CP3-EN-0203 FRev. 9	**TITLE**: Design Change Process	Page 1 of 31

DOCUMENT CATEGORY:	Administrative
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FUNCTIONAL AREA: Engineering Programs and System Engineering **SUBJECT MATTER AREA:** Programs, Procedures, Standards	**SUBJECT MATTER EXPERT**: Karen Sizemore, Chief Engineer
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REVISION/CHANGE LOG

Revision/ Change Letter	Description of Changes	Pages Affected	Date of Revision/ Change	Approved By (signature on file)
FR0	Procedure Bluesheeted	All	09/05/2017	Documentation on File
FR1	Non-intent revision to remove from Bluesheet	All	01/04/2018	
FR2	General Revision	All	11/07/2018	
FR3	Updated Sections 4.1, 4.3, 6.5, 6.6 and Definitions per recommendations from MA-FY19-0008 and FSR-FY19-0052.	All	09/18/2019	
FR3A	Added Expedited Nuclear Modification process and associated new form.	3, 7-8, 11, 13, 16, 18, 20-22, 25	12/10/2020	
FR4	Not Issued	N/A	N/A	
FR5	Added Commitment; added step and TSR stamp (6.7.2).	4, 13	12/30/2020	
FR5A	Corrected typo in 6.2.1 and 6.2.3	7	1/26/2021	
FR6	Added reference to ES-0.9-17, updated org. titles and added QA to MTAM, general update	All	12/20/2021	
FR6A	Added CP3-ES-1035 as Use Reference and step for Environmental to use the checklist as part of Mod Team, added term “non-nuclear”, added step 6.5.2	3-4, 8, 11, 16, 27	8/24/2022	

REVISION/CHANGE LOG				
Revision/ Change Letter	**Description of Changes**	**Pages Affected**	**Date of Revision/ Change**	**Approved By (signature on file)**
FR6B	Add steps for determination if Major Modification; added step to send scope for USQ if needed; clarified when Nuclear Safety is on the Mod Team	5, 9-11, 26, 29	3/14/2023	Documentation on File
FR7	Clarified steps and added definition for modification acceptance; added steps to incorporate sustainability and to discuss significant procurement items in designs; clarified A-E design services approach; editorial corrections throughout	All	5/23/2023	
FR8	General revision including update to Section 6.9 and definitions based on recommendations from MA-FY23-019	All	7/15/2024	
FR8A	Non-intent change to change “Nuclear Material Control and Accountability” to “Material Control and Accountability”	12, 30	02/17/2025	
FR9	Clarified language regarding A-E firms completing nuclear modification design services; Deleted DOE O 436.1 requirement; formatting; editorial corrections	All	03/26/2025	Karen Sizemore

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides guidance and specifies requirements for developing, implementing, and closing out plant modifications required to support deactivation, demolition, environmental tasks, operations, and maintenance for the Paducah Gaseous Diffusion Plant (PGDP) Deactivation & Remediation (D&R) project.

1.2 Scope

Nuclear Modifications: This procedure applies nuclear controls to modification design development and implementation functions as specified in American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) NQA-1, 2008/2009a, for all structures, systems, and components (SSC) designated as safety-significant or defense-in-depth in CP1-NS-3000, *Documented Safety Analysis for the U.S. Department of Energy Paducah Site Deactivation Project*, or Nuclear Criticality Safety (NCS)-related SSCs as described in Nuclear Criticality Safety Evaluations (NCSE).

Expedited Nuclear Modifications meet requirements of the nuclear modification and are documented on CP3-EN-0203-F05, in lieu of the Detailed Design Package (DDP) and Design Installation and Verification Specifications (DIVS). This type of nuclear modification is utilized at the discretion of the Engineering Manager/Lead and intended for less complex nuclear modifications.

Non-Nuclear Modifications: This procedure applies non-nuclear controls with a graded approach to implement requirements for design changes for all other SSCs that do **NOT** fall under nuclear controls. This includes modifications to equipment, including significant upgrades. Nuclear controls can be applied to a non-nuclear modification at the discretion of the Engineering Manager/Lead.

2.0 REFERENCES

2.1 Use References

- CP1-NS-3001, *Technical Safety Requirements for the Department of Energy Paducah Site Deactivation and Remediation Project*
- CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP3-EN-0207, *Facility Change Process*
- CP3-EN-0209, *Plant Drawings*
- CP3-EN-0212, *Test Plans*
- CP3-EN-0213, *Design Analysis and Calculations*
- CP3-EN-0215, *Engineering Evaluations*
- CP3-EN-0219, *Technical Reviews*
- CP3-EN-0224, *Configuration Management System (CMS) Control*
- CP3-EN-0302, *Engineering Change Requests and Notices*
- CP3-EN-0306, *Setpoint Change Control*
- CP3-EN-0307, *Engineering Procurement Specification*

- CP3-EN-0314, *Preventive Maintenance Program*
- CP3-EN-0400, *Quality Level Determination*
- CP3-ES-1035, *Environmental Management System Environmental Checklist*
- CP3-OP-0003, *Developing a Readiness Assessment/Operational Readiness Review Plan of Action*
- CP3-OP-0025, *Document Control Process*
- CP3-QA-1002, *Software Quality Assurance*
- CP3-QA-2005, *Nonconformance Control*
- CP3-QA-3001, *Issues Management*
- CP3-RD-0010, *Records Management Process*
- CP3-TR-0103, *Systematic Approach to Training*
- ES-0.9-1, *Design Installation & Verification Specifications*
- ES-0.9-11, *Control of Vendor Technical Manuals and Documents*
- ES-0.9-2, *Modification Team Conduct of Operations*
- ES-0.9-5, *Detailed Design Package*
- ES-0.9-17, *Equipment Specifications*
- ES-0.9-21, *System Engineering Assignments*

2.2 Source References

- ASME NQA-1, *2008/2009a, Quality Assurance Requirements for Nuclear Facility Applications*
- CP1-NS-3000, *Documented Safety Analysis for the U.S. Department of Energy Paducah Site Deactivation Project*
- CP2-EN-0201, *Configuration Management Program Description at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP3-EN-0221, *Audibility Testing of Criticality Accident Alarm Systems*
- CP3-NS-1031, *Nuclear Criticality Safety Program*
- DOE-STD-1189-2016, *Integration of Safety into the Design Process*

3.0 COMMITMENTS

CP1-NS-3001, *Technical Safety Requirements*, Section 5.5.12.1, *Configuration Management Program Key Elements*, changes to facility structures are evaluated for natural phenomena hazards resistance.

