SECTION J

APPENDIX G

URANIUM PROCESSING FACILITY (UPF)

PROJECT MANAGEMENT PLAN

Replaced Mod 0015

CNS Project Management Plan For the Uranium Processing Facility Project

Project Number 06-D-141

July 2014

Prepared by the
Uranium Processing Facility Transition Team
Consolidated Nuclear Security, LLC
Management & Operating Contractor
for the
Y-12 National Security Complex
under Contract No. DE-NA-0001942
with the U.S. Department of Energy
National Nuclear Security Administration

CNS | consolidated nuclear security, llc

APPROVALS

Review:

[redacted]

June 23, 2014

John J. Meersman
UPF Deputy Project Manager

Date

[redacted]

June 23 2014

Michael B. Pratt,
UPF Project Manager

Date

Approve: [redacted]

23 June 2014

Brian Reilly
Office of CNS - UPF Project Director

Date

CNS | consolidated nuclear security, llc

REVISION LOG

Revision	Date	Description	Affected Pages
0	July 1, 2014	Issued for Use	All

CONTENTS

APPENDIXES

FIGURES

TABLES

1. EXECUTIVE SUMMARY

Consolidated Nuclear Security, LLC (CNS) manages and operates the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee and Pantex in Amarillo, Texas for the U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA). Y-12 serves as the nation's Uranium Center of Excellence where highly enriched uranium (HEU) is stored and where enriched uranium (EU) processing takes place.

In addition to the management and operating functions for Y-12 and Pantex, the Management & Operations (M&O) contractor is tasked with executing the Uranium Processing Facility (UPF) project at Y-12. The goal of the UPF project is to construct a modern, state-of-the-art facility to begin the consolidation of Y-12's EU processing and manufacturing into an efficient, high-security facility. Current scope of the project is to design and construct the buildings and infrastructure and install capabilities to replace those currently in Building 9212. The UPF project is currently in the engineering and design phase and is executing Site Readiness subproject activities.

This Project Management Plan (PMP) outlines the M&O contractor's plan for managing the UPF project and serves as agreement between the M&O and the NNSA UPF Project Office (UPO) for execution of the project.

This UPF PMP describes the contractor's management methods, organization, control systems, and documentation for ensuring contractual requirements for the project are met. The PMP establishes roles and responsibilities and summarizes how the M&O/UPF project team will carry out the engineering/design, procurement, construction, startup testing, readiness, and transition to operations for this one-of-a-kind nuclear facility while satisfying the requirements of Prime Contract DE-NA-0001942 between DOE and the Contractor. This PMP complies with and complements the NNSA/UPO Project Execution Plan for the Uranium Processing Facility (PL-PJ-801768-A006) (PEP).

This PMP serves as a bridge to the UPF project team's subordinate plans and procedures, which detail how management and control are implemented and which are referenced throughout this document. Although document references are to specific revisions and publication dates at the time this PMP was prepared, CNS will utilize the most current revision of these documents. The documents listed are for reference only, official lists and current revisions are kept in the CNS/UPF document management system. Incorporation of this PMP into the contract does not incorporate the referenced plans and procedures into the contract. They are listed for use by CNS and UPO for convenience and reference only and not considered contractually binding. Non-compliances and deviations will be addresses through CNS/UPF management systems.

Consolidated Nuclear Security (CNS) proposed and provided a Business Case to NNSA for an alternate execution approach for the engineering, procurement, construction and start-up of the Uranium Processing Facility (UPF) under Contract Line Item 0002 of the Contract No. DE-NA001942. This approach relies on the services of its lead member, Bechtel National Inc. (BNI), to support the execution of the project based on the standard approach Bechtel uses to design and build High-hazard facilities, and to break the paradigm of the M&O approach to delivering capital projects. This approach will include the following improvements:

- Implement proven BNI EPC suite of tools
- Access to experienced/skilled workforce
- Reduce cost of the project

This proposal addressed use of Bechtel resources to support project management/construction management and use of BNI resources to support the management and execution of design and the application of the same concept to full construction, when authorized, managing direct-hire craft for most construction scope. With NNSA approval, CNS will perform the agreed and appropriate portions of the scope on a progressive lump sum basis after CD-3, using a combination of direct-hire construction and competitively bid lump sum and fixed price subcontracts. Upon NNSA approval of the Business Case and execution of the BNI Subcontract, the UPF PMP will be revised as appropriate.

1.1 GENERAL PROJECT INFORMATION

The goal of NNSA's UPF project is to construct a modern, state-of-the-art facility to begin replacement of the aging EU processing facilities at Y-12, starting with the capabilities in Building 9212. Out of concern over the affordability of the overall UPF project and the continuing risk of operating Building 9212, the Acting Administrator of NNSA commissioned an independent team to develop alternatives that could deliver production operations currently carried out in Building 9212 by the year 2025 at a cost not to exceed $6.5B. The independent team completed their review of the UPF project and issued their report in April 2014. In mid-April the UPF project was directed by NNSA to focus their efforts on one of these alternatives (a multi-facility option) and create a Rough Order of Magnitude (ROM) estimate. In a complementary effort, the UPF project initiated a study of alternatives to current scope and execution strategies to help enable transition of critical Building 9212 capabilities into UPF no later than 2025 and not exceeding $6.5B. In parallel, NNSA is reviewing the recommendations from the independent team and may provide additional guidance to the project.

The multi-facility option will consist of a central Main Processing Building (MPB) constructed to nuclear standards and supported by adjacent or nearby buildings of less costly construction. These support buildings are currently conceptualized as a Mechanical Equipment Building (MEB), a Salvage/Accountability Building (SAB), and a Personnel and Material Access Building (PMAB).

The UPF MPB will consist of multiple process areas, a utility area, and transport corridors. There will be two processing areas, with high-traffic material flow in one area and personnel traffic flow in another. Deferral of some process systems necessitates that UPF interface with the enduring facilities: Buildings 9204-2E, 9998, and 9215.

The utility infrastructure, building service systems, and process service systems will be designed to accommodate only the project scope included in the multi-facility option, as defined with additional direction from NNSA. With this option, utilities and service systems for deferred scope will not be installed.

Although the scope and execution of the UPF project is currently being reviewed and modified there are some basic project requirements that define the boundaries of the project. UPF is currently being designed to house the necessary capabilities and capacities to comply with the requirements of *Uranium Processing Facility Program Requirements Document* (U), (PRD) (DOE/ORO-2171) as well as guidance letters on the Highly Enriched Uranium Materials Facility (HEUMF) fire water supply.

System requirements are defined in *Systems Requirements Document for the Uranium Processing Facility Project (U)* (SRD), (SR-PE-801768-A001). Criteria governing the Project Engineering and Design (PED) phase of the project are detailed in the multi-volume *Uranium Processing Facility Design Criteria (U)* (DE-PE-801768-A001 through A050).

The NNSA has provided direction to the project to review the current PRD and SRD for basic program level requirements which may be eliminated in the interest of achieving reduced project costs.

UPF has identified and NNSA has accepted a defined set of standards and requirements under which the design of the UPF project will be conducted. This set of standards and requirements includes federal, state, and local laws and regulations as well as DOE directives, such as orders, manuals, and standards. These standards and requirements, as well as other regulations, are referenced in PL-RM-801768-A001, *UPF Code of Record* and represent the project's Code of Record. Further discussion of the Code of Record is in Section 3.1.1.

UPF operations are described in *Uranium Processing Facility Concept of Operations Plan* (PL-PJ-801768-A027) which will be subject to a revision upon formalizing the updated design option. The facility is being designed for a 50-year operating life; increased efficiency in operations and maintenance; and minimized risk to employees, the public, and the environment through the use of engineering controls.

1.2 MANAGEMENT STRUCTURE

The UPF project will be managed in accordance with this PMP. A UPF core project team has been established to execute the project. The core team is shown in Figure 1, which is subject to change to address project needs. To isolate UPF to the maximum degree possible from the ongoing operations at the site to avoid impacts in either direction, UPF will interface with the functional/support areas within the M&O during all phases of the project through a CNS Integrated Project Team (IPT). The (IPT) will provide services to the project as well as act as the interface between the UPF Project and the M&O. A charter for the IPT was developed during transition. Services from other organizations (e.g., Security Interface, Production Support, Maintenance Support, Safety Basis, and Design Authority) will be coordinated through the CNS Operator's Representative accountable to the CNS Project Director. Each organization will perform its particular function in accordance with its established procedures and policies. The UPF project will be as self-sufficient as possible, drawing support from the M&O only when it is required.

During the execution of the project, the UPF team has the ability to leverage corporate resources and talent as required. This could be in the areas of staffing needs in support of critical tasks, implementation of proven tools/processes, and subject matter expert's review of selected work products.

During the project execution, the UPF design team will serve as Design Agent. There will be significant interface and engagement with the Design Authority, a CNS responsibility as a member of the CNS Integrated Project Team. Those interfaces will be defined and formalized in accordance with a formal process as defined in Section 2.3 and as generally described in Section 2.4.1 of this PMP. The Design Authority organization will assign Design Authority Representatives to the project responsible for safety basis, criticality safety requirements and oversight for implementation of the requirements in the design.

The roles and responsibilities of the members of the core team are included in Appendix B.

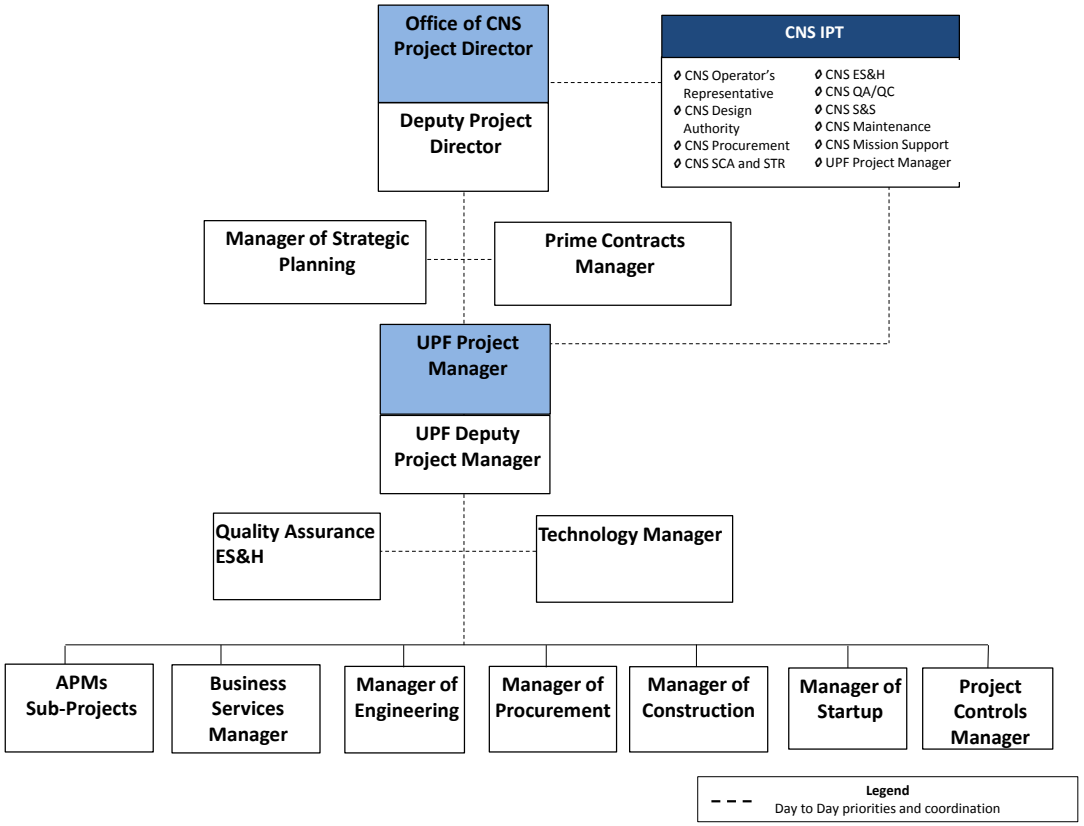

Fig. 1 UPF Organization Chart (Core Team)

1.3 FUNDING RESOURCE PLAN

The UPF Project Data Sheet identifies that design, construction and other project costs are executed utilizing Line Item Funding. In general, engineering, procurement and construction are funded from LI funds, which together make up the total estimated cost (TEC) for the project. Project Initiation, Project Closures, and Operational Readiness are funded through other project costs (OPC), which with total estimated cost (TEC) makes up the total project cost (TPC). The TPC includes management reserve and contingency. The funding sources for this project are budget and reporting (B&R) codes 39DP09202 for PED and LI and DP0901300 for OPC.

While the CD-2/3 baselines will be a firm point estimate for the entire UPF project, each component or subproject has an associated estimate for that phase of work. The basis of the estimate will be detailed in documentation provided as part of the CD-2/3 submittals.

Using the Basis of Estimate (BOE) and the input from Engineering, Procurement, Construction, and functional organizations, a TPC point estimate will be calculated. Detailed reports for this TPC estimate are included in a cost and schedule document that will be issued as part of the CD-2 submittal. This TPC estimate will include NNSA contingency for specifically defined project risks. For planning purposes, a funding profile is assumed based on the fiscal year (FY) 15 Future Year Nuclear Security Plan (FYNSP) through FY 2018 and $520M per fiscal year thereafter.

