Department of Energy
Washington, DC 20585

National Nuclear Security Administration

March 20, 2025

The Honorable Thomas A. Summers
Acting Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, DC 20004

Dear Chairman Summers:

Consistent with the Board's letter dated January 6, 2022, attached please find the Fiscal Year 2024 Annual Metrics Report on Nuclear Criticality Safety Programs covering the fiscal year from October 1, 2023, through September 30, 2024. 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,

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2024
ANNUAL METRICS REPORT
To
THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD
March 2025

NUCLEAR CRITICALITY SAFETY PROGRAMS

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.

2. 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.

3. 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.

4. 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.

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

5. **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.

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Lawrence Livermore National Laboratory (LLNL)

1. LLNL Overall Performance

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

Summary: LLNL has a history of stable and exceptional NCS Program performance over the years, which continued in FY24 with LLNL internal NCS performance metrics resulting in a grade of Excellent (highest on a five-category scale) with quality NCS products such as evaluations, assessments, infraction reports, walkthrough inspection reports, etc., delivered in a timely fashion as programmatic funding allowed. The LLNL NCS Division (NCSD) has provided outstanding technical support to Superblock, Radioactive & Hazardous Waste Management, and LLNL operations at the NNSS, as well as won multiple LLNL awards in support of Global Security, Operations and Business, and Strategic Deterrence major milestones.

Accomplishments included LLNL providing leadership as NNSA POC for Joint Working Group (JOWOG)-30-04-07, criticality safety, and leadership in US national standards development through membership in ANS-8, with one member of ANS-8 standards national consensus (oversight) committee, members in ANS-8.3, -8.20 and -8.26 working groups, and two elected members of the Executive Committee of the ANS Nuclear Criticality Safety Division. The LLNL NCSD supported the International Criticality Safety Benchmark Evaluation Project (ICSBEP) by providing the Chair and four SME members of the Technical Review Group, and completed an ICSBEP evaluation of TEX-Hafnium in support of the US Naval Nuclear Propulsion Program and a fundamental physics benchmark of thermal neutron scattering laws. In addition, NCSD provided a US official delegate to the Organization for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) Working Party on Nuclear Criticality Safety. These and many LLNL awards and honors are evidence of the competency and influence of the NCSD.

LLNL continued its contributions by providing longstanding support for the Criticality Safety Support Group (two members) and providing one CNS Y-12 NCS Committee member. It also supported the DOE NCSP nuclear data program with two members of the Nuclear Data Advisory Group. NCSD continued to play a vital role in the national NCS instruction by providing principal instructors and significant portions of the national hands-on NCS training course for practitioners and managers under DOE NCSP auspices and further developing and teaching the UC Berkeley NCS pipeline course which included hands-on experiments at LLNL's Inherently Safe Subcritical Assembly. NCSD also provided hands-on training to first responders for the Nuclear Counter-Terrorism Program. It provided an NCS SME for CNS Y-12's triennial internal independent assessment. NCSD also temporarily assumed management of MC&A and led it through two successful NA-70 audits prior to returning the role to the Security Organization. Further, a Nuclear Criticality Safety Engineer (NCSE) accepted the position of LLNL Holdup Manager. NCSD is planning on retaining the role to ensure holdup procedures are effectively implemented to fully address LFO CS concerns. NCSD is re-establishing a hold-up measurement capability to address an LFO-identified issue open longer than one year.

Based on national and international leadership in the NCS community and assistance to other sites, the LLNL NCSD remains a top group in the complex. The NCSD has also been successful in hiring. Overall, the LLNL NCS program health is graded as 'Good.' The program elements consistently exceed the requirements, and many are considered best-in-class. However, many CS non-compliances have not been actively corrected or improved in FY24 (delayed issues screening or causal analysis, lack of developing or completing corrective actions on time, issue closure with an incomplete corrective action, ineffective corrective action to prevent recurrence), which is an area of LFO focus, reducing the grade from Excellent in FY23.

Operational implementation at LLNL is graded as 'Good,' as evidenced by conservative NCS controls that are easy for operations to comply with. There continues to be good engagement and very close and effective collaboration between criticality safety and operations, 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, a challenge faced by the NCS program this year included a repeat infraction relating to exceeding moderation limits, and important safety concerns from last year around LLNL Physics and Life Sciences (PLS) operations' actions and responses regarding a couple of infractions that reflected a potentially weak safety culture have not yet been directly addressed due to lack of entering them into the LLNL Issues Tracking System (ITS) and lack of required reporting of one of them in the Occurrence Reporting and Processing System (ORPS). LFO continues to track these infractions and CS issues management issues 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	3	0	0

Summary: Two of the infractions were almost identical due to LLNS management not correcting the causes of the previous infraction to prevent this recurrence or future ones. This instantiates the trend of LLNS issues with infractions and CS issues management that LFO has identified in its oversight, which is of moderate concern.

3. LLNL Program Non-Compliances

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

Summary: There were no program level non-compliances for FY24.

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
3	18	6	5	9

Summary: LFO is tracking many more CS-related issues than LLNL internal metrics. Most of the issues reflected in this table are overdue for screening, causal analysis, corrective action development, or corrective action completion. One had its causal analysis assigned to the wrong individual, and for another, LFO is questioning the effectiveness of its closure. This underpins LFO's moderate and growing concerns with LLNS's CS issues management.

For background, it appears the LLNS Management Assurance Office has not been keeping up with managing these CS issues, such as not coordinating with different stakeholder groups, not assigning the correct issue owner, not reassigning to another issue owner when the initially assigned owner no longer works for LLNS and not requesting extensions. There is also a long-standing issue that LLNS has been working on to create an accumulations procedure that is an involved process, which is delaying updating the CSP document – its closure will address two of the issues open longer than 1 year. With LFO prompting, LLNS is paying more attention and refocusing efforts to address these CS issues.

5. LLNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	11	22	8	0	3	0
Federal	1	4	0	0	0	0

Summary: LLNL staffing is currently adequate to support mission needs with no vacancies.

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 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
0	2	0	0	1

Summary: All issues are overdue for corrective action completion, underpinning LFO's moderate and increasing concerns with LLNS's CS issues management. The LLNS issue owners have been unresponsive to LFO inquiries; the LFO CS SME has reached out to the NFO CS SME for assistance, who has not yet learned more about the issues' status as of this Report's writing. For the issue open for longer than 1 year, a month after LFO reached out to the LLNS issue owner, he responded to LFO and stated it was being extended to 5/1/25 since the implemented corrective action did not meet MSTS requirements. In the interim, LLNS CS walkthroughs have shown there haven't been any discrepancies related to the issue. LLNS assured LFO they would not be extending the date further.

4. NNSS LLNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	0.2	45	0	0	0	1
Federal	N/A (Subset of LLNL Staffing - Federal)					

Note: Staffing here is NNSS residents.

Summary: LLNL has no full-time NNSS resident qualified NCSEs. As a future possibility, an LLNL-qualified NCSE volunteered to relocate to Nevada to become LLNL's Nevada resident NCSE to replace the last LLNL Nevada resident who had retired. They will have to qualify at NNSS (in progress with completion early in 2025), and LLNS must secure funding and transfer the employee (pending). Among the LLNL non-residents, there are four NCSEs qualified to work at NNSS, and two in training (qualified NCSEs who need, e.g., DAF-specific courses). Another LLNL NCSE hired in 2024 will eventually support NNSS operations. Also, LLNS employs an LLNL retiree part-time contractor and Nevada resident, who was LLNL's full-time Nevada resident prior to retirement.

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). NFO and NA-LL will coordinate assessments, investigations, local Emergency Management, Emergency Management drills and exercises, and other required oversight activities of NNSS LLNL operations per the MOA, which expired on 11/1/24. A new draft MOA is in process.

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 is engaged in all criticality safety work at NNSS through planning meetings, performance of NCS evaluations, reviews and/or revisions of procedures and facility documents, and the administration of the Criticality Control Review (CCR) process. The MSTS also provides support for the revision of safety basis documents. MSTS hosted 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 approximately 18 months. This may decrease long-term program continuity.

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
13	6	12	3	3

Summary: The issues open longer than a year relate to the hiring a NCS Manager and the update of qualification procedures. The NCS Manager position has been posted multiple times with no successful candidate. Recently the position was reposted and is awaiting qualified applicants.