4.0 RESPONSIBILITIES

4.1 Chief Engineer

4.1.1 Acts as Design Authority and delegates design authority to Engineering Managers/Leads.

4.1.2 Ensures adequate procedures are established, maintained, and followed to control design activities.

4.2 Contract Technical Representative

4.2.1 Acts as liaison between Contractors performing work and the Modification Team, including oversight and coordination of activities for compliance with the design package(s) to minimize conflict and delay between the Contractor and the D&R project.

4.2.2 Ensures installation is performed according to engineering specifications.

4.3 Engineering Manager/Lead

4.3.1 Acts as Design Authority for PGDP D&R Contractor activities as delegated by the Chief Engineer.

4.3.2 Determines appropriate modification process based on the request.

4.3.3 Assigns engineering staff personnel whose skills and experience are commensurate with the technical complexity and difficulty of the modification.

4.3.4 Provides specific direction and technical oversight to the modification process and approves design documents generated and revised by the modification.

4.3.5 Approves design changes by signing the DDP. Also approves other design output documents, as part of the Certified for Construction (CFC) package, that support implementation of the modification.

4.3.6 Ensures design activities are conducted at a level of detail commensurate with the safety significance and complexity of the modification. The level of detail, timeliness, and cost effectiveness must be balanced with safety significance and complexity of the design change.

4.4 Engineering Document Control

4.4.1 Receives design documents developed as part of the modification process and posts in Controlled Documents.

4.4.2 Maintains Controlled Documents List (CDL) for Engineering.

4.5 Facility Manager/Requesting Manager/Operations Manager

4.5.1 Ensures procedure changes, training, and operator aids resulting from the modification are identified and implemented.

4.5.2 Designates a representative to participate on the Modification Team and be the organization or customer point of contact participating in design reviews and ensuring final designs meet the intended objectives.

4.6 Modification Manager

4.6.1 Assembles the Modification Team.

4.6.2 Assists the Engineering Manager/Lead with determining the correct modification process (nuclear modification, expedited nuclear modification, or non-nuclear modification) in consultation with the Modification Team.

4.6.3 Follows this procedure for modification to SSCs, including equipment.

4.6.4 May serve as the Contract Technical Representative (CTR) for Architect-Engineer (A-E) designs.

4.6.5 When assigned, performs the duties of a Responsible Engineer (RE).

4.6.6 Responsible for design activities and delegating responsibilities associated with the development of design packages.

4.7 Modification Team

4.7.1 Represents their discipline or functional area and assists in the development of design inputs.

4.7.2 Provides expertise as required to support the modification and ensures identified comments/concerns are satisfactorily resolved.

4.7.3 Documents concurrence with the resolution of comments by signing the appropriate portion of CP3-EN-0203-F01, *Modification Team Approval Matrix* (MTAM).

4.7.4 Identifies the procedures and training that may be impacted by the modification.

4.7.5 Considers operational impacts if changes result from modification to existing equipment or installation of new equipment.

4.8 Procurement

Administers contracts for A-E services.

4.9 Responsible Engineer

4.9.1 Acts as a design discipline interface and develops design output documents.

4.9.2 Provides technical expertise for installation activities.

4.9.3 Assesses modification results, assists with preparation of closeout documents and as-built drawings, and forwards documents to the Modification Manager (MM) for modification closeout activities following construction completion.

4.9.4 Identifies new Preventative Maintenance (PM) Requests or revisions to existing PMs.

4.9.5 Provides input and review on the boundary of different quality level systems.

4.9.6 Completes Input Change Request (ICR) and ensures the Configuration Management System (CMS) is updated, if applicable.

4.9.7 Provides completed design documents to Work Planners.

4.10 Nuclear Criticality Safety Engineer

4.10.1 When designated, acts as a member of the Modification Team, reviews modification against NCSEs.

4.10.2 Prepares NCSEs and other NCS documents as required for the modification.

4.10.3 Confirms that NCS requirements have been satisfied by the modification package.

4.11 Nuclear Safety

When designated, acts as a member of the Modification Team reviewing modifications against the accident analysis requirements of the Safety Basis.

4.12 Requester

4.12.1 Contacts Engineering Manager/Lead with request for engineering services.

4.12.2 Provides scope description, justification, and charge code to Engineering Manager/Lead.

4.13 System Engineer/Cognizant System Engineer

4.13.1 Provides system requirements, as necessary.

4.13.2 Follows the design process to ensure compatibility of the existing plant systems as defined in ES-0.9-21, *System Engineering Assignments*, and any newly designed system modifications or interface points of those systems. Reviews modifications and design documents applicable to the existing plant systems as member of the Modification Team.

4.13.3 Provides input and review on the quality level when necessary for clarification.

4.13.4 Defines system boundaries.

4.13.5 Identifies new Preventative Maintenance (PM) Requests or revisions to existing PMs.

4.13.6 Reviews and revises existing Surveillance Requirements (SR) and determines if new SRs are needed.

4.13.7 Assists RE with ICR and CMS changes.

4.14 Technical Reviewer

4.14.1 Performs verification of the design package(s) and supporting design documents against design inputs according to CP3-EN-0219, *Technical Reviews,* for nuclear modifications.

4.14.2 Resolves with the document originator or elevates to Engineering management any technical issues identified during the review.

5.0 GENERAL INFORMATION

None

6.0 INSTRUCTIONS

NOTE:

The Modification Master Checklist is an optional checklist found in ES-0.9-2, *Modification Team Conduct of Operations,* to assist the MM/RE with planning and execution of modifications.

6.1 Request for Engineering Services

Requester

6.1.1 Contact Engineering Manager/Lead with request for engineering services **and** provide scope description, justification, and charge code.

System Engineer/Cognizant System Engineer

6.1.2 Provide system requirements, as necessary.

Engineering Manager/Lead

NOTE:

The Engineering Manager/Lead, using input from the Requester, SE/CSE and other SMEs, determines the Engineering process for disposition of the request. If the request would result in any change in function, configuration, or operating limits of SSCs, including equipment, due to revisions, improvements, corrections, upgrades, adjustments, or alterations to equipment, systems or components, then the change is considered a modification. The Engineering Manager/Lead chooses from the modification processes discussed in this procedure, or the Facility Change Traveler (FCT) process as described in CP3-EN-0207, *Facility Change Process*.

6.1.3 Determine Engineering process required for disposition of the request.

6.1.4 **If** process is determined to be FCT, **then** exit procedure **and** follow process outlined in CP3-EN-0207.

6.1.5 Determine proposed modification is not a Major Modification by confirming the following statements:

- The modification involves only hazards that have been evaluated by the existing safety analysis;
- Existing hazard and accident sequences remain applicable, including the frequency, consequence, and probability of malfunction of safety SSCs; and
- Required hazard controls have already been identified and implemented.

