Department of Energy
National Nuclear Security Administration
Washington, DC 20585

January 30, 2024

The Honorable Joyce L. Connery
Chair, Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, DC 20004

Dear Chair Connery:

Consistent with the Board's letter dated January 6, 2022, attached please find the *Fiscal Year 2023 Annual Metrics Report on Nuclear Criticality Safety Programs*. This metrics report includes a series of tables and narratives that satisfy the annual reporting requirement established for closure of Defense Nuclear Facilities Safety Board Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex*.

If you have any specific questions regarding the report, please contact Kevin Hahn, National Nuclear Security Administration, who has overall responsibility for the consolidated report, at (505) 379-5131. Kevin Witt, Office of Environmental Management (EM), 202-525-9653, is responsible for the EM information; and Joanna Serra, Office of Science (SC), (301) 903-6136, is responsible for the SC information.

Sincerely,

AHMAD AL-DAOUK
Digitally signed by AHMAD AL-DAOUK
Date: 2024.01.30 07:48:06 -07'00'

Ahmad M. Al-Daouk
Associate Administrator for
Office of Environment, Safety, and Health,
National Nuclear Security Administration

Juston K. Fontaine
Digitally signed by Juston K. Fontaine
Date: 2024.01.30 06:39:09 -05'00'

Juston K. Fontaine
Deputy Director for Field Operations,
Office of Science

TODD LAPOINTE
Digitally signed by TODD LAPOINTE
Date: 2024.01.30 08:51:37 -05'00'

Todd N. Lapointe
Director, Office of Environment,
Health, Safety and Security

GREGORY SOSSON
Digitally signed by GREGORY SOSSON
Date: 2024.01.29 15:24:58 -05'00'

Gregory Sosson, PE
Associate Principal Deputy Assistant
Secretary for Field Operations,
Office of Environmental Management

cc: Kevin Hahn, NNSA
Larry Berg, NNSA
Ta'keira Benoit, NNSA
Jim Todd, NNSA
Kermit Bunde, EM
Robert Wilson, EM
Kevin Witt, EM
Brenda Hawks, EM
Joanna Serra, SC
Joe Olencz, EH-1.1
David Nester, EH-1.1

2023
ANNUAL METRICS REPORT
To
THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD
January 2024

NUCLEAR CRITICALITY SAFETY PROGRAMS

National Nuclear Security Administration
United States Department of Energy
Washington, DC 20585

Purpose

A Defense Nuclear Facilities Safety Board (DNFSB) letter dated January 6, 2022, requested that the Department of Energy (DOE) provide an annual metrics report on the nuclear criticality safety criteria listed below in its Annual Report on Nuclear Criticality Safety (NCS) Programs. The Board's letter modified the annual reporting requirement established for closure of DNFSB Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex,* which requires DOE to provide a report and briefing on the requested subject areas for its various NCS programs.

The points-of-contact for this report are Kevin Hahn, National Nuclear Security Administration (NNSA), 505-379-5131, Kevin Witt, Office of Environmental Management (EM), 202-525-9653, and Joanna Serra, Office of Science (SC), 301-903-6136.

The requested metrics include:

1. A **summary of the health of the criticality safety program** as assessed by each DOE field office and DOE program office, consistent with DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy;*

   The following qualitative grades are used:
   - Excellent
     - The program elements consistently exceed the requirements.
     - Many program elements are considered best in class and worthy of consideration by each DOE site.
   - Good
     - The program elements meet the minimum requirements, or any minor non-compliances are actively being corrected or improved.
   - Marginal
     - The program elements meet most of the minimum requirements, with one or more significant associated elements identified below the minimum program requirements.
     - This level of performance typically warrants a Headquarters federal response including assist visits or additional assessments, and compensatory measures may be required to continue operations.
   - Unacceptable
     - The program elements do not meet minimum requirements with more than a few significant associated elements identified below the minimum program requirements such that operations cannot be executed safely.
     - This level of performance warrants a Headquarters federal response and typically results in a pause in operations or stop work.

The respective Field Office provides the grade and summary for the overall performance of the site which is broken into program health and operational implementation. The DOE program office will either concur with this opinion or provide a different perspective in the summary

discussion. Note that support to the DOE Nuclear Criticality Safety Program (NCSP) as well as support to other offices, agencies, universities, countries, etc. could be noted in the health summary but has not been factored into the program or operational implementation health grades.

  - The program health grade is based on items such as contractor staffing levels, quality, timeliness, and backlog of NCS Evaluations, adequate funding, NCS procedures and policies…etc.

  - The operational implementation grade is based on items such as those events and issues affecting the handling and processing of nuclear materials…i.e., infractions, conduct of operations, implementation of NCS in operating procedures…etc.

- The **number and a short description of criticality safety infractions per site-specific criteria** identified by each of the following: the contractor, DOE field office, and DOE headquarters;

  - Note that the short description (summary) is a Federal point-of-view of the significance of any trends or concerns based on the infractions.

- The **number and a short description of identified non-compliances with DOE Order 420.1**, *Facility Safety,* and the American National Standards Institute/American Nuclear Society-8 series of criticality safety standards identified by each of the following: the contractor, DOE field office, and DOE headquarters;

  - Note that the short description (summary) is a Federal point-of-view of the significance of any trends or concerns based on the non-conformances.

- The **total number of criticality safety issues** in the issues management system for each of the following categories: open at the start of the FY, added during the FY, closed during the FY, open for longer than six months (only those still open at the time of reporting), and open for longer than one year (only those still open at the time of reporting). Opportunities for Improvement and Observations shall not be included, and;

  - Note that the short description (summary) is a Federal point-of-view of the significance of any trends or concerns based on the issues.

- **Contractor and federal criticality safety staffing levels**, including the number of qualified staff, average years of experience in criticality safety, the number of staff in training for initial qualification, and the number of vacancies. Also include for each the contractor and federal staff the numbers of staff hired and staff lost during the year.

  - The number of qualified NCS engineers reflects the number of staff qualified to independently perform criticality safety work consistent with site-specific criteria.

  - The “experience” metric is an average of the years of experience in criticality safety for the qualified staff at the time of reporting.

Table of Contents

Lawrence Livermore National Laboratory (LLNL)

1. LLNL Overall Performance

Field & Program Office Assessment	Program Health: Excellent
	Operational Implementation: Good

Summary: LLNL has a history of stable and exceptional NCS Program performance over the years, which continued in FY23 with LLNL internal NCS performance metrics resulting in a grade of Very Good (second highest on a five-category scale), and current program health remains strong with quality NCS products such as evaluations, assessments, infraction reports, walkthrough inspection reports, etc., delivered in a timely fashion. Challenges faced by the program this year include a repeat infraction relating to inadequacy in inventory systems, which has since been rectified, and difficulties in maintaining NCS training qualifications for the entire Alameda County Fire Department. The LLNL NCS Division (NCSD) has provided outstanding technical support to Superblock, Radioactive & Hazardous Waste Management, and LLNL operations at the NNSS.

Accomplishments included the NCSD Nuclear Criticality Safety Program (NCSP) Task Manager supporting the ICNC 2023 conference as a Member of the International Scientific Advisory Committee and concluding the conference with a closing plenary address. LLNL staff won the best (most interesting) poster and second place poster. At the International Symposium on Packaging and Transportation of Radioactive Materials, a criticality safety engineer-in-training won best poster for young members. These and many LLNL awards and honors are evidence of the competency and influence of the NCSD. LLNL also continues to provide leadership in Joint Working Group (JOWOG)-30 (Facility Safety) under auspices of the US/UK Mutual Defense Agreement and leads in US national standards development through membership in ANS-8. In FY23, the NCSD NCSP Task Manager hosted and chaired the annual meeting of the International Criticality Safety Benchmark Evaluation Project (ICSBEP) technical review group in Paris, France, and approved seven new evaluations for publication. LLNL will host the next meeting at Livermore Valley Open Campus (LVOC) in April 2024. In the past five years, the NCSD has contributed five new benchmarks approved for publication and will submit three additional benchmarks in April.

Going above and beyond, LLNL continued its contributions through longstanding Criticality Safety Support Group and CNS NCS Committee memberships. The NCSD continues to play a vital role in the national NCS instruction by continuing to provide significant portions of the national hands-on NCS training course, further developing and teaching the UC Berkeley NCS pipeline course, and providing the two-week national Safety Analysis Report for Packaging (SARP) preparation and review course. The NCSD also took on additional responsibility in support of Material Control and Accountability (MC&A) to complete required inventory measurements for NA-70 on short notice.

Based on national and international leadership in the NCS community, assistance to other sites, and commitment to effective succession planning including hiring, training and qualification, and retention, the LLNL NCS program health is graded as Excellent. The NCSD was successful in hiring and currently has nine qualified CSEs, 10 CSEs-in-training, and only one vacancy for a

technical position. The program elements consistently exceed the requirements, and many are considered best in class. The minor non-compliances are actively being corrected or improved.

Operational implementation at LLNL is graded as Good, as evidenced by conservative NCS controls that are easy for operations to comply with; good engagement and very close and effective collaboration between criticality safety and operations as highlighted in this year's triennial independent internal assessment (IIA) of the LLNL criticality safety program, a strong safety reporting culture in both LLNL and NNSS locations; and participation in information exchanges with criticality safety experts at other sites. Assessments performed through the year did not identify any significant issues that would indicate a failure to effectively implement the NCS program. However, three infractions were identified at LLNL over the past year, two of which were recurrent and indicated significant safety concerns around LLNL Physics and Life Sciences (PLS) operations' actions and responses that reflected a potentially weak safety culture. LFO will continue to track this for correction and improvement.

The NNSA Headquarters office agrees with these health grades.

2. LLNL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	1	0	0
Level 4	2	0	0

Summary: The infractions reported involved a depleted uranium reflection limit being exceeded, an enriched uranium mass limit being exceeded (Level 3 Infraction), and a waste drum's fissile material being incorrectly inventoried in the tracking system (LLNMAS) based on incorrect gamma-spectroscopy results. The first two infractions had similarities in that they both were under the same LLNL department (Physics and Life Sciences), and the response and recovery efforts to both were found to be inadequate and raised concerns. This was of moderate significance given that the Level 3 infraction also reflected a concern with safety culture. LLNS is expected to enter these occurrences and corrective actions into their Issues Tracking System (ITS) and is working on identifying issue owners - LFO will continue to track their progress on addressing these issues.

3. LLNL Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: No program non-compliances were identified during this reporting period.

4. LLNL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
8	2	3	1	6

Summary: An issue on employees inadvertently exceeding the 100kg material storage limit in B235 was added in FY23 and has been open for longer than 6 months. It had among its apparent causes that LLNL management did not coordinate work planning with NCS, as well as employees who approved shipments of Depleted Uranium lacked an understanding of NCS controls (similar to LLNL operations at NNSS, ISS-071277.01). However, it is not clear that LLNS's corrective actions (CAs) addressed these identified causes, which LFO will be reviewing further.

The trend of significant LLNS implementation gaps in providing a nuclear accident dosimetry system per ANSI N13.3-2013 (R2019) was open for longer than a year and was of moderate significance since the gaps detract from the rapid and accurate assessment of personnel absorbed doses resulting from a criticality accident, which may be of the utmost importance for assisting exposed individuals with their medical treatment. LLNS has not entered CAs for this for ~14 months as of this reporting (11/2/23) – the same length without identified CAs as the issue of an outdated procedure attached to a work control document (WCD). This issues mgt. trend is of moderate concern and LFO has identified this as an issue in ITS.

The trend of multiple instances of a waste drum without a criticality condition selected and labeled, open for longer than a year, was also of moderate significance given assumptions without verification, complacency, and unclear roles and responsibilities (this last cause also contributing to LLNL's DAF ISS-071277.01). LLNS is reviewing SCCC label requirements with Radiological Hazardous Waste Management and Superblock technicians for corrective training and updating the OSP or applicable work control document to add responsibilities.

The lack of accumulations procedures supporting NCS has been open for longer than a year and is of moderate significance – while historical Non-Destructive Assay measurements suggested fissionable material would not inadvertently accumulate in significant quantities, these measurements were almost two decades old, and per a 2019 LFO Security-identified issue, hold-up was not being adequately tracked. LLNL plans to develop a Holdup Plan and begin characterization measurements by the end of 2023.

The occurrence on the B332 TSR violation related to potential discrepancies impacting TSR CAAS alarm setpoints has been open for longer than a year and is now of lower significance since corrective actions have been completed and LLNS is currently performing an Effectiveness Review.