5. NNSS Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	3	20	0	0	0	1
Federal	1	15	0	0	0	0

Summary: The MSTS direct position of Nuclear Criticality Safety Manager has been unfilled for approximately 18 months. Currently the MSTS Nuclear Safety Manager is acting in the role of NCS Manager as a secondary duty. MSTS uses subcontractor staff augmentation to maintain program performance. A full-time MSTS NCS Manager would reinforce program continuity, communication, and line management responsibility.

Los Alamos National Laboratory (LANL)

1. LANL Overall Performance

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

Summary: Throughout FY24, the LANL Nuclear Criticality Safety (NCS) program has made substantial improvements and is considered a stable, mature and compliant safety management program. This rating aligns with the FY24 NCS Program performance metrics ranking of "Satisfactory" confirming that the program elements meet requirements.

Following many years of work to rebuild Criticality Safety Analyst (CSA) staffing, develop and implement compliant Criticality Safety Evaluations (2014 Fire Water Ingress into Gloveboxes Potential Inadequacy of the Safety Analysis) and other organizational challenges, the FY 2023 DOE Criticality Safety Support Group (CSSG) assist visit provided several recommendations to improve the NCS program's ability to efficiently and effectively support ramp-up to 30 pits per year (PPY) production mission requirements. Sustainment of those actions taken to implement the recommendations is being actively managed. The LANL NCS program has actively managed and already implemented many of these CSSG recommendations. A NCS Division reorganization was completed to better align Operations with NCS support, CSA hiring and mentoring processes are in place and stabilized, and several significant efforts by management to improve and simplify NCS operational implementation on the floor are proving successful. Furthermore, implementation of the final 'backlog CSEDs' is nearly completed with less than a dozen outstanding.

Of particular note, Pit Technologies (PT) collaborated successfully with NCS analysts to develop a consistent set of NCS controls that can be applied across many process locations in PF-4. This will lead to efficiencies in implementation and CSED development and was one recommendation from the CSSG assist visit. This pilot process helps pave the path for working to develop consistent NCS control sets in other areas of PF-4.

Efforts are required to complete implementation of the remaining CSSG recommendations to fully integrate criticality safety practices into ongoing work. All indicators are that the processes, procedures and leadership are in place to make this successful. One significant challenge remains regarding development of an integrated (D&D, installation, and on-going work) resource-loaded schedule to identify NCS resource requirements. ALDPI, ALDWP, and NCSD are collaboratively working to address the issues.

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	0	0	0
Level 4	29	0	0
Level 5	37	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: The number of LANL criticality safety infractions remains relatively consistent with previous years. However, the highest severity index level in FY24 was 4 as opposed to 3 in FY23. The LANL NCSP FY24 criticality control process deviation metrics are graded "Needs Improvement" primarily due to a large number of similar infractions involving administrative spacing requirements or overmass. Causal analyses are performed for all significant overmass infractions, CSEDs are routinely revised to remove any ambiguities identified during fact-finding, and the newly developed standardized limit sets is being rolled out in new CSEDs to mitigate this concern.

CSAs responded to over 140 Potential Process Deviations (PPDs) which resulted in 29 severity level 4 infractions and 37 severity level 5. The majority of the PPDs were not infractions. This indicates a good reporting culture. However, there are recurring similar infractions regarding administrative spacing and overmass. Collocated in-the-facility support office improvements and the introduction of verbal recovery for simple and straight forward infractions have improved efficiency in responding and recovering from deviations/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 FY24.

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
72	79	75	39	25

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 FY24 operational awareness activities, external assessments, internal self-assessments and other review activities, 57 new NCSP issues were identified, including issues tied to implementation of facility specific NCS programs. Most issues are being managed primarily by the NCSD Management Review Board (MRB) and TA-55 NCSP MRB. While some actions are still being worked, most are closed within 6 months indicating improvement from FY23. NA-LA assessed NCS Issues Management (IM), which included attending an MRB meeting and interviews with IM SMEs, concluding that the majority of LANL IM issues affecting NCS are managed appropriately. As part of this assessment, all of the IM issues written to address the 2023 CSSG recommendations were evaluated. Of these, 70% of the recommendations have been implemented and are complete. LANL management is working towards implementing the remaining 30% in FY25, with no significant obstacles identified. These issues make up the majority of the 25 longer term issues which require more time to complete. NA-LA is continuing to track progress on closure of these issues through periodic briefings with LANL management (~ twice/year they come to the Field Office to report the state of the NCS program and progress on closure of significant issues – Backlog CSEDs, CSSG Recommendation implementation, closure of open ESS items, etc.).

5. LANL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	24	14	15	4	13	9
Federal	1	1.5	0	0	0	0

Note: Four of the fifteen in-training NCS analysts are task-qualified (facility and/or calculations). The table includes staffing for LANL NCS operations at NNSS to avoid skewing overall LANL NCSP reporting numbers**.**

Summary: FY24 saw major growth in NCS staff at LANL, with eleven new staff hires and two additional subcontractors (with several decades of experience). One CSA loss was a full-time staff member who transitioned to the Associate Laboratory Directorate for Weapons Production (ALDWP) as a Criticality Safety Officer (CSO) – a net zero loss for LANL criticality safety experience. Of the eleven hires, seven came from within LANL; three experienced staff came from other sites and the other hire recently graduated college. The NCS Division reorganization

in FY24 also resulted in the hiring of three Group Leaders (each 0.5 FTE CSA), two Deputy Group Leaders (each 0.5 FTE) and the Deputy Division Leader.

For completeness, NCS Division revised the NCS Division staffing plan to reflect the NCS Division reorganization and ramping up of the 30 pit-per-year mission. While recognizing the continuing need to hire CSAs, it also focuses on retaining staff and reducing attrition. NCS Division remains concerned that attrition of CSAs could negatively impact the mission. To address these needs, the division has worked to increase professional development opportunities toward a focus on retention of staff. Additionally, retention surveys and focus group meetings have been conducted to increase understanding of and explore avenues to increase retention. A revamped retention/incentive program, a recommendation from the CSSG assist visit, remains a recommendation that has not yet been completed.

Note that this information includes qualified CSA LANL and subcontractor personnel, together. The average NCS experience for the 7 subcontractors is 29 years in comparison to 7 years on average for the 17 LANL qualified CSAs. While LANL employs nine individual subcontractor employees (seven of which are qualified CSAs), some work part-time resulting in 5 FTEs.

NCS Division submitted a revised Program Improvement Plan (PIP) to NA-LA and received concurrence. The plan documents continued improvements toward a focus on safe, compliant and efficient fissionable material operations.

Two additional Federal staff have completed the NCS functional area qualification but do not perform day-to-day oversight of the Contractor’s NCS program.

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: The NCS Division Balance of Programs Group Leader was hired resulting in significant improvement to support for NNSS operations. First time in many years achieving/exceeding goals for CSA time in facility and availability (1700 hours or 130% of 0.75 FTE goal). Five CSAs participated in hands-on criticality safety training classes at NCERC. Three CSED/TECH documents were issued for NNSS operations. CSAs participated in critical experiment work for benchmarks and experimental measurements using the BeRP ball.

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 in FY24.

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
11	0	9	2	2

Summary: No issues were added specific to NNSS during FY24. For the two issues open longer than one year, one is a criticality safety improvement (i.e., not a non-compliance) which requires dedicated analytical methods support for new validation methods and is being actively

managed. The second issue required revision of CSED for the class demonstration; the revision has been completed but not yet implemented while operations is actively managing transition from RTO-01/RTO-02 to DEMO-039. Implementation will be completed following the transition to a different classroom.

4. NNSS LANL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	11	25	4	N/A (Included in LANL Staffing)		
Federal	N/A (Subset of LANL Staffing - Federal)					

Summary: At the end of FY24, LANL NCSD has nine Senior Qualified CSAs (CSA-SQ) that are qualified to perform all NCS work at NNSS and an additional two qualified CSAs that are task qualified (facility) to perform work at NNSS.

