



Functional Analysis of Selected NNSA Sites

Sites Included

Kansas City Plant

Pantex Plant

Savannah River Site (NNSA Operations Only)

Y-12 National Security Complex

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Approved for public release; further dissemination
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A handwritten signature in cursive script that reads "Richard Givens".

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TABLE OF CONTENTS

1.0	Introduction and Background.....	4
1.1	Purpose of this Functional Analysis Update.....	4
1.2	Scope	4
1.3	Approach	4
1.4	Limitation and Constraints	5
2.0	Functional Hierarchy.....	7
3.0	Transition from Current to Future State	27
4.0	Interfaces.....	27
5.0	Information Flow Across the Enterprise	32
5.1	Information/Documents Flow Across the NSE - Current State.....	32
5.2	Information Technology (IT) Applications / Systems - Current State.....	33
5.3	Applications within Information Technology (IT) Systems Grouping	39
6.0	Work Performed Outside Defense Programs	42
7.0	References	44
	Appendix A – Glossary of Terms and Acronyms	45
	Appendix B – Approach Used.....	55

LIST OF FIGURES

Figure 1 – SRS Federal Reporting Structure	6
Figure 2 – SRS Contractor Reporting Structure.....	6
Figure 3 – Top Level Functional Hierarchy and Functional Cost Activity Grouping	8
Figure 4 –Functional Hierarchy Diagram – Nuclear Weapons Stewardship	9
Figure 5 –Hierarchy Diagram – Naval Reactors Stewardship.....	10
Figure 6 –Functional Hierarchy Diagram – Nuclear Nonproliferation.....	11
Figure 7 –Functional Hierarchy Diagram – Manage Work & Site Stewardship	12
Figure 8 – Current State External Interface Diagram, Physical Items - KCP	28
Figure 9 – Current State External Interface Diagram, Physical Items - PX.....	29
Figure 10 – Current State External Interface Diagram, Physical Items - SRS	30
Figure 11 – Current State External Interface Diagram, Physical Items – Y-12.	31
Figure 12 – Information Processing	32
Figure 13 – Current State Information Interface Diagram – Product/Technical Aspect.....	34
Figure 14 – Current State Information Interface Diagram – Business/Administrative Aspect	35
Figure 15 – Overview of Information Technology System	36

LIST OF TABLES

Table 1 – Function Listing, Definitions and Performing Sites.....	13
Table 2 - Product / Technical Aspect - IT Applications	40
Table 3 - Business / Administrative Aspect - IT Applications	41
Table 4 – Estimated Revenue from Work for Others	42
Table 5 – Work for Other Agencies.....	42

1.0 Introduction and Background

A very thorough functional analysis was completed for the Nuclear Security Enterprise (NSE) in September 2007 (Reference 1). Since the completion of that study, the NSE has been undergoing changes that were thought to be significant enough to warrant an update and revalidation of the 2007 study. In particular, key decision documents^{1 2} have been issued after the publication of the Supplemental Programmatic Environmental Impact Statement (Reference 2).

1.1 Purpose of this Functional Analysis Update

The contracts for Pantex (PX), Y-12, and the Kansas City Plant (KCP) expire towards the end of 2010. In support of the NNSA NSE Acquisition Strategy for these contracts, an interim update to Reference 1 was considered necessary because of the changes that have occurred with transforming the weapons complex enterprise. Savannah River Site (SRS) Tritium Operations was also included even though the overall site contract had recently been re-competed. The additional information for Tritium was easier to obtain because of the clause placed in the current contract, administered by the Environmental Management (EM) Program, for the Management and Operating contractor to complete a “severability” study to understand the actions needed to transfer Tritium to a separate NNSA contract.

The update is intended be provided to potential bidders as supplemental information to the statement of work that would be contained in the Request for Proposals for potential competition of the plant contracts. As time allows, a similar update will be conducted for Sandia National Laboratory (SNL), Los Alamos National Lab (LANL), Lawrence Livermore National Laboratory (LLNL), and the Nevada Test site (NTS). The culmination of the entire effort would then be published in a full revision to Reference 1.

1.2 Scope

The scope of this updated report is to revalidate the functions and interfaces described in Reference 1 for PX, Y-12, KCP, and SRS Tritium Operations. This report also expands the evaluation of functions related to nuclear nonproliferation, Naval Reactors propulsion programs, and Work for Others and provides a much more detailed evaluation for information flow and interfaces, an area given only cursory attention in Reference 1.

1.3 Approach

The approach used to revalidate the functions and interfaces described in Appendix B.

¹ Documentation includes the following :

- Department of Energy Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement—Operations Involving Plutonium, Uranium, and the Assembly and Disassembly of Nuclear Weapons – December 19, 2008
- Department of Energy Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement—Tritium Research and Development, Flight Test Operations, and Major Environmental Test Facilities – December 19, 2008

² NNSA Nuclear Security Enterprise Acquisition Strategy, April 30, 2009

1.4 Limitation and Constraints

Relative Magnitude of Functions Not Assessed: This review did not examine the relative magnitude of scope or cost associated with the functions that are performed at multiple sites. In some cases, the difference in magnitude is extremely high.

Impacts of Missing Information: Two documents that have not been issued at the completion of this update are a potential ROD for Hydrodynamic Testing and High Explosives Research and Development (R&D) and the 2009 Nuclear Posture Review (NPR). This review did not assume a position with respect to these documents but the analysis is expected to be consistent with future directions for each.

Performance Requirements Not Identified: This analysis focused on functions, which define what must be done. Without linking functions with the associated performance requirements, which define **how well** the functions must be performed, it is not possible to understand impacts to the NSE mission.

An example of the need to understand performance requirements is impacts on Infrastructure. Relocation of functions will impact infrastructure at the donor and recipient sites. Donor sites will incur new decommissioning and demolition requirements, and recipient sites would likely have to modify the infrastructure utilities capacity (e.g., electricity, water, steam, waste treatment, additional space in existing buildings, etc).

Landlord-Tenant Relationships: DP activities are performed at various Department of Energy (DOE) sites and site operations (landlord) are typically an NNSA responsibility. The Savannah River Site (SRS) tritium activity for DP is unique relative to this relationship because it is autonomously operated at an Environmental Management (EM) Program site. There, NNSA is in the role of tenant. The functional review did not make a distinction relative to “funding” responsibility of the function, only that the function was conducted at the site; however, all NNSA work at the site is funded by NNSA. The nuclear nonproliferation functions (Function C) are conducted at SRS, but are not the direct responsibility of the local NNSA Site Office, although the Site Office does provide contracting, legal, Environmental, Safety & Health (ES&H), and other logistical support.

Figure 1 depicts the reporting structure at the site at the federal level. Figure 2 shows the reporting structure at the site level.

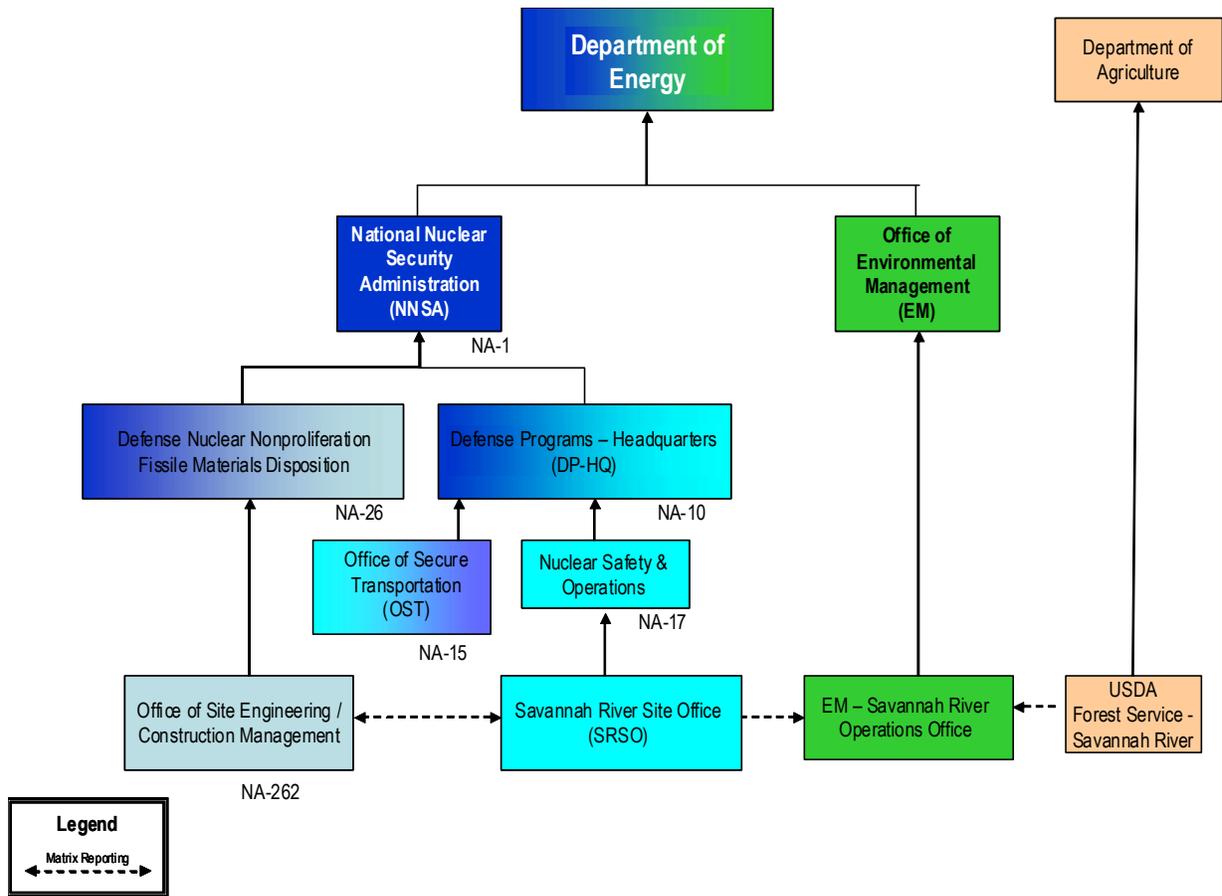


Figure 1 – SRS Federal Reporting Structure

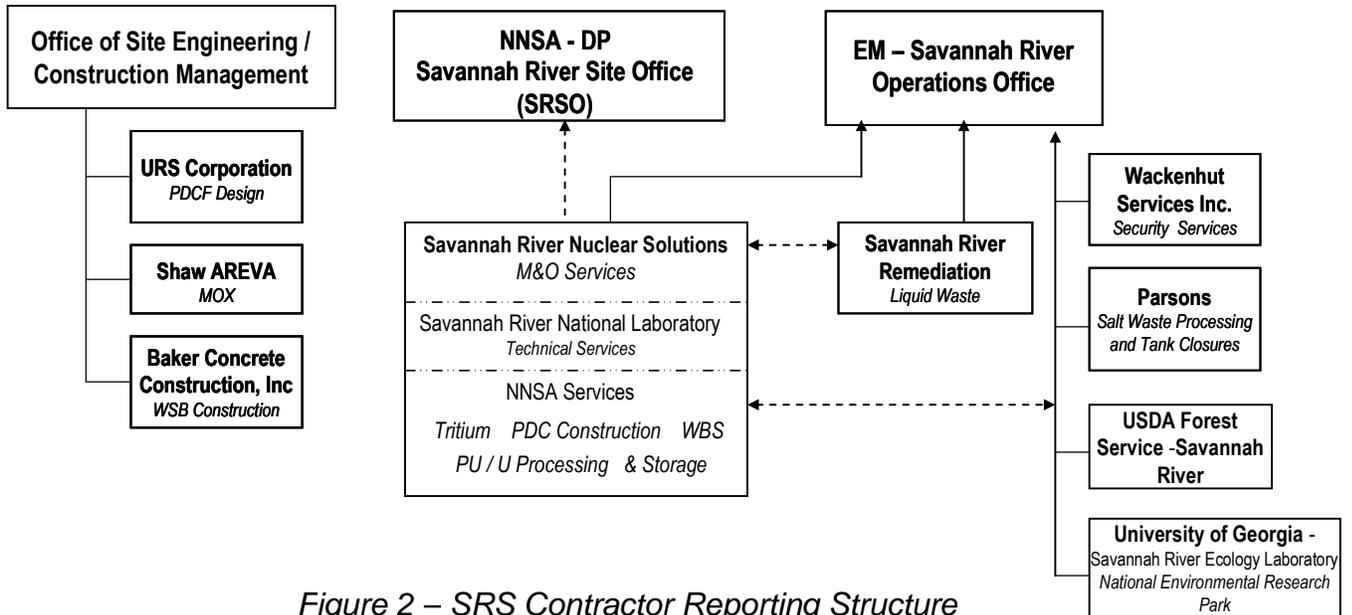


Figure 2 – SRS Contractor Reporting Structure

2.0 Functional Hierarchy

The original 2007 function listing was used as the starting baseline for this update. Since its issuance a number of key decisions have been made and include:

- SPEIS (DOE-EIS 0236-S4)
- Records of Decision
 - Operations Involving Plutonium, Uranium, and the Assembly and Disassembly of Nuclear Weapons – December 19, 2008
 - Tritium Research and Development, Flight Test Operations, and Major Environmental Test Facilities – December 19, 2008
 - Continued Operations at various sites
- Congressional Language for Tritium Research and Development (R&D)
- NNSA Nuclear Security Enterprise Acquisition Strategy
- Functional Analysis by SITS (2009) for the Corporate Physical Infrastructure Business Plan
- NWC Work Breakdown System (draft)
- Ten Year Site Plans (2009-2018)
- Information Technology (IT) Optimization Studies

The 2007 hierarchy was structured around the NNSA-Defense Programs weapons production activities, i.e. mission direct activities. As functions for other NNSA missions were further defined, the need to revise the hierarchical layout was assessed. Alignment with the DOE's Chief Financial Officer's (CFO) Office of Internal Review's Report on Functional Support Cost Activities was determined to be a prudent approach to relate the functional hierarchy with the categories used in the cost activity report. The Office of the CFO is responsible for coordinating and assembling the Department's Support Cost by Functional Activity information. Support cost activities are those necessary functions that enable the Department to accomplish direct mission activities. Support costs are allocated into twenty-two distinct categories, such as procurement, maintenance and safety and health. This schema provides a means to more easily identify the cost of a function.

Figure 3 is a diagram that shows the top level of the NSE functional hierarchy and correlates the CFO's existing cost activity structure with the functional hierarchy.

Figures 4 through 7 provide hierarchy diagrams for each top level functions. Definitions of the tier 1 and 2 functions are provided in Table 1 along with a list of functions for the entire hierarchy that identifies performing sites³ for each. Detail information and definitions relative to the CFO cost activity structure can be found on their web site (Reference 3).

³ Performing Site: Refers to the home site of the personnel performing the function, regardless of their physical location. Some "sites" (e.g., SNL) exist in multiple locations (e.g., Albuquerque, NM; Livermore, CA; and Amarillo, TX), and some sites' personnel perform NSE functions at other NSE sites.

