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Administrative Procedure

PRC-PRO-EN-440

Engineering Documentation Preparation and Control

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CHANGE SUMMARY

Description of Change

- added reference to PRC-STD-EN-40281, Engineering Test Documentation for creation of test documents.

- revised drawing approval requirements.

- clarified required approvals on the Calculation Cover Sheet and the releasing documents (FMP, EDC).

- revised description for new and revised Engineering Vendor Information File release based on DMCS capabilities.

- clarified when and how the Page Change method for revising engineering text documents is to be used.

- added new section to describe DMCS submittal method.

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1.0 INTRODUCTION

1.1 Purpose

This procedure describes the process for preparation, review, approval, and release of engineering documentation (drawings, specifications, calculations, etc.) for the CH2M HILL Plateau Remediation Company (CHPRC).

This procedure also describes the change control methods used for previously released engineering documentation.

1.2 Scope

This Level 2 Management Control Procedure applies to engineering documentation created and maintained by CHPRC personnel for CHPRC work scope. Documentation to which this procedure applies is considered formal engineering documentation which includes the following types:

1. Drawings
2. Specifications
3. Calculations
4. Engineering Test Plans, Specifications, Procedures, and Reports
5. Functional Design Criteria (FDC)
6. Conceptual Design Report (CDR)
7. Design Review Reports
8. System Design Description (SDD)
9. Vendor Information (VI) Files
10. Support Documents (e.g., Engineering Study, Engineering Analysis, Technical Basis)

This procedure applies to engineering documentation intended to be released into the Document Management and Control System (DMCS) and Integrated Document Management System (IDMS) as records.

1.3 Applicability

Applicability of this procedure is as follows:

- Engineering documentation previously released into the DMCS are accepted as is and do not require revision to comply with this procedure.
- Changes or revision made to previously released engineering documentation shall comply with this procedure. Revisions to legacy documents not prepared using a specified standard shall comply with this procedure for release and change control. Use of the specified standard for legacy documentation is recommended for guidance using a graded approach.
- Engineering drawings prepared for CHPRC by off-site architectural/engineering firms or vendors which are intended to be released into DMCS and IDMS shall comply with PRC-STD-EN-40279, *Engineering Drawing Standards* and are released and controlled in accordance with this procedure.

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- This procedure does not apply to engineering documentation prepared for CHPRC by off-site architectural/engineering firms or vendors unless those documents are intended to be released into DMCS/IDMS.
- This procedure does not apply to non-engineering technical and administrative documentation or other documentation that does not need to be placed under formal change control. These type of documents are managed in accordance with PRC-PRO-IRM-9679, *Administrative and Technical (Non-Engineering) Document Control*.
- Engineering documentation prepared for use in formal projects are issued and controlled in accordance with PRC-PRO-EN-8016, *Design Change Notice Process* during the life of the project. Upon project turnover and acceptance by Operations, engineering documentation to be placed under configuration control for operations shall be released and controlled in accordance with this procedure.

1.4 Implementation

This procedure is effective upon publication.

2.0 RESPONSIBILITIES

All responsibilities associated with this procedure are identified in the process steps.

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3.0 PROCESS

This section describes the process for creating new engineering documentation, changing existing engineering, and superseding or cancelling previously released change documentation.

This section is organized as follows:

- Section 3.1 Preparation of New Engineering Documentation including the following subsections:
- Subsection 3.1.1 Drawings
 - Subsection 3.1.2 Specifications
 - Subsection 3.1.3 Calculations
 - Subsection 3.1.4 Engineering Test Documentation
 - Subsection 3.1.5 Functional Requirements Document
 - Subsection 3.1.6 Functional Design Criteria
 - Subsection 3.1.7 Conceptual Design Report
 - Subsection 3.1.8 Design Review Reports
 - Subsection 3.1.9 System Design Description
 - Subsection 3.1.10 Engineering Vendor Information Files
 - Subsection 3.1.11 Supporting Documents
- Section 3.2 Change Control of Existing Engineering Documentation including the following subsections:
- Subsection 3.2.1 Drawings
 - Subsection 3.2.2 Calculations
 - Subsection 3.2.2 Engineering Text Documents
 - Subsection 3.2.3 Vendor Information
- Section 3.3 Supersedure or Cancellation of Change Documents
- Section 3.4 Submittal for Release

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The following table summarizes relevant information pertaining to the various types of engineering documentation:

Table 1 – Engineering Documentation Summary

Type	Media	Format	Preparation Standard	Initial Release Via	Change Via
Drawings	Graphical	CAD	PRC-STD-EN-40279, <i>Engineering Drawing Standards</i>	Facility Modification Plan (FMP)	FMP
Specifications	Textual	Standalone or FMP Section	PRC-STD-EN-40280, <i>Engineering Specifications</i>	FMP or Engineering Document Change (EDC)	FMP or EDC
Calculations	Calculation	Standalone or FMP Section	PRC-STD-EN-40259, <i>Engineering Calculations</i>	FMP or EDC	FMP or EDC
Engineering Test Documentation	Textual	Standalone or FMP Section	PRC-STD-EN-40281, <i>Engineering Test Documentation</i>	FMP, EDC, or Work Package	FMP, EDC, or Work Package
Functional Requirements Document (FRD)	Textual	Standalone	PRC-STD-EN-40254, <i>Functional Requirements Document</i>	FMP or EDC	FMP or EDC
FDC	Textual	Standalone or FMP Section	PRC-STD-EN-40255, <i>Functional Design Criteria</i>	FMP or EDC	FMP or EDC
CDR	Textual	Standalone	PRC-STD-EN-40261, <i>Conceptual Design Report</i>	FMP or EDC	FMP or EDC
Design Review Report	Textual	Standalone	PRC-STD-EN-40258, <i>Preliminary/Final Design Report</i>	FMP or EDC	FMP or EDC
SDD	Textual	Standalone	DOE-STD-3024, <i>Content of System Design Description</i>	FMP or EDC	FMP or EDC
Engineering Vendor Information (VI) Files	Various	File	NA	FMP or EDC	FMP or EDC
Supporting Documents	Textual	Standalone	NA	FMP or EDC	FMP or EDC

All CHPRC engineering documentation to be entered into the Hanford configuration management (DMCS) and records management (IDMS) systems shall use either a FMP or EDC form to document the release.