Sandia National Laboratories (SNL)

1. SNL Overall Performance

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

Summary: The Program Health grade is excellent based on the continuous improvements Sandia National Laboratories (SNL) has implemented. SNL has utilized its *Program Improvement and Implementation Plan* started in Fiscal Year (FY) 2016 and currently at Issue 7, to focus and track these key programmatic improvements. In FY 2024, SNL provided metrics to the Sandia Field Office (SFO) showing positive trends. Staffing continues to be strong with seven staff qualified and five staff in qualification. At the annual briefing to the Associate Laboratory Director, the budget was discussed and resolved when budget was an issue. SNL continues to provide high quality criticality safety evaluations as needed (1-2 per year) and supports the floor-level implementation of recently approved criticality safety evaluations. In FY 2023, an external assessment with nine staff from three DOE sites resulted in nine observations and seventeen noteworthy practices. The Naval Nuclear Laboratory (NNL) read the report and sent six staff to benchmark the SNL criticality safety program processes for integration with line organizations, performing assessments and analyses, and operational awareness of activities.

The Operational Implementation grade is good based on support completing multiple evaluations, assessments and other requested items for multiple facilities across SNL. The number of infractions and non-compliances for a 10th year was low, with no infractions and one non-compliance. Seven assessments of facilities where activities occur routinely were completed on schedule and were used to train new engineers. Floor level support during operational activities continues to improve and SNL now has a database for tracking the facility visit with notes on discussions and actions. In FY 2024, SNL completed 74 operational awareness activities with line organizations in the database. Criticality safety reviews all procedures that implement controls and supported several facility safety committees.

Although a small program with an extremely small risk of a criticality accident, the SNL criticality safety program continues to formalize their program to improve. In FY 2024, SNL completed a third year of training for over 20 SNL emergency management responders and 70 Kirkland Air Force Base Emergency Response firefighters. SNL supported the DOE complex by taking a lead position in negotiations on the resolution to requested items in the upcoming DOE O 420.1D; attendance and contribution at both of the DOE Community of Practice (CoPs); attendance at meetings of the DOE Nuclear Criticality Safety Program (NCSP) with one individual serving as a member of the DOE NCSP management team and another serving on the Nuclear Data Advisory Group (NDAG); several members of the SNL criticality safety team lead or support American National Standards Institute/American Nuclear Society (ANSI/ANS)-8 standards and ANS Nuclear Criticality Safety division activities; finalized a criticality safety assessment of LANL; attended and presented seven papers at the 12th International Conference on Nuclear Criticality Safety (ICNC) in Japan; and procured new hardware and completed the epithermal tantalum experiments (IER 441), which will be submitted to the International

Criticality Safety Benchmark Evaluation Project (ICSBEP) Technical Review Group (TRG) in FY 2025.

SNL provided four hands-on courses for DOE NCSP and supported two criticality safety courses at the University of New Mexico. SNL added a fourth DOE NCSP course due to the increased need for training to approximately 65 students from 4 countries, 11 DOE sites, 3 DoD sites, 8 companies, and the NRC. SNL has continued to support the new Combined Radiation Environments for Survivability Testing (CREST) facility currently in the CD-1 phase of design. This includes evaluating the need for a Criticality Accident Alarm System (CAAS) at CREST which there has not been a CAAS at SNL for over 15 years.

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	0	0	0

Summary: There were no criticality safety infractions reported during FY 2024.

3. SNL Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no program non-compliances in FY24.

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	1	1	2	1

Summary: There was one open issue at the start of FY 2024 for the Sandia Pulse Reactor Facility (SPRF) fission chamber co-located with fissionable material event. All actions

associated with this event were closed in FY 2024. One other event was entered for a procedure violation for not staging a container in the correct area from Building 957 to Building 957C upon identifying that fissionable material was contained within the container. There were seven actions assigned to this event which six were closed in FY 2024 one remains open by the line organization. Overall, SNL maintains a healthy response to identifying issues and corrective actions and tracking them to completion.

5. SNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	7	11.2	5	0	1	0
Federal	1	19	0	1	0	1

Summary: SNL lost two of their senior criticality safety staff three years ago; however, neither were heavily involved in performing criticality safety activities. SNL has been very aggressive in hiring and retaining criticality safety staff. In FY 2023, SNL hired 2 new staff and converted a graduate student from their university pipeline, as a 3rd new staff member. In FY 2024, one additional staff member from another program entered the qualification program and will support as a part time duty when qualified. SNL expects to qualify two staff, with a stretch goal for three, and will requalify all seven qualified staff in FY 2025.

The one qualified Sandia Field Office (SFO) criticality safety staff member is able to devote approximately 15% of his time to criticality safety oversite due to being responsible for oversight of another three functional areas and is a team leader. The SFO is working on succession planning as the SFO staff is eligible for retirement.

Pantex

1. Pantex Overall Performance

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

Summary: The majority of work for the Pantex NCS Program is associated with a large multi-year improvement plan which began in FY20 and is scheduled to be completed in FY25. The intent of the NCS Improvement Plan is to upgrade the overall quality and effectiveness of the NCS Program at Pantex through improvements in 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

The Pantex NCS Improvement Plan is on track to be completed by Quarter 2 of FY25. Among the issues completed in FY24 were improvements in clarification of NCS controls in procedures; verification of Pantex NCS credited items for special tooling and containers; and development and concurrence of Pantex NCS Program metrics. These improvements elevate the NCS Program at Pantex to a level meeting contemporary standards. Overall, the NCS program health is considered 'Good.'

Due to the nature of fissile material operations at Pantex, infractions, non-compliances and issues are generally very low. Of note, one issue has been open for longer than a year and is associated with completion of the 40+ actions identified in the Pantex NCS Improvement Plan. Therefore, the operational implementation of the NCS Program at Pantex is considered to be 'Good.'

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: There were no NCS Infractions at Pantex in FY24.

3. Pantex Program Non-Compliances

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

Summary: There were no NCS Program Non-Compliances at Pantex in FY24.

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
2	0	1	0	1

Summary: At the start of FY24, two issues were open and no issues were added in FY24. The single issue open longer than one year tracks several improvements the contractor is making to the Pantex NCS Program, which are identified in a Pantex NCS Improvement Plan and is scheduled to be complete by Quarter 2 of FY25.

5. Pantex Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	3	8.33	3	2	3	1
Federal	1	2	0	0	0	0

Summary: The contractor at Pantex has a total of six NCS Engineers, three of which were hired in FY24 and are currently in training. Additionally, the contractor has one vacancy for a chief engineer in which a candidate has been selected and is expected to start early in FY25. The federal Pantex Field Office qualified one and is designating 0.5 FTE to NCS oversight. NCS staffing at Pantex is adequate regarding the mission needs and risk at Pantex.

Y-12 National Security Site (Y-12)

1. Y-12 Overall Performance

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

Note: The Program Health grade reflects the combined performance of the contractor at Y-12 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. 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), the NCS Integrated Schedule (since 2020), and the annual NCS Metrics Report (since 2022). The level of oversight and the quality of the oversight provided through these processes exceeds expectations.

In Fiscal Year (FY) 2024, the NCSP was tasked with a marked increase in the amount of directed stockpile work, in addition to the significant number of ongoing projects supported by the program. These deliverables were well managed and adequately prioritized; however, CNS was unable to make progress as scheduled on several NCSP improvement tasks. These included established 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. CNS management and Y-12 Field Office (YFO) are working to address this repeated gap in performance as these improvement tasks have fallen behind established goals for multiple years. 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 YFO and some delays in the established goal are viewed as acceptable. One notable area of improvement for the program was in the successful completion of a FY24 goal to reduce the inventory of open NCS infractions. CNS management provided adequate priority and resources and maintained focus on this goal throughout the year. The NCSP demonstrated a firm commitment to this goal, while thoroughly investigating infractions and taking actions as necessary to prevent recurrence. The NCSP staffing level was maintained despite higher attrition rates as CNS was able to hire experienced engineers for backfills. Additionally, the NCS training program remained strong with a demonstrated record of producing well trained and prepared engineers. Overall, the NCS program health is considered 'Good.'

The NCSP at Y-12 is implemented via a mature suite of administrative and technical procedures. CNS has completed actions to improve 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. Incorporation of NCS requirements into work execution documents, most notably in maintenance work packages, has been improved. Additionally, the NCSP has improved on the implementation and configuration management of passive design features. Performance in these areas has seen a marked improvement, but additional runtime is needed to fully evaluate action effectiveness.