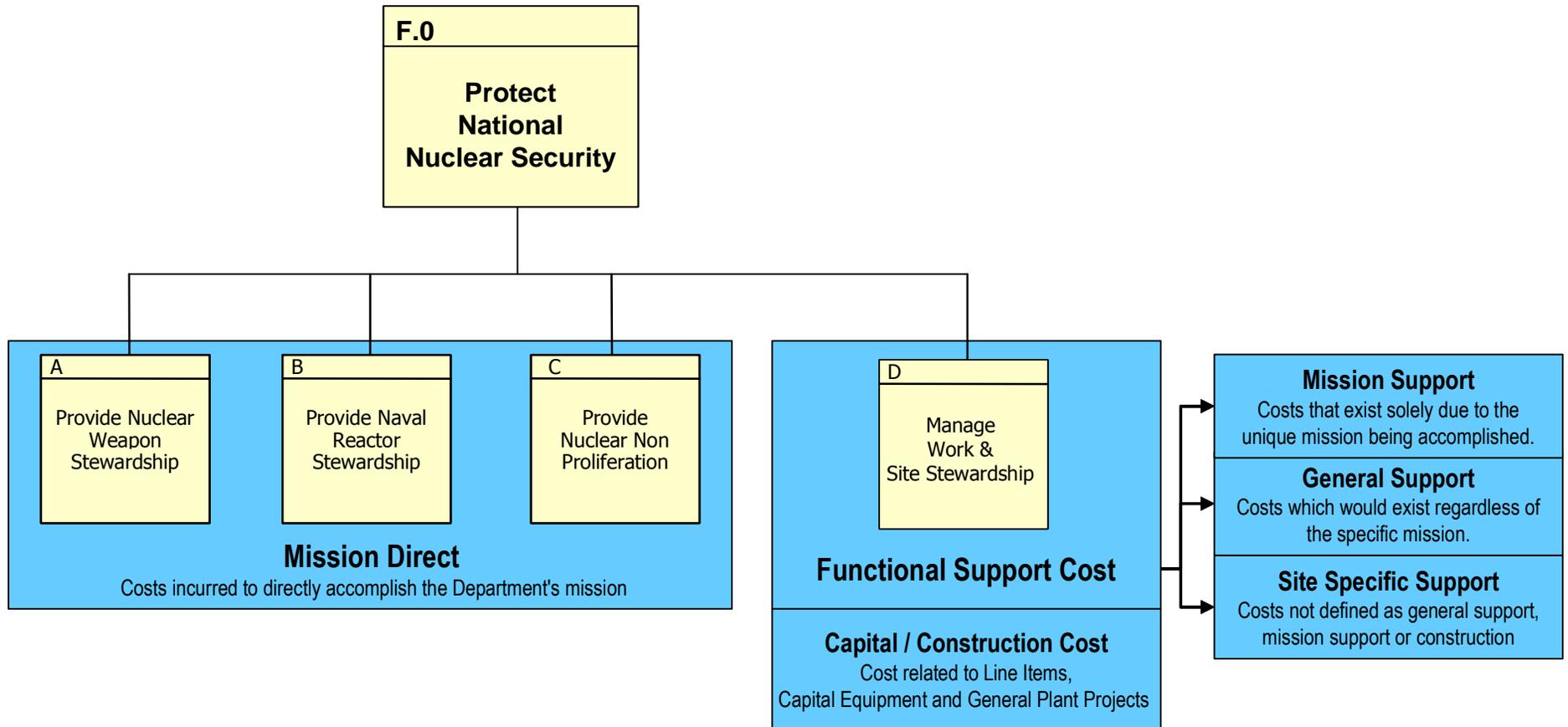


Figure 3 – Top Level Functional Hierarchy and Functional Cost Activity Grouping

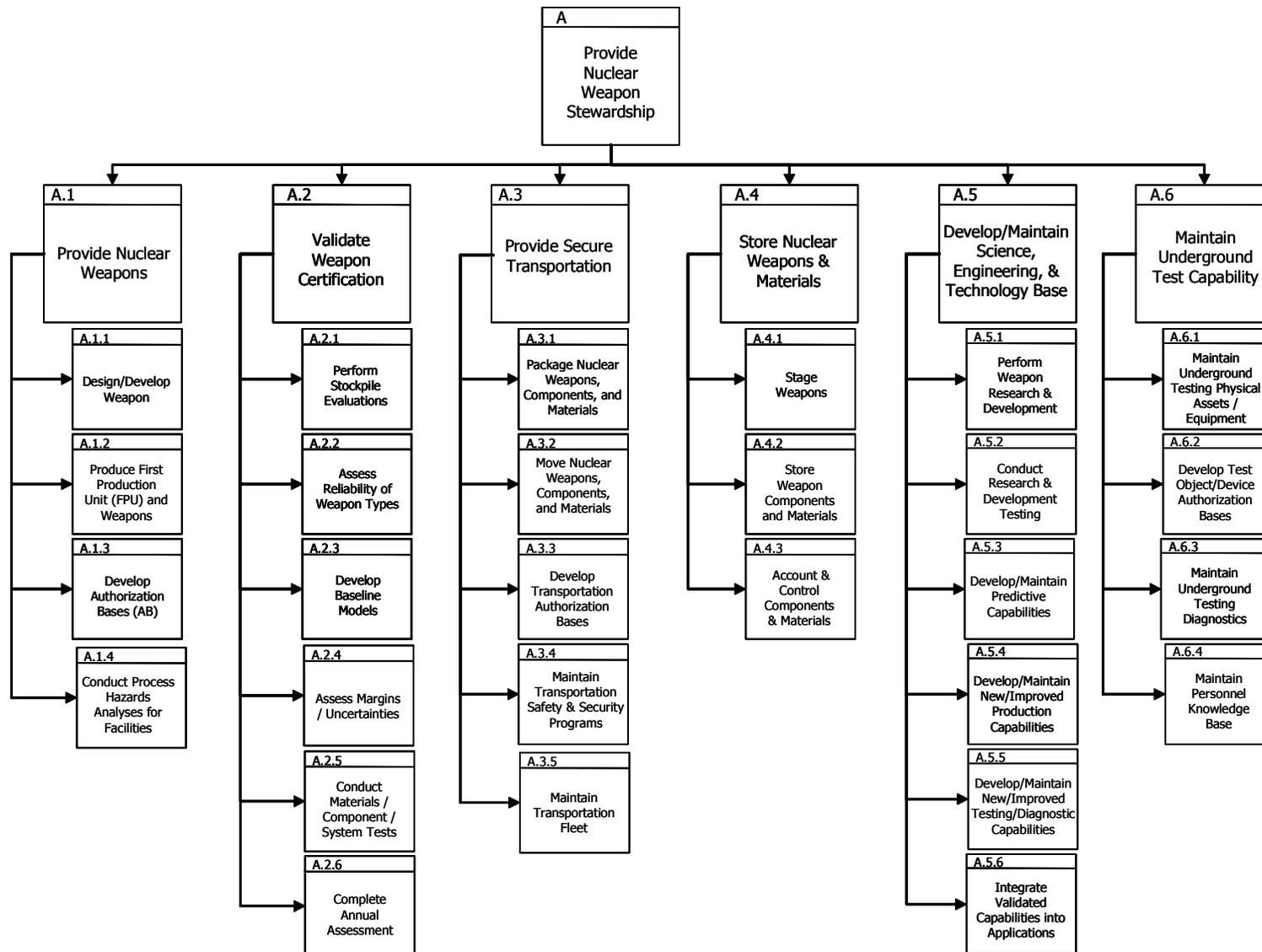


Figure 4 – Functional Hierarchy Diagram – Nuclear Weapons Stewardship

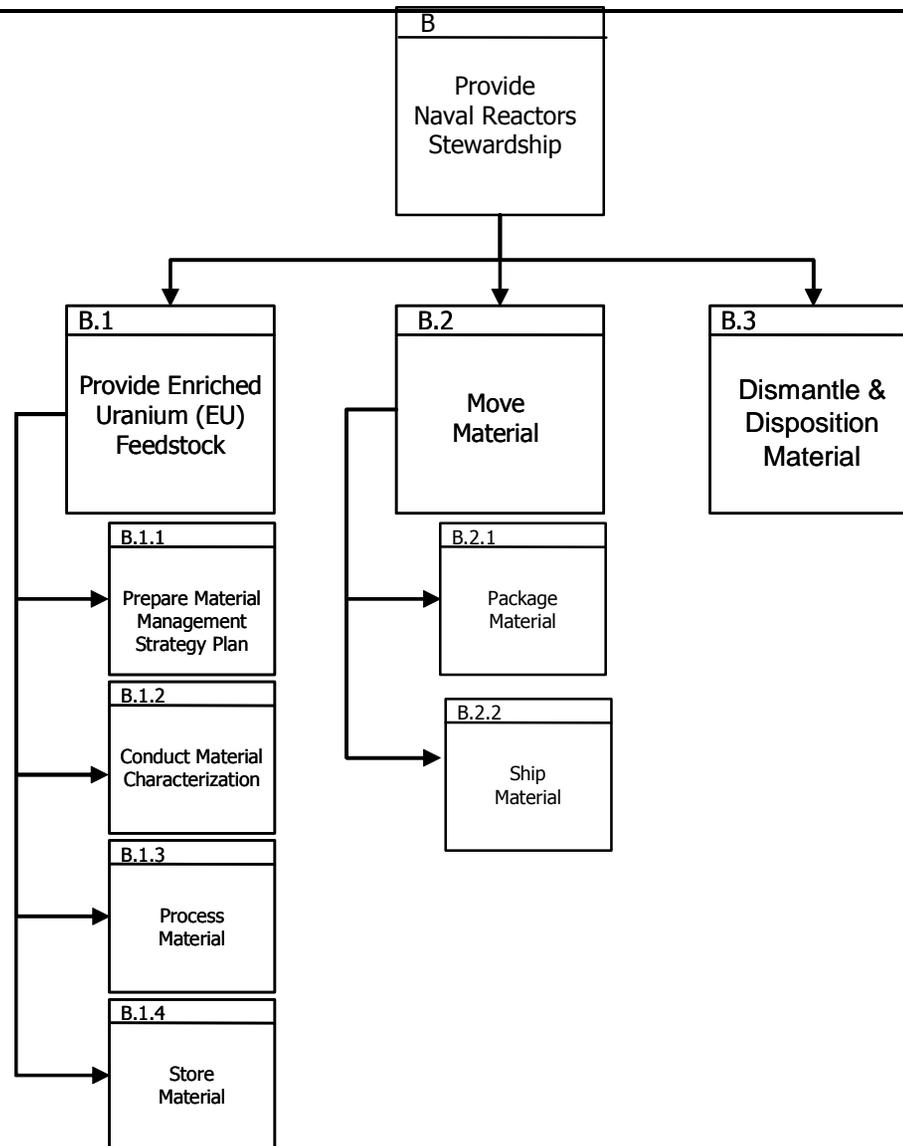


Figure 5 –Hierarchy Diagram – Naval Reactors Stewardship

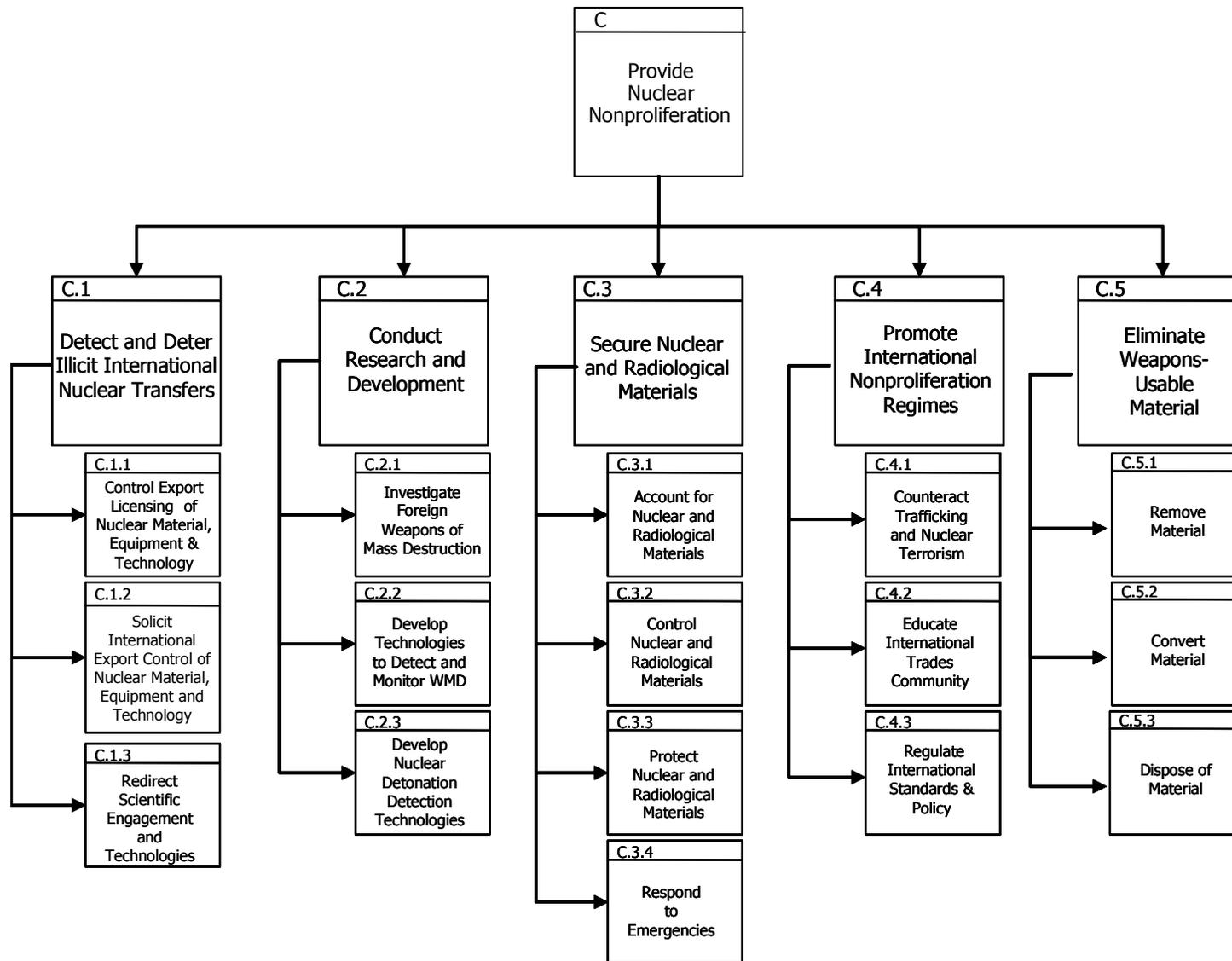


Figure 6 –Functional Hierarchy Diagram – Nuclear Nonproliferation

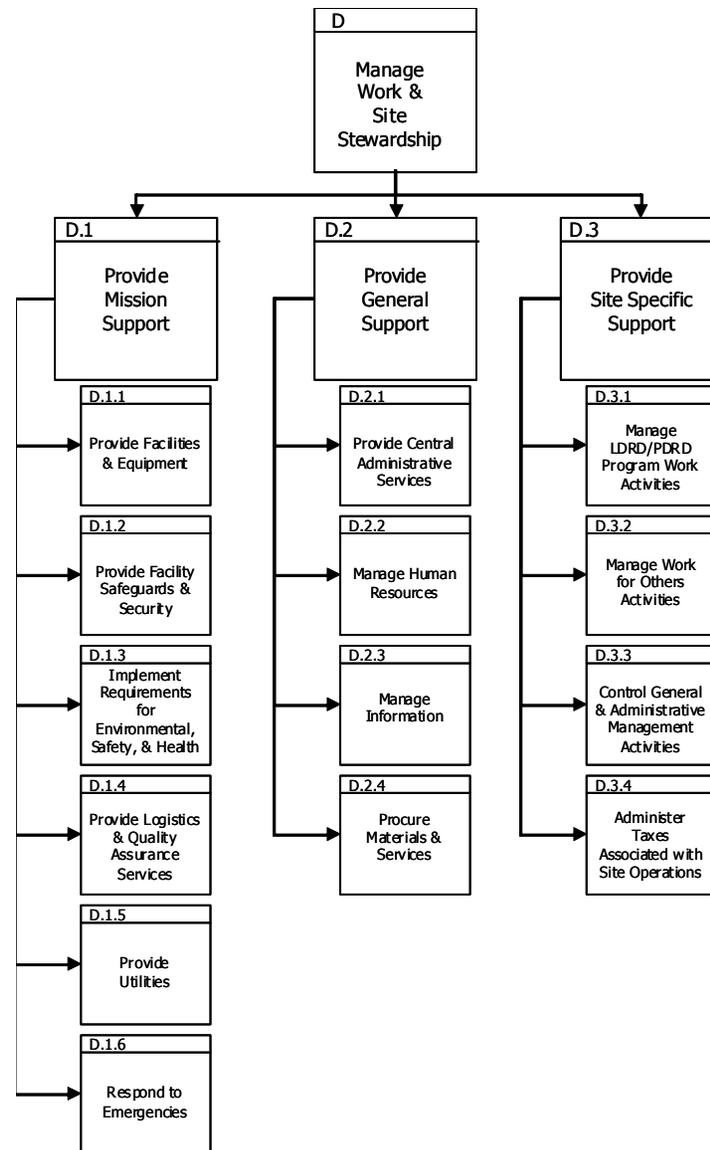


Figure 7 –Functional Hierarchy Diagram – Manage Work & Site Stewardship

Table 1 – Function Listing, Definitions and Performing Sites

(Note: Performing sites are indicated only at the lowest level of functional decomposition. Higher levels are shaded gray.)