The concerns that NCSD controlled documents were not assigned a periodic review cycle (new for FY23) and an outdated version of a procedure attached to a WCD (mentioned above, open for longer than a year) were of lower significance, as no major issues with the documents themselves have yet been noted. Also, the issue with a Raschig ring inspection procedure missing requirements is older than a year but is of low significance as Raschig rings are used at LLNL only as an additional defense-in-depth measure for beyond design basis events, and when LLNS updates the CSP document, they plan to remove the requirements in question.

The LFO is tracking these issues through the issues tracking system (ITS) for progress and performs interviews and has email exchanges to discuss the items. Additionally, they are discussed during weekly NCSD staff meetings that LFO attends. For almost all cases, these issues are captured in the monthly CS metrics.

5. LLNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	9	24	10	3	11	1
Federal	1	3	0	0	0	0

Summary: Nothing significant to note regarding staffing.

Nevada National Security Site (NNSS) LLNL Operations

1. NNSS LLNL Overall Performance

Field & Program Office Assessment	Program Health: N/A
	Operational Implementation: Good

Note: Refer to the LLNL section for the program health.

Summary: LLNL has implemented NCS procedures for all NNSS operations. LLNL participates in the Criticality Control Review processes as described in the Integrated Nuclear Criticality Safety Program Description, PD-NOPS.003.

LLNL has performed operations in accordance with approved evaluations and procedures, resulting in no violations or infractions during the reporting period.

The NNSA Headquarters office agrees with these health grades.

2. NNSS LLNL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0

Summary: No infractions reported for NNSS LLNL operations during this period.

3. NNSS LLNL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
1	0	0	0	1

Summary: The previous Device Assembly Facility LLNL Infraction where the Criticality Safety Index (CSI) was exceeded revealed a lack of procedures for material moves such that roles and responsibilities were not clearly defined, which was similar to the LLNL site's multiple instances of a waste drum without a criticality condition being selected and label applied that similarly had unclear roles and responsibilities contributing to it. The Fissile Material Handlers (FMHs) also lacked an understanding of NCS controls, a similar cause to the B235 infraction at the LLNL site (discussed in the LLNL section). While LFO will monitor these aspects, due to the high safety

margin of the CSIs in this event, this was considered a low significance concern from a criticality perspective.

4. NNSS LLNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	0	N/A	0	1	0	1
Federal	N/A (Subset of LLNL Staffing - Federal)					

Note: Staffing here considered to be NNSS residents.

Summary: There is currently no contractor LLNL NNSS NCS resident (as there was in the past), but LLNL NCSD has a qualified part-time employee helping to fill this gap and adequate NCSD staff supporting remotely, campaign by campaign.

On the Federal side, the Nevada Field Office (NFO) requests other federal offices' resources as needed to ensure adequate federal oversight of the respective contractor activities at NNSS per the Memorandum of Agreement (MOA). However, since NFO, NA-LA, and NA-LL will coordinate assessments, investigations, local Emergency Management, Emergency Management drills and exercises, and other required oversight activities of LANL and LLNL NNSS operations per the MOA, the volume and pace of LANL and LLNL fissile material work at NNSS may justify a specific NA-LA and NA-LL oversight position or assignment. Thus, OA-23-AMOS-010, *Oversight Assessment Report for the Implementation of the Integrated Nuclear Criticality Safety Program at the NNSS*, which LFO, NFO, and NA-LA performed jointly, identified OFI-CS.2-3: "The NA-LA and NA-LL Field Offices do not have oversight staff positions dedicated for oversight of NNSS activities such as a JLON Champion, or a specific description in the MOA."

Nevada National Security Site (NNSS)

1. NNSS Overall Performance

Field & Program Office Assessment	Program Health: Good
	Operational Implementation: Good

Note: Program Health and metrics data is for the NNSS M&O Contractor Mission Support and Test Services (MSTS) only. Other programs that perform work at NNSS such as Los Alamos and Lawrence Livermore report their metrics through their own respective sections.

Summary: The MSTS nuclear criticality safety program has completed all scheduled facility walk-throughs and assessments on time. The staff remains engaged in all criticality safety work at NNSS through the attendance of staff in operations planning meetings, performance of NCS Evaluations (NCSEs), reviews and/or revisions of procedures and facility documents, the administration of the Criticality Control Review (CCR) process and providing support for the revision of safety basis documents. MSTS participated in the Joint Criticality Safety Committee meeting this reporting period. While performance remains good due to long term sub-contractor support, the direct MSTS position of Criticality Safety Division Manager has remained vacant for nearly a year.

The NNSA Headquarters office agrees with these health grades.

2. NNSS Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: The MSTS program has had no infractions during this reporting period.

3. NNSS Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: The MSTS program has had no program non-compliances during this reporting period.

4. NNSS Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	12	0	0	0

Summary: Multiple program and management assessments during the year discovered 12 Opportunities for Improvement (OFIs) in total.

5. NNSS Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	3	19	0	1	0	1
Federal	1	14	0	0	0	0

Summary: MSTS is currently utilizing long-term sub-contractor staff. The MSTS direct position of Criticality Safety Division Manager has been unfilled for approximately 10 months.

Los Alamos National Laboratory (LANL)

1. LANL Overall Performance

Field & Program Office	Program Health: Marginal
	Operational Implementation: Good

Summary: The LANL Nuclear Criticality Safety Program (NCSP) health this year has been qualitatively lowered to marginal; vice good in previous years. This rating substantially aligns with the FY23 LANL NCS Division's performance metrics ranking of "Needs Improvement" confirming that the program elements meet most of the minimum requirements with some elements identified below the minimum program requirements. Despite program health weaknesses, overall operational implementation of criticality safety at LANL's defense nuclear facilities continues to be good while acknowledging that further improvements are needed.

With longstanding NCS challenges still outstanding and the ramping up of the NNSA 30 pit-per-year (ppy) mission at the Technical Area (TA)-55 Plutonium Facility (PF-4) underway, the Los Alamos Field Office (NA-LA) requested an assist visit from the DOE Criticality Safety Support Group (CSSG) to review the LANL NCSP related to PF-4 with a focus on the ability of the facility to safely transition to the 30 ppy mission (CSSG Tasking 2022-01). The CSSG final report concluded "At this moment the NCS Program is capable of enabling the 30-ppy mission. However, the situation is fragile." In all, the final report included 21 recommendations summarily describing NCS organizational structure challenges (alignment and funding); criticality safety analyst (CSA) staffing levels (including the lack of Senior CSA qualifications); inadequate empowerment of the analysts; and the need for Operations to team with the NCSD "to drive consistent limits for similar operations." Following issuance of the CSSG final report, LANL promptly completed several actions to address some of the recommendations including:

- Realigning NCS resources and groups with TA-55 operations organizations
- Completing Senior Qualification of three LANL CSAs and several additional subcontractor CSAs
- Revising a procedure that provides a disposition path for minor nonconformances, including field-recoverable process deviations using a graded approach, and
- Establishing a Chief NCS Engineer position within the NCSD

In addition, the Senior Leadership of the NCSD was changed in FY23, along with their immediate supervisor – the LANL Nuclear Safety Program Director (due to a recent retirement). While the goal of this change is to provide added criticality safety expertise within the division (the new NCSD Leader and the Chief NCS Engineer are both DOE CSSG members with extensive NCS experience), the immediate effect has introduced some concerns with the continued requisite administration of the NCSD (e.g., timely and quality submittals to DOE, the need to further improve management of scheduled NCS assessments, and CSA field time and infraction resolution length – which are all NCSP performance metrics currently measured locally on a quarterly basis).

Furthermore, the stated concern from last year's report remains mostly unchanged:

> *Notwithstanding the [substantial completion of the new/revised criticality safety evaluation documents (CSEDs) to address the 'backlog' of 2013/14 Evaluation of the Safety of the Situation (ESS) deficient CSEDs], challenges remain to efficiently implementing criticality safety requirements to support 30 pit-per-year (ppy) program requirements. One of the primary concerns is timely implementation of approved DOE-STD-3007-compliant CSEDs which have been written to resolve the aforementioned 2014 ESS. While the 'backlog' is substantially complete, a significant number of new and revised CSEDs have been issued but not implemented in the facility – more than 50. This delay in posting the new CSED limits and controls necessitates the facility's continued reliance upon ESS-imposed criticality safety limits because previously posted limits and controls were deemed, by definition, inadequate and non-compliant with consensus codes and standards. Some of this delay has been hesitancy of Operations to accept the 100 KW combustible loading control administrative control limit – a DSA-specified key element of the TA-55 Transient Combustible Loading SMP.*

Notwithstanding these concerns, the continuous efforts of the LANL Associate Laboratory Director – Weapons Production Deputy Chief Operating Officer (ALD-WP-DCOO), the LANL Nuclear Criticality Safety Committee (NCSC) Chairman, and the TA-55 Nuclear Criticality Safety Board (NCSB) Chairman – who are all the same person – must be acknowledged. In addition to performing his regular duties as assigned, he is (1) ensuring the effective and timely resolution of the CSSG recommended actions through the LANL issues management system by actively managed each issue; (2) convening TA-55 Learning Teams to resolve longstanding conduct of operations (CONOPS) concerns affecting criticality safety such as with the TA-55 operating procedure (TA55-DOP-016) to prevent recurrence of NCS process deviations during material movements, and (3) significantly improving ownership of nuclear criticality safety by Operations.

Despite the overall NCSP health challenges described above, operational implementation of the LANL NCSP by workers on the floor is judged to be good. This primarily considers criticality safety implementation at the deck-plate rather than the managerial and supervisory weaknesses describe above (i.e., delayed implementation of revised 'backlog' CSEDs, need to fully address CSSG assist visit recommendations, continued emphasis on NCSD centric performance – NCS assessments, field time, infraction resolution length, etc.). Continued emphasis of criticality safety on the floor is evident with the Operators' self-identification of potential process deviations, the Fissionable Material Handlers and Operators regular participation in TA-55 learning teams – suggesting criticality safety related procedural improvements that work for them, and having no measurable increase in the number of criticality safety infractions during the year despite the vastly accelerated number and diversity of fissile material operations occurring across LANL (including PF-4 D&D and LAP4 equipment refurbishment efforts) as part of the ramping up the 30 ppy mission.

Finally, it is noted that NA-LA Criticality Safety Staff completed two independent assessments of the LANL NCS program this year.

1. LANL NCS Nature of Process Implementation – no significant issues identified.
2. NCS Implementation at the NCERC – no significant issues identified. [See LANL NCS Operations at NNSS – Overall Performance Summary for further discussion.]

The marginal performance rating reflects the challenges and issues discussed above. However, LANL and NA-LA are fully addressing these challenges and issues and additional federal management focus (e.g., HQ visits, additional assessments, additional compensatory measures, etc.) are not warranted for the LANL NCS. Assist visits and assessments help identify issues and the recommendations from the FY23 CSSG final report are already being undertaken to remedy the underlying causes of these program weaknesses. Recognizing that there are no short-term fixes, LANL Management and the NCSD must now resolve to incorporate the recommended NCS program improvements throughout the organization on a deliberate and persistent path. This will take time and its undertaking in the middle of the LAP4 mission improvements, an NCSD senior management change, and a divisional/group/CSA reorganization is challenging. However, there is cautious optimism in this approach too. LANL is refreshing their NCSP on bedrock following the recommendations of the CSSG assist visit (strong technical expertise, Operations ownership of nuclear criticality safety with Management's support, empowerment of CSA staff and their purposeful advancement and retention) and is moving towards a more simple, principled, and responsive program. Already, changes to the NCS Program resulting from the CSSG assist visit recommendations have resulted in growth toward a more healthy, robust, and sustainable program to meet mission needs and much of the efforts have been dedicated to improving the staffing and organizational structure that will improve resources for FY24. In all of this, the primary challenge is recognizing the urgency of change and the necessary (and timely) effort to move forward with the CSSG assist visit recommendations.

The NNSA Headquarters office agrees with these health grades.

