Category C) This item reported that work performed in the Zero Power Plutonium Reactor (ZPPR) cell had been performed without proper use of the nuclear material handling procedure, which is used for all nuclear material movements in ZPPR. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2021-0243	(Category D) This item reported SLL 2021-001: *Pyrophoric and Reactive Materials Events*. Contrary to the requirements of LWP-13840, appendix D, and given the broader significant issues identified by MFC operations leadership, this item should have been screened as or integrated with (e.g., as an action) a Category B issue.
2021-0409	(Category C) This item reported that the FASB material balance area (MBA) continues to fail material control and accountability physical inventory tests. The MBA has not instituted actions within the facility to correct this deficiency. Contrary to the requirements of LWP-13840, item 4.8.3.2, the CAs did not address the cause of these recurring failures or the identified discrepancies in the inventory.
2021-0448 2021-0458 2021-0518 2021-0585 2021-0608 2021-0644 2021-0761 2021-0763 2021-0765 2021-0818 2022-0030	(Category D) These items identified holes in gloves/gauntlets in FCF/HFEF enclosures. Although BEA had taken actions before to address holes in gloves, ten of the COs listed here demonstrated that those actions were not effective in resolving this adverse trend. No CAs were pending to review the effectiveness of previous actions. In response to concerns raised during this EA assessment, BEA managers at MFC entered CO 2022-0030 (the last CO listed here).
2021-0482	(Category C) This item reported that FCF personnel performing cathode harvesting opened an MTG material transfer and incorrectly selected the destination. Actions from CO 2020-1574 (above) were not effective, and no actions were initiated to address them.
2021-0495	(Category C) DOE-ID identified that place-keeping and adherence to work orders did not meet MFC management expectations. Other than changing the work order to allow the deviation, the only action was to have a discussion with applicable personnel. This issue is one of the indications of an ongoing, adverse trend in procedural compliance.
2021-0533	(Category C) This item reported a failure to correct a condition adverse to quality dealing with cold weather preparations on the firewater storage tank freeze protection. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address the failure to correct the adverse condition.

2021-0617	(Category C) This item reported that a cargo container containing low-level waste (LLW) had a bag of mixed low-level waste (MLLW) stored inside. Contrary to the requirements of LWP-13840, step 4.8.3.2, there was no CA for the development of training. Although the submitted training request form documented concurrence that training was needed, there was no action to track the development or conduct of the training, and the CO was closed solely on the basis of the request form.
2021-0726	(Category C) This item reported weak status control during replacement of an air operated isolation valve. Contrary to LWP-13840, step 4.8.3.2, the CAs did not address all aspects of the event (e.g., no CA addressed the loss of configuration control by operations personnel).
2021-0820	(Category C) This item reported that two events highlighted the need to emphasize the importance of proper preparation for work by requiring personal protective equipment to prevent heat stress. The CA resulted in suggested changes in the pre-job briefing form, without a CA to implement or track those changes to completion.
2021-0905	(Category B) This item reported that criticality hazard control zone rules were not implemented at FCF. The causal analysis identified the lack of independence of the responsible individual as the apparent cause. However, this individual is a second check on the implementation of these rules, and the analysis did not identify why they were not appropriately implemented initially.
2021-1067	(Category D) This item reported SLL 2021-002, which identified that the high number of recent injuries indicated a need for improved efforts to protect the MFC workforce. Contrary to LWP-13840, appendix D, and given the broader significant issues identified by MFC leadership, this item (adverse trend) should have been screened as a Category B issue.
2021-1099	(Category C) This item reported a DOE-ID identified finding of an adverse trend in independent verification. The CA response recommends additional actions that were not incorporated as CAs for CO 2021-1099. Contrary to GDE-574, the CO was closed without verifying that the trend was resolved.