6.1.6 **If** any of the above statements are not true, **then** ensure a Major Modification Assessment is performed according to DOE-STD-1189.

6.1.7 Assign Engineering Service Order (ESO) number and MM, as required.

6.2 Processing a Design Change

Modification Manager

NOTE:

Section **6.3** provides instruction for assembling a Modification Team.

6.2.1 Review scope with Engineering Manager/Lead to determine if design change can be processed as an Expedited Nuclear Modification.

6.2.2 **When** change meets requirements for Expedited Nuclear Modification, **then** proceed to section **6.6**.

6.2.3 **When** change does **NOT** meet requirements for this process, **then** proceed to Step **6.2.4**.

6.2.4 Initiate a nuclear modification or non-nuclear modification by assembling the modification team. Schedule a kick-off meeting and invite team members with input from Project Manager, if assigned.

6.2.5 Define the design inputs in the DDP **and** resolve through development of design outputs with the Modification Team as design progresses.

NOTE:

Changes to scope at any point following an initial USQ review warrant additional USQ review.

6.2.6 **If** management or the Modification Team determines that modification may result in a safety basis change, **then** attain Engineering Manager/Lead concurrence **and** submit proposed scope for USQ review.

6.2.7 **If** management determines that the design is to be performed by an outside organization (A-E firm), **then** initiate the A-E process according to Section **6.5** of this procedure.

6.2.8 Discuss scope **and** design inputs with the Modification Team at the kick-off meeting.

6.2.9 Discuss with Modification Team any significant procurement or long lead items anticipated and how to provide early or expedited support in order to minimize project impact.

6.2.10 Coordinate as many meetings and walkdowns as necessary for the Modification Team to define scope, design inputs, sequence, and schedule for the modification.

6.2.11 Issue meeting minutes to document **and** inform the team of the results of the kick-off meeting and walkdown.

6.2.12 Ensure the correspondence of the kick-off meeting includes team member action items and schedule information such as individual Modification Team Member deliverables and design package review dates.

Modification Team

6.2.13 Assist in development of design inputs **and** modification planning through a multi-disciplined approach in accordance with ES-0.9-2, *Modification Team Conduct of Operations*.

6.2.14 In addition to using Engineering's design input guidelines in ES-0.9-2, utilize Subject Matter Expert (SME), discipline specific input/checklists, such as CP3-ES-1035-F01, *Environmental Checklist*, used by Environmental Services, **and** provide input to the Modification Manager/Responsible Engineer during the design process.

6.3 Establishing/Maintaining a Modification Team

6.3.1 The following are the minimum Modification Team members:

A. Modification Manager (MM)

B. Responsible Engineers (RE)

C. System Engineers (SE), Cognizant System Engineer (CSE) or SME for all affected systems

D. Facility Manager (FM)

E. Project Manager (if assigned)

F. Stabilization & Deactivation (S&D) Representative if applicable

G. Planner

H. Quality Assurance, if a nuclear controls modification

I. Waste Certification Official (WCO) if related to Nevada National Security Site (NNSS)

J. Transportation Manager for containers or other Department of Transportation related items

K. NCS, if a fissile material operation or involves an SSC that is credited in an NCSE for maintaining NCS controls.

NOTE:

The Modification Team composition varies based on the modification complexity and scope and may be adjusted at any time during the modification process based on the requirements of the modification. Form CP3-EN-0203-F01, *Modification Team Approval Matrix* (MTAM), is used to identify participating Modification Team members and to obtain approval signatures. The MTAM is **NOT** required for the Expedited Nuclear Modification process. The RE/MM identifies required Modification team members and SME signatures to be provided on CP3-EN-0203-F05.

Modification Manager

6.3.2 Ensure the appropriate Modification Team members are represented **and** identified using CP3-EN-0203-F01, *Modification Team Approval Matrix,* throughout the modification.

6.3.3 Additional Modification Team members will be selected based on the needs of the modification and are **NOT** limited to the following:

A. Nuclear Safety representative for Nuclear Modifications, or those modifying Hazard Category 2 or 3 nuclear SSCs, or if modification may require a safety basis change.

B. Site Operations for modification with the potential to impact SSCs, equipment, and facilities under their control.

C. S&D representative as designated by the appropriate Manager and shall ensure that the modification can be maintained upon completion of modification activities. This includes corrective and preventive maintenance, spare parts available, technical manuals received/approved, and surveillance procedures developed.

D. Fire Protection Engineer for modifications to building sprinkler systems or modifications that may impact egress or life safety.

E. Quality Control for modifications deemed necessary by Engineering where quality inspection will be required to verify processes used to ensure the quality of the modification construction, installation, and testing.

F. Security for modifications in which Security SSCs or activities are affected.

G. Environmental Services for modification impacting the environment.

H. Safety and Health for modifications affecting the health and safety of personnel involved in the construction; and/or affecting the health and safety of workers or the public.

I. Radiation Protection for modifications presenting non-routine radiation concerns.

J. Waste Management for modifications which create unusual/special waste requirements such as handling, type, quality, etc.

K. Material Control and Accountability for modifications which modify or involve equipment which measure nuclear material or equipment which perform uranium inventory functions.

6.3.4 Coordinate commitment of time and resources for selected Modification Team members with the Team member's management.

A. Document when support is **NOT** required **or** no longer required by placing "N/A" on the appropriate line of form CP3-EN-0203-F01, *Modification Team Approval Matrix*.

B. **If** requested support from an organization has been determined unnecessary by that organization, **then** obtain documentation (email, signature on CP3-EN-0203-F01) from the subject organization manager signifying that support from that organization is **NOT** required.

6.4 Perform Walkdowns

NOTE:

Group walkdowns are an essential part of the design process. Group walkdowns should be performed to ensure the completeness of the design where practical. It is acceptable to document walkdown results by email.

Modification Manager and Modification Team

6.4.1 Perform **and** document walkdowns throughout the design phase to visually inspect affected structures, systems, components, and equipment with the location of the modification. General consideration for performing walkdowns is given in ES-0.9-2, *Modification Team Conduct of Operations*; however, mandatory elements of the walkdown shall include the following:

A. Perform field verifications for systems/items/equipment to ensure that design documentation agrees with the as-found configuration.

NOTE:

Configuration of safety-significant, defense-in-depth or NCS-related SSCs that differ from drawing details must be evaluated by Engineering prior to issuing an as-built drawing to reflect field conditions. For commercial items, the as-built drawing can be generated from the as-found field configuration.

B. **If** latest version of as-built drawing is different from the as-found field configuration, **then** notify Engineering Manager/Lead **and** correct the discrepancy according to applicable procedures.