2. LANL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	1	0	0
Level 4	20	0	0
Level 5	38	0	0
Program Non-Compliances	0	0	0

Note: Includes LANL NCS Operations at NNSS Criticality Safety Infractions to avoid skewing overall LANL NCSP reporting numbers**.**

Summary: While the number of LANL criticality safety infractions remains relatively consistent with previous years, the LANL NCSP FY23 performance metrics also identify as "needs improvement" for both the criticality infraction index and the criticality control process deviation metrics. This is a recurring concern since FY21. As stated in last year's report,

> "*These observations reinforce a continuing need exists for the NCS program to engage facility, engineering and operations management and all technical staff personnel to ensure their understanding of the responsibilities as defined by LANL SD130, Nuclear Criticality Safety Program, and in the flow down of facility specific NCS implementation policies and procedures*."

Furthermore, the CSSG final report included three recommendations specifically related to criticality safety infractions:

> R19. Adopt the minor-nonconformance best practice used at Y12;
> R20. Identify a subset of potential process deviations (PPDs) that are correctible by person-in-charge (PIC) and the Criticality Safety Officer (CSO);
> R21. Empower the PIC, CSO, and CSA to approve recovery plans for Level 3-4 PPDs.

While the growing infraction recovery time was previously mentioned as an emerging concern, the LANL NCSP has taken several actions to address these recommendations. Specifically, NCS-AP-010, *Event Response*, was revised to provide clarification for verbal recovery and written recovery, to more closely align with the minor-nonconformance best practice used at Y12 and empower the responsible CSA to approve infraction recovery plans. Furthermore, the existing TA-55 NCS Program procedures (e.g., TA55-AP-522, *Nuclear Criticality Safety Program at TA*-55) are being revised to permit a pre-approved facility recovery list of potential process deviations which are not otherwise considered NCS infractions.

3. LANL Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Note: This metric reports program non-compliances with DOE orders and standards, typically found through formal assessments. This should not be confused with LANL's non-compliance category of infractions, which are typically conditions found which indicate a non-compliance with the site's SD 130, *LANL Nuclear Criticality Safety Program* (e.g., identifying a process with no controls and/or no evaluations when they should have them).

Summary: No program non-compliances were identified during this period.

4. LANL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
47	132	107	39	20

Note: Includes LANL NCS Operations at NNSS Issues from the IM System to avoid skewing overall LANL NCSP reporting numbers**.**

Summary: As a result of FY23 operational awareness activities, external assessments, internal self-assessments and other review activities, 132 new NCSP issues were identified, including issues tied to implementation of facility specific NCS programs. There were 242 actions closed during FY23 either directly with the NCS Division or related to implementation of facility-specific programs. The NCS Division is working hard to apply resources to resolve issues, while also dedicating resources to support assist visits, reviews, external assessments, and internal assessments. The few actions open for longer than one year specific to the NCS Division are few and being actively managed; they require additional time on the part of experienced criticality safety analysts, increased support for analytical methods, or simply more time (i.e., performance of an effectiveness review for closure several issues is purposefully scheduled six months following the issue's closure action(s), but issue closure is dependent upon the effectiveness review of closure actions too, thereby keeping the issue open). The other actions open for longer than one year are being addressed through the applicable NCSP implementing organizations and their management (CMR, TA-55 and the TA-55 Nuclear Criticality Safety Board). Much time has been dedicated to successful implementation of recommendations from the DOE CSSG assist visit; there has been significant progress toward completion.

5. LANL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	22	17	9*	5	10	10
Federal	3	6	0	0	0	0

Note: Includes Staffing for LANL NCS Operations at NNSS to avoid skewing overall LANL NCSP reporting numbers**.**

* Four of the nine in-training NCS analysts are task-qualified (facility and/or calculations)

Summary: While past years did not include subcontractors in the number of qualified NCS engineers as part of this staffing and experience metric, this information includes LANL and subcontractor personnel, together. For completeness, the average NCS experience for the six subcontractors is 28 years in comparison to the average NCS experience for the thirteen LANL CSAs of 10.7 years. There were five LANL staff that left in FY23 and include a Division Leader, Executive Advisor, two qualified CSAs and one CSA in-training. There were 10 LANL staff that joined the division in FY23 and include a Division Leader (Senior Qualified CSA, CSSG Member), Chief Engineer (previous Senior Qualified CSA, CSSG Chair), Staff Operations Manager, and seven CSAs in-training. LANL management has developed a staffing needs analysis and plan.

Of particular note is the completion of Senior Qualification of three LANL CSAs and several additional subcontractor CSAs. In addition, several CSAs have been successful in this year's pilot Immersion Program where they work alongside operations personnel in PF-4 for experience and in-depth understanding of operations.

Two previously reported Federal in-training Criticality Safety Program Oversight staff members became fully qualified in FY23.

Nevada National Security Site (NNSS) – LANL Operations

Includes National Criticality Experiments Research Center (NCERC)

1. NNSS LANL Overall Performance

Field & Program Office Assessment	Program Health: N/A
	Operational Implementation: Good

Note: Refer to the LANL section for the program health.

Summary: In FY22, LANL received concerns from the DNFSB which "identified weaknesses in the NCERC criticality safety program." [Reference DNFSB letter dated June 16, 2022, that enclosed *Staff Issue Report Review of the Integrated Criticality Safety Program at the National Criticality Experiments Research Center, Nevada National Security Site*, dated December 14, 2021] Since that time, and continuing into FY23, NA-LA Criticality Safety Program Oversight Staff and the LANL NCSD have aggressively pursued corrective actions for the identified weakness, to include an increased focus on safety oversight of the NCERC activities.

As similarly described in the DOE FY 2023 Annual Report to Congress on Defense Nuclear Facilities Safety Board-Related Activities,

> *[I]n FY23, NNSA re-validated the analysis and evaluations of NCERC nuclear criticality safety evaluations to address DNFSB concerns regarding inadequate consideration of impacts of an increased seismic hazard in NCERC; no additional issues were identified because of the increased seismic hazard in NCERC and applicable technical documentation was revised as a result of the analysis and evaluations to explicitly address the concern. In conjunction with the FY23 establishment of performance metrics to evaluate the health of the nuclear criticality safety program at NCERC (specifically), an increased availability of LANL-qualified Criticality Safety Analysts was included as a new NCERC NCS performance metric (i.e., 0.75 FTE availability goal). Finally, as committed to the Board, NA-LA completed an independent NCS assessment of the LANL NCS program implementation at NCERC in July 2023, that was shadowed by DNFSB Staff. Part of the assessment's scope was to evaluate LANL's corrective actions to weaknesses identified within the Board's letter; the assessment concluded "several of the DNFSB identified weaknesses remain unresolved." These remaining four weaknesses were identified as observations in the assessment report with corrective actions being managed per the LANL Issues Management system.*

In the NA-LA performed independent assessment *NCS Implementation at the NCERC* (July 2023), the assessment concluded:

> *[T]he integrated NCSP used at NCERC substantially complies with NNSS Policy Document (PD)-NOPS.003, Integrated Nuclear Criticality Safety Program Description, … and LANL System Description (SD) 130, Nuclear Criticality Safety Program, requirements. However, several of the DNFSB identified weaknesses remain unresolved.*

These remaining weaknesses include:

- a necessary revision to CEF-PLA-014, *LANL NCERC NCS Program Plan*, to acknowledge and address inconsistencies between the integrated criticality safety program used at NCERC and the applicable LANL NCS program;
- a recommended revision to the LANL NCSP performance metrics for improved clarity, usefulness, and management;
- improved management of NCSD resources "to provide 0.75 FTE criticality safety analyst availability at the NNSS to support NCERC and other ongoing LANL NCSD requirements." In 4th quarter FY23, this availability was improved from previous quarters to 0.75 FTE; and
- improved management of NCSD resources to provide "three fully duty-qualified CSAs at the NNSS to support NCERC NCS programmatic requirements in response to DNFSB letter Review of the Integrated Criticality Safety Program at the NCERC, NNSS. At the end of FY23, LANL NCSD has 11 Senior Qualified CSAs that are qualified to perform all NCS work at NNSS and an additional two qualified CSAs that are task qualified to perform work at NNSS. [Completed.]

For completeness, it is noted that LANL did not perform any Fissile Material Handling operations under the purview of SCE-PLA-024, *Subcritical Experiments (SCE) Los Alamos National Laboratory Nuclear Criticality Safety Division Plan for Administrative Practices* during FY23; SCE-PLA-024 was inactivated.

The NNSA Headquarters office agrees with these health grades.

2. NNSS LANL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0
Program Non-Compliances	0	0	0

Summary: There were no infractions to report for LANL NNSS operations this period.

3. NNSS LANL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
5	10	4	3	3

Summary: LANL NCERC-Field Operations (FO), Nuclear Engineering and Nonproliferation (NEN)-2 and NCSD staff are making adequate and sustained progress in addressing outstanding issues, to include new issues from the *NCS Implementation at the NCERC* NA-LA assessment report. While a few have been open for longer than one year, they do not pose a significant NCS concern/non-compliance; they are otherwise categorized as opportunities for further program improvement (i.e., low risk) and their completion is subject to other ongoing priorities (to include completion of the CSSG assist visit recommendations).

4. NNSS LANL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	13	23.7	0	N/A (Included in LANL Staffing)		
Federal	N/A (Subset of LANL Staffing - Federal)					

Summary: At the end of FY23, LANL NCSD has 11 Senior Qualified CSAs that are qualified to perform all NCS work at NNSS and an additional two qualified CSAs that are task qualified to perform work at NNSS.

Sandia National Laboratories (SNL)

1. SNL Overall Performance

Field & Program Office	Program Health: Excellent
	Operational Implementation: Good

Summary: The Program Health grade is excellent based on continuous improvement as Sandia National Laboratories (SNL) updated the *Program Improvement Plan,* started in Fiscal Year (FY) 2016, to Revision 6. In FY 2023, SNL provided metrics to the Sandia Field Office (SFO) for a third year showing positive trends. SNL procedures, processes, and other documents were provided to Los Alamos National Laboratories (LANL), Lawrence Livermore National Laboratory (LLNL), Savannah River Site (SRS), Y-12 National Security Complex, and Pacific Northwest National Laboratory (PNNL) to share lessons learned and best practices at SNL. SNL completed a requested Triennial assessment of LANL supporting the National Nuclear Security Administration's criticality safety overall program. A thorough Triennial assessment was completed of SNL by nine Nuclear Criticality Safety (NCS) engineers from three sites (LANL, SRS, and PNNL) resulting in no Findings, nine Opportunities for Improvement (OFIs) and 17 Noteworthy Practices stating that the program is very healthy and formal.

The Operational Implementation grade is good based on support completing analyses for multiple locations across SNL. The number of infractions and non-compliances for a ninth year was low, with one minor infraction and two non-compliances; one identified during an SFO assessment. Assessments of facilities continued to improve as they met schedule and were used for training new engineers. One facility had multiple issues and the SNL Criticality Safety Program (CSP) has been heavily involved monitoring all activities. Floor level support (time in facility) during operational activities continues to improve and SNL now has a database for tracking time in facility.

Although a small program with a low risk, the SNL CSP continues to formalize their program and continues to improve. In FY23, SNL completed a second year of NCS training for over 75 emergency management responders and Kirtland Air Force Base firefighters. SNL supported the DOE complex and international partners by supporting NCS assessments at LANL; attending the 12th International Conference on Nuclear Criticality Safety (ICNC) in Japan presenting seven papers; and submitting a benchmark evaluation to the International Criticality Safety Benchmark Evaluation Project (ICSBEP) Technical Review Group (TRG) for the next edition of the ICSBEP Handbook. SNL performed subcritical benchmark experiments with LLNL, LANL, and the French Institut de radioprotection et de sûreté nucléaire (IRSN) for validating time-dependent radiation transport software and non-destructive assay techniques. SNL provided NCS training for the DOE NCS Program (NCSP), University of New Mexico, the United Kingdom, and provided the SNL NCS firefighting training to LANL, LLNL, NNSS, and PNNL. Three DOE NCSP courses were provided to approximately 50 students from five countries, 11 DOE sites, six companies, one university and two outside Federal agencies. SNL has proactively increased staffing support for the new Combined Radiation Environments for Survivability Testing (CREST) facility currently in the CD-1 phase of design which may require a Criticality Accident Alarm System. SNL started discussions with the two Navy Nuclear Laboratories for benchmarking the SNL CSP in FY24.

The NNSA Headquarters office agrees with these health grades.

