DOE - EM - SRP - 2010
2nd Edition

Environmental Management

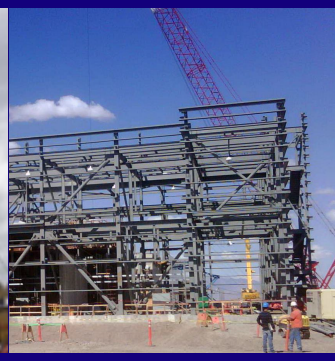
*Safety ▪ Performance ▪ Cleanup ▪ Closure*

# Standard Review Plan (SRP)

## Checkout, Testing, and Commissioning Plan Review Module







## Corporate Critical Decision (CD) Review and Approval Framework Associated with Nuclear Facility Capital and Major Construction Projects

March 2010

Office of Environmental Management
U.S. Department of Energy
Washington D. C. 20585

**OFFICE OF ENVIRONMENTAL MANAGEMENT**

**Standard Review Plan (SRP)**

# Checkout, Testing, and Commissioning Plan

**Review Module**

| Critical Decision (CD) Applicability | | | | | |
|---|---|---|---|---|---|
| **CD-0** | **CD-1** | **CD-2** | **CD-3** | **CD-4** | **Post Operation** |
| | | | ✓ | ✓ | |

**March 2010**

## FOREWORD

The Standard Review Plan (SRP)[1] provides a consistent, predictable corporate review framework to ensure that issues and risks that could challenge the success of Office of Environmental Management (EM) projects are identified early and addressed proactively. The internal EM project review process encompasses key milestones established by DOE O 413.3A, Change 1, *Program and Project Management for the Acquisition of Capital Assets*, DOE-STD-1189-2008, *Integration of Safety into the Design Process*, and EM's internal business management practices.

The SRP follows the Critical Decision (CD) process and consists of a series of Review Modules that address key functional areas of project management, engineering and design, safety, environment, security, and quality assurance, grouped by each specific CD phase.

This Review Module provides the starting point for a set of corporate Performance Expectations and Criteria. Review teams are expected to build on these and develop additional project-specific Lines of Inquiry, as needed. The criteria and the review process are intended to be used on an ongoing basis during the appropriate CD phase to ensure that issues are identified and resolved.

[1] *The entire EM SRP and individual Review Modules can be accessed on EM website at http://www.em.doe.gov/Pages/Safety.aspx , or on EM's internet Portal at https://edoe.doe.gov/portal/server.pt Please see under /Programmatic Folder/Project Management Subfolder.*

**TABLE OF CONTENTS**

**ACRONYMS**

| | |
|---|---|
| CD | Critical Decision |
| CP | Commissioning Plan |
| DEAR | Department of Energy Acquisition Regulation |
| DOE | Department of Energy |
| EM | Environmental Management |
| FPD | Federal Project Director |
| IST | Integrated System operational Testing |
| LOIs | Lines of Inquiry |
| QA | Quality Assurance |
| SB | Safety Basis |
| SMP | Safety Management Program |
| SOPP | Standard Operating Policies and Procedure |
| SRP | Standard Review Plan |
| SSC | Safety Class and Safety Significant |
| USQ | Un-reviewed Safety Questions |

# I. INTRODUCTION

This Checkout, Testing, and Commissioning Plan (CP) Review Module (EM) addresses the requirements and guidance of DOE O 413.3A, Change1, *Program and Project Management for Acquisition of Capital Assets;* DOE Acquisition Regulation (DEAR), 48 CFR 970.5223-1; DOE O 425.1C, *Startup and Restart of Nuclear Facilities*; DOE-STD-3006-2008, *Planning and Conduct of Operational Readiness Reviews (ORRs);* DOE-HDBK-3012-2008, *Guide to Good Practices for Readiness Reviews, Team Leader's Guide;* DOE O 226.1A, *Implementation of DOE Oversight Policy;* DOE O 414.1C, *Quality Assurance;* DOE P 450.4, *Safety Management System Policy*; DOE-STD-1189-2008, *Integration of Safety into the Design Process*; and EM-62 Standard Operating Policies and Procedure (SOPP) 47 and associated guidance.