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
F.0	Protect National Nuclear Security Maintain a credible and effective deterrent with the lowest possible level of nuclear weapons consistent with the national security and commitments/ obligations to US allies.				
A	Provide Nuclear Weapon Stewardship Sustain warheads for the indefinite future utilizing a science-based Stockpile Stewardship Program (SSP), which emphasizes development and application of greatly improved technical capabilities to assess the safety, security, and reliability of existing nuclear warheads without the use of nuclear testing.				
A.1	Provide Nuclear Weapons Develop, produce, maintain, and dispose nuclear weapons in accordance with the D&P Manual Phase 1-7 and 6.X processes to include maintaining the capability to design, manufacture, and certify new warheads; conducting routine maintenance and repair; dismantling retired weapons; and refurbishing warheads.				
A.1.1	Design/Develop Weapon Conceive, plan, and realize full scale production capabilities for the manufacture of a first production unit (FPU) of a nuclear weapon type. Activities include pre-production design (i.e. conceptualization, analysis, research, specification and requirement), production development, situ testing and certification processing.				
A.1.1.1	Develop Weapon Concept	No	No	No	No
A.1.1.2	Develop Weapon Feasibility/Design Definition	No	No	No	No
A.1.1.3	Perform Development Engineering				
A.1.1.3.1	Perform Detailed Component/Assembly Design	No	No	No	No
A.1.1.3.2	Perform Material Studies	Yes	Yes	Yes	Yes
A.1.1.3.3	Conduct Modeling & Simulation Analyses	Yes	No	Yes	No
A.1.1.4	Perform Production Engineering				
A.1.1.4.1	Develop Production Concepts	Yes	Yes	Yes	Yes
A.1.1.4.2	Develop Production Process	Yes	Yes	Yes	Yes
A.1.1.4.3	Develop Full Production Capabilities	Yes	Yes	Yes	Yes
A.1.1.4.4	Develop Tooling/Gauging for Weapon Assembly	Yes	Yes	Yes	Yes
A.1.1.5	Conduct Validation & Verification (V&V) Testing				
A.1.1.5.1	Conduct V&V Assembly Level Testing	Yes	Yes	Yes	No
A.1.1.5.2	Conduct V&V Component Level Testing	Yes	Yes	Yes	Yes
A.1.1.6	Certify Weapon	No	No	No	No
A.1.2	Produce First Production Unit (FPU) & Weapons Monitor and manage the life cycle stages of a weapon type from manufacture to disposal, including the data and information flow associated with the overall life- cycle process.				
A.1.2.1	Manufacture Weapon & Assemblies				
A.1.2.1.1	Process Materials for Weapons Production				
A.1.2.1.1.1	Process Plutonium	No	No	No	No
A.1.2.1.1.2	Process Beryllium	No	No	No	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.1.2.1.1.3	Process & Recover Lithium	No	No	No	Yes
A.1.2.1.1.4	Obtain & Process Tritium				
A.1.2.1.1.4.1	Extract Tritium from TPBARs	No	No	Yes	No
A.1.2.1.1.4.2	Unload Tritium from Reservoirs	No	No	Yes	No
A.1.2.1.1.4.3	Process Tritium	No	No	Yes	No
A.1.2.1.1.5	Process Highly Enriched Uranium (HEU)				
A.1.2.1.1.5.1	Recover HEU	No	No	No	Yes
A.1.2.1.1.5.2	Fabricate HEU	No	No	No	Yes
A.1.2.1.1.6	Process Depleted Uranium				
A.1.2.1.1.6.1	Fabricate Depleted Uranium	No	No	No	Yes
A.1.2.1.1.6.2	Fabricate U6 Nb	No	No	No	Yes
A.1.2.1.1.7	Produce/Obtain/Process Explosives				
A.1.2.1.1.7.1	Synthesize Explosives	No	Yes	No	No
A.1.2.1.1.7.2	Formulate Explosives	No	Yes	No	No
A.1.2.1.1.7.3	Procure Explosives	No	Yes	No	No
A.1.2.1.1.7.4	Press Explosives	No	Yes	No	No
A.1.2.1.1.7.5	Machine Explosives	No	Yes	No	No
A.1.2.1.1.7.6	Inspect/Test/Qualify Explosives	No	Yes	Yes	No
A.1.2.1.1.7.7	Dispose of Explosives (production residues)	Yes	Yes	Yes	No
A.1.2.1.1.8	Produce/Obtain Specialized Materials	Yes	No	Yes	Yes
A.1.2.1.2	Manufacture Primary Components				
A.1.2.1.2.1	Produce Main Charge Assembly	No	Yes	No	No
A.1.2.1.2.2	Manufacture Pits	No	No	No	No
A.1.2.1.2.3	Produce Other Primary Components	No	No	No	Yes
A.1.2.1.2.4	Re-qualify & Reaccept Pits for Reuse	No	Yes	No	No
A.1.2.1.3	Manufacture Secondary Components				
A.1.2.1.3.1	Produce HEU Components	No	No	No	Yes
A.1.2.1.3.2	Produce & Recover Lithium Components	No	No	No	Yes
A.1.2.1.3.3	Produce Depleted Uranium Components	No	No	No	Yes
A.1.2.1.3.4	Produce Aluminum Alloy Components	No	No	No	Yes
A.1.2.1.3.5	Produce Special Components	No	No	No	Yes
A.1.2.1.3.6	Produce Stainless Steel Can	No	No	No	Yes
A.1.2.1.3.7	Assemble Canned Sub Assemblies	No	No	No	Yes
A.1.2.1.3.8	Manufacture Radiation Cases	No	No	No	Yes
A.1.2.1.3.9	Assemble Limited Life Component (LLC) Kits	No	No	No	Yes
A.1.2.1.2.10	Recertify & Re-qualify CSA for Reuse	No	Yes	No	Yes
A.1.2.1.4	Produce Gas Transfer Assembly				
A.1.2.1.4.1	Prepare Reservoirs	No	No	Yes	No
A.1.2.1.4.2	Load Reservoirs				
A.1.2.1.4.2.1	Fill with Tritium Gas	No	No	Yes	No
A.1.2.1.4.2.2	Fill with Other Gases (Non-Radioactive)	No	No	Yes	No
A.1.2.1.4.3	Finish Reservoirs	No	No	Yes	No
A.1.2.1.4.4	Assemble Limited Life Component (LLC) Kits	No	No	Yes	No
A.1.2.1.5	Manufacture Energetic Assemblies	No	No	No	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
		KCP	PX	SRS	Y-12
Function Number	Function Title and Definition				
A.1.2.1.6	Manufacture/Supply Non-nuclear Assemblies & Components				
A.1.2.1.6.1	Manufacture/Supply Engineered Materials	Yes	No	No	Yes
A.1.2.1.6.2	Manufacture/Supply Machined Parts/Assemblies	Yes	No	No	Yes
A.1.2.1.6.3	Manufacture/Supply Electrical/Electronic Assemblies	Yes	No	No	No
A.1.2.1.6.4	Manufacture/Supply Specialized Equipment	Yes	Yes	No	No
A.1.2.1.6.5	Manufacture/Supply Neutron Generators (NG)	No	No	No	No
A.1.2.1.6.6	Assemble Limited Life Component (LLC) Kits	Yes	No	No	No
A.1.2.2	Assemble Weapons	No	Yes	No	No
A.1.2.3	Disassemble Weapons				
A.1.2.3.1	Disassemble Weapon Into Assemblies	No	Yes	No	No
A.1.2.3.2	Disassemble Weapon Assemblies Into Components	Yes	Yes	No	Yes
A.1.2.4	Maintain Weapons in Field				
A.1.2.4.1	Replace Limited Life Components (LLC)	No	Yes	No	No
A.1.2.4.2	Perform Routine Maintenance	No	Yes	No	No
A.1.2.4.3	Implement Corrective Actions	No	Yes	No	No
A.1.2.4.4	Maintain Weapon Components				
A.1.2.4.4.1	Perform Routine Maintenance	Yes	Yes	Yes	No
A.1.2.4.4.2	Implement Corrective Actions	Yes	Yes	Yes	No
A.1.2.5	Refurbish Weapons (Alts/Mods) in Field	Yes	Yes	No	No
A.1.2.6	Dismantle Production Returns / Waste / Byproducts				
A.1.2.6.1	Characterize Components & Materials	Yes	Yes	Yes	Yes
A.1.2.6.2	Recover Components & Materials	Yes	Yes	Yes	Yes
A.1.2.6.3	Recycle Components & Materials				
A.1.2.6.3.1	Produce Helium-3	No	No	Yes	No
A.1.2.6.3.2	Produce Other Products/Materials for Reuse	Yes	Yes	No	Yes
A.1.2.6.4	Demilitarize Components & Materials	Yes	Yes	Yes	Yes
A.1.2.6.5	Dispose of Components & Materials	Yes	Yes	Yes	Yes
A.1.2.7	Provide Military Liaison/Intra-Interagency Support				
A.1.2.7.1	Provide Hardware & Software Support	Yes	Yes	Yes	No
A.1.2.7.2	Provide Assessment Support	No	Yes	Yes	No
A.1.3	Develop Authorization Bases (AB) Determine, document and maintain the composite of information, which comprise a facility design basis and operational requirements, submitted to, and accepted by, DOE that responds to radiological, nuclear, and process safety requirements considered to be important to the safety of the operation.				
A.1.3.1	Develop Manufacturing AB for Nuclear Facilities	No	Yes	Yes	Yes
A.1.3.2	Develop Weapon Assembly/Disassembly AB	No	Yes	No	No
A.1.4	Conduct Process Hazardous Analyses (PHA) for Facilities (Nuclear & Non-Nuclear) Perform assessments directed toward analyzing potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals, and it focuses on equipment, instrumentation, utilities, human actions, and external factors that might impact the process.	Yes	Yes	Yes	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.2	Validate Weapon Certification Conduct weapon, component, and system testing and perform analyses to ensure the vitality, safety, and readiness of the nuclear weapons stockpile.				
A.2.1	Perform Stockpile Evaluations Conduct extensive and rigorous tests to evaluate the portions and components of the stockpile weapons to provide indicators of constancy through comparison with baseline data gathered during weapon development and production. Stockpile Evaluation includes new material laboratory tests, new material flight tests, stockpile laboratory tests, stockpile flight tests, quality evaluations, special testing, and surveillance of weapon systems to support assessment of the safety and reliability of the nuclear weapons stockpile and to confirm that design choices did not cause problems.				
A.2.1.1	Develop Stockpile Evaluation Requirements	No	No	No	No
A.2.1.2	Perform Weapon & Component Surveillance				
A.2.1.2.1	Determine Statistical Sample Size	No	No	No	No
A.2.1.2.2	Conduct Disassembly & Inspections (D&I)	No	Yes	No	Yes
A.2.1.2.3	Conduct Surveillance of Assembly/Component Evaluation Tests (<i>Shake-Rattle-Roll Testing</i>)	Yes	Yes	Yes	Yes
A.2.1.2.4	Build Joint Test Assemblies / JTA Sub-Assemblies	Yes	Yes	Yes	Yes
A.2.1.2.5	Confirm Nuclear Explosive-Like Assembly (NELA) status as a Test Article				
A.2.1.2.5.1	Build Test Beds	No	Yes	No	No
A.2.1.2.5.2	Evaluate Test Beds	No	Yes	No	No
A.2.1.2.5.3	Disassemble Test Beds	No	Yes	No	No
A.2.1.2.5.4	Ship & Test Quality Evaluation Test (QET) Parts	No	Yes	No	No
A.2.1.2.6	Conduct Stockpile Tests				
A.2.1.2.6.1	Conduct Stockpile Laboratory Tests (SLT)	No	Yes	Yes	No
A.2.1.2.6.2	Conduct Stockpile Flight Tests	No	No	No	No
A.2.1.2.6.3	Conduct Joint Integrated Laboratory Tests (JILTs) with DoD	No	Yes	No	No
A.2.1.2.7	Perform Post Mortem Evaluation	Yes	Yes	Yes	Yes
A.2.1.3	Perform Aging Assessments	Yes	No	Yes	Yes
A.2.1.4	Assess Anomalies				
A.2.1.4.1	Collect Data	No	Yes	Yes	Yes
A.2.1.4.2	Evaluate Results	No	Yes	No	No
A.2.2	Assess Reliability of Weapon Types Provide a quantitative metric that reflects the ability of a weapon to perform its intended function successfully. A weapon's reliability is the probability of achieving the specified yield, at the target, across the Stockpile-To-Target Sequence of environments, throughout the weapon's lifetime, assuming proper inputs.	No	No	No	No
A.2.3	Develop Baseline Models Develop baseline models that provide accurate simulations of device behavior outside the parameter space spanned by the underground test data.	No	No	No	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.2.4	Assess Margins/Uncertainties Conduct evaluations of the reliability of the nuclear weapon systems and determine the confidence that can be placed in estimates of that reliability on the performance thresholds and associated margins for engineered systems that are made under conditions of uncertainty for the nuclear weapons stockpile, in light of the test moratorium. Explore how quantification of margins and uncertainties (QMU) methodology may evolve to meet future needs.	No	No	No	No
A.2.5	Conduct Materials/Component/Assembly Tests Analyze the physical and chemical characteristics of materials, components and systems against Design Authority weapons specific specification	No	No	No	No
A.2.5.1	Conduct Material Testing	No	Yes	No	Yes
A.2.5.2	Conduct Component Testing	No	Yes	No	Yes
A.2.5.3	Conduct Assembly Testing	No	Yes	No	No
A.2.6	Complete Annual Assessment Perform annual formalized reviews, utilizing wide range of processes, technologies, and expertise, culminating in a written certification letter from the Secretaries of Defense and Energy to the President that the nuclear weapons stockpile is safe and reliable in the absence of underground testing, and provides a measure of confidence that the nuclear deterrent is still safe and militarily effective.	No	No	No	No
A.3	Provide Secure Transportation Provide the resources to safely and securely transport nuclear weapons, weapons components, and special nuclear materials to meet projected DOE, DoD, and other customer requirements.	No	No	No	No
A.3.1	Package Nuclear Weapons, Components & Materials Package nuclear weapons, weapons components, and special nuclear materials in accordance with current requirements.	Yes	Yes	Yes	Yes
A.3.2	Move Nuclear Weapons, Components, & Materials Schedule and securely transport nuclear weapons, weapons components, and special nuclear materials in accordance to customer requirements and federal/state regulations.	No	No	No	No
A.3.2.1	Coordinate Shipments for Off-site Movement	No	No	No	No
A.3.2.1.1	Schedule Shipments	No	No	No	No
A.3.2.1.1.1	Schedule Weapon Shipments	No	No	No	No
A.3.2.1.1.2	Schedule Component Shipments	Yes	Yes	Yes	Yes
A.3.2.1.1.3	Schedule Other Materials Shipments (Category III or less)	No	Yes	No	Yes
A.3.2.1.2	Control Shipments	No	Yes	No	No
A.3.2.2	Transport Weapon	No	No	No	No
A.3.2.3	Transport Weapon Components	Yes	Yes	Yes	Yes
A.3.2.4	Transport Nuclear Materials	No	Yes	No	No
A.3.2.5	Transport Other Materials (Category III or less)	No	Yes	No	Yes
A.3.2.6	Move Components & Materials On-Site	Yes	Yes	Yes	Yes
A.3.3	Develop Transportation Authorization Bases Determine, document and maintain the composite of information, submitted to, and accepted by, DOE that responds to radiological, nuclear, and process safety requirements considered to be important to the safety of the operation.	No	Yes	No	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.3.4	Maintain Transportation Safety & Security Programs Provide and implement efficient and effective business operations and intellectual property in support of NNSA's mission.	No	Yes	No	Yes
A.3.5	Maintain Transportation Fleet Provide, maintain, modify and redesigned transport equipment to incorporate features that effectively enhance self protection and deny unauthorized access to the materials.				
A.3.5.1	Provide Transportation Equipment				
A.3.5.1.1	Perform Vehicle Maintenance	Yes	Yes	Yes	Yes
A.3.5.1.2	Provide Vehicle Replacements	Yes	No	Yes	No
A.3.5.1.3	Maintain Aviation Services	No	No	No	No
A.3.5.1.4	Provide Safeguards Transporter (SGT)				
A.3.5.1.4.1	Design SGT/Components	Yes	No	No	No
A.3.5.1.4.2	Build SGT	Yes	No	No	No
A.3.5.1.4.3	Maintain SGT	Yes	Yes	No	No
A.3.5.2	Provide Storage/Transportation Containers				
A.3.5.2.1	Research/Design Containers	Yes	Yes	Yes	Yes
A.3.5.2.2	Produce/Procure Containers	Yes	Yes	Yes	Yes
A.3.5.2.3	Certify Containers	Yes	Yes	Yes	Yes
A.3.5.2.4	Maintain Containers	Yes	Yes	Yes	Yes
A.3.5.2.5	Test/Evaluate Containers	Yes	Yes	Yes	Yes
A.3.5.2.6	Recertify & Requalify Containers for Reuse	Yes	Yes	Yes	Yes
A.3.5.2.7	Dispose of Containers	Yes	Yes	No	Yes
A.3.5.3	Perform Office of Secure Transportation (OST) Logistics & Training	Yes	No	No	No
A.3.5.3.1	Conduct OST Training for Transportation, Logistic and Operations	Yes	No	No	No
A.4	Store Nuclear Weapons & Materials Store weapons and weapon materials at nuclear material facilities until deployed as spares, as a source of parts for remanufacture or the manufacture of other weapons, or held in reserve as a responsive force that may augment deployed forces.				
A.4.1	Stage Weapons Temporarily store nuclear weapons in accordance with DOE/DoD requirements until requested to be a source of parts for remanufacture or the manufacture of other weapons, or held in reserve as a responsive force that may augment deployed forces.	No	Yes	No	No
A.4.2	Store Nuclear Weapons Components & Materials Store weapon components and nuclear materials in accordance with Design Agency requirements until requested to be deployed as spares, as a source of parts for remanufacture or the manufacture of other weapons, or held in reserve as a responsive force that may augment deployed forces.				
A.4.2.1	Develop Nuclear Material Storage Strategy/Plan	No	Yes	Yes	Yes
A.4.2.2	Store Bulk Plutonium 238	No	No	No	No
A.4.2.3	Store Bulk Plutonium 239	No	No	No	No
A.4.2.4	Store Uranium	No	No	No	Yes
A.4.2.5	Store Tritium	No	No	Yes	No
A.4.2.6	Store Special & Weapon Non-Nuclear Material	Yes	Yes	Yes	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.4.2.7	Store Weapon Components	Yes	Yes	Yes	Yes
A.4.2.8	Store Lithium	No	No	No	Yes
A.4.3	Account & Control Components & Materials Control of nuclear material inventory holdings, operations, and missions to provide assurance that nuclear materials are accounted for properly, and detect and defer theft or diversion of nuclear materials or components.				
A.4.3.1	Characterize Components & Materials	Yes	Yes	Yes	Yes
A.4.3.2	Manage Components & Materials in Storage				
A.4.3.2.1	Inventory Components & Materials	Yes	Yes	Yes	Yes
A.4.3.2.2	Account for Components & Materials in Inventory	Yes	Yes	Yes	Yes
A.5	Develop/Maintain Science, Engineering, & Technology Base Conduct research and development, testing, and analyses of weapon systems, components, and materials to enhance the understanding of weapons performance, science, and material properties. Develop and provide the analytical tools to perform analyses. Develop enhanced design and production capabilities.				
A.5.1	Perform Weapon Research & Development Identify, develop and deploy innovative new enabling technologies to improve and provide required capabilities for weapon design, production and dismantlement needs. Technologies include both physical and computation techniques use as input for numerical modeling.				
A.5.1.1	Recreate Environment Within Weapon During Implosion				
A.5.1.1.1	Recreate Weapon Environment via Inertial Confinement Fusion	No	No	No	No
A.5.1.1.2	Recreate Weapon Environment via Pulse Power	No	No	No	No
A.5.1.1.3	Recreate Weapon Environment via Large-Scale Hydrodynamic Testing	No	No	No	No
A.5.1.2	Model/Simulate Weapon Behavior				
A.5.1.2.1	Develop Computer Codes	No	No	No	No
A.5.1.2.2	Develop Computer Models	No	No	No	No
A.5.1.2.3	Validate Computer Codes/Models	No	No	No	No
A.5.1.2.4	Provide Capability Platform (computers, hardware, interface)	No	No	No	No
A.5.1.2.5	Maintain Codes/Models for Users	No	No	No	No
A.5.1.2.6	Provide Visualization/Storage Capability	No	No	No	No
A.5.1.3	Investigate Hostile Environments	No	No	No	No
A.5.1.4	Improve Weapon & Component Performance				
A.5.1.4.1	For HE Components	No	Yes	No	No
A.5.1.4.2	For Tritium Components	No	No	Yes	No
A.5.1.4.3	For Plutonium Components	No	No	No	No
A.5.1.4.4	For Uranium Components	No	No	No	Yes
A.5.1.4.5	For Non-Nuclear Components	Yes	No	No	Yes
A.5.1.4.6	For Lithium Components	No	No	No	Yes
A.5.1.5	Improve Weapon Material Characteristics				
A.5.1.5.1	For HE Components	No	Yes	No	No
A.5.1.5.2	For Tritium Components	No	No	Yes	No
A.5.1.5.3	For Plutonium Components	No	No	No	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.5.1.5.4	For Uranium Components	No	No	No	Yes
A.5.1.5.5	For Non-Nuclear Components	Yes	No	No	Yes
A.5.1.5.6	For Lithium Components	No	No	No	Yes
A.5.1.6	Improve Weapon Surety Features	No	No	No	No
A.5.1.7	Develop/Maintain New/Improved Design Capabilities				
A.5.1.7.1	For HE Components	No	Yes	No	No
A.5.1.7.2	For Tritium Components	No	No	Yes	No
A.5.1.7.3	For Plutonium Components	No	No	No	No
A.5.1.7.4	For Uranium Components	No	No	No	Yes
A.5.1.7.5	For Non-Nuclear Components	No	No	No	Yes
A.5.1.7.6	For Lithium Components	No	No	No	Yes
A.5.2	Conduct Research & Development Testing Conduct research and development, testing, and analyses of weapon systems, components, and materials to make better predictions regarding weapons safety, performance, and reliability and whether problems will develop as they age.				
A.5.2.1	Conduct Large-Scale Hydrodynamic Testing	No	No	No	No
A.5.2.2	Conduct Major Environmental Testing	No	Yes	No	No
A.5.2.3	Conduct Materials Testing				
A.5.2.3.1	For HE Components	No	Yes	No	No
A.5.2.3.2	For Tritium Components	No	No	Yes	No
A.5.2.3.3	For Plutonium Components	No	No	No	No
A.5.2.3.4	For Uranium Components	No	No	No	Yes
A.5.2.3.5	For Non-Nuclear Components	Yes	Yes	No	Yes
A.5.2.3.6	For Lithium Components	No	No	No	Yes
A.5.2.4	Conduct High Explosives Testing	No	Yes	No	No
A.5.2.5	Conduct Dynamic Special Nuclear Material (SNM) Experiments	No	No	No	No
A.5.2.6	Process Materials for Research & Development				
A.5.2.6.1	Process Plutonium	No	No	No	No
A.5.2.6.2	Process Beryllium	No	No	No	No
A.5.2.6.3	Process Lithium	No	No	No	Yes
A.5.2.6.4	Process Tritium	No	No	Yes	No
A.5.2.6.5	Process Uranium	No	No	No	Yes
A.5.2.6.6	Process Other Special Materials	No	Yes	No	Yes
A.5.2.6.7	Process Explosives	No	Yes	No	No
A.5.3	Develop/Maintain Predictive Capability Framework Develop predictive capabilities for early identification of stockpile concerns, assess component lifetimes in the existing stockpile to support refurbishment decisions, provide information to improve the longevity and sustainability of replacement systems, and transform stockpile evaluation and surveillance.	No	No	No	No
A.5.3.1	Develop/Maintain Scientific Foundations	No	No	No	No
A.5.3.2	Analyze Legacy Underground Testing Data	No	No	No	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
A.5.4	Develop/Maintain New/Improved Production Processing/Storage Capabilities Provide advanced methods to enhance production process in terms of cycle time, efficiency and effectiveness.				
A.5.4.1	For HE Components	No	Yes	No	No
A.5.4.2	For Tritium Components	No	No	Yes	No
A.5.4.3	For Plutonium Components	No	Yes	No	No
A.5.4.4	For Uranium Components	No	No	No	Yes
A.5.4.5	For Non-Nuclear Components	Yes	Yes	No	Yes
A.5.5	Develop/Maintain New/Improved Testing/Diagnostic Predictive Capabilities Provide new or improved diagnostic techniques for detection and quantification of aging degradation and other potential defects in the stockpile to provide assurance that the nuclear weapons systems will, if operating, perform within designed and tested "regimes" and away from known failure modes of the system.				
A.5.5.1	For HE Components	No	Yes	No	No
A.5.5.2	For Tritium Components	No	No	Yes	No
A.5.5.3	For Plutonium Components	No	Yes	No	No
A.5.5.4	For Uranium Components	No	No	No	Yes
A.5.5.5	For Non-Nuclear Components	Yes	Yes	No	Yes
A.5.6	Integrate Validated Capabilities into Applications Incorporate the capabilities developed for production and diagnostics into relevant or applicable processes.				
A.5.6.1	For HE Components	No	Yes	No	No
A.5.6.2	For Tritium Components	No	No	Yes	No
A.5.6.3	For Plutonium Components	No	Yes	No	No
A.5.6.4	For Uranium Components	No	No	No	Yes
A.5.6.5	For Non-Nuclear Components	Yes	Yes	No	Yes
A.6	Maintain Underground Test Capability Preserve the resources to resume nuclear underground testing if needed to ensure the safety, security and reliability of the nation's stockpile.				
A.6.1	Maintain Underground Testing Physical Assets/Equipment Maintain in compliant condition those physical assets used to test detonations of nuclear weapons that are performed underground.	No	No	No	No
A.6.2	Develop Test Object/Device Authorization Bases Determine, document and maintain the composite of information, submitted to, and accepted by, DOE that responds to radiological, nuclear, and process safety requirements considered to be important to the safety of the operation.	No	No	No	No
A.6.3	Maintain Underground Testing Diagnostics Maintain the diagnostic methods used for underground nuclear tests that produced the bulk of the archival data. Diagnostics include prompt diagnostics and radiochemistry.	No	No	No	No
A.6.4	Maintain Personnel Knowledge Base Preserve, manage, store, and retrieve vital information to be used in detecting clandestine nuclear test	No	Yes	No	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
B	Provide Naval Reactor Stewardship Provide the U.S. Navy with safe, militarily effective nuclear propulsion plants, and ensure their continued safe and reliable operation.				
B.1	Provide Enriched Uranium (EU) Feedstock Provide the resources to manufacture enriched uranium feedstock to meet U.S. Naval Reactor requirements.				
B.1.1	Prepare Material Management Strategy Plan	No	No	No	Yes
B.1.2	Conduct Material Characterization	No	No	No	Yes
B.1.3	Process Material	No	No	No	Yes
B.1.4	Store Material	No	No	No	Yes
B.2	Move Material Provide resources to safely and securely transport materials to meet projected requirements.				
B.2.1	Package Material	No	No	No	Yes
B.2.2	Ship Material	No	No	No	No
B.3	Dismantle & Disposition Material Provide the resources to safely and securely dismantle and disposition materials no longer needed in the Naval Reactor program.	No	No	No	Yes
C	Provide Nuclear Nonproliferation Partner with U.S. Government agencies, national laboratories, and international partners to develop non-proliferation policies that strengthen export control regimes, support the IAEA and the system of nuclear safeguards, conduct technology exchanges other countries, strengthen emergency management systems, and reduce incentives for Weapons of Mass Destruction (WMD) proliferation worldwide.				
C.1	Detect & Deter Illicit International Nuclear Transfers Partner with U.S. Government agencies, national laboratories, and international partners to develop non-proliferation policies that strengthen export control regimes, support the IAEA and the system of nuclear safeguards, conduct technology exchanges other countries, strengthen emergency management systems, and reduce incentives for Weapons of Mass Destruction (WMD) proliferation worldwide.				
C.1.1	Control Export Licensing of Nuclear Material, Equipment & Technology	Yes	No	Yes	Yes
C.1.2	Solicit International Export Control of Nuclear Material, Equipment & Technology	No	No	Yes	Yes
C.1.3	Redirect Scientific Engagement & Technologies	No	No	Yes	Yes
C.2	Conduct Research & Development Conduct research and development by cooperatively developing and employing new technologies to improve U.S. capabilities to detect and monitor nuclear weapons production, proliferation, and nuclear explosions worldwide				
C.2.1	Investigate Foreign Weapons of Mass Destruction				
C.2.1.1	Sample / Collect Source Materials	No	No	Yes	Yes
C.2.1.2	Analyze Source Materials	No	No	Yes	Yes
C.2.2	Develop Technologies to Detect & Monitor WMD	Yes	No	Yes	Yes
C.2.3	Develop & Test Nuclear Detonation Detection Technologies	No	No	Yes	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
C.3	Secure Nuclear & Radiological Materials Protect nuclear and radiological materials worldwide and provide resources to respond to nuclear and radiological emergencies in the United States and abroad.				
C.3.1	Account for Nuclear & Radiological Materials / Sources	No	Yes	Yes	Yes
C.3.2	Control Nuclear & Radiological Materials / Sources	No	Yes	Yes	Yes
C.3.3	Protect Nuclear & Radiological Materials / Sources	No	Yes	Yes	Yes
C.3.4	Respond to Emergencies (Radiological Assistance Program)				
C.3.4.1	Provide Response Capabilities to Weapons of Mass Destruction	Yes	No	Yes	Yes
C.3.4.2	Provide Response Capabilities to Radiological Accidents	Yes	Yes	Yes	Yes
C.3.4.3	Provide Emergency Responder Training	Yes	Yes	Yes	Yes
C.4	Promote International Nonproliferation Regimes Provide policy and technical support to implement and monitor transparent WMD reductions; strengthen nuclear safeguards, physical protection and export control systems in other countries; transition WMD expertise and infrastructure in partner countries to peaceful purposes; and improve international regimes, agreements and arrangements.				
C.4.1	Counteract Trafficking & Nuclear Terrorism	Yes	No	Yes	Yes
C.4.2	Educate International Trades Community	Yes	No	Yes	Yes
C.4.3	Support the Development of International Standards & Policy	Yes	Yes	Yes	Yes
C.5	Eliminate Weapons-Usable Material Partner with national laboratories, federal agencies, international partners, and the private sector to remove, convert, and dispose of high-risk nuclear material radiological sources worldwide in order to reduce and eliminate these materials from being made into crude weapons for use against the United States or other nations.				
C.5.1	Remove Material	No	Yes	Yes	Yes
C.5.2	Characterize Materials	No	No	Yes	Yes
C.5.3	Convert Material				
C.5.3.1	Convert Reactors Materials	No	No	Yes	Yes
C.5.3.2	Accelerate Mo-99 Production	No	No	No	Yes
C.5.4	Dispose of Material				
C.5.4.1	Dispose Excess Uranium				
C.5.4.1.1	Receive Uranium	No	No	Yes	Yes
C.5.4.1.2	Store Uranium	No	No	Yes	Yes
C.5.4.1.3	Process Uranium	No	No	Yes	Yes
C.5.4.1.4	Package Uranium	No	No	Yes	Yes
C.5.4.1.5	Ship Uranium	No	No	Yes	Yes
C.5.4.2	Dispose Plutonium				
C.5.4.2.1	Receive Plutonium	No	No	Yes	No
C.5.4.2.2	Store Plutonium	No	Yes	Yes	No
C.5.4.2.3	Process Plutonium	No	No	Yes	No
C.5.4.2.4	Package Plutonium	No	Yes	Yes	No
C.5.4.2.5	Ship Plutonium	No	Yes	Yes	No

