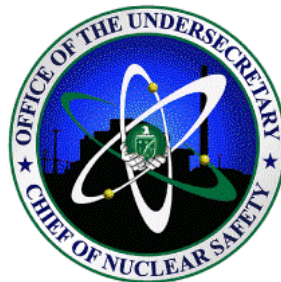




U.S. DEPARTMENT OF
ENERGY



STRATEGIC PLAN
CHIEF OF NUCLEAR SAFETY

DECEMBER 2015

CENTRAL TECHNICAL AUTHORITY FOR ENVIRONMENTAL MANAGEMENT



2016 Strategic Plan
Chief of Nuclear Safety (CNS)
Office of the Undersecretary
December 2015

FY 2016 Strategic Plan

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Chief of Nuclear Safety
Office of Environmental Management

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Executive Summary

The purpose of this strategic plan is to communicate our role in the safety of the Office of Environmental Management (EM) nuclear facilities. It provides an integrated framework for the mission, functions, vision, and strategic direction for the Chief of Nuclear Safety (CNS) and Central Technical Authority (CTA). It was developed, in part, using the outcome of a risk-informed analysis that helps identify the facilities and activities where CNS will focus its attention during the upcoming year.

The CNS has purview over more than 100 EM nuclear facilities across the Department of Energy (DOE) complex ([Figure 1](#) and [Appendix C](#)), including the Area G and the Material Disposal Areas (MDAs) in Los Alamos National Laboratory (LANL)¹. As part of a broad range of responsibilities, the CNS monitors and strengthens federal oversight of nuclear projects and operations; leverages lessons learned and promotes best practices; manages Differing Professional Opinions (DPOs); and provides guidance for implementing nuclear safety requirements, while attaining a high level of technical knowledge and current operational awareness. In addition, the CNS serves as the CTA for EM.

¹ Area G and MDAs are owned by the National Nuclear Security Administration (NNSA).



Over the course of CY 2015, the CNS and staff conducted over 50 field operational awareness assessments, addressed numerous emerging technical concerns and issues from the field, supported several technical reviews across the DOE complex, and were responsible for the review of and concurrence on dozens of DOE Orders, Guides, and DOE/National/International Technical Standards affecting nuclear safety. CNS and staff were also instrumental in the successful completion of various nuclear safety matters, both nationally and internationally. The CNS and staff were closely involved with activities involving nuclear safety matters posing a high risk or a broad impact. For example, they

- Developed first-of-a-kind DOE Standard Review Plan to guide design and engineering evaluation of nuclear projects at 30, 60, and 90 percent design maturity level.
- Revamped the process framework for startup and commissioning of DOE nuclear facilities.
- Began application of the enterprise risk management concept to risk ranking of nuclear facilities.
- Provided support and subject matter expertise to determine how DOE's nuclear safety and environmental remediation expertise could be applied to the recovery efforts at the Fukushima Nuclear Power Plant.
- Developed guidance for seismic monitoring programs across the DOE complex, to be included in the forthcoming Handbook on natural phenomena hazards (NPH) analysis and design.
- Provided technical expertise to support WIPP Documented Safety analysis (DSA) development and ultimate restart of operations.
- Provided technical expertise to support the transition of legacy waste operations at LANL and eventual treatment of remediated nitrate salt waste (RNS).
- Led the American Society of Mechanical Engineers (ASME) Committee on Nuclear Quality Assurance to produce a new version of the standard ASME NQA-1 to better address DOE needs and applications,



- Completed development of technical guidance on non-reactor probabilistic risk assessment as part of the American Nuclear Society Committee on Risk Management.
- Chaired, and served as U.S. contributor to, International Atomic Energy Agency (IAEA) Technical Meetings on Procurement Management, Nuclear Management Systems, Counterfeit Items Prevention, and Quality Assurance Standards.

Based on ongoing operational awareness, EM leadership priorities, and risk-informed analysis, the CNS and staff have identified the following four areas as the primary focus of activities in 2016. These include:

1. Waste Isolation Pilot Plant (WIPP)
 - Risk Reduction Activities.
 - Resolution of Safety Basis issues.
 - Restart.
2. Los Alamos National Laboratory (LANL) Area G
 - Risk Reduction Activities.
 - Resolution of Safety Basis issues.
 - Transition Activities.
3. Site Visits
 - Emergency Management.
 - Fire Protection.
 - Conduct of Operations.
4. Contract Reviews
 - Prime contracts at EM sites
 - Select support service contracts with safety implication.

These four priorities require a dedicated staff of six highly skilled individuals who possess a specific mix of expertise to make an impact and meet the responsibilities



defined by the Secretary and DOE Order 410.1². Like the CNS they serve, these career federal employees are committed to delivering high-quality services and ensuring that sound nuclear safety best practices and effective oversight are in place across the DOE complex.

² DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*.



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1 Vision

The CNS and staff are recognized as the nuclear safety proponent for activities under the purview of the Office of Environmental Management. Department senior leadership seeks CNS counsel on nuclear safety issues. Line organizations routinely engage and seek CNS and staff support to resolve issues, conduct assessments, provide training, and facilitate activities across organizations. National and international standards and safety organizations recognize CNS and staff as leaders and major contributors to their efforts.



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2 Introduction

In developing its strategic direction and goals, CNS first conducted a comprehensive analysis of the agency’s external and internal situation. This process involved analyzing the DOE complex nuclear safety landscape and examining past, present, and future trends and issues. The analysis also included an assessment of current CNS programs and strategies to determine whether new or different priorities were appropriate. This risk-informed approach provided a data-driven foundation on which to construct a balanced set of strategic goals. [Figure 2](#) illustrates the approach used and the resulting facility ranking. More detailed information on the 2014/2015 CNS facility ranking can be found in [Appendix C](#) and [Appendix D](#).

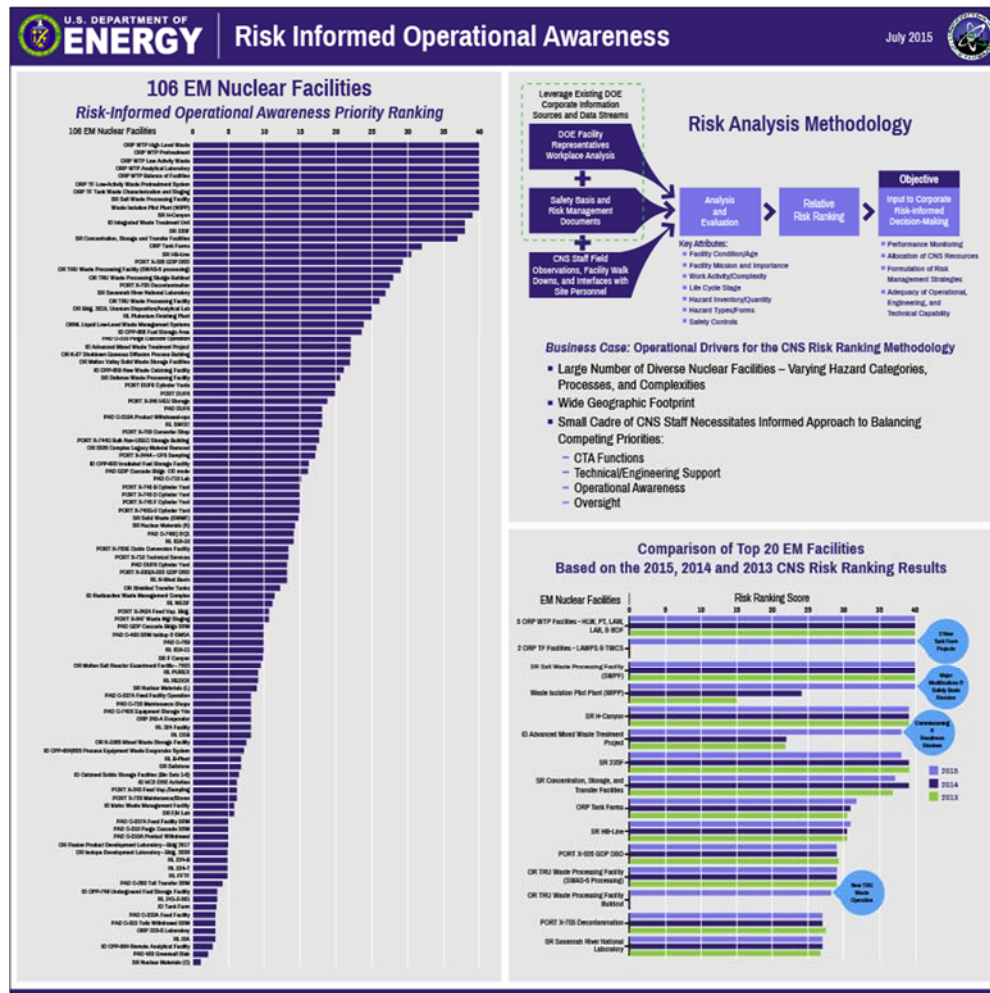


Figure 2. CNS risk analysis methodology and results.



2.1 Background. The position of the DOE CNS was established in 2005 by the Secretary of Energy to support the Under Secretary of Energy and Under Secretary for Science as they carried out their functions as the CTAs for their organizations. The Secretarial memorandum dated April 26, 2005 lists seven specific CTA responsibilities that CNS and staff currently fulfill. For details, see Section 2, Missions and Functions, starting on page [5](#).

The CNS assembled a technical staff to implement the functions. Over time, the Secretary and Deputy Secretary made organizational and personnel changes affecting the CTA and CNS. But the original functions remained intact; in fact, they have expanded. Beginning in 2011, the Deputy Secretary designated the CNS to also serve as the CTA for EM. In 2012, the CNS was transferred to the Office of Environmental Management from the Under Secretary's Office. The Senior Executive Service (SES) position of CNS has been held by one person since its establishment, lending stability and consistency of purpose to the role.

2.2 Purpose of the Strategic Plan. The purpose of the CNS strategic plan is to communicate our role in the safety of EM nuclear facilities and provide an integrated framework for the CNS mission, vision, challenges and strategic direction. It also helps us perform our responsibilities and ensures that we will be held accountable for providing productive, mission-oriented oversight and technical support.

2.3 EM Challenges for 2016 and beyond. In 2016, EM faces a number of project challenges; some challenges will persist until early next decade. The CNS functions and activities will be applied to help meet those challenges and contribute to improving EM's safety posture. Specific CNS activities to address the challenges are described in Section 8. These challenges include

- WIPP restart
- Major construction projects, technology maturation
- Loss of experienced federal technical staff,
- Transition of facilities and activities to the EM portfolio,
- Startup and commissioning of new EM nuclear facilities, and
- Documented safety analysis, maintenance, quality assurance, and commercial grade dedication.



3 Guiding Principles

The CNS and staff operate under the following guiding principles:

- **Customer Focus.** Actively pursue the identification of stakeholder needs to provide effective services with efficiency, accountability, and a caring attitude.
- **Open Communication.** Promote honest, open communication and easy access to information.
- **Creativity.** Strive to improve the quality and efficiency of the Department through creative approaches and innovative, cost-effective tools, methods, and approaches.
- **Fiscal Responsibility.** Provide quality services, of the best value, to effectively meet the needs of our stakeholders.
- **Cooperation.** Promote a spirit of fairness, trustworthiness, respect, and teamwork among our colleagues across the DOE nuclear complex, contractors, and stakeholders.
- **Commitment of Excellence.** Strive to achieve excellence in all we do.
- **Continuous Improvement.** Advocate and support the freedom to actively pursue suggestions, ideas, and creative approaches, leading to continuous improvement in everything we do.



Figure 3. The Waste Treatment and Immobilization Plant.



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4 Mission and Functions

The Secretary established the mission of the CTA and supporting CNS in 2005 to provide independent analysis, advice, and recommendations to DOE senior management, program offices, field offices, and contractors on the health of the oversight and practices associated with the nuclear facility safety. Beginning in 2011, the Deputy Secretary also delegated EM CTA responsibilities to the CNS ([Appendix E](#) and [Appendix F](#)).

Over the past 10 years, the CNS functions have evolved to address the full range of policy, implementation, and executive decision-making activities that bear directly on nuclear safety. Currently, these activities are carried out in support of the Office of Environmental Management, as directed by the Secretary and identified in multiple DOE Orders—for example, O 410.1, O 226.1, O 251.1, O 413.3, and O 450.2. The original (2005) set of CTA responsibilities were:

- Concur with determination of applicability of directives included in contracts;
- Concur with nuclear safety requirements in contracts;
- Concur with exemptions to nuclear safety requirements in contracts;
- Recommend to the Office of Environment, Health, Safety and Security (AU) issues and proposed resolutions concerning safety requirements, and concur in adoption or revision of nuclear safety requirements;
- Maintain operational awareness of implementation of nuclear safety requirements;
- Assess whether EM and site offices maintain adequate numbers of technically competent personnel; and
- Provide input to, and concur with, DOE-wide nuclear safety-related research and development activities.



The original and expanded current CTA and CNS responsibilities are listed in [Table 1](#).

Table 1. Original and expanded current set of CTA and CNS responsibilities.

Function	Responsibilities
Nuclear Safety Requirement Concurrence and Exemption	<ul style="list-style-type: none"> • Concurs with the determination of the applicability of DOE directives involving nuclear safety included in Environmental Management (hereafter specifically referring to EM activities) contracts pursuant to Department of Energy Acquisition Regulation (DEAR), Title 48 of the Code of Federal Regulations (CFR), Section 970.5204-2, Laws, regulations, and DOE directives, item (b). • Concurs with nuclear safety requirements included in EM contracts pursuant to DEAR 970.5204-2(c). • Concurs with all exemptions from nuclear safety requirements in EM contracts that were added to the contract pursuant to DEAR 970.5204-2.
Guidance for Implementing Nuclear Safety Requirements	<ul style="list-style-type: none"> • Advises EM-1 on recommendations to AU and the program offices for issues and proposed resolutions concerning DOE safety requirements. • Concurs with the adoption or revision of nuclear safety requirements (including supplemental requirements). • Provides expectations and guidance for implementing nuclear safety requirements, as necessary, for use by DOE EM employees and contractors.
Operational Awareness of Nuclear Safety Requirements Implementation	<ul style="list-style-type: none"> • Maintains operational awareness of the implementation of nuclear safety requirements and guidance consistent with the Integrated Safety Management (ISM) guiding principles and core functions across the EM complex as defined in DOE O 450.2. Awareness is accomplished by working with Headquarters, Field Office, and Facility Representative (FR) staff to implement DOE O 226.1B, Implementation of DOE Oversight Policy. To fulfill this responsibility, CNS staff participate in project reviews, , ensure operational readiness, and review documented safety analyses to evaluate the adequacy of safety controls and their implementation. • Ensures that DOE Orders, Guides, and Standards, and industry standards are correctly applied in the conduct of DOE's mission.
Maintaining Adequate Numbers of Technically Competent Personnel	<ul style="list-style-type: none"> • Periodically reviews and assesses whether DOE EM organizations are maintaining adequate numbers of technically competent personnel necessary to fulfill their nuclear safety responsibilities. • DOE O 450.2, Integrated Safety Management. Provides concurrence on delegation of approval of documented safety analyses, technical safety requirements, and unreviewed safety question procedures below the most senior-level program officer or deputy at a Field Element. Provides concurrence on compensatory measures related to the delegation-of-authority process. Conducts an annual review of the delegation process to evaluate whether it is adequate and functioning properly and to identify any concerns to the CTA, who will notify the EM-1 and the Secretarial Office (SO) and recommend action, as appropriate. Independently reviews the EM self-assessments of delegations; notifies EM-1 if issues are unresolved.



Table 1. Original and expanded current set of CTA and CNS responsibilities.

Function	Responsibilities
Advising DOE-Wide Nuclear Safety-Related Research and Development Activities	<ul style="list-style-type: none"> • Serves as a voting member of the Nuclear Safety Research and Development Committee providing direction and concurrence of the DOE-wide nuclear safety-related research and development activities. • Evaluates annual, DOE-wide nuclear safety-related research-and-development proposals and contributes to their selection.
Managing Differing Professional Opinion (DPO) Evaluation and Decision Authority at DOE Nuclear Facilities	DOE O 442.2, Differing Professional Opinions for Technical Issues Involving Environment, Safety and Health. Establishes a DPO process to provide DOE and contractor employees with an alternate path for resolving technical issues related to environment, safety, and health. In a memorandum dated November 7, 2013, the Deputy Secretary appointed the CNS as the DPO Manager for issues affecting any nuclear facility under the auspices of the Office of Environmental Management.
Program and Project Management Safety Documentation and Critical Decisions	DOE O 413.3B, Program and Project Management for the Acquisition of Capital Assets. Reviews, and provides concurrence on, multiple safety and quality documents generated at the various phases of capital projects. Reviews and provides concurrence on Critical Decisions for major modifications and new facility projects. Participates as a member of the Energy Systems Acquisition Advisory Board (ESAAB) and similar advisory boards for nuclear facility design and construction projects.
EFCOG Engineering Practices Working Owners Group	CNS was appointed by DOE senior management to be DOE sponsor for the EPWOG. The Engineering Practices group will be sponsored by CNS and will develop a business plan with deliverables. This group will also help support the development of the process engineering group for EM. This function will reside in the new Project Working Group that CNS is sponsoring.

CNS aligns its mission with the Department’s Strategic Plan as applied to EM’s mission and goals. These goals are translated into performance objectives for staff appraisals, considering nuclear safety in all technical aspects of EM’s work. Goal 3 of the DOE Strategic Plan 2014-2018 is specifically applicable to EM:

Position the Department of Energy to meet the challenges of the 21st century and the nation’s Manhattan Project and Cold War legacy responsibilities by employing effective management and refining operational and support capabilities to pursue departmental mission.



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5 CNS's Strategic Direction

While leaving room for growth and improvement, CNS's staff have served the DOE well by proactive engagement in nuclear safety issues affecting EM and DOE at large. CNS remains committed to meeting its mission safely and securely. Over the past several years, the Department and CNS have taken a more balanced approach to the mission and safety, especially nuclear safety. CNS will continue to build on this balanced approach. Compliance assistance, outreach, education, and cooperative programs provide the support needed to help employers and workers achieve a safe work environment, while strong, fair, and effective enforcement of safety regulations creates incentives for management to address nuclear safety issues. This strategy will be expanded and modified to allow CNS to be even more effective and address emerging issues.

To address the major challenges previously identified, CNS goals will reflect three themes:

5.1 Focus CNS resources in the areas that provide maximum return-on-investment. CNS and technical staff possess substantial capabilities, capabilities they developed and refined over many years. Given the large number and variety of EM nuclear facilities (95), the office must regularly review the nuclear facility conditions to adjust its rankings and continually reinforce its strategic surveillance capabilities to identify the most significant safety risks, determine what is causing them, and recommend appropriate actions to minimize these risks.

5.2 Make greater progress, using both direct intervention and cooperative approaches, in creating a deeply ingrained culture that values and fosters best practices in Nuclear Safety. By managing and implementing safety and a complex wide best practices program, CNS adds significant value to individuals and management as it reduces both the extent and the severity of incidents.