Consistent with the Critical Decision-4 (CD-4) requirements of DOE O 413.3A, there are three interrelated activities that need to be performed prior to approval on start of operations. These include: 1) Checkout, Testing, and Commissioning Plan (or Commissioning Plan); 2) Readiness Review; and 3) Project Transition to Operations Plan.

This requirement is stated in DOE Order 413.3A:

> *When the project nears completion and has progressed into formal transition and commissioning, which generally includes final testing, inspection, and documentation, the project is prepared for operation, long-term care, or closeout. The nature of the transition and its timing depends on the type of project and the requirements that were identified subsequent to the mission need.*

DOE Order 413.3A further states:

> *All projects must have a project transition or closeout plan that clearly defines the basis for attaining initial or full operating capability or meeting performance criteria as required for project closeout, as applicable.*

This CP RM provides performance expectation and criteria for addressing checkout, testing and commissioning. Readiness Review and Project Transition to Operations Plan are addressed by separate Standard Review Plan (SRP) Review Modules.

For the purposes of this module, commissioning is the systematic process of assuring by verification and documentation from the design phase through integrated system testing and turnover. This is to ensure that all facility systems perform interactively in accordance with the design documentation and intent, and in accordance with operational needs including preparation of operation personnel. While the Commissioning Plan is a required element for CD-4, the commissioning and transition process must be initiated early in the project process for the transition to operations to occur efficiently. As a minimum, the Commissioning Plan and related activities should be initiated in the construction phase of the project after CD-3 approval.

## II. PURPOSE

The CP RM Module is a tool that assists DOE federal project review teams in evaluating the sufficiency of the Commissioning Plan and its implementation. The CP RM can be used by the DOE federal project teams both to evaluate the adequacy of the Commissioning Plan documentation/programs and the execution of programs by the contractor. The CP RM addresses all of the key aspects of commissioning including; systems and equipment testing and acceptance, quality assurance, selection and training of personnel, procedure development and implementation, maintenance procedures and equipment, safety basis implementation, safety management program implementation, and emergency preparedness.

The key elements and LOIs identified in this RM were specifically developed to be generic in nature to ensure that they were applicable to as many DOE projects as possible, therefore, it is essential that the review team use these key elements and LOIs only as a starting point, and that more detailed project specific elements and LOIs be developed to ensure that the project is adequately evaluated.

Completion of commissioning is the immediate precursor to Readiness Review preparations. Therefore, successful completion by the construction and operations contractors of the Commissioning Plan elements identified in this document will provide a supporting basis for the contractor readiness activities. It is suggested that this document be used in conjunction with the SRP Readiness Review RM to ensure that the key elements for readiness are integrated into the project and addressed early in the project.

## III. ROLES AND RESPONSIBILITIES

A successful CP review depends on an experienced and qualified team. The team should be augmented with appropriate subject matter experts selected to complement the specific elements of the Commissioning Plan being reviewed. The specific types of expertise needed will be dependent on the type of facility being reviewed, as well as other factors such as complexity and hazards or risks.

To the maximum extent possible, personnel selected to participate in a Commissioning Plan review should have design, construction, commissioning or operating experience within the DOE complex or related programs. First hand experience (as opposed to that of an oversight role) in a successful engineering design and construction project, including transition activities, executed under DOE O 413.3A, is preferred.

Management support is another necessary component to a successful CP review. Field element managers, as well as the Federal Project Director (FPD), must recognize the importance of the CP REVIEW and facilitate the resources necessary for its execution. This also requires appropriate interfaces with EM headquarters personnel who may direct or participate in the CP review process.

The roles and responsibilities for all involved in the CP review must be clear and consistent with the various requirements of DOE O 413.3A. The table below provides a compilation of CP review roles and responsibilities.