Emergency Management COs	
CO Number	Comment
2018-1276	(Category C) This item reported issues with the response to severe weather at MFC. Corrective actions were delayed three times, delaying closure of this issue for more than 16 months and representing a timeliness issue.
2019-2754	(Category C) This item reported that the ATR Emergency Control Center (ECC) lost several internet connections when the network switch battery failed upon loss of commercial power. Additionally, the uninterruptible power supply did not function properly because of the battery failure. Closure of this issue took more than seven months, representing a timeliness issue. Also, GA 2019-1668 should have been identified as a CA per LWP-13840.
2019-1897	(No significance level assigned) This item addressed increasing the staffing for two-person 24/7 coverage for Fire Alarm and Emergency Dispatch Center operations. Closure of this issue took more than 10 months, representing a timeliness issue. No evidence of increased staffing was provided as specified in the CA (originally GA 2019-1040, rolled over to CA 2019-1174).

2019-2330	(Category D) This issue reported that continuity-of-operations plan data did not document bulk fuel availability and directed providing a bulk fuel report. Per PDD-13000, this deficiency (condition adverse to quality) should have been screened as a Category B or C issue. Closure documentation did not indicate that action was taken to provide the bulk fuel report, and the provided documentation discussed an unrelated paving project. Closure took more than 14 months, representing a timeliness issue.
2019-0075	(No significance level assigned) This issue reported a need to emphasize the importance of drills and training to improve the Continuity Emergency Response Group program and ensure program continuity of operations. This CO was cancelled without explanation, contrary to LWP-13840.
2019-2037	(Category C) This issue reported the need to develop an HPI plan specific to emergency management using GDE-863. Corrective action was delayed six times, with justification provided only twice, delaying closure of this issue for more than 14 months and representing a timeliness issue. Additionally, a new HPI plan was not developed for emergency management. Instead, the closure statement indicated that HPI is integrated into existing emergency management programs, without stating why the separate plan was unnecessary.
2019-1991	(Category D) This item reported an issue with providing compensatory time for emergency response operations for the Sheep Fire event. The closure statement addressed overtime but did not address compensatory time.
2019-1996	(No significance level assigned) This issue addressed emergency response organization (ERO) personnel completing offsite notifications. It was cancelled without explanation, contrary to LWP-13840.
2019-2466	(Category D) This item addressed the availability of weather data to support TREAT operations at MFC. Per PDD-13000, this deficiency (condition adverse to quality) should have been screened as a Category B or C issue. The answer provided information on manual estimation of stability class but no other information about weather data or wind. The information provided to close the issue was incomplete. Per LWP-13840, this issue should have been addressed with a CA.
2019-2751 2019-2752 2019-2753 2019-2755	(Category D for 2751, 2752, & 2753, and No significance level assigned for 2755) During an ATR drill, issues were identified for the ERO in use of checklists, follow-up notification forms, and consequence assessment forms, and in three-way communications. All four COs were cancelled without explanation, contrary to LWP-13840, and were then incorrectly replaced by GAs. Per LWP-13840, these issues should have been addressed in COs with CAs. Per PDD-13000, the non-compliance (condition adverse to quality) of CO 2019-2751 should have been screened as a Category B or C issue.
2019-2019	(Category D) This CO reported numerous "opportunities for improvement" identified during the INL Fire Department's response to the Sheep Fire event (east of ATR). BEA took more than 13 months to close this CO, representing a timeliness issue. The Sheep Fire event was an actual emergency response, and the identified issues (conditions adverse to quality) warranted correction as Category B or C issues instead of trending as a Category D issue. Additionally, the scope of this CO included multiple issues rather than a single issue, contrary to LWP-13840. GAs 2020-0288 and 2019-1361 through 1368 were incorrectly assigned to correct issues identified by the BEA Fire Department. These issues should have been addressed in separate COs and CAs per LWP-13840.