1.4 PROJECT OBJECTIVES

The primary objectives of the UPF project are:

- Execute a zero-accident policy
- Complete UPF per contractual quality commitments
- Design and construct UPF to meet the mission needs
- Perform UPF within approved cost baseline established at CD-2 and defined on a preliminary basis through the interim baseline, including management reserve and contingency, and in accordance with any approved baseline changes
- Mitigate potential adverse risk consequences
- Achieve Key Performance Parameters as defined in the NNSA/UPO Project Execution Plan
- Plan and deliver the project using a commercial approach and methods

1.5 CRITICAL DECISION EXECUTION STRATEGY SUMMARY

The project's Critical Decision (CD) strategy is being modified based on the option currently being developed. The revised strategy will consist of issuing multiple request packages for specifically defined scope. To the extent practical, each package will be complete and standalone for the scope of the CD request, and each package will be baselined and ready to start line-item activities upon receipt of approval. Table 1 is the preliminary listing of suggested CDs and key approval milestones at the time of this document revision. After obtaining an NNSA decision on the changes in the program requirements along with consensus on the selected facility layout, the project will submit a CD strategy plan and obtain approval. In addition, the project will prepare an estimate and schedule for developing the design and CD-2/3 baseline, technical requirements documents, and design/procurement/construction execution plans. This estimate and schedule will be developed by the 1QCY15 for review/approval by 2QCY15. As part

of the estimate and schedule for the preparation of the CD-2/3 baselines, a timeframe will be determined to develop a preliminary TPC estimate and schedule (with supporting bases). This TPC estimate will establish project management control measures needed to control the project through completion of the baseline at CD-2/3. Changes to this estimate will be managed per the baseline control process. During the development of the project schedule based on the current design option, the Critical Decision milestones will be established and this PMP will be revised accordingly.

Table 1 Critical Decision Milestones (to be updated when revised schedule is available)

Critical Decision	Submittal to UPO	Approval
CD-0 Mission Need	---	12/17/2004A
CD-1 Alternative Selection and Cost Range	---	07/25/2007A
CD-1 Reaffirmation Alternatives Analysis	02/15/2012A	06/8/2012A
CD-2/3 Site Readiness	10/31/2012A	01/29/2013A
CD-2/3 Site Infrastructure & Services	3rd Q 2014	4th Q 2014
CD-3A Long-Lead/Bulk Procurements and Site Preparation	TBD	TBD
CD-2/3 Performance Baseline (PB) and Construction of MEB and other BOP utility installation/Start of Construction	TBD	TBD
CD-3 Balance of Construction (BOC)	TBD	TBD
CD-4 Project Closeout	TBD	TBD

2. EXECUTION STRATEGY AND APPROACH

2.1 PROCEDURES/PROCESSES

During the contract transition, the existing procedures were "blue sheeted" for implementation by CNS. To enhance UPF execution and achieve efficiency through streamlined processes, the project will develop project specific execution procedures. Specific procedures developed in each phase are included in Appendix C.

In addition to the procedure revisions discussed above the development of the UPF/UPO Zipper plan is included in Appendix C, Phase II.

2.2 WBS/RAM

The UPF project technical scope is organized by a work breakdown structure (WBS). The WBS is a hierarchy of elements that organizes and displays the required work to be performed, thus serving to establish and control the scope baseline as well as the associated cost and schedule. The WBS breaks down the work to a level where roles and responsibilities can be assigned. The WBS is included in the *Uranium Processing Facility Project Work Breakdown Structure* (WBS-PC-801768-A002) and described in the *Uranium Processing Facility Project WBS Dictionary* (WBS-PC-801768-A001). Control Account Managers (CAMs) are designated at appropriate levels for managing control accounts. The WBS process is defined in *Work Breakdown Structure, Control Accounts and Work Authorization* (Y13-87-202).

Integrating the organizational breakdown structure with the WBS creates a Responsibility Assignment Matrix (RAM) that assigns responsibility for scope, cost, and schedule for specific WBS elements. The RAM is developed to the control account level and documented in CAM notebooks. The RAM relates the project's organization to the anticipated work for the purpose of ensuring all components of the work are properly attributed to a responsible organization or team member. The UPF RAM helps in making sure all components of the project are properly assigned and that resources are being used to their utmost advantage.

The July 2014 BCP includes a revised WBS for the engineering scope of work as well as a framework for the remainder of the project. When consensus on the path forward for the design and construction of the project is finalized, both the WBS and the RAM will be updated as required.

2.3 CROSS FUNCTIONAL TOPICS

While the UPF project will be organized in a traditional functional organization approach, an integrated team culture is expected and required. The purpose of this integrated execution approach is to improve safety, quality, inter-discipline communication, improve efficiency, foster synergy, increase productivity, improve decision making ownership and accountability, and focus on completing the work scope. Typical areas where the integrated team concept is employed are: during the design phase with meaningful constructability reviews, potential material/equipment vendor consolidation, and overall engineering, procurement, and construction sequencing and integration.

In addition to the cross-functional interfaces within the UPF project team, there are interfaces, support and services required from other organizations across Y-12. A CNS Integrated Project Team (IPT) has been established to focus on these interface areas. Examples of these are in the CNS Design Authority area, Site Procurement, Operations, Security, Nuclear Safety, Facility Maintenance, Emergency Management, etc. A charter for the IPT was developed during transition.

To manage these interfaces, Interface Control Documents (ICDs) (PL-PM-801768-A032) will be established with each affected organization within CNS in accordance with the CNS UPF Interface Control Plan, which will be developed and formally issued. It is anticipated that there will be approximately five ICDs developed to address the following CNS Functional Organizations: Uranium Operations, Mission Engineering, Mission Assurance, Mission Support and Safeguards and Security. The intent of the ICDs is to define the scope of services required, develop roles and responsibilities, document the extent of effort required, and develop a method to manage deliverables in support of the UPF baseline. The ICD's will be developed and managed through the UPF Operator's Representative, a position within the CNS Uranium Operations team, who will be a member of the IPT. Changes to these ICDs will be coordinated and overseen by the CNS Integrated Project Team. Impacts to the Project resulting from changes to the ICDs will be processed through the project change control processes (Trends, Baseline Change Control, etc.).

2.4 FUNCTIONAL EXECUTION

Each functional area is responsible to meet the project staffing requirements and to execute their scope of work in accordance with approved procedures and policies. The functional areas have the ability to reach back to their counterpart organizations in the parent companies to support staffing needs, technical guidance and, when appropriate, to review completed activities to ensure they are in accordance with expected quality and baseline requirements.

2.4.1 Engineering

The UPF project engineering strategy is defined by *Engineering Execution Plan for the Uranium Processing Facility Project* (PL-PE-801768-A002), which describes the UPF Engineering organization's role in the project and how the design and engineering for UPF will be executed. The Engineering Execution Plan (EEP) complements and augments this PMP with the appropriate level of detail necessary to engineer a project as large and complex as UPF. Key items identified in the EEP include:

- Engineering organization and interfaces, which define the Project Engineering organization in detail as well as interfaces with other team members.
- Division of responsibilities, which defines engineering organizational responsibilities with respect to project scope and execution.
- Design strategy, which defines the technical goals and objectives for design deliverables and level of completeness.
- Interface with Mission Engineering relative to engineering design authorization, safety engineering and requirements and surveillance.
- Subcontracting strategy, which defines when and how the design will be subcontracted and includes scope, value, subcontract type, and selection method.

- Engineering planning tools and methods used to manage and control the design.
- Design process procedures and methods used to execute the design and control organizational and technical interfaces.
- Engineering deliverables to other project functional groups, which define the organization and deliverables that are due to other functional groups.
- Engineering automation tools, which summarize the information technology and engineering automation plan strategy.
- Implementation of value management/value engineering studies.

UPF is classified as a Category II nuclear facility. The *Safety Design Strategy for the Uranium Processing Facility* (RP-FS-801768-A003) outlines the strategy for ensuring compliance with *Program and Project Management for the Acquisition of Capital Assets* (DOE 413.3B) and *Integration of Safety into the Design Process* (DOE-STD-1189-2008) to ensure that UPF is designed, constructed, and operated to protect workers, other on-site personnel, the environment, and the public. The safety strategy for UPF includes application of basic safety philosophies from Facility Safety (DOE O 420.1C 2012) , such as minimization of hazardous materials, use of engineered controls over administrative controls, selection of passive over active structure, system, or components (SSCs), and preference for preventive controls over mitigative controls. The safety strategy also includes Classification of NPH design categories based DOE-STD-1189, 1020, and ANSI-2.26.

The UPF Criticality Safety program follows the Y-12 plant program which is principally driven by Y70-150 and Y70-160. The UPF Criticality Safety Design Criteria contains general requirements for design and points to the Criticality Safety Process Studies for specific requirements for the process systems.

Safety basis documents will be developed for each phase of the project and will be submitted to UPO for review and approval as required. A Preliminary Safety Design Report has been issued and the PFHA has been maintained. Nuclear Criticality Safety process studies are updated in concert with design changes. NPO approved the PSDR based on the previous building design through a *Preliminary Safety Validation Report* (PSVR-PM-801768-A002). The Safety Structures, Systems, and Components (SSSC) Table from the Design Criteria is aligned with that in the PDSR. The SSSC Table defines the set of safety functions, functional requirements and performance criteria for the UPF facility and its processes and is the vehicle used to formally communicate safety analysis requirements to the designers. Based on the recent scope changes to the project, a Conceptual Safety Design Report (CSDR) will be developed and submitted to NPO/UPO for approval. The CSDR will be followed by the submittal of a new PSDR and PDSA(s) as necessary depending upon timing for construction and procurement needs to support the Critical Decision Strategy that is currently being developed.

While this PMP defines the overall management approach for the project, *System Engineering Management Plan for the Uranium Processing Facility* (PL-PJ-801768-A017) describes the UPF project's strategy for the planning, control, and conduct of a fully integrated engineering effort. PL-PJ-801768-A017 describes the process and methods necessary to clearly define the project mission and requirements; evaluate, select, and verify the best design from identified alternatives; control interfaces; manage risk; and to integrate technical work and engineering disciplines.

The UPF project team's technology development mission is to improve safety, responsiveness and flexibility through modernized equipment and advanced technologies, recommend UPF baseline technologies, and provide input to UPF facility and equipment design. Implementation of new baseline technologies require technology demonstration to ensure that requirements can be met. New equipment may require prototyping to develop design input data.

Configuration Management (CM) is an integrated management process that establishes (1) the design requirements, (2) the design/operations documentation, and (3) the physical/functional configuration of a SSC and maintains consistency among these items during the design process. The CM program maintains effective control of a facility's as-built arrangement and operation/maintenance to ensure compliance with approved and/or accepted technical design requirements and other governing criteria. Control of the facility's as-built configuration begins with the input into the facility design at the pre-conceptual stage and extends through final design, construction, startup, and operation.

In accordance with the programmatic configuration management requirements set forth in, *Configuration Management Program* (Y15-004PD) and *Criteria for Application of Y-12 Configuration Management Program* (Y15-009), the UPF project has developed a project-specific CM program as outlined in *Technical Configuration Management Plan for the Uranium Processing Facility Project* (PL-EG-801768-A007).

The CNS Design Authority is responsible for establishing the design requirements and providing oversight to ensure design output documents appropriately and accurately reflect the design basis. The design authority is responsible for design control with respect to conformity to the safety basis. These responsibilities are applicable regardless of whether the process is conducted fully in house, partially contracted to outside organizations, or fully contracted to outside organizations. The design authority function on the UPF project is executed through design authority representatives.

The design authority representative (DAR) is a qualified individual assigned by CNS Mission Engineering to the UPF project to establish and maintain the design requirements and design bases and to ensure the technical adequacy of the engineering designs. DARs are responsible for providing assurance that correct technical bases are established and maintained; design input from all appropriate technical disciplines is obtained and integrated in the completed engineering product; and changes are reviewed, approved, documented in accordance with applicable change control procedures.

The DARs for the UPF project maintain functional and technical reporting responsibility to the CNS Mission Engineering design authority. The UPF manager of engineering provides day-to-day assignments and priorities to the DARs. As an example, a UPF DAR assigned to UPF is intimately familiar with the Code of Record, contract requirements and criteria (e.g., PRD and SRD) for the UPF. They are accountable to the CNS Mission Engineering design authority to ensure the criteria,

etc. is incorporated into the design. The determination of which engineering deliverables are prioritized to be reviewed is direction given by the UPF manager of engineering.

2.4.2 Procurement

UPF plans to integrate the Bechtel Procurement System (BPS) into the UPF project procedures and tools. BPS provides integrated automation tools for supply chain organizations and material management tailored for engineering and construction projects. BPS includes 40 applications that integrate all elements of the purchasing process from the requisition to receipt and maintenance of material and equipment. A review of the procurement process for migration from the current M&O Y-12 process is an action included in Appendix C, Phase III.

Currently the M&O contractor's strategy for acquisition on UPF is detailed in *B&W Y-12 Acquisition Plan for the Uranium Processing Facility* (PL-PJ-801768-A020). The Y-12 UPF Procurement organization is currently responsible for procuring the materials, labor, equipment, and design and construction services necessary to support the project. The procurement strategy is documented in *Uranium Processing Facility Project Procurement Execution Plan* (PL-PR-801768-A002). All procurements are performed in accordance with the NNSA approved Y-12 Procurement Operating Practices. Procurement responsibilities are defined in *Uranium Processing Facility Material Assignment Schedule* (RP-PJ-801768-A015). A team consisting of Quality, Engineering and Procurement personnel provide vendor qualification and surveillance as well as oversight for factory acceptance testing in accordance with Y60-95-811, UPF Supplier Quality manual.