| Position | Responsibility |
|---|---|
| Field Element Manager | Provides support and resources to the Federal Project Director and Review Team Leader in carrying out the CP review. |
| | Facilitates the conduct of the review. Allocates office space, computer equipment, and support personnel to the team as necessary to accomplish the review within the scheduled time frame |
| Federal Project Director | Coordinates with the Review Team Leader in the selection of subject areas for the review and in developing the review criteria. |
| | In conjunction with the Contractor Project Manager, develops the briefing materials and schedule for the review activities. |
| | Coordinates the review team pre-visit activities and follows up review team requests for personnel to interview or material to review. |
| | Coordinates the necessary training and orientation activities to enable the review team members to access the facility and perform the review. |
| | Unless other personnel are assigned, acts as the site liaison with the review team. Tracks the status of requests for additional information. |
| | Coordinates the Federal site staff factual accuracy review of the draft report. |
| | Leads the development of the corrective action plan if required. Tracks the corrective actions resulting from the review. |
| Review Team Leader | In coordination with the Federal Project Director and the Acquisition Executive, selects the subject areas to be reviewed. |
| | Based on the project complexity and hazards involved, selects the members of the review team. |
| | Verifies the qualifications, technical knowledge, process knowledge, facility specific information, and independence of the Team Members. |
| | Leads the CP review pre-visit. |
| | Leads the review team in completing the Review Criteria for the various subject areas to be reviewed. |
| | Coordinates the development of and forwards to the Federal Project Director, the data call of documents, briefings, interviews, and presentations needed for the review. |
| | Forwards the final review plan to the Acquisition Executive for approval. |
| | Leads the on-site portion of the review. |
| | Ensures the review team members complete and document their portions of the review. Coordinates the characterization of the severity of the findings. |
| | Coordinates the review team response to factual accuracy comments by Federal and Contractor personnel on the draft report. |
| | Forwards the final review report to the Acquisition Executive for approval. |
| | Remains available as necessary to participate in the closure verification of the findings from the review report. |
| Review Team Member | Refines and finalizes the criteria for the appropriate area of the review. |
| | Develops and provides the data call of documents, briefings, interviews, and presentations needed for his or her area of the review. |

| Position | Responsibility |
|---|---|
| | Completes training and orientation activities necessary for the review. Conducts any necessary pre-visit document review. |
| | Participates in the on-site review activities. Conducts interviews, document reviews, walk downs, and observations as necessary. |
| | Based on the criteria and review approaches in the Review Plan, assesses whether his or her assigned criteria have been met. |
| | Documents the results of the review for his or her subject areas. Prepares the review report. |
| | Makes recommendations to the Review Team Leader for the characterization of findings in his or her area of review. |
| | Resolves applicable Federal and Contractor factual accuracy comments on the draft review report. |
| | Prepares the final review report for his or her subject area of review. |

## IV. REVIEW SCOPE AND CRITERIA

The primary objective of the Commissioning Plan is to provide a detailed plan for the testing and acceptance of facility systems and equipment and to clearly define the basis for attaining initial operating capability, full operating capability and project closeout. The scope of a CP review is influenced by factors such as the types and magnitude of hazards, the complexity of the facility or process, and the project mission. These influences are considered when the CP review team is commissioned, and they are reflected in the final review criteria selected by the review team. Once selected, the review criteria define the planned scope of the CP review.

This Module provides a set of review criteria that are organized into each of the key commissioning and transition areas. These review areas are summarized below include: system turnover process, plant testing, quality assurance, plant staffing, training and qualification, procedures, emergency preparedness, maintenance, safety basis implementation, and safety management programs. For each review area, Appendix A of this Module provides overall performance objectives and then a subset of review criteria that satisfy each performance objective. These performance objectives and review criteria will provide consistent guidance to project-specific review teams to develop their Lines of Inquiry.

### *General Requirements and Overview*

This area of the review is intended to address the overall commissioning process including the commissioning authority identification and responsibilities, budget, commissioning plan format and content and commissioning schedules. Some of these elements will be considered in greater detail in other review areas. However, the goal of this area is to ensure that integration of these elements into a successful commissioning plan (document) and process.

***System Turnover Process***

This area of the review is intended to capture the elements required to evaluate the adequacy of the formal process to transfer responsibility for equipment and systems from the construction forces to the facility operating staff. This area of review includes assessing the process to ensure that requirements of DOE Orders and industry standards are incorporated into a consistent, cost effective and rigorous process for placing new, modified or restarted Safety Class and Safety Significant (SSC)'s into service. This review will also evaluate the adequacy of acceptance and systems testing to ensure that the equipment/systems meet the design criteria and project objectives.