2. SNL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	1	0	0

Summary: On November 21, 2022, during the first activity of the week at the Sandia Pulsed Reactor Facility (SPRF), two operators discovered a <2 g highly enriched uranium fission chamber on a fuel handling table where only 7uPCX fuel elements are allowed. The operators immediately followed the response for a NCS process violation or non-emergency. The incident was categorized as an Occurrence Reporting and Processing System (ORPS) criteria 10 (1) *Management Concern* as it was not a credible criticality accident scenario due to the small quantities of material. The SFO followed the causal analysis for this infraction and noted that although it was only a small quantity of material, SNL pursued this to determine the causes of the event and has updated the CSE to allow for this condition. SNL is to be commended for the initial and follow-on response actions.

3. SNL Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no identified non-compliances with DOE O 420.1, *Facility Safety,* and the American National Standards Institute/American Nuclear Society-8 series of criticality safety standards.

4. SNL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
1	3	3	1	0

Summary: There was one open issue *Open at the Start of the Year* for the Radioactive and Mixed Waste Management Facility for the inventory of Criticality Safety Index (CSI) containers tracking log discrepancy. There were three issues added during FY23 through the corporate event notification system discussed previously: 1) a material handling deviation at Sandia Pulsed Reactor Facility (SPRF); 2) a mishandling of a ^{239}Pu package at Building 957C; and 3) a CSI log sheet deviation at Building 957C. The event at SPRF is being tracked with corrective actions that have been opened for longer than six months.

There was one issue identified during the 2023 self-assessment and was associated with the 9940 Site. This issue was related to the facility manager not completing NCS120/220 training within the one-year period of assuming the manager position as required in the NCS Program Description Document. However, it was determined that no corrective actions needed to be entered related to this event as the manager has since come into compliance with this requirement.

5. SNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	7	10.3	4	0	3	0
Federal	1	18	1	0	0	1

Summary: In the last two years, SNL lost two of their senior NCS staff (neither were heavily involved in performing NCS activities) and one junior staff that was active in the program. SNL has been very aggressive in hiring and retaining NCS staff. In the past year, SNL hired two new staff members to primarily support NCS, converted a graduate student from their NCS university pipeline, qualified one new NCS staff, and requalified all six others.

The one qualified SFO NCS staff member devotes approximately 20% of their time to NCS oversite due to being responsible for oversight of another three functional areas. In 2023, the SFO had a PNNL Fellow in NCS oversight training; however, the Fellow left to join SNL (and incidentally, is qualifying in NCS.) The SFO is working on succession planning as the SFO NCS staff member is eligible for retirement.

Pantex

1. Pantex Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Note: The Program Health grade reflects the combined performance of the contractor at Y-12, Pantex and the Uranium Processing Facility (UPF). However, the Operational Implementation grade is specific to implementation at this site.

Summary: The majority of work for the Pantex NCS Program is associated with the large multi-year improvement plan which began in FY20 and is scheduled to be completed by the end of FY24. The intent of the NCS Improvement Plan is to upgrade the overall quality and effectiveness of the NCS Program at Pantex through improvements with the following:

- Criticality Safety Evaluations
- Document Management and Implementation of NCS Controls
- NCS Staffing and Qualifications
- Management and Operator Training
- Issues Management and Metrics
- Hazard Categorization

Pantex has done a good job completing a majority of the Improvement Plan Actions. The issues completed in FY23 were clarification improvements in procedures with NCS controls; verification of NCS credited items for special tooling & containers; and development & concurrence of Pantex NCS Program metrics. Currently, five issues remain with a scheduled completion date towards the end of FY24. These improvement efforts continue to elevate NCS program health and operational implementation from previous years. The overall Program Health and Operational Implementation at Pantex are considered good, which was demonstrated through two independent assessments conducted in FY23 that covered implementation of management responsibility requirements in ANSI/ANS-8.19 at Pantex, in which feedback was overall positive for the Pantex NCS Program.

The NNSA Headquarters office agrees with these health grades.

2. Pantex Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Occurrences	0	0	0
Deficiencies	0	0	0
Minor Non-Compliances	0	0	0

Summary: Due to the simplicity of the NCS requirements at Pantex, NCS infractions are rare.

3. Pantex Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: There were no identified program non-compliances at Pantex in FY 2023.

4. Pantex Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
6	4	6	7	3

Summary: Six issues were open at the start of FY23 and four issues added in FY23. The four issues added in FY23 were all identified by CNS through various self-assessment activities. Three issues have been open longer than a year and are summarized below:

- One involves tracking several improvements CNS is making to the Pantex NCS Program. This is a large multi-year plan which began in FY20 and is identified in the Pantex NCS Improvement Plan detailed in the Pantex Overall Performance Summary (Section 1.) above.
- The remaining two issues were identified in an NPO led assessment. Actions to resolve these issues require changes to E-SD-2026, *Nuclear Criticality Safety Program Description,* which is the Criticality Safety Program description document for Pantex and Y-12. Revisions to E-SD-2026 require NPO review and approval. Additionally, the overall complexity of the document and the associated procedures/documents that are needed to support changes generally take an extended amount of time to revise E-SD-2026. For this reason, the age of these issues is considered acceptable.

The management of all NCS issues is adequate and the length of time taken to close them is appropriate given the scope of the issues.

5. Pantex Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	3	8.3	2	0	1	0
Federal	2	15	2	1	2	0

Note: Criticality Safety Federal oversight of Pantex, Y-12 and UPF is performed by the NPO.

Summary: Pantex acquired one new NCS Engineer in FY23. NCS staffing in FY23 at Pantex is adequate for the mission needs and NCS risk at Pantex. Y-12 and Pantex NPO site separation occurs in Q3 of FY24 with contractor site separation proceeding thereafter. After site separation, the federal Pantex Field Office is designating ½ FTE to NCS oversight. See Y-12 Staffing for additional information on NPO staffing.

Y-12 National Security Site (Y-12)

1. Y-12 Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Marginal

Note: The Program Health grade reflects the combined performance of the contractor at Y-12, Pantex and the UPF. However, the Operational Implementation grade is specific to implementation at this site.

Summary: The Nuclear Criticality Safety Program (NCSP) at Y-12, Pantex, and UPF is described in document E-SD-2026, *Nuclear Criticality Safety Program Description*. At Y-12, the NCS program is very mature and is implemented through a number of organizations and long-established procedures. Various management oversight processes are in place by Consolidated Nuclear Security, LLC (CNS) to monitor the health of the NCS program, including the Nuclear Criticality Safety Committee (NCSC), the Nuclear Criticality Safety Advisory Council (NCSAC) and the Corrective Action Review Board (CARB). CNS has established additional tools for monitoring the performance and health of the NCS program, including the Health Survey tool (since 2019) and the NCS Integrated Schedule (since 2020). The level of oversight and the quality of the oversight provided through these processes exceeds expectations.

Fiscal Year (FY) 2023 was a challenging year for the Y-12 site due to a number of serious NCS infractions. Despite these challenges, the NCSP managed to actively work improvement efforts in addition to responding to NCS infractions. CNS exceeded several FY23 NCS goals and fell short in only a handful of goals, notably with the goals for simplifying the analysis and control set associated with certain fissile containers (Container Improvement Plan), and the approval of the target number of Criticality Safety Evaluation (CSE) updates across the site. This is not viewed as a serious concern as CNS's commitment to both the CSE update process and the Container Improvement Plan are well established. Shortfalls in the scheduled progress of these efforts are primarily due to an increased level of effort over the predicted effort needed, rather than a lack of prioritization. The CSE update process in particular is recognized as a best-in-class effort by CNS and NPO and some delays in the established goal are viewed as acceptable. NPO has emphasized the need to focus on Container Improvement Plan progress in the coming FY as these aging CSEs are viewed as the greatest risk within the current suite of NCS analysis documentation. Improved performance on the Container Improvement Plan in FY24 is expected. Overall, the NCS program health is considered 'Good'.

The NCSP at Y-12 is implemented via a mature suite of administrative and technical procedures. Significant improvements and corrections have been completed regarding the incorporation of NCS requirements into work execution documents and the in-field verification of implementation of NCS passive design features. These actions followed a number of NCS infractions in FY22 and FY23 that pointed to weaknesses in these areas. With completion of these actions to prevent recurrence, incorporation of NCS requirements into work execution documents as well as implementation and configuration management of passive design features are considered to meet expectations.

During the reporting period CNS submitted a Justification for Continued Operations (JCO) and Evaluation of the Safety of the Situation (ESS) for disposition of the "Raschig Ring Drum" detailed in occurrence report NA--NPO-CNS-Y12NSC-2022-0006. The NPO Safety Basis Approval Authority approved this submittal on 09/11/2023 and CNS is expected to begin work in the first quarter of FY24. This effort by CNS is a notable achievement that brings Y-12 closer to dispositioning the legacy non-compliance and will result in a significant reduction in risk at the site.

Y-12 continues to struggle with working to the set of NCS general requirements applicable to most fissile activities (NCSGR). Inadequate compliance with NCSGR was a contributing factor in all three in-field NCS Occurrences in FY23. Many actions have been taken in response to these issues and this area is scheduled for an FY24 NPO Assessment to review whether actions taken to date are sufficient to prevent recurrence.

Operational execution to NCS requirements presents additional issues/concerns. A high-level Management Concern that NPO has across both Y-12 and Pantex is regarding disciplined operations (i.e. CONOPS). This Management Concern is global, long standing, and extends beyond the necessity of implementing disciplined operations for NCS. The April reportable NCS event in which fissile-bearing liquid was collected in an unfavorable geometry container (i.e. bucket) highlighted the need for more aggressive action on this Management Concern.

In response to this event, the Y-12 Site Manager issued a site wide pause in fissile operations. NCS Engineering and the Criticality Safety Management and Integration organizations supported the resumption of fissile material handling in execution of, among many other actions, detailed briefings on the event and supplemental training on NCS general requirements (NCSGR) in all of fissile production. Following the training, operators were required to pass a written examination on the course content to receive approval to return to work. Y-12 further issued a Standing Order regarding maintenance affecting NCS which, among other things, required a substantial increase in the level of effort from NCS Engineering due to an increased volume of packages being sent for review.

Following the April reportable NCS event, CNS reinvigorated efforts to address the disciplined operations Management Concern after investigations into the event uncovered systemic issues identified with verbatim compliance to procedures; primarily procedures governing work planning and control for maintenance activities. CNS completed a Significant Event Investigation (SEI) after the April event, and concluded the following:

> *All levels of Y-12 Management need to understand, demonstrate, enforce, and reinforce a high standard of Conduct of Operations performance (an acceptable level of rigor and formality) of all Y-12 processes, procedure use, and work execution.*

NPO agrees with this very self-critical conclusion and the candor demonstrated by CNS with this conclusion is noteworthy. In response to this finding, CNS management revised command media to include more explicit expectations and issued a "visible leadership" plan to improve both the amount and effectiveness of supervisor and manager floor time. This plan intends to close the gap identified in the SEI through clearly communicated and demonstrated expectations for work

execution. While on the floor, supervisors and managers are expected to provide feedback regarding CONOPS performance strengths and weaknesses. Observations from this floor time will be tracked and monitored for trends. CNS is taking appropriate actions commensurate with the significance of their SEI conclusion. NPO closely monitored all resumptive and investigative efforts by CNS in the weeks and months following the event and continues to track progress on long-term corrective actions. Overall, CNS's response was exemplary in their initial action suite, their appropriately self-critical investigation, and their management of a complex corrective action plan.

Due to the severity of the April NCS Occurrence and the significant weaknesses in Conduct of Operations that were underscored by that Occurrence, the Operational Implementation is graded as 'Marginal'. Based upon CNS's response to the Occurrence and the NPO Management Concern on Disciplined Operations, no additional actions are considered necessary at this time. NPO has scheduled two FY24 assessments to evaluate the effectiveness of these actions and overall CNS progress addressing disciplined operations performance weaknesses.

The NNSA Headquarters office agrees with these health grades.

2. Y-12 Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Occurrences	7	1	0
Deficiencies	15	1	1*
Minor Non-Compliances	47	7	0

Summary:
The site-specific definitions for Deficiency and Minor Non-compliance are included below to aid the discussion.

- Deficiency: A condition inconsistent with the intended process and resulting in an NCS requirement violation. At least two unlikely, independent, and concurrent changes in process conditions are still necessary before a criticality accident is possible, but there has been a deviation from a Criticality Safety Approval (CSA)/Criticality Safety Requirements (CSR)/Criticality Safety Evaluation (CSE), an NCS-related program, or an NCS-related operating procedure. The conditions resulting from the deviation are not within the normal conditions considered in the supporting CSE. At the discretion of the NCS engineer, a condition that does not meet the above criteria may be elevated to a deficiency if it warrants more attention than that of a Minor Non-compliance.
- Minor Non-compliance: An NCS-related condition inconsistent with the intended process, but not significant enough to qualify as an NCS deficiency or NCS occurrence.