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Standalone engineering documents have their own number and stand on their own. Engineering Documents released with an FMP as an FMP Section are considered an integral part of the FMP.

3.1 Preparation of New Engineering Documentation

This section describes the process for preparing, approving, and releasing new engineering drawings, calculations, vendor information, and the various types of text based engineering documents. Each major type of engineering document will be discussed in its own section.

3.1.1 Drawings

All new engineering drawings are required to be released using an FMP in accordance with PRC-PRO-EN-2001, *Facility Modification Package Process*.

New engineering drawings are created using the site standard CAD software package identified in PRC-STD-EN-40279. CAD data files are configuration controlled using DMCS.

Altered Item Drawings (new engineering drawings created from vendor drawings contained in VI files) shall also be prepared as new drawings.

Actionee	Step	Action
Engineer/ Designer/ Drafter	1.	DETERMINE need for new engineering drawing to support the FMP scope.
Designer/ Drafter	2.	OBTAIN new drawing number from the Hanford Document Numbering System (HDNS). Refer to PRC-STD-EN-40279 for selection of correct drawing number prefix (i.e. H-1, H-2, etc.).
	3.	CREATE new CAD data file and PREPARE new drawing in accordance with PRC-STD-EN-40279.
	4.	<u>WHEN</u> drawing is considered finished, <u>THEN</u> OBTAIN a Drafting Check.
Drafting Checker	5.	CHECK drawing for clarity, completeness, and compliance with Hanford drawings standards as described in PRC-STD-EN-40279.
Designer/ Drafter	6.	UPDATE drawing with results from the Drafting Check <u>AND</u> SUBMIT for inclusion in the FMP.

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Actionee	Step	Action
Designer/ Drafter	7.	<p>Upon work completion of the FMP, PERFORM the following to release the new drawing:</p> <ol style="list-style-type: none"> a. IDENTIFY the approvers in the Title Block of the new drawing in accordance with Table 2 and as described PRC-STD-EN-40279. Additional approvals are as specified by the Design Authority using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. b. SUBMIT the new drawings CAD data file into the DMCS Check-in process. c. PLOT the new drawing <u>AND ENSURE</u> the same PLOTID number is shown on the CAD data file and the hardcopy plot. d. OBTAIN drawing approvals. e. SUBMIT approved drawing along with the FMP to Document Control for release in accordance with Section 3.4.

Table 2 – New Drawing Approval Summary

Title Block Approval	Approver Identification	Reason	Note
Drawn By	Name	Identify drawing creator	Designer or Drafter who created the new drawing
Drafting Approval	Name	Indicates drawing complies with Hanford Drawing Standards	Cannot be the Drafter/ Designer
Engineer	Name	Approves the technical content of the drawing	Engineer responsible for the technical content.
Design Authority	Name	Indicates the new drawing adequately reflects the technical baseline, meets the design requirements, has the necessary reviews and approvals, and is ready for release	DA responsible for the affected SSC
Additional Approvals (if specified)	Name	Indicates approval of the drawing revision for functional area requirements.	As specified by the Design Authority

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3.1.2 Specifications

The following three options are available for specifications:

- Prepare the specification as a section of an FMP and release with the FMP.
- Prepare the specification as a standalone document and release with an FMP.
- Prepare the specification as a standalone document and release with an EDC.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need for a new engineering specification.
	2.	DETERMINE if the specification will be a standalone document or will be an FMP section.
	3.	<u>IF</u> the specification is to be a standalone, <u>THEN</u> OBTAIN a specification number from the Hanford Document Numbering System (HDNS). Specification numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	4.	PREPARE the new specification in accordance with PRC-STD-EN-40280.
	5.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for an engineering specification is the Author, Design Authority/Technical Authority (DA/TA), and the DA/TA Manager. Required approvals are identified on the FMP or EDC. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational requirements.
	6.	PREPARE release documentation for the specification. <ol style="list-style-type: none"> a. For FMP integration, ADD the specification as an FMP section to the FMP. b. For a standalone specification to be released with an FMP when the FMP is initially released, IDENTIFY the specification in the FMP's Document Index and designate it as "N" (New). c. For a standalone specification to be released with an FMP when the FMP is work complete, IDENTIFY the specification in the FMP's Document Index and designate it as "NWC" (New Work Complete).

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Actionee	Step	Action
Engineer/ Author	d.	For a standalone specification to be released separately from an FMP, PREPARE an EDC in accordance with Appendix B, Engineering Document Change Form.
	7.	OBTAIN document approvals as identified on the FMP or EDC.
	8.	SUBMIT the specification and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.1.3 Calculations

The following three options are available for calculations:

- Prepare the calculation as a section of an FMP and release with the FMP.
- Prepare the calculation as a standalone document and release with an FMP.
- Prepare the calculation as a standalone document and release with an EDC.