***Quality Assurance***

This review area verifies that Quality Assurance requirements are identified and implemented for the commissioning process. This area also addresses QA during testing and acceptance to ensure the final product meets the design and safety basis criteria.

***Plant Staffing***

This review area focuses on the overall plant staffing and hiring plan. A detailed plan is necessary for the project to ensure that the correct mix of qualified personnel is hired for the various project phases. This review area is limited to the selection and hiring of personnel and does not address the training or/qualification of personnel to the site and project procedures.

***Training and Qualification***

The purpose of this review area is to ensure that the personnel hired per the plant staffing plan are trained and qualified to perform their assigned duties prior to commencing those duties. This review area also addresses the adequacy of the overall training and qualification process for the transition and initial operations phases.

***Procedure Development and Verification***

This review area focuses on the adequacy of procedures for operation and maintenance of the facility both during the transition phase and in the operations mode. Procedures are required for normal, off-normal and emergency operations.

***Emergency Preparedness***

This review area focuses on the adequacy of the emergency preparedness program and procedures to ensure the safety of the workers, public and the environment during an off-normal event. The EP review is limited to the transition program – the operational readiness review will ensure that the program is sufficient for facility operations.

***Maintenance Implementation***

This review area addresses the adequacy of the project maintenance program and procedures necessary to maintain the facility operational once full operations are achieved. This includes the calibration program, surveillance program, preventative maintenance program, and the associated work control and recall processes necessary to effectively implement and perform maintenance activities.

***Safety Basis Implementation***

The purpose of this review area is to ensure that the approved safety basis and associated controls have been adequately implemented for the operations. Successful implementation of the safety basis documents and controls will encompass many other areas addressed in this process. The associated areas include the implementation of controls in operating procedures and training of personnel to the safety basis and controls.

***Safety Management Programs***

As the project transitions from construction to operations, the safety management programs will also transition from those of construction related and focused programs to SMPs identified and committed to in the safety basis documents. This review area will ensure the adequacy of the SMPs as implemented.

## V. REVIEW PLANS AND DOCUMENTATION

The results of a CP review will be used by the DOE Federal Project Director and ultimately the Acquisition Executive to help determine that the facility may begin operations. It is important to clearly document the methods, assumptions and results of the CP review. The overall SRP provides guidelines for preparing a Review Plan and a final report.

The following activities should be conducted as part of the Review Plan development and documentation/closure of the review:

- Subsequent to the selection, formation and chartering of the review team and receipt and review of the prerequisite documents, assignment of responsibilities for the development of specific lines of inquiry should be made.
- The review team members should develop specific lines of inquiry utilizing the topics and subject areas listed in the respective appendices of this module.
- The individual lines of inquiry should be compiled and submitted to the sponsor of the review for concurrence prior to starting the review.
- The project-specific review plan should be compiled with a consistent and uniform numbering scheme such that the results of each line of inquiry can be documented and tracked to closure.

- The lines of inquiry should be satisfied via document reviews and personnel interviews. The method used as the basis for closure/comment/finding and the results of the inquiry should be documented and tracked.

## VI. REFERENCE MATERIAL

- DOE O 413.3A, Change1, *Program and Project Management for Acquisition of Capital Assets*
- DOE Acquisition Regulation (DEAR), 48 CFR 970.5223-1
- DOE O 425.1C, *Startup and Restart of Nuclear Facilities*
- DOE-STD-3006-2008, *Planning and Conduct of Operational Readiness Reviews*
- DOE-HDBK-3012-2008, *Guide to Good Practices for Readiness Reviews, Team Leader's Guide*
- DOE O 226.1A, *Implementation of DOE Oversight Policy*
- DOE O 414.1C, *Quality Assurance;* DOE P 450.4, *Safety Management System Policy* DOE-STD-1189-2008, *Integration of Safety into the Design Process*
- EM-62 Standard Operating Policies and Procedure (SOPP) 47 and associated guidance
- www.wbdg.org – Whole Building Design Guide Website, *Plan the Commissioning Process* by the WBDG Project Management Committee, 6/5/2008
- *Commissioning Plan for the $DUF_6$ Conversion Project at Paducah, Kentucky and Portsmouth, Ohio,* Rev 0, August 2007
- *Salt Waste Processing Facility Project Commissioning Strategy*, Revision 2, February 2007