During the previous 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 YFO Safety Basis Approval Authority approved this submittal on 09/11/2023 and CNS began work in FY24. A significant number of containers were generated during the disposition of this container and NDA measurements of each container validated overall NDA of the drum. The drum was fully emptied without incident and normal operations have resumed. This effort by CNS is a notable achievement that addressed a significant NCS hazard at Y-12.

Y-12 has improved performance working to the set of NCS general requirements (NCSGR) applicable to most fissile activities. 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 was the focus of an FY24 YFO Assessment. This assessment found that while some issues remain with NCSGR, overall performance to these controls is generally adequate.

Operational execution to NCS requirements has also seen improvements over the reporting period. Y-12 experienced fewer personnel error caused infractions in FY24. Additionally, all NCS related occurrences were due to equipment or documentation issues. Improved performance allowed YFO to close a long standing YFO Management Concern for NCS infractions due to personnel error. This performance notwithstanding, YFO continues to track a high-level Management Concern 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 2023 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. Following the completion of all related actions, CNS performed an effectiveness review which concluded that additional corrections are necessary to improve overall effectiveness of preventative actions. YFO shares this conclusion and continues to closely track CNS actions associated with the Discipline Operations Management Concern.

With the observed improvement in operational execution that allowed for the closure of the YFO Management Concern on NCS infractions, the Operational Implementation is graded as 'Good.'

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	4	3	0
Deficiencies	19	3	0
Minor Non-Compliances	34	3	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 saw a slight decrease in the total number of infractions over the reporting period compared to FY23.

The seven Occurrences identified remains elevated above typical values. However, all of these events were categorized as 3C4 (L) or 10-1 (I) Occurrences. These events 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 continue 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 considered a noteworthy practice for an NCS program.

YFO identified three of the seven Occurrences, as well as an increased share of the NCS deficiencies in FY24. This continues a trend observed by YFO of an increase in field-office-

identified infractions year over year. YFO will be working with CNS to determine if improvement in performance in this area is necessary.

3. Y-12 Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	1

Summary: DOE Enterprise Assessments (EA) identified a non-compliance with the Y-12 NCS training program during an assessment in FY24. This issue was cited against ANSI/ANS 8.26, section 5.2 as the training program allows for engineers to qualify in and independently perform NCS tasks without supervision by a fully qualified NCSE. This approach was not codified in the NCSP description document; however, EA concluded that "in general, CNS has adequately established training and qualification programs for NCSEs…" indicating that the approach, while inconsistent with the prescribed requirements in ANSI/ANS 8.26, was not viewed as a significant detraction to the overall adequacy of the training program. YFO and CNS have since worked to formally address the EA deficiency and ensure the Y-12 NCS training program is adequately described and implemented.

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
35	70	63	19	5

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 as 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 YFO to be acceptable. Additionally, the issue significance level may drive a corrective action effectiveness review to be performed, which is typically conducted 3-6 months after completion of all actions. This naturally leads to an extended duration for some issues.

In FY24, CNS demonstrated significant improvement in issue management and prioritization. This improvement led to a reduction in the inventory of issues open for longer than six months (19, down from 32 in FY23) and longer than one year (5, down from 13 in FY23). Issues open for longer than one year in particular were properly prioritized to work off several long-standing

issues resulting in a net decrease of eight items open for longer than one year. This demonstrates CNS management's focus on closing aging issues. Only five issues now remain open for longer than one year. Of these five issues, two remain open to track equipment modifications, for which the age of the issue is generally considered acceptable. One issue had an extensive action plan (81 actions) that was completed near the end of the FY and is awaiting review and closure. One issue remains open while awaiting changes to a number of impacted CSEs. Finally, the fifth issue remains open pending implementation of CSE changes in a facility which is expected by the end of the calendar year. Overall, CNS demonstrated a strong commitment to addressing issues with appropriate timeliness and priority in FY24.

5. Y-12 Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	29	14.1	29	13	14	10
Federal	2	6	0	1	0	1

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

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. FY24 saw a marked increase in attrition of NCS engineers, which nearly doubled in the number of staff lost compared to FY23. Despite this increase in losses, CNS has managed to hire experienced engineers in order to maintain a high average experience level (14.1 years) and an adequate staffing number (29) for the forecasted work in FY24. Average experience has steadily increased each year with 14 years and 12.3 years reported for FY23 and FY22 respectively, while qualified staffing levels have remained relatively consistent with 32 and 28 reported for FY23 and FY22 respectively. Additionally, CNS management announced sweeping organizational changes within the NCS Program at the end of the FY in response to the continued loss of staff. CNS management demonstrated a notable response to feedback received by individual contributors in the follow through with these organizational changes. These changes will be closely monitored by YFO in FY25 to evaluate its effect on retention. The staffing element of the program is considered 'Good.' However, sustained improvement in staffing retention is necessary.

YFO NCS staffing levels are adequate. One staff loss occurred in FY24, and YFO Management is actively working to fill the vacancy in early FY25.

Uranium Processing Facility (UPF)

1. UPF Overall Performance

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

Note: The Program Health grade reflects the combined performance of the contractor at Y-12 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 2024 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 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 and is rated 'Good.'

The NNSA Headquarters office agrees with these health grades.

2. UPF Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
0	0	1

Summary: See the Y-12 section for the one program non-compliance.

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	21	12	2	0

Summary: UPF issues are appropriately prioritized and closed. YFO is notified as required of issues that could impact the approved DSA. No concerns have been identified by YFO regarding the UPF NCS organizations identification and timely closure of NCS issues. Four CNS NCS management self-assessments were conducted examining selected criteria from ANSI/ANS-8.19 during the Fiscal Year 2024, with no issues identified against the reviewed criteria.

4. UPF Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	13	29	0	1	1	0
Federal	2	6	0	1	0	1

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

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.

NNSA Savannah River Site (SRS)

Savannah River Plutonium Processing Facility

1. SRS Overall Performance

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

Summary: The Program Health grade is 'Good' based on the current state of the SRPPF project. Significant improvements have been made by both the Field Office and SRPPF contractor during FY24 in response to the "marginal" rating of the FY23 Annual Metrics Report. Improvements have been prompted by the addition of a Criticality Safety SME support services contractor supporting the SRPPF Field Office in FY24. With the additional support, issues previously mentioned in the FY23 Annual Metrics Report are clearly understood, and efforts to ameliorate the issues are underway.

The maturity of the Nuclear Criticality Safety (NCS) program is satisfactory based on the current maturity of the overall project. Savannah River Nuclear Solutions (SRNS) has continued to support the staffing needs of the project and has responded in a timely manner to increase staffing and to replace staffing as necessary. Preliminary Nuclear Criticality Safety Evaluations (PNCSEs) have been authored and approved for every system involving fissile material operations planned in the SRPPF. Currently, ongoing efforts are underway to revise a number of these PNCSEs to revise controls based on further development of SRPPF design and to provide Criticality Safety Engineers (CSEs) In-Training to gain experience authoring PNCSEs. Within the next fiscal year, focus will shift from revising PNCSEs to developing programmatic documentation and other, lower priority NCS procedures.

No non-compliances have been identified with the project's implementation of the site criticality safety program. No findings have been identified from reviews of preliminary Nuclear Criticality Safety Evaluations.

Metrics for Surplus Plutonium Disposition (SPD) will still be included in EM's section of the report for K-Area this year. Though SPD has been owned by NNSA, the primary NCS Contractors for SPD are the leads for K-Area. Thus, any updates to SPD would be documented in EM's report on K-Area.

K-Area landlord ownership changed hands October 1, 2024, and K-Area is now under the authority of the NNSA. So going forward, K-area and SPD will most likely still be wrapped into one section; however, this will be in NNSA's portion of the report.

The area in which SPD will be located is currently just an empty room with some minor construction activities ongoing. Startup is scheduled for late-2020's. As of FY24, no updates to the project from an NCS perspective (revisions to the single NCSE, CAAS documents, etc.) have occurred.

The NNSA Headquarters office agrees with these health grades.

2. SRS Program Non-Compliances

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

Summary: No non-compliances were identified on SRPPF's implementation of the site Criticality Safety Program.