5.3 Ensure that CNS has the expertise and capabilities, now and in the future, to carry out its nuclear safety leadership responsibilities across EM. The office effectiveness in carrying out its national leadership responsibilities requires that CNS be widely respected and be seen as technically competent, innovative and "leading the charge" in improving nuclear safety practices across DOE facilities. This requires a dedicated staff of six highly skilled individuals who possess a specific mix of expertise to make an impact and meet the responsibilities defined by the Secretary and DOE Order



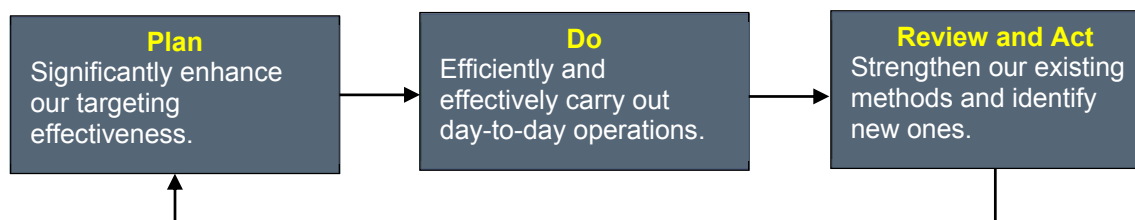
410.1³. Like the CNS they serve, these career federal employees are committed to delivering high-quality services and ensuring that sound nuclear safety best practices and effective oversight are in place across the DOE complex.

³ DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*.



6 Management and Operation Processes

The CNS executes the functions and responsibilities as the Nuclear Safety CTA for EM. In this role, CNS has access to all EM nuclear safety-related activities and facilities (consistent with training and security requirements) to provide expert analysis and advice to the Assistant Secretary for EM, Program Offices, Site Office Managers, and other senior officials. In performing its mission and vision, the CNS uses the following process approach:



Two appendices further define implementation of the CNS Strategic Plan. [Appendix A, Chief of Nuclear Safety \(CNS\) Responsibilities for Site Interfaces, Contract Reviews, and Directives Reviews](#), identifies CNS and staff roles and responsibilities for implementing the CNS strategy, mission, and functions. It further defines CNS and staff, specifying site liaison assignments, areas of expertise, and assignment of the directives affecting nuclear safety (ref. [Table 2](#) and [Table 3](#).)

[Appendix A](#) is a living document and was current as of December 2015. [Appendix B, CNS Operational Awareness Activities: High-Priority Facilities Identified \(2015 CNS Risk Ranking\)](#), reflects planned visits to the priority facilities identified through the annual CNS risk-informed ranking. This plan also changes throughout the year in response to events, site office and headquarters priorities and requests, and other factors.



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7 Fiscal Year 2015 Accomplishments

In many respects, CNS's success depends on one-to-one interactions with DOE professionals, managers, and other key stakeholders. Over the past fiscal year, CNS was proactively engaged in strengthening Federal oversight of nuclear safety, promoting technical execution of projects and programs, and implementing crosscutting nuclear safety initiatives. In the pages that follow, we will summarize select 2015 accomplishments whose benefits are being felt across DOE (Section 7.1), across the nation (Section 7.2), and around the world (Section 7.3).



Figure 4. Portsmouth Gaseous Diffusion Plant (GDP).

7.1 DOE-Wide Accomplishments

- **Conducted** over 60 operational awareness visits and assessments of EM and other nuclear facilities, guided by the CNS Nuclear Facility Risk Informed Analysis.
- **Developed** a Standard Review Plan (SRP), *Application of Engineering and Technical Requirements for 30, 60 and 90% Design of DOE Nuclear Facilities*, to help strengthen the technical rigor of line management oversight and federal monitoring of the design process of DOE nuclear facilities. This SRP supports the implementation of the S-1 memorandum regarding 90% design, and the revision of DOE O 413.3B and DOE-STD-1189.
- **Developed** a SRP on Safety Basis Development. This SRP consists of five volumes that contain, lines of inquiry to guide management level reviews, and the review of nuclear facilities at design, operations, and decommissioning stages.
- **Supported the Low Activity Waste Pretreatment System (LAWPS) 30% Design Review** at the Office of River Protection (ORP). CNS staff members assisted in the preparations and reviewed documents for the ORP LAWPS 30% Design Review. This review helped to expand the proposed Washington River Protection Solutions (WRPS) 30% Design Review for LAWPS. CNS is identifying additional areas for review and associated LOIs. The review is scheduled to



begin in early November. CNS will support the review from Headquarters and onsite at ORP

- **Safety Culture Improvement Panel.** CNS chaired the “Contract Language Working Group” for the subject panel for AU. This group was chartered with reviewing contracts clauses for safety culture implications and developing draft language to be included in future DOE contracts. CNS and EM-40 had previously developed language for the Idaho RFP. Final report was issued.
- **Represented DOE** at the 2015 NQA meetings. NQA is the U.S. national standards body responsible for NQA-1, Quality Assurance Requirements for Nuclear Facility Applications. NQA-1 is utilized at all DOE nuclear facilities to implement 10 CFR 830, Nuclear Safety Management.
- **Participated** in a RESRAD program review with the Office of Environmental Policy and Assistance (AU-20) and Argonne National Laboratory in support of the Office of D&D Facility Engineering (EM-13)
- **Organized** a specialized workshop on *Understanding DOE Quality Assurance Requirements and ASME NQA-1 For Application in DOE Nuclear Projects* for the newly created Office of DOE Acquisition and Project Management.
- **Administered** the Software Quality Assurance (SQA) Examination. The CNS as the EM/NE/SC SQA Support Group Sponsor, provided the DOE - American Society of Quality (ASQ) exam and instructions to a NNSA staff member in the process of being qualified under DOE-STD-1172-2011, *Safety Software Quality Assurance Functional Area Qualification*. The NNSA staff member request was submitted. In accordance with Technical Report 2012-01, EM/NE/SC Software Quality Assurance Support Group (Qualifying Candidates to DOE-STD-1172-2011). 2012-01 states that the CNS for Environmental Management offers the DOE ASQ-based examination to any Qualifying Official who chooses to use this method to evaluate the knowledge and skills covered by the examination. The examination will be used by the NNSA staff member’s Qualifying Official to evaluate SQA knowledge and skills.
- **Reviewed and commented on numerous Departmental Directives and Technical Standards.** A CNS staff member is the author of DOE-STD-1129-2015 on tritium handling and storage, while the CNS administrative assistant processed



all the comments and edits for the issuance of the Standard in 2015. Another CNS staff member was a key contributor to the forthcoming Handbook on natural-phenomena hazard analysis and design along with updating DOE STD-1020-2012. Another CNS staff member also contributed to the draft Accident Analysis Handbook. CNS submitted comments on the draft changes to O 413.3B, Chg. 1, *Program and Project Management for the Acquisition of Capital Assets*. The intention of the limited DOE O 413.3 revision is to capture the Secretary's memo direction on Project Management. CNS review found that the draft requires several improvements before it is ready for approval. CNS and staff met with AU staff for comment resolution on comments to the pre-RevCom draft of DOE-STD-1189, *Integration of Safety into Design*. Key discussion topics included the integration of 30-60-90% design reviews, use of Standard Review Plans for project reviews, and alignment with DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. CNS staff will further review the draft Standard once it has been placed into RevCom. Additionally, CNS staff were involved in the review and update of STD-3011-XX, *Preparation of Documented Safety Analysis for Interim Operations At DOE Nuclear Facilities*, STD-1120-XX, *Preparation Of Documented Safety Analysis for Decommissioning and Environmental Restoration Activities*.

- **Supported EM-53 peer reviews** and independent project reviews as part of the Safety Subteams. These include the Office of River Protection (ORP) Low Activity Waste Pretreatment System (LAWPS) and peer review for the Portsmouth On-Site Waste Disposal Facility (OSWDF).
- **Led the Salt Waste Processing Facility (SWPF) Project Peer Review.** While the construction complete date is being targeted for May 11, 2016, significant work remains. The Project is focused with DOE, Parsons and the Site working towards a common goal. The few recommendations provided by the team will support moving the project forward, construction complete and the transition to startup and commissioning
- **Supported WTP Project Peer Review.** CNS staff participated on the WTP LBL Project Peer Review as part of the Environmental, Safety & Health Subteam and Startup and Commissioning Subteam. The focus of the review was to evaluate progress of the LBL facilities towards transitioning to start-up and commissioning including the progress towards implementing Direct Feed LAW contract direction.



- **Reviews Safety Design Strategy (SDS) for Oak Ridge Building-2026 and Oak Ridge TWPC SWAS-5 processing.** Reviewed and commented on the revision of the SDSs for Oak Ridge Building-2026's proposed processing campaign of Building-3019 inventory and TWPC processing of the SWAS-5 material. Building-2026 is currently a SC Hazard Cat III nuclear facility awaiting transfer to EM. Upon transfer the facility will then undergo a major modification. The TWPC facility is adding a glovebox and associated modifications to accept the SWAS-5 material.
- **Support for Hanford Ashfall Re-Suspension Modeling.** In support of the Office of River Protection (ORP), CNS assisted with contracting for a new volcanic ashfall modeling, and re-suspension of ash, that can impact the Waste Treatment and Immobilization Plant. The output of the model for an ashfall event, and re-suspension of ash, will be used in design of the Waste Treatment and Immobilization Plant. This new project will derive an estimate of ashfall at Hanford using a new model called Ash3d developed by the United States Geological Survey (USGS). Ash3d will also estimate airborne concentration of volcanic ash during an ashfall event.
- **Supported Los Alamos National Laboratory (LANL) Transuranic (TRU) Waste Processing Activities.** Reviewed and commented on the bridge contract with Los Alamos National Laboratory, the indefinite delivery/indefinitely quantity (ID/IQ) nuclear safety support contract, and the Memorandum of Understanding (MOU) between the NA-LA and EM-LA site offices. Provided technical advice to NA-LA and EM-LA on expedited treatment of the remediated nitrate salt (RNS) waste, multiple safety basis issues in Area G, and the safety basis strategy for developing a DOE-STD-3009-2014 compliant documented safety analysis (DSA) for Area G.
- **Reviewed Safety Design Strategies (SDSs) for projects before seeking CD-1 approval.** These projects included LAWPS, the West Valley Demonstration Project (WVDP) and the WIPP Underground Ventilation System. SDS review is necessary to obtain CNS concurrence as required by DOE O 413.3B.
- **CNS Staff Support to WIPP Safety Basis Review Team.** CNS staff members provided support to the WIPP Safety Basis Review Team (SBRT) as external SMEs. The WIPP SBRT, which integrates CBFO and HQ resources, was established to develop, review and approve a revised WIPP safety basis.



- **Championed the development and use of the EM Standard Review Plan.** In 2015, CNS developed first-of-a-kind DOE Standard Review Plan to guide design and engineering evaluation of nuclear projects at 30, 60, and 90 percent design maturity level. The SRP has been disseminated across the complex and is undergoing review and comment.
- **Provided** technical support for the DOE Order 458.1 Property Clearance Process and the Office of D & D Facility Engineering (EM-13) with a review of program guidance for the DOE Order 458.1 Property Clearance Process. and consultation with the EM Contracting Officer Representative (COR) for approval of authorized limits in support of property clearance from Complex-wide DOE sites to Waste Control Specialists (WCS).
- **Consulted** to the WIPP Accident post recovery efforts at both Carlsbad and Los Alamos.

- **Served as the responsible manager** for implementing DOE's approach to resolving the self-identified concerns—later confirmed by the Defense Nuclear Facility Safety Board (DNFSB)—associated with potential technical and quality aspects of the **System for Analysis of Soil–Structure Interaction (SASSI) code**. SASSI

is used across DOE, including NNSA, for performing SSI analyses. CNS and NNSA co-sponsored the SASSI Verification and Validation (V&V) project to develop a set of test problems that can demonstrate the accuracy of SASSI results over the range of input parameters important to DOE nuclear facilities. This project concluded in mid-2015, and the DNFSB was briefed on the final results. A website was established to permanently house the test problems developed for this project, and SASSI practitioners around the world are able to access this resource.



Figure 5. Paducah Gaseous Diffusion Plant (GDP).



- **Completed an alternative structural analysis of the PF-4 facility** at Los Alamos. This alternative analysis was strongly encouraged by the DNFSB.
- **Obtained greater** outreach and dissemination of technical expertise to the nuclear safety community by providing SASSI and SQA portals on CNS website.
- **Co-Led** with the Office of Environmental Health, Safety and Security (AU-1) and information exchange between DOE and the Office of Nuclear Regulation (ONR), UK, the Nuclear Decommissioning Authority (NDA), UK, and Magnox, Ltd., the in support of the Arrangement Between the ONR and US DOE for the Exchange of Information and Cooperation in the Area of Nuclear Safety Matters.
- **Participated** as a member of the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) working in support of the Office of D & D Facility Engineering and provided technical expertise to the multi-agency working group on a revision of the manual.
- **Provided technical support on DOE radiation survey clearance standards and Department of Transportation (DOT) conveyance criteria during a joint meeting with** the Office of D&D Facility Engineering (EM-13), the Office of Packaging and Transportation (EM-33), the Office of Environmental Policy and Assistance (AU-22), and the Energy Facility Contractors Group (EFCOG) Radiation Protection subgroup on DOE and DOT conveyance clearance criteria.

7.2 National-Level Accomplishments

- Served as a leader or member on various Federal and industry technical committees, including
 - **the American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) Standards Committee.** NQA develops and maintains the nuclear industry's consensus standard "NQA-1," which is adopted by DOE and endorsed by the NRC for compliance with nuclear safety regulations (DOE 10 CFR 830). Recent efforts of the Committee have focused on engaging stakeholders, including DOE, to ensure that the NQA-1 Standard supports the safe construction and operation of nuclear facilities today and in the future.
 - Elected to the American Society of Mechanical Engineers (ASME) Board on Conformity Assessment (BCA): The CNS and DOE Standards Executive



nominated CNS staff member for a seat on ASME BCA. At their August 4th meeting, the BCA voted to elect CNS staff member. The BCA is the management body that oversees all ASME certification activities for nuclear and non-nuclear piping, vessels, components, nondestructive test personnel, quality assurance programs, etc. DOE, NRC and State governments rely on this independent certification to provide assurance that item and service and technical and safety requirements are met.

- **the ASME Standards Committee on Nuclear Risk Management**, which develops and maintains standards and guides on risk management techniques, including probabilistic risk assessments for nuclear facilities;
- **the U.S. Government Procurement Anti-Counterfeiting Interagency Working Group (IWG)**, an interagency working group chaired by the President's Office of the Intellectual Property Enforcement Coordinator (IPEC) and composed of 14 Federal offices to address the prevalence of counterfeit goods in the United States (U.S.) Government supply chain. The group authored a report to the President, together with various recommendations. In a follow-on task, the General Services Administration was charged with assembling an ad hoc writing team for revising the Federal Acquisition Regulations (FAR) to address anti-counterfeiting. A CNS staff member is a primary author on the team and is using the DOE counterfeit items policy (which he developed years earlier) as a basis for the new FAR requirements. His contribution will ensure that DOE requirements remain valuable in any future regulatory environment.
- **Coauthored a paper published in the September 2014 issue of the journal *Health Physics***. Titled "Comparison of the MACCS2 Atmospheric Transport Model with Lagrangian Puff Models as Applied to Deterministic and Probabilistic Safety Analysis," the paper was a collaboration with independent risk assessment experts John E. Till and Arthur S. Rood. This paper and its analysis were completed in 2011 in response to discussions with the DNFSB about their concerns with deposition velocity in MACCS2 as it related to the WTP accident analysis methodology.
- **Co-sponsored the Next Generation Attenuation East (NGA-East) project** to develop a new seismic ground-motion attenuation model for the Central and Eastern United States (CEUS). The DOE Office of Nuclear Energy, Electric



Power Research Institute (EPRI), and the NRC also sponsor this project. A CNS staff member serves on the Joint Management Committee overseeing this project. The project will complete in 2016, and it will be useful for DOE Oak Ridge and Savannah River sites that need to update their seismic hazard analyses, as well as for the commercial nuclear industry.

7.3 International-Level Accomplishments

- **Conducted a Technical cooperation visit** to Japan with the Associate Principal Deputy Assistant Secretary for Environmental Management to determine how DOE nuclear safety and environmental remediation expertise could be applied to the recovery efforts at the Fukushima Nuclear Power Plant.
- **ISO Technical Committee-85, “Nuclear”, Working Group** to Resolve International Comments on a New ISO Nuclear Quality Assurance (QA) Standards: CNS staff member is the U.S. government representative and voting member on ISO Technical Committee-85, Nuclear, Working Group-4, Nuclear Management Systems. As such he was invited to support the ISO meeting on a new nuclear QA standard for international suppliers of safety related items. It is critical that any new ISO standard be acceptable to DOE for implementing 10 CFR Part 830, Nuclear Safety Management. DOE utilizes international suppliers for most of our nuclear facilities. The meeting participation informs those suppliers of DOE with requirements and how the ASME NQA-1 standard and International Atomic Energy Agency (IAEA) requirements meet (or does not meet DOE requirements). This information will support the resolution of DOE’s comments and comments from other countries on the draft ISO standard and prepare a new draft that is better suited to DOE use under 10 CFR Part 830. Mr. Danielson also coordinated with IAEA staff to raise issues on their behalf (IAEA staff were unavailable for this meeting). The meeting was held in Paris, France and concluded July 3, 2015 without resolving all comments. Another comment resolution meeting is scheduled for September 2015, to be hosted by either the IAEA in Vienna, Austria or AREVA, GmbH, in Frankfurt, Germany.
- **International Atomic Energy Agency (IAEA) Interregional Nuclear Management System Training for Newcomer States to Nuclear Power:** A CNS staff member was invited back for the third year to teach modules of the IAEA course on Nuclear Management Systems. The students were from fifteen Newcomer States to Nuclear Power. Argonne National Laboratory hosts the course for the IAEA. Other instructors are from US and Canadian nuclear power utilities, US



NRC, Germany, and US engineering firms. Participation in the meeting will allow for significant input to the projects undertaken by the IAEA so that they have benefit to the Department. The CNS staff member has had twenty years of involvement with the work of the IAEA Nuclear Power and Nuclear Safety Divisions.