2019-1607	(Category D) After the INL Sheep Fire, this CO identified numerous opportunities for improvement for wildland fire response in the Central Facilities Area (CFA). BEA took more than 24 months to close this item, representing a timeliness issue. GAs 2019-1184 through 1187, GA 2019-1275, GA 2019-1277, and GAs 2019-1458 and 1459 were reported for CAs in this single CO. These issues should have been addressed in separate COs and CAs per LWP-13840.
2020-1464	(Category C) This item required a comment in the Electronic Document Management System (EDMS) and an update in the next revision. The closure statement indicated that a suggested EDMS change was submitted; however, neither the closure statement nor objective evidence had the EDMS suggestion number to verify that the change was submitted per LWP-13840.
2020-1465	(Category C) This item reported that the baseline needs analysis (BNA) document needs to be reviewed and updated and document ownership needs to be resolved. The Emergency Management Manager created a committee to review, update, and establish authorities for the BNA, and the committee was to evaluate and update BNAs for INL site and other facilities. The closure statement did not indicate that the committee reviewed, updated, or established authorities for the BNAs, and no committee reports, authorities, or BNAs were attached as objective evidence.
2020-1467	(Category C) This item identified that EPI-113, "Area Command," did not support the new incident management structure. This issue was closed on a promise of future action before EPI-113 was either updated or inactivated. This issue should have remained open until final disposition of EPI-113 was completed.
2020-1620	(Category C) This issue reported a deficiency in LST-26, INL "Emergency Telephone Numbers Listing," and directed an evaluation of LST-26 by the ATR emergency management planner to ensure that all appropriate telephone numbers are included and to determine the correct communication pathway for contacting the ATR information management coordinator. The ATR emergency management planner reviewed LST-26, but the closure statement did not address or include the necessary changes to LST-26 or specify any other CA taken to resolve the deficiency.
2020-0188	(Category C) This issue reported deficiencies in the response actions for a manual fire alarm pulled at CF-624. Additionally, the Area Warden for the building did not fully evacuate the building and did not notify the Building Manager as required by procedure. The CA was an email notification sent to Area Wardens regarding response to a fire alarm, although the actual issue was that the Area Warden failed to follow procedures. The condition owner should have identified the correct issue and directed implementation of the appropriate CA (e.g., additional training). Closure of CAs took more than 12 months, representing a timeliness issue.
2020-0938	(Category C) This issue reported failures of the INL fire alarm communication system. These failures were reported per DOE Order 232.2A but were screened as a Category C issue. No causal analysis or extent-of-condition review was performed as required by DOE Order 232.2A for reportable events. Instead of issuing a CA as required by LWP-13840, GA 2020-0544 was used to work with the fire system vendor to resolve these failures. The fire system vendor was contacted but did not perform an onsite evaluation of the system. Contrary to LWP-13840, this issue was closed on a promise of future actions (i.e., further investigation with Cyber and the vendor on site would be pursued), without a review by the condition owner.

2021-0915	(Category C) This item reported deficiencies in the NRAD drill conduct and performance. However, the CO did not address two issues that were outlined in the management observation (OBSR-2021-1265): drill setup and progression were inadequate, and appropriate telephone numbers for the ECC were not available. This CO has been open (awaiting response to two CAs) for more than 180 days, representing a timeliness issue.
2020-0363	(Category C) This item reported that the audible fire alarm signals in MFC 701 do not meet requirements in certain areas of the building. The identified condition is a worker safety and health non-compliance associated with a failure to maintain a life safety communication system per NFPA 72. CAs have been delayed four times. The work delays and untimely CAs are not in accordance with LWP-13840 and life-safety requirements. After 18 months, this CO remains open pending completion of CAs.
2021-0735	(Category C) This item reported that medical response was delayed when responding units were not clear where MFC-771 was located. Immediate action provided directions, and the issue was closed without addressing why the medical units were not clear where to respond or taking CAs to support timely medical support.
2021-0742	(Category D) This item reported that MFC personnel incorrectly approved significant event entries in the electronic database of the emergency management operations center (WebEOC). Per PDD-13000, this deficiency (condition adverse to quality) should have been screened as a Category B or C issue. The issue was addressed as a GA and published in an ERO Training newsletter. Per LWP-13840, this issue should have been addressed in a CA.
2021-0743	(Category D) This item reported issues in the extent of the surveys conducted by the field monitoring team (FMT) at MFC. Per PDD-13000, this deficiency (condition adverse to quality) should have been screened as a Category B or C issue. Action, assigned as a GA, was to notify FMT Coordinators and Emergency Action Managers of the jurisdiction boundaries between FMTs and the site monitoring team. Per LWP-13840, this issue should have been addressed with a CA.
2021-0744	(Category D) This item reported that WebEOC entries did not have military time annotated per procedure. Per PDD-13000, this deficiency (condition adverse to quality) should have been screened as a Category B or C issue. The issue was addressed in a GA to notify the MFC ERO of the military time requirement in WebEOC entries. Per LWP-13840, this issue should have been addressed with a CA.