CNS has a mature NCS Infraction response process, from immediate actions to ensure safe and stable field conditions, to a thorough investigation of all events. CNS consistently works to adequately evaluate an infraction, understand the causes for the infraction, and develop appropriate corrective actions that have a reasonable expectation of preventing recurrence. Due to the number of fissile material operations, associated NCS requirements, and the site-specific infraction criteria, Y-12 experiences a number of infractions yearly. Y-12 experienced an increased number of Criticality Safety Infractions during the reporting period compared to last year, including a notable 3C2 (H) Occurrence that occurred in April. This event reinforced pre-existing NPO concerns regarding disciplined operations, NCS infractions due to personnel errors, and NCS control implementation. The response to this event fully met expectations in addressing the severity of this NCS Occurrence. Y-12 initiated site wide corrective actions, including a pause on all fissile material handing operations and maintenance in fissile areas on site with resumption occurring only after the completion of remedial training and subsequent approval from the Y-12 Site Manager or the CNS President and CEO based upon the relative NCS risk of the operation.

Y-12 placed an increased emphasis on verbatim compliance, and personnel have displayed higher sensitivity to criticality safety in the wake of this event. A review of the infraction data confirms this, as the majority (46) of the infractions occurred after the event, which was essentially in the middle of the FY. This was particularly the case in Building 9215, where the event occurred, with half (23) of the post-event infractions occurring in this facility. Because of this heightened sensitivity, while the overall infraction total increased, the ratio of deficiencies to minor non-compliances decreased, indicative of less severe infractions being identified more readily.

The eight Occurrences are also a significant increase over the previous reporting period. However, five of these events were categorized as 3C4 (L) Occurrences that were primarily identified through routine NCS activities such as the annual NCS Operational Review, the CSE update process, or the Criticality Safety Officer led Triennial Review. The regular NCS reviews and CSE updates are proving to provide effective self-oversight through the identification of these latent NCS issues. The practice of reviewing and updating NCS analysis on a routine basis, is a recommended best practice that should be considered by other sites.

* Deficiency was identified by the DNFSB Resident Inspector.

3. Y-12 Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: There were no NCS Program non-compliances identified during the reporting period.

4. Y-12 Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
20	43	27	32	13

Summary: Table 4 identifies a number of issues associated with the Y-12 NCS program which have been open for greater than six months or a year. In all instances, issue closure is tied to completion of the identified corrective actions and improvement actions if applicable. Issues that require revision and implementation of the NCS approval documentation as an action typically necessitate a longer duration to close despite the condition in the field being made safe and stable well before the documentation is revised. Some issues result in actions intended to evaluate potential solutions to the original non-compliance. Such issues can involve several iterations of an action plan to allow for the results of an evaluation and creation of the additional actions that capture the identified path forward. The necessary time to perform these steps often leads to extending issue duration, which is considered by NPO to be acceptable. Additionally, the issue significance level may drive a corrective action effectiveness review to be performed, which is typically conducted three to six months from completion of all actions. This naturally leads to an extended duration for some issues. Nevertheless, the majority (eight) of the issues open for longer than one year are carried over from the previous reporting period (open for longer than two years), representing marginal progress in burning down the inventory of long-standing issues. Three of these issues are being held open to track equipment modifications, for which the age of the issue is generally considered acceptable. Four issues are awaiting command media changes for closure of the issue. In these cases, the length of time to close the issue is considered marginal to unsatisfactory. The remaining issue is tied to a non-compliance on the uranium solution control program and is awaiting a field evaluation. This issue age is considered unacceptable given the remaining action could result in additional actions. For these five issues, lack of demonstrated progress on remaining actions by CNS is less than adequate. NPO is working with CNS on prioritization of these issues to ensure timely completion is realized. In general, however, CNS works issues with appropriate timeliness and priority.

The six issues open for longer than one year that were not carried over from the previous reporting period (less than two years old) are being held open awaiting command media changes or safety basis changes or are of low priority. For all these issues, current progress is considered acceptable.

5. Y-12 Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	32	14	26	7	14	10
Federal	2	15	2	1	2	0

Note: Criticality Safety Federal oversight of Pantex, Y-12 and UPF is performed by the NPO.

Summary: CNS has a large NCS staff and annually measures staffing needs against the site baseline (i.e. budget and work scope). Y-12 has increased mission work forecasted for the years to come, which has led to greater NCS engineer staffing needs. CNS continues to hire in excess of the mission need to account for NCS engineer attrition. FY23 saw a marked improvement in retention of NCS engineers, with a nearly 50% reduction in the number of staff lost compared to FY22. The staffing element of the program is graded as 'Good' with improvement efforts completed by CNS appearing to have impact on staff retention. Sustained improvement in staffing and retention is necessary but this area is trending in a positive direction.

NPO NCS staffing levels are adequate. The single noted staff loss is for a transition from NCS oversight into the NPO management team. One of each of the two hired staff are stationed at Y-12 and Pantex performing oversight of their respective duty location only.

Uranium Processing Facility (UPF)

1. UPF Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Note: The Program Health grade reflects the combined performance of the contractor at Y-12, Pantex and the Uranium Processing Facility (UPF). However, the Operational Implementation grade is specific to implementation at this site.

Summary: The Nuclear Criticality Safety Program (NCSP) at Y-12, Pantex, and UPF is described in document E-SD-2026. The primary focal points for the UPF NCS organization throughout FY 2023 were development of the final suite of Criticality Safety Evaluations (CSEs) to support the final UPF Documented Safety Analysis, and oversight of design, procurement, and construction activities to ensure the requirements set was adequately protected throughout. The UPF project employs the same NCS command media in use at Y-12, with some appropriate adaptations to support a project environment. The suite of command media and guidance documentation at UPF is thorough and has resulted in the production of high quality CSEs. Overall, the NCS program health is considered 'Good'.

The UPF project has done well in establishing and managing a large set of NCS requirements through the project phases – engineering, procurement, and construction. Implementation of the of NCS requirements into verified as-built configurations and operating procedures is underway but will extend for the next couple of years. The project has already begun to perform NCS requirement implementation tasks to support successful testing and startup. Thus, NCS operational implementation at UPF meets expectations.

The NNSA Headquarters office agrees with these health grades.

2. UPF Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: There were no NCS Program non-compliances identified during the reporting period.

3. UPF Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
4	8	8	2	1

Summary: UPF issues are appropriately prioritized and closed. NPO is notified as required of issues that could impact that approved DSA. No concerns have been identified by NPO regarding the UPF NCS organizations identification and timely closure of NCS issues.

4. UPF Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	12	27	0	4	0	0
Federal	2	15	2	1	2	0

Note: Criticality Safety Federal oversight of Pantex, Y-12 and UPF is performed by the NPO.

Summary: NCS staffing for the project is adequate, and no issues have been noted with CNS's ability to modify staffing levels based upon project demand.

Savannah River Plutonium Processing Facility (SRPPF)

1. SRPPF Overall Performance

Field & Program Office	Program Health: Marginal
	Operational Implementation: N/A

Summary: Savannah River Nuclear Solutions has continued to plan for future staffing needs in this area as the project and design continue to mature. The project is in the design stage and has developed Nuclear Criticality Safety Evaluations in concert with the design. No non-compliances have been identified with the project's implementation of the site criticality safety program, but significant issues pertaining to classification of the Criticality Safety Program as a Specific Administrative Control as well as concerns regarding the lack of elevated controls in some instances have been identified. The project is working through those issues. No findings have been identified from reviews of preliminary Nuclear Criticality Safety Evaluations (pNCSE). Reviews to revisit the pNCSEs are planned for 2024 with the arrival of additional Criticality Safety specific support service contractors.

Hiring obstacles had prevented the Field Office from acquiring a new staff member for Criticality Safety oversight in a timely manner but does now have a Criticality Safety Specialist in training. The Field Office has been able to obtain additional resources through support service contractors. Additionally, the Field Office is expected to gain a qualified Criticality Safety Specialist as the site transitions from DOE-EM as the landlord to NNSA. The Savannah River Project Office has hired an experienced team of additional subcontractors to assist with reviews to close staffing gaps.

Metrics specific to the Surplus Plutonium Disposition project will be added for the FY24 report.

The NNSA Headquarters office agrees with these health grades.

2. SRPPF Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: An assessment reviewing the Criticality Safety Program Description Document (CSPDD) Revision 7 was performed by the project team and captured in assessment record 2023-SA-002525. Additionally, an Annual Performance Review was performed in June of 2023. No non-compliances were identified.

3. SRPPF Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
2	0	2	0	0

Summary: During this year, Criticality Safety document reviews were limited as all pNCSEs had been completed in the previous year and there were no outstanding revisions. Resources were dedicated to resolving observations made by the DNFSB pertaining to nuclear safety. Resources have been obtained to perform another review of the pNCSEs and the Criticality Safety Program now that the design has matured and is described further in the "Staffing" section. The 2023 project Annual Peer Review (APR) final report identified two observations related to criticality safety. The first observation determined that "significant issues exist with classification of multiple structures, systems, or components (SSCs) [e.g., ventilation system, Criticality Safety Program (CSP), GBs], which are not in accordance with Project hierarchy of controls". The second observation states, "Aqueous Recovery System Nuclear Criticality Safety document (N-NCS-F-00144) for GB/Enclosure identifies a control for sumps slope to drain to a low point, before, during, and after a seismic event. SDD - Aqueous Recovery and Recycle (X-SYD-F00017) does not maintain this requirement during and after a seismic event." The first observation is consistent with issues previously identified by CDNS and the DNFSB in Nuclear Safety reviews. SRNS is currently addressing the APR, DNFSB, and CDNS observations.

4. SRPPF Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	8	21.9	7	2	6	0
Federal	0	0	1	1	1	0

Summary: The Field Office Nuclear Safety and Engineering department was stood up in late 2022 to help focus on staffing with increasing mission needs. Unfortunately, in December 2022, the Criticality Safety SME for SRPPF retired and their replacement was not able to be brought onboard until March 2023. Requests were made to bring the replacement candidate on board in November of 2022 for double encumbrance and was authorized, but a start date was unable to be provided to the onboarding individual due to the agency reaching the cap of excepted service positions. This was resolved as expeditiously as possible, but the new employee was unable to begin employment with NNSA until March of 2023. At the time, the replacement was not qualified per the Technical Qualification Program but holds a Nuclear Engineering degree from an accredited engineering school, is a graduate of the Naval Nuclear Program, and has held multiple positions within the Department of Defense and the Department of Energy which includes Facility Representative at a Hazard Category 2 facility at the Savannah River Site. Two support service contractors with a combined experience of 40+ years in nuclear safety were hired by the project in mid-2018 and early 2019 and remain on staff today. Nuclear Criticality Safety reviews are performed by the federal employee with assistance from the support service

contractors in conjunction with support from the site program SMEs when needed. In preparation for the increased attention needed to the Criticality Safety program, another support service contractor was hired late 2023 and begins onboarding mid-January 2024. A second possible service contractor has been identified as planning for the additional oversight continues into 2024. Additionally, the Field Office anticipates onboarding a TQP qualified Criticality Safety Engineer shortly after the site transitions to NNSA as landlords in 2024. The Savannah River Operations Office of DOE-EM has committed to support the Field Office for the Surplus Plutonium Disposition project with Nuclear Safety SMEs until landlord transition and up to two subsequent years as programmatic responsibilities shift. This is expected to allow for more resources to be allocated to SRPPF as needed.

Pacific Northwest National Laboratory (PNNL)

1. PNNL Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The Program Health grade is Good based on PNNL's substantial program improvements where the program elements meet the minimum requirements and is actively correcting minor non-compliances. In FY23, procedures, processes, evaluations, and other documents were updated and improved due to continued efforts of full-time staff. PNNL modified their annual review process, which resulted in more comprehensive assessments of all fissile material handling activities. All nuclear criticality safety evaluations and other documents requested by fissile material operations staff were completed in a timely manner.

The Operational Implementation grade is Good based on PNNL's effective record of self-identification. In FY23, PNNL has met or exceeded the minimum operational implementation requirements. The number of infractions and non-compliances for the fourth year in a row were low with six low-level infractions and four minor non-compliances identified.