Calculations may be prepared using electronic worksheets (e.g., Mathcad, Excel) or hand prepared worksheets.

The following requirements apply to calculations that are prepared for Office of Civilian Radioactive Waste Management (OCRWM) activities:

- The Calculation Author and Checker shall meet the applicable indoctrination, training, and qualification requirements described in PRC-PRO-QA-20765, *OCRWM Personnel Training*.
- OCRWM related calculations shall be issued and controlled as standalone documents.
- OCRWM related calculations shall have a *Review Checklist* (Site Form A-6004-797) prepared by the Calculation Checker. The *Review Checklist* shall be included in a Technical Check section of the calculation (see PRC-STD-EN-40259).
- The Calculation Checker shall provide comments on a calculation copy or shall provide comments on a *Review Comment Record (RCR)* (Site Form A-6004-835). If comments are to be provided on a calculation copy, all pages of the calculation copy shall be initialed by the Checker.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need for a new engineering calculation.
	2.	DETERMINE if the calculation will be a standalone document or will be an FMP section.
	3.	OBTAIN <u>OR</u> DETERMINE the calculation number in accordance with PRC-STD-EN-40259.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	4.	PREPARE the new calculation and a <i>CHPRC Calculation Cover Sheet</i> (Site Form A-6004-793) in accordance with PRC-STD-EN-40259.
	5.	OBTAIN calculation check from a qualified checker as required in PRC-PRO-EN-8336, <i>Design Verification</i> .
Calculation Checker	6.	PERFORM a technical check of the calculation. The calculation check shall include checking of all sections of the calculations (purpose, approach, assumptions, inputs, equations, references, conclusions, etc.) for adequacy, accuracy, and completeness. DOCUMENT the check on a copy of the calculation as follows: <ol style="list-style-type: none"> a. For OCRWM Calculations: PREPARE Site Form A-6004-797 for each OCRWM Calculation and provide comments back to the Calculation Author. Comments shall be documented using one of the following two methods: <ol style="list-style-type: none"> 1) PROVIDE markups/comments on the calculation copy as needed. INITIAL each page of the calculation copy. 2) PREPARE Site Form A-6004-835 to document the review and comments. b. For other Calculations: MARK UP a copy of the calculation, PREPARE a documented list of the comments, <u>OR</u> PREPARE Site Form A-6004-835 <u>AND</u> PROVIDE to the Calculation Author.
Engineer/ Author	7.	RESOLVE comments with the Checker and revise the calculation per the agreed upon resolution. COMPLETE the <i>RCR</i> form if one is provided. <u>WHEN</u> complete, <u>THEN SIGN AND DATE</u> Site Form A-6004-793 <u>AND OBTAIN</u> the Checkers signature.
DATA	8.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals for the Calculation Cover Sheet are the Calculation Author and Checker as identified in PRC-STD-EN-40259. b. Minimum approvals needed for the calculations releasing document (e.g. FMP, EDC) is the Calculation Author, Design Authority/ Technical Authority (DA/TA), and the DA/TA Manager. These are identified on the FMP or EDC.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
DA/TA	c.	Additional approvals may be required based on organizational requirements or DA/TA determination.
Engineer/ Author	9.	PREPARE release documentation for the calculation.
	a.	For FMP integration, ADD the calculation as an FMP section to the FMP.
	b.	For a standalone calculation to be released with an FMP when the FMP is initially released, IDENTIFY the calculation in the FMP's Document Index and designate it as "N" (New).
	c.	For a standalone calculation to be released with an FMP when the FMP is work complete, IDENTIFY the calculation in the FMP's Document Index and designate it as "NWC" (New Work Complete).
	d.	For a standalone calculation to be released separately from an FMP, PREPARE an EDC in accordance with Appendix B, Engineering Document Change Form.
	10.	OBTAIN document approvals as identified on the FMP or EDC.
	11.	SUBMIT the calculation and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.1.4 Engineering Test Documentation

Engineering Test Documentation can include any single or combination of the following types:

- Test Plan
- Test Specification
- Test Procedure
- Test Report

The following four options are available for Engineering Test Documentation:

- Prepare the test documentation as a section of an FMP and release with the FMP.
- Prepare the test documentation as a standalone document and release with an FMP.
- Prepare the test documentation as a standalone document and release with an EDC.
- Prepare the test documentation as a section of a Work Package (WP).

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need for new engineering test documentation.
	2.	DETERMINE if the engineering test documentation will be a standalone document or will be an FMP or WP section.

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Actionee	Step	Action
Engineer/ Author	a.	IF the engineering test documentation is to be a standalone, THEN OBTAIN an engineering test documentation number from the HDNS. Engineering test documentation numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new engineering test documentation in accordance with PRC-STD-EN-40281.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web.
	a.	Minimum approvals needed for engineering test documentation is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the FMP or EDC.
	b.	The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational requirements.
	5.	PREPARE release documentation for the engineering test documentation.
	a.	For FMP integration, ADD the engineering test documentation as an FMP section to the FMP.
	b.	For standalone engineering test documentation to be released with an FMP when the FMP is initially released, IDENTIFY the engineering test documentation in the FMP's Document Index and designate it as "N" (New).
	c.	For standalone engineering test documentation to be released with an FMP when the FMP is work complete, IDENTIFY the engineering test documentation in the FMP's Document Index and designate it as "NWC" (New Work Complete).
	d.	For standalone engineering test documentation to be released with an EDC, PREPARE the EDC in accordance with Appendix B.
	e.	For inclusion as a WP section, ADD the engineering test documentation as a WP section in accordance with PRC-PRO-WKM-12115, <i>Work Management</i> .
	6.	OBTAIN document approvals as identified on the FMP or EDC.
	7.	SUBMIT the engineering test documentation and FMP/EDC to Document Control for release in accordance with Section 3.4.