3. SRS 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: No criticality safety findings were identified from NNSA review of the project's implementation of the site NCS Program or reviews of PNCSEs. NNSA collaborated with EA-31 for an annual assessment of the SRPPF NCS Program during FY24. EA-31 did not issue any findings or otherwise but noted many areas where the SRPPF NCS Program could improve prior to startup. These areas included programmatic deficiencies, justification of credited assumptions and design features/controls in PNCSEs, and formal interface between Design Authority and NCS. The FY23 Annual Metrics Report for SRPPF also included a statement regarding the formality of capturing NCS design features within the design documentation. This was observed by the EA-31 group during their assessment. These issues have been summarized and recorded in a report issued to the SRPPF NNSA, who will be monitoring each issue in the coming FY and beyond. Many of these observations are expected based on the maturity phase of the program and have already been planned to be addressed by the SRPPF NCS Program.

An assessment performed by the DNFSB early in FY24 identified three more areas that need to be bolstered related to the SRPPF NCS Program. These areas included: the need for Criticality Accident Alarm System (CAAS) in the SRPPF, the thoroughness of NCS involvement throughout the design process, and the use and interpretation of "unlikely" in NCS documents. Of these issues, the one of primary focus involves the need for CAAS in SRPPF. The NNSA has reached out to the Criticality Safety Support Group (CSSG) for further guidance in responding to the DNFSB in the form of an assessment of the SRPPF CAAS documents. A decision from the Field Office on the path forward regarding the extent of CAAS placement and use within the SRPPF will be made following the results from the CSSG assessment, which are expected in FY25. The other two areas identified by the DNSFB were also identified during the annual assessment supported by EA-31 and will be addressed as the SRPPF NCS Program matures.

4. SRS Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	8	16.8	4	2	0	3
Federal	0	0	1	1	0	1

Summary: Contractor staffing for the SRPPF NCS Program is sufficient based on the staffing needs of the program. SRPPF NCS Program duties are performed by the SRNS employees with assistance from support service contractors and in conjunction with support from SRNS program SMEs when needed. Two support service contractors have been lost recently, though both were part-time subcontractors. No full-service SRNS employees have been lost in FY24. It is expected that one senior CSE may retire in FY25, though the SRPPF NCS Program is actively training qualified CSEs to assume Senior CSE positions. Ample Associate (In-Training) CSEs are positioned to be qualified in the coming months to backfill those qualified CSE positions as well. One vacancy in the SRPPF NCS Program has been identified, the role of the NCS Program Manager. However, this role is not required by the SRS NCS Program and the responsibilities of the position are being performed by the Nuclear Safety/NCS Program Manager and the NCS Senior Technical Lead.

There are currently no qualified NNSA Criticality Safety SMEs overseeing the SRPPF project. One support service contractor was hired in late 2023 and began working in mid-January 2024. The Field Office currently has one Nuclear Safety SME cross-qualifying in Nuclear Criticality Safety and anticipates onboarding a TQP qualified Criticality Safety Engineer sometime in FY25. 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 Assessment	Program Health: Good
	Operational Implementation: Good

Summary: The Program Health grade is 'Good' based on PNNL's maintenance of existing processes where the program elements meet the minimum requirements and is actively correcting minor non-compliances. In Fiscal Year (FY) 2024, the Program Description Document was successfully revised, approved, and implemented despite significant staff turnover. Other associated procedures, processes, and evaluations were also updated and improved due to continued efforts of full-time staff. PNNL conducted comprehensive assessments of fissile material operations and NCS administrative practices. 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 strong collaboration between criticality safety and operations. In FY24, PNNL met or exceeded the minimum operational implementation requirements. The number of identified infractions and non-compliances were low with seven low-level infractions which include two non-compliances.

None of the infractions resulted in a loss of double-contingency within any criticality safety control area. The infractions included one event which was ORPS reported where multiple sample locations were inconsistent with the administrative tracking software. The second infraction was due to a deficiency in implementing a new PNNL program requirement to conduct operational reviews on a monthly frequency.

During an independent assessment of PNNL's nuclear criticality safety program. The external assessment team identified two noteworthy practices relating to the improved ease of implementing criticality controls and a healthy relationship between the criticality safety program and fissile material operations. The NCS Program has continued staff development and continues hiring efforts due to multiple vacancies. The NCS Program Manager position was satisfactorily filled this year. Open forums were conducted for both operations staff and management, which provided lessons learned from across the complex.

In FY24, 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 in spite of significant staffing turnover.

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
Level 1	0	0	0
Level 2	0	0	0
Level 3	0	0	0
Level 4	2	0	0
Level 5	4	1	0

Summary: A total of seven Criticality Safety Infractions were identified in FY24. Five met the criteria of Level 5, Discrepancy, and two of which met the second-lowest, Level 4, Deviation. The first infraction occurred in Oct. 2023 and met the criteria of a Level 4, Discrepancy. This event was ORPS reported. A Shielded Facilities Operations (SFO) technician working in the High-Level Radiochemistry Facility (HLRF) hot cells, opened and inspected a sample storage container they believed to contain an archived spent nuclear fuel sample. The sample container held items and components related to the project but not the actual archive sample. The technician searched in the hot-cell for the correct sample storage and was unable to locate it. The technician searched in the adjacent hot-cell and located the correct sample storage tube that contained the archived sample in a waste container that was being staged for disposal. An extent of condition was conducted to verify location of additional archived project sample storage tubes expected to be in the hot-cells. This exercise identified five additional samples that could not be located but were also found in subsequent corrective activities.

The second Level 4 infraction related to fissionable material limit errors within the radioactive material tracking software, where these limits were not aligned with the approved Criticality Safety Specification. The infraction appeared to be transposition errors which bound the approved criticality safety specification, and the impact was limited to one criticality safety specification. The issue was remedied on the day of discovery, the rooms affected were verified to be bounded, and the issue was fully resolved within two days.

The five deviations pertained to various elements of the criticality safety program including lack of program metrics, discovery of historic material within the shielded hot cell, a non-destructive assay documentation gap for material in transit, inconsistent performance of operational walkdowns and training materials which diminished the risk of criticality. The NCS program staff are actively working with operators and fissile material handlers to improve awareness of criticality risks and consequences, which was identified by the Field Office as a potential weakness. Recognizing improvements needed in training materials, the NCS program is taking a holistic look to assure the right emphasis is placed on the importance of a good criticality safety culture.

3. PNNL Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
2	0	0

Summary: Two PNNL Program Non-Compliances were identified in FY24. One was identified during conduction of an independent assessment of administrative practices as required per ANS/ANSI-8.19. The assessment finding identified no discernable metrics to measure and monitor the effectiveness and health of the criticality safety. PNNL management is actively developing tools and gathering data to address this finding. The second program non-compliance was internally identified during performance of the triennial operational assessment. The finding revealed that criticality safety operational observations were not conducted at the monthly interval established as a PNNL program requirement.

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
6	2	6	0	0

Summary: The NCS Program staff addressed multiple issues carried forward from FY23, and no issues remained open longer than 6 months. PNNL issues management is effective, and issues are resolved in a timely manner. PNNL resolved an issue related to the requirements for the qualification of criticality safety analysts in that no documentation was required to show the analysts had participated in the conduct and interpretation of hands-on critical experiments as required by ANSI/ANS 8.26. The qualification package was revised to incorporate that this verification is completed by the NCS Program Manager. The requirement has been met for all qualified analysts.

PNNL resolved two issues from FY23 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. The Program issued procedures to incorporate review of the historical and current modes and quantities of accumulation on an ongoing basis with periodicity specified for confirmation through empirical measurement. Reviews of non-destructive assay (NDA) have determined that there is not excess accumulation within dismantled glovebox ductwork nor equipment from within gloveboxes. PNNL Criticality Safety has provided continuous updates to the Field Office of NDA results.

The issue from FY23 related to the training of operations for their response to non-conformances was resolved. The criticality safety program added a specific distance guideline for responding to non-conformances and operations staff have provided consistent and satisfactory responses during operational walkdowns for non-conformance conditions and response actions.

The new issues include the lack of metrics to measure and monitor the effectiveness and health of the criticality safety and that operational observations were not conducted at the monthly interval established as a PNNL program requirement and are currently being addressed.