The UPF Project has developed a commercial grade dedication (CGD) procedure that outlines a process for procuring materials and equipment meeting nuclear quality assurance (NQA)-1 safety requirements. *Commercial Grade Dedication Packages for the UPF Project* (Y15-95-910), allows the project to make decisions on the best way to procure items that have a safety function.

Prior to the determination of the implementation of BPS, the project will use the government-certified Y-12 procurement and financial systems. *Uranium Processing Facility Project Procurement Automation Plan* (PL-PR-801768-A001) provides the strategy to enhance the existing procurement, materials receipt and management, and financial systems in order to track pre- and post-award procurement milestones, monitor in-shop fabrication status, administer contracts and purchase orders, acknowledge receipt of materials, and track how the equipment and materials are released.

Following the decision on the execution path forward for construction, the PMP will be revised to document the procurement process and automation tools to be implemented in support of construction. Included in Appendix C, Phase III, the project plans to evaluate the implementation of the corporate approved procurement system.

To the extent practical, the UPF project team will arrange for participation from small and disadvantaged businesses. The proposed execution strategy for the project is to use small and disadvantaged businesses for performing specific work packages matching their capability or for providing staff augmentation to service organizations. The project team will organize and host vendor forums based on the supplier scope of interests (e.g., design, construction, or equipment fabrication) where vendors will become informed about outsourcing scopes, qualifying

requirements, and subcontracting opportunities. These forums will allow interested vendors and subcontractors to further understand UPF's mission needs, acquisition strategies, and schedules as well as provide CNS Y-12 with a ledger of viable service and material providers.

2.4.3 Construction

The UPF project team will serve as the Construction Manager/General Contractor and provide oversight and integration of direct hire construction activities and multiple construction subcontractors. The current construction strategy is detailed in *Construction Management and Execution Strategy for the Uranium Processing Facility* (PL-CM-801768-A001). UPF Construction Management will be responsible for:

- Construction planning
- Constructability reviews
- Supporting Procurement for solicitation and award of construction subcontracts
- Receipt and warehousing of government-furnished materials and equipment through the procurement organization
- Management and oversight of construction subcontracts
- Manage direct-hire construction work
- Inspection and acceptance of construction activities
- Interface and support of Federal Direct Contractors

UPF will be built in a highly congested construction zone. Laydown areas, warehousing, fabrication shops, and worker parking will be at a premium. The project will have onsite warehousing to receive, store, protect, and maintain vital and sensitive equipment and materials. Additional off-site bonded and un-bonded storage and fabrication shops are anticipated. Parking alternatives are under consideration and will be further evaluated as parking needs are better quantified. Shuttles will likely be used to transport workers between a yet-to-be-determined parking area and the construction site. As the construction strategy and execution plans are finalized a review of any impacts to the existing project permits will be identified.

By the time the UPF project enters its construction phase, craft resources are expected to be in high demand and of limited availability. In anticipation of this challenge, the project team is sponsoring multiple focused workshops to gather industry data, identify trends, and improve forecasting ability. This data will be used to forecast specific skills and resource shortages and allow the project team to incorporate solutions into the planning process.

In addition, UPF Construction Management has engaged local building and construction trade unions early in the project. A series of meetings and open discussions have been and will be held to exchange staffing projections and explore options and ideas to address any anticipated shortages. With UPO's consent, Construction Management will also explore innovative ideas to enhance the collective bargaining relationship between the building trade unions and the UPF project. Relationships established by the corporate partners at the unions' national levels will also be relied on for this effort. The project Construction Manager will consider the competition for qualified craft labor in developing construction schedule strategies.

Automation tools are required to support UPF construction, including a robust personnel tracking system (i.e., badging system) at the construction site for emergency management, worker safety, performance, and subcontract management. Additional automation tools will be required to assign and track small tools allocated to the direct-hire crafts, identify and track performance of manufacturers' recommended and required storage, and track periodic maintenance activities.

Following the decision on the execution path forward for construction, the PMP will be revised to document the use of corporate resources, processes and tools (such as: TeamWorks, BSAPs, Custom Arc, and others) to be implemented in support of construction.

2.4.4 Startup and Commissioning

Testing will occur during the latter part of the UPF project execution phase and is a sub-element of UPF commissioning. Testing and commissioning are necessary to ensure that the as-installed systems were installed according to design, that the systems and processes perform to design-specified functional acceptance criteria, and that systems and processes are capable of meeting operating requirements. A comprehensive and coordinated test program for UPF will identify the essential elements to be validated to ensure that components, systems, integrated systems, and processes within areas are fully functional and will support safe and reliable operations. The UPF testing program will validate SSCs in a cost-effective manner to allow for an orderly transition to operations.

The *Uranium Processing Facility Engineering Test Plan* (PL-EG-801768-A001) provides guidelines for the implementation of UPF preoperational testing activities and the compilation of records and documentation required in accordance with *Startup Testing Program Manual* (Y17-011). A graded approach will be implemented in accordance with UPF-specific procedures for UPF testing activities to ensure that proper resources and level of effort are applied to those areas most important to the achievement of safety and reduction of risk in an efficient manner.

The M&O Contractor will develop and submit a Startup Notification Report which will address the readiness reviews planned for UPF to NNSA for approval. The M&O contractor will conduct a Contractor Operational Readiness Review (CORR) for the UPF building and supporting systems (e.g., ventilation, utilities, security, etc.). Following the CORR, NNSA may elect to perform a readiness review. A formal NNSA Operational Readiness Review (ORR) will then be conducted in time to receive startup authorization. These readiness reviews will ensure production staff are properly trained and qualified to operate and maintain the equipment, systems, and facilities. Remaining capabilities, when and if installed, will receive RAs following component and system testing.

As part of the Contractor Operational Readiness Review and contractor RAs, Implementation Validation Reviews will be performed for the facility and the processes.

2.4.5 Transition to Operations/Closeout

The transition strategy is currently documented in *Uranium Processing Facility Commissioning Management Plan* (PL-PJ-801768-A009), which depicts the process through the readiness reviews

and will be updated and approved prior to the CD-2 request that includes the full Project Performance Baseline. The *UPF Commissioning Management Plan* will be supplemented by the *Enriched Uranium Transition Plan* (U) (Y/MOD-105), which describes the main activities associated with moving enriched uranium (EU) operations out of current facilities and into UPF following start of operations. (EU operations transition is outside the scope of the UPF project.)

The plan for maintenance of UPF and its processes is documented in the *Uranium Processing Facility Maintenance Execution Plan* (PL-MA-801768-A001).

The UPF project will be complete when testing and readiness activities are successfully completed, startup authorizations are granted, all systems are turned over to Y-12 Production, and all documentation is transferred to the facility records document management center (DMC). The interim construction phases (configured as separate subprojects) will be closed out with tailored CD-4s consisting of notification of completion and closeout and lessons-learned reports and with equipment and material turnover to the next phase of the project.

Following the last startup authorization, a formal CD-4 to close out the UPF project will be initiated. The CD-4 request will be based on the NNSA ORR for the UPF. Project closeout activities will include project lessons learned, technical cost and schedule baseline accomplishments, final cost report, photographic documentation, and project completion status documented in initial and final project closeout reports.

2.4.6 Records Retention

Records management and document control for the UPF project is maintained in accordance with *Records and Controlled Documents* (Y15-101), applicable UPF procedures and in accordance with DOE O 243.1. Document control and records management are accomplished through a process of:

- Identifying potential documents to be created.
- Identifying those documents that require special controls during use.
- Establishing clear direction for the UPF project team regarding responsibilities for records and for turnover to Y-12.
- Establishing and maintaining a consistent and controlled process for maintaining these records.

Records developed in the execution of the project are provided to, managed by, and maintained by the project DMC as described in *Document Control and Records Management Plan for the Uranium Processing Facility Project* (PL-PJ-801768-A001). INFOWORKS will be used to manage the records and to perform document control for UPF. A records retention and turnover plan will be prepared and maintained to facilitate project closeout.

2.5 KEY ACTIVITIES FOR SUCCESSFUL EXECUTION (KASE)

The UPF project will utilize the Key Activities for Successful Execution (KASE) process to increase assurance that the project will be successful as a result of the stronger focus placed on key activities that occur during each phase of the project. It also provides an additional avenue for Bechtel Systems and

Infrastructure Inc. (BSII) functional management oversight and reach back into corporate expertise and support.

Key benefits of the KASE process include:

- Ensures a thorough approach to project execution
- Provides a self-assessment process driven by the Project Director
- Focuses the project team on timely development and quality of deliverables
- Defines a process by which functional management, both on project and affiliate company, can provide consistent oversight
- Increases the certainty of a successful project outcome

The gate review consists of key activities required to demonstrate readiness to proceed to the next phase of the project (e.g., start of construction, ready for startup/operations, etc.). Selected activities are designated as critical to increase visibility to ensure a higher probability of success. A rating is provided for each activity to demonstrate a level of adequacy and any issues of concern are identified. An overall readiness rating is determined by the review team. Any action items identified during the KASE review will be tracked to closure. A detailed KASE checklist will be developed prior to each review. A KASE review may use project assessments discussed in Section 4.8.1 as supporting information.

3. PROJECT BASELINE

3.1 SCOPE OF WORK

The work scope to be accomplished by the UPF project is defined in a technical baseline consisting of requirements, scope, and key performance parameters. The technical baseline matures as the project is executed to include other documents, including final design and safety basis documentation, which together will form the basis for the design of record. The list of technical baseline documents, including safety basis documentation, is maintained in *Technical Basis Index Summary* (TBIS-EG-801768-FAC-A001).

The scope baseline is described in the *UPF WBS Dictionary* (WBS-PC-801768-A001) and in more detail in *Scope Book for the Uranium Processing Facility Project* (RP-PA-801768-A001). However, these documents contain scope descriptions that are summaries of the facilities and processes to be constructed by the UPF project. For more precise information, engineering documents, drawings, and calculations must be consulted for specific details on facilities, equipment types and sizes, and the work activities necessary to accomplish this line-item project. The project scope book will serve as a principal project document for change control.

3.1.1 Code of Record

UPF has identified and NNSA has accepted a defined the set of standards and requirements under which the design of UPF will be conducted. This set of standards and requirements includes federal, state, and local laws and regulations as well as DOE directives, such as orders, manuals, and standards. These standards and requirements, as well as other regulations, are controlled through PL-RM-801768-A001, *UPF Code of Record* and represent the project's Code of Record. They are also referenced in individual sections of the Design Criteria. Changes to the Code of

Record require approval of the Senior Management Change Control Board (SMCCB) chaired by the Federal Project Director.

Additional documents and standards (e.g., Engineering Standards, technical project documents, Y-12 specific design documents, etc.) are identified in PL-RM-801768-A002, UPF Other Basis Records (OBR). Changes to the OBR are controlled by the project Technical Change Control Board.

3.2 SCHEDULE BASELINE

The UPF project schedule includes activities to execute planning, engineering/design, procurement, facility construction, equipment installation, startup testing, and operational readiness. For schedule development, the project is using Primavera P6 Professional Project Management™. The detailed project schedule is contained in a P6 database from which schedule reports are issued periodically. Upon submittal of a baseline, the project will maintain and update Level 1 and 3 schedules on a monthly basis. The Level 1 schedule summarizes the overall project showing start/finishes for the project phases and the major milestones. This Project Management Schedule is usually a one-page document. The Level 3 Integrated Project Control Schedule uses the critical path method to show the logic dependencies of engineering, procurement, contracts, construction, and startup/readiness activities, major and intermediate project milestones, and the critical path of the project. The level of detail will demonstrate key interfaces and will be resource loaded at the WBS level to provide control metrics. The Level 3 Integrated Project Control Schedule is used to monitor progress and to provide project reports and submittals.

The UPF project will develop and issue monthly schedule "health metrics" based on the Acument Fuse process. The ranges used in the metric rating will be prepared and reviewed with UPO.

The schedule detail assumes project phases will be continuous and sufficient funds will be available to support each phase as planned within the specified funding profile. A contingency allowance for design and construction will be included in the schedule baseline.

3.3 COST BASELINE

The basis for the baseline estimate is contained in a series of documents that compile Engineering input to Cost Estimating. This baseline estimates will be prepared in accordance with *Uranium Processing Facility CD-2 Cost Estimate Plan* (CE-PC-801768-A023). The baseline upon submittal will be a Class 1 estimate, as recommended at CD-2 by NNSA's *Independent Cost Estimates Procedure* (BOP-06.03). Prior to CD-2 approval, the design will be 90% complete and will include the preparation and/or completion of key design deliverables. To ensure that the CD-2 approval package represents the most current design, the project will use a disciplined change control process to make adjustments, along with reconciliation to the original submittal as necessary, prior to Energy Systems Acquisition Advisory Board approval. The objective of this approach is to initiate the baseline review while continuing to update the baseline as the design evolves to meet the optimal project execution schedule. This strategy is documented in *Critical Decision Path Forward for the Uranium Processing Facility Project (*WP-PC-801768-A001), which describes in detail the configuration management imposed on the working baseline submittal to ensure the most accurate estimate upon CD-2 approval. A CD-2 Cost and Schedule Document will detail the cost and schedule baseline, which will be reported in an update to the *NNSA UPF Project Execution Plan* (PL-PJ-801768-A006).

3.4 CONTINGENCY

Contingency for the UPF project is comprised of three categories: cost contingency, schedule contingency, and technical & programmatic (T&P) risk contingency. Care is taken during contingency development to avoid any overlap of T&P contingency with cost and schedule contingency.