## APPENDIX A- PERFORMANCE OBJECTIVES AND CRITERIA

### *Legend of Commissioning Plan Review Topics*

| Review Topical Area | Identifier |
|---|---|
| General Requirements/Overview | GR |
| System Turnover Process | ST |
| Quality Assurance | QA |
| Plant Staffing | PS |
| Training & Qualifications | T&Q |
| Procedure Development and Verification | PD |
| Emergency Preparedness | EP |
| Maintenance Implementation | MI |
| Safety Basis Implementation | SB |
| Safety Management Programs | SMP |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| ***General Requirements/Overview*** | | |
| GR-1 | Has the project clearly identified an appropriate commissioning authority? | |
| | Is the commissioning authority impartial? **(GR-1.1)** | |
| | Does the commissioning authority have the necessary education and experience to perform the task for the project? **(GR-1.2)** | |
| GR-2 | Does the project have a formal documented Commissioning Plan? | |
| | Does the Commissioning Plan include the following items as appropriate?<br>• General Project Information<br>• Overview and Scope of Project Commissioning<br>• Commissioning Protocols and Communications<br>• Commissioning Process, including team responsibilities<br>• Commissioning schedule<br>• Commissioning documentation<br>• Appendices<br>o Testing and Inspection Plans<br>o Pre-Functional and Test Procedures<br>o Construction Checklists<br>o Issues logs? **(GR-2.1)** | |
| | Has the Commissioning Plan been approved by the commissioning authority? **(GR-2.2)** | |
| | Is the Commissioning Plan maintained under a configuration control process and updated as appropriate? **(GR-2.3)** | |
| GR-3 | Does the project budget include a specified budget item for commissioning activities? | |

[2] *The site should provide the technical bases and assumptions that support the answers provided to each Line of Inquiry. If possible, the review teams should independently verify the technical bases and assumptions.*