- **Served on the International Atomic Energy Agency (IAEA) Seismic Hazard Working Group**, which is developing technical documents and safety guides for characterizing and mitigating seismic hazards at nuclear facilities worldwide.
- **Served on the International Scientific Committee (ISC) for Structural Mechanics in Reactor Technology (SMiRT)**. A CNS staff member participated in the 23rd SMiRT conference held August 2015 in Manchester, England. The CNS staff member was a coordinator of the conference division titled Fuel Cycle Facilities, Waste Management and Decommissioning. More than 500 abstracts were submitted to SMiRT-23. The CNS presented a paper at SMiRT-23 on mitigating the volcanic ashfall hazard at WTP. The 24th SMiRT conference is scheduled for August 2017 in South Korea.
- **Served as Chairman for several IAEA Technical and Consultancy meetings** on Nuclear Safety Management Requirements, Counterfeit Items Prevention, Procurement Management, and Management System Standards. Was also invited to serve on an IAEA *Technical Cooperation Mission* to China that presented training and technical discussions in IAEA and DOE nuclear safety management systems.
- **Served on the Technical Program Committee** for the *2015 International Topical Meeting on Probabilistic Safety Assessment and Analysis (PSA 2015)*. CNS was asked to support the technical program development for the subject meeting. More than 225 technical summaries were accepted; as of January 2015, the full papers were being submitted. CNS reviewed a number of papers on Probabilistic Safety Assessment for acceptability and binning into the appropriate topical area, such as Accident Analysis, Advanced Nuclear Systems, Common Cause Failures, Risk Management, Cyber Security / Cyber Risk, and Risk-Informed Decision Making.
- A CNS staff member is the **subgroup lead of the Design and Commissioning under Technical Uncertainty Subgroup** of the Facilities Commissioning



Working Group of the Tank Waste Corporate Board. Chaired by CNS, this sub-group includes representatives from the Nuclear Decommissioning Authority of the UK government, including the Lead Programme Manager - Operations, Sellafield. Tours and presentations are planned at Sellafield in the future to illustrate applicable Lessons Learned for EM use.

- *Nuclear Fusion and Technology* published in April/May 2015 the proceedings of the 10th International Tritium Conference, including **an article by a CNS staff member** who presented there. While attending the conference, the CNS staff member, who is the co-coordinator of DOE's Tritium Focus Group (TFG), expanded the expertise and experience of the group by **identifying a number of French and British tritium experts** and enlisted them to join the TFG.
- **Served as chairman of the ASME Committee on Nuclear Quality Assurance (NQA) Subcommittee on *International (SC-I) Activities and International Working Groups (IWG)***. The SC-I helps foreign countries or regions form a Subcommittee that allows direct involvement in the NQA Committee. One IWG was successfully launched in Europe during 2015. The Europe IWG includes 15+ representatives from many European Union countries that use NQA-1. Plans are in progress for another in China mid-2016. Other regions/countries that will be pursued include India, South America, and Korea. Improving use and understanding of ASME NQA-1 will benefit DOE and U.S. commercial nuclear facilities that purchase and/or sell safety related items using NQA-1.



8 CNS Focus in 2016

To address project challenges facing EM and achieve its mission, CNS is adopting a more dynamic approach for identifying and targeting sectors and hazards that require direct interventions. After gathering information from various sources (CNS, DNFSB, Inspector General, and Government Accountability Office) and analyzing the content for relevance to the CNS mission, operational priorities were established for 2016. Four priorities were identified: 1) WIPP restart; 2) Transition of Los Alamos Area G facilities to EM; 3) Maintain operational awareness through periodic site visits; and 4) Review safety requirements in EM prime contracts. In addition to these four priorities, CNS staff will continue performing myriad oversight and technical support activities across the EM complex. Some of these are described below.

8.1 Top Four Priorities

- A. **WIPP Restart:** Since the 2014 radioactive material release and shutdown of WIPP, restarting WIPP disposal operations is the highest EM priority. CNS staff will continue providing technical support to the restart efforts, including review, approval, and implementation of Revision 5 of the WIPP DSA. CNS staff will also perform WIPP oversight during periodic site visits. WIPP has an ongoing project to construct a new underground ventilation system to enhance facility safety and efficient operations. This major modification project achieved CD-1 approval in late 2015. CNS staff will continue supporting this effort by serving on project technical reviews.
- B. **Transition of Los Alamos Area G Facilities to EM:** On September 25, 2014, the Secretary of Energy directed NNSA and EM to transition the TRU legacy waste processing activities to EM. In October 2015 a bridge contract was issued to allow EM to give direction to the contractor for TRU legacy waste operations until another contract is in place. It is anticipated that new contract will be in place by FY 2018. An EM-LA site office was established in March 2015 and is in the process of hiring nuclear safety staff. NA-LA will retain nuclear safety basis authority for TRU legacy waste processing facilities until the EM-LA is adequately staffed. A Memorandum of Understanding (MOU) was signed between the NA-LA and EM-LA site offices requiring the concurrence of EM on nuclear safety basis decisions.



Area G is a Hazard Category 2 nuclear facility and the primary site at LANL that processes TRU legacy waste. 60 drums of remediated nitrate salt (RNS) waste are currently stored in Area G and are the highest contributor to offsite dose consequence in the safety basis. A team is working to develop a plan for treatment of the RNS waste, but no plan has been approved yet. Area G is operating under a Basis for Interim Operations (BIO). There are currently 5 open evaluations for the safety of the situation (ESS) that collectively render every accident analysis in the BIO faulty. EM-LA and EM-HQ are working with NNSA on the near term safety basis issues. As a long-term strategy, EM-LA has issued an indefinite delivery/indefinitely quantity (ID/IQ) to develop a DOE-STD-3009-2014 compliant documented safety analysis (DSA) for Area G by the time the bridge contract period ends.

- C. **Maintain Operational Awareness Through Periodic Site Visits:** Each major EM site has a CNS staff member assigned as a site lead. Site leads are responsible for maintaining operational awareness of nuclear facility activities at their sites. Approximately once per quarter, site leads are expected to visit their sites to conduct operational awareness activities. These site visits should ensure that each of the top 20 facilities on the CNS risk ranking receive a visit from CNS staff each year. CNS staff are expected to meet with assigned Facility Representatives and/or Safety System Oversight personnel during facility walk-throughs. During 2016 site visits, CNS staff will focus attention on the two EM safety priorities of fire protection and emergency preparedness, as well as conduct of operations.
- D. **Review safety requirements in EM prime contracts:** DOE O 410.1 requires that the CTA concur on the inclusion of certain nuclear safety-related directives in requests for proposals (RFPs) for prime contracts to operate DOE nuclear facilities. Likewise, O 410.1 requires CTA concurrence on prime contract modifications when certain conditions exist. In recent years, CNS staff were not always alerted to pending contract RFPs and modifications to provide the required reviews. In 2016, CNS staff will place a renewed focus on this requirement to ensure the proper contract reviews are performed, and CTA concurrences are obtained.



8.2 Additional Technical, Engineering, and Policy Support

- A. **Savannah River Site (SRS) Tank closing, Concentration, Storage and Transfer Facilities (CSTF).** The process for the closure of tanks at CSTF continues. Moving toward this goal, in 2015 the CSTF will be analyzing changes to existing waste processing that are expected to reduce maintenance, increase throughput, and wet dry sludge. Conservatism contained in the engineering calculations associated with flammable gas in the waste sludge are being evaluated with potential subsequent changes to the authorization basis. Flammability Control program requirements for tracking the inventory of select chemicals and radionuclides in the tanks, representing real-time conditions, are implemented through a waste characterization software application that is undergoing replacement in 2015. These analyses and process changes will result in a higher-than-normal number of changes to the documented safety analyses, and thus process changes to ensure safe operations.
- B. **Waste Treatment Plant (WTP), Low Activity Waste Pretreatment System (LAWPS), Tank Waste Conditioning System (TWCS) and SRS Salt Waste Processing Facility (SWPF).** The CNS and staff will continue to support and oversee activities at two high-profile projects: WTP and SWPF. Significant attention to these projects is expected to be necessary over a period of many years. In addition, the Hanford Tank Farms Facility has two new projects that are in their early phases: Low Activity Waste Pretreatment System (LAWPS) and Tank Waste Conditioning System (TWCS). These projects will require Critical Decision (CD) support for CTA concurrence and CNS operational awareness over many years. LAWPS received CD-1 approval in 2015.
- C. **Idaho Integrated Waste Treatment Unit (IWTU) Start up (SU) and Startup & Commissioning (SU&C).** Startup of the IWTU continues after equipment and safety basis documentation had to be substantially modified in the wake of the June 2012 overpressure event. The IWTU is a first-of-a-kind and one-of-a-kind facility. An extensive startup plan has been developed to ensure the rigorous establishment of facility knowledge and experience with abnormal conditions. Nonradiologic simulant was introduced in late 2014 to begin validation of plant's design adequacy. Once the design is successfully validated, radiologic material is expected to be introduced in 2016.
- D. **Project Oversight.** CNS staff conducted timely, rigorous project reviews, including peer reviews and improved Federal monitoring. Project reviews have



proven beneficial for identifying issues and providing guidance to site office project managers for resolution. Such reviews include construction project reviews and peer reviews, as well as reviews mandated for capital projects by DOE O 413.3B. CNS staff will continue to serve on, and lead, CPR teams and project peer-review teams, when requested by EM.

CNS staff plan to serve on several additional project reviews scheduled in FY 2015, and outside experts will be sponsored by CNS to augment review teams when beneficial. Engineering peer reviews are extremely important during project design phases, and CNS staff will ensure that adequate peer reviews are performed. CNS has access to a wide variety of outside experts through its support services contract.

- E. **Engineering Discipline and Site Office Support.** CNS staff will continue to support site offices in specialty topics such as criticality safety, software QA, and NPH assessment. Improved engineering discipline among both Federal and contractor staff on major design and construction projects and ongoing operations is another area of CNS support. One of the CNS staff's core responsibilities is to periodically assess whether EM and the site offices maintain adequate numbers of technically competent personnel necessary to fulfill nuclear safety responsibilities. Opportunities for CNS staff assistance are often identified during staff site visits. Each CNS staff member is assigned as a lead for a major EM site and visits his or her site about once a quarter. CNS has observed a slow decline of technical expertise, caused by an unfortunate combination of attrition and limited hiring. This decline has the greatest impact on site offices with smaller technical staff, as well as in the more specialized disciplines, such as criticality safety, software QA, and NPH assessment. In addition to assessing site office capabilities, CNS staff members occasionally provide direct support to site offices on specific tasks.
- F. **Policy Support.** In the past, CNS provided considerable support to the Office of the Associate Under Secretary for Environment, Health, Safety and Security (AU) for revising existing, and drafting new, nuclear safety directives and standards. CNS will continue to support reviews of, and revisions to, nuclear safety requirements, most notably when AU requests specialized expertise held by the CNS staff. Maintaining current, technically accurate nuclear safety requirements is a critical component of nuclear safety. DOE's directives and standards require



periodic review and revision to maintain compatibility with technical advancements and changes to national standards. The AU Office of Nuclear Safety is responsible for developing and maintaining the nuclear safety requirements. However, the CTA must concur on the adoption or revision of all nuclear safety requirements. In accordance with CTA responsibilities described in the April 26, 2005, Secretarial memorandum, CNS will alert AU to any issues with nuclear safety requirements and propose resolutions, as well as review and concur with any nuclear safety research and development activities proposed by AU.

The AU Office of Nuclear Safety, as well as other Headquarters elements, is also losing Federal technical expertise. AU often needs specialized support in maintaining nuclear safety requirements and fulfilling their other nuclear safety functions. This support will extend to other AU initiatives, such as the Accident Analysis and NPH Handbooks and the DOE nuclear safety workshops. CNS will also team with AU and NRC staff to update IAEA guidance on counterfeit items prevention and the IAEA management system requirements to ensure compatibility with DOE policy. CNS will also partner with AU staff to help support existing CNS initiatives, such as having AU co-sponsor the biennial Natural Phenomena Hazards Technical Meeting.

- G. Oak Ridge Building 2026 Modification for U233 Down Blending.** Building 2026 is currently a Hazard Category 3 Nuclear Facility managed by the Office of Science. It will be transitioned to the Office of Environmental Management (EM) and will subsequently house the down-blending process for U-233 currently stored in EM's Building 3019. Building 2026 will undergo a modification for the addition of U-233 Processing, which will also result in the Building's becoming a Hazard Category 2 facility after all modifications are complete. The modifications meet the definition of a Major Modification in accordance with 10 CFR 830 and DOE-STD-1189. Additionally, the modification project meets the definition of a Capital Asset Project and will follow DOE O 413.3B's applicable requirements, including the U.S. Code of Federal Regulation (CFR), Title 10 Energy, Part 830, NUCLEAR SAFETY MANAGEMENT (10 CFR 830), Subparts A and B. Building 2026 contains a number of laboratory-sized hot cells, and the total inventory of nuclear material will be restricted to ensure that none of this material can go critical. CNS staff will provide reviews of nuclear safety reviews in accordance with DOE requirements as the safety documentation is



generated. The facility is listed on the CNS risk matrix, where its risks are being tracked and updated to account for modifications and inventory changes.

- H. **Backfill staff departures** and increase the rigor and standardization of staff's Operational Awareness (OA) activities.
- I. **Maintain OA activities** for the top 20 facilities listed on CNS risk-informed ranking.
- J. **EM Nuclear Facility Ranking.** Update the CNS database based on available 2016 information on facility operations and safety basis development. Rank the facilities based on their risk attributes to provide insights to support CNS operational awareness.
- K. **Continue web-based development** of the EM nuclear facility ranking database. The analytical tool will facilitate sensitivity analysis to assess the impact of changing assumptions on relative risk ranking.
- L. **SRP Revision on Lines of Inquiry (LOIs) for Project Critical Decision Implementation.** Review revision to DOE O 413.3C and DOE-STD-1189 regarding requirements on critical decision implementation and safety-in-design strategy and revise the LOIs accordingly. SRP Revision on LOIs for Engineering Review -- Revise the Engineering SRP to address conceptual design (less than 20% completion) to the existing SRP for 30, 60, and 90% design review. Review the current set of DOE directives and technical standards and revised the LOIs and their references.
- M. **SRP Senior Management Handbook.** Revise the handbook based on requirement changes in DOE 413.3C and DOE-STD-1189. SRP Revision on LOIs for Safety Basis Review -- Review the changes in DOE-STD-3009 and other safety basis related DOE directives and technical standards and revised the LOIs.
- N. **Conduct field tests of the 30, 60, and 90% design LOIs** in the Engineering SRP. Modify the SRP with lessons learned from the field tests. Revised the LOIs based on lessons learned from the WTP LAWPs 30% design review.
- O. **Conduct field test of the applicable LOIs in the Engineering SRP** on the major modifications of the permanent ventilation system of the Waste Isolation Pilot Plant.



- P. **Review the impact of requiring final design** and the preparation of safety basis documents at 90% design completed prior to CD-2 approval (before was CD-3). Incorporate lesson learned into the Engineering SRP and Safety Basis SRP.
- Q. **Revise DOE O 410.1 (developed in 2007)** to reflect current CTA responsibilities regarding the current nuclear safety directives and technical standards

8.3 Internal Focus on Management Initiatives

- A. **CNS Staffing and Workforce Turnover.** The preceding challenges will require a dedicated staff of highly skilled individuals with a specific mix of expertise to address the above challenges and to meet the responsibilities defined by the Secretary and DOE Order 410.1. Currently five of the required six individuals are on-staff. In mid-2015, one of the six retired, and another staff member moved out of the organization, reducing the staffing level. One of the two positions has been filled. The CNS is trying to mitigate the impact of the staffing shortfall, using various methods. These methods do not always assure an adequate level of federal staff resources needed to fully accomplish the planned activities. Hence, one senior technical position will be posted to fill in 2016. Future federal position postings are dependent on EM providing increased staff ceiling to CNS.
- B. **Communication Strategies with the Stakeholder.** CNS will build on its recently launched website to further engage and share nuclear safety lessons learned and issues with the key stakeholders across the complex. The new communication strategy encourages interactions and collaborations among peers, communicates information and ideas effectively to multiple audiences, develops cultural understanding and global awareness of issues related to nuclear safety facilities across the DOE complex, and contributes to project teams to solve problems.
- C. **Differing Professional Opinions (DPOs).** CNS will continue to receive and adjudicate DPOs from site office staff. Ideally, technical differences will be resolved at a low level, using processes and procedures in place at local DOE and contractor organizations, making it unnecessary to file a DPO. However, a quality, safety-conscious work environment requires a robust DPO process that staffs are comfortable using.
- D. **Interface with CDNS and NNSA.** Several crosscutting nuclear safety concerns affect both EM and NNSA facilities and projects. For example, SASSI is used in the seismic analysis of many government and commercial nuclear facilities, so



the SASSI verification and validation (V&V) project benefitted from cooperation between EM, CNS, AU, NNSA, and CDNS. The review of SASSI software QA implementation also required cross-organizational cooperation. To efficiently address DOE's nuclear safety needs, these groups must communicate frequently and exchange specialized technical expertise. CNS will be proposing an update to DOE Order O 410.1, *CENTRAL TECHNICAL AUTHORITY RESPONSIBILITIES REGARDING NUCLEAR SAFETY REQUIREMENTS*. This Order will require a joint effort with the CDNS, NE CNS and Science CNS. Furthermore, sharing of staff across organizations to serve on review teams brings a broader range of knowledge to the reviews and allows staff members to develop professionally.

- E. **Professional Development and National/International Technical Bodies.** The CNS and staff will continue to participate in professional organizations and standards committees, such as ASME Committee on Nuclear Quality Assurance (NQA), International Atomic Energy Agency (IAEA) and the American Nuclear Society (ANS). In their elected roles and through continuing participation in working groups, CNS staff members ensure that nuclear standards continue to be aligned with, and supportive of, the Department's mission. Such participation is essential: It not only ensures that DOE remains aware of industry standards, but it ensures that DOE's interests are represented as such standards develop and evolve.

CNS staff currently holds senior member positions within the ASME NQA Committee. Recent efforts of the Committee focus on engaging stakeholders, including DOE, to ensure that the NQA-1 Standard supports the safe construction and operation of nuclear facilities today and in the future.

Additionally, CNS is the lead DOE member of the ASME/ANS Joint Committee on Nuclear Risk Management, working toward the development of probabilistic risk assessment requirements.

Additional membership positions held by the CNS and staff include: ASME Board on Conformity Assessment; ISO Nuclear Quality Management System Working Group 4; the ANSI International Conformity Assessment Committee and liaison to the SAE International G-19 Committee on Suspect/Counterfeit Items; the IAEA Seismic Hazard Working Group.



9.0 Maintaining Technical Proficiency

CNS staff maintains adequate technical proficiency, including the timely completion of Senior Technical Safety Manager (STSM) qualification. Further, CNS staff periodically review and assess whether EM is maintaining adequate numbers of technically competent personnel necessary to fulfill its nuclear safety responsibilities and identify gaps in nuclear safety-related technical human capital. To properly support the CTA, CNS staff members maintain the following core competencies:

- Technical expertise, including the ability to make technical decisions and to apply technical standards;
- Systems engineering perspective and experience;
- The ability to ensure safe and reliable operations;
- Stewardship of engineering capabilities;
- Accountability and technical integrity; and
- The ability to effectively communicate at all levels throughout the entire nuclear security complex.