5. PNNL Staffing

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

Summary: PNNL filled both their Line and NCS Program Manager vacancies during FY24. Staff are readily adapting to their new positions and fulfilling responsibilities. The resulting staffing configuration includes two full-time qualified analysts, one of which is dual-qualified as a CSE-Analyst and CSE-Representative and augmented two part-time qualified CSE-Analysts with two open position requisitions for a CSE-Analyst and CSE-Representative. Two subcontract staff are qualified for independent reviews for criticality safety evaluations. For FY24, the PNNL NCS program had enough qualified, experienced full time and augmented qualified staff to fully support the program.

Richland Operations Office
Central Plateau Cleanup Company (CPCCo)

1. CPCCo Overall Performance

Field & Program Office Assessment	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.'

EM HQ agrees with this summary.

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	0	0	0
Level 4	0	0	0

Summary: There were no NCS nonconformances in Fiscal Year 2024.

3. CPCCo Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no NCS Programmatic non-compliances in Fiscal Year 2024.

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
1	32	10	2	3

Summary: The contractor performed five management assessments that were captured in iCAS generating 32 low level actions (all level C or D not requiring causal analyses). A significant emphasis was placed on training which resulted in many opportunities for improving the training program and NCS testing materials. The focus was for the fissionable materials operators and the NCS facility representatives. The NCS Program description document was updated which resulted in modifying some oversight requirements. Several open issues are awaiting DOE review and approval, and the long-term open items will be closed by the end of the calendar year 2024.

5. CPCCo Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	30+	2	0	0	0
Federal	3	26	0	0	0	0

Note: Federal staff perform oversight of all prime contractors with criticality safety programs. This includes four prime contractors – CPCCo, HMLI, BNI, and WRPS. Currently the Hanford Field Office (HFO) relies on General Service Support Contractors (GSSC) to assist federal staff, as necessary. GSSC numbers and experience are not included in the table above.

Summary: Contractor staffing is small. Two personnel working in nuclear safety have been tasked to qualify as criticality safety engineers by the end of Fiscal Year 2026. Federal staffing is sufficient for the current workload.

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

1. BNI-WTP Overall Performance

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

Summary: The Direct Feed Low Activity Waste facility has not yet transitioned to hot operations. This year the NCS program was split into two independent NCS programs. One for low-level waste and a new program for high-level waste. The high-level waste NCS program was conditionally approved by ORP via a Condition of Approval. The contractor is working to meet the conditions for final approval.

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	6	8	4	1	2	0
Federal	3	26+	0	0	0	0

Note: Federal staff perform oversight of all prime contractors with criticality safety programs. This includes four prime contractors – CPCCo, HMLI, BNI, and WRPS. Currently the Hanford Field Office (HFO) relies on General Service Support Contractors (GSSC) to assist federal staff, as necessary. GSSC numbers and experience are not included in the table above.

Summary: BNI lost one staff member and hired two. Since FY23, two staff completed qualification, and two were added to in training. Federal staffing is sufficient for the current workload.

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

1. WRPS-Tank Farms Overall Performance

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

Summary: The contractor retains highly trained and experienced criticality safety engineers with minimum turnover. Furthermore, the NCS program is well established and mature. The program elements meet requirements resulting in an overall grading of 'Good.'

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: There were no NCS nonconformances in Fiscal Year 2024.

3. WRPS-Tank Farms Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no NCS non-compliances in Fiscal Year 2024.

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
0	3	3	0	0

Summary: The annual assessment of the NCS program identified opportunities for improving communications with operations and providing more consistent NCS control descriptions. Another readiness assessment for the 242-A Evaporator identified an opportunity for improving shift staff NCS knowledge.

5. WRPS-Tank Farms Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	2	30+	0	0	0	0
Federal	3	26+	0	0	0	0

Note: Federal staff perform oversight of all prime contractors with criticality safety programs. This includes four prime contractors – CPCCo, HMLI, BNI, and WRPS. Currently the Hanford Field Office (HFO) relies on General Service Support Contractors (GSSC) to assist federal staff, as necessary. GSSC numbers and experience are not included in the table above.

Summary: The Contractor has not identified a need for staffing adjustments. Federal staffing is sufficient for the current workload.

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

1. 222S Labs Overall Performance

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

Summary: The NCS program has completed transitioning all procedures and processes to the HLMI contractor. The NCS program is compliant and does not have any identified deficiencies. The program elements meet requirements resulting in an overall grading of 'Good.'

EM HQ agrees with this summary.

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: There were no infractions in the last year.

3. 222S Labs Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: There were no non-compliances in the last year.

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	1	0	0

Summary: The item open at the beginning of the fiscal year involved clarification of which staff needs criticality training. A revision to the NCS program description fixed this issue. The field office approved the revision to the NCS program description document during FY24.

5. 222S Labs Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	1	32	0	0	0	0
Federal	3	26+	0	0	0	0

Note: Federal staff perform oversight of all prime contractors with criticality safety programs. This includes four prime contractors – CPCCo, HMLI, BNI, and WRPS. Currently the Hanford Field Office (HFO) relies on General Service Support Contractors (GSSC) to assist federal staff, as necessary. GSSC numbers and experience are not included in the table above.

Summary: The Nuclear Safety manager is qualified as a Criticality Safety Engineer**.** Federal staffing is sufficient for the current workload.

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

1. Idaho Environmental Coalition Overall Performance

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

Summary: The Idaho Environmental Coalition (IEC) Criticality Safety Program (CSP) was rated as effective on average in fiscal year 2024 during DOE's quarterly evaluation of IEC performance. The IEC CSP continues to function in an effective manner and is sufficiently self-critical to identify any issues and communicates those issues in a timely manner with DOE for quick resolution. 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 NCS 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	1	0	0
Level 3	1	0	0
Level 4	0	0	0
Level 5	0	0	0

Summary: Two operational infractions were identified by the contractor.

The Level 2 (Level 1 being the lowest reporting level) infraction concerned a dual-verification criticality safety evaluation (CSE) control implementing procedural step that was signed-off by a qualified operator and a trainee, instead of two qualified operators. Additionally, the procedure was not immediately available to the operators as required. However, fissionable-bearing materials were otherwise never out of compliance with handling limits.

The Level 3 infraction concerned the discovery of water in a fuel storage vault after fuel loading, but prior to installation of the shield plug and closure of the vault. Removal of the discharging cask and closure of the vault was delayed by inclement weather. This led to identification of a deficiency in the CSE regarding moderator inspections to protect shield plug handling operations. Required moderator inspections were complied with prior to fuel handling, and the

quantity of water was within the upset quantity analyzed in the CSE. The CSE was revised to strengthen moderator inspections prior to shield plug handling.

3. Idaho Environmental Coalition Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
1	0	0

Summary: One non-compliance with a criticality safety program procedure occurred when a CSE was approved and issued prior to a supporting engineering reference being approved and issued. The supporting engineering reference document was approved prior to the CSE being implemented.

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	11	5	4	2

Summary: One issue was opened during FY23 and remained open for more than a year until it was closed in FY24.

Two other items were open for more than six months total during FY24 and both were closed before the end of FY24. The two items that were open for more than one year during FY24 are also counted as being open for more than six months, for the total of four.

At the close of FY24, one issue remains open longer than six months or one year, which is the one issue that was open at the start of FY24.

5. Idaho Environmental Coalition Staffing

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

Summary: 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.

Federal staffing is sufficient for the moment. An EM HQ staff member is available to assist as requested. This person is assisting with training and qualification of local Federal staff. Two current nuclear safety staff members are working toward the qualification.

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

1. UCOR Overall Performance

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

Summary: Overall, the UCOR NCS Program is doing well. The staffing levels have been increased to address the additional scope of work that UCOR had taken on with the absorption of the TRU Waste Processing Center (TWPC). Regular meetings are held with the NCS staff and oversight to ensure the program's health is maintained and no trends develop.

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	0	0	0
Level 5	0	0	0

Summary: Nothing to note.

3. UCOR Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: Nothing to note.

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: Nothing to note.

5. UCOR Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	7	19	1	0	1	0
Federal	2	6.5	0	0	0	0

Note: Federal oversight is combined for UCOR and Isotek Systems, LLC (Isotek).

Summary: The UCOR staffing levels are sufficient for the scope of work that is being performed. Regular meetings will continue to be held between UCOR NCS personnel and oversight to maintain awareness of the program. Federal staffing levels are sufficient to support the current level of work.