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
		KCP	PX	SRS	Y-12
Function Number	Function Title and Definition				
C.5.4.3	Dispose Other Nuclear Material				
C.5.4.3.1	Receive Other Nuclear Material	No	No	Yes	Yes
C.5.4.3.2	Store Other Nuclear Material	No	No	Yes	Yes
C.5.4.3.3	Process Other Nuclear Material	No	No	Yes	Yes
C.5.4.3.4	Package Other Nuclear Material	No	No	Yes	Yes
C.5.4.3.5	Ship Other Nuclear Material	No	No	Yes	Yes
C.5.5	Provide & Dispose of Test Equipment	No	Yes	No	Yes
D	Manage Work & Site Stewardship Provide and implement efficient and effective business operations, and develop personnel in support of NNSA's mission to ensure that the nuclear weapons, materials, facilities, and information assets are secure through effective safeguards and security policy, implementation, and oversight. Operate and maintain NNSA program facilities in a safe, secure, efficient, reliable, and compliant condition.				
D.1	Provide Mission Support Provide activities that represent support activities that exist solely due to the unique mission being accomplished.				
D.1.1	Provide Facilities & Equipment Provide, maintain, and operate NNSA program facilities and equipment in a safe, secure, efficient, reliable, and compliant condition.				
D.1.1.1	Maintain Existing Facility Infrastructure				
D.1.1.1.1	Provide Facilities Management & Support	Yes	Yes	Yes	Yes
D.1.1.1.2	Perform Direct Maintenance	Yes	Yes	Yes	Yes
D.1.1.1.3	Maintain Standby Status Facilities	Yes	Yes	No	Yes
D.1.1.1.4	Disposition Excess Facilities	Yes	Yes	Yes	Yes
D.1.1.1.5	Disposition Facility Waste Products	Yes	Yes	Yes	Yes
D.1.1.2	Provide New Facilities				
D.1.1.2.1	Design New Facilities	Yes	Yes	Yes	Yes
D.1.1.2.2	Construct New Facilities	Yes	Yes	Yes	Yes
D.1.1.2.3	Transition Operations to New Facilities	Yes	Yes	Yes	Yes
D.1.1.3	Modify Existing Facilities				
D.1.1.3.1	Design Facility Modifications	Yes	Yes	Yes	Yes
D.1.1.3.2	Construct Facility Modifications	Yes	Yes	Yes	Yes
D.1.1.4	Provide Process Systems & Equipment				
D.1.1.4.1	Design Process Systems	Yes	Yes	Yes	Yes
D.1.1.4.2	Deploy/Field New Process Systems	Yes	Yes	Yes	Yes
D.1.1.4.3	Deploy/Field Process/Equipment Modifications	Yes	Yes	Yes	Yes
D.1.1.4.4	Disposition Process/Equipment	Yes	Yes	Yes	Yes
D.1.1.5	Implement & Sustain Energy Efficiency & Renewable Energy (EERE) Technologies	Yes	Yes	Yes	Yes
D.1.2	Provide Facility Safeguards & Security				
D.1.2.1	Provide Protective Forces	Yes	Yes	Yes	Yes
D.1.2.2	Provide Physical Security Systems				
D.1.2.2.1	Detect Unauthorized Entry and/or Presence	Yes	Yes	Yes	Yes
D.1.2.2.2	Prevent Unauthorized Access	Yes	Yes	Yes	Yes
D.1.2.2.3	Authorize Entry of Personnel	Yes	Yes	Yes	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
D.1.2.2.4	Control, Impede, & Deny Access & Direct Flow Through Designated Portals	Yes	Yes	Yes	Yes
D.1.2.2.5	Provide Rapid, Reliable, & Protected Information Exchange	Yes	Yes	Yes	Yes
D.1.2.2.6	Test, Maintain, & Service Systems	Yes	Yes	Yes	Yes
D.1.2.3	Provide Information Security	Yes	Yes	Yes	Yes
D.1.2.4	Provide Cyber Security	Yes	Yes	Yes	Yes
D.1.2.5	Provide Personnel Security	Yes	Yes	Yes	Yes
D.1.2.6	Evaluate/Deploy Security Technology	Yes	Yes	Yes	Yes
D.1.3	Implement Requirements for Environmental, Safety, & Health				
D.1.3.1	Conduct Environmental Assessments				
D.1.3.1.1	Perform Monitoring & Sampling	Yes	Yes	Yes	Yes
D.1.3.1.2	Conduct Long-Term Environmental Stewardship	Yes	Yes	Yes	Yes
D.1.3.1.3	Document/Report	Yes	Yes	Yes	Yes
D.1.3.2	Conduct & Integrate Safety Management System Protocols	Yes	Yes	Yes	Yes
D.1.3.3	Manage Health Issues				
D.1.3.3.1	Implement Onsite Occupational Medical Program (<i>Health Promotion Program / Office of Science</i>)	Yes	Yes	Yes	Yes
D.1.3.3.2	Maintain a Healthful Work Environment	Yes	Yes	Yes	Yes
D.1.3.3.3	Conduct Employee Health Evaluations	Yes	Yes	Yes	Yes
D.1.3.3.4	Diagnose & Treat Injury or Disease	Yes	Yes	Yes	Yes
D.1.3.3.5	Provide Employee Counseling, Health Promotion, & Prevention	Yes	Yes	Yes	Yes
D.1.3.3.6	Document/Report	Yes	Yes	Yes	Yes
D.1.4	Provide Logistics & Quality Assurance Services	Yes	Yes	Yes	Yes
D.1.5	Provide Utilities	Yes	Yes	Yes	Yes
D.1.6	Respond to Emergencies	Yes	Yes	Yes	Yes
D.2	Provide General Support Provide activities that would exist regardless of the specific mission.				
D.2.1	Provide Central Administrative Services Provide and implement efficient and effective business operations and intellectual property in support of NNSA's mission.				
D.2.1.1	Manage Program Work Activities				
D.2.1.1.1	Plan Program Work	Yes	Yes	Yes	Yes
D.2.1.1.2	Manage Resources for Program Work	Yes	Yes	Yes	Yes
D.2.1.1.3	Direct Program Work Activities	Yes	Yes	Yes	Yes
D.2.1.1.4	Monitor Performance	Yes	Yes	Yes	Yes
D.2.1.1.5	Communicate Program Work Information	Yes	Yes	Yes	Yes
D.2.1.2	Provide Management Processes				
D.2.1.2.1	Develop/Maintain Manuals	Yes	Yes	Yes	Yes
D.2.1.2.2	Prepare Implementation Guidance	Yes	Yes	Yes	Yes
D.2.2	Manage Human Resources Obtain and develop personnel in support of NNSA's mission				
D.2.2.1	Develop Personnel Base				
D.2.2.1.1	Hire/Obtain Critical Skill Personnel	Yes	Yes	Yes	Yes
D.2.2.1.2	Train Personnel	Yes	Yes	Yes	Yes
D.2.2.2	Manage & Direct Personnel	Yes	Yes	Yes	Yes

List of Nuclear Security Enterprise Functions		Performing Site As of 2009/2010			
Function Number	Function Title and Definition	KCP	PX	SRS	Y-12
D.2.2.3	Manage Legacy Benefits Program	Yes	Yes	Yes	Yes
D.2.3	Manage Information				
D.2.3.1	Provide Information Management Systems	Yes	Yes	Yes	Yes
D.2.3.2	Maintain/Archive Data & Information	Yes	Yes	Yes	Yes
D.2.3.3	Maintain Personnel Knowledge Base				
D.2.3.3.1	Maintain Center of Excellence & Expertise on High Reliability Operations (HRO)	No	Yes	No	No
D.2.3.3.2	Maintain Expertise on Conduct of Operations (ConOps)	Yes	Yes	Yes	Yes
D.2.3.3.3	Maintain Expertise on Emergency Management & Response	Yes	Yes	Yes	Yes
D.2.3.3.4	Maintain Expertise on Other DOE Critical Skills	Yes	Yes	Yes	Yes
D.2.3.4	Communicate Secure Information in Real-time	Yes	Yes	Yes	Yes
D.2.4	Procure Materials & Services	Yes	Yes	Yes	Yes
D.3	Provide Site Specific Support Provide for activities not defined as general support, mission support, or construction.				
D.3.1	Manage LDRD/PDRD Program Work Activities	Yes	Yes	Yes	Yes
D.3.2	Manage Work for Others Activities	Yes	Yes	Yes	Yes
D.3.3	Control General & Administrative Management Activities	Yes	Yes	Yes	Yes
D.3.4	Administer Taxes Associated with Site Operations	Yes	Yes	Yes	Yes

3.0 Transition from Current to Future State

This review assessed impacts to functions being performed as the NSE transitions from its current to future state. The review looked at three periods of time and assessed what if any functional changes would occur. The team assessed changes that have occurred since 2007 (current state), changes expected by 2012 (transitional state - near term) and changes expected to be complete within the next 10+ years (future state).