The infractions were mostly related to administrative errors in the fissile material tracking software. The remainder were procedural errors resulting in no loss of double-contingency within any criticality safety control area. The four minor non-compliances were identified by personnel from an external nuclear criticality safety program, during their assessment of PNNL's nuclear criticality safety program. The external assessment team also noted two noteworthy practices relating to the healthy relationship between the criticality safety program and fissile material operations, and the comprehensive overhaul of the annual, internal assessment process. In addition, the NCS Program has continued to hold monthly development sessions to further enhance the technical competency of the NCS staff. The NCS Program held multiple NCS forums for both operations staff and management, which provided lessons learned from across the complex. The NCS Program has also developed tabletop exercises with assistance from operations and emergency response staff, which simulate criticality accidents and other non-conformances. These exercises allow NCS staff to demonstrate and strengthen their ability to respond to a variety of events that could occur at PNNL. Notable improvements to the skills of the NCS staff include: communication skills, both within the NCS Program and with operations, management, and emergency response staff; efficiently deriving data from NCS Program documentation, reference guides, and criticality safety software; and maintaining professionalism under pressure.

In FY23, all Criticality Safety Infractions and Program Non-Compliances have been properly communicated to the fissile material operations staff and the field office. PNNL has addressed all infractions and is currently in the process of addressing the non-compliances.

The Field and Program Offices agree as to the assessment of the PNNL NCS Program Health and Operational Implementation.

2. PNNL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Violation	0	0	0
Infraction	0	0	0
Discrepancy	2	0	0
Deviation	4	0	0

Summary: A total of six Criticality Safety Infractions were identified in FY23. Four of which met the lowest criteria, Deviation, and two of which met the second-lowest level, Discrepancy.

The four Deviations were largely related to fissile material tracking. Two of which were associated with the fissile material tracking software, i.e., errors involving the incorrect revision number to the criticality safety reference document listed in the software. The third Deviation involved a divided hot cell that has been authorized to use paper logs as an alternative tracking method. It was discovered that a transfer of fissile material had been reported in the paper logs, but not completed. This resulted in inaccurate accounting of fissile material in one section of the hot cell, though no criticality safety mass controls were violated. These three instances of fissile material tracking errors were self-identified by PNNL personnel who took the appropriate corrective actions in a timely manner. The final Deviation related to a typo in the controls section of a criticality safety evaluation. This typo was discovered by operations staff prior to fissile material movement and quickly addressed by the PNNL criticality safety program, who revised the evaluation.

The two Discrepancies reported relate to a single event. This event involved transfer of a fissile material sample (less than two grams) without meeting the associated fissile material transfer requirements. The sponsor of the associated project requested the transfer of a sample from one building to another. The affiliated and qualified fissile material handler allowed a non-qualified handler to both transfer the sample to another building and to perform the transfer without properly coordinating the transfer with the fissile material tracking software. This event resulted in two Discrepancy level Infractions. One relating to the improper use of the Direct Control procedure by the qualified handler, and one relating to the violation of the criticality safety control associated with the tracking software. The subsequent response involved modifying the training requirements of staff who handle fissile material and revisions of training documents and procedures for clarity on the controls.

3. PNNL Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
4	0	0

Summary: An external assessment team identified four minor non-compliances (findings) with the PNNL criticality safety program. One finding was related to the requirements for the qualification of criticality safety analysts in that no documentation is required to show that the analysts have completed the two-week hands-on course as required by ANSI/ANS 8.26. The qualification package is being revised to incorporate that this verification is completed by the NCS Program Manager. The requirement has been met for all qualified analysts; however, this had not been documented. Two findings related to the method by which PNNL addresses and documents the current and legacy accumulation of small quantities of fissile material within ventilation and ductwork outside of criticality safety control areas. Historically, all information relating to the accumulation of fissile material within a criticality safety control area has been documented in the criticality safety evaluations. Additionally, documentation describing legacy accumulation was completed in 2014 and documents that any accumulated fissile material is in a safe configuration. The Program will revise procedures to incorporate review of the historical and current modes and quantities of accumulation on an annual basis with periodicity specified for confirmation through empirical measurement. The fourth finding related to the training of operations for their response to non-conformances. The criticality safety program added a specific distance guideline for responding to non-conformances, guidelines which were modified in FY23. However, it was not clear to the assessment team that operations were familiar with the changes. Additional training requirements have been incorporated into the qualification and continuous training for fissile material handlers.

4. PNNL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
2	4	0	2	2

Summary: Two items were open from FY22. The first is where the ANSI N13.3 requirements were not implemented in the NCS Program nor were these requirements subsequently flowed down into the Radiation Protection (RP) Program as necessitated by the Standard. The RP Program and NCS Program partnered on a management self-assessment to identify gaps between ANSI N13.3 requirements and the PNNL Nuclear Accident Dosimetry Program. The corrective actions are actively being completed and have included long lead items (i.e., new hire, equipment, and laboratory space) that will push issue closure into the first part of FY24.

The second compliance gap carried over from FY22 regards the ANSI/ANS 8.23 emergency responder training criteria. It was determined that the nuclear criticality training for the Hanford emergency response personnel was not fully meeting the criteria within ANSI/ANS 8.23. The

areas missing are subsets of larger focus areas regarding what a nuclear criticality accident is, the specific characteristics of such an accident, and the hazards associated with reentry. The NCS Program has developed training for emergency responders that fully meets the ANSI/ANS 8.23 criteria and is in the process of ratifying contractual agreement that facilitate implementation of this required training early in FY24.

Four issues were added to the issues management system in FY23 relating to the four findings identified by the external program assessment team as listed in Section 3 above.

5. PNNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	4	10	0	2	0	2
Federal	2	5	0	0	0	0

Summary: PNNL lost both their Line Manager and NCS Program Manager during FY23. These losses have precipitated a reorganization that has moved the Nuclear Safety and Nuclear Criticality Safety organizations out of operations and into the Environmental, Health, Safety & Security Division to better align work scope, facilitate independence, and permanently assigned a Group Leader. While the Program fills these two critical management positions, interim promotions were made of a Criticality Safety Engineer - Analyst (CSE-A) and Criticality Safety Engineer – Representative (CSE-R) to cover these management positions. The resulting staffing configuration includes two full-time qualified analysts, one of which is dual-qualified as an CSE-A and CSE-R, and two part-time qualified CSE-As.

Richland Operations Office
Central Plateau Cleanup Company (CPCCo)

1. CPCCo Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The contractor retains trained and highly experienced criticality safety engineers with minimum turnover. Furthermore, the nuclear criticality safety (NCS) program is well established and mature. The program elements meet requirements resulting in an overall grading of Good. The addition of three new NCS staff is necessary for future facility D&D work at the REDOX and PUREX facilities.

EM HQ agrees with this summary with the understanding that the contractor needs to improve their operational implementation.

2. CPCCo Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	1	0	0
Level 4	0	0	0

Summary: There was one criticality safety reportable event in FY23 resulting in one ORPS report (EM-RL-CPCC-GENLAREAS-2023-0011) CR 10(1). The infraction involved a vessel under a process drip line that exceeded the criticality safety volume limit. In this case the vessel showed no evidence of dripped liquid. The REDOX facility, under a new contractor, has experienced difficulty in transitioning from a static state to a D&D operation dealing with fissile material concerns. CPCCo have taken corrective actions to close the weaknesses in the work planning process, ensure appropriate reviews by criticality safety personnel, and ensure all facility personnel understand the criticality safety requirements for the work they are performing.

3. CPCCo Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: The contractor's criticality safety staff continues to ensure that fissile material activities adhere to the requirements of the approved Criticality Safety Program. It is compliant and does not have any documented non-compliances.

4. CPCCo Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
3	1	2	1	1

Summary: The open and added issues are resulting from an update to the Site Transportation Program with regard to fissile material movements. Two of these have been closed and the last will be closed in October 2023. These issues are all administrative in nature with no identified trends or concerns. The NCS infraction resulting in ORPS report EM-CPCC-GENLAREAS-2023-0011 is currently under review. The apparent cause evaluation and subsequent corrective actions will be documented this FY in the issue management system.

5. CPCCo Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	30+	3	0	0	0
Federal	2	12	0	0	0	0

Note: Federal staffing is combined for CPCCo, HMLI, BNI, and WRPS.

Summary: Criticality safety staffing only includes criticality safety engineers. The number of qualified criticality safety engineers is adequate to address current day-to-day activities. Three individuals, currently working within the nuclear safety group, have been identified for further training as criticality safety engineers. They will most likely have dual roles, once qualified, due to the limited criticality safety workload in the foreseeable future.

Office of River Protection
Bechtel National Inc (BNI), Waste Treatment and Immobilization Plant Project (WTP)

1. BNI-WTP Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The facility has not yet transitioned to hot operations. It is compliant and does not have any identified deficiencies.

EM HQ agrees with this summary.

2. BNI-WTP Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0

Summary: There were no criticality safety infractions at WTP over the past year. WTP currently has no facilities operating that process fissionable material or that have criticality safety controls.

3. BNI-WTP Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no program non-compliances at WTP identified over the past year.

4. BNI-WTP Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	0	0	0	0

Summary: There are no open issues, and no issues were added at WTP during the past year.

5. BNI-WTP Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	5	8	4	0	3	0
Federal	2	12	0	0	0	0

Note: Federal staffing is combined for CPCCo, HMLI, BNI, and WRPS prime contractors.

Summary: In addition to hiring new staff, some existing Nuclear Safety staff were assigned the qualification and are in training.

Office of River Protection
Washington River Protection Solutions (WRPS) Tank Farms

1. WRPS-Tank Farms Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The contractor retains highly trained and experienced criticality safety engineers with minimum turnover. Furthermore, the nuclear criticality safety (NCS) program is well established and mature. The program elements meet requirements resulting in an overall grading of Good. Funding is needed researching long term plutonium chemistry issues which the contractor is pursuing. It is compliant and does not have any identified deficiencies.

EM HQ agrees with this summary.

2. WRPS-Tank Farms Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0

Summary: No infractions have been identified.

3. WRPS-Tank Farms Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: No non-compliances have been identified.

4. WRPS-Tank Farms Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
4	3	7	0	0

Summary: The open and added issues are resulting from certain programmatic changes and have all been closed. These issues are all administrative in nature with no significant trends or concerns.

5. WRPS-Tank Farms Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	29	0	0	0	0
Federal	2	12	0	0	0	0

Note: Federal staffing is combined for CPCCo, HMLI, BNI, and WRPS prime contractors.

Summary: The Contractor has not identified a need for staffing adjustments.

Office of River Protection
Hanford Laboratory Management and Integration (HLMI)
222S Laboratory

1. 222S Labs Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The program is transitioning procedures and processes from what was approved by the previous contractor to their format and content guide. It is compliant and does not have any identified deficiencies.

EM HQ agrees with this summary and acknowledges that the contractor is behind on transition activities.

2. 222S Labs Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0

Summary: No infractions have been identified.

3. 222S Labs Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: No non-compliances have been identified.

4. 222S Labs Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
1	0	0	1	1

Summary: The one open issue was identified early in contract transition. Clarification of which staff needs criticality training was the identified issue. The criticality program description document is at DOE for approval and this issue will be closed with DOE's approval. The issue is administrative in nature with no identified trends or concerns.

5. 222S Labs Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	20+	0	0	0	0
Federal	2	12	0	0	0	0

Note: Federal staffing is combined for CPCCo, HMLI, BNI, and WRPS prime contractors.

Summary: The organization consists of one staff at the Lab and one at the corporate office.

Idaho Operations Office – Idaho Cleanup Project
Idaho Environmental Coalition, LLC

1. Idaho Environmental Coalition Overall Performance

Field & Program Office	Program Health: Excellent
	Operational Implementation: Good

Summary: The Idaho Environmental Coalition (IEC) Criticality Safety Program (CSP) was consistently rated effective in fiscal year 2023 during DOEs quarterly evaluation of IEC performance. The IEC CSP continues to function in an effective manner. This determination was made based on DOE and IEC assessments, operational awareness oversight of criticality safety, implementation of criticality safety evaluations, interviews, and review of the contractor's criticality safety documents and metrics. The IEC Nuclear Criticality Safety organization continues to support facility operations and programs by supplying technically accurate fissile material handling limits that support safe operations.

EM HQ agrees with this summary.

2. Idaho Environmental Coalition Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: There were no nuclear criticality safety infractions identified during the fiscal year 2023.