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3.1.5 Functional Requirements Document

FRDs are standalone documents which are typically released with an EDC but can be released with an FMP. For FRD approval, a Project Engineer may be considered to be the DA/TA, and a Project Engineering Manager may be considered to be the DA/TA Manager.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need for a FRD.
	2.	OBTAIN a FRD number from the HDNS. FRD numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new FRD in accordance with PRC-STD-EN-40254.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for a FRD is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the EDC or FMP. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or project requirements.
	5.	PREPARE release documentation for the FRD. <ol style="list-style-type: none"> a. PREPARE an FMP to release the FRD as an "N" (New) document, <u>OR</u> b. PREPARE an EDC in accordance with Appendix B for release of the FRD.
	6.	OBTAIN document approvals as identified on the EDC or FMP.
	7.	SUBMIT the FRD and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.1.6 Functional Design Criteria

The following three options are available for FDC documents:

- Prepare the FDC as a section of an FMP and release with the FMP.
- Prepare the FDC as a standalone document and release with an FMP.
- Prepare the FDC as a standalone document and release with an EDC.

For FDC approval, a Project Engineer may be considered to be the DA/TA and a Project Engineering Manager may be considered to be the DA/TA Manager.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need for a new FDC document.
	2.	DETERMINE if the FDC will be a standalone document or will be an FMP section. <ol style="list-style-type: none"> a. <u>IF</u> the FDC is to be a standalone, <u>THEN</u> OBTAIN an FDC number from the HDNS. FDC numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new FDC in accordance with PRC-STD-EN-40255.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for an FDC is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the FMP or EDC. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or project requirements.
	5.	PREPARE release documentation for the FDC. <ol style="list-style-type: none"> a. For FMP integration, ADD the FDC as an FMP section to the FMP. b. For a standalone FDC to be released with an FMP when the FMP is initially released, IDENTIFY the FDC in the FMP's Document Index and designate it as "N" (New). c. For a standalone FDC to be released with an FMP when the FMP is work complete, IDENTIFY the FDC in the FMP's Document Index and designate it as "NWC" (New Work Complete). d. For a standalone FDC to be released separately from an FMP, PREPARE an EDC in accordance with Appendix B.
	6.	OBTAIN document approvals as identified on the FMP or EDC.
	7.	SUBMIT the FDC and FMP/EDC to Document Control for release in accordance with Section 3.4.

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3.1.7 Conceptual Design Report

CDRs are standalone documents which are typically released with an EDC but can be released with an FMP. For CDR approval, a Project Engineer may be considered to be the DA/TA and a Project Engineering Manager may be considered to be the DA/TA Manager.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need for a CDR.
	2.	OBTAIN a CDR number from the HDNS. CDR numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new CDR in accordance with PRC-STD-EN-40261.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for a CDR is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the EDC or FMP. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or project requirements.
	5.	PREPARE release documentation for the CDR. <ol style="list-style-type: none"> a. PREPARE an FMP to release the CDR as an "N" (New) document, <u>OR</u> b. PREPARE an EDC in accordance with Appendix B, Engineering Document Change Form for release of the CDR.
	6.	OBTAIN document approvals as identified on the EDC or FMP.
	7.	SUBMIT the CDR and FMP/EDC to Document Control for release in accordance with Section 3.4.

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3.1.8 Design Review Reports

Design Review Reports are standalone documents which are typically released with an EDC but can be released with an FMP. For approval, a Project Engineer may be considered to be the DA/TA, and a Project Engineering Manager may be considered to be the DA/TA Manager.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need for a Design Review Report.
	2.	OBTAIN a Design Review Report number from the HDNS. Report numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new Design Review Report in accordance with PRC-STD-EN-40258.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for a Design Review Report is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the EDC or FMP. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or project requirements.
	5.	PREPARE release documentation for the Design Review Report. <ol style="list-style-type: none"> a. PREPARE an FMP to release the Design Review Report as an “N” (New) document, <u>OR</u> b. PREPARE an EDC in accordance with Appendix B, EDC Form for release of the Design Review Report.
	6.	OBTAIN document approvals as identified on the EDC.
	7.	SUBMIT the Design Review Report and FMP/EDC to Document Control for release in accordance with Section 3.4

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3.1.9 System Design Description

SDDs are standalone document which are typically released with an EDC but can be released with an FMP. SDDs should be considered as configuration baseline documentation for a Configuration Managed Structure, System, or Component (CM SSC).

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need for a SDD.
	2.	OBTAIN a SDD number from the HDNS. SDD numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new SDD using DOE-STD-3024 as guidance. SDDs may be tailored to meet the requirements of the system and facility.
	4.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for an SDD is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the EDC or FMP. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or facility requirements.
	5.	PREPARE release documentation for the SDD. <ol style="list-style-type: none"> a. PREPARE an FMP to release the SDD as an "N" (New) document, <u>OR</u> b. PREPARE an EDC in accordance with Appendix B for release of the SDD.
	6.	OBTAIN document approvals as identified on the EDC.
	7.	SUBMIT the SDD and FMP/EDC to Document Control for release in accordance with Section 3.4

3.1.10 Engineering Vendor Information Files

Vendor information for plant equipment and components may be captured in DMCS as Engineering Vendor Information. Vendor information may need to be captured for existing equipment or components. Vendor information received as contract submittals shall be reviewed by the appropriate DA for capture as Engineering Vendor Information (VI).