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| | Is the identified commissioning budget sufficient? (Generally 2 to 4 percent of the construction cost for systems being commissioned). **(GR-3.1)** | |
| | Does the commissioning budget consider the following items as appropriate?<br>• Commissioning process start<br>• Number and complexity of systems being commissioned<br>• Complexity of the overall project<br>• The necessary level of detail in the commissioning process<br>• Deliverables required<br>• Allocation costs such as increased design fees, contractor bids, training, etc.<br>• The type of project? **(GR-3.2)** | |
| GR-4 | Does the project have adequate commissioning schedules? | |
| | Were the schedules developed by the commissioning team and construction personnel? **(GR-4.1)** | |
| | Are the schedules sufficiently detailed to ensure their effective implementation and execution? **(GR-4.2)** | |
| | Do the schedules address all of the systems that require commissioning? **(GR-4.3)** | |
| | Are the schedules integrated with the construction schedules for effective implementation? **(GR-4.4)** | |
| | Are the schedules maintained and changes to the schedules controlled under an appropriate process? **(GR-4.5)** | |
| ***System Turnover Process*** | | |
| ST-1 | Does the project have a formal and documented process for commissioning the transfer of equipment from the construction staff to the operating staff? | |
| | Does the process include all of the key systems, equipment and facilities that are encompassed in the project? **(ST-1.1)** | |
| | Does the process include specific schedules that are incorporated in the project baseline? **(ST-1.2)** | |
| | Does the system turnover process address system testing and acceptance, and system documentation for maintenance and operations? **(ST-1.3)** | |
| | Are roles and responsibilities for systems turnover clearly defined and well understood by the appropriate personnel? **(ST-1.4)** | |
| | Is the commissioning/transition process identified in the design process or earlier? **(ST-1.5)** | |
| ST-2 | Does the project have a formal and documented process for plant testing of equipment and systems? | |
| | Is the plant testing process adequately identified in project/facility procedures? **(ST-2.1)** | |
| | Does the plant testing process procedures include specific roles and responsibilities appropriate for the facility systems and equipment to be tested and transitioned using the program? **(ST-2.2)** | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| ST-3 | Does the plant testing program include an acceptance testing and/or factory acceptance testing program for initial testing and acceptance of equipment? | |
| | Does the plant testing process include acceptance testing for systems and equipment in accordance with the manufacture's specifications? **(ST-3.1)** | |
| | Are acceptance tests for key equipment witnessed by QA or engineering personnel? **(ST-3.2)** | |
| | Are acceptance of testing results reviewed and approved by engineering and QA personnel? **(ST-3.3)** | |
| | Is there a formal process to document deficiencies identified during acceptance testing and track them to resolution? **(ST-3.4)** | |
| ST-4 | Does the plant testing program include a process for system testing by the receiving organization? | |
| | Are system test plans developed by process engineers? **(ST-4.1)** | |
| | Do process and operations engineers serve as the test engineers? **(ST-4.2)** | |
| | Do operators perform or assist in the manipulation of equipment during the tests? **(ST-4.3)** | |
| | Is there a formal process to document deficiencies identified during the system testing and track them to resolution? **(ST-4.4)** | |
| | Does the systems testing process evaluate the ability of the components in the system to work together to achieve the design objective? **(ST-4.5)** | |
| ST-5 | Does the project have a formal documented process for the turnover of systems from construction/testing to operations? | |
| | Does the systems turnover process include a method to track deficiencies to completion? **(ST-5.1)** | |
| | Is acceptance of the system by operations formally documented? **(ST-5.2)** | |
| | Does the process include the development, verification and implementation of startup procedures? **(ST-5.3)** | |
| ST-6 | Has the project acquired the services of a qualified commissioning agent? | |
| | Has the commissioning agent been involved in the project since the design stage? **(ST-6.1)** | |
| | In the design stage, has the commissioning agent completed review of the project requirements and the basis of design? **(ST-6.2)** | |
| | Has the commissioning agent been involved in design reviews including the preliminary and final design documents? **(ST-6.3)** | |
| | Does the commissioning agent ensure that the Commissioning Plan is updated throughout the project including after each phase of the design review? **(ST-6.4)** | |
| ST-7 | Does the project have a formal documented systems operational testing process? | |
| | Does the system operational testing process ensure that all equipment within the given system boundary undergoes a system operational test? **(ST-7.1)** | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| | Do the system operational tests demonstrate the ability of the system to perform as designed and in accordance with operating procedures? **(ST-7.2)** | |
| | Do the system operational tests effectively field-validate the system operating procedures for system startup, normal operations and shutdown? **(ST-7.3)** | |
| | Does the systems operational testing process include a formal documented method to track and close deficiencies identified in the testing process? **(ST-7.4)** | |
| ST-8 | Does the project have a documented formal process for integrated system operational testing (IST)? | |