Oak Ridge Office of Environmental Management
Isotek

1. Isotek Overall Performance

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

Summary: The NCS program of Isotek is a small group that is sufficient to handle the scope of work for the project. The program has been proactive to maintain staff levels so as to adequately maintain coverage for the U-233 disposition project. Currently they have personnel stationed with the operations to ensure timely responses to any issues and to monitor the work being performed on a more regular basis. The NCS program as a whole is performing well and continues to be monitored through assessments and regular meetings with oversight personnel. The NCS program has an excellent relationship with operations which allows for close coordination between the groups to ensure adequate training, coordination on control development, and proper implementation controls.

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	1	0	0
Level 5	1	0	0

Summary: The infraction that carried over from the previous year pertained to having two containers within a hot cell when the limit was that only one container could be present in the hot cell. The infraction was rated as a level 5 due to the circumstances associated with this infraction. One of the containers present was already grouted and, before it was deposited into a waste drum, a new grout container was brought into the hot cell. This infraction was closed through a clarification of the NCSE control and associated procedure revision.

The level 4 infraction that occurred in FY24, was the result of a flange that was bolted on a canister carrier in the wrong configuration when compared to the drawing. Additional operator aids were added to prevent recurrence.

The actions taken to prevent recurrence has been determined to be sufficient. The program is functioning as it should. Regular meetings will continue with the group to maintain awareness of the health of the program.

3. Isotek Program Non-Compliances

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

Summary: Nothing to note.

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
1	1	2	1	0

Summary: The summary for each of the infractions can be found above that were entered into their issues management system. The infractions were closed with sufficient actions to prevent recurrence. The timeliness of their closure was fair with only one infraction remaining open for greater than 6 months.

5. Isotek Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	4	28.5	1	1	1	0
Federal	2	6.5	0	0	0	0

Note: Federal oversight is combined for UCOR and Isotek.

Summary: The staffing levels of the Isotek NCS program are sufficient for the scope of work for this project. Federal staffing levels are sufficient to support the current level of work.

Savannah River Site
Savannah River Nuclear Solutions (SRNS)

1. SRNS Overall Performance

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

Summary: SRNS's program health of their NCS program consistently exceeds the requirements and many of their practices are best in class and so deserves a rating of "Excellent." Staffing is at full capacity and has maintained at this level consistently over the past several years despite site peers experiencing significant attrition. SRNS's operational implementation of their criticality safety program meets the minimum requirements while often exceeding them and so deserves a rating of 'Good.' Minor issues are quickly addressed in a timely manner. No adverse trend has been identified for any aspect of SRNS's NCS program or its implementation.

SRNS meets routinely on a monthly basis with DOE NCS staff to review monthly performance of their self-assessment schedule over their operating facilities, facility and program issues, as well as staffing and training issues where they have received primarily a rating above meeting the minimum requirements and with many best practices noted.

Nuclear criticality 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 (SCD stands for Source Compliance Document). These SRNS criticality safety program documents are used across the SRS site by all three SRS contractors (SRNS, SRMC and BSRA) for their facilities with 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	4	0	0
Level 5	33	0	0

Summary: SRNS documents their criticality safety related issues in their Issues Management System and produces good summaries and trend analysis in their quarterly metrics reporting.

Level 4 infractions are non-3C ORPS reportable events and other notable occurrences with criticality safety overtones that are among the more serious findings as determined by engineering judgment. Of the four SRNS Level 4 CS (Criticality Safety) Infractions, one was a procedure reference error that was corrected immediately, another was an operations conduct issue that was corrected during the process, another was a discontinued surveillance that was credited but resumed when identified (no resulting issues from the surveillance review) and the fourth dealt with the pause of the DOE Readiness Assessment for H-Canyon due to two discovered implementation errors, which resulted from the DOE-SR Readiness Assessment for H-Canyon's Fast Critical Assembly (FCA) operation. One issue concerned the retained training knowledge of the operations staff of their criticality safety responsibilities as mandated by ANSI/ANS-8.19, Administrative Practices for Nuclear Criticality Safety. The other issue was a lack of verification of a criticality safety control to be implemented as required by the NCS evaluation covering the process. These findings resulted in SRNS performing a deep dive review of their engineering and training programs to improve rigor and accountability. Actions from this review are still ongoing to ensure not only correction but preventative measures to preclude similar future issues. The number of Level 4 CS infractions are in line with the totals from previous years and so do not represent a degrading trend in number or significance.

Level 5 infractions are non-ORPS reportable events and determined as less serious findings by engineering judgment. The thirty-three SRNS Level 5 infractions are a significant increase above last year's totals and primarily were a result of significant mission changes in H-Canyon including issues discovered by DOE in the DOE Readiness Assessment that covered FCA operations in H-Canyon that spurned a deep dive by SRNS into engineering practices that resulted in additional contractor-discovered findings.

Fourteen of the thirty-three Level 5 infractions were from SRNS team assessments of facilities (HB-Line and F/H Laboratory) that involved a criticality safety SME that found administrative issues of which all but two were closed within the fiscal year. HB-line and F/H laboratory are deactivated facilities with minimal fissile material remaining and minimal limited operations.

While there is an increased number from the 2023 DNFSB Annual Metrics report, it is two data points over a two-year period, as earlier years do not indicate a degrading performance trend. The SRNS deep dive into their overall site-wide engineering and training programs resulted in a prompt increase in issues resulting from a lowered tolerance standard and can be viewed as the result of an improvement in the NCS Program to identify issues found through extent of conditions. Currently, there is no immediate concern for a degrading performance trend, but it is worthwhile to continue to monitor this metric.

3. SRNS Program Non-Compliances

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

Summary: SRNS continues its trend in FY2024 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
4	38	35	4	1

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: The issues cited here are the same issues as cited in Section 2 above. Only six issues remain open past the end of the fiscal year. The one issue that is open longer than a year is a DOE-generated issue concerning K-Area's CAAS Needs Assessment regarding a needed revision to it to specifically demonstrate compliance with the ANSI/ANS-8.3-1997-R2017, Criticality Accident Alarm System, without relying upon the not-yet-adopted revision 2022 of the same standard. It is expected that this issue will be remedied within fiscal year 2025 without changes to K-Area's operational conditions. (Note that K-Area moved to be under the jurisdiction of the NNSA as of Fiscal Year 2025.) Currently, there is no concern about a degrading performance trend, but it is worthwhile to continue to monitor this metric.

5. SRNS Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	25	20.6	16	4	2	3
Federal	2	4	2	0	2	1

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 improved its staffing headcount a number of years ago and is doing an admirable job of maintain that staffing level, especially when compared with the attrition seen at peer sites. Their staffing turnover is also less frequent than peer sites. Federal staffing has succeeded in hiring two additional persons who are undergoing NCS qualification and is in the process of hiring one more person which would return federal staffing levels to that which was considered to be fully staffed in previous years (2018). There is no degrading trend in this area.

Savannah River Site
Savannah River Mission Completion (SRMC)

1. SRMC Overall Performance

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

Summary: SRMC's program health and overall implementation of their NCS program consistently exceeds the requirements and many of their practices are best in class and so deserves a rating of 'Excellent.' Staffing is at full capacity having greatly improved over past levels. Facility-specific Criticality Safety Officer program implementation improves the Criticality Safety Engineer's focus and expertise on each facility. Issues are actively addressed in a timely manner. Flexibility to incorporate Accelerated Basin Deinventory (ABD) and Fast Critical Assembly (FCA) process changes into the existing mission did not result in schedule delays or insurmountable technical challenges. No adverse trend has been identified for any aspect of SRMC's NCS program or its operational implementation.

SRMC meets routinely monthly with DOE NCS staff to review monthly performance of their self-assessment schedule over their operating facilities, facility, and program issues, as well as staffing and training issues where they have received a rating above meeting the minimum requirements and with substantial best practices noted.

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	1	0	0
Level 5	1	0	0

Summary: Level 4 infractions are non-3C ORPS reportable events and other notable occurrences based on engineering judgment, such as procedure deviations. Level 5 infractions are non-ORPS and determined to be less consequential by engineering judgment. There is no degrading trend in this area.