Engineering VI Files are contained in DMCS. Engineering VI Files are released into DMCS via an FMP or EDC.

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An Engineering VI File consists of the following items:

- Vendor provided information arranged in a logical manner.
- A *CHPRC Engineering Vendor Information (VI) Form* (Site Form A-6004-969) listing the contents of the VI File.

Engineering VI File numbers are obtained from DMCS. The Engineering VI Form provides data about the VI File and provides an index to the file.

Vendor Information should be obtained in electronic format whenever possible. Vendor information which is available only in hardcopy form will be scanned to an electronic format for inclusion in DMCS.

Actionee	Step	Action
Engineer/ Design Authority	1.	DETERMINE need for capturing vendor information within an Engineering VI File.
	2.	OBTAIN an Engineering VI File Number from DMCS or Document Control.
	3.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for a VI File is the Author, DATA, and the DATA Manager. Required approvals are identified on the FMP or EDC. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational requirements.
	4.	PREPARE the Engineering VI File. <ol style="list-style-type: none"> a. IDENTIFY contents <u>AND</u> ARRANGE in a logical manner. b. PREPARE Site Form A-6004-969 to identify associated equipment, Manufacturer info, System where installed, and other related data. IDENTIFY <u>AND</u> INDEX the contents of the Engineering VI File on the form. REFER to Appendix C, Engineering Vendor Information (VI) Form, for instructions on preparing an Engineering VI Form.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Design Authority	5.	PREPARE release documentation for the Engineering VI File. <ol style="list-style-type: none"> a. For a standalone Engineering VI File to be released with an FMP when the FMP is initially released, IDENTIFY the VI in the FMP's Document Index and designate it as "N" (New). b. For a standalone Engineering VI File to be released with an FMP when the FMP is work complete, IDENTIFY the VI in the FMP's Document Index and designate it as "NWC" (New Work Complete). c. For a standalone Engineering VI File to be released with an EDC, PREPARE an EDC in accordance with Appendix B.
	6.	OBTAIN DA approval on the Engineering VI Form.
	7.	OBTAIN Engineering VI File approvals as identified on the FMP or EDC.
	8.	SUBMIT the Engineering VI File and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.1.11 Supporting Documents

Supporting Documents are standalone documents which are prepared for specific purposes. Supporting Documents include the following:

- Engineering Reports
- Engineering Studies
- Engineering Analysis
- Technical Basis Documentation
- Safety Basis Documentation
- Other technical reports or documentation needing to be configuration controlled.

Supporting Documents are typically released with an EDC but can be released with an FMP.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need for supporting documentation.
	2.	OBTAIN a supporting document number from the HDNS. Supporting Document numbers can be CHPRC Company specific (e.g., CHPRC-XXXXX) or Project specific (e.g., D&D-XXXXX, SGW-XXXXX).
	3.	PREPARE new supporting documentation. There is no engineering standard for supporting documents. FORMAT for supporting documentation will vary depending on the type and purpose of the document.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	4.	<p>DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web.</p> <p>a. Minimum approvals needed for a supporting document is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the EDC or FMP.</p> <p>b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or facility requirements.</p>
	5.	<p>PREPARE release documentation for the supporting document.</p> <p>a. PREPARE an FMP to release the supporting document as an “N” (New) document, <u>OR</u></p> <p>b. PREPARE an EDC in accordance with Appendix B for release of the supporting document.</p>
	6.	OBTAIN document approvals as identified on the FMP or EDC.
	7.	SUBMIT the supporting document and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.2 Change Control of Existing Engineering Documentation

This section describes the process for changing and revising engineering drawings, textual documents, and vendor information.

3.2.1 Drawings

Drawings revisions are authorized with a FMP prepared and performed in accordance with PRC-PRO-EN-2001.

Drawings are revised using the site standard CAD software package identified in PRC-STD-EN-40279.

CAD data files for drawings are configuration controlled using the DMCS. Revisions to existing CAD based drawings require the CAD data file to be checked out of DMCS. The revised CAD data file is checked backed in with the next higher revision number upon completion and approval of the drawing.

Manual drawings may be revised by obtaining a TIFF file of the drawing from DMCS or a hardcopy from IRM Central Files. Manual drawings shall be converted to electronic CAD files prior to revision. This can be accomplished with either a complete redraw or conversion to a Compound Drawing (electronic drawing consisting of raster image and vector data). Refer to Appendix D, Compound Drawing Creation for more information on Compound Drawings.

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The following are two special types of drawing revision actions with specific requirements:

- **Supersedure:** Developing or revising a drawing that replaces a previously released drawing requires the older drawing to be superseded. Both drawings are revised to provide two-way traceability between the superseding and superseded drawings
- **Void:** Drawings placed into Void status shall not be revised, referenced, or used for any activity. Voiding a drawing requires the drawing to be marked as Void and revised up to the next revision number.

Drawings may also be placed into inactive status in DMCS. Drawings may be inactivated without requiring a revision. Inactivation is performed by setting the drawing status in DMCS to "Historical". Inactive drawings shall not be revised, referenced, or used for any activity unless while in this status. Inactive drawings may be reactivated at a later date if needed.