Cost contingency reflects the degree of confidence in the scope definition and design components upon which the cost estimate is based and is intended to account for uncertainties in unit quantities, unit prices, unit hours, labor rates, and other rates associated with the estimate. The scope within each WBS element is analyzed to determine the most appropriate best case, most likely, and worst case values for each WBS element. These values are used in a Monte Carlo simulation using Crystal Ball™ software. The contingency included in the cost estimate is based on an 85% confidence level in accordance with *NNSA Cost Estimating Guide* (50.005).

Schedule contingency is the confidence that the project schedule can meet the completion objectives and is intended to account for schedule uncertainties, such as issues of the availability of resources. The scope of work associated with each deliverable is analyzed by members of the project team to determine the most appropriate best case, most likely, and worst case values for the related schedule activities. These values are used in a Monte Carlo simulation using Primavera™ risk analysis software to determine the contingency duration needed for the project at an 85% confidence level. The resulting duration is then multiplied by the estimated "hotel load" to determine the cost impact of the corresponding schedule contingency. The resulting schedule contingency duration is included in the project schedules per the scheduling procedure and best practices.

T&P risk contingency is the amount of contingency attributed to discrete risks outside the confidence levels established for the cost estimate and schedule. T&P risk cost and schedule impacts, as defined by each risk evaluator, are extracted directly from the UPF Risk Register. T&P risk schedule impacts are indicated as a number of weeks; the duration between the original finish date and the 85% probability

date is the schedule contingency, which is applied to the forecasted hotel load to calculate an associated cost impact.

Total Project Contingency is the sum of the three contingency values. This contingency is split between the contractor's management reserve and NNSA contingency based on definition of control in accordance with *Project Baseline Development* (Y13-87-203), Appendix J. Management reserve held by CNS UPF will include all cost contingency, all schedule contingency, and all contractor T&P risk contingency, while NNSA's contingency held by UPF Project Office (UPO) consists of the government's T&P risk contingency.

3.5 BASELINE CHANGE CONTROL

Once the project's Performance Baseline has been approved, the scope, schedule, and cost baselines will be under a formal baseline change control process. At that time, no change will be made to the Performance Baseline elements without review and approval of the appropriate-level Baseline Change Control Board (BCCB). Change thresholds for scope, schedule, and cost are formally established in the *Uranium Processing Facility Project, Project Execution Plan* (PL-PJ-801768-A006) at the four DOE/NNSA approval levels. Change thresholds for subprojects are established in each subproject's execution plan. The Level 3 Contractor BCCB is chaired by the UPF Project Manager, in accordance with *Project and Baseline Change Control for Multi-Year Projects* (Y13-87-207). The Level 2 BCCB is chaired by the FPD. All baseline changes beyond the UPF Project Manager's approval thresholds (Level 3) must be submitted to and approved by the FPD and the UPO BCCB (Level 2). If a change is beyond UPO's approval thresholds, UPO may endorse and forward the proposed change to the next higher level board.

At the M&O project level, a request for a baseline change is initiated by preparing a formal Baseline Change Proposal (BCP). BCPs are processed in accordance with *Earned Value Management* (EVM) – *Program Description*. The BCP form, along with back-up documentation that provides the rationale and justification for a change to an approved baseline, is reviewed by the Contractor BCCB.

The Contractor BCCB meets, as needed, to consider and deliberate each request, which may then be (1) approved or disapproved if within the Board's approval authority, (2) endorsed and forwarded to the FPD/UPO Board if approval authority is exceeded, or (3) deferred if additional study and/or information is needed. The UPF Project Manager is responsible for ensuring that no work is performed outside of the approved baselines until a BCP is approved.

At times, a change may be directed by DOE/NNSA Headquarters; however, a directed change is still subject to the baseline change control process. The UPO BCCB, with assistance of the contractor, prepares the BCP and the back-up documentation that not only provides the justification for the change but also examines the implications and consequences of the directed change. The BCP is evaluated and, when approved by the appropriate level Board, the directed change may then be implemented.

While DOE O 413.3B does not require baseline change control prior to CD-2 approval of the Performance Baseline, the UPF project team, in keeping with Y-12's good business practices, initiated change control on the PED estimate at the beginning of preliminary design. The change control process will also be applied to the interim baseline.

3.6 PROJECT CONTROLS SYSTEM DESCRIPTION

The process for preparing standardized, consistent, and traceable project cost and schedule baselines is defined in the procedure titled, *Project Baseline Development* (Y13-87-203) and supported by *Documentation in Support of Project Baseline Development* (Y13-87-006). The processes for planning and developing schedules and maintaining them under configuration control are prescribed in *Project Schedules* (Y13-87-204). Project performance is updated monthly and transmitted to UPO through the Monthly Progress Report. Cost control and variance reporting is at designated levels of the WBS.

The WBS is used to establish and track budgets and schedule performance for each control account. High priority is placed on early warning of potential baseline impacts and the estimate at completion. This is accomplished through the use of a project trend program as outlined in *Trends Identification, Analysis and Reporting* (Y13-87-206). The trend program is designed to provide the project team with early identification and warning of potential changes in baselines with the philosophy that the impact of any change can be mitigated if identified as early as possible.

DOE O 413.3B requires that the industry standards for project control systems described in American National Standards Institute (ANSI) EIA-748B, *Earned Value Management Systems*, be implemented on all projects with TPC greater than $20M. The UPF project uses the DOE Office of Acquisition and Project Management (OAPM)-certified Y-12 Earned Value Management System (EVMS) to track progress against the Performance Measurement Baseline (PMB) approved with each Critical Decision.

As required by DOE O 413.3B, annual surveillances of the UPF EVMS will be conducted by the CNS Project Controls group to ensure the UPF project remains in compliance with the certified Y-12 EVMS. Following the transition, a plan will be prepared to certify the EVMS under the new contract as indicated in Appendix C, Phase III.

The UPF Project Manager is responsible for establishing reporting and control mechanisms to monitor project activities against the approved baseline. While DOE O 413.3B does not require performance measurement and earned value prior to CD-2, the UPF project team, in keeping with Y-12's good business practices, initiated performance measurement reporting on the PED baseline during preliminary design. Monthly progress reports are prepared by the project team under the direction of the UPF Project Manager. Project performance is updated monthly and transmitted from the M&O to UPO as part of the monthly progress report including PARS II.

Once all costs are incurred against the scope, a final closeout report will be prepared outlining lessons learned, best practices, and customer feedback. In addition, final cost reports and project completion forms will be prepared and forwarded to NNSA by the Project Manager upon closeout of the cost accounts.

4. PROJECT EXECUTION PLAN

4.1 ORGANIZATION

While the UPF project is under the prime contract between CNS and NNSA, UPF will assemble a fully integrated project team consisting of functional managers for each element of work segregated from the

M&O. These managers are responsible for the management and integration of the CNS team members assigned to the project in their area of responsibility, as well as the contractors and subcontractors selected to perform specific project functions. Team members report on a day-to-day basis and receive functional guidance and support from the managers assigned to UPF.

4.2 PROJECT INTERFACE

4.2.1 General

The primary point of contact between the NPO/UPO will be at the Project Director/Project Manager level. While formal correspondence and agreements will be at this level of the organization for the project to succeed there will and must be dialog throughout the organization. Formal lines of communication will be established between the UPF team and the subcontractor and supplier organizations.

4.2.2 Zipper Plan

Following the completion of the transition to CNS, a project Zipper Plan (addressed in Appendix C, Phase II) will be developed and issued to involved members of the project team. This plan will identify the appropriate points of contact on the CNS, UPF, NPO and UPO organizations. This plan should not hinder open and honest dialog between other members of the respective organizations but will identify primary interfaces. Alignment meetings with those identified on the zipper plan will be conducted periodically to allow for the sharing of ideas and resolution of any interface issues that may arise. These alignment meetings provide an opportunity to establish stronger relationships between all members of the team.

4.2.3 Reviews

Project reviews are integral to tracking project performance. Reviews communicate ongoing progress, identify issues and concerns, and actively involve appropriate management levels in oversight of the project. Reviews may be used to ensure readiness to proceed to a subsequent project phase, ensure progress of project efforts, confirm functional integration, identify and resolve issues at the earliest time, support event-based decisions, and control risk.

The UPF Project conducts and undergoes a wide range of reviews to ensure performance and to promote confidence that the project is progressing as anticipated. Periodic reviews examine project status, trends, design, and construction progress for systems and interfaces. These include monthly reviews, quarterly reviews, NNSA-required reviews, peer reviews, and team reviews.

Special reviews are conducted as needed and requested to address areas of concern, respond to specific events, or to status the project at a given point in time.

- Technical and design reviews are conducted in accordance with engineering and design procedures and as identified on the project schedule. Specific reviews to be included are being evaluated and added to the project schedule, and will include reviews at the end of the

conceptual design, for submittal of CD-2 baseline, approval of CD-2 baseline, and completion of Title II design.

- Technical Independent Project Reviews, or Technical Peer Reviews, are held as necessary to verify technology decisions and address design uncertainties related to such areas as alternative systems, constructability, requirements, design, technology, system verification, physical configuration, and operability and reliability.
- External Independent Reviews will be conducted at each CD request to validate the performance baseline and confirm the project is ready to proceed into the next phase of the project.
- Defense Nuclear Facilities Safety Board (DNFSB) reviews are conducted as needed to help ensure safety is integrated into the project.

Near the end of the project, an Operational Readiness Review (ORR) and Readiness Assessments (RAs) will be conducted to evaluate the readiness of completed facilities, systems, equipment, procedures, personnel, and supporting and interfacing systems and organizations to begin facility operation.

4.3 NUCLEAR SAFETY CULTURE

The project developed a Nuclear Safety Culture Policy Statement and a *Safety Culture Plan* (PL-SH-801768-A005). The plan outlines steps the project would take to implement Health, Safety and Security recommendations in a unified approach among government and contractor staff to reinforce the core values of safety, security, and quality.

The project established a *Nuclear Safety Culture Program Plan* (PL-SH-801768-A006) that describes the formal safety program and policy for the UPF project. The program blends the theories and concepts of two prominent safety management programs: (1) organizational culture change and (2) behavior-based safety (BBS). Organizational culture change focuses on establishing and reinforcing desired management behaviors starting with the most senior managers, while BBS focuses on reinforcing or correcting worker behaviors that are observed on the front line. The UPF project will leverage the two programs over the life of the project into a single, unified nuclear safety culture program.

An additional concept incorporated into the UPF Nuclear Safety Culture Program is a safety conscious work environment (SCWE). SCWE is an environment in which employees feel free to raise safety concerns, both to their management and to a regulatory agency, without fear of retaliation.

Implementation of the UPF Nuclear Safety Culture Program, including SCWE, is founded on several robust institutional programs listed below. The program will build on this foundation to establish a better understanding by workers and management of the connection between project and institutional safety activities.

- Integrated Safety Management Program
- Voluntary Protection Program
- Environment, Safety & Health Program
- Construction Safety & Health Program

- Human Performance Improvement Program
- People-Based Safety Program
- Safety Design Strategy
- Nuclear Criticality Safety

Activities to implement the program include:

- Establishing enabling policies and procedures
- Providing relevant and timely training
- Communicating effectively
- Recognizing and reinforcing appropriate behaviors while correcting inappropriate behavior
- Evaluating the effectiveness of the program
- Adjusting methods based on the evidence complied during the evaluation

Because safety culture is relatively resistant to change, a long term approach to improving safety culture is appropriate. Activities will be planned and executed based on a long term logic model that will target certain organizational traits:

- Environment for raising concerns
- Problem identification and resolution
- Questioning attitude
- Respectful work environment
- Personal accountability
- Work processes
- Continuous learning
- Effective safety communication
- Leadership safety values and actions
- Performance monitoring through multiple means

4.4 QUALITY ASSURANCE

The interface to the CNS Y-12 Quality Assurance (QA) organization is through the CNS IPT. To define this relationship with a focus on specific needs and level of involvement between the CNS QA organization and the UPF QA organization an ICD was developed as discussed in Section 2.3. In addition to the ICD, the UPF project is reviewing specific target areas as included in Appendix C. These areas are: Phase I - UPF Internal QA Audit procedure and in Phase II – Graded Approach to Quality and

Qualification/certification on ND Testing Personnel. The project will evaluate the merits of proceeding with a UPF stand-alone Quality Assurance Plan as indicated in Appendix C Phase III.

Quality Assurance (QA) includes all processes and activities required to ensure product and performance quality meet project objectives as well as customer requirements and expectations. *Quality Assurance Plan for the Uranium Processing Facility* (PL-PJ-801768-A004) defines a project-specific approach in meeting the requirements of *Quality Program Description* (Y60-101PD), which implements 10 CFR 830, *Nuclear Safety Management,* Subpart A, "Quality Assurance Requirements", DOE O 414.1D, *Quality Assurance*, and DOE/NNSA *Weapon Quality Policy* (NAP-24). The national consensus standard used for the UPF QA program is American Society of Mechanical Engineers (ASME) NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications* (NQA-1), Parts I and II, including NQA-1a-2009, *Addenda to ASME NQA-1–2008 Quality Assurance Requirements for Nuclear Facility Applications*. The incorporation of the NQA-1-2011 requirements is planned during the evaluation of a UPF QAP included in Appendix C Phase III.

The project's QA requirements and processes ensure that design, development, procurement, construction, and preoperational testing satisfy the objectives of the UPF project and comply with applicable DOE, NNSA, and CNS Y-12 QA requirements. The UPF QA organization interfaces with UPF Project Management, Engineering (including work performed in other Bechtel office locations), Procurement, and Construction organizations and provides subject matter expert advice in the project administration, design, procurement, construction, and startup of the project.