C. **If** drawing discrepancy affects safety-significant, defense-in-depth or NCS-related SSCs, **then** identify the issue in Issues Management according to CP3-QA-3001, *Issues Management* or by submitting an NCR according to CP3-QA-2005, *Nonconformance Control*, as appropriate.

D. Identify issues that could affect the modification installation, constructability (interferences, obstacles, radiological and contamination zones, etc.), operability, NCS/Nuclear Safety acceptance criteria for modifications whose functions affect NCS/Nuclear Safety, and maintainability (including As Low As Reasonably Achievable [ALARA]). These issues are design inputs and must be documented and resolved in design output documents.

E. For constructability reviews, ensure the modification can be implemented by verifying alignment between modification design documents and the field conditions.

F. For post-modification walkdowns, ensure the installation has been performed according to modification design documents.

G. **If** modification design documents conflict with the actual installation, **then** RE(s) assess the differences, initiate the steps (punch list, work task, etc.) necessary to ensure alignment as required.

6.5 Design Performed by an Architect-Engineer

Modification Manager

6.5.1 **If** management determines that the design is to be performed by an A-E, **then** obtain A-E services by creating a Performance Statement of Work (PSOW) **and** provide to Procurement and/or Project Manager.

6.5.2 **If** the A-E firm is performing design that includes nuclear modification, **then** there are two acceptable options:

A. A-E firm is on Approved Supplier List (ASL) for NQA-1 design; or,

B. A-E firm submits engineering design procedures, and they are accepted as equivalent to D&R Contractor design procedures by the Chief Engineer.

6.5.3 **If** the A-E performs non-nuclear design or is an A-E approved to perform NQA-1 (nuclear) design, **then** perform the following:

A. Ensure Modification Team from plant personnel is developed and performs reviews of A-E firm design packages (i.e., 30% 60%, 90% reviews as determined by Engineering Manager/Lead).

B. Ensure Modification Team comments are passed to the A-E Firm and A-E Firm provides documented resolution.

C. Ensure design basis documents, such as drawings, calculations, etc., are submitted by A-E in final form, including appropriate reviews and approvals.

D. Provide A-E firm with the plant drawing AutoCad title block for preparing drawings according to CP3-EN-0209, *Plant Drawings*.

E. Ensure A-E signs and Professional Engineer (P.E.) stamps drawings, as required in Kentucky.

F. Ensure Modification Team signs final CP3-EN-0203-F01, *Modification Team Approval Matrix,* form signifying their approval of the A-E design.

G. Incorporate A-E design documents, including documentation of meetings, walkdowns and comment resolutions into Engineering Service Order (ESO) package.

H. Submit approved A-E documents to Controlled Documents, as required.

I. Ensure completion of Sections 6.11 through 6.13 of this procedure.

Engineering Manager/Lead

6.5.4 Review A-E design document submittals for acceptance and compliance with engineering requirements **and** notify Modification Manager of acceptance.

Modification Manager

6.5.5 Perform acceptance of A-E design document submittals in conjunction with CTR through the procurement contract submittal process.

6.6 Performing an Expedited Nuclear Modification

Responsible Engineer/Modification Manager

NOTE:

The MTAM is **NOT** required as applicable SMEs, designated by the MM, participate in the design process and review and sign CP3-EN-0203-F05, *Expedited Nuclear Modification*.

6.6.1 Identify modification team members in accordance with Section 6.3 for the design change **and** perform walkdown(s) as necessary.

6.6.2 **If** Nuclear Safety or NCS requirements apply, **then**, as applicable, include those organizations on the modification team.

6.6.3 Organize Modification Team meetings as necessary.

6.6.4 Follow steps in Section **6.7**, except the DDP and DIVS are **NOT** required.

6.6.5 Identify applicable design inputs/outputs as needed for the expedited modification process and document on CP3-EN-0203-F05.

6.6.6 Document technical instructions **and** testing requirements on CP3-EN-0203-F05.

6.6.7 Provide listings of other Engineering documents **and** attachments in appropriate sections of CP3-EN-0203-F05.

6.6.8 Send completed CP3-EN-0203-F05 form to Modification Team for review and comment.

6.6.9 Resolve comments with reviewers, sign **and** route CP3-EN-0203-F05 form for signature.

System Engineer/Cognizant System Engineer/Subject Matter Expert/Modification Team

6.6.10 Review design documents **and** provide comments to MM/RE.

6.6.11 **When** Nuclear Safety and/or NCS is on the modification team **and** following resolution of comments, **then** ensure Nuclear Safety and/or NCS sign CP3-EN-0203-F05.

6.6.12 Following resolution of comments, System Engineer/Cognizant System/SME sign CP3-EN-0203-F05 as applicable or as determined by MM/RE.

Technical Reviewer

6.6.13 Perform technical review of engineering documents per CP3-EN-0219, *Technical Reviews* **and** provide comments to the MM.

6.6.14 Following resolution of comments, sign CP3-EN-0203-F05.

Engineering Manager/Lead

6.6.15 **When** satisfied with CP3-EN-0203-F05 completeness, technical adequacy, and documentation of design verification methodology, **then** sign the document.

Responsible Engineer/Modification Manager

6.6.16 Place approved CP3-EN-0203-F05 in Workgroup Folder for Work Planners **and** to the corresponding ESO folder.

6.6.17 Follow steps in Sections **6.10** through **6.12** as required and determined by MM and Engineering Manager/Lead.

6.6.18 Follow steps in **6.13** for ESO closeout **and** submittal to Records when work is complete.

6.7 Performing a Detailed Design

Responsible Engineer

6.7.1 Identify **and** document design inputs and bases such as environmental, security, maintenance requirements, human factors concerns, physical interface, functional interface, equipment protection, quality, industrial safety, nuclear safety/NCS, equipment interference, installation and testing requirements, and design and acceptance criteria in conjunction with Modification Team members. General considerations for developing design inputs and bases are given in Engineering Standard ES-0.9-2, *Modification Team Conduct of Operations*.

TSR 5.5.12.1

6.7.2 **If** changes are made to the structure of a process facility (C-310, C-310-A, C-331, C-333, C-333-A, C-335, C-337, and C-337-A, excluding the tie lines), **then** evaluate changes for natural phenomena hazards resistance when developing design input/output documents.

System Engineer/Cognizant System Engineer/Responsible Engineer

6.7.3 Identify any preventive maintenance tasks impacted by the modification and initiate a Preventive Maintenance Request (PMR) to add, delete, or change the tasks according to CP3-EN-0314, *Preventive Maintenance Program*.