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Appendix A Chief of Nuclear Safety (CNS) Responsibilities for Site Interfaces, Contract Reviews, and Directives Reviews

I. Site Leads

Office of Environmental Management (EM) Site	Lead & Backup
Savannah River Site Office WDED/SRR and SWPF/Parsons	Weaver, Garzon
Savannah River NMSP/SRNS	Weaver, McDuffie
Idaho	Anderson, McDuffie
Richland	McDuffie, Danielson
Office of River Protection (ORP) – Waste Treatment and Immobilization Plant	Garzon, Danielson
ORP/Tank Farms	Garzon, McDuffie
Carlsbad	McDuffie, Anderson
OREM	Weaver, Anderson
PPPO	Weaver, Garzon
LANL	Anderson, Weaver

II. CNS Site Liaison Assignments, Responsibilities, and Activities

A. CNS Liaisons

The CNS is the site manager liaison. The CNS staff members interact with:

- Site program managers and project directors;
- Site safety personnel, including Safety Basis Approval Authority (SBAA);
- Senior safety representatives;
- Quality assurance (QA) managers;
- Senior Technical Safety Managers (STSMs);
- Safety System Oversight (SSO) personnel;
- Facility Representatives (FRs);



- Defense Nuclear Facilities Safety Board (DNFSB) site representatives;
- Contractor safety and QA leads;
- Contractor technical representatives; and
- Chief of Defense Nuclear Safety (CDNS) counterparts.

B. CNS Liaison Activities

- Assessments/audits/technical reviews
 - Operational readiness reviews and high-priority readiness assessments)
 - Requests for Proposal (RFPs) and contract reviews
 - Construction project reviews and peer reviews
 - Safety Design Strategy (SDS) reviews
 - Design reviews
 - Technical Independent Project Review (TIPRs)
 - Oversight assessments, including FR/SSO/subject matter expert walkdowns and work planning and control reviews
 - Risk ranking updates
 - Safety basis document reviews
 - DNFSB implementation plan reviews
- Critical Decision (CD) packages for the Energy Systems Acquisition Advisory Board (ESAAB)
- CNS site assist and oversight visits
- Site requests for assistance
 - Responses to issues raised by the DNFSB and other external organizations



- Safety basis reviews
- Hazards assessments
- Other requests

C. Information to be collected or readily available

- Risk ranking database
- Startup notification reports
- Authorization basis (AB)
 - Documented safety analysis (DSAs)
 - Technical safety requirements (TSRs)
 - Exemptions
 - Unreviewed safety questions (USQs)
- Monthly project reviews and occurrence reports
- Price-Anderson Amendments Act (PAAA) status
- Noncompliance Tracking System reports
- Contracts
 - RFP/new contract development
 - Contract modifications
 - Special reports/investigations
 - Natural Phenomena Hazard (NPH) assessments/reviews



III CNS and CNS Staff Areas of Technical Expertise

Name	Areas of Expertise
Anderson, Amanda	<ul style="list-style-type: none"> • Health physics/radiation protection • Nuclear safety analysis • Engineering practices • Criticality safety • Risk assessment • Hydrogen safety • Radioactive waste management
Danielson, Bud	<ul style="list-style-type: none"> • ASME Committee on Nuclear Quality Assurance • Alternate EM Quality Assurance board member • ISO TC 85, WG4 – Nuclear Quality Management Systems • QA • Construction quality control • Integrated Safety Management • Nuclear safety regulation • PAAA and enforcement • CNS Technical Standards Manager and directives system point of contact • International Conformity Assessment Committee • IAEA Management Systems for Nuclear Facility Safety
Garzon, Caroline	<ul style="list-style-type: none"> • Environmental engineering • Alternate Nuclear Safety Research and development member • CNS/ EM Standard Review Plan Modules • Safety Bases • Nuclear safety analysis • CNS risk ranking • MACCS2 and atmospheric dispersion modeling
Lagdon, Chip	<ul style="list-style-type: none"> • Nuclear Operations • EM Quality Assurance board member • EM/NE/SC Software Quality Assurance Support Group sponsor • Nuclear Safety Research and development member • FTCP member



Name	Areas of Expertise
	<ul style="list-style-type: none"> • ANS/ASME Joint committee for Nuclear Risk Management • Tank Waste corporate board • EPWOG Sponsor • Authorization Bases • Unreviewed Safety Questions • Operational readiness reviews • Accident investigations • Construction Project Reviews • PMRC • NSCC
McDuffie, Steve	<ul style="list-style-type: none"> • NPH • SMiRT Scientific Committee • Operations • Facility representative program • SSO engineer • Maintenance • Integrated Safety Management • Operational readiness reviews
Weaver, Bill	<ul style="list-style-type: none"> • Safety Design Strategy • Alternate FTCP member • NTC instructor • Risk assessments • Authorization Bases • Operational readiness reviews • Tritium handling and storage • Member, ASTM Subcommittee for Deactivation and Decommissioning Activities • Operations • Integrated Safety Management



V. CNS Activities to Meet DOE O 410.1 Requirements

- Support to the CTA on nuclear safety policies, regulations, and directives is aimed at establishing and implementing them in a consistent and effective manner across the EM portfolio of nuclear facilities and in coordination with the greater nuclear security complex (see Appendix A for a list of CNS site interfaces).
- The development and revision of rules, directives, and standards (DOE, national, and international) have a positive effect on nuclear safety and can be reasonably implemented by DOE and its contractors (see the tables in Appendix A for the CNS staff member assignments corresponding to the tables in DOE O 410.1).
- Nuclear safety issues are openly communicated with DOE project and program senior leaders and external regulatory or oversight bodies.
- CNS and staff operate independently while maintaining credibility with Headquarters line and oversight personnel as well as with field personnel.
- The CNS evaluates staffing, training, and qualification of technical personnel within EM and provides assistance where appropriate, such as for training and staff support.
- The CNS encourages, challenges, and assists Site Offices and Headquarters (HQ) program elements in promoting nuclear safety consistent with the ISM guiding principles.
- The CNS and staff work to eliminate hazards where possible and develop effective controls to reduce risks.
- The CNS and staff promote a strong safety culture by modeling technical inquisitiveness within EM, promoting a questioning attitude and technical debate.
- The CNS applies a collaborative approach to problem solving that involves knowledgeable individuals with a diversity of opinions on solutions. The actions and technical position that CNS takes for decisions and recommendations rely on a sound basis.



- The CNS and staff model the technical competence and human capital expectations for the entire Management and Performance complex, maintaining a technically competent staff whose expertise is widely accepted and effective in enhancing the safety of nuclear operations. CNS staff members are experts in technical disciplines that contribute to nuclear safety.
- The CNS reinforces the use of appropriate requirements for conducting oversight, including promoting the development and use of consistent Standard Review Plan modules and Criteria and Review Approach Documents.
- The CNS applies a risk-informed approach to operational awareness and functional area assessments. The approach ranks nuclear facilities to inform priority facilities for assessment, review frequency, and resource-loaded schedule (see Appendix B for a list of CNS operational awareness activities for calendar year 2014).
- CNS and staff coordinate site visits and operational awareness activities with FRs and site and Headquarters teams to increase collaboration and integrate CNS functions with existing activities. CNS staff members are accountable to site processes when performing operational awareness activities.
- The CNS provides support and expertise to the Chief of Defense Nuclear Safety (CDNS) and utilizes CDNS staff expertise on an as-requested/as-needed basis.

VI. CNS ASSIGNMENTS for CONTRACT and DIRECTIVES REVIEWS

See [Table 2](#) on page [A-8](#) (Attachment I of DOE O 410.1) for directives requiring CTA/CNS concurrence for inclusion in contracts affecting nuclear facilities and requiring CTA/CNS concurrence prior to any revision or cancellation. See [Table 3](#), starting on page [A-9](#) (Attachment II of DOE O 410.1), for directives requiring CTA/CNS concurrence prior to any revision or cancellation. Bud Danielson is the CNS staff lead for RFPs, contracts reviews, and directives.

The following lists are updated from the versions attached to DOE O 410.1. The list reflects changes to the directives that were approved by the CNS after DOE O 410.1 was issued. Consult the DOE [Directives](#) web page for the current status.



Table 2. Directives requiring CTA concurrence prior to granting exemptions or exceptions (DOE 410.1 Attachment 1).

Primary	Backup	Regulation/ Directive	Title/Comment
Bud Danielson	Stephen McDuffie	10 CFR Part 830	<i>Nuclear Safety Management</i>
Bud Danielson	William (Bill) Weaver	10 CFR 830 Subpart A	<i>Nuclear Safety Management – Quality Assurance Requirements</i>
William (Bill) Weaver	Stephen McDuffie	10 CFR 830 Subpart B	<i>Nuclear Safety Management – Safety Basis Requirements</i>
Bud Danielson	Stephen McDuffie	DOE O 410.1	<i>Central Technical Authority (CTA) Responsibilities Regarding Nuclear Safety Requirements</i>
Richard (Chip) Lagdon	Caroline Garzon	DOE O 413.3B	<i>Program and Project Management for the Acquisition of Capital Assets</i>
Bud Danielson	William (Bill) Weaver	DOE O 414.1D, Adm Chg 1	<i>Quality Assurance</i>
Larry Berg	William (Bill) Weaver	DOE O 420.1C, Chg 1	<i>Facility Safety</i>
Stephen McDuffie	William (Bill) Weaver	DOE O 422.1, Adm Chg 1	<i>Conduct of Operations</i>
William (Bill) Weaver	Stephen McDuffie	DOE O 425.1D, Adm Chg 1	<i>Verification of Readiness to Start Up or Restart Nuclear Facilities</i>
Stephen McDuffie	William (Bill) Weaver	DOE O 426.2, Adm Chg 1	<i>Personnel Selection, Qualification, and Certification Requirements for DOE Nuclear Facilities</i>
Stephen McDuffie	William (Bill) Weaver	DOE O 433.1B, Adm Chg 1	<i>Maintenance Management Program for DOE Nuclear Facilities</i>
Amanda Anderson	Caroline Garzon	DOE O 435.1, Chg 1	<i>Radioactive Waste Management</i>
Amanda Anderson	Caroline Garzon	DOE M 435.1-1, Adm Chg 2	<i>Radioactive Waste Management Manual</i>
Amanda Anderson	Stephen McDuffie	DOE O 460.1C	<i>Packaging and Transportation Safety</i>
Amanda Anderson	Stephen McDuffie	DOE O 461.1B	<i>Packaging and Transportation of Materials of National Security Interest</i>
William (Bill) Weaver	Caroline Garzon	DOE O 5480.30, Chg 1	<i>Nuclear Reactor Safety Design Criteria</i>



Table 3. Directives requiring CTA concurrence or approval prior to any revision or cancellation.

Primary	DOE Directive	Title
Amanda Anderson	DOE M 140.1-1 B	<i>Interface with the Defense Nuclear Facilities Safety Board</i>
William (Bill) Weaver	DOE O 151.1C	<i>Comprehensive Emergency Management System</i>
Bud Danielson	DOE G 200.1-1 series	<i>Software Engineering Methodology Guide</i>
William (Bill) Weaver	DOE O 225.1B	<i>Accident Investigations</i>
Amanda Anderson	DOE G 226.1-2A	<i>Federal Line Management Oversight of Department of Energy Nuclear Facilities</i>
Bud Danielson	DOE O 226.1B	<i>Implementation of Department of Energy Oversight Policy</i>
Bud Danielson	DOE P 226.1B	<i>Department of Energy Oversight Policy</i>
Bud Danielson	DOE O 227.1	<i>Independent Oversight Program</i>
William (Bill) Weaver	DOE O 231.1B, Adm Chg 1	<i>Environment, Safety and Health Reporting</i>
William (Bill) Weaver	DOE O 232.2	<i>Occurrence Reporting and Processing of Operations Information</i>
Bud Danielson	DOE G 414.1-1D	<i>Management Assessment and Independent Assessments Guide for Use with 10 CFR Part 830, Subpart A, and DOE O 414.1C, Quality Assurance; DOE M 450.4-1, Integrated Safety Management System Manual; and DOE O 226.1A, Implementation of DOE Oversight Policy</i>
Bud Danielson	DOE G 414.1-2B, Adm Chg 2	<i>Quality Assurance Program Guide</i>
Bud Danielson	DOE G 414.1-4	<i>Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance</i>
Bud Danielson	DOE P 420.1	<i>Department of Energy Nuclear Safety Policy</i>
Stephen McDuffie	DOE G 420.1-1A	<i>Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE O 420.1C, Facility Safety</i>
William (Bill) Weaver & Stephen McDuffie	DOE O 422.1, Adm Chg 2	<i>Conduct of Operations</i>
Stephen McDuffie & Caroline Garzon	DOE G 423.1-1B	<i>Implementation Guide for use in Developing Technical Safety Requirements</i>
Stephen McDuffie & Caroline Garzon	DOE G 424.1-1B, Adm Chg 2	<i>Implementation Guide for use in Addressing Unreviewed Safety Question Requirements</i>
William (Bill) Weaver	DOE O 426.1, Chg 1	<i>Federal Technical Capability</i>
William (Bill) Weaver	DOE O 426.2, Adm Chg 1	<i>Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities</i>
Stephen McDuffie	DOE G 430.1-2	<i>Implementation Guide for Surveillance and Maintenance during Facility Transition and Disposition</i>
Stephen McDuffie	DOE G 430.1-3	<i>Deactivation Implementation Guide</i>
Stephen McDuffie	DOE G 430.1-4	<i>Decommissioning Implementation Guide</i>
Stephen McDuffie	DOE G 430.1-5	<i>Transition Implementation Guide</i>



Table 3. Directives requiring CTA concurrence or approval prior to any revision or cancellation.

Primary	DOE Directive	Title
Stephen McDuffie	DOE G 433.1-1A, Adm Chg 1	<i>Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B</i>
Stephen McDuffie	DOE O 433.1B, Adm Chg 1	<i>Maintenance Management Program for DOE Nuclear Facilities</i>
Amanda Anderson	DOE O 435.1, Chg 1	<i>Radioactive Waste Management</i>
Amanda Anderson	DOE M 435.1-1, Adm Chg 2	<i>Radioactive Waste Management Manual</i>
Amanda Anderson	DOE G 435.1-1 series	<i>Implementation Guide for Use with DOE M 435.1-1, Chapters 1 through 4</i>
William (Bill) Weaver	DOE G 440.1-1B, Adm Chg 1	<i>Worker Safety and Health Program for DOE (including the National Nuclear Security Administration) Federal and Contractor Employees</i>
William (Bill) Weaver	DOE O 440.1B, Adm Chg 2	<i>Worker Protection Program for DOE (including the National Nuclear Security Administration) Federal Employees</i>
Amanda Anderson	DOE G 441.1-1C Adm Chg 1	<i>Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection</i>
Caroline Garzon	DOE O 442.1A	<i>Department of Energy Employee Concerns Program</i>
Caroline Garzon	DOE G 442.1-1	<i>Department of Energy Employee Concerns Program Guide</i>
Caroline Garzon	DOE O 442.2	<i>Differing Professional Opinions on Technical Issues Involving Environment, Safety, and Health</i>
Bud Danielson	DOE O 450.2	<i>Integrated Safety Management</i>
Bud Danielson	DOE P 450.4A	<i>Integrated Safety Management Policy</i>
William (Bill) Weaver	DOE G 450.4-1C	<i>Integrated Safety Management System Guide</i>
Caroline Garzon	DOE O 451.1B, Adm Chg 3	<i>National Environmental Policy Act Compliance Program</i>
Stephen McDuffie	DOE P 454.1	<i>Use of Institutional Controls</i>
Amanda Anderson	DOE O 458.1, Adm Chg 3	<i>Radiation Protection of the Public and Environment</i>
Amanda Anderson	DOE O 460.1C	<i>Packaging and Transportation Safety</i>
Amanda Anderson	DOE G 460.1-1	<i>Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety</i>
Amanda Anderson	DOE O 460.2A	<i>Departmental Materials Transportation and Packaging Management</i>
Amanda Anderson	DOE G 460.2-1	<i>Implementation Guide for Use with DOE O 460.2, Departmental Materials Transportation and Packaging Management</i>
Amanda Anderson	DOE M 460.2-1A	<i>Radioactive Material Transportation Practices Manual</i>
Amanda Anderson	DOE O 461.1B	<i>Packaging and Transportation for Offsite Shipment of Materials of National Security Interest</i>
Amanda Anderson	DOE O 461.2	<i>Onsite Packaging and Transfer of Materials of National Security Interest</i>



Table 3. Directives requiring CTA concurrence or approval prior to any revision or cancellation.

Primary	DOE Directive	Title
William (Bill) Weaver	DOE O 5480.30, Chg 1	<i>Nuclear Reactor Safety Design Criteria</i>
Bud Danielson	10 CFR Part 820	<i>Procedural Rules for DOE Nuclear Activities</i>
Bud Danielson & Stephen McDuffie	10 CFR Part 830	<i>Nuclear Safety Management</i>
Bud Danielson	10 CFR 830, Subpart A	<i>Nuclear Safety Management, Quality Assurance Requirements</i>
William (Bill) Weaver & Stephen McDuffie	10 CFR 830, Subpart B, including Appendix A	<i>Nuclear Safety Management, Safety Basis Requirements</i>
Amanda Anderson	10 CFR Part 835	<i>Occupational Radiation Protection</i>
Bud Danielson	48 CFR 970.5203-2	<i>DOE Acquisition Regulation, Performance improvement and collaboration</i>
Bud Danielson	48 CFR 970.5204-2	<i>DOE Acquisition Regulation, Laws, regulations, and DOE directives</i>
Bud Danielson	48 CFR 970.5215-3	<i>DOE Acquisition Regulation, Conditional payment of fee, profit, and other incentives – facility management contracts</i>
Bud Danielson	48 CFR 970.5223-1	<i>DOE Acquisition Regulation, Integration of environment, safety, and health into work planning and execution</i>
Amanda Anderson	Various	DOE Handbooks and Technical Standards cited in Orders and related documents of interest to the Board as listed in the tables above
Stephen McDuffie	DOE-STD-1020-2012	<i>Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities</i>
Stephen McDuffie	DOE-STD-1030-96	<i>Guide to Good Practices for Lockouts and Tagouts</i>
Stephen McDuffie	DOE-STD-1063-2011	<i>Facility Representatives</i>
Stephen McDuffie & William (Bill) Weaver & Caroline Garzon	DOE-STD-1027-92, Ch. 1	<i>Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports</i>
Caroline Garzon	DOE-STD-1066-2012	<i>Fire Protection</i>
Stephen McDuffie	DOE-STD-1073-2003	<i>Configuration Management Program</i>
Bud Danielson	DOE-STD-1083-2009	<i>Processing Exemptions to Nuclear Safety Rules and Approval of Alternative Methods for Documented Safety Analyses</i>
William (Bill) Weaver & Caroline Garzon	DOE-STD-1104-2014	<i>Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents</i>
William (Bill) Weaver & Caroline Garzon	DOE-STD-1120-2005	<i>Integration of Environment, Safety, and Health into Facility Disposition Activities, Vols. 1 & 2</i>
William (Bill) Weaver	DOE-STD-1129-2015	<i>Tritium Handling and Safe Storage</i>
Amanda Anderson	DOE-STD-1134-99	<i>Review Guide for Criticality Safety Evaluations</i>
William (Bill) Weaver	DOE-STD-1137-2007	<i>Fire Protection Engineering Functional Area Qualification Standard</i>
Bud Danielson	DOE-HDBK-1148-2002	<i>Work Smart Standards (WSS) Users Handbook</i>
Bud Danielson	DOE-STD-1150-2002	<i>Quality Assurance Functional Area Qualification Standard</i>



Table 3. Directives requiring CTA concurrence or approval prior to any revision or cancellation.