Actionee	Step	Action
Engineer/ Designer/ Drafter	1.	DETERMINE need to revise an existing engineering drawing to support an FMP scope.
Designer/ Drafter	2.	Upon work completion of the FMP, CHECK OUT drawing to be revised: <ol style="list-style-type: none"> a. For a CAD drawing, CHECK OUT the CAD data file from DMCS. b. For a manual drawing, OBTAIN a TIFF File from DMCS or hardcopy from IRM Central Files. Create a new electronic CAD file or a Compound Drawing in accordance with Appendix D.
	3.	PREPARE drawing revision in accordance with PRC-STD-EN-40279. <ol style="list-style-type: none"> a. For drawing Supersedure, PROVIDE supersedure information on both superseding and superseded drawings in accordance with PRC-STD-EN-40279. IDENTIFY both the superseding drawing and superseded drawings on the FMP. b. To Void a drawing, MARK drawing as void in accordance with PRC-STD-EN-40279. IDENTIFY drawing to be voided on the FMP.
	4.	PERFORM the following to approve the revised drawing: <ol style="list-style-type: none"> a. ENTER the drawing revision into the DMCS Drawing Approval Workflow, <u>OR</u>

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Designer/ Drafter	b.	<p>APPROVE the drawing revision using the standard approval process as follows:</p> <ol style="list-style-type: none"> 1) IDENTIFY the approvers in the Title Block of the revised drawing in accordance with Table 3 and as described PRC-STD-EN-40279. Additional approvals are as specified by the Design Authority using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. 2) SUBMIT the revised drawings CAD data file into the DMCS Check-in process. 3) PLOT the revised drawing and ensure the same PLOTID number is shown on the CAD data file and the hardcopy plot. 4) OBTAIN required approvals on the hardcopy plot. 5) SUBMIT the revised drawing to Document Control for release in accordance with Section 3.4.

Table 3 – Drawing Revision Approval Summary

Title Block Approval	Approver Identification	Reason	Note
Drawn By	Name	Identify drawing creator	Designer or Drafter making the change
Drafting Approval	Name	Indicates drawing complies with Hanford Drawing Standards	Only required for major redraws / revisions Cannot be the Drafter/ Designer
Engineer	Name	Approves the technical content of the change	Engineer responsible for the technical change
Design Authority	Name	Indicates the drawing change reflects the technical baseline, meets the FMP requirements, has the necessary reviews and approvals, and is ready for release.	DA responsible for the affected SSC
Additional Approvals (if specified)	Name	Indicates approval of the drawing revision for functional area requirements.	As specified by the Design Authority

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3.2.2 Calculations

Calculations shall be revised when corrections need to be made. Revisions made to the calculation shall be performed by using a copy of the original calculation and strikeout method whenever possible.

The following requirements apply to revised calculations prepared for OCRWM activities:

- The Calculation Author and Checker shall meet the applicable indoctrination, training, and qualification requirements described in PRC-PRO-QA-20765.
- OCRWM related Calculations shall be issued and controlled as standalone documents.
- OCRWM related Calculations shall have Site Form A-6004-797 prepared by the Calculation Checker. The *Review Checklist* shall be included in a Technical Check section of the calculation (see PRC-STD-EN-40259).
- The Calculation Checker shall provide comments on a calculation copy or shall provide comments on Site Form A-6004-835. If comments are to be provided on a calculation copy, all pages of the calculation copy shall be initialed by the Checker.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need to revise an existing calculation.
	2.	MAKE required changes to the Calculation. Changes to released calculations shall be performed using one of the following methods appropriate for the method used to prepare the original Calculation: <ul style="list-style-type: none"> a. For Handwritten Calculations: MAKE corrections or changes on a copy of the original. USE a single line strike out to make the correction, ADD the new entry, <u>AND</u> INITIAL/DATE next to the correction. b. For Electronic Calculations: USE a strikeout option if available. Otherwise, MAKE the change <u>AND</u> PROVIDE a brief description within the worksheet of what the change is for each correction.
	3.	ENSURE the Calculation complies with the requirements of PRC-STD-EN-40259 and includes Site Form A-6004-793.
	4.	OBTAIN calculation check from a qualified checker.
Calculation Checker	5.	PERFORM a technical check of the calculation. The calculation check shall include checking of all sections of the calculations (purpose, approach, assumptions, inputs, equations, references, conclusions, etc.) for adequacy, accuracy, and completeness. DOCUMENT the check on a copy of the calculation as follows:

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Actionee	Step	Action
Calculation Checker	a.	<p>For OCRWM Calculations: PREPARE Site Form A-6004-797 for each OCRWM Calculation <u>AND</u> PROVIDE comments back to the Calculation Author. Comments shall be documented using one of the following two methods:</p> <ol style="list-style-type: none"> 1) PROVIDE markups/comments on the calculation copy as needed. INITIAL each page of the calculation copy. 2) PREPARE Site Form A-6004-835 to document the review and comments. <p>For other Calculations: MARK UP a copy of the calculation, PREPARE a documented list of the comments, <u>OR</u> PREPARE Site Form A-6004-835 <u>AND</u> PROVIDE to the calculation author.</p>
Engineer/ Author	6.	<p>RESOLVE comments with the Checker and revise the calculation per the agreed upon resolution. COMPLETE the RCR form if one is provided. <u>WHEN</u> complete, <u>THEN</u> SIGN <u>AND</u> DATE Site Form A-6004-793 <u>AND</u> OBTAIN the Checkers signature.</p>
	7.	<p>DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web.</p> <ol style="list-style-type: none"> a. Minimum approvals for the Calculation Cover Sheet are the Calculation Author and Checker as identified in PRC-STD-EN-40259. b. Minimum approvals needed for the calculations releasing document (e.g. FMP, EDC) is the Calculation Author, Design Authority/Technical Authority (DA/TA), and the DA/TA Manager. These are identified on the FMP or EDC. c. Additional approvals may be requested based on organizational or facility requirements.
	8.	<p>PREPARE the release documentation for the revised engineering calculation.</p> <ol style="list-style-type: none"> a. For a calculation that is an FMP section, ADD the revised calculation to the FMP. b. For a revised standalone calculation to be released with an FMP, IDENTIFY the calculation in the FMP's Document Index <u>AND</u> DESIGNATE it as "R" (Revised).