6.7.4 Review design documents and initiate form CP3-SM-0006-F01, *SR Task Validation*, if needed for those proposed design changes, to ensure task(s) satisfy intent of applicable SRs according to CP1-NS-3001, *Technical Safety Requirements for the Department of Energy Paducah Site Deactivation and Remediation Project*.

Modification Manager

6.7.5 Ensure affected organizations have identified procedures and training modules which require development or revision.

A. Discuss procedural requirements (S&D, Emergency Management, etc.) with Modification Team members and obtain their agreement with the designated responsibilities and actions.

B. **When** Maintenance or Operations training is potentially required, **then** ensure the responsible Modification Team members (or designees) initiate a "Training Needs Analysis" according to CP3-TR-0103*, Systematic Approach to Training*, **and** record the date analysis was requested.

6.7.6 Consult with Modification Team on regulatory reviews that may be required, such as DOE reviews, Commonwealth of Kentucky environmental permit reviews, potential Documented Safety Analysis (DSA) or Technical Safety Requirements (TSR) changes, etc. Ensure such reviews are factored into the modification schedule.

Responsible Engineer

6.7.7 Notify the following for proposed changes that could impact Criticality Accident Alarm System (CAAS) coverage or audibility:

A. NCS Team Member for proposed changes that could potentially affect CAAS coverage calculations. See Appendix C for changes that potentially affect CAAS coverage calculations.

B. CAAS CSE for proposed changes that could impact CAAS audibility. This could include additions/changes to structures or installation of equipment that generates noise or reduces audibility in enclosed areas. Include requirements for CAAS audibility testing in modification documents (DDP, DIVS, etc.)

6.7.8 Designate modification equipment/component quality levels according to CP3-EN-0400, *Quality Level Determination*.

6.7.9 Ensure design inputs for NCS-related modifications are developed and documented in the DDP or CP3-EN-0203-F05 according to NCS documents, as applicable.

6.7.10 Develop or revise the following design documents as required:

A. Component design requirements and inspection criteria according to CP3-EN-0307, *Engineering Procurement Specification*.

B. Computer Software Packages according to CP3-QA-1002, *Software Quality Assurance*, for all software applications.

C. Setpoint calculations on instrumentation controls according to CP3-EN-0306, *Setpoint Change Control*.

D. Design analysis and/or calculation on equipment and systems according to CP3-EN-0213, *Design Analysis and Calculations*.

E. Engineering evaluations on subjects (evaluation of test results, evaluations of non-conforming items, as-found conditions, etc.) required to support the modification according to CP3-EN-0215, *Engineering Evaluations*.

F. Controlled vendor manuals according to ES-0.9-11, *Control of Vendor Technical Manuals and Documents*. RE may submit a controlled vendor manual prior to CFC to support installation and testing requirements or may submit during modification closeout activities.

G. Drawings to reflect the design changes and determined to be essential or non-essential according to CP3-EN-0209, *Plant Drawings*.

H. Tests to support modification acceptance where applicable according to CP3-EN-0212, *Test Plans*.

I. Detailed Design Package(s) to ensure design changes are properly defined, controlled and verified according to ES-0.9-5, *Detailed Design Package*.

NOTE:

Specifications and Post-Maintenance Testing (PMT) instructions may be included on drawings in lieu of Design, Installation, and Verification Specifications (DIVS). Industry construction specifications in CSI type format may also be used instead of DIVS.

J. DIVS, if applicable, to communicate fabrication and installation of plant changes according to ES-0.9-1, *Design Installation & Verification Specifications*.

K. Equipment Specifications according to ES-0.9-17, *Equipment Specifications*.

L. Bills of Material.

NOTE:

Specifications may be issued prior to CFC at the request of the project.

6.7.11 Coordinate with Procurement and/or QA/QC to resolve any issues for components and equipment procured by the PGDP D&R project for which engineering provided Engineering Procurement Specifications.

6.7.12 Control post-modification acceptance testing by modification drawing, DIVS, Test Plan, or other Engineering document, as applicable.

6.7.13 **If** tests demonstrate TSR Operability **or** tests are complex such that they challenge the skill of the craft, **then** flow tests into procedures or test plans, as applicable.

6.8 Review of Modifications

Modification Team Members

6.8.1 Review applicable design documents and the appropriate design output documentation provided by the MM/RE at intervals determined by the MM and Engineering Manager/Lead.

A. Review the design documents to ensure that all design inputs/bases have been considered and the appropriate design documentation has been developed.

B. Applicable Modification Team members perform and document constructability, operability, and maintainability walkdowns for 90% reviews, as required.

C. Send comments to the MM by the requested "Due Date" via email.

D. **If NO** comments, **then** respond to MM email indicating **NO** comments. No email response is considered equivalent to **NO** comments.

NOTE:

Technical reviews are normally performed after **or** concurrently with the Modification Team review of the 90% review.

Responsible Engineer

E. Resolve Modification Team comments and Technical Review comments as applicable, incorporate resolutions into the DDP and supporting documents, and convey the comment resolutions to the Modification Team.

Modification Team Members

6.8.2 Approve the final detailed design by signing the CP3-EN-0203-F01 form, which identifies the status of the modification and ESO which is being approved. Alternative approval methods (telecom or email) are acceptable, provided that they are identified on the CP3-EN-0203-F01 or attached to the CP3-EN-0203-F01.

6.9 Design Verification and Approval of Modifications

NOTE:

Procurement, fabrication, and construction may be performed prior to CFC if management requests specific scope proceed at risk. The design verification shall be completed prior to relying on the component, system, structure, or computer program to perform its functions or where the installation would become irreversible (require extensive rework).

Technical reviews are **NOT** required for non-nuclear modifications. Technical reviews are the primary design verification method for nuclear controls modifications, but may be supplemented by Alternative Calculations and/or Qualification Tests.

Responsible Engineer

6.9.1 Perform technical reviews according to CP3-EN-0219, *Technical Reviews*.

6.9.2 **If** needed, **then** supplement technical reviews by Alternative Calculations and/or Qualification Tests.

6.9.3 **When** the Alternate Calculation is used to verify a calculation that forms the basis of the design, **then** ensure the requirements of CP3-EN-0213, *Design Analyses and Calculations*, are satisfied.

6.9.4 **When** a Qualification Test is used to verify some aspect of the design, **then** ensure the following requirements are met:

A. Appropriate approved procedures are used **or** qualification tests are developed as Test Plans according to CP3-EN-0212, *Test Plans*.