Primary	DOE Directive	Title
Amanda Anderson	DOE-STD-1158-2010	<i>Self-Assessment Standard for DOE Contractor Criticality Safety Programs</i>
William (Bill) Weaver	DOE-STD-1166-2003	<i>Deactivation and Decommission Functional Area Qualification Standard</i>
Bud Danielson	DOE-STD-1172-2011	<i>Safety Software Quality Assurance Functional Area Qualification Standard</i>
William (Bill) Weaver	DOE-STD-1175-2006	<i>Senior Technical Safety Manager Functional Area Qualification Standard</i>
William (Bill) Weaver	DOE-STD-1183-2007	<i>Nuclear Safety Specialist Functional Area Qualification Standard</i>
Stephen McDuffie	DOE-STD-1186-2004	<i>Specific Administrative Controls</i>
Stephen McDuffie/ Amanda Anderson	DOE-STD-1189-2008	<i>Integration of Safety into the Design Process</i>
Caroline Garzon	DOE-STD-1195-2011	<i>Design of Safety Significant Safety Instrumented Systems Used at DOE Nonreactor Nuclear Facilities</i>
William (Bill) Weaver	DOE-HDBK-1208-2012	<i>Accident Investigation and Prevention</i>
William (Bill) Weaver	DOE-HDBK-1211-2014	<i>Activity-Level Work Planning and Control Implementation</i>
Stephen McDuffie	DOE-HDBK-XXXX-YR	<i>Natural Phenomena Hazards Handbook</i>
William (Bill) Weaver	DOE-STD-3006-2010	<i>Planning and Conducting Readiness Reviews</i>
Amanda Anderson	DOE-STD-3007-2007	<i>Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities</i>
Amanda Anderson	DOE-STD-3009-2014	<i>Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports</i>
Caroline Garzon/ Amanda Anderson	DOE-HDBK-3010-94	<i>Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities Volume 1 - Analysis of Experimental Data Volume 2 - Appendices</i>
Stephen McDuffie & Caroline Garzon	DOE-STD-3011-2002	<i>Guidance for Preparation of Basis for Interim Operation (BIO) Documents</i>
William (Bill) Weaver	DOE-HDBK-3012-2003	<i>Guide to Good Practices for Operational Readiness Reviews (ORR), Team Leader's Guide</i>
William (Bill) Weaver	DOE-STD-3013-2012	<i>Stabilization, Packaging, and Storage of Plutonium-Bearing Materials</i>
Caroline Garzon	DOE-STD-3014-2006	<i>Accident Analysis for Aircraft Crash into Hazardous Facilities</i>
Bud Danielson	DOE-STD-3020-2005	<i>Specification for HEPA Filters used by DOE Contractors</i>
William (Bill) Weaver	DOE-STD-3024-2011	<i>Content of System Design Descriptions</i>
Bud Danielson	DOE STD-3025-2007	<i>Quality Assurance Inspection and Testing of HEPA Filters</i>
Amanda Anderson	DOE-STD-5506-2007	<i>Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities</i>



Appendix B CNS Operational Awareness Activities: High-Priority Facilities Identified (2016 CNS Risk Ranking)

Facility (Site Office)	2015					2016								
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WTP (ORP) [New design & construction]						OA/QA			OA/QA					
SWPF (SRS) [New Construction]					OA			OA					OA	
IWTU (ID) [New Startup & operations]			OA					OA		Start Up				
WIPP Mods and Restart				OA						OA				
H-Canyon (SRS)					OA			OA					OA	
235F PuFF (SRS)					OA			OA					OA	
CSTF Tank Farms (SRS)					OA								OA	
3019/2026 (ORO)						OA			OA			OA		
PFP (RL)						OA							OA	
Tank Farm (ORP)							OA							
LAWPS (ORP)					PPR								60% Re-view	
HB Line (SRS)					OA			OA					OA	
TRU WPF SWAS 5 (ORO)						OA			OA			OA		
X-326 (PORT)			OA					OA						
X705 (PORT)			OA					OA						
SRNL (SRS)					OA			OA					OA	
TRU WPF (ORO)						OA			OA					
C-400 (PAD)														
Liq. Waste Facility (ORNL)					OA				OA					
CPP 666 IFMS (ID)						OA								
AMWTP (ID)						OA								
K27 (ORO)					OA				OA					
GDP (PAD)					OA					OA				
OTHER FACILITIES BELOW TOP 20 RANK														
Facility (Site Office)	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
242-A Evaporator (ORP)							OA							
CPP 603 ISFS (ID)						OA								
DWPF (SRS)					OA			OA					OA	
K Area (Crit) (SRS)					OA			OA					OA	
L Area (Crit) (SRS)					OA			OA					OA	
DUF ₆ (PAD)					OA					OA				
DUF ₆ (PORT)			OA				OA							
618-10 (RL)								OA						
324 Bldg. (RL)								OA						
LANL Area A			OA			OA			OA			OA		



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Appendix C CNS Risk Rankings

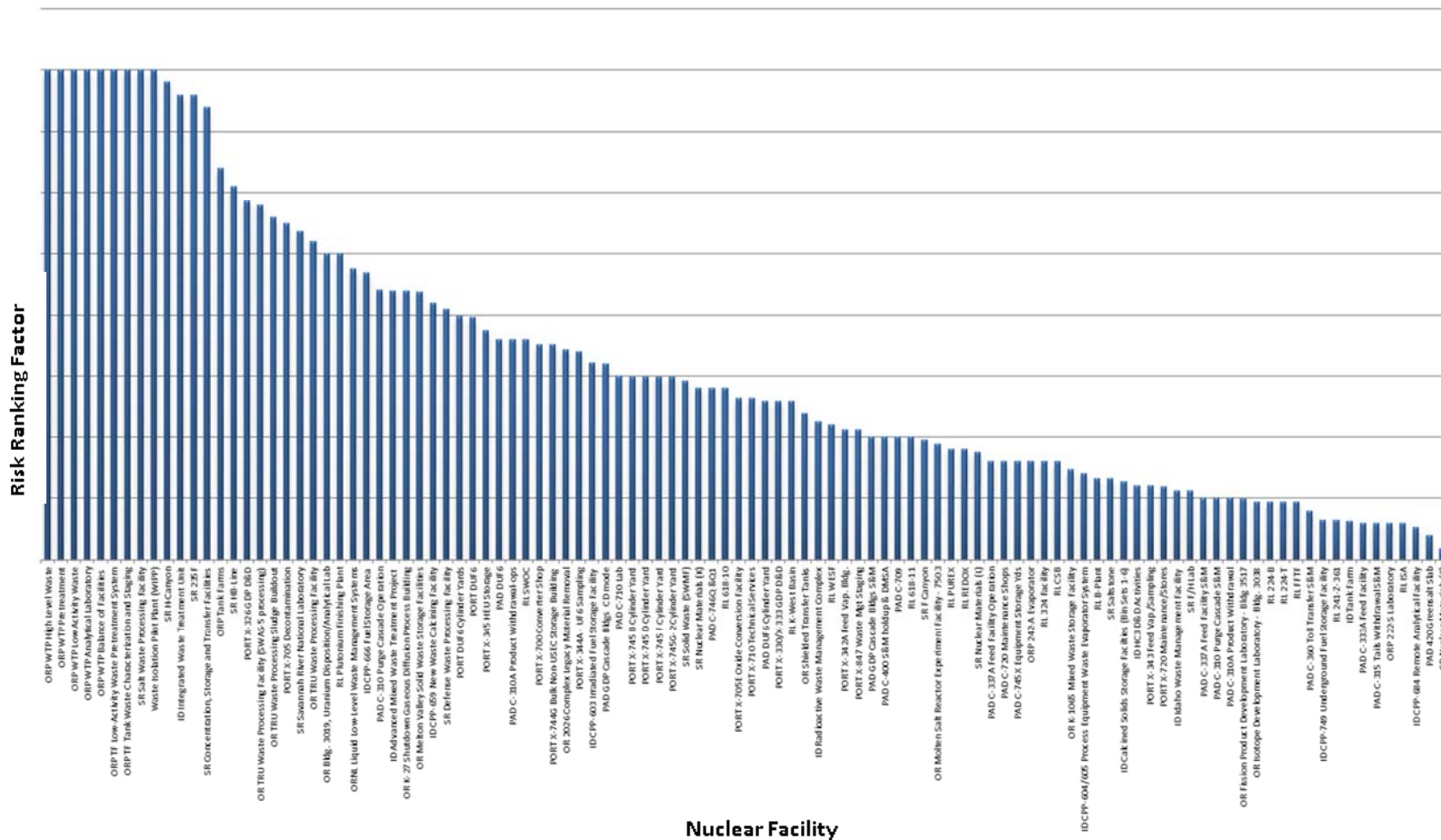


Figure 6. 2015 CNS risk ranking of 106 EM nuclear facilities.

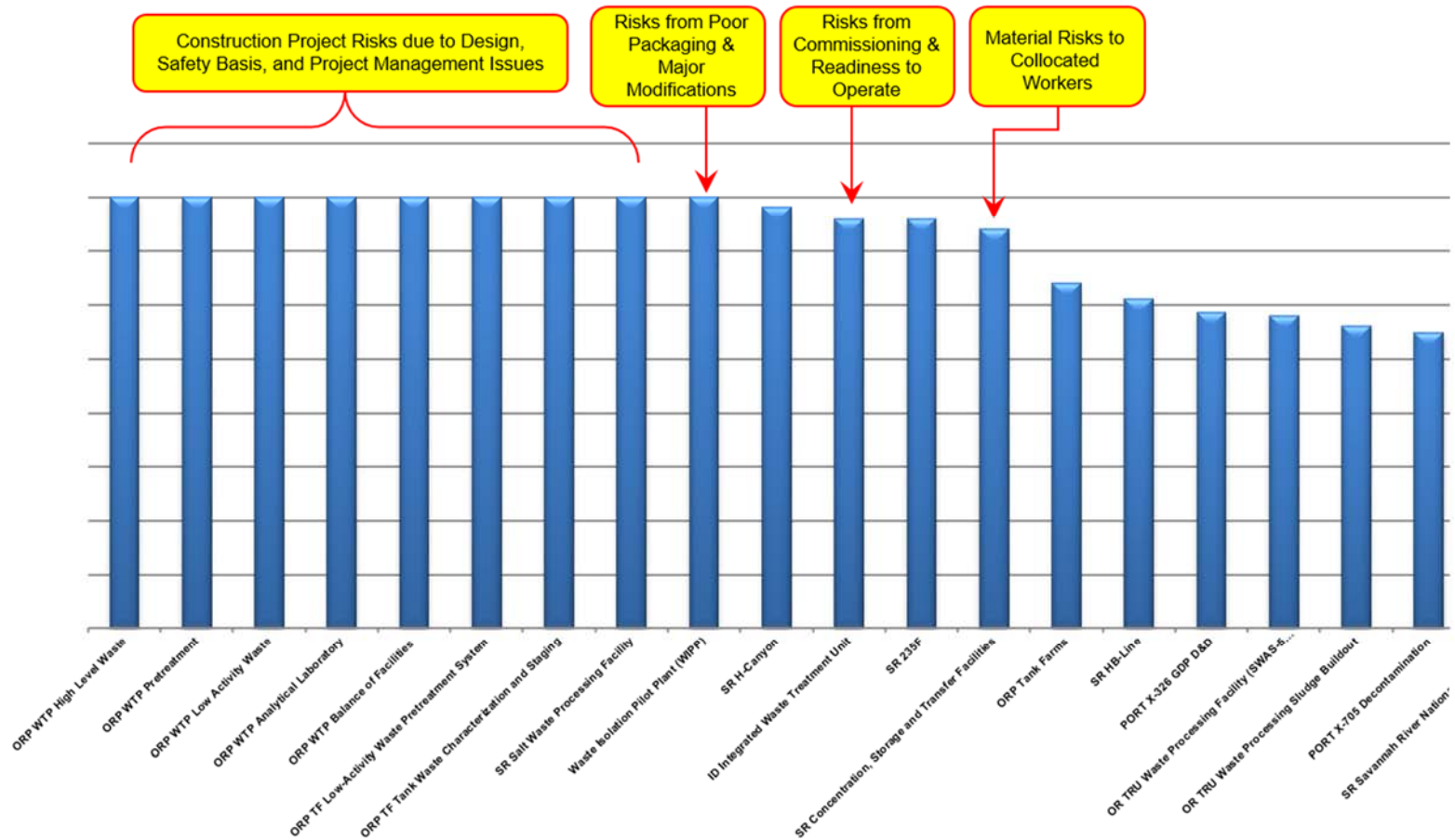


Figure 7. Comparison of top 20 EM nuclear facilities, based on the 2014 and 2015 CNS risk rating results.

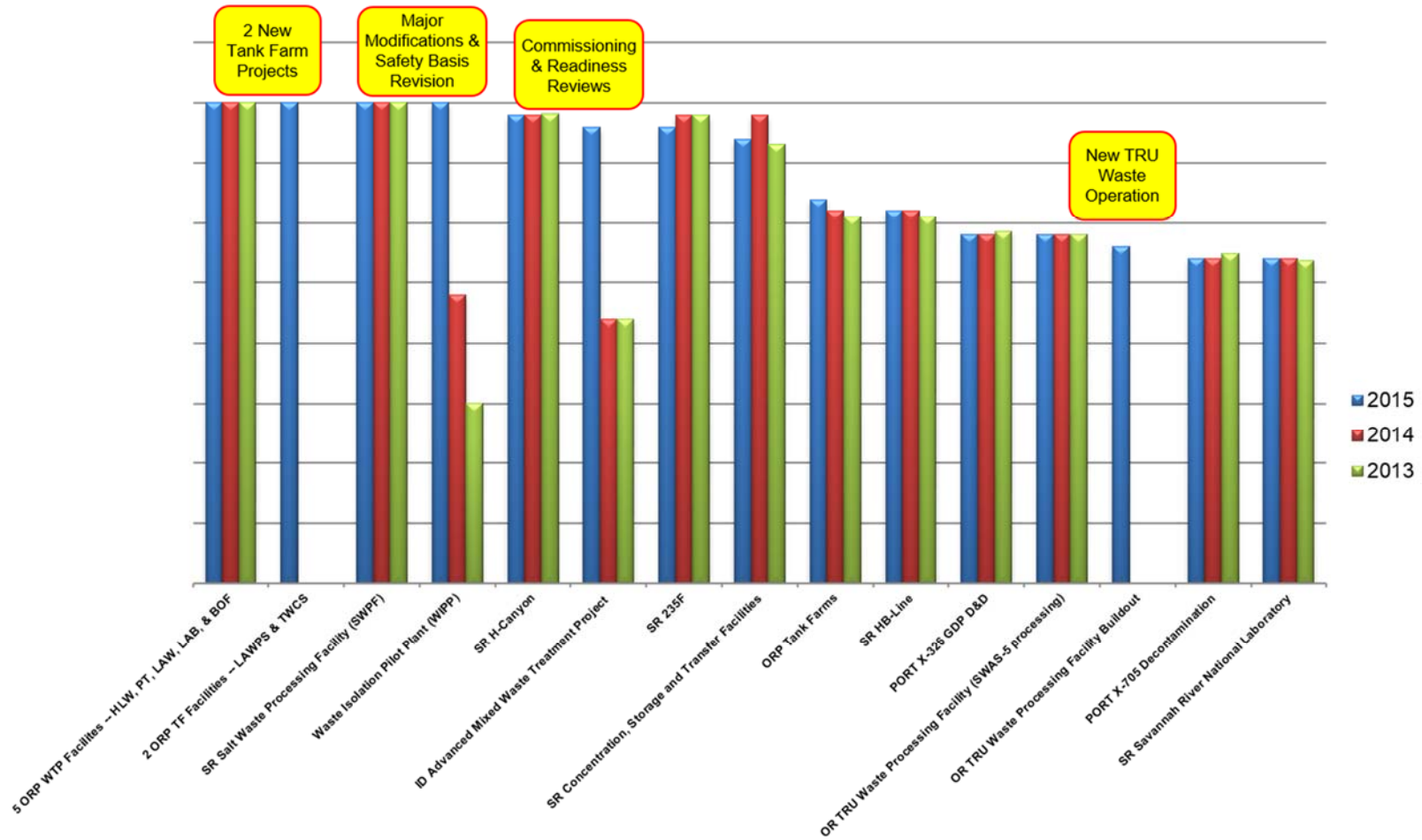


Figure 8. Comparison of Top 20 EM Facility Rankings Based on 2015, 2014, and 2013 Analyses

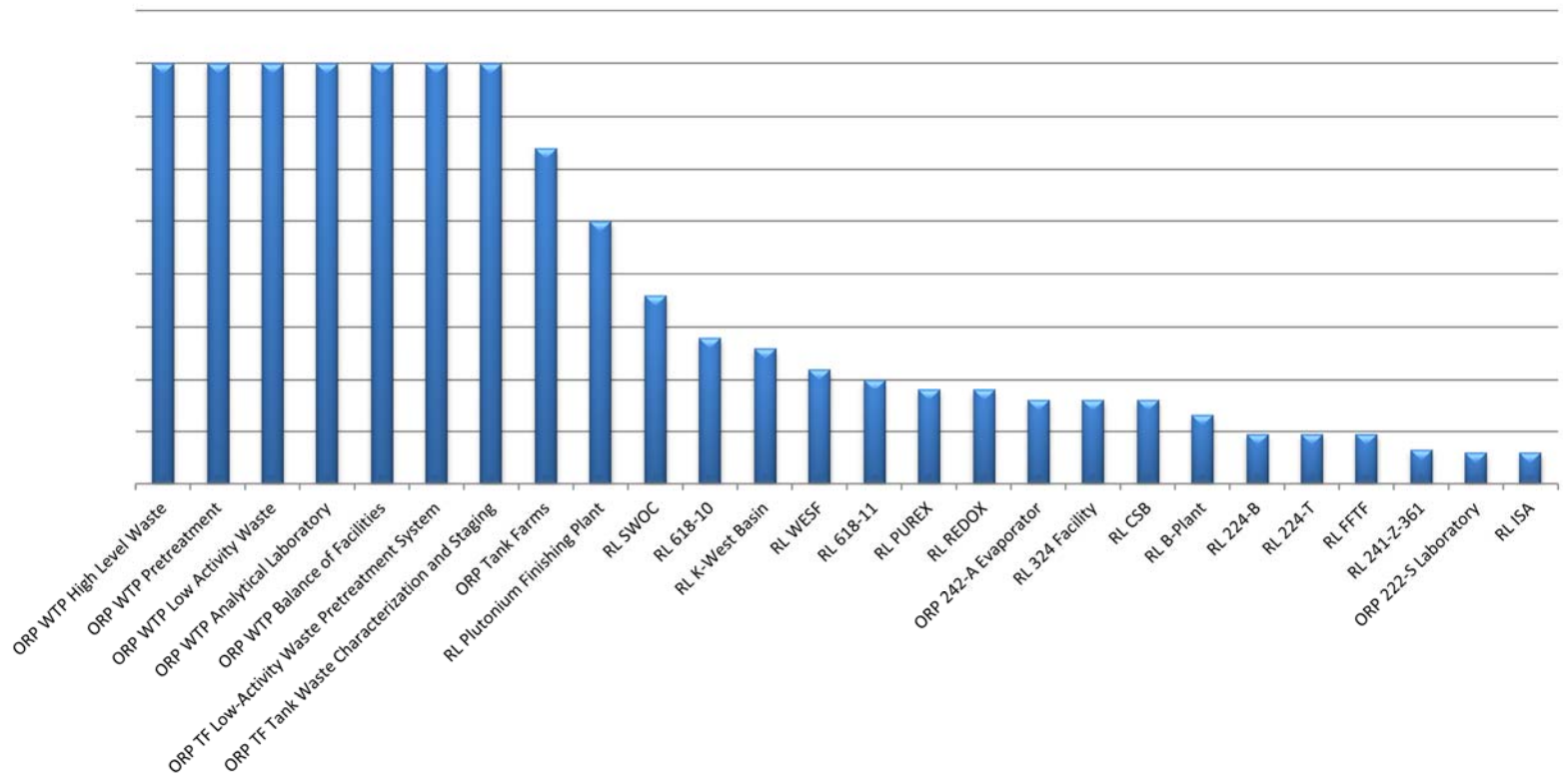


Figure 9. 2015 CNS risk ranking of Hanford Site nuclear facilities.