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Actionee	Step	Action
Engineer/ Author	c.	For a revised standalone calculation to be released with an EDC, PREPARE an EDC in accordance with Appendix B.
	9.	OBTAIN document approvals as identified on the FMP/EDC and Record of Revision.
	10.	SUBMIT the revised calculation and FMP/EDC to Document Control for release in accordance with Section 3.4.

3.2.3 Engineering Text Documents

Engineering Text Documents include specifications, test documents, FDCs, SDDs, engineering reports, design reports, etc. Engineering Text Document revisions are approved and authorized using either an FMP or EDC.

Engineering Text Documents in electronic form are **revised** by making the changes to the native electronic file and incrementing the revision number (e.g., Rev 1, Rev 2, etc.). A Record of Revision is prepared to describe the change. When approved, the following shall be provided to the Document Control Station for inclusion into DMCS:

- the Approved revised document in pdf format
- a Record of Revision describing the change in pdf format
- the change authorization (FMP or EDC) in pdf format
- the native file used to revise the document

Engineering Text Document may be **voided** when no longer needed. Voiding a document will set its status to "Void" in DMCS and the voided documents cannot not be revised, referenced, or used for any activity. To void a document, revise only the Title Page to the next revision number, and prepare a Record of Revision stating the new revision voids the document. When approved, the following shall be provided to the Document Control Station for inclusion into DMCS:

- the Title Page of the voided document in pdf format (a native file is not required)
- a Record of Revision in pdf format
- the change authorization (FMP or EDC) in pdf format

Engineering Text Documents which are only available in hardcopy form are recommended to be converted to electronic and revised as described above. Those documents for which it is impractical to convert to electronic format can use the **page change** method of revision. The page change method requires the hardcopy to be scanned in total and submitted, along with the changed pages, for inclusion into DMCS. Page Changes shall be numbered with alphanumeric designation (e.g. 0A, 0B, 1A, 1B, etc.). New or additional pages shall use decimal numbering (e.g. new pages 6.1 and 6.2 to go between existing pages 6 and 7). When approved, the following shall be provided to the Document Control Station for inclusion into DMCS:

- an electronic copy of the hardcopy document being revised in pdf format
- an electronic copy of the individual pages being changed or added in pdf format
- a Record of Revision describing the change in pdf format
- the change authorization (FMP or EDC) in pdf format

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Contact Document Control for information or help in scanning of hardcopy documents for placement into DMCS.

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need to revise an existing engineering text document.
	2.	DETERMINE the type of revision method: <ol style="list-style-type: none"> a. Revision – REVISE the document <u>AND PROVIDE</u> the whole document in the change package. b. Page Change – REVISE individual pages of a document <u>AND PROVIDE</u> the individual pages in the change package. c. Void – REVISE the document Title Page with the next revision number <u>AND PROVIDE</u> the Title Page only in the change package.
	3.	PREPARE the document revision in accordance with the appropriate standard for the document type as defined in Table 1.
	4.	PREPARE a Record of Revision to describe the change in accordance with Appendix C, Record of Revision.
	5.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for an engineering text document is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the FMP or EDC. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or facility requirements.
	6.	PREPARE the release documentation for the revised engineering textual document. <ol style="list-style-type: none"> a. For a revised engineering text document to be released with an FMP when the FMP is initially released, IDENTIFY the document in the FMP's Document Index and designate it as "R" (Revised). b. For a revised engineering text document to be released with an FMP when the FMP is work complete, IDENTIFY the document in the FMP's Document Index and designate it as "RWC" (Revise Work Complete). c. For a revised engineering text document to be released separately from an FMP, PREPARE an EDC in accordance with Appendix B.

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Actionee	Step	Action
Engineer/ Author	7.	OBTAIN document approvals as identified on the FMP/EDC and Record of Revision.
	8.	SUBMIT the engineering text document and FMP/EDC to Document Control for release in accordance with section 3.4.

3.2.4 Engineering Vendor Information

Engineering VI Files are changed either through adding additional documentation or replacing existing vendor data or documentation with newer versions. Engineering VI Files are revised by providing the vendor information in pdf file format, either obtained from the vendor or scanned from a hardcopy. Since Engineering VI Files are complete revisions, the file in its entirety shall be provided to Document Control for release into DMCS. This may be provided as individual pdf files of the contents of the Engineering VI File or one file with all elements included.

If a scanned pdf file of an existing VI File is not available in DMCS, contact Central Files to have the file scanned and entered into DMCS.