Transitioning from current state to future state for these four sites will not be impacted relative to the functions being performed with the exception of the following functions:

1. *Develop/Maintain New/Improved Production Processing/Storage Capabilities for Uranium Components (A.5.5.4)*
PX would in the future conduct this function based on potential to perform CSA surveillance/reacceptance at the site.
2. *R&D of Transportation Containers (A.3.5.2.1)*
PX will no longer perform this function in the future state based on the discontinued use of the DT-22 transportation container, which PX is the Design Authority.
3. *Provide Assessment Support (A,1.2.7.2)*
KCP is anticipating within the near term to be providing military and inter-agency assessment support.

While functions are not being eliminated, each site is working to more efficiently execute their responsible functions through consolidation and right sizing initiatives.

4.0 Interfaces

Physical Items: Figures 8 through 11 provide site-level interface diagrams that convey the current state⁴ inter-site dependencies for physical items (e.g., components and materials). Appendix A provides the associated definitions of these items.

⁴ Current State: Refers to the actual functions that are “currently” ongoing and not “planned” functions (projects). Planned/funded initiatives that will modify or create new functions and/or new facilities (e.g. Mixed Oxide Facility) have been excluded regardless of implementation status.

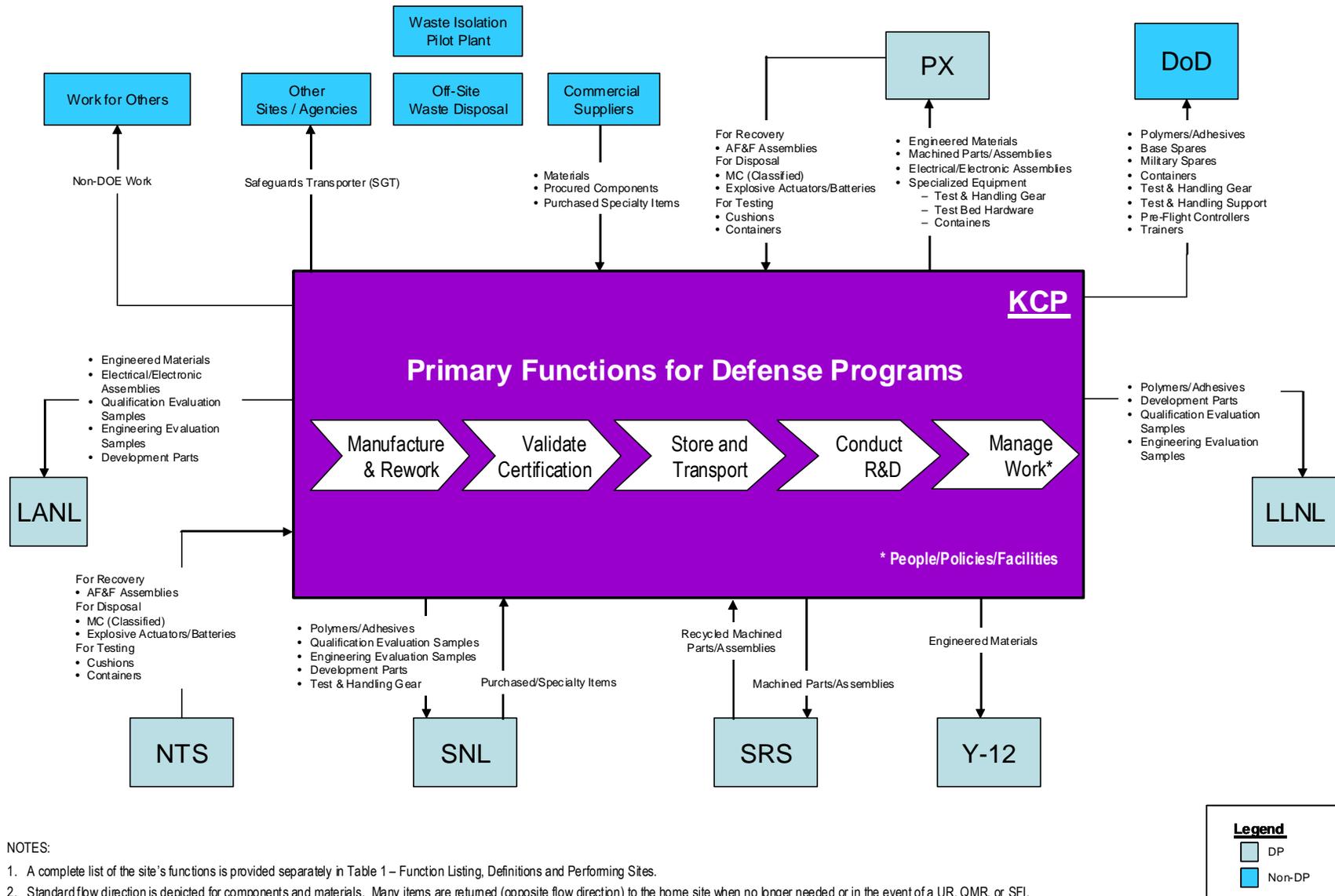


Figure 8 – Current State External Interface Diagram, Physical Items - KCP

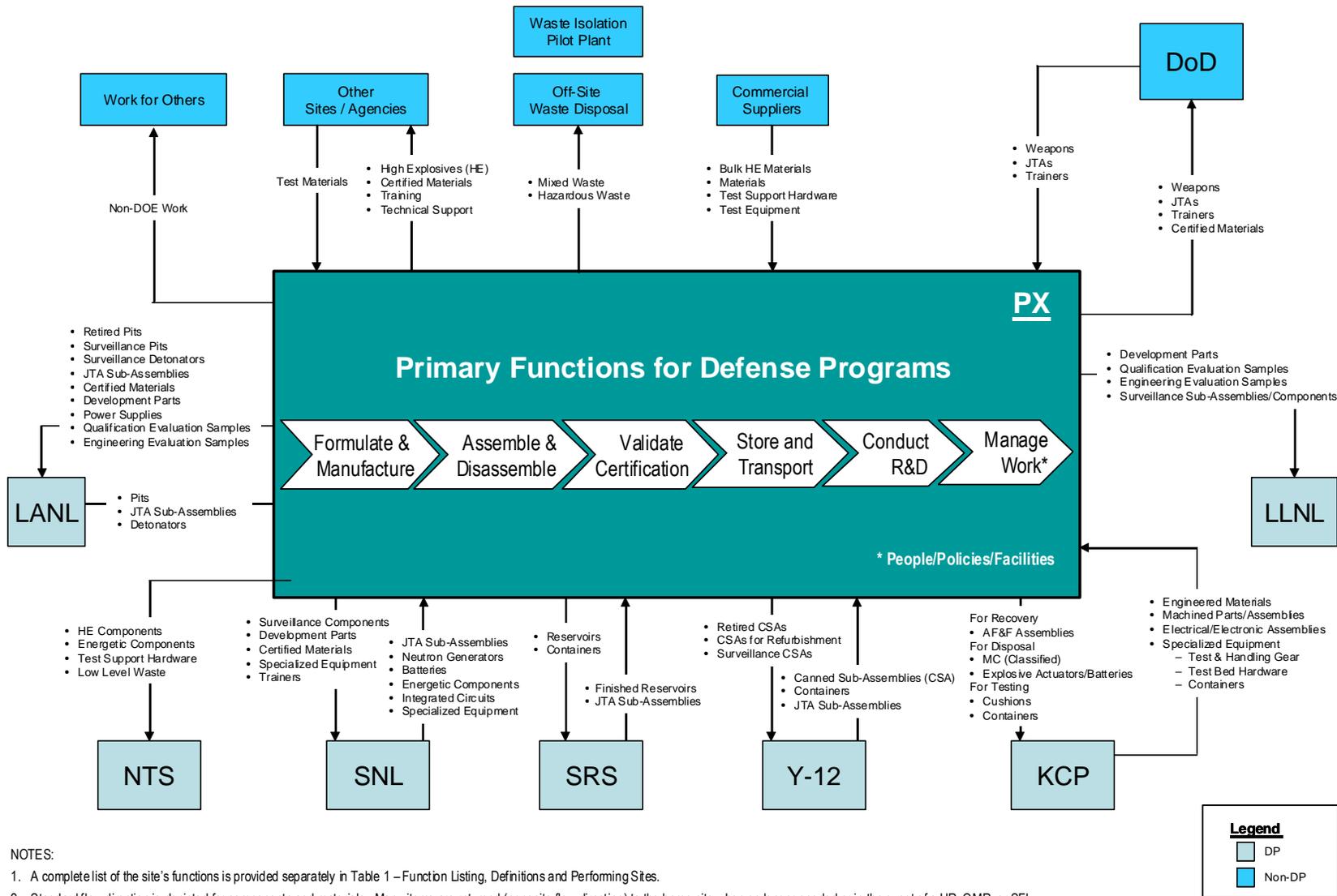
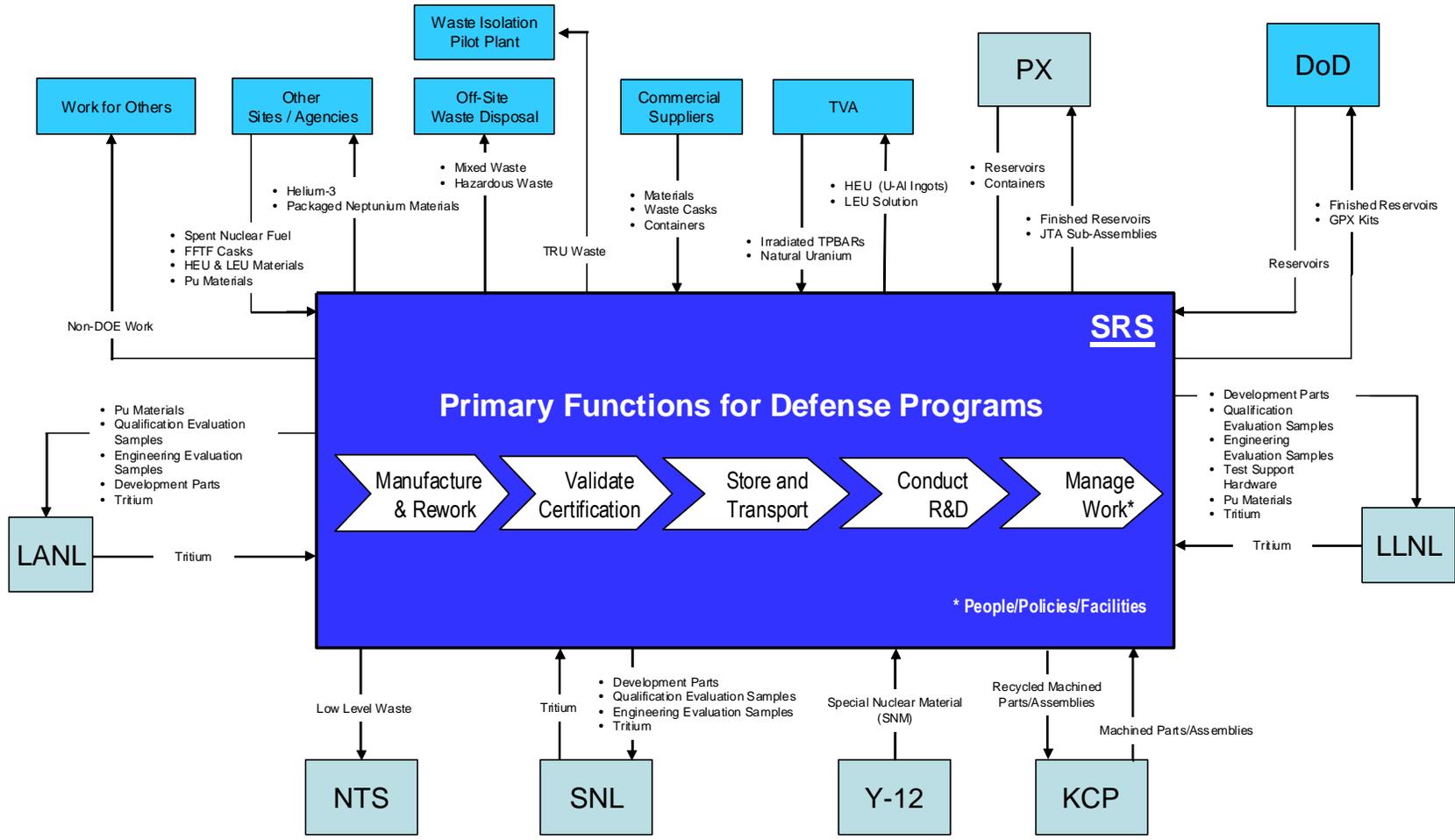


Figure 9 – Current State External Interface Diagram, Physical Items - PX



NOTES:

1. A complete list of the site's functions is provided separately in Table 1 – Function Listing, Definitions and Performing Sites.
2. Standard flow direction is depicted for components and materials. Many items are returned (opposite flow direction) to the home site when no longer needed or in the event of a UR, QMR, or SFI.

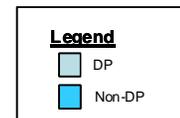


Figure 10 – Current State External Interface Diagram, Physical Items - SRS

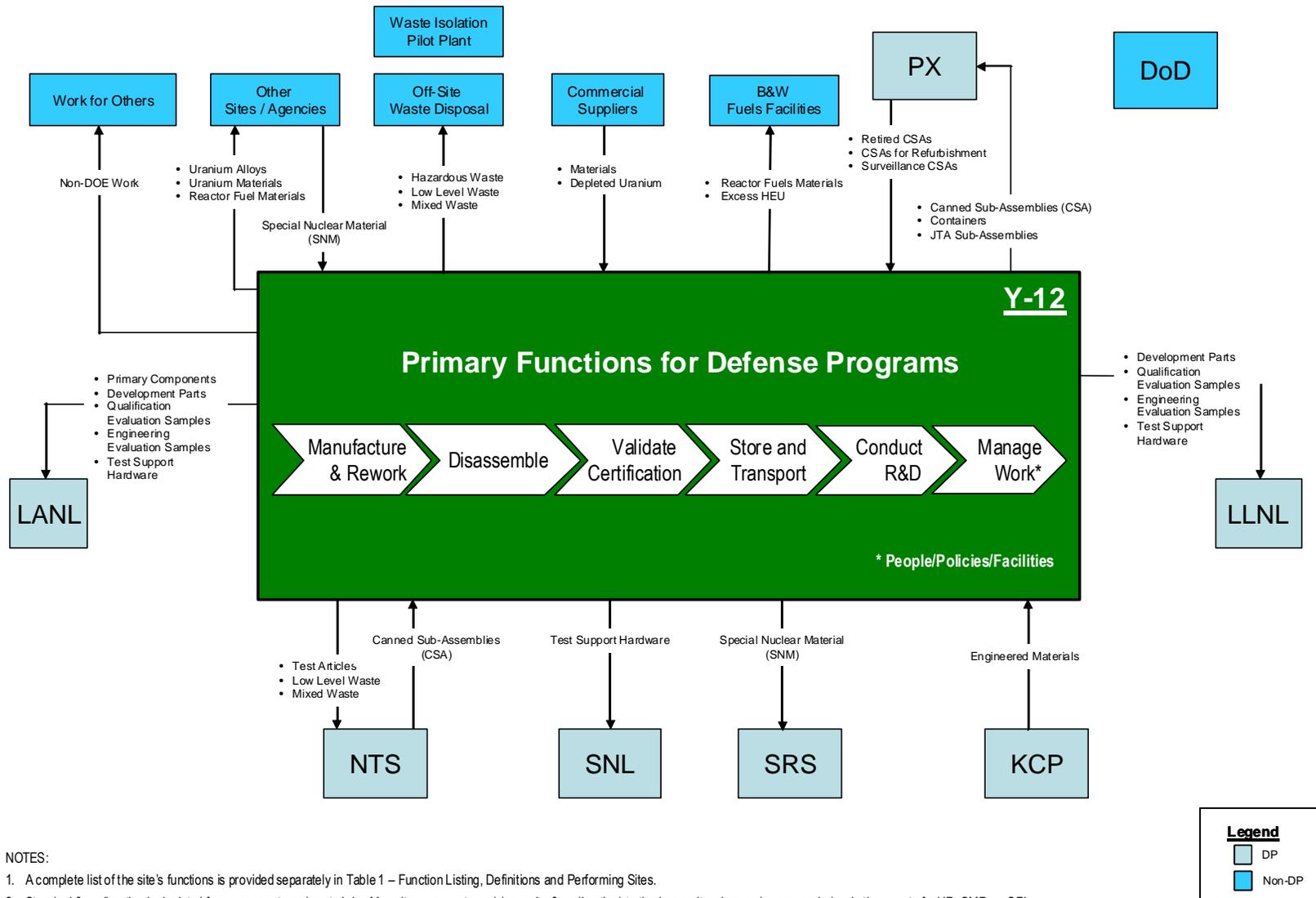


Figure 11 – Current State External Interface Diagram, Physical Items – Y-12.

5.0 Information Flow Across the Enterprise

During the initial analysis performed in 2007, a cursory review of information exchange across the enterprise was conducted, with the recommendation that a more detailed evaluation of this area be explored. Open discussions of what types of information and how it was exchanged between the sites and NNSA Headquarters (NNSA-HQ) were conducted during each site visit.

Information technology plays an ever increasing role as the NSE seeks to reduce costs and improve efficiency by transforming business methods and systems infrastructure. As the need for exchanging data among sites has increased, it has become clear that efforts to maximize the integration of this data are critical to achieving transformation goals. This section makes an attempt to show the types of documents generated within the NSE using information technology systems that are in place at the current time.

The types of information and documents generated by the NSE were identified in two categories; those associated with the **product/technical** aspect of the enterprise and those related to the **business/administrative** aspect of the enterprise. These documents are generated with software applications that are a part of the Information Technology (IT) Systems at various sites. This section provides a brief description of

- Information / Documentation needs (both product/technical and business/administrative) within the NSE at a high-level
- IT Systems / Grouping that are used in the production of the documents
- Software Applications that are within the IT Systems

Figure 12 illustrates how information needs are collected via the NSE IT systems / applications and indicates the applicable sub-section that provides further details of each.