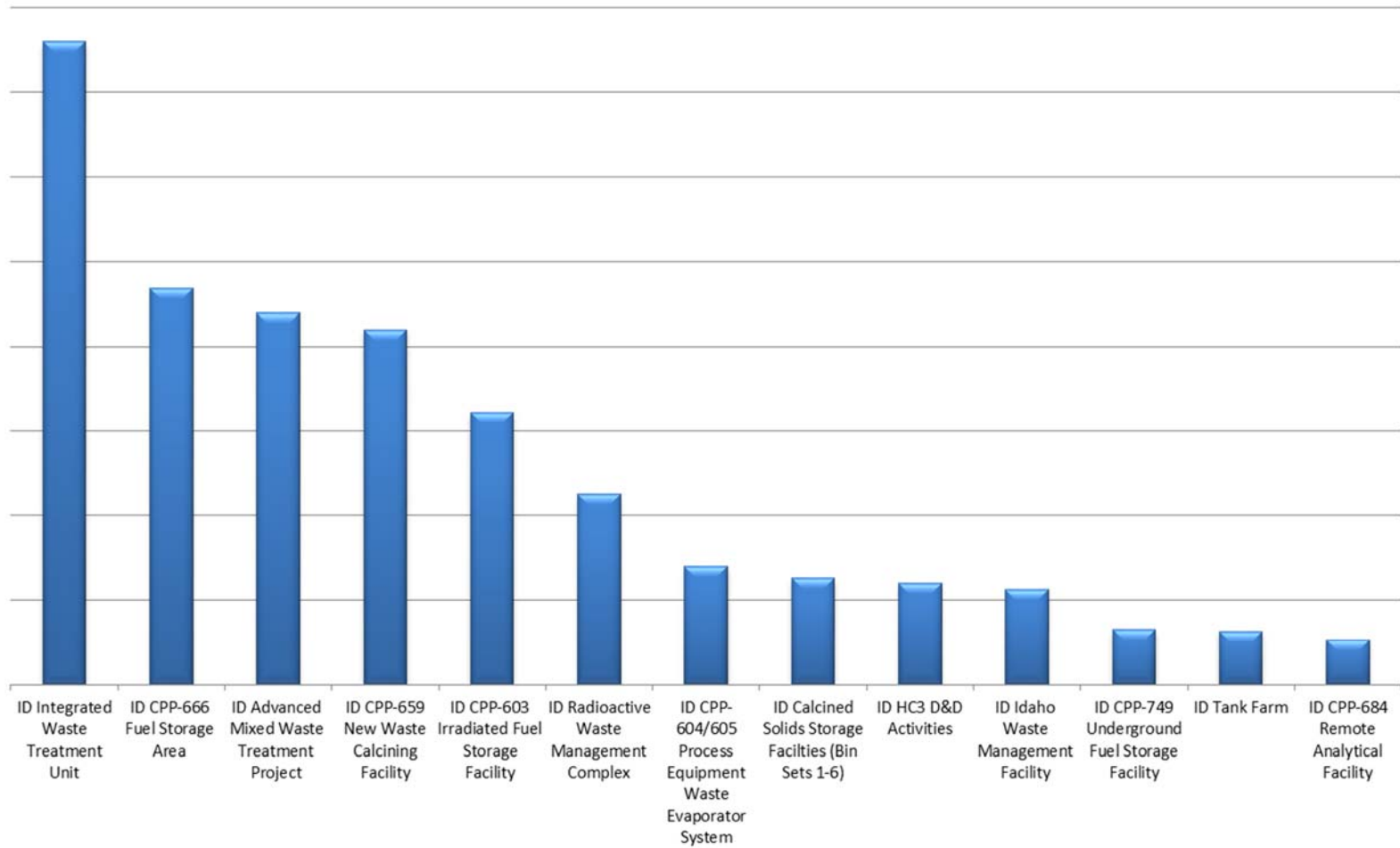


Figure 10.2015 CNS risk ranking of Idaho Site nuclear facilities.

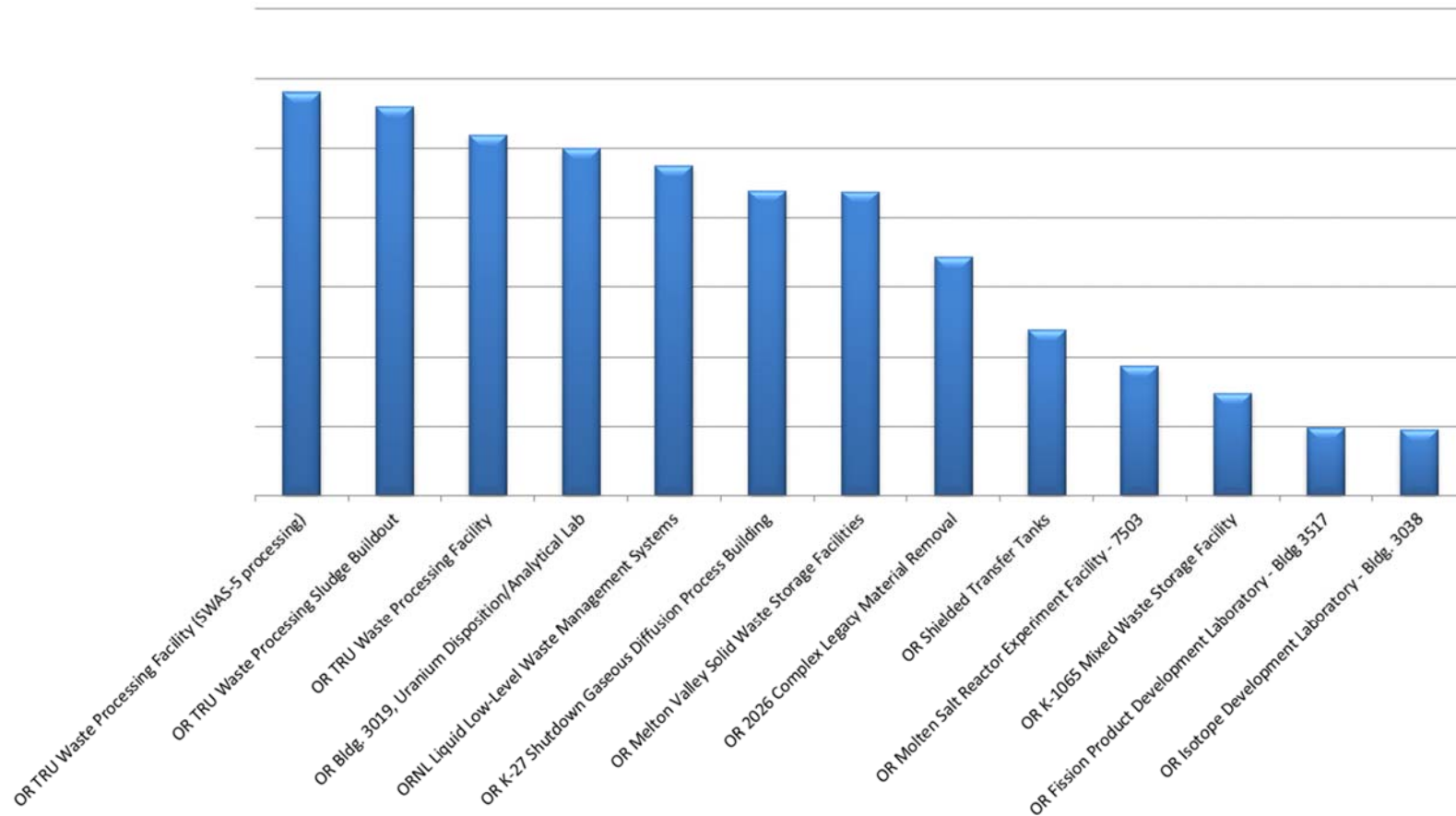


Figure 11. 2015 CNS risk ranking of Oak Ridge Site nuclear facilities.

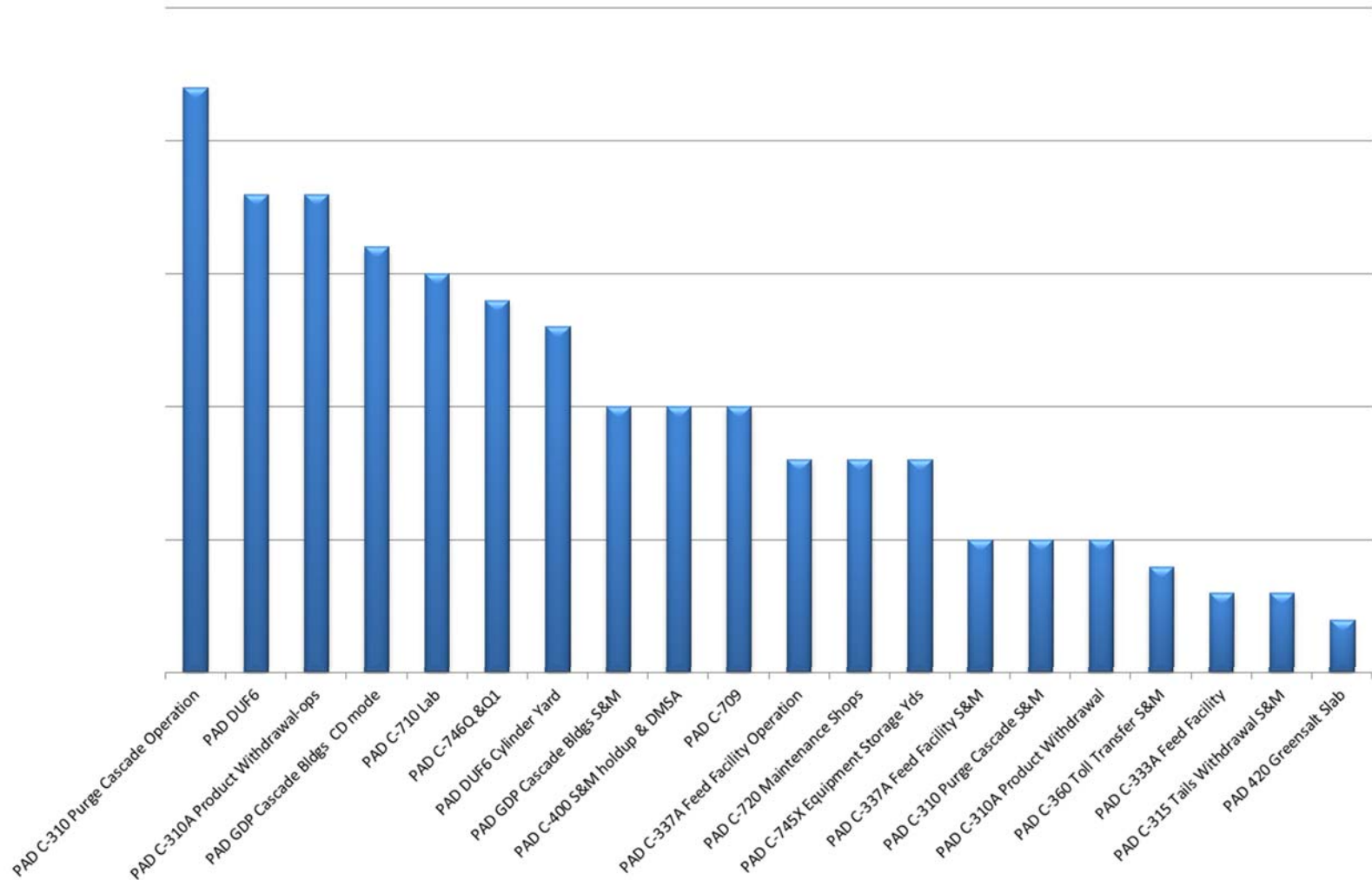


Figure 12. 2015 CNS risk ranking of Paducah Site nuclear facilities.

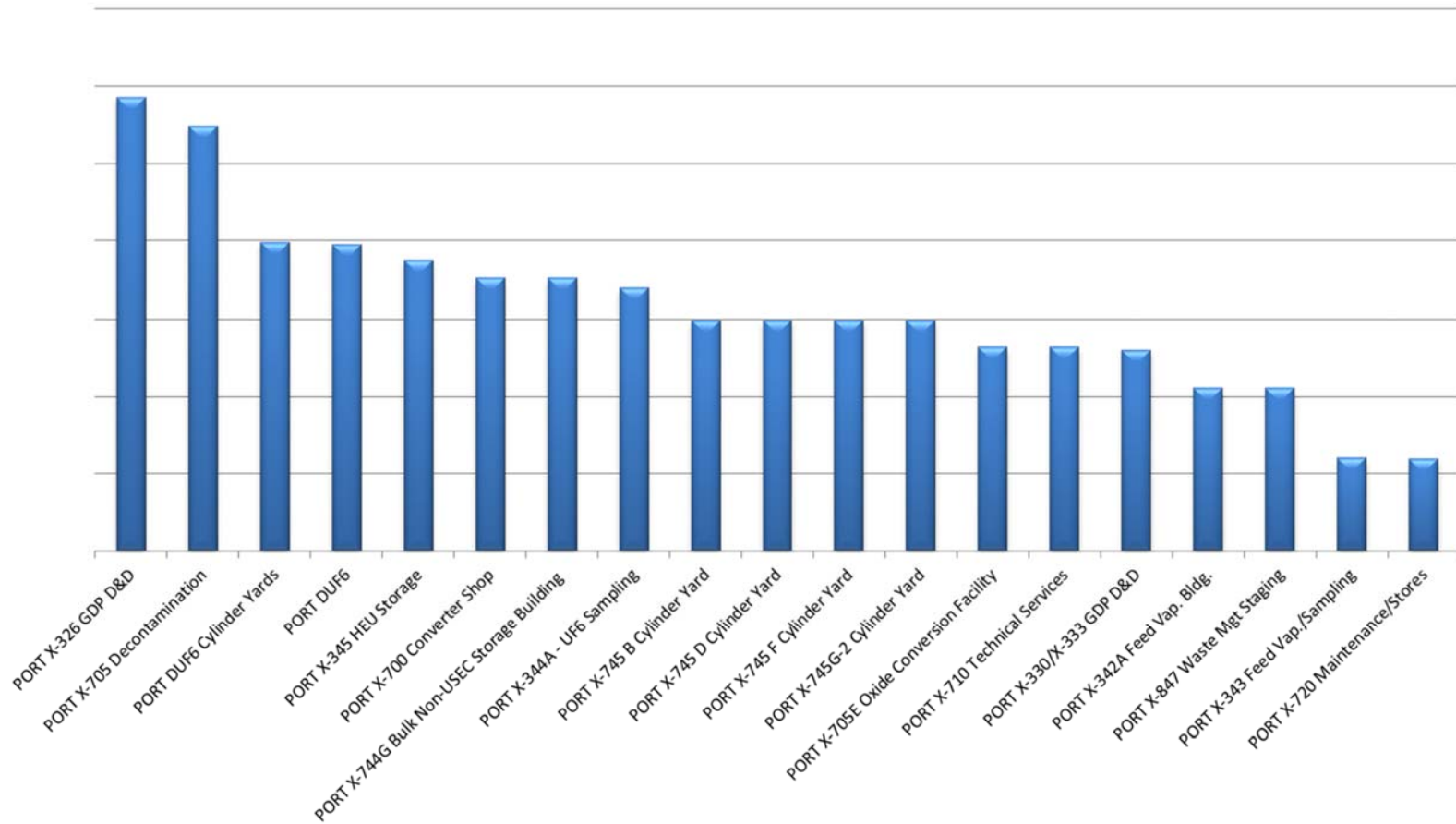


Figure 13. 2015 CNS risk ranking of Portsmouth Site nuclear facilities.