3. Idaho Environmental Coalition Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
1	1	0

Summary: There were two programmatic nuclear criticality safety non-compliances identified during the fiscal year 2023 under the Idaho Cleanup Project.

IEC identified an issue regarding a revision of the software version of SCALE (6.2) that was executing on the computing cluster, that differed from the version verified in the configuration control documentation (6.2.2). No calculations were performed with SCALE during the timeframe of the software verification document disagreement.

The DOE Idaho Operations Office identified an issue where the Contractor revised the criticality safety program document without obtaining DOE approval. The revision was editorial to update the cover page with the current project operating contractor, and to correct a numbering error. No changes to the program were specified in the revision, however the change caused the program document revision number to fail to agree with the DOE approved revision. The revision was therefore retracted a couple of days after its implementation.

4. Idaho Environmental Coalition Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
4	13	13	2	0

Summary: Of the items opened in FY23, there were seven opportunities for improvements, one administrative task, four corrective actions, and one finding. The finding related to a non-compliance with IEC's program manual for conducting self-assessments, as not all issues identified during Criticality Safety Operational Inspections were entered into IEC's issues management system. Of the items open for longer than 6 months, one is for an opportunity for improvement, the other is for the finding discussed above, both items have been open for 6 months. IEC issues management is effective, and issues are resolved in a timely manner. IEC's CSP contractor assurance system is sufficiently self-critical and identified multiple opportunities for improvement in FY23 within the CSP.

5. Idaho Environmental Coalition Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	22	2	0	1	0
Federal	0	3	1	1	0	0

Summary: The recent Federal attrition is due to personnel who took a position with the Office of Environmental Management (EM) Headquarters (HQ) organization. The successor is a qualified Nuclear Safety and Safety System Oversight specialist who was previously a Nuclear Criticality Safety Engineer. She has completed all DOE-STD-1173 qualifications and needs to complete DOE Idaho criticality safety qualifications.

IEC maintains enough qualified, experienced, staff to support the Idaho Cleanup Project mission. Currently, most operations are routine and do not require a high workload from criticality safety staff.

Oak Ridge Office of Environmental Management
United Cleanup Oak Ridge (UCOR)

1. UCOR Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The UCOR Nuclear Criticality Safety Program is doing good. They have hired additional staff to assist with the increasing workload that has developed because of the merging of the UCOR and TWPC programs and the additional work that is being performed on the Oak Ridge Reservation. There were two infractions identified for fiscal year 2023 which have been addressed adequately.

EM HQ agrees with this summary.

2. UCOR Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	2	0	0
Level 5	0	0	0

Summary: For FY2023 there was a total of two infractions identified by UCOR. Both infractions pertained to the discovery of legacy fissile material while performing work in less than Category 3 facilities. It should be noted that there was no expectation of finding any fissile material in these facilities. As a result of these infractions, it was determined that additional training was needed for general employees on how to identify potential fissile material and what to do when discovered. These changes will better prepare workers for future work in other facilities in which they could potentially come across unknown fissile material.

3. UCOR Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: There have been zero UCOR nuclear criticality safety (NCS) program non-compliances identified in FY23.

4. UCOR Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	0	0	0	0

Summary: There were no issues entered into the issues management system.

5. UCOR Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	4	22	2	0	2	0
Federal	2	5.5	0	0	0	0

Note: Federal oversight is combined for UCOR, Isotek Systems, LLC (Isotek), and Transuranic Waste Processing Center (TWPC).

Summary: UCOR has hired two personnel this year that are in the process of getting qualified as Nuclear Criticality Safety Engineers. This increase in staff will help with the additional work that has been a result the merging of the UCOR and TWPC Nuclear Criticality Safety Programs.

Oak Ridge Office of Environmental Management
Isotek

1. Isotek Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: Overall, the Isotek nuclear criticality safety (NCS) program is in good health. The NCS program has maintained a field presence as they did in the past fiscal year. This continued NCS presence has allowed operations to become familiar with the NCS staff and get clarifications and assistance as needed. This fiscal year there has been a total of five safety infractions. One safety infraction was from last year, two were identified by an Office of Enterprise Assessment (EA) assessment, and two were self-identified.

EM HQ agrees with this summary.

2. Isotek Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	1
Level 5	2	0	2

Summary: Isotek has had four newly identified Nuclear Criticality Safety Infractions and one that was identified last fiscal year. All but one of the Nuclear Safety Infractions were categorized as level five while the other infraction was determined to be a level four. Below is a summary for each of the infractions:

This infraction was identified in FY 2022 and was closed in early FY 2023. During the Operational Readiness Review it was determined that the criticality safety analysis does not adequately document the required margins associated with the criticality safety analysis. All NCS personnel were briefed on the need to address mass measurement uncertainties in each Nuclear Criticality Safety Evaluation (NCSE) and all NCSEs were reviewed to determine which needed to be revised to address this infraction. All identified NCSEs have been revised to document the margins associated with the analysis and this infraction has been closed.

- An assessment of the documentation associated with the Oak Ridge Oxide Processing (OROP) campaign determined that some blanks in the documentation were not filled out including an NCS credited step. This infraction was closed with the completion of

required reading by the operating supervisors on the importance of ensuring that all paperwork was completed correctly.

- An assessment of the Isotek NCS program performed by the Office of Enterprise Assessments (EA) resulted in this infraction. This infraction stated that ISO-NCS-CSE-602 did not specifically analyze the potential for a criticality event due to the introduction of water into cells from nearby non-seismically qualified water-bearing systems following a seismic event. Upon review of the analysis, it was determined that the existing analysis was bounding for these scenarios. However, discussion was added to the NCSE to specifically include the identified scenarios and how they are bounded by the analysis. This infraction has been closed due to the corrective actions being completed.

- The EA assessment resulted in another infraction which stated that Isotek has not established a method to reliably determine an accurate down-blending system flow rate for demonstrating the ongoing implementation of a minimum volume ratio credited as an NCS control in ISO-NCS-CSE-603. This infraction was closed by revising the Down-blended Uranyl Nitrate (DbUN) System Orifice Trend Report to add a periodic orifice performance report which measures system degradation to specify how Isotek is reliably demonstrating an adequate down-blending ratio.

- While performing a canister transfer from Building 3019 to Building 2026 the personnel from Building 2026 self-identified an error in which the paperwork and the canister being transferred were not in agreement. The paperwork was then corrected to allow for the completion of the transfer of the canister. The closure action for this infraction was to update procedures to verify the correct canister prior to the canister leaving the original facility, which has been done. The procedure has been revised but has not been approved.

3. Isotek Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: Isotek did not have any non-compliances in FY 2023.

4. Isotek Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	0	0	0	0

Summary: Isotek did not have any NCS issues entered in their issues management system.

5. Isotek Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	5	27.4	1	1	1	0
Federal	2	5.5	0	0	0	0

Note: Federal oversight is combined for UCOR, Isotek, and TWPC.

Summary: The Isotek staffing levels are adequate for the work that they are providing coverage for. The staffing for Isotek reflects the retirement of one staff member and the hiring of another. This brought the average years of experience down from last year.

Oak Ridge Office of Environmental Management
Transuranic Waste Processing Center (TWPC)

1. TWPC Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: TWPC is currently undergoing a contract transition to merge with UCOR. The Nuclear Criticality Safety Program, as well as all other safety management programs, of TWPC are in the process of merging with UCOR's programs. Currently the plan is to carry out cross training between the NCS staff of both TWPC and UCOR.

EM HQ agrees with this summary.

2. TWPC Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: For fiscal year 2023 there have not been any safety infractions.

3. TWPC Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: For fiscal year 2023 there have not been any non-compliances.

4. TWPC Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	0	0	0	0

Summary: There were no entries into the issues management system.

5. TWPC Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	1	22	0	2	0	0
Federal	2	5.5	0	0	0	0

Note: Federal oversight is combined for UCOR, Isotek, and TWPC.

Summary: The staffing levels of TWPC will change in the future because of TWPC merging with UCOR. Work is currently being conducted to blend the two groups into one Nuclear Criticality Safety Program. The staff from both contractors will undergo cross training for the others site which will provide more than adequate staffing for TWPC.

Savannah River Site
Savannah River Nuclear Solutions (SRNS)

1. SRNS Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: SRNS's nuclear criticality safety (NCS) program health and overall implementation of their criticality safety program meet the minimum requirements and accordingly deserves a rating of Good. Minor issues are actively addressed in a timely manner. No adverse trend has been identified for any aspect of SRNS's criticality safety program or its implementation.

SRNS meets routinely on a monthly basis with DOE criticality safety staff to review monthly performance of their self-assessment schedule that is carried out at their operating facilities, facility and program issues, as well as staffing and training issues.

Nuclear criticality safety (NCS) procedures and policies are mature and updated to be current. SRNS NCS conducts its activities in accordance with Criticality Safety Program Description Document (CSPDD) N-NCS-G-00136, and the Criticality Safety Manual, SCD-3 (this is just a document number, but SCD stands for Source Compliance Document). These criticality safety program documents are used by all three Savannah River Site (SRS) contractors that have criticality safety programs.

EM HQ agrees with this summary.

2. SRNS Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	5	0	0
Level 5	6	0	0

Summary: SRNS documents their criticality safety related issues in the Site Tracking, Analysis and Reporting (STAR) system and produces good summarizations and trend analysis in their quarterly metrics reporting. No criticality safety infractions were identified by DOE that were not first identified by SRNS.

Of the five Level 4 criticality safety (CS) Infractions, four were minor operational procedure errors, and one was a security rounds incident (ammunition dropped into the spent fuel pool). No nuclear criticality controls were violated or challenged in any of the cases.

Of the six Level 5 CS Infractions, four were minor procedure errors, one was documenting a good catch by staff, and one dealt with training requirements.

Last fiscal year had several training deficiency issues of which there was only one for this year. This is representative of improvements made in SRNS's training program to ensure that staff are adequately trained.

A reduction in the total number of infractions as compared to previous and earlier years demonstrates that there is no increasing trend of infractions, and given the Low Infraction Category, adds to the confidence that these infractions and the annualized trend do not represent an area of concern.

3. SRNS Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: SRNS continues its trend in FY2023 to have no program non-compliances.

4. SRNS Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
7	11	13	2	0

Note: No. of Issues = No. of Criticality Safety Findings + No. of Category 3C (Criticality Safety) ORPS (Occurrence Reporting & Processing System) Reportable Occurrences + No. of Non-3C ORPS and Other Notable Occurrences. The formula demonstrates how SRS calculates the "Issues from the Issues Management System" as the DNFSB has not made it clear on the criteria for this metric. It is confused with the terms "Criticality Safety Infractions" and "Program Non-Compliances", so to be clear, SRS has specifically shown how it has tabulated these issues.

Summary: SRNS tracks their criticality safety related issues entered into the Site Tracking, Analysis and Reporting (STAR) system and exhibits good behavior and response to issues, as compared to last year's data, their response times have improved to address and close issues.

Of the two issues open longer than six months, they both involved staff briefings that needed the time to address all of the facility staff. No issues have been open greater than one year.

Overall, SRNS exemplified timely response to address and correct identified issues. None of the issues are of significant concern nor challenging to criticality safety and thusly there is not an adverse trend of program performance.

5. SRNS Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	28	20.3	14	2	8	3
Federal	2	3	0	0	0	2

Note: Federal oversight is combined for Savannah River Nuclear Solution (SRNS), Savannah River Mission Completion (SRMC), and Savannah River National Laboratory (BSRA/SRNL).

Summary: SRNS has a full complement of staff that is commensurate to the needs of SRS. SRNS has been successful in hiring criticality safety staff, especially in light of the challenging employment environment and scarcity of criticality safety professionals, to meet SRS needs and address staff attrition.

Savannah River Site
Savannah River Mission Completion (SRMC)

1. SRMC Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: SRMC's nuclear criticality safety program health and overall implementation of their criticality safety program meet the minimum requirements and accordingly deserves a rating of Good. Minor issues are actively addressed in a timely manner. Salt Waste Processing Facility (SWPF) is nearly fully transitioned to current criticality safety program standards from legacy ownership. Integration of the impacts to criticality safety documents affected by recent waste stream additions are being handled in a comprehensive and timely manner. No adverse trend has been identified for any aspect of SRMC's criticality safety program or its implementation.

SRMC meets routinely on a monthly basis with DOE criticality safety staff to review monthly performance of their self-assessment schedule that is carried out at their operating facilities, facility and program issues, as well as staffing and training issues.

EM HQ agrees with this summary.