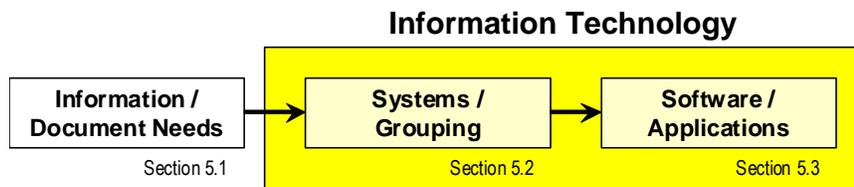


Figure 12 – Information Processing

5.1 Information/Documents Flow Across the NSE - Current State

Information and documents related to the weapons technical data and associated details are mainly generated by the Design and Production Agencies interfacing with the customers in NNSA-HQ as well as the Department of Defense. Not all of the information generated is fully integrated or automated. However, there is a certain amount of integration through the NNSA portal at Kansas City Plant and also through the hub at Sandia in terms of scheduling, inventory and data exchange. Figure 13 depicts the documents that flow between the sites and NNSA-HQ for the product/technical aspect and key information management system interfaces that are employed. Definitions are provided in Appendix A.

A similar approach is depicted in Figure 14 for the business/administrative aspect of the NSE to show the documentation flow used between the sites and NNSA-HQ and key information management system interfaces. It should be noted that from a business/administrative perspective, information also flows through systems that are established for use across the DOE. Examples of DOE systems where information from the NNSA sites is recorded are Facility Information Management Systems (FIMS), Nuclear Material Management and Safeguards Systems (NMMSS) and Occurrence Reporting and Processing System (ORPS).

5.2 Information Technology (IT) Applications / Systems - Current State

The information used to generate NNSA documentation is derived using various NSE Information Technology (IT) applications / systems. NNSA established a Product Realization Integrated Digital Enterprise (PRIDE) team to evaluate the various types of IT systems and determine how they can be used more effectively and efficiently. The PRIDE program has initiated the effort to transform systems in the Product Data Management (PDM) arena. As this program advanced, it became clear that related systems involved in the entire Product Lifecycle Management (PLM) process needed to be addressed as well. The product life cycle involves designing, manufacturing, and delivering product hardware as well as managing the associated data to support these phases. Logistical issues become quite complex as hardware and data are passed among Design Agencies, Production Agencies, and the customer. Multiple systems are typically involved in performing these PLM functions, and seamlessly passing data among them is critical to efficient operations of a manufacturing enterprise.

In general, an overall Enterprise Resource Planning (ERP) package governs the IT applications/systems. It is a commercial software package that promotes seamless integration of all the information flowing through an enterprise and is intended to manage all the information and functions from shared data stores.

Figure 15 depicts the various IT applications/systems used for managing the product/technical aspect of information, as well as the business/administrative aspect of information.

Product/technical aspects are discussed in Section 5.2.1 include the following sub-systems:

- Manufacturing Resource Planning (MRP)
- Product Definition Management (PDM)
- Manufacturing Execution Systems (MES)
- Manufacturing Support Systems (MSS)
- Shop Floor Applications (SFA)

Business/administrative aspects are discussed in Section 5.2.2 and include:

- Supply Chain Management (SCM)
- Supplier Relationship Management (SRM)
- Web Presentation (WP)
- Enterprise Content Management (ECM)
- Enterprise Collaborative Workspace (ECW)
- Enterprise Access Provisioning (EAP)

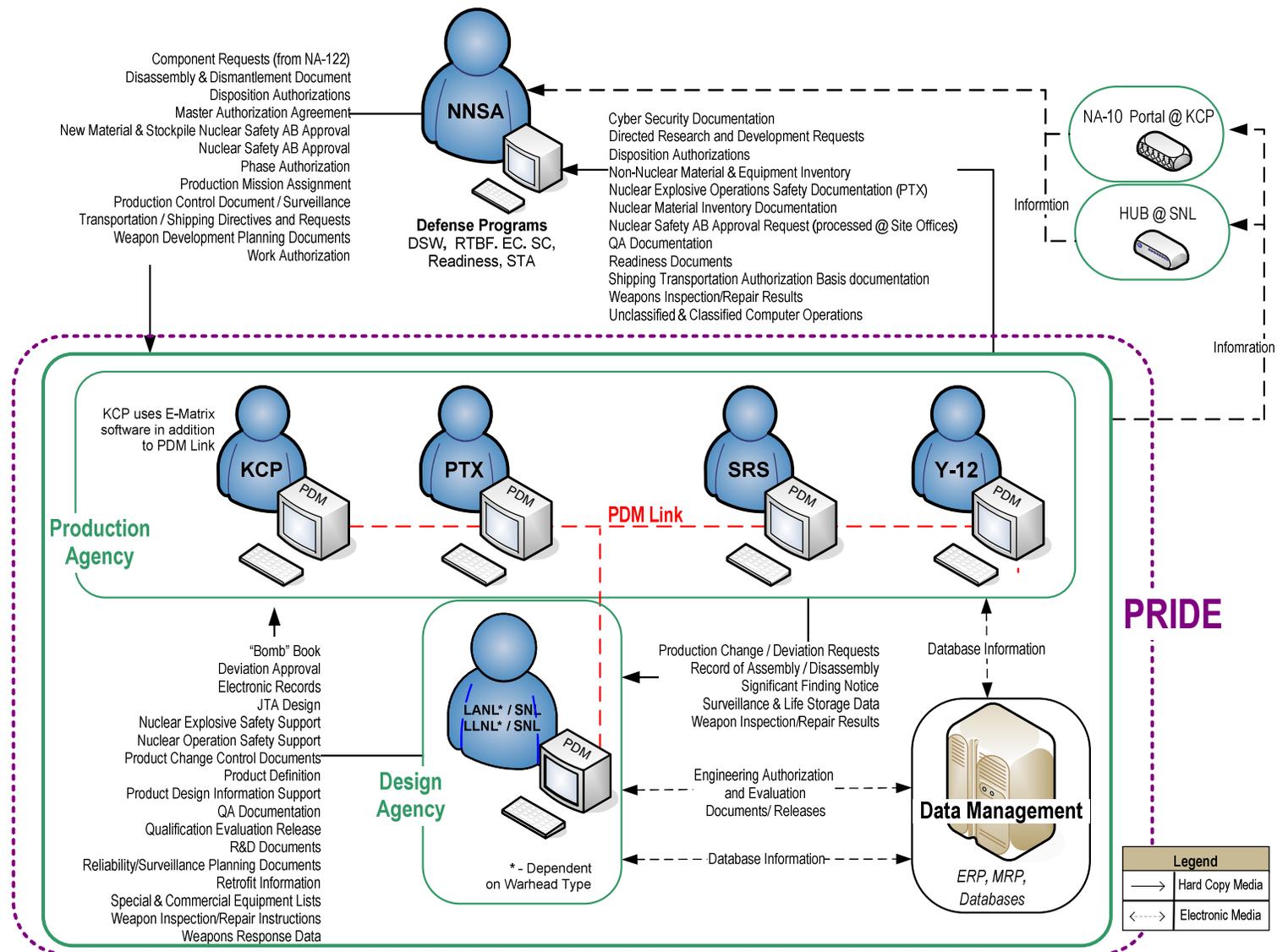


Figure 13 – Current State Information Interface Diagram – Product/Technical Aspect

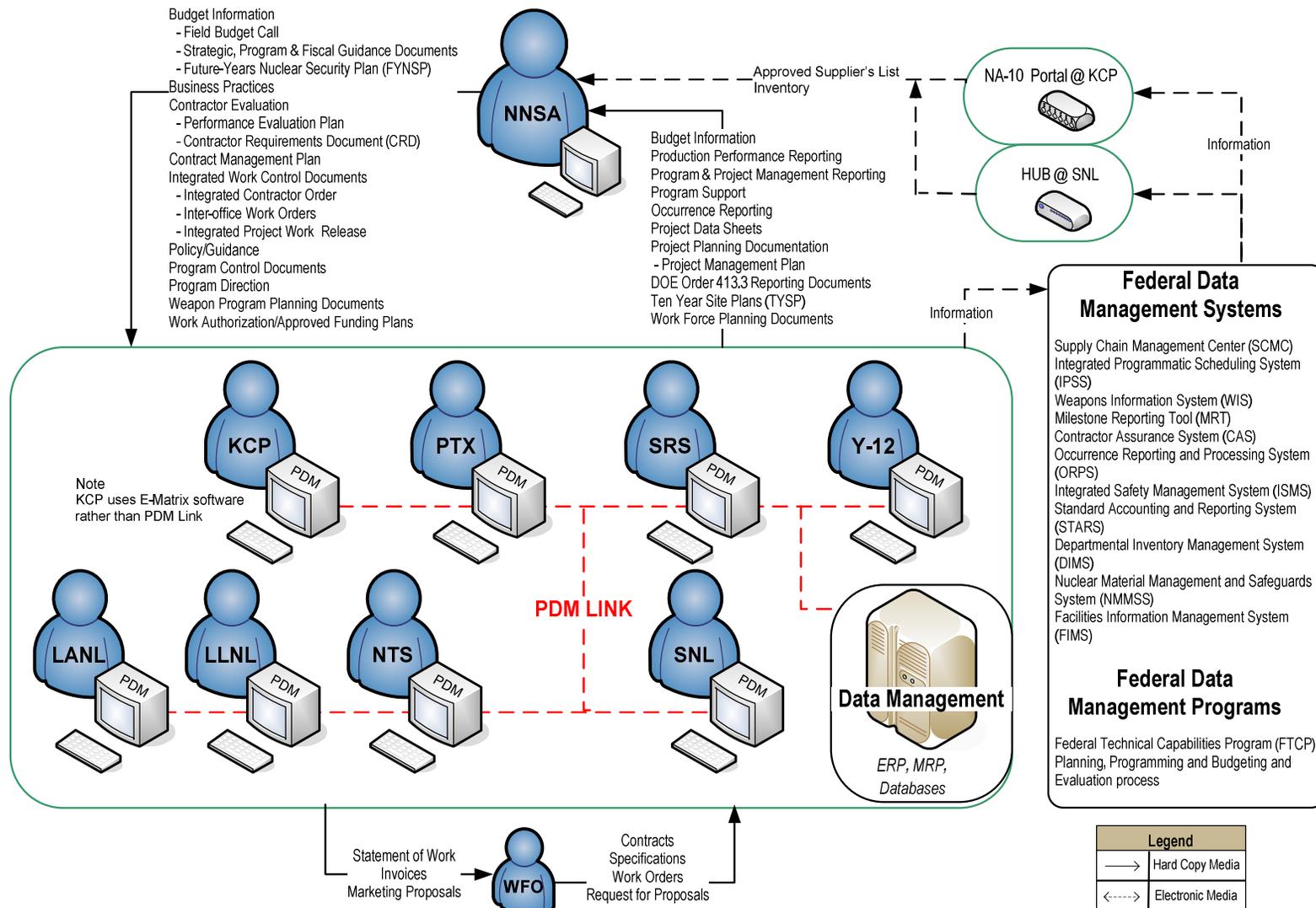


Figure 14 – Current State Information Interface Diagram – Business/Administrative Aspect

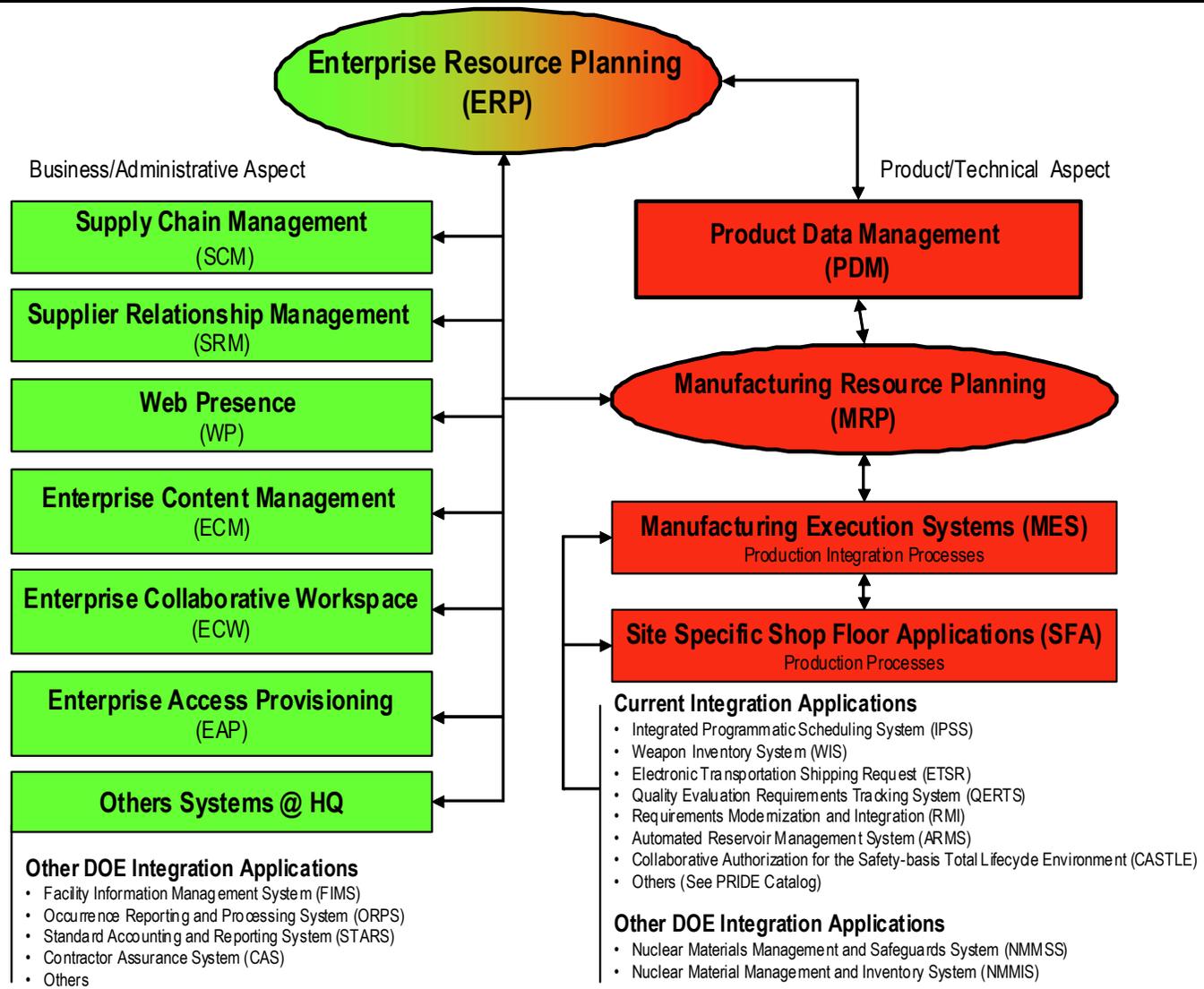


Figure 15 – Overview of Information Technology System

5.2.1 Product /Technical Aspect

The various sub-systems that comprise ERP for the **product/technical aspect** are:

- *Product Definition Management (PDM)*
PDM manages and controls product related information throughout the product lifecycle. These systems also provide role based access to view product definition data (drawings, documents, CAD models) and electronically approve Engineering Authorizations.
- *Manufacturing Resource Planning (MRP)*
MRP is an integrated information system that synchronizes all aspects (not just manufacturing) of the business including: production, sales, inventories, schedules, and cash flows. MRP is a statement of the anticipated manufacturing schedule for selected items for selected periods. **It is the MRP that addresses most of the IT needs related to product/technical aspects or weapons data.**
- *Manufacturing Execution System (MES)*
MES manages and monitors work in process on the factory floor including manual or automatic labor and production reporting, as well as online inquiries and links to tasks that take place on the production floor. MES may include one or more links to work orders, receipt of work, shipping, quality control, maintenance and scheduling of other related tasks.
- *Shop Floor Applications (SFA)*
Site-specific SFA represent the most diverse environment. Sites have selected equipment and devices to meet their unique production manufacturing missions. Integrating these resources with MES and/or ERP/MRP is done using industry standards where they exist, and there have only been limited efforts to integrate at this lowest level of manufacturing support across the NSE sites.

All sites have ERP or ERP-like systems in place that are managing site business/administrative functions at some level. MRP is one key production-related module of a typical ERP system, and some sites are using this integrated capability. Currently, some sites have identified the need to move in this direction in order to replace obsolete Commercially-available Off-The Shelf (COTS) packages. NSE sites do not use the same MRP systems and have selected MRP solutions that best fit their strategic, functional, and integration needs with their ERP components to provide overall integration at the site level between business and manufacturing needs.

MES applications vary from site to site as well. Production processes vary significantly at each NSE site, and MES applications have been selected to meet these unique needs. Sites make MES decisions based on the functionality provided and the potential for integration with existing ERP/MRP systems. MES COTS packages are typically tailored toward either discrete or continuous manufacturing or process industries. An MES package that is a good functional match at one site would likely be a poor match at another site due to the manufacturing diversity within the NSE and the local strategic, functional, and integration issues.

Integration of MES with ERP/MRP and other site applications also drives the selection of an MES application. While most MES comply with the industry standards for interfacing with ERP systems, some MES vendors target particular ERP systems as integration partners. It is essential to note that the ERP/MRP systems in place at a particular site are likely a significant consideration in selecting an MES solution at that same site.

5.2.2 Business/Administrative

Like the product/technical aspect of information, the **business/administrative aspect** is generated by other sub-systems within ERP. These sub-systems include:

- *Supply Chain Management (SCM)*
SCM is the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers. Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption.
- *Supplier Relationship Management (SRM)*
SRM is a comprehensive approach to managing an enterprise's interactions with organizations that supply the goods and services the NNSA uses. The goal of supplier relationship management is to streamline and make more effective the processes between an enterprise and its suppliers. Just as with a customer relationship management (CRM) system, a SRM system streamlines the processes between an enterprise and its customers.
- *Web Presentation (WP)*
WP is a collection of systems that provide information through the internet via standard desktop web clients.
- *Enterprise Content Management (ECM)*
ECM enables organizations to create/capture, manage/secure, store/retain/destroy, publish/distribute, search, personalize, and present/view/print digital content such as pictures/images, text, reports, video, audio, transactional data, catalog, code. ECM systems primarily focus on the capture, storage, retrieval, and dissemination of digital files for enterprise use and the digital file life-cycle management.
- *Enterprise Collaborative Workspace (ECW)*
ECW is an environment, which enable project teams and other groups within an enterprise to work together more efficiently on important business processes and projects.
- *Enterprise Access Provisioning (EAP)*
EAP monitors access rights and privileges to ensure the security of an enterprise's resources and user privacy. As a secondary responsibility, it ensures compliance and minimizes the vulnerability of systems to penetration and abuse.