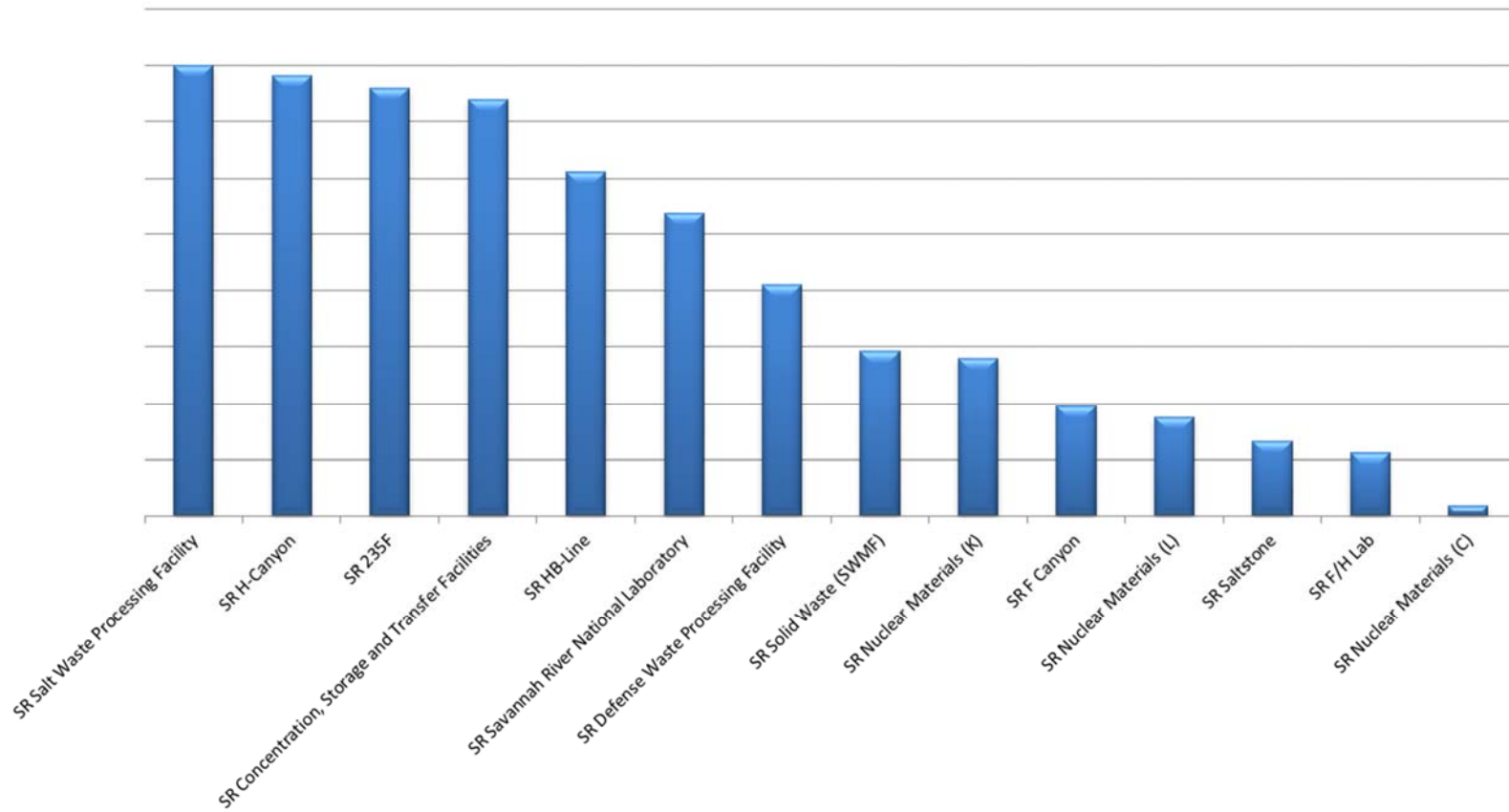


Figure 14. 2015 CNS risk ranking of Savannah River Site nuclear facilities.

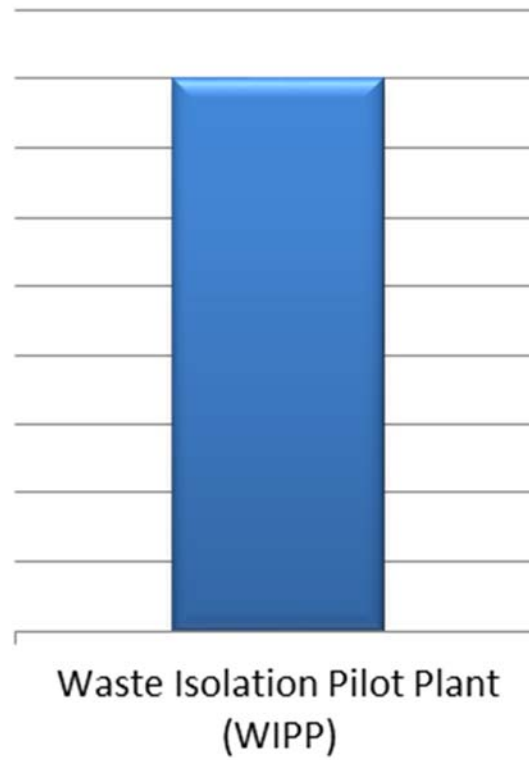


Figure 15. 2015 CNS risk ranking of WIPP at Carlsbad Site.



Appendix D 2015 CNS Facility Ranking Information of 106 EM Nuclear Facilities

Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
1	Hanford	Waste Treatment & Immobilization Plant Project (WTP) ⁸ High Level Waste (HLW) Facility	Radioactive Liquid Waste Processing & Vitrification	Design & Construction Critical Decision-3 Phase	2	High	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	N/A	N/A	N/A	N/A

⁴ High: Facilities that involve daily to weekly activities related to hazardous materials; Medium: Facilities that involve weekly to monthly activities related to hazardous materials; Low: Facilities that involve monthly to quarterly activities related to hazardous materials. For WPT and SWPF project, the “High” work level activity designation is for construction activities.

⁵ The safety condition of the facility (Good, Average, or Poor) considers the age and overall degradation of the building and other Structures, Systems, and Components (SSCs). A rating of “poor” is assigned when degradation has potential to significantly impact worker safety and/or SSC operability. A “good” condition is assigned when the facility is well maintained and no significant facility degradation is obvious that can have a direct impact on the operability of the nuclear safety systems. Average is assessed when a strong case can’t be made for either “poor” or “good” condition. Typically, cosmetic types of condition, such as paint peeling off, should not include in the qualitative evaluation.

⁶ Facility Inventory Level, or HC2TQ, provides a general perspective on the magnitude of a facility’s inventory when compared to DOE-STD-1027 Hazard Category 2 TQ’s. One HC2TQ equals the quantity for a given isotope in Table A-1 of the standard. Where multiple isotopes exist in a facility, the standard directs a “sum of fractions” approach in which each isotopic quantity is divided by the corresponding HC2 quantity. The sum of these isotopic fractions is equal to the fraction or multiple of HC2TQs.

⁷ High – Potential for onsite and offsite impacts to large numbers of persons or for major impacts to the environment. Moderate – Potential onsite impacts to people or the environment, but at most only minor offsite impacts. Low – Potential for minor onsite and negligible offsite impacts to people and the environment.

⁸ WTP project is still under design and construction and safety basis information is still being developed.



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
2	Hanford	WTP Pretreatment (PT) Facility	Radioactive Liquid Waste Processing & Vitrification	Design & Construction Critical Decision-3 Phase	2	High	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	N/A	N/A	N/A	N/A
3	Hanford	WTP Low Activity Waste (LAW) Facility	Radioactive Liquid Waste Processing & Vitrification	Design & Construction Critical Decision-3 Phase	3	High	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	N/A	N/A	N/A	N/A
4	Hanford	WTP Analytical Laboratory (LAB)	Radioactive Liquid Waste Processing & Vitrification	Design & Construction in Critical Decision-3 Phase	3	High	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	Project in Design and Construction; Safety Basis in PDSA phase	N/A	N/A	N/A	N/A
5	Hanford	WTP Balance of Facilities (BOP)	Radioactive Liquid Waste Processing & Vitrification	Design & Construction in Critical Decision-3 Phase	Below Radiological	High	Project in Design and Construction	Project in Design and Construction	Project in Design and Construction	N/A	N/A	N/A	N/A
6	Hanford	Tank Farm Low-Activity Waste Pretreatment System (LAWPS) Facility	Radioactive Liquid Waste Processing & Vitrification	Proposed New Design & Planning in Critical Decision-0 Phase	N/A	Low, in Planning and Design	Project in Design and Construction	Project in Design and Construction	Project in Design and Construction	N/A	N/A	N/A	N/A



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
7	Hanford	Tank Farm Waste Characterization and Staging (TWCS) Facility	Radioactive Liquid Waste Processing & Vitrification	Proposed New Design & Planning in Critical Decision-0 Phase	N/A	Low, in Planning and Design	Project in Design and Construction	Project in Design and Construction	Project in Design and Construction	N/A	N/A	N/A	N/A
8	Savannah River	Salt Waste Processing Facility (SWPF)	Radioactive Liquid Waste Processing	Close to End of Construction: Hot Commissioning in 12/2018	2	High	30	13	Good	Cs-137, Pu-238	Liquid, Slurry	87	Low
9	Carlsbad	Waste Isolation ⁹ Pilot Project (WIPP)	Radioactive Solid Waste	Operating; Major Ventilation Modifications, Updating Safety Basis	2	High	10	6	Poor	Pu-239, Am-241, Pu-238	Solid	N/A	Low
10	Savannah River	H-Canyon	Pu Processing and Handling	Operating	2	High	37	21	Average	Pu-239	Liquid, Solid	1,000	High
11	Idaho	Integrated Waste Treatment Unit (IWTU)	Radioactive Solid Waste, Radioactive Liquid Waste	Commissioning; Readiness Reviews prior to Operations	2	High	10	6	Good	Mixed Fission Products	Solid, Liquid	66	Low
12	Savannah River	235F	Pu Storage	Operating	2	Low	9	6	Average	Pu-238, Pu-239	Oxide	441,	Low, High Risk to Co-

⁹ WIPP is requiring more CNS attention since it experienced two accident events. As a result; material condition declined from good to poor; waste operations were suspended; a new DSA is in development; and, modifications to the safety-related ventilation system are being designed.



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
												Legacy holdup in process Puff area.	Located Workers
13	Savannah River	Concentration, Storage, and Transfer Facility (CSTF)	Radioactive Liquid Waste	Operating	2	High	61	25	Average	Cs-137, Sr-90, Pu-238	Liquid	15,000	Low
14	Hanford	Tank Farms	Radioactive Liquid Waste	Operating	2	High	9	14	Average	Cs-137, Pu-239, Am-241, Sr-90; caustic solutions with pH>12.5	Liquid (slurry), Hydrogen Gas, Sludge, Salt Cake	100,000	Low
15	Savannah River	HB-Line	Pu Processing and Handling	Operating	2	High	30	22	Average	Pu-239	Liquid, Solid	400	High
16	Portsmouth	X-326 Gaseous Diffusion Plant (GDP) D&D	Cleanup	D&D	2 (Criticality)	High	2	8	Good	U Components	Oxides and Fluorides	< 1	High
17	Oak Ridge	TRU Waste Processing Facility Processing (SWAS-5 Processing)	Radioactive Solid Waste	Operating	2	High	8	10	Good	TRU waste (Pu-239 dominate isotope) and chemical (PMDI)	Powder (contaminated cel-lulosics)	45	Low
18	Oak Ridge	TRU Waste Processing Facility Sludge Buildout	Radioactive Solid Waste	Operating	2	High	8	10	Good	TRU waste (Pu-239 dominate isotope) and chemical (PMDI)	Powder (contaminated cel-lulosics)	45	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
19	Portsmouth	X-705 Decontamination	Uranium Recovery	Operating	2 (Criticality)	High	2	0	Good	U Components	Solid oxides and fluorides	< 1	High
20	Savannah River	Savannah River National Laboratory	Laboratory	Operating	2	High	16	3	Average	Pu and U components	Liquid, Powder, Solid, Oxides	45	High
21	Oak Ridge	TRU Waste Processing Facility	Radioactive Solid Waste	Operating	2	High	8	10	Good	TRU waste (Pu-239 dominate isotope) and chemical (PMDI)	Powder (contaminated celulosics)	45	Low
22	Oak Ridge	Bldg. 3019, Uranium Disposition/ Analytical Lab	Uranium Processing and Handling	Operating and New Design	2	Moderate	3	3	Average	U-233, Radon	Powder	N/A	High
23	Hanford	Plutonium Finishing Plant (PFP)	Cleanup	D&D	2	High	4	7	Average	Pu-239	Residual material in oxide and metal forms	13	High
24	Oak Ridge	Liquid Low Level Waste Management Systems	Radioactive Liquid Waste	Operating	2	Moderate	20	12	Good	Cm-244, Cs-137, Pu-239, Sr-90, Th-232, U-233, Y-90	Sludge, Liquid	33	Low
25	Idaho	CPP-666 Fuel Storage Area	Irradiated Fissile Material Storage	Operating	2	High	8	7	Good	Mixed Fission Products	Solid	2,000,000	Moderate
26	Paducah	PAD C-310 Purge Cascade Operation	U Processing and Handling	Operating	2	High	8	13	Average	U	Solid oxides, fluorides, and gaseous UF ₆	1.4	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile				
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷	
27	Idaho	Advanced Mixed Waste Treatment Project	Radioactive Solid Waste	Operating	2	High	6	5	Good	Pu-241, Am-241, Pu-238, Pu-239, Pu-240, U-233, Cm-244	Solid	3,600	High	
28	Oak Ridge	K-27 Shut-down Gaseous Diffusion Process Building	Cleanup	D&D	2 (Criticality)	High	17	32	Poor	Chemical (uranium toxicity and PMDI)	Powder	<1	High	
29	Oak Ridge	Melton Valley Solid Waste Storage Facilities	Radioactive Solid Waste	Operating	2	Moderate	20	45	Good	TRU waste (Pu-239 dominate isotope) and chemical (PMDI)	Powder (contaminated celulosics)	82	Low	
30	Idaho	CPP-659 New Waste Calcining Facility, CPP-666 Fluorine Dissolution Process Area	Irradiated Fissile Material Storage	Operating	2	High	4	2	Good	Mixed Fission Products	Solid, Liquid	46	High	
31	Savannah River	Defense Waste Processing Facility	Vitrification	Operating	2	High	3	8	9	Good	Cs-137, Sr-90, Pu-238	Liquid	1000	Low
32	Portsmouth	Depleted Uranium Hexafluoride (DUF6) Cylinder Yards	Radioactive Solid Waste	Operating	2	High	1	7	Average	U-235, U-238	Gas UF6 and DUF6 in cylinders	253	Low	



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
33	Portsmouth	DUF6	U Processing and Handling	Operating	3	High	24	24	Good	U-235, U-238	Gas DUF6 and oxides	< 1	Low
34	Portsmouth	X-345 Highly Enriched Uranium (HEU) Storage	Unirradiated Enriched U Storage	Operating	2 (Criticality)	Moderate	2	8	Good	U-235, U-238	Gas UF6 in cylinders	< 1	High
35	Paducah	DUF6	U Processing and Handling	Operating	3	High	24	29	Good	U-235, U-238	Gas DUF6 and oxides	< 1	Low
36	Paducah	C-310A Product Withdrawal Operations	Uranium Handling	Operating	2 (Criticality)	High	8	13	Average	U	Solid oxides, fluorides, and gaseous UF6	<1	High
37	Hanford	Solid Waste Operations Complex	Radioactive Solid Waste	Operating	2	Moderate	16	6	Average	Misc Hanford waste materials	Solids and drum waste	N/A	Low
38	Portsmouth	X-700 Converter Shop	Radioactive Solid Waste	Operating	2 (Criticality)	Low	3	0	Good	U	Solid oxides and fluorides	<1	Low
39	Portsmouth	X-744G Bulk Non-UESA Storage Building and Associated Outside Storage	Radioactive Solid Waste and Radioactive Liquid Waste	Operating	2	Moderate	1	7	Average	U-235, U-238	Solid oxides, fluorides, metal powder	61	High
40	Oak Ridge	2026 Complex Legacy Material Removal	Converting to future down blending mission	Transitioning from SC to EM	3	Low	2	2	Poor	Legacy fissionable materials, radioactive surface contamination, radioactive waste, and	Liquid and Solid	Assumed 20% of the HC 2 TQs during standby	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
										toxic chemical materials			
41	Portsmouth	X-344A-UF6 Sampling	Uranium handling	Operating	2	High	29	0	Good	UF6	Gas	<1	Low
42	Idaho	CPP-603 Irradiated Fuel Storage Facility	Irradiated Fissile Material Storage	Operating	2	Moderate	6	9	Average	Mixed Fission Products	Solid	30,000	High
43	Paducah	GDP Cascade Bldgs	Cleanup	D&D	2 (Criticality)	High	8	13	Average	U	Solid oxides, fluorides, and gaseous UF6	1.4	High
44	Paducah	C-710 Lab	Laboratory	Operating	2	Low	1	0	Average	U	Solid oxides, fluorides, and gaseous UF6	1.2	Low
45	Portsmouth	X-745 B Cylinder Yard	Radioactive Solid Waste	Operating	2	High	1	7	Good	UF6	GAS UF6 and DUF6 in cylinders	>100	low
46	Portsmouth	X-745 D Cylinder Yard	Radioactive Solid Waste	Operating	2	High	1	7	Good	UF6	GAS UF6 and DUF6 in cylinders	>100	low
47	Portsmouth	X-745 F Cylinder Yard	Radioactive Solid Waste	Operating	2	High	1	7	Good	UF6	GAS UF6 and DUF6 in cylinders	>100	low
48	Portsmouth	X-745G-2 Cylinder Yard	Radioactive Solid Waste	Operating	2	High	1	7	Good	UF6	GAS UF6 and DUF6 in cylinders	>100	low
49	Savannah River	Solid Waste Management Facility	Radioactive Solid Waste	Operating	2	High	4	7	Average	TRU waste (Pu isotopes dominate hazard)	Powder (contaminated celulosics)	2700	Moderate



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
50	Savannah River	K-Areas Nuclear Materials	Pu Storage	Cleanup	2	High	29	24	Good	H-3, U-235, Pu-239	Liquid (heavy water for tritium), Solid, Oxides	10000	High
51	Paducah	746-Q & Q1	Radioactive Solid Waste	Operating	2 (Criticality)	High	1	0	Average	U-235, U-238	Solid oxides	< 1	Low
52	Hanford	618-10 Burial Grounds	Cleanup	Environmental Restoration	3	High	0	1	Average	Cs-137, Sr-90 Pu-239	Hanford 300 Area wastes	2.7	Low
53	Portsmouth	PORTS X-705E Oxide Conversion Facility	Cleanup	Awaiting D&D	2 (Criticality)	Moderate	1	3	Average	U-235, U-238	Solid oxides and fluorides	< 1	High
54	Portsmouth	X-710 Technical Services	Support	Operating	3 (Criticality)	Moderate	2	0	Average	U-235, U-238	Solid oxides and fluorides	<1	low
55	Paducah	DUF6 Cylinder Yards	Radioactive Solid Waste	Operating	2	High	1	24	Average	U-235, U-238	Solid oxides, fluorides, and gaseous UF ₆	275	Low
56	Portsmouth	GDP X-330/X-330 D&D	Cleanup	Awaiting D&D	2 (Criticality)	Low	1	0	Average	U-235, U-238	Solid oxides and fluorides	N/A	Moderate
57	Hanford	K-West Basins	Irradiated Fissile Material Storage	Operating	2	Moderate	7	0	Average	Cs-137, Sr-90, Am-241	Spent Fuel and sludge	55	Low
58	Idaho	Radioactive Waste Management Complex	Radioactive Solid Waste	Operating	2	High	1	6	Average	Am-241, Pu-239, Pu-240	Solid	1,850	High