The applicability of the UPF QA Plan is based on a graded approach so that resources applied are commensurate with the importance of the result to the achievement of project, site, and customer goals. The graded approach employed by the UPF project implements the approach, philosophy, and procedures described in the *Quality Assurance Program Description*.

This graded approach to quality will not compromise public, employee, or facility safety or adversely impact the environment and complies with requirements, rules, and regulations. The graded application of facility and activity requirements shall be dependent on the hazards and/or level of risk associated with the activity or SSCs under consideration. The scope, depth, and rigor of the quality management system's application of requirements shall be determined by the use of a grading process before performing the activity. The purpose of grading shall be to select the controls and verifications to be applied to various items and activities consistent with their importance to safety and success of the program. The graded approach to quality shall not be used to "grade quality assurance criterion to zero" which has the effect of eliminating all controls or verifications over the activity.

4.5 ENVIRONMENTAL SAFETY & HEALTH

The interface to the CNS Y-12 Environmental Safety and Health (ES&H) organization is through the CNS IPT. To define this relationship with a focus on specific needs and level of involvement between the CNS ES&H organization and the UPF ES&H organization an ICD will be developed.

Integrated Safety Management System (ISMS) requirements from Y-12 procedure *B&W Y-12 Integrated Safety Management System* (Y15-635PD) and associated implementing procedures will be incorporated throughout the design, construction, and startup phases of the UPF project. The project team is committed to doing work safely and recognizes that line-management responsibility, accountability, good management systems, and worker involvement are key elements to an effective ISMS. Implementing ISMS principles during design will ensure that the final design produces a safe workplace for personnel. Specifically, the design will ensure adequate protection from hazards for the public, the workers, and the environment through multiple layers of engineered controls supported by additional administrative controls. This approach will provide a process that will prevent accidents and provide containment to

prevent or mitigate accidental release of hazardous materials into the environment. By protecting the workers to the highest degree possible and using a concept of maintenance with limited exposure, the collocated worker, the public, and the environment are protected.

The Y-12 ISMS is in compliance with DOE guide, *Integrated Safety Management System Guide* (DOE G 450.4-1B), and is also supported by Y-12 procedures, *Integrated Safety Management System/Integrated Safeguards and Security Management (ISMS/ISSM)* (Y12-047) and *Integrated Safety Management Program* (Y15-636). The Y-12 ISMS is also applicable to subcontractors and ISM requirements are incorporated into subcontract documents, as applicable.

The UPF project incorporates the Y-12 ISMS through implementation of *Integrated Management Plan for the Uranium Processing Facility Project* (PL-PJ-801768-A024). The Integrated Management Plan (IMP) describes the methodology used by the UPF project to implement the requirements of DOE O 413.3B and DOE-STD-1189-2008. The IMP identifies functional areas of responsibilities (Engineering, Facility Safety, ES&H, Quality, Security, and Production) to ensure integration of safety measures and controls into the project execution, especially design of the facility. The IMP identifies the process by which safety-in-design considerations are integrated into all design activities with the intent to provide the UPF project team with direction on establishing an integrated project design execution approach involving all functions and stakeholders throughout the project's life cycle. As part of that function, the IMP links all project plans, work processes, and procedures.

Uranium Processing Facility Environment, Safety, and Health Plan (U) (PL-PJ-801768-A007) outlines the programs and procedures that the UPF project will use to control environmental, safety, and health hazards associated with activities during design and construction as well as operation of the facility. The ES&H Plan defines requirements and related roles, responsibilities, and interfaces in accordance with applicable federal, state, and local laws, regulations, and DOE Orders. Hazard controls will be incorporated as part of design and during field installation. Design outputs and requirements will include finalized drawings, specifications, and test requirements that will incorporate any hazard controls identified.

The UPF project will comply with all applicable environmental laws and regulations, including the Clean Air Act, the Clean Water Act, National Emission Standards for Hazardous Air Pollutants, and associated Tennessee regulations. *The Environmental Regulatory Permitting Plan for the Uranium Processing Facility* (PL-SH-801768-A001) identifies the environmental permits and regulatory approvals that will be required to construct and operate the facility. The *National Environmental Policy Act* (NEPA) requires an evaluation of all federal actions with the potential to affect the environment. NEPA evaluation of the UPF project includes the development of the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex and subsequent Record of Decision. The process has included NEPA Scoping with public comment, DOE-HQ review, issuance of the ROD, and the development of a draft Supplement Analysis based on the results of the project fit study. Evolving project design is expected to be evaluated against bounding conditions established in the SWEIS.

Waste Management Plan for the Uranium Processing Facility (U) (PL-PJ-801768-A010) identifies the waste streams that will be generated by UPF and defines the treatment, storage, and disposal path for each stream in accordance with regulatory requirements, with an emphasis on minimizing the generation rates and maximizing the diversion rates for all categories of waste. During the construction phase, the Waste Management Plan (WMP) is supplemented by *Construction Waste Management Plan for the Uranium Processing Facilit*y (PL-SH-801768-A002), which addresses requirements of *Federal Leadership in Environmental, Energy, and Economic Performance* (Executive Order 13514).

The UPF project has integrated 10 CFR 851 into project execution through implementation of *B&W Y-12 10 CFR Part 851 Worker Safety and Health Program*, (Y73-004PD). This includes emphasis on the following essential elements to ensure industrial safety and occupational health:

- Management responsibilities and worker rights
- Hazard identification and assessment
- Hazard prevention and abatement
- Safety and health standards
- Functional area responsibilities
- Training and information
- Recordkeeping and reporting

The UPF project maintains an effective safety program to achieve the program's target of zero accidents; work will not be conducted until adequate safety controls are in place. The UPF Safety Program is consistent with the requirements of federally mandated regulations, Y-12 policies, applicable DOE orders, and *B&W Y-12 Safety Program* (Y73-001). All UPF activities are expected to adhere to *Environment, Safety, and Health Policy* (Y72-001) which is implemented through the application of the guiding principles of the Y-12 ISMS. During the construction phase of the project, supplemental guidance is provided by *Construction Environment, Safety, and Health Plan for the Uranium Processing Facility* (PL-CM-801768-A004).

The UPF project also maintains an Industrial Hygiene Program to provide a work environment conducive to the health and wellbeing of employees and subcontract personnel through the anticipation, recognition, evaluation, and implementation of recommended controls for chemical, physical, biological, and ergonomic stresses associated with the design and construction phases of the UPF project. In providing this support, the project will solicit expertise from the Y-12 Industrial Hygiene organization, which provides SMEs and technical support in the areas of industrial hygiene, demolition, construction, and maintenance support.

4.6 SAFEGUARDS AND SECURITY

As an integral part of project planning and execution, safeguards and security (S&S) will be considered and incorporated into all project phases. S&S establishes the parameters of physical security concerning access control, intrusion alarms, construction of vaults, property protection features, operational security (OPSEC), nuclear materials control and accountability (NMC&A), and architectural surety built into the facility. An ICD will be developed to document the relationship between the UPF S&S organization and the CNS Y-12 S&S organization.

Safeguards and security requirements for UPF have been addressed early in the project, and along with safety, quality, and environmental protection, will be integrated throughout all project phases. *Life-cycle Cost Analysis and Overall System Engineering* will identify S&S requirements and costs during project planning. As part of that process, S&S standards and requirements are incorporated into the design criteria, specifications, and drawings. Construction and testing will address and confirm S&S design requirements, which also affect other components of the execution plan, such as emergency preparedness planning, communications, and procurement planning.

The UPF project is committed to implementing Integrated Safeguards and Security Management (ISSM) methodology across all project functions that affect safeguards and security. This methodology ensures that the scope of work is well defined, security risks are analyzed, and measures are developed and implemented to ensure that security risks are mitigated. This methodology also includes feedback and a continuous improvement process.

The project's security objectives are documented in *Security Objectives for the Proposed Uranium Processing Facility (U)* (RP-PJ-801768-A004). ISSM requirements are summarized in *Determination of the Security Requirements for the Uranium Processing Facility (U)* (FR-PE-801768-A002), which incorporates a *Security Interests Evaluation Checklist, and NMC&A Requirements for the Uranium Processing Facility* (FR-PE-801768-A001). *Security Design Strategy for the Uranium Processing Facility (U)* (SGS-ST-801768-A001) describes the project's security strategy, which includes engineered controls, designed-in active and passive delays, and protected engagement capabilities to produce a robust and cost-efficient protection posture separated from routine operations.

4.7 PERFORMANCE REPORTING

The UPF project participates in a web-based performance metrics system, monitoring performance through site-level metrics. The Project manager ensures performance data are analyzed, identifying leading indicators, and that the metrics are systematically updated using the best available information. The Project Manager also conducts causal analyses of negative performance data and develops corrective actions to improve performance. The UPF project implements the requirements in *Y-12 Performance Metrics Program* (Y15-908PD) for the performance metrics process.

4.8 CONTRACTOR ASSURANCE

Implementation of Department of Energy Oversight Policy (DOE O 226.1B) requires contractors to develop and implement comprehensive assurance programs. The CNS Y-12 Contractor Assurance System is described in *Contractor Assurance System* (Y15-906PD). The UPF project participates in the Y-12 system's assessment and corrective action processes through assessment schedule development, implementation, issues identification, corrective actions development, implementation and verified completion, and effectiveness determinations.

4.8.1 Assessments

The UPF project implements an assessment plan and schedule that centers on rigorous, risk-based, credible self-assessments resulting in feedback used for continued improvement. The assessment plan and schedule include independent assessments which could be led by other M&O organizations, internal assessments which could be led by QA, external assessments, management assessments which generally are led by UPF project leads/managers, surveillances, and assessments by walk downs. The UPF project assessment schedule includes assessments by each UPF functional organization to evaluate requirements implementation and corrective actions; the assessment schedule is developed annually.

Surveillances are conducted as prescribed in *Surveillance* (Y15-909) Audits are conducted as prescribed in *Conduct of Uranium Processing Facility Internal Quality Assurance Audits* (Y60-95-801), Management and independent assessment programs are implemented per *Management Assessment* (Y15-902) , and *Independent Assessment Program* (Y15-903).

4.8.2 Event Reporting

The Contractor Assurance System includes incident/event reporting processes identifying issues and also reporting, analyzing, and addressing operational events, accidents, and injuries. These issues and events will be reported and investigated promptly and thoroughly, including cause identification and resolution, and management and programmatic weaknesses, and will be distributed as Lessons Learned when appropriate.

4.8.3 Feedback

The UPF project solicits worker feedback or suggestions on work definition effectiveness, hazard analysis and controls, and implementation for all work activity types. Some of the established site-wide programs and processes available to workers are the Employee Concerns Program, telephone or intranet for reporting concerns or questions, pre-job briefs, worker job hazard walk-downs prior to work, post-job reviews, employee suggestion forms, safety meetings, critiques and related investigations, employee participation in teams, committees and working groups, and labor organization input.

4.8.4 Issues Management

The UPF project documents, tracks, and resolves issues identified during management assessments, UPO reviews, independent assessments, reportable or non-reportable events, external assessments, and other reviews including lower-level assessments, and safeguards and security assessments. The responsible UPF managers ensure corrective actions address each problem's causes and extent of condition and are planned, implemented, and verified as effective. Issues are tracked using the Issues Management System database. Closure of issues are communicated to the effected organizations. Functional area codes are assigned to issues that are managed using a graded approach as prescribed in *Issues Management* (Y15-312). The UPF project manages UPF issues as identified above through the UPF Internal Review Board (IRB).

4.8.5 Lessons Learned

The UPF project develops, implements, and participates in a lessons learned program as described by *Lessons Learned Program* (Y15-331). The project uses the formal Y15-331 process for identifying applicable lessons learned from external and internal sources—taking necessary corrective and preventive actions, disseminating lessons learned to targeted audiences, and ensuring that lessons learned are understood and applied. An automated database is used to capture potential lessons learned, record the results of the screening, assign responsibility for resolution, identify closure actions, and track progress until closure. Periodic reports are issued as requested by project management. Metrics are published monthly.

At the completion of a phase of the project, a UPF lessons learned report will be prepared, distributed, and placed in the project records. Following CD-2 approval, lessons learned on up-front planning and design will be documented and issued as required by DOE O 413.3B. A final report will be a compilation of the lessons learned during the course of the project plus any lesson identified in a project critique at the conclusion of the project.

4.9 SIX SIGMA

The UPF project will be executed with a continuous focus on identifying opportunities to improve and streamline processes, which will result in improved efficiencies, reduced schedule, and cost reductions. This savings program is founded upon the organizational and methodological principles of the Six Sigma program. Six Sigma relies on the integration of organization with management and execution, in the same way that EVMS relies on the integration of OBS and WBS.

The UPF project established annual goals for the identification and execution of savings opportunities. Progress in meeting these targets are included in the Monthly Project Status Report. Actionable

improvement opportunities resulting from the Six Sigma program are incorporated into the existing UPF processes and procedures to allow for improvements to be leveraged throughout the project.

5. RISK MANAGEMENT

The UPF project uses a disciplined approach to risk identification and management of technical and programmatic (T&P) risks as well as project schedule and cost risks. Achieving risk reduction is an integral part of setting priorities, sequencing project work, and responding to the most serious risks first.