| | Does the IST process demonstrate the integrated operation and control of multiple systems or subsystems that are required to perform a major unit operation in the facility? **(ST-8.1)** | |
| | Does the IST process effectively field validate the operating procedures? **(ST-8.2)** | |
| | Does the IST process provide adequate on the job training to operations on the major systems? **(ST-8.3)** | |
| | Does the IST process include a documented formal method to track any identified deficiencies to closure? **(ST-8.4)** | |
| ST-9 | Does the project have a formal documented process for cold commissioning of the facility as appropriate? | |
| | Does the cold commissioning process effectively demonstrate the operability of the entire facility process? **(ST-9.1)** | |
| | Does the cold commissioning process perform a final field validation of the facility procedures? **(ST-9.2)** | |
| | Does the cold commissioning process include a documented formal method to track any identified deficiencies to closure? **(ST-9.3)** | |
| ***Quality Assurance*** | | |
| QA-1 | Are controls established that ensure that correct and accepted items are installed in the facility? | |
| | Is production related information identified and evident on items to be installed? **(QA-1.1)** | |
| | Where physical identification is impractical, are other identification methods required such as physical separation or procedural control? **(QA-1.2)** | |
| | Are any pertinent special requirements necessary for item identification so specified (e.g., items with limited life, specific identification or traceability to code requirements)? **(QA-3.3)** | |
| QA-2 | Are quality assurance requirements identified in the Commissioning Plan? | |
| | Are quality assurance requirements for testing and acceptance clearly identified in the Commissioning Plan? **(QA-2.1)** | |
| | Are quality assurance personnel involved in the testing and acceptance process to verify that equipment and systems are built and installed in accordance with the design requirements and applicable design codes? **(QA-2.2)** | |
| ***Plant Staffing*** | | |
| PS-1 | Does the Commissioning Plan include a plan for the staffing of the facility for transition to and final operations? | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| | Does the staffing plan for commissioning include sufficient details to identify the specific numbers and qualifications of personnel that are required for each phase of the transition to final operations? **(TS-1.1)** | |
| | Are sufficient resources identified at the site/surrounding area to support the staffing plan? **(PS-1.2)** | |
| PS-2 | Does the plant staffing plan identify the numbers and qualifications for personnel required to complete commissioning activities including testing activities? | |
| | Are testing and acceptance personnel identified in the Commissioning Plan? **(PS-2.1)** | |
| | Are the qualifications of personnel identified for testing and acceptance developed based on the systems and processes that they will be involved with? **(PS-2.2)** | |
| ***Training and Qualifications*** | | |
| T&Q-1 | Does the contractor training program ensure that the work force is trained and qualified with the knowledge, skills, and abilities to effectively perform their work while protecting themselves, co-workers, the public and the environment? | |
| | Has appropriate training and qualification been specified for personnel based on their assigned tasks and responsibilities? **(T&Q-1.1)** | |
| | Are personnel assigned tasks trained and qualified in accordance with federal or state laws, DOE directives and other applicable requirements? **(T&Q-1.2)** | |
| | Are equipment operators certified and/or qualified to operate assigned equipment? **(T&Q-1.3)** | |
| T&Q-2 | Are personnel trained and qualified to handle hazardous materials and waste as required by federal or state laws, DOE directives and other applicable requirements? | |
| | Do employees receive introductory training with respect to hazardous materials in the general employee training? **(T&Q-2.1)** | |
| T&Q-3 | Are adequate training staff and resources available for the required ES&H and other training? | |
| | Is required ES&H training identified and tracked for newly hired workers? **(T&Q-3.1)** | |
| | Do training resources account for all types of required training? **(T&Q-3.2)** | |
| | Are training personnel adequately trained? **(T&Q-3.3)** | |
| T&Q-4 | Does the Commissioning Plan have a clearly defined process for training operating personnel? | |
| | Are operating personnel trained on the systems they will be operating as part of the commissioning/transition process? **(T&Q-4.1)** | |
| | Does training specifically address:<br>• Step-by step procedures for normal operations<br>• Adjustment instructions including information for maintaining operational parameters<br>• Troubleshooting procedures | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| | • Maintenance and inspection procedures<br>• Repair instructions including disassembly, component removal, replacement and reassembly, and<br>• Upkeep of maintenance documentation and logs? **(T&Q-4.2)** | |
| ***Procedure Development and Verification*** | | |
| PD-1 | Does the Commissioning Plan include a documented process for development and validation of the operating procedures for new/modified equipment and systems? | |
| | Are operating procedures developed by process and operations engineering personnel and are approved in accordance with site procedures and programs? **(PD-1.1)** | |
| | Are procedures developed for normal, off-normal and emergency operations? **(PD-1.2)** | |
| | Are procedures uniform in format and follow DOE requirements and guidance for content and format? **(PD-1.3)** | |