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
59	Hanford	Waste Encapsulation and Storage Facility	Irradiated Fissile Material Storage	Operating	2	Low	7	4	Average	Cs-137, Sr-90	Capsules	1154	Low
60	Portsmouth	X-342A Feed Vap. Bldg.	U Processing and Handling	Operating	2	High	29	0	Good	U	Gas UF6	<1	low
61	Portsmouth	X-847 Waste Mgt Staging	U Processing and Handling	Operating	2	High	2	0	Good	U	Solid oxides and fluorides	<1	low
62	Oak Ridge	Shielded Transfer Tanks	Cleanup	Partially D&D	3	Low	2	3	Good	Cm-244, Cs-137, Sr-90	Liquid	< 1	Low
63	Paducah	GDP Cascade Bldgs S&M	Cleanup	Partially D&D	2	Low	3	7	Average	U	Solid oxides and fluorides	1.4	Low
64	Paducah	C-400 S&M holdup & DMSA	Cleanup	Partially D&D	2	Low	1	5	Average	U	Solid oxides and fluorides	1.2	Low
65	Paducah	C-709	Cleanup	Partially D&D	2	Low	1	5	Good	U	Solid oxides and fluorides	1.2	Low
66	Hanford	618-11 Burial Grounds	Cleanup	Environmental Restoration	3	Low	0	3	Average	Cs-137, Sr-90 Pu-239	Hanford 300 Area wastes	11.3	N/A
67	Savannah River	F-Canyon	Radioactive Solid Waste	Partially D&D in S&M	2	Low	12	0	Average	Pu-239	Oxide	15	Low
68	Oak Ridge	Molten Salt Reactor Experiment Facility - 7503	Cleanup	Partially D&D	2	Low	15	15	Average	Pb-212, Bi-212	Powder (Fuel and Flush Salts)	10	Low
69	Hanford	PUREX	Cleanup	Awaiting D&D	2	Low	0	0	Average	Pu-239, Am-241, Cs-137, Sr-90	Solid residual material in old processing systems	96	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
70	Hanford	Reduction-Oxidation Plant (REDOX)	Cleanup	Awaiting D&D	2	Low	0	0	Average	Pu-239, Am-241, Cs-137, Sr-90	Solid residual material in old processing systems	71	Low
71	Savannah River	L-Area Nuclear Materials	Irradiated Fissile Material Storage	Operating	2	High	13	0	Average	H-3, U-235, Fission Products	Liquid, Solid	1.9 Tritium, 8.4x10 ⁴ U, 2x10 ⁶ fission	High
72	Paducah	C-337A Feed Facility Operation	Cleanup	Partially D&D	2 (Criticality)	Low	3	8	Average	U	Solid oxides and fluorides	<1	Low
73	Paducah	C-720 Maintenance Shops	Radioactive Solid Waste	Operating	2	Low	1	0	Average	U	Solid oxides and fluorides	1.2	Low
74	Paducah	C-745X Equipment Storage Yards	Radioactive Solid Waste	Operating	2	Low	1	5	Good	U	Solid oxides and fluorides	1.2	Low
75	Hanford	242-A Evaporator	Radioactive Liquid Waste	Operating	2	Moderate	7	2	Average	Cs-137 and Sr-90; caustic solution with pH>12.5	Liquid (slurry)	1.7	Low
76	Hanford	324 Building	Cleanup	Undergoing D&D	2	Moderate	4	0	Average	Cs-137, Sr-90, Am-241	Residual dispersible material within the hot cells.	3.4	Low
77	Hanford	Canister Storage Building	Irradiated Fissile Material Storage	Operating	2	Moderate	23	23	Good	Spent Fuel	Spent Fuel Components	N/A	Low
78	Oak Ridge	K-1065- A, B, C, D, E, F, G, H Mixed	Radioactive Solid Waste	Operating	2	Moderate	8	10	Good	Chemical with high	Liquid	2	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
		Waste Storage Facility								offsite consequence; Fire			
79	Idaho	CPP-604/605 Process Equipment Waste Evaporator System	Radioactive Liquid Waste	Operating	2	Low	1	1	Average	Cs-137, Sr-90	Liquid	86	Low
80	Hanford	B-Plant	Cleanup	Awaiting D&D	2	Low	0	0	Average	Cs-137, Sr-90	Solid residual material in old processing systems	8	Low
81	Savannah River	Saltstone Processing Facility	Radioactive Liquid Waste	Operating	2	High	1	3	Good	Cs-137, Sr-90	Liquid	5	Low
82	Idaho	Calcined Solids Storage Facility (CSSF) 1-6 (Bin Sets)	Radioactive Solid Waste	Operating	2	Low	1	0	Good	Mixed Fission Products	Solid	44,000	Low
83	Idaho	HC3 D&D Activities	Cleanup	Undergoing D&D	3	High	0	1	Poor	Mixed Fission Products	Solid	< 1	Low
84	Portsmouth	X-343 Feed Vap./ Sampling	U Processing and Handling	Operating	2	High	0	0	Good	U	Solids oxides	<1	Low
85	Portsmouth	X-720 Maintenance/Stores	Radioactive storage	Operating	2	Moderate	2	0	Good	U	Solids oxides	<1	Low
86	Idaho	Idaho Waste Management Facility	Radioactive Solid Waste	Operating	2	High	0	1	Average	Am-241, Pu-239, Pu-240	Solid	11	High



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
87	Savannah River	Areas F and H Labs	Laboratory	Operating	2	High	6	7	Average	Pu-239, Pu-238	Liquid, Powder, Solid, Oxides	10	Moderate
88	Paducah	C-337A Feed Facility	U Processing and Handling	Operating	2 (Criticality)	Low	3	8	Average	U	Solid oxides and fluorides	<1	High
89	Paducah	PAD C-310 Purge Cascade S&M	U Processing and Handling	Operating	2 (Criticality)	High	8	13	Average	U	Solid oxides, fluorides, and gaseous UF ₆	1.4	High
90	Paducah	C-310A Product Withdrawal	U Processing and Handling	Operating	2 (Criticality)	High	3	7	Average	U	Solid oxides, fluorides, and gaseous UF ₆	<1	High
91	Oak Ridge	Fission Product Development Laboratory - Building 3517	Cleanup	Awaiting D&D	2	Low	16	30	Average	Cs-137, Sr-90	Powder	500	Low
92	Oak Ridge	Isotope Development Laboratory - Bldg. 3038	Cleanup	Awaiting D&D	3	Low	5	5	Poor	Cs-137, Sr-90	Powder (surface contamination)	<1	Low
93	Hanford	224-B Facility	Cleanup	Awaiting D&D	3	Low	0	0	Average	Pu-239	Solid residual material in old processing systems	1.9	Low
94	Hanford	224-T Facility	Cleanup	Awaiting D&D	3	Low	0	0	Average	Pu-239	Solid residual material in old processing systems	< 1	Low
95	Hanford	Fast Flux Test Facility	Cleanup	Awaiting D&D	3	Low	0	0	Good	Cs-137	Cs contaminated sodium and residuals in piping	3.9	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
96	Paducah	C-360 Toll Transfer	Uranium Handling	Operating	2 (Criticality)	Moderate	22	0	Low	UF6	Gas	<1	Low
97	Idaho	CPP-749 Underground Fuel Storage Facility	Irradiated Fissile Material Storage	Operating	2	Low	17	7	Average	Mixed Fission Products	Solid	30,000	High
98	Hanford	241-Z-361	Cleanup	Awaiting D&D	2	Low	2	0	Average	Pu-239	Sludge remaining inside the tank from past PFP processes	30	Moderate
99	Idaho	Tank Farm	Radioactive Liquid Waste	Operating	2	Low	3	2	Average	Mixed Fission Products	Liquid	660	Low
100	Paducah	C-333A Feed Facility	U Processing and Handling	Operating	3	Low	3	0	Average	U	Solid Oxides	<1	low
101	Paducah	C-315 Tails Withdrawal	U Processing and Handling	Operating	3	Low	3	0	Average	U	Solid Oxides	<1	low
102	Hanford	222-S Laboratory	Laboratory	Operating	3	High	0	1	Average	Cs-137, Sr-90, Pu-239, Am-241, Pu-240	Liquid, some Solids	< 1	Low
103	Hanford	Interim Storage Area	Irradiated Fissile Material Storage	Operating	2	Moderate	0	0	Good	Spent Fuel	Solid Spent Fuel	234	Low
104	Idaho	CPP-684 Remote Analytical Facility	Laboratory	Operating	3	Low	1	1	Good	Mixed Fission Products	Liquid	< 1	Low



Ranking	Facility Profile						Safety Control Profile			Hazard Profile			
	Site	Name	Type	Life Cycle	Hazard Category	Current Work Level Activity ⁴	Engineered Safety Controls (Passive and Active)	Administrative Safety Control	Safety Condition ⁵	Type	Form	Inventory Level ⁶	Criticality Risk To Workers ⁷
105	Paducah	420 Greensalt Slab	U Processing and Handling	D&D	2	Low	0	3	Average	U	UO ₂ F ₂ , UF ₆ , and UF ₄	1.4	Low
106	Savannah River	C-Area Nuclear Materials	Cleanup	Partially D&D	2	Low	0	1	Average	H-3	Liquid (stored in heavy water)	19	Low



2016 Strategic Plan
Chief of Nuclear Safety (CNS)
Office of the Undersecretary
December 2015

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Appendix F DOE Deputy Secretary Memorandum dated July 5, 2011, Roles and Responsibilities for the Central Technical Authority, Chief Nuclear Safety/Chief Defense Nuclear Safety, and Chief Operating Officer



The Deputy Secretary of Energy
Washington, DC 20585

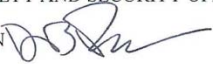
July 5, 2011

MEMORANDUM FOR THOMAS P. D'AGOSTINO
UNDER SECRETARY FOR NUCLEAR SECURITY

ARUN MAJUMDAR
SENIOR ADVISOR/DIRECTOR, ARPA-E

STEVEN E. KOONIN
UNDER SECRETARY OF SCIENCE

GLENN S. PODONSKY
CHIEF, HEALTH, SAFETY AND SECURITY OFFICER

FROM: DANIEL B. PONEMAN 

SUBJECT: Roles and Responsibilities for the Central Technical Authority,
Chief Nuclear Safety/Chief Defense Nuclear Safety, and Chief
Operating Officer

Subsequent changes in leadership roles and responsibilities within the Department have made it advisable to affirm the Central Technical Authority (CTA) and Chief Nuclear Safety (CNS)/Chief Defense Nuclear Safety (CDNS) roles and responsibilities. Additionally, the Chief Operating Officers (COOs) for respective Under Secretaries are integral to the overall effectiveness of DOE mission execution and should remain involved in nuclear safety and security performance.

By this action, individuals assigned to serve as CTA, CNS/CDNS, and COO are:

<u>Under Secretary</u>	<u>CTA</u>	<u>CNS/CDNS</u>	<u>COO</u>
NNSA	Thomas P. D'Agostino	Don Nichols	James Cavanagh ¹
ENERGY ²	Dr. Arun Majumdar	Richard Lagdon	George Malosh
SCIENCE	Dr. William F. Brinkman	Carol Sohn	Joseph McBrearty
EM	Richard Lagdon	Richard Lagdon	Cynthia Anderson

Each CTA, on behalf of their respective Under Secretary, has the following line management responsibilities:

1. Concurs with the determination of the applicability of DOE Directives involving nuclear safety included, pursuant to DEAR 970.5204-2(b), in contracts for the

¹ On behalf of Neile Miller

² Without EM



Figure 16. DOE Deputy Secretary memorandum, July 5, 2011, page 1 of 3.



management and operation of nuclear facilities for which the Under Secretary is responsible (referred to subsequently as simply 'contracts');

2. Concurs with nuclear safety requirements included in contracts, pursuant to DEAR 970.5204-2(c);
3. Concurs with all exemptions or equivalencies to nuclear safety requirements in contracts that were added to the contract, pursuant to DEAR 970.5204-2;
4. Recommends to the Office of Health, Safety and Security issues and proposed resolutions concerning DOE safety requirements; concurs in the adoption or revision of nuclear safety requirements (including supplemental requirements); and provides expectations and guidance for implementing nuclear safety requirements as necessary for use by the Under Secretary's employees and contractors;
5. Maintains operational awareness of the implementation of nuclear safety requirements and guidance, consistent with the principles of Integrated Safety Management, at sites for which the Under Secretary is responsible (for example, reviewing Documented Safety Analyses, Authorization Agreements, and readiness reviews, as necessary, to evaluate the adequacy of safety controls and implementation);
6. Periodically reviews and assesses whether sites for which the Under Secretary is responsible are maintaining adequate numbers of technically competent personnel necessary to fulfill nuclear safety requirements;
7. Provides inputs to, reviews and concurs, with DOE-wide nuclear safety-related research and development activities; and
8. Directs the identification and prioritization of nuclear-safety related research and development activities as necessary at sites for which the Under Secretary is responsible.

Additional details regarding CTA responsibilities are delineated in DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, and other Departmental Directives as applicable.

The CTAs are supported in executing their responsibilities by a CNS (or CDNS for NNSA). The individuals in these positions are selected and assigned by their respective Under Secretaries, and execute functions as designated by their Under Secretary and Departmental Directives. The respective Under Secretaries are responsible for supplying resources needed to execute the CTA and supporting functions.

The Under Secretaries are supported in executing their responsibilities by a COO. The individuals in these positions are selected and assigned by their respective Under Secretary, and execute functions as designated by their Under Secretary and Departmental Directives. The CTA support organizations should work closely with their respective COO and the Associate Deputy Secretary in the conduct of the Nuclear Safety and Security Council (NSSC) activities, whereby NSSC recommendations shall be

Figure 17. DOE Deputy Secretary memorandum, July 5, 2011, page 2 of 3.



forwarded to the Chief Operating Officer Board chaired by the Associate Deputy Secretary.

The existence of the CTA responsibilities does not diminish or otherwise affect the responsibility of other line managers for safety in the execution of their mission, or the responsibility of the Office of Health, Safety and Security for performing independent oversight and other assigned functions, responsibilities, and authorities on behalf of the Secretary.

I direct the CTAs to include the changes established in the June 22, 2007, memorandum, as amended by this action, in the next update to DOE O 410.1 or successor directive(s).

Sunset Date: This memorandum shall be reviewed annually in June for continued relevance.

Figure 18. DOE Deputy Secretary memorandum, July 5, 2011, page 3 of 3.



2016 Strategic Plan
Chief of Nuclear Safety (CNS)
Office of the Undersecretary
December 2015

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Appendix G DOE Deputy Secretary Memorandum dated July 11, 2012, Roles and Responsibilities for the Central Technical Authority, Chief Nuclear Safety/Chief Defense Nuclear Safety, and Chief Operating Officer



The Deputy Secretary of Energy
Washington, DC 20585

July 11, 2012

MEMORANDUM FOR THOMAS P. D'AGOSTINO
UNDER SECRETARY FOR NUCLEAR SECURITY

DAVID B. SANDALOW
ACTING UNDER SECRETARY OF ENERGY

W.F. BRINKMAN
DIRECTOR, OFFICE OF SCIENCE

GLENN S. PODONSKY
CHIEF HEALTH, SAFETY, AND SECURITY OFFICER

FROM: DANIEL B. PONEMAN 

SUBJECT: Roles and Responsibilities for the Central Technical Authority,
Chief Nuclear Safety/Chief Defense Nuclear Safety, and Chief
Operating Officer

Subsequent changes in leadership roles and responsibilities within the Department have made it advisable to affirm the Central Technical Authority (CTA) and Chief Nuclear Safety (CNS)/Chief Defense Nuclear Safety (CDNS) roles and responsibilities. Additionally, the Chief Operating Officers (COOs) for respective Under Secretaries are integral to the overall effectiveness of DOE mission execution and should remain involved in nuclear safety and security performance.

By this action, individuals assigned to serve as CTA, CNS/CDNS, and COO are:

<u>Under Secretary</u>	<u>CTA</u>	<u>CNS/CDNS</u>	<u>COO</u>
NNSA	Thomas P. D'Agostino	Don Nichols	Neile Miller/ Michael Lempke
ENERGY	Peter B. Lyons	Ray Furstenau	George Malosh/ Devon Streit
SCIENCE	W.F. Brinkman	Carol Sohn	Joseph McBrearty
EM	Richard Lagdon	Richard Lagdon	Tracy Mustin

Each CTA, on behalf of their respective Under Secretary, has the following line management responsibilities:

1. Concurs with the determination of the applicability of DOE Directives involving nuclear safety included, pursuant to DEAR 970.5204-2(b), in contracts for the management and operation of nuclear facilities for which the Under Secretary is responsible (referred to subsequently as simply 'contracts');



Figure 19. DOE Deputy Secretary memorandum, July 11, 2012, page 1 of 3.



2. Concurs with nuclear safety requirements included in contracts, pursuant to DEAR 970.5204-2(c);
3. Concurs with all exemptions or equivalencies to nuclear safety requirements in contracts that were added to the contract, pursuant to DEAR 970.5204-2;
4. Recommends to the Office of Health, Safety and Security issues and proposed resolutions concerning DOE safety requirements; concurs in the adoption or revision of nuclear safety requirements (including supplemental requirements); and provides expectations and guidance for implementing nuclear safety requirements as necessary for use by the Under Secretary's employees and contractors;
5. Maintains operational awareness of the implementation of nuclear safety requirements and guidance, consistent with the principles of Integrated Safety Management, at sites for which the Under Secretary is responsible (for example, reviewing Documented Safety Analyses, Authorization Agreements, and readiness reviews, as necessary, to evaluate the adequacy of safety controls and implementation);
6. Periodically reviews and assesses whether sites for which the Under Secretary is responsible are maintaining adequate numbers of technically competent personnel necessary to fulfill nuclear safety requirements;
7. Provides inputs to, reviews and concurs, with DOE-wide nuclear safety-related research and development activities; and
8. Directs the identification and prioritization of nuclear-safety related research and development activities as necessary at sites for which the Under Secretary is responsible.

Additional details regarding CTA responsibilities are delineated in DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, and other Departmental Directives as applicable.

The CTAs are supported in executing their responsibilities by a CNS (or CDNS for NNSA). The individuals in these positions are selected and assigned by their respective Under Secretaries, and execute functions as designated by their Under Secretary and Departmental Directives. The respective Under Secretaries are responsible for supplying resources needed to execute the CTA and supporting functions.

The Under Secretaries are supported in executing their responsibilities by a COO. The individuals in these positions are selected and assigned by their respective Under Secretary, and execute functions as designated by their Under Secretary and Departmental Directives. The CTA support organizations should work closely with their respective COO and the Associate Deputy Secretary in the conduct of the Nuclear Safety and Security Council (NSSC) activities, whereby NSSC recommendations shall be forwarded to the Chief Operating Officer Board chaired by the Associate Deputy Secretary.

Figure 20. DOE Deputy Secretary memorandum, July 11, 2012, page 2 of 3.



The existence of the CTA responsibilities does not diminish or otherwise affect the responsibility of other line managers for safety in the execution of their mission, or the responsibility of the Office of Health, Safety and Security for performing independent oversight and other assigned functions, responsibilities, and authorities on behalf of the Secretary.

I direct the CTAs to include the changes established in the June 22, 2007, memorandum, as amended by this action, in the next update to DOE O 410.1 or successor directive(s).

Sunset Date: This memorandum shall be reviewed when necessary for continued relevance.

Figure 21. DOE Deputy Secretary memorandum, July 11, 2012, page 3 of 3.