Emergency Management GAs	
GA Number	Comment
ASMT-2019-0057, *Emergency Management Functional Drill. Materials and Fuels Complex*	
2019-0671 2019-0672 2019-0673	These GAs were developed to correct issues in the iMap emergency action level (EAL) tables, FCF zone numbers, and Warning Communications Center activation of the ERO. Per LWP-13840, these issues should have been entered into LabWay as COs, and these GAs should have been identified as CAs.
ASMT-2019-0058, *Emergency Management Functional Drill. Materials and Fuels Complex*	
2019-0836 2019-0837 2019-0838 2019-0839	These GAs were developed to correct issues in initial notification form availability, incorrect declaration times, electronic consequence assessment forms, and situational awareness. Per LWP-13840, these issues should have been entered into LabWay as COs, and these GAs should have been identified as CAs.

ASMT-2019-0096, [After-action Report] *AAR Idaho National Lab 2019 Annual Exercise*	
2019-1024 2019-1032 2019-1033 2019-1034 2019-1035 2019-1036	These GAs were developed to correct issues in communications. Per LWP-13840, COs and CAs should have been assigned to these issues (i.e., failure to follow communication procedures, delayed communications, unclear communication channels, and communication equipment deficiencies). Additionally, closure of GAs 2019-1032 through 1034 took more than 8 to 12 months, representing a timeliness issue.
2019-1038 2019-1039 2019-1040 2019-1041	These GAs were developed to correct issues in air ambulance communication procedures and communications plan, and the lack of an injury reporting system. Per LWP-13840, these issues should have been entered into LabWay as COs, and these GAs should have been identified as CAs. Additionally, closure of GAs 2019-1038, 1039, and 1040 took more than 8 to 12 months, representing a timeliness issue.
2019-1043	This GA addressed the lack of exercise controllers and evaluators at the incident command post. This exercise planning failure should have been entered into LabWay as a CO, and the GA should have been identified as a CA.
ASMT-2019-0390, *AAR: MFC 2019 Evaluated Drill*	
2019-1374 2019-1377 2019-1378 2019-1379	These GAs were developed to correct issues in changing a checklist, relocating equipment, camera displays in ECC, and command bridge repair. These issues should have been addressed as COs, and the GAs should have been identified as CAs per LWP-13840.
ASMT-2019-0621, *AAR: Sheep Fire*	
2019-1321	This item reported that the process to card out of the TREAT facility needs to be reviewed to ensure accountability; the card reader was reflecting reverse status (i.e., indicating personnel leaving TREAT were entering it and vice versa). Security technicians fixed the card reader at the TREAT facility. However, this equipment discrepancy should have been entered as a CO to ensure that other elements of this issue were adequately managed (e.g., the impact on physical security and the extent of cause or condition within TREAT and other INL facilities). Also, this issue should have been addressed with a CA per LWP-13840.
2019-1323	This item reported that employees were taking and posting pictures to social media during the Sheep Fire instead of taking shelter as directed. Additionally, the pictures were released to the public without the required BEA review. Per LWP-13840, the following issues should have been identified as three separate COs and CAs: • Failure to follow protective actions • Failure to follow security procedures by taking photos of emergency response and releasing the photos on social media without authorization • Failure to comply with the onsite use of social media procedures.
2019-1348	This item reported a mismatch in the video inputs and outputs needed at a workstation, which should have been addressed as a configuration management issue and addressed as a CO and a CA per LWP-13840.