- *Other IT Systems / Applications used at HQ*

There are several established IT systems used across the DOE organization to gather and report information related to topics such as asset management, regulatory compliance, human capital management, records management, and environmental, safety and health issues. Examples of these types of systems include Facility Information Management System (FIMS), Records Inventory Disposition System (RIDS), Occurrence Reporting and Processing System (ORPS), and Cost Accounting System (CAS).

It is likely that some of the business/administrative aspect related IT applications / systems may also support the flow of information in the product/technical aspect.

As previously indicated, all sites have ERP or ERP-like systems in place to manage site business functions at some level. These are expensive applications to procure and deploy, and each site has selected and deployed the ERP system or similar technologies that best meets its needs. Significant investments, totaling in the millions of dollars, have been made for many years to modernize these business functions within site ERP systems. Due to the broad-based capabilities and modular design of these ERP systems, many sites continue to expand the use of ERP systems to replace both aging COTS systems and internally developed systems as their site systems evolve. A common ERP system is not in use across the NSE.

Further details of the high level technical, business, and financial analyses and recommendations to enhance multi-site information integration in a manner that may allow consolidation of existing solutions and reduce costs are being assessed by NNSA Office of Chief Information Office.

5.3 Applications within Information Technology (IT) Systems Grouping

It should be noted that several software applications are used within these IT systems. These software applications are shown in Tables 2 and 3 for the sites that fall within the scope of this report. A yellow cell indicates that the Application is being phased out and phased out with replacement

Several sites indicated that software upgrades are proposed that would potentially enhance more efficient “real-time” communications between other sites and NNSA-HQ. NNSA is pursuing baseline understanding of the systems that make up the information technology (IT) systems inventory.

Table 2 - Product / Technical Aspect - IT Applications

Product Data Management	
KCP	Dassault Matrix One PDM
	I2 Technologies Electronic Comp
	PDM Link
PX	PDM Link
	MultiSim
	Models Based Manufacturing
	EACreator
SRS	BlastX-NES
SRS	None Specified
Y-12	Product Characterization System
Manufacturing Resource Planning	
KCP	Oracle/Peoplesoft ERP Module
	NSE Classified Applications
PX	CA-CAS
	Integrated Reporting & Info
	LANMAS/TEXMAS
	Integrated Tooling System
SRS	PCD
	Information Global Solutions Visual
Y-12	GraFIC
	SAP
	Bill and Route Consolidation Sys
	Shop Floor Control (SFC)
	Production Requirements Sys
	Detail Scheduling Sys / OPT II
	DYMCAS
	Nuclear Material Management
Manufacturing Execution Systems	
KCP	Solumina suite of products from iBASEt.
	LabTrax
	Base and Military Spares System
PX	CA-CAS
	Models Based Manu. Tooling Sys
	OPTIX – Calibration Notification Workflow
	QERTS
	Optical 3D Imaging System
	Mastercam
	Classified Comp. Tooling System
SRS	ARMS II
	ARMS
Y-12	DRIFT
	DRIFT Web Application
	LIFCOM
	LIFPMP
	Leak Test (LTS)
	Small Platform Post Processors
	GENSHOP
	Classified Lab. Information
	Shop Floor Control (SFC)
QCASI	
Tooling Suborder System	

Table 3 - Business / Administrative Aspect - IT Applications

Supply Chain Management	
KCP	Ariba (SCMC) Modules
	Base and Military Spares System
PX	None Specified
SRS	DOE-EM Contract Supplied
Y-12	None Specified
Supplier Relationship Management	
KCP	Ariba (SCMC) Modules
	I2 Technologies Electronic Comp
PX	None Specified
SRS	DOE-EM Contract Supplied
Y-12	Subcontractor Performance Evaluation System
Web Presence	
KCP	Oracle Stellent (ECM)
	Confluence Wiki/Portal
PX	Stellent Electronic Procedures Sys
	Issues Management (PERS/E*STARS)
SRS	DOE-EM Contract Supplied
Y-12	Apache
	IIS
	Adobe Creative Suite
Enterprise Content Management	
KCP	Oracle Stellent (ECM)
	Adobe/Lifecycle Captivate
	Tower Record Info Management
PX	Oracle Universal Content Management
	Microsoft Sharepoint
	Secure Video
SRS	DOE-EM Contract Supplied
Y-12	Lesson Learned Program
	Versatile
	SAP
	APAT
	TPAT
	Adobe
Enterprise Collaborative Workspace	
KCP	IBM Lotus Notes / Sametime
PX	WebEOC
SRS	DOE-EM Contract Supplied
Y-12	Lesson Learned System
	Outlook
	Conference Room Scheduler
	Outlook for Vehicle Scheduling
	ProjectLink
	Enterprise Secure Network
Enterprise Access Provisioning	
KCP	Resource Access Mgmt Sys
	Entrust
PX	VIBES
	WEBSense
SRS	DOE-EM Contract Supplied
Y-12	SAP
	UCAMS
	Information Access Control
	IAC_SFC
	DBARMS

6.0 Work Performed Outside Defense Programs

The Work For Others (WFO) also known as Work With Others (WWO) Program is a mechanism in place for both private industrial firms and federal agencies to take advantage of DOE/NNSA unique technological capabilities and facilities on a full-cost recovery basis.

It should be noted that the WFO category can also be shown as another function which is management of work done for customers other than NNSA Defense Programs Office. The sub-functions that are in this category are not shown as in the classification terminology but rather as type of work performed for various agencies. Hence these activities are not shown in the functions table but shown in this separate section.

For this review, site personnel were asked to identify those agencies where work was executed by DOE-NNSA personnel and/or their respective contractor personnel or where the use of DOE-NNSA-DP facilities for work was conducted and not directly funded by DOE-NNSA-DP/NN appropriations. Each site reported some level of participation with WFO program at various funding levels. Table 4 indicates the sites' estimated dollar amount provided by funding sources outside of the NNSA for WFO activities last year.

Table 4 – Estimated Revenue from Work for Others

Work for Others Funding	Estimated Revenue (\$ M)			
	KCP	PX	SRS ⁵	Y-12
Work for Agencies Outside DOE	\$ 60	\$ 2	\$ 58	\$ 130
Work for DOE Agencies Outside of NNSA	\$ 30	< \$ 1	\$ 67	< \$ 2

Table 5 provides a listing by Agency of the types of expertise/functions performed and associated participating site(s).

Table 5 – Work for Other Agencies

	Performing Site			
	KCP	PX	SRS	Y-12
Perform Work for Agencies Outside DOE				
Department of Homeland Security				
Test & Evaluate Equipment	No	No	Yes	Yes
Develop Training for Detection Equipment Use	Yes	No	Yes	Yes
Equipment Development	No	No	Yes	Yes
Sample / Collect Source Materials	No	No	Yes	Yes
Analyze Source Materials	No	No	Yes	Yes
Data Interpretation & Evaluation	No	No	Yes	Yes
Technical Support	No	No	Yes	Yes
Develop Training for Explosive Safety	No	Yes	No	No
Characterize Suspected Explosive Materials	No	Yes	No	No

⁵ SRS is an EM program managed site. Services are provided by the Savannah River National Laboratory, which is an EM funded laboratory. All revenues indicated are EM managed WFO funding. NNSA-DP managed WFO funding is \$0.

	Performing Site			
	KCP	PX	SRS	Y-12
FBI				
Conduct Nuclear Forensics	No	No	Yes	No
Technical Support				
Develop Special Packaging	No	No	Yes	No
Develop IT Fingerprint Information Systems	No	No	No	Yes
Develop Metrology Standards	No	No	No	Yes
Conduct Analytical Work	No	No	Yes	Yes
Department of Defense				
Technical Support	Yes	Yes	Yes	Yes
Equipment Development	Yes	No	Yes	Yes
Develop Training for Defense Threat Reduction Agency	Yes	No	Yes	Yes
Manufacture Prototypes	Yes	No	Yes	Yes
Manufacture Specialty Explosive Materials	No	Yes	No	No
Recycle Excess and/or Waste Materials	No	Yes	No	No
Robotics Development	Yes	No	Yes	No
Develop Training for Coast Guard	No	No	Yes	No
Perform Trusted Services Program Management	Yes	No	No	No
Department of Commerce				
Conduct Export Control	No	No	No	Yes
Develop Metrology Standards	No	No	No	Yes
Conduct Analytical Work	No	No	No	Yes
Atomic Weapons Establishment (AWE)-UK				
Produce Specialty Explosive Materials/Parts				
Formulate Explosives	No	Yes	No	No
Press Explosives	No	Yes	No	No
Machine Explosives	No	Yes	No	No
Test Explosives	No	Yes	No	No
Material Recovery & Fabrication	No	No	No	Yes
Perform Gas Transfer System Surveillance	No	No	Yes	No
Office of Personnel Management (OPM)				
IT System Maintenance Support	No	No	No	Yes
Commercial Vendors				
Supply Small Scale Specialty Explosive Materials Production	No	Yes	No	No
International Atomic Energy Agency (IAEA)				
Perform Safeguards and MC&A Technology Development	No	No	Yes	No
Provide Technical Consulting	Potentially	No	Yes	Yes
Perform Work for DOE Agencies Outside of NNSA				
Environmental Management				
Weather Station (Emergency Response)	No	No	Yes	No
Waste Certification	No	No	Yes	No
Pump & Treat	No	Yes	No	No
Deactivate & Decommission Facilities	No	Yes	No	Yes
National Security	Yes	No	Yes	No
Intelligence Community				
Technical Support & Training	Yes	Yes	Yes	Yes
Office of Science				
Technical Support for Energy Efficiencies (Hydrogen)	No	No	Yes	No
Technical Support for Fusion Programs	No	No	Yes	No
Technical Support for Tritium Technologies	No	No	Yes	No
OST (outside of DP & NN)				
Move Materials	Yes	Yes	No	No
Transportation Development and Logistics	Yes	No	No	No
Integrated Contractor Order (ICO)				
Supply Domestic Research Reactor Fuel	No	No	No	Yes
Training	No	Yes	No	No

7.0 References

1. G-ESR-A-00019, Functional Analysis of the Nuclear Weapons Complex – Phase 1 Report, September 2007
2. DOE/EIS 0236-54, Final Complex Transformation Supplemental Programmatic Environmental Impact Statement, October 2008
3. <http://www.cfo.doe.gov/cf1-2/scfa.htm> - U.S. Department of Energy FY 2008 Support Cost by Functional Activity Data Guidance – Attachment 4 – Definitions

Appendix A – Glossary of Terms and Acronyms

ACRONYMS AND ABBREVIATIONS

CFO	Chief Financial Officer
COTS	Commercially-available Off-The Shelf
DOE	Department of Energy
DP	Defense Programs
DSW	Directed Stockpile Work
EC	Engineering Campaign
EM	Environmental Management
ERP	Enterprise Resource Planning
FY	Fiscal Year
FYNISP	Future Years Nuclear Security Plan
IT	Information Technology
KCP	Kansas City Plant
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
MES	Manufacturing Execution System
MRP	Manufacturing Resource Planning
NN	Nuclear Nonproliferation
NNSA-HQ	National Nuclear Security Administration - Headquarters
NPR	Nuclear Posture Review
NSE	National Security Enterprise
NTS	Nevada Test Site
OST	Office of Secure Transportation
PDM	Product Data Management
PLM	Product Lifecycle Management
PRIDE	Product Realization Integrated Digital Enterprise
PX	Pantex Plant
R&D	Research and Development
ROD	Record of Decision
RTBF	Readiness in Technical Base and Facilities
SC	Science Campaign
SFA	Shop Floor Applications
SNL	Sandia National Laboratories
SPEIS	Supplemental Programmatic Environmental Impact Statement
SRS	Savannah River Site
STA	Secure Transportation Asset
WFO	Work for Others
Y-12	NNSA Y-12 Plant at Oak Ridge, Tennessee

DEFINITIONS OF TERMS

NOTE: This table defines the terms used in the report. Self-explanatory and items that could create classification issues were left undefined

Item	Definition
AF&F Assemblies	Electrical/Electronic Assembly item.
Base Spares (NNSA)	Hardware spares for the military that are paid for by NNSA.
Batteries	Devices used to store electrical potential energy.
Budget Information – Field Budget Calls – Strategic Guidance FYNSP	Budget information provided in response to NNSA Budget Call for Information, including any recommendations for enhancements to design/production capabilities during the Planning Phase of the Planning, Programming, Budgeting, and Execution/Evaluation process.
Bulk High Explosive (HE) Material	Mass-produced, high-explosive material that is available for commercial sale.
Business Practices	Required business methods and procedures (e.g., Development & Production Manual, Weapon Quality Policy (QC-1), WQSD Assurance Procedure, Technical Business Practices, etc.).
Canned Sub-Assemblies (CSAs)	Also referred to as Secondary Assemblies. Assembly of components used for secondary activation of nuclear weapon.
Certified Materials	Commercial items that have been certified for use in the weapons production process (e.g., solvents, markers, tapes, gloves, etc.).
Component Requests	NA-122 requested components used in assessments.
Containers	Containers and transports (casks) used within the NW Complex for storage and transportation of radioactive materials.
Contractor Evaluation – Performance Evaluation Plans / Reports Contract Management Plan	Evaluations of contractor performance provided to Design Agencies and Production Agencies as part of the Evaluation Phase of the Planning, Programming, Budgeting, and Execution/Evaluation process. Provides the process and standards of performance by which a Contractor's performance will be evaluated and rated under a specific Contract during a specific fiscal year (FY) and upon which the determination of the Performance Incentive Fee earned is based.
Contractor Requirements Document (CRD)	Establishes the requirements for Department of Energy (DOE) site/facility management contractors.
CSAs for Refurbishment	CSAs returned to Production Agency to be repaired or refurbished.
Cushions	Engineered material made by Kansas City for use in the NW Complex.
Cyber Security Documentation	
Database Information	Traceability information associated with nuclear weapons, which has been systematically organized for easy access and analysis. Data accessible to both Design Agencies and Production Agencies includes weapons test data, surveillance data, weapons inventories, sub-critical experiment test data, parts inventories, production data, process modeling data, surveillance test data, validation & verification data, etc.
Depleted Uranium	Includes both metals and oxide forms.
Design Agency (DA)	The organization responsible for the design of DOE/NNSA weapon material and the integrity of the design through stockpile life.
Detonators	Engineered Material.
Development Parts	Any sub-assembly/component made by a Production Agency to support Design Agency design development. Includes Engineered Materials, Electrical/Electronic Assemblies, Machined Parts/Assemblies, Specialized Equipment, etc.).

Item	Definition
DIMS Departmental Inventory Management System (DIMS).	DIMS is a classified subsidiary ledger; a database used to account for and report the nuclear weapons stockpile inventory and other stockpile material activities. DIMS files include detail entries with opening balances, summary level transactions of SGL codes, summary classification codes, asset types, element and isotopic weights and dollar amounts.
Directed Research and Development Requests	Any New Design Agency DRD or Production Agency DRD request that elicits research and development activities that are expected to benefit or enhance war reserve design or production capabilities.
Disassembly & Dismantlement Documents	As defined in DOE G 430.1-2, DOE G 430.1-3, DOE G 430.1-4, and DOE G 430.1-5.
Disposition Authorizations	Authorization to retain or dispose of excess/surplus materials, equipment, tooling, base spares.
Electrical/Electronic Assemblies	Electrical/Electronic items (Warhead AF&F Assembly, Bomb – AF&F Components, Neutron Generator Monitor, Cables, Warhead Interface Module, Detonator Cables, SGT Electronic Monitoring).
Electronic Records	Information recorded in a form that only a computer can process that satisfies the definition of a record. Electronic records are preferably kept in recordkeeping systems but may be created, stored, and managed in any form of electronic information system or application program.
Energetic Components	Explosive components (either high explosive, pyrotechnics, propellants, etc.) that are not associated with the main charge.
Engineered Materials	Non-metal parts (Polymers/Adhesives, Foams, Supports, Cushions, Filled Elastomers, Detonator Parts, Pit Parts).
Engineering Authorization Documents (Releases)	Includes Advanced Engineering Release (AER), Complete Engineering Release (CER), Development Engineering Release (DER), Engineering Evaluation Release (EER), Information Engineering Release (IER), Qualification Engineering Release (QER), V&V Data, etc.
Engineering Evaluation (EE) Samples	Any item that is developed during Weapon Design and Development, or Research.
Explosive Actuators	Electrical/Electronic component.
Federal Technical Capabilities Program (FTCP) Annual Plans / Reports	Planning and reporting of efforts to recruit, deploy, develop, and retain Federal personnel with the necessary technical capabilities to safely accomplish the Department's missions and responsibilities.
FFTF Casks	DOT-approved transportation containers.
Finished Reservoir	Either a new or reclaimed reservoir that can be deployed for weapons use (WR).
Future-Years Nuclear Security Plan (FYNSP)	Headquarters-driven programming planning processes to develop, prioritize, and integrate the five NNSA Programs. (<i>Missions</i>).
GPX Kits	A kit containing commercial and/or special design items required to support limited life component exchange.
Hazardous Waste	Waste that is designated hazardous by state and local waste management regulations.
HE Components	High Explosive components designed for weapon use.
Helium-3 (He-3)	Commercial grade Helium-3 for sale to industrial customers.
HEU & LEU Materials	Highly Enriched Uranium and Low Enriched Uranium.
HEU (U-Al Ingots)	Highly Enriched Uranium - Aluminum Ingots.
High Explosives (HE)	Primary (sensitive to shock) and Secondary (insensitive to shock) that undergo detonation at 1000 to 9000 meters per second.