B. The individual and groups to perform the test are identified.

C. Test results are to be evaluated and approved by the appropriate RE.

Modification Team Members

6.9.5 Sign CP3-EN-0203-F01 after all comments, including those from technical reviewers, have been resolved.

Engineering Manager/Lead

6.9.6 Sign the design output documents signifying approval.

6.10 Disposition of Detailed Design Documents

Responsible Engineer

6.10.1 Forward the supporting design documents to the ESO file point as directed by Engineering management. Forward any Engineering Evaluations, Design Analysis Calculations, Equipment Specifications, and Configuration Item Specification to Engineering Document Control according to CP3-OP-0025, *Document Control Process,* and to Records Management according to CP3-RD-0010, *Records Management Process*.

Modification Manager

6.10.2 Ensure that the supporting design documents are distributed to the appropriate personnel.

Responsible Engineer

6.10.3 **When** changes to the DDP, CP3-EN-0203-F05 and/or associated design documents are required after CFC, **then** use the screening criteria in CP3-EN-0302, *Engineering Change Request and Notices*, Engineering Change Notice (ECN) or Engineering Change Request (ECR) to determine the change is either an ECR or ECN.

6.11 Performing Installation and Testing

Responsible Engineer/Modification Team

6.11.1 Support the activities as described in CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*.

Responsible Engineer

6.11.2 Perform changes, as required, to approved design documents (DIVS, drawings, test plans, etc.) according to CP3-EN-0302, *Engineering Change Requests and Notices.*

6.11.3 Initiate Input Change Request (ICR) to complete changes to SSC descriptions and information in CMS, as needed, according to CP3-EN-0224, *Configuration Management System (CMS) Control*.

6.11.4 **If** an extended PAUSE requires project closeout without implementation, **then** document project status and proceed to Section **6.13**.

Modification Manager

6.11.5 Identify **and** control all changes (ECRs and ECNs) to approved design documents.

6.11.6 Identify nonconformance, noncompliance, and deficiencies on Nonconformance Reports (NCRs) or Issues Management according to CP3-QA-2005, *Nonconformance Control,* or CP3-QA-3001, *Issues Management*.

6.11.7 Monitor completion of PMT.

6.11.8 Concur with PMT by Engineering review per CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* (if applicable).

6.11.9 Develop punch list items.

6.11.10 Ensure all construction activities, changes, issues, and NCRs associated with a particular phase are complete/resolved/dispositioned.

6.11.11 **When** partial modification acceptance is to be performed, **then** ensure acceptance testing is complete for each partial modification acceptance.

Responsible Engineer

6.11.12 **When** requested by the PM/FM, **then** participate in an operational readiness review according to CP3-OP-0003, *Developing a Readiness Assessment/Operational Readiness Review Plan of Action*.

6.12 Modification Acceptance

NOTE:

Partial modification acceptance may be performed if a portion of the modification has been installed and tested and a need to accept that portion has been determined. Multiple partial modification acceptances may be performed as needed until complete modification acceptance is attained.

Modification Manager

6.12.1 Ensure essential drawings are updated to reflect the as-built configuration.

6.12.2 Ensure CMS is updated, as needed, according to CP3-EN-0224, *Configuration Management System (CMS) Control*.

Facility Manager/S&D Modification Team Member (or designee)

6.12.3 Accept the modification by verifying the following as applicable:

A. Operating, maintenance, and surveillance procedures required to support SSC functionality are complete and issued.

B. Operations and maintenance training required to support use of SSCs is complete.

C. The applicable TSR revisions are implemented.

D. **If** procedures and/or training are incomplete, **then** Facility Manager and/or the S&D Modification Team Member (or designee) ensures tracking mechanisms (that is, NCR, Issues Management, PMR, etc.) are established to track any incomplete items. This may include procedures required to support future activities such as calibration.

Modification Manager

6.12.4 **If** modification relates to TSR actions or equipment, **then** inform the Plant Shift Superintendent and the Facility Manager of modification acceptance.

6.13 Performing Closeout

NOTE:

In general, modification closure should be accomplished within 30 days after the Facility Manager accepts the project.

Responsible Engineer

6.13.1 Ensure punch list items are complete.

6.13.2 **When** punch list items/activities are **NOT** complete, **then** perform the following:

A. Coordinate with PM to ensure tracking mechanisms (that is, work order, Issues Management, PMR, etc.) are established to track the incomplete items such as procedures/training which were **NOT** required for modification acceptance and identified as punch list items.

B. Document the status of incomplete items and include as part of the ESO close-out package.

6.13.3 As-built the drawings as applicable to include any field changes (ECNs/ECRs).

6.13.4 Submit the ESO close-out package to Records Management according to CP3-RD-0010, *Records Management Process*.

7.0 RECORDS

7.1 Records Generated

The following records may be generated by this procedure:

- CP3-EN-0203-F01, *Modification Team Approval Matrix*
- CP3-EN-0203-F02, *Detailed Design Package*
- CP3-EN-0203-F03, *Design Installation and Verification Specifications*
- CP3-EN-0203-F04, *Equipment Specification*
- CP3-EN-0203-F05, *Expedited Nuclear Modification*
- Test Plan
- Design Review Package
- Modification Close-out Package
- Bills of Material

Forms are to be completed according to CP3-OP-0024, *Forms Control*.

7.2 Records Disposition

The records are to be maintained according to CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

A-E — Architect-Engineer (outside Engineering Firms)

ALARA — As Low As Reasonably Achievable

ASL — Approved Suppliers List

ASME — American Society of Mechanical Engineers

CAAS — Criticality Accident Alarm System

CDL — Controlled Documents List

CFC — Certified For Construction

CMS — Configuration Management System

CSE — Cognizant System Engineer

CTR — Contract Technical Representative

D&R — Deactivation and Remediation

DDP — Detailed Design Package

DIVS — Design Installation and Verification Specifications

DSA — Documented Safety Analysis

ECR/ECN — Engineering Change Request/Engineering Change Notice

ESO — Engineering Service Order

FM — Facility Manager

ICR — Input Change Request

MM — Modification Manager

MTAM — Modification Team Approval Matrix

NCS — Nuclear Criticality Safety

NCSE — Nuclear Criticality Safety Evaluation

NCR — Nonconformance Report

NNSS — Nevada National Security Site

NQA — Nuclear Quality Assurance

Appendix A – Acronyms/Definitions (Continued)

P.E. — Professional Engineer (licensed in KY)

PGDP — Paducah Gaseous Diffusion Plant

PM — Preventive Maintenance

PMR — Preventive Maintenance Request

PMT — Post-Maintenance Testing

PSOW — Performance Statement of Work

RE — Responsible Engineer

S&D — Stabilization & Deactivation

SR — Surveillance Requirements

SE — System Engineer

SME — Subject Matter Expert

SRV — Surveillance Requirement Task Validation

SSC — Structures, Systems, and Components

TSR — Technical Safety Requirement

WCO — Waste Certification Official

DEFINITIONS

As-Built — The configuration that physically exists in the Plant and that has been verified to be reflected in the specifications, engineering drawings, software media, and associated design changes to which the configured item has been installed.