| | Do procedures include the appropriate limits and requirements from the safety basis document and or TSRs? **(P-1.4)** | |
| | Are startup procedures developed for the initial startup and operation of systems? **(P-1.5)** | |
| PD-2 | Are procedures developed for maintenance and repair activities? | |
| | Are maintenance and inspection procedures developed as part of the commissioning/transition process? **(PD-2.1)** | |
| | Are troubleshooting procedures developed as part of the commissioning/transition process? **(PD-2.2)** | |
| | Are repair procedures developed as part of the commissioning/transition process? **(PD-2.3)** | |
| ***Emergency Preparedness*** | | |
| EP-1 | Does the Commissioning Plan include an emergency preparedness program that meets the requirements of the DOE Orders and associated guidance? | |
| | Is the emergency preparedness program for transition activities formal and documented in accordance with applicable DOE Orders? **(EP-1.1)** | |
| | Are facility personnel trained and qualified including the appropriate emergency procedures and processes? **(EP-1.2)** | |
| EP-2 | Does the emergency preparedness program address the facility equipment, conditions and activities for the commissioning/transition phase? | |
| | Do emergency preparedness hazards analyses consider the planned commissioning/transition activities? **(EP-2.1)** | |
| | Do emergency preparedness hazards analyses consider initial operations? **(EP-2.2)** | |
| | Are emergency preparedness responses based on equipment and systems that are fully operational and do not rely upon systems in testing and transition? **(EP-2.3)** | |
| | As systems are transitioned to operations, are the appropriate emergency procedures updated or transferred? **(EP-2.4)** | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| ***Maintenance Implementation*** | | |
| MI-1 | Does the Commissioning Plan include a formal documented process for maintenance implementation (and validation of effectiveness) as systems and equipment complete the testing process and are transferred to operations? | |
| | Are maintenance requirements derived from the equipment manufactures and their recommendations? **(MI-1.1)** | |
| | Does the MI program include a formal process for the recall of components and equipment for calibration and maintenance activities? **(MI-1.2)** | |
| | Does the MI program include surveillance activities for equipment and parameters in accordance with manufacture recommendations and safety basis commitments and requirements? **(MI-1.3)** | |
| | Does the MI program include a work development and control process that allows for the effective and timely development of work to support maintenance and surveillance activities? **(MI-1.4)** | |
| ***Safety Basis Implementation*** | | |
| SB-1 | Does the Commissioning Plan include a formal documented process for the implementation of the approved safety basis document and controls? | |
| | Does the Safety Basis (SB) implementation plan include a review of operating and transition procedures to ensure the implementation of safety basis commitments and controls? **(SB-1.1)** | |
| | Does the SB implementation plan include a review of facility equipment and conditions to ensure that they are consistent with the facility as described in the approved SB documents? **(SB-1.2)** | |
| | Does the SB implementation plan include a process to review all outstanding work documents to ensure that they are consistent with the SB requirements? **(SB-1.3)** | |
| | As required by DOE orders and guidance, are the safety basis documents incorporated into an Authorization Agreement for the transition and operation of the facility? **(SB-1.4)** | |
| SB-2 | Are facility personnel trained and qualified on the SB documents? | |
| | Has training been developed and provided for personnel to ensure that they are knowledgeable about the SB document, its commitments and requirements? **(SB-2.1)** | |
| | Have personnel in positions requiring qualifications been qualified in accordance with the training program? **(SB-2.2)** | |
| SB-3 | Does the Commissioning Plan include a facility safety equipment list? | |
| | Has the facility equipment list been revised to reflect the new/modified and the equipment as they are transitioned? **(SB-3.1)** | |
| | Does the Commissioning Plan include a process to ensure the facility safety equipment list is consistent with the safety basis documents? **(SB-3.2)** | |
| SB-4 | Does the Commissioning Plan include the Un-reviewed Safety Questions (USQ) process for configuration management during transition activities? | |
| | Have facility/project USQ procedures been revised to include the new SB documents? **(SB-4.1)** | |

| ID # | Performance Objectives and Criteria[2] | Met? |
|---|---|---|
| | Have outstanding facility modification packages been reviewed (USQ'd) against the SB documents being implemented with no deficiencies identified? **(SB-4.2)** | |
| ***Safety Management Programs*** | | |
| SM-1 | Have the Safety Management Programs (SMPs) identified in the SB documents been effectively implemented? | |
| | Have SMP commitments in the SB documents been identified and verified as implemented? **(SM-1.1)** | |
| | Does the project SMP include a) oversight process (management and independent), and b) routine self-assessment and identification of appropriate corrective actions? **(SM-1.2)** | |
| SM-2 | Does the SMP identified in the Commissioning Plan include the appropriate SMPs? | |
| | Does the safety management program effectively implement the ISMS process? **(SM-2.1)** | |
| | Does the SMP address required security programs to ensure the security of the operations? **(SM-2.2)** | |
| | Does the SMP address the following programs as appropriate?<br>• Waste management<br>• Transportation<br>• Environmental management<br>• Nuclear materials control? **(SM-2.3)** | |