UPF project T&P risks are managed in accordance with *Uranium Processing Facility Risk Management Plan* (RA-PJ-801768-A001) supported by procedure, *UPF Risk and Opportunity Management Process* (Y13-95-009). The Risk Management Plan (RMP) establishes the process for identifying and assessing probabilities and consequences as well as handling and managing risks that could potentially jeopardize successful completion of UPF. Implementation of the RMP ensures that the UPF project identifies and incorporates appropriate, efficient, and cost-effective measures to handle project risks, including both threats and opportunities.

As directed in the RMP, the project team has instituted an ongoing process for identification and assessment of potential T&P risks. A risk screening questionnaire has been developed to aid in the identification of risks (RMP, Appendix A). Identified risks are maintained in a UPF-developed Risk Register, an automated database for tracking and reporting risks and their handling strategies and action items. The register is a menu driven tool for managing threats and opportunities and has the capability for multiple users to access information simultaneously.

In the Risk Register, the evaluator/owner determines an overall risk score by pairing probability with consequence, using the matrix shown in Fig. 2. One of four handling strategies is then identified for each risk—Accept, Transfer, Mitigate, or Avoid. Mitigate or Avoid require action items to implement the handling strategies; each action item is assigned to an individual and is tracked to closure. Residual risk is then determined, with the potential schedule and cost impacts estimated to remain after the handling strategies are fully implemented by the action items. Risk triggers are designated and entered into the project schedule to identify when and if a risk is realized.

CNS will develop an Enterprise Risk Management program and once the reporting requirements are identified, UPF will modify the current UPF reports to provide input into the enterprise reports. The UPF project plans to migrate to a process in line with the Enterprise Risk Management program. This migration is included in the list of activities included in Appendix C, Phase III.

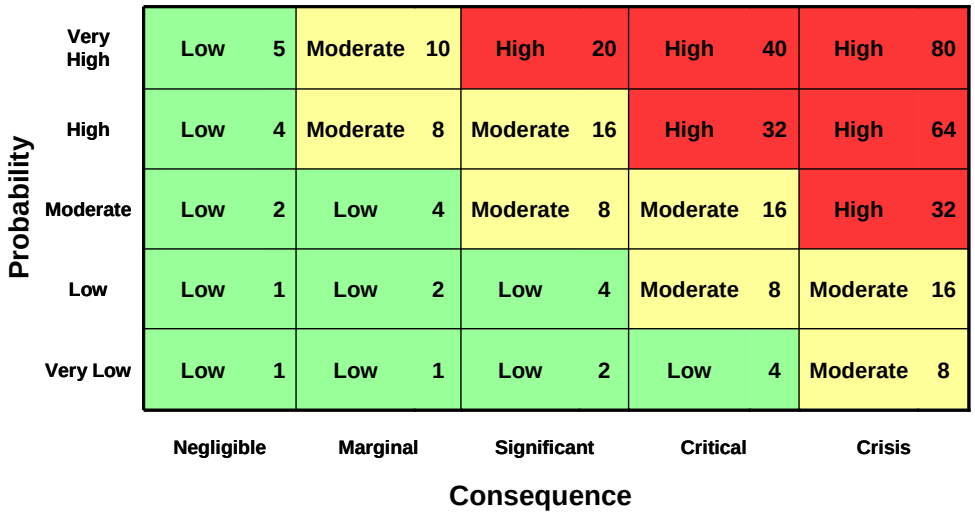

Fig. 2 Threat grading matrix.

Risks, both threats and opportunities, are formally documented in *Uranium Processing Facility Risk Analysis Report* (RP-PC-801768-A016), which provides detailed discussion on how the risk assessments were conducted and the results, including T&P risk contingency that is input to cost and schedule estimates. The Risk Analysis Report (RAR) is periodically updated as existing risks are updated or closed and new risks are identified. While the Risk Register is constantly maintained, the RAR is updated as needed, at a minimum at each CD request.

ACRONYMS, ABBREVIATIONS, & INITIALISMS

3-D	three-dimensional
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
B&R	budget and reporting
BAC	budget at completion
BBS	behavior based safety
BCCB	Baseline Change Control Board
BCP	baseline change proposal
BOE	basis of estimate
BSII	Bechtel Systems and Infrastructure Inc.
CAM	Control Account Manager
CD	Critical Decision
CM	Configuration Management
CNS	Consolidated Nuclear Security, LLC
CORR	Contractor Operational Readiness Review
DAR	Design Authority Representative
DMC	Document Management Center
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
EEP	Engineering Execution Plan
EPPR	Engineering Progress and Performance Reporting
ES&H	environment, safety, and health
ESAAB	Energy Systems Acquisition Advisory Board
EU	enriched uranium
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FY	fiscal year
HEU	highly enriched uranium
HEUMF	Highly Enriched Uranium Materials Facility
ICD	Interface Control Document
IMP	Integrated Management Plan
IPT	Integrated Project Team
ISMS	Integrated Safety Management System
ISSM	Integrated Safeguards and Security Management
KASE	Key Activities for Successful Execution
LI	line item
M&O	management and operating
NCS	nuclear criticality safety
NEPA	National Environmental Policy Act
NMC&A	nuclear materials control and accountability
NNSA	National Nuclear Security Administration

OAPM	Office of Acquisition and Project Management
OPC	other project cost
ORR	Operational Readiness Review
OPSEC	Operations Security
PED	project engineering and design
PEP	Project Execution Plan
PMB	performance measurement baseline
PMP	Project Management Plan
PRD	Program Requirements Document
QA	quality assurance
RA	Readiness Assessment
RAM	Responsibility Assignment Matrix
RAR	Risk Analysis Report
RMP	Risk Management Plan
ROM	Rough order of magnitude
S&S	Safeguards and Security
SCWE	safety conscious work environment
SME	subject matter expert
SRD	Systems requirement document
S/RID	Standards/Requirements Identification Document
SSC	structure, system, or component
SSSC	safety structure, system, or component
SWEIS	Site-Wide Environmental Impact Statement
T&P	technical and programmatic
TCCB	Technical Change Control Board
TEC	total estimated cost
TPC	total project cost
UPF	Uranium Processing Facility
UPO	UPF Project Office
WBS	work breakdown structure
WMP	Waste Management Plan
Y-12	Y-12 National Security Complex

APPENDIX A: References

CE-PC-801768-A008, *Uranium Processing Facility FY 2010 Total Project Cost Estimate Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, January 2010.

DE-PE-801768-A001 – A050, *Uranium Processing Facility Design Criteria (U)*, B&W Technical Services Y-12, Y-12 National Security Complex.

DOE 413.3B, *Program and Project Management for the Acquisition of Capital Assets,* U.S. Department of Energy, Washington D.C., November 2010.

DOE G 420.1-1A, *Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for use with DOE O 420.1, Facility Safety,* U.S. Department of Energy, Washington, D.C., December 2012.

DOE O 414.1D, Admin Chg. 1, *Quality Assurance*, U.S. Department of Energy, Washington, DC, May 2013.

DOE/EIS-0309, *November 2001 Site-side Environmental Impact Statement for the Y-12 National Security Complex*

DOE-STD-1073-2003, *Configuration Management*, U.S. Department of Energy, Washington, D.C., October 2003.

DOE-STD-1189-2008, *Integration of Safety into the Design Process,* U.S. Department of Energy, Washington, D.C., March 2008.

DOE-STD-3006-2010, *Planning and Conduct of Operational Readiness Reviews (ORR)*, U.S. Department of Energy, Washington, D.C., 2010.

DOE-STD-3007-2007, *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Nonreactor Nuclear Facilities,* U.S. Department of Energy, Washington, D.C., February 2007.

DOE/EIS-0309, *Final Site-wide Environmental Impact Statement for the Oak Ridge Y-12 Plant*, November 2001.

DOE/EIS-0387, *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex*, February 2011.

DOE/ORO-2169, *Enriched Uranium Manufacturing Facility Mission Need Statement*, Y-12 Site Office, National Nuclear Security Administration, October 2004.

DOE/ORO-2171, *Uranium Processing Facility Program Requirements Document*, Rev. 5, National Nuclear Security Administration, November 2013.

EXECUTIVE ORDER 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, October 2009

FR-CS-801768-A001, *Nuclear Criticality Safety Design Considerations for the Uranium Processing Facility*, BWXT Y-12, Y-12 National Security Complex, September 2005.

FR-PE-801768-A001, *NMC&A Requirements for the Uranium Processing Facility,* BWXT Y-12, L.L.C., Y-12 National Security Complex, February 2005.

FR-PE-801768-A002, *Determination of the Security Requirements for the Uranium Processing Facility (U),* BWXT Y-12, L.L.C., Y-12 National Security Complex, January 2006.

NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications* (NQA-1), Parts I and II, including NQA-1a-2009, *Addenda to ASME NQA-1–2008 Quality Assurance Requirements for Nuclear Facility Applications*.

PL-CM-801768-A001, Rev. 4, *Construction Management and Execution Strategy for the Uranium Processing Facility,* B&W Technical Services Y-12, Y-12 National Security Complex, March 2013.

PL-CM-801768-A004, *Construction Environment, Safety, and Health Plan for the Uranium Processing Facility,* B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

PL-EG-801768-A001, *Uranium Processing Facility Engineering Test Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

PL-MA-801768-A001, *Uranium Processing Facility Maintenance Execution Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, November 2010.

PL-PE-801768-A002, *Engineering Execution Plan for the Uranium Processing Facility Project*, B&W Technical Services Y-12, Y-12 National Security Complex, August 2011.

PL-PJ-801768-A001, *Document Control and Records Management Plan for the Uranium Processing Facility Project*, B&W Technical Services Y-12, Y-12 National Security Complex, January 2011.

PL-PJ-801768-A004, *Quality Assurance Plan for the Uranium Processing Facility*, B&W Technical Services Y-12, Y-12 National Security Complex, April 2013.

PL-PJ-801768-A006, *Uranium Processing Facility Project, Project Execution Plan*, NNSA Y-12 Site Office, Y-12 National Security Complex, April 2012.

PL-PJ-801768-A007, *Uranium Processing Facility Environment, Safety, and Health Plan (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

PL-PJ-801768-A009, *Uranium Processing Facility Commissioning Management Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

PL-PJ-801768-A010, *Waste Management Plan for the Uranium Processing Facility (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, February 2010.

PL-PJ-801768-A016, *Value Management Plan for the Uranium Processing Facility*, B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

PL-PJ-801768-A017, *Systems Engineering Plan for the Uranium Processing Facility,* B&W Technical Services, Y-12, Y-12 National Security Complex, March 2010

PL-PJ-801768-A020, *B&W Y-12 Acquisition Plan for the Uranium Processing Facility*, BWXT Y-12 L.L.C., Y-12 National Security Complex, December 2011.

PL-PJ-801768-A027, *Uranium Processing Facility Concept of Operations Plan (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, May 2013.

PL-PM-801768-A029, *Uranium Processing Facility Long-Lead/Bulk Procurements and Site Preparation Execution Plan*, NNSA Production Office, National Nuclear Security Administration, draft.

PL-PR-801768-A001, *Uranium Processing Facility Project Procurement Automation Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, November 2008.

PL-PR-801768-A002, *Uranium Processing Facility Project Procurement Execution Plan*, B&W Technical Services Y-12, Y-12 National Security Complex, February 2013.

PL-RM-801768-A001, *UPF Code of Record*,

PL-SH-801768-A001, *Environmental Regulatory Permitting Plan for the Uranium Processing Facility*, B&W Technical Services Y-12, Y-12 National Security Complex, December 2009.

PL-SH-801768-A006, *Nuclear Safety Culture Plan,* B&W Technical Services Y-12, Y-12 National Security Complex, September 2009

PL-SH-801768-A002, *Construction Waste Management Plan for the Uranium Processing Facility,* B&W Technical Services Y-12, Y-12 National Security Complex, January 2011.

PSVR-PM-801768-A002 (PSVR-9226-R0), *Preliminary Safety Validation Report for the Uranium Processing Facility (Building 9226) Preliminary Safety Design Report September 2012, NNSA Production Office, National Nuclear Security Administration*, February 2013 (approval transmitted by COL-NNSA-YSO-PM-801768-A216, March 6, 2013).

RA-PJ-801768-A001, *Uranium Processing Facility Risk Management Plan,* B&W Technical Services Y-12, Y-12 National Security Complex, June 2013.

RA-PJ-801768-A002, *Uranium Processing Facility Risk Analysis Report*, B&W Technical Services Y-12, Y-12 National Security Complex, July 2010.

RP-EF-801768-A004, *Preliminary Safety Design Report for the Uranium Processing Facility (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, September 2012.

RP-PA-801768-A001, *Scope Book for the Uranium Processing Facility Project*, B&W Technical Services Y-12, Y-12 National Security Complex, May 2010.

RP-PJ-801768-A015, *Uranium Processing Facility Material Assignment Schedule*, B&W Technical Services Y-12, Y-12 National Security Complex, May 2012.

SGS-ST-801768-A001, *Security Design Strategy for the Uranium Processing Facility (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, December 2007.

SR-PE-801768-A001, *Systems Requirements Document for the Uranium Processing Facility Project (U)*, B&W Technical Services Y-12, Y-12 National Security Complex, June 2013.

TBIS-EG-801768-FAC-A001, *Technical Basis Index Summary* B&W Technical Services Y-12, Y-12 National Security Complex September 2013

WBS-PC-801768-A001, *Uranium Processing Facility Project WBS Dictionary,* B&W Technical Services Y-12, Y-12 National Security Complex, June 2012.