Item	Definition
Integrated Circuits	Electrical/Electronic Assembly item.
Integrated Work Control Documents – Integrated Construction Project Plan – ICOs – IWOs Integrated Project Work Release	Either an ICO (Integrated Contractor Order -- a formal requisition, with a value greater than \$250k, placed by one integrated contractor with another for the delivery of material, equipment, or services in support of DOE/NNSA-sponsored and/or DOE/NNSA-authorized work.) ,or an IWO (Interoffice Work Order -- A formal requisition, with a value greater than \$250k, for materials, equipment, or services between two DOE/NNSA integrated contractors under the jurisdiction of different DOE/NNSA operations offices.; IWOs are authorized between two affected DOE/NNSA Operations Offices prior to commencement of the supplying DOE/NNSA integrated contractor work activities.).
Irradiated TPBARs	Tritium Producing Burnable Absorber Rods irradiated by TVA.
Joint Test Assembly (JTA)	A DOE/NNSA-developed configuration, based on DOE/NNSA-DoD requirements, for use in the flight test program. The physical appearance and characteristics of a JTA approximate a WR configuration to the extent practicable. It includes development and production JTAs derived from WR designs, modified to remove the nuclear explosive capability, and fitted with telemetry and instrumentation to the extent required by each test.
JTA Design	JTA Design package per test requirements.
JTA Sub-Assemblies	A DOE/NNSA-developed sub-assembly configuration, based on DOE/NNSA-DoD requirements, for use in the flight test program. The physical appearance and characteristics of a JTA Sub-Assembly approximate a WR configuration to the extent practicable. It includes development and production components derived from WR designs, modified to remove the nuclear explosive capability, and fitted with telemetry and instrumentation to the extent required by each test.
Legacy Benefits Program	
LEU Solution	Low Enriched Uranium.
Low Level Waste	Radioactive waste that is not high-level waste, spent nuclear fuel, transuranic waste, byproduct material (per Atomic Energy Act), or is a naturally occurring radioactive material.
Machined Part/Assemblies	Includes Reservoirs, Valves, Cases, Supports, Brackets, Covers, Miscellaneous Mechanical Parts, Mechanical Switches, Environmental Sensing Devices, Mock Pit. Also includes those items that are recycled components
Master Authorization Agreement	Provides agreement between DOE and its contractor as to the implementation of an Authorization Basis Document.
Materials	Materials purchased from commercial suppliers (e.g., metals, chemicals, gas cylinders, solvents, tapes, markers, etc.).
MC (Classified)	Classified component.
Military Spares (DoD)	Hardware spares for the military that are paid for by DoD.
Mixed Waste	Waste containing both radioactive and hazardous components.
Natural Uranium	Natural uranium from DOE Stockpile via TVA.
Neutron Generators (NG)	Specialty part manufactured by SNL.
New Material & Stockpile Evaluation Schedule (NMSES)	A schedule that tracks and initiates implementation of the NMSEP for all weapon systems with an active evaluation program. The NMSES includes such information as the weapon system, cycle number, sample quantities and serial numbers by cycle, required and actual return dates of sample weapons, required Joint Test Assembly delivery dates and locations, and flight test dates.

Item	Definition
Non-DOE Work	Work performed by a DOE DP facility for another government agency (i.e. DHS, DOJ, etc.) or for any other outside agency (local or state government, foreign country, or commercial entity). Includes development of Counterterrorism Technology Tools, Radiation Detection Equipment, rapid prototype development, R&D, Analysis, Training, etc.
Non-Nuclear Material & Equipment Inventory	Listings of surplus non-nuclear weapon material on reserve status, handling gear provided by Pantex and KCP, surplus and reserve tooling, and acceptance equipment from retired weapons.
Nuclear Explosive (Px) / Nuclear Operations Safety Support	Weapon-response data for Pantex, and criticality analysis and miscellaneous analytical to Production Agencies.
Nuclear Explosive Operations Safety Documentation Readiness Documents	Documented Safety Analyses, including assembly and disassembly operations evaluations, Safety Analysis Report (SAR), Hazards Analysis Report (HAR), Technical Safety Requirements (TSRs), AB Control Document, Undetermined Safety Question (USQ) Determination, Justification for Continued Operation (JCO), Contractor Readiness Assessment, Restart Notification Report.
Nuclear Facilities Safety Documentation	Documented Safety Analysis for Nuclear Facilities: Safety Analysis Report (SAR), Hazards Analysis Report (HAR), Technical Safety Requirements (TSRs), AB Control Document, Undetermined Safety Question (USQ) Determination, Justification for Continued Operation (JCO), Contractor Readiness Assessment, Restart Notification Report.
Nuclear Material Inventory Documentation	Nuclear Material assessment, inventory, disposition plans, reports.
Nuclear Safety AB Approval	Nuclear Explosive Operations Safety at Pantex. Also includes safety basis authorization for all complex nuclear facilities.
Occurrence Reports	Notification to the DOE complex of events that could adversely affect: public or DOE worker health and safety, the environment, national security, DOE's safeguards and security interests, functioning of DOE facilities, or the Department's reputation.
Phase Authorization	Authorization to start work on one of the weapon life cycle phases (Feasibility, Conceptual Design, Design, or Production).
Pits	Component used in weapon primary.
Policy/Guidance	Policy and guidance documents provided to Design Agencies and Production Agencies as part of the Planning Phase of the Planning, Programming, Budgeting, and Execution/Evaluation process.
Polymers/Adhesives	Engineered material used at sites other than Pantex.
Power Supplies	Classified component.
Preflight Controllers	Electrical/Electronic Assembly item.
Procured Components	Components and materials procured from commercial industry for use in or for the construction of a weapon. These components range from standard off-the-shelf items to highly sophisticated custom designs that require considerable engineering support.
Product Change / Deviation Control / Surveillance Documents	Advance Change Orders (ACO) and Final Change Orders (FCO), including deviation requests and surveillance
Product Definition	Information and/or data related to specific products manufactured by Production Agencies, as specified in TBP-301.

Item	Definition
Product Design Information Support	Information and/or data provided by the Design Agencies to address questions, issues, concerns, etc., related to specific products manufactured by Production Agencies [e.g., Special Instruction Engineering Releases, Information (SIER & SIER/B), Engineering Releases (IER)]
Production Agency	The organization responsible for the procurement or production of DOE/NNSA weapon material. The term production applies to processing new and/or reused material as well as repair, modification, surveillance, test, disassembly, and re-assembly operations.
Production Change Requests	Engineering Change Request (ECR), see D&P Manual Glossary.
Production Mission Assignment	The formal assignment by NNSA of the responsibility for manufacturing process development, production, and/or procurement of specified products, materials, product or material family, and for management of the related technology bases.
Production Performance Reporting	Monthly Operations Performance Report, Ship Performance Metrics, Quality Acceptance Rate, Interruption of Work Impact Assessment.
Production Program Definition (PPD)	Program Management Documents – see D&P 3.2. Includes Weapon Program Description (A Doc), PPD Dataset, Retirement Disposition Instruction (RDI, D Doc), Limited Life Component Support Definition.
Program & Project Management Reporting – Project Management Plan Project Data Sheet	Periodic reports of contractor progress, as required during the Execution Phase of the Planning, Programming, Budgeting, and Execution/Evaluation process.
Program Control Document (PCD)	Program Management Documents, see D&P 3.2. Includes : Planning Schedule, Authorization Schedule, Directive and Directive Schedule.
Program Direction – Program Guidance Fiscal Year Guidance	Program- direction documents provided to Design Agencies and Production Agencies as part of the Programming Phase of the Planning, Programming, Budgeting, and Execution/Evaluation process.
Program Support	Site program execution information and data as requested by NNSA (e.g., production scheduling, ADAPT/R&D/Campaign recommendations, risk management.
Pu Materials	Current Pu stockpile inventory.
Purchased Specialty Items	Commercial items specifically purchased by the Design Agencies for use by the Production Agencies (Integrated Circuits, High Voltage Capacitors, Gap Tubes, Batteries, Magnetics).
QA Documentation	All documentation specified by the WQAP Manual required to ensure weapon quality during production, acceptance, and its associated disposition as applicable. Includes quality assessments and corrective actions.
Qualification Evaluation (QE) Samples	Any item that is developed during Weapon Design and Development, or Research that is used to certify the weapon.
Qualification Evaluation Release	An engineering release that assigns the qualification status of a product, process, software, acceptance equipment, or system test equipment, and (if the evaluation results are satisfactory) authorizes the listed items for an intended use.
R&D documentation	Research and Design Documentation
Reactor Fuel Material	Radioactive fuel provided to support the US Navy's nuclear fleet.
Record of Assembly/Record of Disassembly (ROA/ROD)	Per referenced IBP, all associated documentation related to weapon/component assembly/disassembly activities reside in the NWC-ROA Master Databank.
Reliability/Surveillance Planning Documents	Includes New Material and Stockpile Evaluation Plan (NMSEP) and Nuclear Weapon Sub System Test Plan (NWSSTP).

Item	Definition
Reservoirs	Reservoirs that are returned from field deployment.
Retired CSAs	CSAs no longer required by the active stockpile that are retained for potential reuse.
Retired Pits	Pits no longer required by the active stockpile that are retained for potential reuse.
Retrofit Information	Materials and tools for retrofit, retrofit instructions, definitions, and requirements.
Safeguards Transporter (SGT)	Specially designed trailers used by the Office of Secure Transportation to transport weapons.
Shipping Transportation Authorization Basis documentations	An NNSA-prepared approval that details a regulatory equivalent transportation configuration, authorized contents, regulatory (addressed by Federal regulations) and emergency response hazards, and transportation restrictions
Significant Finding Investigation Report (SFIR)	A formal investigation by a committee, chaired by the appropriate Design Agency, to determine the cause and impact of a reported anomaly, and to recommend corrective actions as appropriate.
Significant Finding Notice	The communication channel used by a Production Agency to advise the appropriate Design Agency of weapon anomalies.
Special Equipment List / Commercial Equipment List	SELs specify the Test, Handling, and Use Control (UC) equipment/software required in the field for each nuclear weapon system produced by the DOE/NNSA. Nomenclature, description, use, specification, packaging, and estimated times for first delivery to the DoD of each new item are incorporated in the SEL. CELs specify those parts of nuclear weapons and T, H and UC equipment that have a general commercial application, do not contain source and special nuclear materials, and are not within the definition of non-nuclear weapon parts.
Special Nuclear Materials (SNM)	Plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, has been determined to be special nuclear material, but does not include source material; or any material artificially enriched by any of the foregoing, but does not include source material.
Specialized Equipment	Custom equipment/supports/containers used to support weapon R&D, Production, Maintenance, and Training (e.g., Test & Handling Gear, Test Bed Hardware, Containers, Trainers and Trainer Components, Parachutes, etc.).
Spent Nuclear Fuel	Nuclear fuel (Foreign and Domestic Research) returned for disposition.
Standard Accounting and Reporting System (STARS)	STARS is the DOE's primary unclassified financial reporting system. The NNSA Service Center ensures DIMS/STARS balances agree.
Surveillance Components	Components identified by Design Agency that need to be evaluated and tested during surveillance of a weapon. Includes CSA, detonators and pits.
Surveillance Sub-Assemblies/Components	Weapon sub-assemblies or components removed from a Surveillance unit by Pantex for testing.
Technical Qualification Program	Describes the training and qualification requirements for technical personnel with safety responsibilities at defense nuclear facilities. It documents how NNSA identifies these positions; tailors qualification standards for them; establishes time and duty limitations for qualification; describes the process to identify learning activities to achieve competency for the specific job duties; and establishes methods for evaluating qualification.
Technical Support	Personnel provided by a Design Agency or Production Agency to support another site, DOE Program, or non-DOE organization.

Item	Definition
Ten Year Site Plans (TYSP)	The planning document linking a site's real property requirements to its mission in support of the DOE's overall strategic plan. It is a comprehensive site-wide plan encompassing the needs of tenant activities. The TYSP is integral to and supports the Department's Planning, Programming, Budgeting, and Evaluation System (PPBES). It describes site-specific actions the programs plans in order to meet stewardship, recapitalization and sustainability goals for their facilities.
Test & Handling (T&H) Gear	Specialty ancillary equipment necessary to safely conduct weapons systems testing and/or handle weapons systems and transportation containers.
Test & Handling Support	Personnel provided by a Production Agency to support use of specialized test and handling gear.
Test Articles	The sub-system, component, material, object, or device that is to be tested. Includes associated test support hardware. Test articles can be for sub-critical, dynamic, environmental or underground testing.
Test Bed Hardware	All hardware required to support test bed.
Test Equipment	Commercial off-the-shelf test equipment.
Test Materials	Consumable items that support test procedures.
Test Support Hardware	Everything needed to support test of a specific test article.
Trainers	Mockup "simulator" of weapon used to train Military and Pantex technicians.
Training	Either weapons training (maintenance, repair, handling, etc.) or materials-handling training provided to Technicians, DoD, Emergency Responders, etc.
Transportation / Shipping Directives and Requests	See DOE O 461.1A
Transuranic (TRU) Waste	Materials contaminated with beta-gamma-emitting radionuclides.
Tritium	Tritium gas provided in hydride transport vessels (HTVs) and/or commercial tritium-contaminated vessels (CTCVs).
Unclassified & Classified Computer Operations	Computer operations that have the determination by an authorized official that information requires protection under the provisions of an Executive order (for National Security Information - NSI) or that a document or material contains classified information for NSI, Restricted Data (RD), or formally RD.
Uranium Alloys	
Uranium Materials	
Waste Casks	DOT-approved transportation containers.
Weapon Development Planning Documents.	Includes Program Information Document (PID), Weapons Design and Cost Report, Joint Integrated Project Plan (JIPP), NNSA Project Plan (NPP), and Advance Planning Document (APD).
Weapon Inspection/Repair Instructions	Instructions for inspection and repair of a DoD-returned, defective weapon.
Weapon Inspection/Repair Results	Reporting of results, defects, and conditions that impact weapon system operations AB.
Weapon Program Planning Documents	The primary documents used to make key programming decisions and to develop the NNSA budget.
Weapon Technical Procedures/Manuals (BOMB Book)	Includes all weapon and component technical, operational, maintenance, and training publications (e.g., procedures, manuals, instructions, etc.)
Weapon(s)	Fully assembled and certified weapons deployed to DoD or returned to NW Complex for disposition.
Weapons Response Data	

Item	Definition
Work Authorizations / Approved Funding Plans	The Work Authorization (WA) is the form used to authorize an M&O contractor to carry out specific work in accordance with their contract. The M&O contractor indicates acceptance of the work on this same form.
Work For Others Documents	Documents used to support work for others
Work Force Planning Documents	Systematic identification and analysis of what an organization is going to need in terms of the size, type, and quality of workforce to achieve its objectives. It determines what mix of experience, knowledge, and skills is required and sequences steps to get the right number of right people in the right place at the right time.

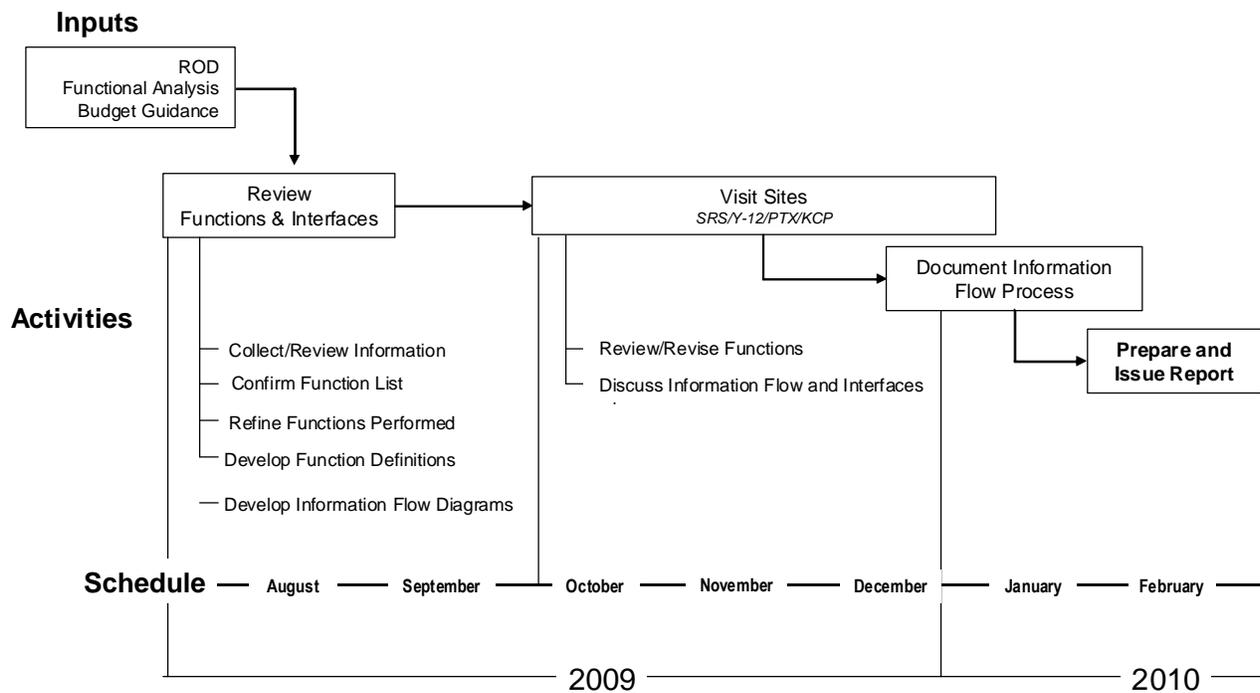
Appendix B – Approach Used

Approach and Schedule

The approach to the functional analysis update consisted of the following:

- Plan and schedule sites with contracts that expire in the near-term and include the Savannah River Tritium Operations
- Review/Refine definitions for all 2nd tier functions
 - Collect information that defines weapons work activities performed and provides basis for update
 - Review documentation - note gaps to be confirmed with sites
- Conduct site visits with site Point of Contacts and subject-matter experts to verify information
 - Review and concur with functions update
 - Determine other non-weapons activities and interfaces (Work for Others)
 - Gather data/insight to information flow processes
- Develop draft information flow diagrams
- Prepare and issue report

The figure bellows depicts the activities conducted and associated timeframe used.



Participation Team

This functional review was a collaborative effort. Subject-matter experts from each of the sites visited participated and contributed their insight to this review. The Director of Strategy, Policy, and Modernization appointed Ed Wilmot, Senior Advisor at the NNSA Service Center, to lead the review effort. A core team was established and included members of the initial functional analysis effort conducted in 2007. The core team members were:

<u>Member</u>	<u>Affiliation</u>
Ed Wilmot - Lead	NNSA-Service Center
George C. Allen	NNSA-Headquarters
Robert A. Edlund	Y-12 Site Office
Joseph M. Newell	Savannah River Office
Angela Barnhill	Pantex Site Office
Srini Venkatesh	TechSource Inc.
Caroline W. Bruns	TechSource Inc.