Certified for Construction (CFC) — The point in the modification process when Design Engineering, including all reviews and design verification, is complete. The CFC is typically acknowledged by signature of the Engineering Manager/Lead on the DDP or CP3-EN-0203-F05. For A-E design using their process, CFC may be indicated by A-E manager approval on the design documents. The CFC package includes all approved documents necessary that support implementation of the modification. Partial CFCs may be approved, provided the boundaries are specifically defined in the DDP/CP3-EN-0203-F05. Partial CFCs may be performed by developing multiple DDPs/CP3-EN-0203-F05s or revising the DDP/CP3-EN-0203-F05 using the ECN/ECR process according to CP3-EN-0302, *Engineering Change Requests and Notices*.

Non-Nuclear Controls — The safety designation of a modification that does **NOT** fit the definition of nuclear controls.

Common Mode Failure — Whenever a single failure from any source could reasonably be expected to cause multiple failures. Such cascaded or common mode failures are collectively treated as a single failure.

Appendix A – Acronyms/Definitions (Continued)

Complex — For modifications, a term used to assist the Responsible Engineer and Engineering Manager/Lead in determining what method to use for documenting the technical and design requirements, considering various factors. Within the context of this procedure, for nuclear modifications the method choices are Nuclear Modification or Expedited Nuclear Modification. For example, a modification may be considered low in complexity if it involves only one discipline, contains straightforward technical and design requirements and/or the field tasks are simple to implement. An example of low complexity may include a project to air-gap or isolate a system of piping. In this case, the Expedited Nuclear Modification Process may be chosen. Determination of complexity is ultimately determined by the Responsible Engineer and Engineering Manager/Lead on a project case-by-case basis. As delegated by the Chief Engineer, the Engineering Manager/Lead makes the determination on method of documenting the modification requirements.

Configuration Management System (CMS) — A controlled listing of configuration items and their data stored in a database management system in SharePoint. CMS is managed by Engineering. It contains information based on quality levels for configuration items. CMS may contain QL-3 and QL-4 SSCs if deemed beneficial to PGDP as determined by Engineering.

Design Authority — The Chief Engineer acts as the plant Design Authority and is responsible for establishing design requirements that ensure design input/output information appropriately and accurately reflect the design bases. Design Authority responsibilities remain with the Chief Engineer whether design is performed by in-house engineering, staff augmentation or A-E firms. Engineering Managers/Leads are delegated Design Authority by the Chief Engineer and; therefore, also act as plant Design Authority.

Design Bases — The underlying rationale for the design requirements. The bases are the design input information identifying the specific function(s) to be performed by a structure, system, or component and the specific values and ranges of values for controlling parameters as reference bounds for the design. Design Bases include:

- Engineered Design Bases: The entire set of design constraints that are implemented, including those that are (1) part of the current safety basis, and (2) those technical requirements that are **NOT** included in the safety basis but are implemented to achieve certain economies of operation, maintenance, procurement, or construction.
- Technical Requirements: Those requirements that define the performance or function of structures, systems or equipment in particular applications or end-uses. Examples may include specified material properties, equipment vendors, dimensions, controls, etc. These requirements are defined in design output documents (e.g., drawings, specifications, test plans, etc.)

Design Change — As defined in ASME NQA-1, 2008 (with Addenda through 2009), a design change is any revision or alteration of the *technical requirements* defined by approved and issued design output documents, and approved and issued changes thereto.

Design Inputs — Design inputs are the design features, parameters, bases technical requirements, considerations or installation and testing specifications which are required to ensure installed SSCs meet applicable codes, standards, and regulations and are fit for intended use. Design inputs consist of items such as human factor concerns, performance and functional requirements, environmental requirements, and regulatory requirements.

Design Outputs — Design documentation in response to defined design input. Includes technical requirements shown on drawings, specifications, and other design documents.

Appendix A – Acronyms/Definitions (Continued)

Design Reviews — A process to ensure designs are correct and satisfactory. Reviews ensure design inputs are correctly identified, assumptions are adequately described and reasonable, design outputs are reasonable and correctly respond to design inputs, and the appropriate design method has been used.

Design Verification — The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to the specified requirements. In other words, it is the method of verifying the adequacy of a design. Design verification can include technical reviews, alternate calculations and qualification tests.

Detailed Design Package (DDP) — A DDP is an approved design output document which identifies and resolves design inputs/bases, provides a listing of design output documents, identifies the procedure revision and training requirements. The approved DDP represents the final design of the modification and provides documentation that the design has been verified and approved (i.e., "CFC'd"). The design inputs/outputs identified on CP3-EN-0203-F05 for the Expedited Nuclear Modification meet the requirements for detailed design package.

Engineering Change Request (ECR) and Notice (ECN) — ECRs and ECNs are approved design documents which are used to process design changes to modification design documents after the CFC is obtained. The description and controls for ECRs and ECNs are included in CP3-EN-0302, *Engineering Change Requests and Notices*.

Engineering Service Order (ESO) — Engineering services are assigned an engineering service order number for tracking purposes.

Expedited Nuclear Modification — Process used to document a modification that meets requirements of a nuclear modification, but is of low complexity. Design change must be simple in nature and involves fewer design inputs. For modifications involving numerous or complex design inputs, this process is **NOT** appropriate. Determination if this process is applicable is made by Design Authority, which is the Chief Engineer, and is also delegated to the Engineering Managers/Leads.

Final Design — Approved design output documents and approved changes thereto.

Hazard Category 2 and 3 Facilities — Facilities as listed in CP1-NS-3000 that meet DOE Hazard Category levels due to containing the requisite quantities of hazardous material or having the potential for criticality as documented in NCSEs.

Major Modification — As defined in DOE-STD-1189, modifications that substantially change the existing safety basis for the facility.

Modification — A modification is a PGDP D&R Contractor term linked to the ASME NQA-1, 2008/2009a, definition of design change. A modification is any change in function, configuration, or operating limits of SSCs, including equipment, such as cranes. These changes can be revisions, improvements, corrections, upgrades, adjustments, or alterations of hardware, geometry, manufacture, configuration, installation or controls for a plant SSC as described in the design, safety, operational, or maintenance documents. All modifications are planned, controlled, and accomplished according to the requirements and limitations of applicable procedures, codes, standards, specifications, regulations, and safety basis. Changes to SSCs may require nuclear or non-nuclear controls.