WBS-PC-801768-A002, Uranium Processing Facility Work Breakdown Structure, B&W Technical Services Y-12, Y-12 National Security Complex June 2013

WP-PC-801768-A001, *Critical Decision Path Forward for the Uranium Processing Facility Project*, B&W Technical Services Y-12, Y-12 National Security Complex, August 2012.

WP-PM-801768-A007, *DOE O 413.3B Implementation Plan for the UPF Project*, B&W Technical Services Y-12, Y-12 National Security Complex, October 2012.

Y13-87-202, *Work Breakdown Structure, Control Accounts and Work Authorization,* B&W Technical Services Y-12, Y-12 National Security Complex, January 2011.

Y13-87-203, *Project Baseline Development*, B&W Technical Services Y-12, Y-12 National Security Complex, April 2011.

Y13-87-206, *Trends Identification, Analysis and Reporting,* B&W Technical Services Y-12, Y-12 National Security Complex, May 2012.

Y13-87-207, *Project and Baseline Change Control for Multi-year Projects,* B&W Technical Services Y-12, Y-12 National Security Complex, October 2012.

Y13-95-009, *UPF Risk and Opportunity Management Process,* B&W Technical Services Y-12, Y-12 National Security Complex, March 2010.

Y13-95-800, *UPF Code of Record Impact Assessment*, B&W Technical Services Y-12, Y-12 National Security Complex, September 2013.

Y15-004PD, *Configuration Management Program*, B&W Technical Services Y-12, Y-12 National Security Complex, November 2009.

Y15-009, *Criteria for Application of Y-12 Configuration Management Program* B&W Technical Services Y-12, Y-12 National Security Complex, June 2010

Y15-95-005, *Technical Change Control Process for the UPF Project*, B&W Technical Services Y-12, Y-12 National Security Complex, June 2013.

Y15-95-910, *Commercial Grade Dedication Packages for the UPF Project*, B&W Technical Services Y-12, Y-12 National Security Complex, July 2011.

Y15-101, *Records and Controlled Documents,* B&W Technical Services Y-12, Y-12 National Security Complex, May 2012.

Y15-312, *Issues Management Process*, B&W Technical Services Y-12, Y-12 National Security Complex, March 2013.

Y15-331, *Lessons Learned Program,* B&W Technical Services Y-12, Y-12 National Security Complex, June 2009.

Y15-635PD, *B&W Y-12 Integrated Safety Management,* B&W Technical Services Y-12, Y-12 National Security Complex, June 2012.

Y15-903, *Independent Assessment Program*, B&W Technical Services Y-12, Y-12 National Security Complex, October 2010.

Y15-906PD, *Contractor Assurance System*, B&W Technical Services Y-12, Y-12 National Security Complex, January 31, 2011.

Y15-909, *Surveillance*, B&W Technical Services Y-12, Y-12 National Security Complex, July 2012.

Y17-011, *Startup Testing Program Manual,* B&W Technical Services Y-12, Y-12 National Security Complex, September 2012.

Y17-69-351PD, *Evaluation Process for Use of National Consensus Codes and Standards,* B&W Technical Services Y-12, Y-12 National Security Complex, May 2012.

Y60-101PD, *Quality Assurance Program Description*, B&W Technical Services Y-12, Y-12 National Security Complex, May 3, 2012.

Y73-004PD, *B&W Y-12 10 CFR Part 851 Worker Safety and Health Program*, B&W Technical Services Y-12, Y-12 National Security Complex, May, 2011.

Y/MOD-105, *Enriched Uranium Transition Plan (U)*, B&W Technical Services Y-12, Y-12 National Security Complex.

APPENDIX B: KEY MEMBER RESPONSIBILITIES

Significant responsibilities for the key members of the UPF team are included below.

Project Director/Deputy Project Director

The UPF Project Director integrates support of the Prime Contracts, ES&H and Strategic Planning with the UPF Project Manager's execution of the project. The Project Director is the primary point of contact to the CNS IPT in the areas of Operator's Representative, Design Authority, ES&H, Security, Production and Maintenance, etc.

The Project Director's responsibilities include:

- Overall responsibility for the UPF project to meet all requirements.
- Integrating roles and responsibilities of the overall project organization.
- Ensuring effective communication of programmatic needs and that those needs are successfully integrated into the planning, development, and execution of the UPF project.
- Acting as a primary interface with NNSA and CNS Y-12 peer organizations.
- Acting as the point-of-contact for the Defense Nuclear Facilities Safety Board (DNFSB) and other external stakeholders for UPF.
- Approving UPF budget changes and concurring with baseline change proposals (BCPs).
- Overseeing the Level 3 Baseline Change Control Board (BCCB).
- Approving Performance-Based Incentive (PBI) and Performance-Based Objective (PBO) proposals.
- Serving as the primary project interface with CNS Y-12 senior management and corporate management.

Manager of Strategic Planning

The Manager of Strategic Planning is responsible for the management of long range project planning, the CD process and development of the proposed project baseline. This role involves significant coordination with the Project manager, who is responsible for accomplishing and delivering the project in accordance with the established interim and final baseline. Responsibilities of this manager include:

- Assisting in the preparation of this PMP and other project management documents
- Leading planning efforts and alternatives analysis to determine path forward
- Developing a proposed CD strategy that accommodates the design and safety basis schedule
- Interfacing with NNSA UPO to gain support and approval of the CD strategy
- Coordinating all necessary activities to ensure timely development of the project baseline
- Implementing internal and external reviews to ensure adequacy of the baseline
- Ensuring complete and timely submittal of the CD request packages
- Reviewing, planning, assisting with, and ensuring consistency of submittal documents
- Along with other members of the UPF team, the Manager of Strategic Planning interfaces with the customer to plan and facilitate execution of the project

Prime Contract Manager

The Prime Contracts Manager for UPF is responsible for the interface of project contracting actions between the project and the customer contracts officer, procurement and sub-contract department and the CNS prime contracts organization. Primary responsibilities include:

- Interface with the CNS prime contract organization in the identification of the UPF contract baseline, terms and conditions, specifications, estimates and schedule
- Identify areas of risk and opportunities and assist in the development of the risk mitigation plans
- Development and implementation of the contract management program for the project consistent with the prime contract requirements
- Establish a change control process and procedure
- Coordinate with the other project team members to identify customer related actions
- Prepare negotiation positions and strategies for management approval. Lead negotiation teams and manage negotiations
- Ensure that subcontracts and other procurement actions contain appropriate flow down of prime contract terms and facilitate organizational interfaces between those performing subcontract formation and administration
- Participate in related meetings with Engineering, Construction, Procurement and Project Controls to ensure awareness of all project activities, Identify opportunities for cost/schedule enhancements, take appropriate actions to improve performance and ensure compliance with prime contract terms and conditions
- Conduct regular scheduled meetings with the customer contracting officer to ensure a full understanding of all parties of the contracting actions in development and coordinate any actions requested
- Manage the handling of the prime contract closeout activities and participate in the closeout of subcontracts and procurements
- Coordinate the development and delivery of project training to address contract management principles, subcontract formation and administration and identification and resolution of claims

Project Manager/Deputy Project Manager

The Project Manager/Deputy Project Manager is responsible for managing the day-to-day Project Engineering Design (PED) leading to project authorization. The PED effort includes engineering as well as the other project functions shown on Figure 1. The PM is also responsible for participating, reviewing, approving, and executing the project for which the interim and eventual baselines have been prepared and later approved by UPO and NNSA. This position reports to the CNS Project Director. Primary responsibilities include:

- Define project team roles, responsibilities, and staffing assignments
- Maintain and approve the PED and project execution organization chart
- Establish, maintain, control, and report scope and budgeted cost, and schedule performance baselines that are consistent with project funding
- Establish cost and schedule contingencies that are commensurate with the project owner's acceptable risk level for the project

- Establish the safety and quality environment for the project
- Review and approve project plans and procedures
- Interact with UPO and CNS management, including through the Change Control Board, and the Integrated Project Team
- Interface with Y-12 Mission Engineering for design authorization, safety engineering, and requirements & surveillance activities.
- Meet applicable federal and state laws and regulations and applicable CNS and UPO standards and requirements
- Own the corrective management process
- Establish overall expectations for effective implementation of the quality assurance program
- Ensure that personnel responsible for verifying quality achievement (e.g., quality assurance and quality control personnel) have sufficient authority, direct access to management, organization freedom, and access to work to perform their function
- Implement Configuration Management, Quality Assurance, Integrated Safeguards and Security Management, and Integrated Safety Management

Environmental, Safety, and Health Manager

The UPF ES&H Manager ensures environment, health, and safety issues are addressed throughout the project, as well as operations, and has the following responsibilities:

- Establishing ES&H requirements that are consistent with the scope of the project and method of accomplishment in the areas of environmental compliance, industrial safety, industrial hygiene, radiological control, and waste management.
- Implementing the project safety program, including National Environmental Policy Act (NEPA) compliance, ISM, licensing and permitting activities, waste minimization and pollution prevention initiatives, construction and industrial safety oversight, hazard classification determination, safety assessment documentation and safety analysis reports, and integration of ES&H factors into preliminary and final design, installation, commissioning, and operations.
- Coordinating participation for integrated hazard evaluation studies and developing non-nuclear lines of evaluation for studies.
- Coordinating and interfacing with the ongoing Site-Wide Environmental Impact Statement update for the Y-12 site.
- Serving as the ES&H point-of-contact with the customer and Project Manager.
- Assisting in the implementation of planning and project execution, including definition of program requirements.
- Providing oversight to ascertain that program and project requirements are being met.
- Managing the environmental permitting process.
- Establishing waste management requirements for the project and ensuring waste management plans are prepared.

Quality Assurance Manager

UPF Quality Assurance is responsible for establishing the programmatic quality requirements and measures that are used to ensure that UPF project requirements are met. The QA Manager has the following responsibilities:

- Managing project QA, Quality Engineering, and Contractor Assurance activities from design through readiness.
- Conducting programmatic assessments of quality applications.
- Providing programmatic, procedure, and quality direction to the Procurement Quality, and Construction Quality Controls Managers/Supervisors and Leads.
- Participating in development and review of project documentation.
- Participating in the resolution of quality-related issues.
- Providing direction relative to internal audits, quality assessments and surveillances, and quality direction to procurement activities (e.g., level of quality involvement, supplier evaluations, supplier audits, supplier surveillance, receipt inspection, warehousing, and waivers/deviations).
- Developing and maintaining the project QA Plan.

Technology Manager

The Technology Manager has overall authority and responsibility for technology demonstration and insertion. This Manager fills the key role for physical realization of the selected technologies and has responsibility for implementing plans for achieving technology development activities. The Technology Manager's responsibilities and authorities include:

- Recommending UPF baseline technologies.
- Evaluating potential emerging technologies and recommending additions to the UPF baseline technologies.
- Identifying alternatives for modernization of equipment and advanced technologies.
- Providing input on technologies to facility and equipment design throughout the project's life cycle.
- Providing management of UPF technology development planning and ensuring activities are properly defined, controlled, and executed in accordance with individual technology development tasks.
- Leading the definition and prioritization of technology development tasks supporting UPF.
- Interface with Y-12 Mission Engineering on UPF relevant technology development projects and technology evaluations.
- Monitoring progress and effecting corrective action, where necessary, to resolve problems and conflicts that affect technology development tasks.
- Providing interface and coordination with the Campaigns Program to ensure technology development tasks are properly budgeted, authorized, and reported.
- Coordinating integration of the technology development activities schedule with the UPF project schedule.
- Providing periodic status reports for technology development.
- Coordinating transfer of development requirements with Engineering and communication of process design changes to Development.
- Coordinating and interfacing with the Design Agencies for technology development.
- Leading the Technology Readiness Assessment process and tracking the maturity level of technologies before insertion into the project baseline.
- Providing Information Technology development activities and transferring technology development data and information to Engineering for incorporation of Information Technology concepts and systems into the UPF design.

APM (s) Sub-Projects

During the execution of UPF, some elements of scope such as the site infrastructure and selected buildings will be executed as sub-projects. An Assistant Project Manager will be assigned under the direction of the Project Manager. The responsibility of the APM is:

- Define the scope of work to be performed
- Define project team roles and responsibilities
- Coordinate with the functional managers to have team members assigned
- Execute and report to defined cost and schedule budgets
- Establish safety and quality objectives
- Daily manage the project
- Prepare sub-project closeout activities as required

Project Controls Manager

The UPF Project Controls Manager has the following responsibilities:

- Implements the tools and systems necessary to effectively and actively manage, control, and report on cost and schedule for concurrent projects tasks.
- Collects performance data (installed quantities, expended labor hours, and other progress measurements for direct-hire and subcontract work).
- Interfacing with the CNS Y-12 Chief Financial Officer to ensure reconciliation of project costs with Y-12's financial systems and for the preparation and submittal of annual budget documents.
- Directing integrated cost engineering, cost estimating, cost analysis/control, and planning/scheduling activities.
- Ensuring all integrated project controls tools and systems are compliant with American National Standards Institute (ANSI) Standard 748B, *Standard for Earned Value Management Systems (EVMS)*, and DOE O 413.3B.
- Providing functional direction including approval of the integrated project controls tools being used by the Engineering Project Controls Lead and the Construction Project Controls Lead.
- Directing the preparation and presentation of project estimates and cost forecasts.
- Supporting project organizational and administrative activities.
- Reviewing contract drafts to ensure they include adequate cost and scope definition and meet project controls requirements.
- Developing BCPs, as needed.
- Establishing useful forecasting and predictive tools, procedures, and processes.
- Ensuring effective trend management.
- Serving as a member of the Level 3 BCCB.
- Developing and maintaining an integrated WBS and schedule that encompasses all project participants.