3. SRMC Program Non-Compliances

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

Summary: No program non-compliances were identified as the two noted issues in Section 2 above were self-identified as a result of SRMC's internal NCS program and corrected. There is no degrading trend in this area.

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	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: The two issues added during the fiscal year are the same two issues identified in Sections 2 above. Both have been corrected and closed successfully. There is no degrading trend in this area.

5. SRMC Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	6	15	2	0	1	1
Federal	2	4	2	0	2	1

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

Summary: SRMC has improved their staffing levels as compared to past years to be able to accommodate operational flexibilities without undue schedule impacts. Their productivity output in NCS documents have increased this past year to their highest levels yet. Federal staffing has succeeded in hiring two additional persons who are undergoing NCS qualification and is in the process of hiring yet one more person which would return federal staffing levels to that which was considered to be fully staffed in previous years (2018). There is no degrading trend in this area.

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

1. SRNL Overall Performance

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

Summary: BSRA is the contracted operator for SRNL. BSRA's program health and overall implementation of their NCS program meet the minimum requirements and so 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 NCS 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 over their operating facilities, facility and program issues, as well as staffing and training issues and has received a consistently satisfactory rating having met all requirements.

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	1	0	0

Summary: The one infraction at SRNL dealt with some facility personnel not completing their required NCS training (an annual requirement) in a timely manner. The issue was remedied within the fiscal year, and action was taken to prevent future issues. There is no degrading trend in this area.

3. SRNL Program Non-Compliances

Identified by:		
Contractor	Field Office	DOE Headquarters
0	0	0

Summary: BSRA/SRNL continues its trend in FY2024 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	1	1	0	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: The one issue is the same one detailed in Section 2 above. As it was administrative and remedied in a timely manner, it does not cause a concern nor a declining trend in performance.

5. SRNL Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	1	24	1	0	0	0
Federal	2	4	2	0	2	1

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

Summary: BSRA has no direct NCS staff and instead contracts the fulfillment of that duty to SRNS though BSRA has a direct person accountable to its program. SRNS provides a senior level criticality safety staff member to fulfill the BSRA NCS Program role. Federal staffing has succeeded in hiring two additional persons who are undergoing NCS qualification and is in the process of hiring yet one more person which would return federal staffing levels to that which was considered to be fully staffed in previous years (2018). There is no degrading trend in this area.

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

1. EMLA Overall Performance

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

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

In March 2024, N3B commissioned a Criticality Safety Management Assessment (MA) designed to evaluate the adequacy of the NCS Program's implementation of applicable ANSI/ANS-8 Standards in procedures that constitute the NCS program at N3B Los Alamos. The MA did not include evaluations of operations, facility inspections or tours, on-site interviews or a complete review of operating procedures and processes. Thus, the scope of the MA is limited to evaluating the adequacy of implementation of applicable ANSI/ANS-8 and DOE-O 420.1c, Chg. 3 requirements as described in the N3B approved NCS program documentation. No findings were identified during the review. Several Opportunities for Improvement were identified, mostly lower-level suggestions for improvements and procedural changes to align information and internal procedural requirements with specific DOE (ANSI/ANS-8 Standards) requirements. The number of OFIs is not to be interpreted as a program weakness in general, as programs differ in structure and implementation.

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	1	0	0

Summary: During FY2024, N3B had 1 criticality safety infraction identified. On February 20, 2024, at 1406 hours, the CH-TRU Program Manager paused Corrugated Metal Pipe (CMP) Sort, Segregate, and Size Reduction (SSSR) activities at Dome 375 due to questions regarding the use of water in a sprayer bottle during CMP SSSR activities not having had a Nuclear Criticality Safety Evaluation (NCSE) prior to use. The water in the sprayer bottle is used to mist/spray

surfaces for radiological contamination control and decontamination activities in accordance with the Radiological Work Permit. NCS concluded that the introduction of this small amount of water is bounded by the CMP Size Reduction Criticality Safety Evaluation, resulting in a level 5 determination. The safety margin at no point was compromised nor was a criticality control violated. The real concern from a NCS perspective was the lack of the use of the integrated safety management system. The ISM process was not followed as required per N3B-SD130.

3. EMLA Program Non-Compliances

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

Summary: During Fiscal Year 2024, zero non-compliances were identified with respect to DOE O 420.1 Facility Safety and the ANSI/ANS-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
0	1	1	0	0

Summary: On December 6, 2023, N3B opened an Issue Management (IM) Report for the discovery that per the NCS Software Quality Assurance procedure, an in-use test that was to be performed two times yearly was not performed as required. Actions were taken to rectify this Issue, including running a verification, completing a Nuclear Criticality Safety Review, and revising the procedure for clarity and guidance. The IM Report was closed on February 8, 2024.

5. EMLA Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	5	16.5	1	0	0	0
Federal	0	N/A	0	0	0	0

Summary: For FY24, N3B has had five qualified and one in-training staff members all averaging approximately 16.5 years of experience. Two were full time, one was in training, and three were reach back to be used as needed. EMLA does not have any current NCS staff members or any Full Time Equivalent (FTE) positions within the current organization structure. Due to a limited mission scope involving NCS, 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 Assessment	Program Health: Good
	Operational Implementation: Good

Summary: WIPP NCS Program Health in FY 2024 is 'Good' based on the continuation of qualification for additional WIPP Nuclear Safety personnel and based on the experience of the WIPP NCS Team (including both NWP in-house personnel and subcontractors).

The Prevention of Inadvertent Criticality Program in Chapter 6 of WIPP DSA/TSR Revision 9, dated July 2024, as approved by Carlsbad Field Office Safety Basis Approval Authority describes the essential elements of the WIPP NCS Program. 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. NCS Evaluations analyze the activities involved in the handling and disposal of TRU Waste and demonstrate the criticality incredibility of said activities. The NCS 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 evaluations concluded that no credible criticality accident scenarios exist for CH waste container storage, handling, and disposal activities at the WIPP. Because the evaluation also demonstrates that a criticality at the WIPP is not credible, criticality alarm and detection systems are not required. The contractor's self-assessment ASMT-24-0064 in FY 2024 identified 2 findings in operational procedures. The Operational Implementation is rated 'Good' based on the elements meeting the minimum requirements, and any minor non-compliances being actively corrected or improved.

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: No Criticality Safety Infractions were identified in FY 2024.

3. WIPP Program Non-Compliances

Identified by:		
Contractor	**Field Office**	**DOE Headquarters**
3	0	0

Summary: ASMT-23-0015 Finding #1: It is unclear that waste containing > 1 wt.% carbon or magnesium oxide meets the correct FGE limit from Table 9-1 of WIPP-016 as the evaluation for confirming that these materials are bound and cannot act as a reflector has not been consistently performed since 2018.

ASMT-24-0064 Finding #1: Waste Handling procedures WP 05-WH1011, CH Waste Processing and WP 05-WH1058, CH Waste Handling Abnormal Operations need to incorporate Administrative Control 1 identifying stack height as a criticality safety control.

ASMT-24-0064 Finding #2: In reviewing the Waste Handling Procedures, it is evident by the revision log of each procedure that there have been several revisions made to waste handling procedures. Section 2.2 of WP 12-NS.04, Nuclear Criticality Safety Program, states the following, Ensure the NCS Engineer reviews new or revised waste handling procedures that impact criticality safety. Contrary to the requirement in WP 12-NS.04, this has been implemented inconsistently.

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	2	1	1

Summary: The finding from assessment WIPP-ASMT-22-0399 that was open at the beginning of the year has been closed and the finding from WIPP-ASMT-23-0015 remains open (WI 24-039). The two findings from ASMT-24-0064 section have been entered into the contractor's issues management system.

5. WIPP Staffing

Organization	Qualified	Average Experience	In Training	Staff Lost	Staff Hired	Vacancies
Contractor	1	20	1	0	0	0
Federal	2	15	1	0	0	1

Summary: The WIPP M&O 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 M&O Contractor also has one qualified

subcontracted NCS Engineer (one with NCSE-01/NCSE-02). The subcontracted NCS Engineers raise the average experience to 20 years.

CBFO possesses two DOE Technical Qualification Program Nuclear Safety Specialist qualified individuals who can provide adequate oversight of the contractor's NCS 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 NCS Program when necessary.