Appendix A – Acronyms/Definitions (Continued)

Modification Acceptance — The point in the modification process when the design has been fabricated/ constructed/installed in the field according to the design documents and all testing is satisfactorily complete. Partial modification acceptance may be performed if only a defined portion of the modification has been installed and tested and a need to accept that portion has been determined. Multiple partial modification acceptances may be performed as needed until complete modification acceptance is attained.

Modification Team Approval Matrix (**MTAM**) **—** The MTAM, (CP3-EN-0203-F01), used to document Modification Team member participation in the modification team and concurrence on resolution of comments provided during design reviews.

Nuclear Controls — The safety designation of a modification which has the potential of impacting safety-significant, NCS-related or defense-in-depth SSCs in performance of their intended safety function.

Qualification Test — One (optional) type of design verification. When some aspect of the design or a component in the design is very difficult to mathematically analyze, a Qualification Test may be performed to verify that aspect of the design.

Quality Assurance Program Description — The document that requires design changes to be governed by control measures commensurate with those applied to the original design per NQA-1. The Quality Assurance Program Description further clarifies that design activities are performed in a graded approach where technical requirements are based on the nature of the design and the significance of affected SSCs. By applying a graded approach to design, it follows that NQA-1 "technical requirements" do not encompass non-bounded engineering requirements that have been established to achieve certain efficiencies or economies for operation and maintenance.

Quality Level — An assigned level that determines the quality rigor and controls to be imposed on items and activities. Quality level is assigned by the methodology and criteria identified in CP3-EN-0400, *Quality Level Determination*.

Structures, Systems and Components (SSC) — A physical item designed, built or installed to support the operation of the facility. Structures are elements that provide support or enclosure such as buildings, free standing tanks, basins, dikes, and stacks. Systems are collections of components assembled to perform a function such as piping, cable trays, conduit, or heating, ventilating and air conditioning. Components are items of equipment such as pumps, valves, relays, or elements of a larger array such as computer software, lengths of pipe, elbows, or reducers. Changes to SSCs may require nuclear or non-nuclear controls.

Technical Review — Detailed, independent, objective technical and quality review of engineering designs, evaluations, testing, design analyses and calculations, and supporting documentation by an individual who is knowledgeable and competent in the technical area or on the specific subject matter being evaluated. Technical reviews are required for nuclear modification related items/activities and other items/activities as designated by the Engineering Manager/Lead and performed per CP3-EN-0219, *Technical Reviews*.

Walkdowns — Walkdowns are trips into the field to: (1) become familiar with the area and equipment layouts, (2) to gather information to be used in developing detailed design, including constructability, operability and maintainability, (3) to validate the physical configuration with the design document and NCSE for NCS modifications, (4) to observe overall appearance and labeling for acceptance.

Appendix B – Table of Required Documents and Tasks

	Required For Modification*		
Documents/Tasks	**Nuclear Controls**	**Non-Nuclear Controls**	**Expedited Nuclear Mod**
Kick-off meeting	Yes	Yes	As needed
Walkdowns	Yes	Yes	Yes
Detailed Design Package (DDP)	Yes	Yes	No
CP3-EN-0203-F05 (detailed design)	No	No	Yes
Modification Team Approval Matrix (MTAM)	Yes	Yes	No
Modification Team review	Yes	Yes	Yes
Technical review	Yes	No	Yes
Nuclear Criticality Safety Evaluation (NCSE)	If Applicable	N/A	If Applicable
Design, Installation & Verification Specification (DIVS)	If Applicable	If Applicable	No
Modification drawings	If Applicable	If Applicable	If Applicable
Reference drawings identified	If Applicable	If Applicable	If Applicable
Test Plans	If Applicable	If Applicable	If Applicable
Bills of Material (BOM)	If Applicable	If Applicable	If Applicable
Procurement Specifications (Equipment Spec, CIS)	If Applicable	If Applicable	If Applicable
Design Analysis and Calculations (DAC)	If Applicable	If Applicable	If Applicable
Setpoint Calculations (SPC)	If Applicable	If Applicable	If Applicable
Engineering Evaluations	If Applicable	If Applicable	If Applicable
Software Controls and Software Quality Assurance (SQA)	If Applicable	If Applicable	If Applicable
Configuration Management System (CMS) Update	If Applicable	If Applicable	If Applicable
Preventive Maintenance Requests (PMR)	If Applicable	If Applicable	If Applicable
Surveillance Requirement Task Validation(s) (SRV)	If Applicable	If Applicable	If Applicable
Procedures identified	If Applicable	If Applicable	If Applicable
Training identified	If Applicable	If Applicable	If Applicable

***May vary for A-E design using their processes.**

Appendix C – Changes that Potentially Affect CAAS Detection Coverage or 12-RAD Boundaries

- Change to an exterior wall
- Relocation of CAAS clusters
- Relocation or addition of surge or relief drums in process buildings
- Relocation or addition of lube oil tanks, battery rooms or process cells in process buildings
- Addition of new structures in the C-310 cylinder yard
- Change to a fissile material boundary as shown on drawing C5E-19766-A01
- Relocation, addition or removal of an interior wall having a thickness greater than the following:

Composition	Thickness (in.)
Steel	1/8
Concrete	3/8
Lead	1/16
Wood	1
Brick	3/8
Lucite	5/8
Sheetrock	5/8
Polyethylene	1

Reference EN-C-832-02-10, *Structures Credited in Shielding Calculations at PGDP*, and NCSE CAS-103, *Nuclear Criticality Safety Evaluation for MSA Bundle Compaction and Containerization*, for material thickness information.

Appendix D – CP3-EN-0203-F01 – Modification Team Approval Matrix

ESO/TASK#:	STATUS: Conceptual □ / Final □	
Modification Team Member	**Printed Name**	**Signature/Date**
Modification Manager		
Electrical Engineer		
Instrument Engineer		
Mechanical Engineer		
Civil/Structural Engineer		
CSE/System Engineer		
Contract Technical Representative		
Project Manager		
Site Operations Representative		
Fire Services		
Fire Protection Engineer		
Nuclear Safety		
Facility Manager / Designee		
Deactivation Manager / Designee		
Planner, Electrical		
Planner, Mechanical		
Planner, Instrument		
Safeguards & Security		
Training Representative		
Procedures Representative		
Nuclear Criticality Safety		
Material Control & Accountability		
Radiation Protection		
Safety & Health		
Surveillance & Maintenance		
NDA//Laboratory/Characterization		
Procurement		
Environmental Services		
Waste Management		
Emergency Management		
Quality Assurance/Quality Control		
Waste Certification Official		
Transportation Manager		
Other _____		
NOTE: If a particular discipline or organization is not a team member, mark N/A where not applicable.		