- Providing integrated EVMS services and tools for the preparation of the integrated plans, schedules, cost estimates, budgets, and status reports for all functional areas and ensuring that they correctly reflect the status of the actual and projected work.
- Serving as the owner of the integrated project controls tools.
- Preparing budget and funding documents.
- Providing support to the Project Manager and CAMs in managing the integrated project cost and schedule.
- Maintaining the WBS, WBS dictionary, and Code of Accounts.
- Preparing and maintaining the integrated project cost estimate and EAC, including coordinating with subcontractors in the generation of the project integrated EAC.
- Coordinating all project cost and schedule day-to-day efforts supported by the other Project Controls leads.
- Integrating trends and risk events into the project cost and schedule.

Business Services Manager

The UPF Business Services Manager has the following responsibilities:

- Coordinate/Supervise the scope of work and activities within O&AS, IT, Training and HR organizations.
- Establishing the requirements for project services and administrative support.
- Identifying and staffing project services and administrative support positions.
- Coordinating support services for the project.
- Integrating project automation.
- Providing document control services and records management.
- Providing lessons learned and issues management support.
- Managing the project's Price-Anderson Amendments Act compliance commitments, reporting and tracking commitments, and Occurrence Reporting Process responsibilities.

Manager of Engineering

Engineering for the UPF is executed by an Integrated Design Team (IDT) made up of engineers and multiple subcontractors with physical and functional interfaces between assigned work scopes. The Manager of Engineering has the following responsibilities:

- Managing the technical resources to control the technical adequacy of the engineering design process and ensuring integration and coordination of the technical basis development.
- Overseeing the integration and preparation of technical documents.
- Managing the planned work in accordance with established budgets and schedules
- Developing the technical documents and specifications necessary to support the Acquisition Plan.
- Ensuring the appropriate administrative controls are in place to manage outsourced design interfaces.
- Ensuring implementation of systems engineering functions.
- Supporting the Safety-in-Design Integration Team (SDIT) project engineering in fostering safety-in-design collaboration and integration between the IDT and SDIT support functional organizations.

- Maintaining a good working relationship with the DNFSB, in conjunction with the NPO, and coordinating frequent technical reviews with the board to facilitate open communications.
- Capturing and documenting quantities during the entire design effort and tracking quantity variance through design evolution.
- Ensuring the development of resource-loaded schedules for engineering activities with support from Project Controls.
- Managing technical change and risk, cost, and schedule assessments.
- Actively managing technical issues to resolution
- Ensuring that skilled engineering resources (internal or external) are provided to support the schedule.
- Monitoring progress and controlling the engineering scope, cost, and schedule.
- Ensuring that design reviews are conducted at critical project phases.
- Establishing the Design Control Checklist and obtaining critical peer review of Design Control Checklist deliverables.
- Developing alternate solutions and options to support project needs.
- Providing technical input for procurement of engineered equipment.
- Coordinating constructability reviews.
- Ensuring that design requirements and design output documents appropriately and accurately reflect the design basis.
- Transitioning the technical baseline responsibility to Y-12 Production at the end of the project.
- Serving as the integrator for facility design, facility safety, criticality safety, and fire protection engineering input and requirements.
- Serving as the Engineering point-of-contact with the customer and the Project Manager.
- Leading the Integrated Design Team (IDT).
- Supporting the Design Authority Representative (DAR) in the development of the technical baseline
- Serving as a WBS CAM as assigned by the Project Manager.
- Serving as a member of the Level 3 BCCB.
- Ensuring that design documents identify critical attributes and inspection requirements to ensure design is captured in as-built facility and systems.

Manager of Procurement

The UPF Manager of Procurement has overall responsibility for UPF project procurement operations, including the following responsibilities:

- Identifying staffing requirements.
- Defining the procurement objectives in support of the project goals.
- Providing BOA oversight through closeout.
- Managing the procurement work to meet the cost, schedule, and quality objectives of the UPF project.
- Overseeing purchasing and subcontracting day-to-day operations.
- Serving as a member of the Level 3 BCCB.

Manager of Construction

The UPF Manager of Construction is responsible for all activities at the construction site, facilitating the cooperation and coordination of all entities in the field, and ensuring the priority of safety throughout the construction phase.

Responsibilities include:

- Ensuring construction activities are conducted in a safe, disciplined manner.
- Establishing and managing cost and schedule baselines for construction activities.
- Coordinating constructability reviews using diverse construction subject matter experts, including field engineering reviews during preliminary and final design. This will include participation in three-dimensional (3-D) model reviews.
- Coordinating with Engineering to establish the issuing sequence of construction packages.
- Managing, directing, and accounting for construction forces, assigned subcontractors, and sub-tier subcontractors.
- Obtaining a qualified construction work force.
- Ensuring that field work and modifications meet design requirements.
- Ensuring that construction meets quality requirements.
- Executing construction activities within the cost, schedule, and scope parameters.
- Participating in the resolution of issues relating to constructability reviews and estimates.
- Ensuring that construction field testing and inspections are properly performed.
- Ensuring that requirements for project activities, including training, are clearly defined and met.
- Utilizing a family of curves depicting the design release, fabrication/delivery, and installation for each key bulk commodity (e.g. rebar, concrete, piping, conduit, and cable) to ensure meeting critical construction and pre-operational testing milestones. The relationship between engineering release, material delivery and construction installation for each commodity curve is reviewed to ensure that enough time is available for detailing, fabrication, and delivery to the jobsite to provide sufficient backlog to support construction.
- Monitoring productivity of subcontractors and direct-hire construction activities and initiating corrective actions, where necessary.
- Providing maintainability input throughout project modifications.
- Implementing the construction automation plan.
- Serving as a WBS CAM as assigned by the Project Manager.
- Serving as a member of the Level 3 BCCB.
- Serving as a member of the Commissioning team.

Manager of Startup

The UPF Manager of Startup directs and coordinates all startup activities during design, through construction, turnover, preoperational testing, and completion of cold operations and readiness activities. Responsibilities include the following:

- Assembling the startup team.

- Ensuring that the requirements associated with the CNS Y-12 operational readiness program per Y15-190, *Readiness Manual*, are met for this project.
- Directing and overseeing startup planning and the work scope defined in the startup schedule associated with the project.
- Developing and executing the UPF Project Commissioning Plan.
- Ensuring the scheduling and facilitating of the scoping meeting with NNSA.
- Ensuring development and update of the plan of action.
- Developing and implementing the UPF Engineering Test Plan.
- Providing for independent review of the evidence to provide verification of status and administrative content.
- Managing and coordinating the turnover process for UPF systems.
- Managing and coordinating the Startup preoperational test program.
- Providing coordination for cold operations activities.
- Assisting in the development and review of the Facility Startup Plan.
- Assisting in the development and review of facility staffing plans and providing feedback to the organizations relative to their ability to provide the personnel necessary to operate the facility.
- Planning remedial actions with Production for those activities and issues that do not support the readiness schedule.
- Ensuring assignment of qualified test engineers for post-construction testing supporting operator training and initial cold operations as required.
- Ensuring appropriate selection and training of operations personnel are completed before start of initial operations.
- Serving as a WBS CAM as assigned by the Project Manager.
- Serving as a member of the Level 3 BCCB.
- Serving as the Commissioning Authority.

APPENDIX C: PROJECT SPECIFIC PROCEDURES/PROCESSES

During the contract transition, the existing procedures will be "blue sheeted" for implementation by CNS. To enhance UPF execution and achieve efficiency through streamlined processes, the project will develop project specific execution procedures. These procedures will be developed in a phased approach. Phase 1 (July 1, 2014) will address a specific number of procedures in Engineering, Project Management, Quality Assurance, Procurement and Project Controls. During Phase I, selected procedures will be revised prior to the completion of the "blue sheeting" effort. These procedures will be "blue sheeted" as revised while the remaining Phase I procedures will be implemented on July 1. Phase II (November 2014) will focus on further enhancements to procedures in Engineering, Quality Assurance and Project Controls. Including the development of the Project Management UPO/UPF (Zipper Plan). Phase III will evaluate opportunities to revise procedures in Engineering, Procurement (incorporate corporate approved procurement system), Contractor Assurance (adopt project specific issue management and corrective action program), Quality Assurance (potential standalone Project Quality Assurance Plan (QAP)), Project Controls (transition to certified EVMS system), and inclusion of associated BSAPs.

Upon approval of a BNI Subcontract, further evaluation will be made of the procedures, processes and tools to determine the degree and methods of their conversion and/or addition/replacement and this PMP will be revised accordingly.

As stated in Section 2.1, the UPF project will be developing a suite of project specific procedures and processes in a phased approach. The following are the topics planned in each phase.

Phase I

Engineering

UPF Configuration Management Plan (Y15-95-004)

UPF Design Guides and Standards (Y15-95-805)

UPF Establishing & Maintaining the Technical Basis ((Y17-95-009)

UPF Design Criteria (Y17-95-69-304)

UPF Drawing Control (Y17-95-69-305)

UPF Design Analyses Calculations (Y17-95-69-307)

UPF Equipment Data Sheets (Y17-95-69-309)

UPF Equipment Specifications (Y17-95-69-310)

UPF Design Reviews (Y17-95-69-324)

UPF Design Verification (Y17-95-69-325)

UPF Engineering Studies (Y17-95-69-328)

UPF Engineering Procedure System (Y17-95-69-800)

UPF Systems Engineering Management Plan (Y17-95-69-803)

UPF Engineering Interface Control (Y17-95-69-804)

UPF Material Requisitions (Y17-95-821)

UPF Project Engineering Procedures Master Index (ML-EG-801768-Axxx)

UPF Hazardous Material Identification & Screening (Y74-95-801)

UPF Safety Basis Documents for Nuclear & PSM/RMP Facilities (Y74-95-802)

UPF Safety Basis Documents (Y74-95-803)

UPF Hazardous Identification and Screening to Support Development of a Hazard Evaluation Study (DG-EF-801768-A001)

UPF Hazardous Evaluation Study Process (DG-EF-801768-A002)

UPF Accident Analysis Process (DG-EF-801768-A003)

UPF System, Structure & Component Analysis (DG-EF 801768-A004)

UPF Safety Basis Documents (DG-EF-801768-A005)

Criticality Safety Approval/Requirements Development, Review & Approval (Y70-68-001)

Review of Documents Implementing Fissile Material Activities (Y70-68-007)

UPF Nuclear Criticality Safety Process Study Development (DG-EN-801768-A002)

Project Management

UPF Project Procedure System (Y15-95-235)

Quality Assurance

UPF Internal QA Audits (Y60-95-801)

Procurement

UPF Supplier Quality Manual (Y30-95-801)

Project Controls

Project Schedule (Y13-87-204)

Trends Identification, Analysis and Reporting (Y13-87-206)

Project and Baseline Change Control for Multi-year Projects (Y13-87-207)

Variance Analysis Reporting (Y13-87-210)

Project Control Tools Setup (40P-C030-00205)

Phase II

Engineering

UPF Commercial Grade Dedication Packages (Y15-95-910)

UPF Construction Specifications (Y17-95-69-300)

UPF Design Process (Y17-95-69-321)

UPF Seller Engineering and Quality Verification Documents (Y17-95-69-809)

UPF Equipment, Valve, Instrument, Line Lists (Y17-95-69-820)

UPF Value Engineering (Y17-95-69-8xxx)

UPF Engineering Document and Data Deliverables to Procurement, Construction & Startup (Y17-95-69-8xxx)

UPF Engineering Constructability (Y17-95-69-8xxx)

UPF Dispositioning of Non-Conformance Reports (Y17-95-69-8xxx)

UPF Dispositioning of Field Change Documents (Y17-95-69-8xxx)

UPF Subcontracting Engineering Work (Y17-95-69-8xxx)

UPF Supplier Deviation Disposition Requests (Y17-95-69-8xxx)

UPF Technical Services Contract (Y17-95-69-8xxx)

UPF Contracts and Subcontracts (Y17-95-69-8xxx)

UPF Bid Evaluations (Y17-95-69-8xxx)

UPF Specifying Supplier QA Program Requirements (Y17-95-69-8xxx)

UPF Evaluation of Supplier QA Programs (Y17-95-69-8xxx)

Quality Assurance

Graded Approach to Quality (Y60-015, Ch. 1.1)

Qualification and certification on ND Testing Personnel (Y60-015, Ch. 1.7)

Project Controls

Documentation in support of Project Baseline Development (Y13-87-006)

Project Controls Plan (40P-C030-00202)

Estimating Procedures (40P-C030-003XX)

Cost Control Procedures (40P-C030-004XX)

Planning and Scheduling Procedures (40P-C030-005XX)

Historical cost Report (40P-C030-00701)

Project Controls Quality Assessments (40P-C030-00902)

Project Management Processes

UPF/UPO Zipper Plan by August 1, 2014.

Phase III

Engineering

UPF System Verification and Plant Validation (Y17-95-69-806)

UPF System and Facility Specifications (Y17-95-69-807)

UPF Systems Analysis (Y17-95-69-808)

UPF Safety in Design Integration Team (Y17-95-810)

UPF Facility/System Design Description (Y17-95-69-315)

UPF Engineering Planning and Control

Project Controls

Transition to certified EVMS System

Risk and Opportunity Program

Procurement

Implementation of corporate approved procurement system prior to commencement of procuring long-lead items.

Contractor Assurance

Adopt project-specific issue management and corrective action program

Quality Assurance

Evaluate/develop Project Quality Assurance Plan (QAP)