2. SRMC Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	6	0	0

Summary: Four of the six issues added during FY2023 stem from a single Implementation Verification Review (assessment) which demonstrated their attention to detail in the IVR process (documentation issues). All SRMC issues were categorized at the lowest significance level and were resolved in a timely manner and so in aggregate, do not represent a concern nor a declining trend overall.

3. SRMC Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: SRMC continues its trend in FY2023 to have no program non-compliances.

4. SRMC Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	6	5	2	0

Note: No. of Issues = No. of Criticality Safety Findings + No. of Category 3C (Criticality Safety) ORPS (Occurrence Reporting & Processing System) Reportable Occurrences + No. of Non-3C ORPS and Other Notable Occurrences. The formula demonstrates how SRS calculates the "Issues from the Issues Management System" as the DNFSB has not made it clear on the criteria for this metric. It is confused with the terms "Criticality Safety Infractions" and "Program Non-Compliances", so to be clear, SRS has specifically shown how it has tabulated these issues.

Summary: These six issues are the same ones identified in Section 2 above and are categorized at the lowest significance level. All but one were resolved in a timely manner and so in aggregate, these issues do not represent an overall adverse trend. The one issue remaining open dealt with typographical errors in the Documented Safety Analysis for CSTF revision 23 and is waiting upon the completion of the DSA revision to implement the corrections, which is expected to be done in December 2023.

5. SRMC Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	7	14	1	0	2	0
Federal	2	3	0	0	0	2

Note: Legacy Parsons staffing (one person) is included in SRMC staffing count while the individual is in the process of completing SRMC qualifications. Federal oversight is combined for SRNS, SRMC, and BSRA/SRNL.

Summary: SRMC has a full complement of criticality safety staff commensurate to SRS needs.

Savannah River Site
Battelle Savannah River Alliance (BSRA)/Savannah River National Laboratory (SRNL)

1. SRNL Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: BSRA is the operating contractor for SRNL. BSRA's nuclear criticality safety program health and overall implementation of their criticality safety program meet the minimum requirements and accordingly deserves a rating of Good. Minor issues are actively addressed in a timely manner. No adverse trend has been identified for any aspect of BSRA's criticality safety program or its implementation.

BSRA meets routinely on a monthly basis with DOE criticality safety staff to review monthly performance of their self-assessment schedule that is carried out at their operating facilities, facility and program issues, as well as staffing and training issues.

EM HQ agrees with this summary.

2. SRNL Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	2	0	0

Summary: Two lower-level issues were found this year that were minor and administrative in nature that were resolved in a timely manner. This does not represent a concern nor a declining trend in program performance.

3. SRNL Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	0

Summary: BSRA/SRNL continues its trend in FY2023 to have no program non-compliances.

4. SRNL Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
0	2	1	1	0

Note: No. of Issues = No. of Criticality Safety Findings + No. of Category 3C (Criticality Safety) ORPS (Occurrence Reporting & Processing System) Reportable Occurrences + No. of Non-3C ORPS and Other Notable Occurrences. The formula demonstrates how SRS calculates the "Issues from the Issues Management System" as the DNFSB has not made it clear on the criteria for this metric. It is confused with the terms "Criticality Safety Infractions" and "Program Non-Compliances", so to be clear, SRS has specifically shown how it has tabulated these issues.

Summary: These two issues are the same ones identified in Section 2 above and are categorized at the lowest significance level. One was resolved in a routinely and timely manner. The one issue remaining open requires addressing training with facility staff and so is expected to close within the next two months to allow for all appropriate staff to be trained while on duty. In aggregate, these issues do not represent an overall adverse trend.

5. SRNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	0	0	0	0	0	0
Federal	2	3	0	0	0	2

Note: Federal oversight is combined for SRNS, SRMC, and BSRA/SRNL.

Summary: BSRA is the contracted operator for SRNL. BSRA does not directly have criticality safety staffing but uses SRNS contracted personnel to implement its criticality safety program. SRNS has more than adequate resources to deal with any SRNL criticality safety issues that may arise.

Environmental Management Los Alamos (EMLA)
Newport News Nuclear BWXT (N3B)

1. EMLA Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: The overall programmatic health of the N3B Nuclear Criticality Safety Program is meeting expectations. The program provides support to LANL's Technical Area 54, Technical Area 21, and the Nuclear Environmental Sites.

EM HQ agrees with this summary.

2. EMLA Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: During Fiscal year 2023, N3B had 0 criticality safety infractions identified. It is noted, however, that on March 29, 2022, at approximately 1030 during an annual review of drum storage locations, N3B discovered a >200FGE and ≤ 300 FGE drum comingled with two <325 FGE and ≤520 FGE SWBs in Dome 33. The situation was determined from a criticality perspective to be safe and stable, and the configuration was addressed in a revision to the NCSE; however, the NCSE had not yet been implemented. On March 22, 2023, the NCSE was fully implemented and the issue management report was closed on April 4, 2023.

3. EMLA Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: During Fiscal Year 2023, zero non-compliances were identified with respect to DOE O 420.1 *Facility Safety* and the American National Standards Institute/ American Society -8 Series of criticality safety standards.

4. EMLA Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
2	1	2	1	0

Summary: On May 5, 2022, N3B opened an Issue Management (IM) Report for the discovery of a >200FGE and ≤ 300 FGE drum comingled with two <325 FGE and ≤520 FGE SWBs in Dome 33, that was in violation of the current NCSE at the time of discovery. The situation was determined to be safe and stable, and the configuration was addressed in a revision to the NCSE; however, the NCSE had not yet been implemented. On March 22, 2023, the NCSE was fully implemented, and the IM report was closed on April 4, 2023.

On August 20, 2021, N3B opened an IM Report for an NCSE that was in development for Array Storage of Waste Drums at Area G that had been issued and required a phased implementation. The IM Report was closed on March 23, 2023.

On April 5, 2023, N3B opened an IM Report for document review comments generated for document reviews of NCSE not being managed, maintained, or stored in accordance with NQA-1 2008/2009 requirements. This IM Report is currently open.

5. EMLA Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	6	16	0	0	0	0
Federal	0	N/A	0	0	0	0

Summary: Currently, N3B has six qualified staff members all averaging approximately 16 years of experience. EMLA does not have any current Criticality Safety staff members or any Full Time Equivalent (FTE) positions within the current organization structure. Due to a limited mission scope involving criticality, EM-LA relies on HQ reach back to support oversight activities as needed.

Carlsbad Field Office
Waste Isolation Pilot Plant (WIPP)

1. WIPP Overall Performance

Field & Program Office	Program Health: Good
	Operational Implementation: Good

Summary: Program Health:

For FY 2023, the WIPP Nuclear Criticality Safety Program Health is determined to be good based on the qualification process for the WIPP Nuclear Safety personnel, and on the experience level and demonstrated acumen of the WIPP Nuclear Criticality Safety Team (including both Contractor in-house personnel and subcontractors).

Operational Implementation:

The essential elements of the WIPP Nuclear Criticality Safety Program are properly described in the Prevention of Inadvertent Criticality Program in Chapter 6 of WIPP DSA/TSR Revision 8, dated September 2022, as approved by Carlsbad Field Office Safety Basis Approval Authority. TRU Waste accepted for disposal at the WIPP facility is required to be characterized and certified to meet the requirements of the WIPP Waste Acceptance Criteria (WAC) prior to being approved for shipment to the WIPP. Nuclear Criticality Safety Evaluations analyze the TRU Waste handling and disposal activities and demonstrate the criticality incredibility of evaluated events. The Nuclear Criticality Safety Evaluations for Contact-Handled (CH)- and Remote Handled (RH)-TRU Waste are documented in WIPP-016, *Nuclear Criticality Safety Evaluation for Contact-handled Transuranic Waste at the Waste Isolation Pilot Plant,* and WIPP-020, *Nuclear Criticality Safety Evaluation for Remote-handled Waste at the Waste Isolation Pilot Plant*, respectively. The Nuclear Criticality Safety Program meets the requirements of DOE Order 420.1C, *Facility Safety*, Chapter III, "Nuclear Criticality Safety".

The fissile mass limits, special reflector/moderator mass limits, waste container types, and waste characteristics approved for disposal at WIPP are documented in the WIPP WAC. The fissile mass limits in the WIPP WAC are derived from the CH and RH Nuclear Criticality Safety Evaluations (NCSEs) (i.e., WIPP-016 and WIPP-020) and are specific to the WIPP waste handling, storage, and disposal configurations. The NCSEs evaluate credible upset scenarios during waste handling, disposal, and storage at WIPP and conclude that no credible criticality accident scenarios exist for CH waste container storage, handling, and disposal activities at the WIPP. Because the evaluations also demonstrate that a criticality at the WIPP is not credible, criticality alarm and detection systems are not required. The operational procedures are adequate and support the safe implementation of the WIPP Nuclear Criticality Safety Program to achieve the WIPP mission(s).

EM HQ agrees with this summary.

2. WIPP Criticality Safety Infractions

Infraction Category	Identified by:		
	Contractor	Field Office	DOE Headquarters
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: There were no criticality safety infractions at WIPP during the FY2023.

3. WIPP Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no WIPP Nuclear Criticality Safety Program non-compliances identified at WIPP during FY2023.

4. WIPP Issues from the Issues Management System

Open at the Start of the FY	Added During the FY	Closed During the FY	Open for Longer than 6 Months	Open for Longer than 1 year
1	3	0	3	1

Summary: CBFO ICE-1303 captured the DOE Office of Enterprise Assessment (EA-31) identified Opportunity for Improvement (OFI) in their 2022 Assessment Report on Training and Qualification: (OFI-NWP-2) WP-14-TR.01 requires subcontractor personnel to “meet the qualification requirements for the job function to be performed.” For the two primary subcontractor personnel used by the M&O Contractor's nuclear safety organization (one for safety basis work and one for nuclear criticality safety work), training and qualification equivalencies were documented. However, the Contractor is still developing the applicable task cards (NS-T2, NS-T3, NS-T4, and NS-T5) to which the equivalencies should have been granted for the subcontractor who develops and maintains the DSA and TSR.

The M&O Contractor’s WIPP Issue (WI) 22-1610 which addresses ICE-1303 remains open.

Additional information or concerns:

- The following Finding and two OFIs compiled by the Contractor's CY22 Criticality Safety Program Audit as documented on WIPP-ASMT-22-0399 remain open:

    - Finding: WP 05-WH1010 Rev. 14, Container Overpacking, does not adequately implement administrative control 3 from WIPP-016 as it does not give the FGE limit for an overpack for machine-compacted waste. The Contractor has designated this Finding as WI 23-1503.

    - OFI 1 (WI 23-1504): In WP 05-WH1010, Container Overpacking, confirmation that the FGE limit is met for the overpack container should be directed by an action step referring back to Section 3.2 in addition to the sign off on the data sheet. The action step should also tell the performer where to obtain the FGE values for the containers to be overpacked.

    - OFI 2 (WI 23-1505): WIPP-016, Nuclear Criticality Safety Evaluation for Contact-Handled Transuranic Waste Containers at the Waste Isolation Pilot Plant, should be listed in Section 2, References, of WP 05-WH1025, CH Waste Downloading and Emplacement, and WP 05-WH1010, Container Overpacking, as the NCSE is the source of the Criticality Safety Administrative Controls included in these procedures.

As of October 2023, the Contractor had informed CBFO that WI 23-1503, WI 23-1504, and WI 23-1505 would be resolved and closed by the end of CY2023.

5. WIPP Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	1	2	1	0	0	0
Federal	2	10	1	0	1	1

Summary: WIPP Contractor has one qualified NCS Engineer. Another NCS Engineer is currently in training (in the process of going through the qualification card NCSE-01). Not included in the table above, the WIPP Contractor also has two qualified subcontracted NCS Engineers (one with NCSE-01/NCSE-02 and another with NCSE-01 qualification cards). The subcontracted NCS Engineers raise the average experience to 10 years.

CBFO possesses two DOE Technical Qualification Program Nuclear Safety Specialist qualified individuals who can provide adequate oversight of the contractor's Nuclear Criticality Safety Program Activities at WIPP. Another Nuclear Safety Specialist is currently in training (in the process of going through the DOE Technical Qualification Program). CBFO is in the process of recruiting additional Nuclear Engineers to supplement the current team. In addition, CBFO has two contracted professionals specialized in all areas of nuclear safety from its Carlsbad

Technical Assistance Contractor to provide excellent service support for the Nuclear Criticality Safety Program when necessary.