2019-1349	This item was to address deficiencies in communications (i.e., not maintaining an open planning bridge line) by all ECCs during an event. An immediate action during the event was to email all CFA ERO members involved with the planning bridge to keep the planning bridge open. This action did not address the failure to follow communications procedures. These issues should have been addressed as a CO and a CA per LWP-13840.
2019-1315 2019-1316 2019-1318 2019-1319 2019-1320 2019-1321 2019-1322 2019-1323 2019-1324 2019-1325 2019-1326 2019-1328 2019 1329 2019-1330 2019-1331 2019-1332 2019-1334 2019-1335 2019-1336 2019-1337 2019-1343 2019-1344 2019-1345 2019-1347 2019-1348 2019-1349 2019-1350 2019-1351 2019-1354	These GAs were developed to correct issues identified during the hotwash (review) of the Sheep Fire AAR. The Sheep Fire was an actual emergency response, and the issues identified after the event are safety and response issues and actions that should have been addressed in COs and CAs per LWP-13840. Additionally, resolution of these issues has not been timely: two GAs (GA 2019-1324 and 1326) were closed 8 to 15 months later, and two GAs (GA 2019-1325 and 1328) remain open more than 30 months after the fire.
ASMT-2019-0666, *After Action Report: Monroe Fire*	
2019-1467 2019-1468	These GAs were developed to correct issues involving the ATR area manager activating the CFA ERO and coordinating requirements with environmental specialists. These issues should have been addressed in COs and CAs per LWP-13840.
ASMT-2020-0001, *After Action Report: Special Manufacturing Complex 2019 Evaluated Drill*	
2019-1640	This GA was developed to correct issues involving exercise controller coaching and conduct. These issues should have been addressed as COs and CAs per LWP-13840.

ASMT-2020-0256, *After Action Report: Advanced Test Reactor Complex 2019 Evaluated Drill*	
2019-1665 2019-1667 2019-1668 2019-1669	These GAs were developed to correct issues involving the ATR ERO's use of position checklists, use of electronic consequence assessment forms, testing of the ECC, use of three-way communications, and testing of ECC system functions. These issues should have been addressed in COs and CAs per LWP-13840. Additionally, these issues took more than seven months to close, representing a timeliness issue.
ASMT-2020-0608, *Quarterly Drill/Exercise Rolling Summary Report*	
2020-0768	This GA was developed to correct issues involving the use of weather cue cards during a drill/exercise. The issue should have been addressed as a CO and a CA per LWP-13840. Additionally, it took more than eight months to close, representing a timeliness issue.
ASMT-2021-0180, *1st Quarter Rolling Summary Report 2021*	
2020-0896	This GA was developed to a correct an issue in MFC accountability. This issue should have been addressed as a CO and a CA per LWP-13840. Additionally, it took more than eight months to close, representing a timeliness issue.
2020-0899 2020-0900 2020-0902	These GAs were developed to correct ERO issues involving communication equipment. The Issue Screening Team incorrectly identified the issue as an ERO performance issue. Instead, the BEA EROs should have identified that the correct communications equipment was needed to perform the activity and conduct communications in a noisy environment. A CO with a single CA should have been identified to address the equipment needed to correct the issues.
2020-0895 2021-0897 2021-0898	These GAs were developed to correct issues involving sirens (e.g., sirens providing direction to take shelter and evacuation), ECC phones, and WebEOC. These issues should have been addressed in COs and CAs per LWP-13840.
ASMT-2021-0588, *Quarterly Drill/Exercise Rolling Summary Report: 2nd Quarter Drill and Exercise*	
2021-0772	This GA was developed to correct an issue in the MFC WebEOC Controller Board. The issue should have been addressed as a CO and a CA per LWP-13840.
ASMT-2021-0589, *ATR Evaluated Exercise/Evacuation*	
2021-0619 2021-0620	These GAs were developed to correct issues involving ORPS reporting procedures in position checklists and the Area Warden Coordinator checklist. These issues should have been addressed in COs and CAs per LWP-13840.
ASMT-2021-0697, *Emergency Management Annual Assessment*	
2021-0871	This GA was developed to correct an issue in updating and maintaining emergency management hazards surveys. The issue should have been addressed as a CO and a CA per LWP-13840.