NOTE: *Changes to vendor drawings require creation of Altered Item Drawings as described in Section 3.1.1 of this procedure and PRC-STD-EN-40279.*

Actionee	Step	Action
Engineer/ Author	1.	DETERMINE need to revise an existing Vendor Information File.
	2.	OBTAIN the vendor information in pdf file format either directly from the vendor, printing a pdf using HLAN pdf printer, or scanning a hardcopy of the document.
	3.	COMPILE the Engineering VI File incorporating the changes or additions.
	4.	PREPARE Site Form A-6004-969 in accordance with Appendix D.
	5.	DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web. <ol style="list-style-type: none"> a. Minimum approvals needed for an Engineering VI File is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the FMP or EDC. b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or facility requirements.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	6.	<p>PREPARE the release documentation for the Engineering VI File Supplement or Addendum.</p> <p>a. For an Engineering VI File revision to be released separately by an FMP when the FMP is initially released, IDENTIFY the Engineering VI File in the FMP's Document Index and designate it as "R" (Revised).</p> <p>b. For an Engineering VI File revision to be released with an FMP when the FMP is work complete, IDENTIFY the Engineering VI File in the FMP's Document Index and designate it as "RWC" (Revise Work Complete).</p> <p>c. For an Engineering VI File revision to be released separately from an FMP, PREPARE an EDC in accordance with Appendix B, Engineering Document Control Form.</p> <p>7. OBTAIN document approvals as identified on the FMP/EDC and Engineering Vendor Information (VI) Form.</p> <p>8. SUBMIT the Engineering VI File and FMP/EDC to Document Control for release in accordance with Section 3.4.</p>

3.3 Supersedure or Cancellation of Change Documents

Previously released change documentation (FMPs or EDCs) are superseded or cancelled with FMPs or EDCs.

- Supersedure – Supersedes a previously released change document in its entirety and completely replaces the superseded change document.
- Cancellation – Cancels a previously released change document.

Previously released change documentation to be superseded or cancelled is identified in an FMP or EDC Document Index.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	1.	DETERMINE need to cancel or supersede a previously released FMP or EDC.
	2.	DETERMINE whether the change document will be cancelled or superseded via an FMP or EDC.
	3.	PREPARE the FMP or EDC which will cancel or supersede the previously released change document. An FMP or EDC whose sole purpose is to cancel or supersede the previous change document may be prepared, or the cancellation/supersedure information may be included on an FMP/EDC performing other scope.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Engineer/ Author	4.	<p>DETERMINE reviews and approvals needed for release using the Review Guidelines for Engineering provided on the CHPRC Central Engineering Web.</p> <p>a. Minimum approvals needed for an FMP or EDC cancellation or supersedure is the Author, DA/TA, and the DA/TA Manager. Required approvals are identified on the FMP or EDC.</p> <p>b. The Review Guidelines for Engineering provides guidance for reviews. Additional approvals may be requested based on organizational or facility requirements.</p> <p>5. OBTAIN document approvals as identified on the FMP/EDC.</p> <p>6. SUBMIT the new change documentation and FMP/EDC to Document Control for release in accordance with Section 3.4.</p>

3.4 Submittal for Release

All documents entered into DMCS require a minimum of an electronic file in pdf format. Submittals for DMCS release shall include the following electronic files:

- a native file obtained from the application software
- a pdf of the document
- a pdf of the documents approval page
- a pdf of the approved change authorization (FMP or EDC)

Many software applications provide for the file to be saved in pdf format. For those that don't, a pdf file may be obtained by using HLAN Printer (available in Software Distribution) to "print" a pdf file, which can then be provided to Document Control. Hardcopy documents and document approval pages shall be scanned to pdf format for inclusion into DMCS.

The electronic files shall be saved with the following file naming convention:

- the native file shall use the document number and revision with the file format extension as the file name (e.g. CHPRC-12345-01.doc)
- the pdf file shall use the document number and revision with the pdf file extension as the file name (e.g. CHPRC-12345-01.pdf)
- the Approval page shall use the document number, revision, and CVR with the pdf file extension as the file name (e.g. CHPRC-12345-01-CVR.pdf)
- the change authorization (e.g. FMP, EDC) shall use the change authorization number with the pdf file extension as the file name (e.g. ECR-12-123456.pdf)

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Once the native files and pdf files have been saved, they may be dropped into the PRC Document Control Release Records Staging area in IDMS. This area is located at:

<http://idmsweb.rl.gov/idms/livelink.exe?func=ll&objId=165371721&objAction=browse&viewType=1>

Or can be accessed following this hierarchy in IDMS:

Enterprise: Site Cleanup/Science & Technology: Plateau Remediation: Plateau Remediation Shared Projects: PRC Document Control Release Records Staging

In the staging area, create a new folder with the document number and revision as the folder name (e.g. CHPRC-12345-01) and add all the documents into the folder by selecting the "Add Document" button and browsing to the document files.

Once the files are added to the staging area, send an email to the ^RIM DC mailbox with the subject line "Document 'xxx' in Staging Area Ready for Release". Substitute the actual document number (e.g. CHPRC-12345-01) for "xxx" in the subject. A link to the folder in IDMS can be provided in the body of the message.

4.0 FORMS

CHPRC Calculation Cover Sheet, A-6004-793

CHPRC Review Checklist, A-6004-797

Engineering Document Change, A-6004-684

CHPRC Engineering Vendor Information (VI) Form, A-6004-969

Record of Revision, A-6004-786

Review Comment Record, A-6004-835

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5.0 RECORD IDENTIFICATION

All records are required to be managed in accordance with PRC-PRO-IRM-10588, *Records Management Processes*. OCRWM records are also managed in accordance with PRC-PRO-QA-19579, *OCRWM Records Management*. Performance of this procedure may generate the following records.

Records Capture Table

Name of Record	Submittal Responsibility	Retention Responsibility	OCRWM Retention Schedule (if OCRWM Related)
Drawings	Preparer/DA	DMCS/IDMS	Lifetime
Specifications	Preparer/DA	DMCS/IDMS	Lifetime
Calculations	Preparer/DA	DMCS/IDMS	Lifetime
Acceptance Test Documentation	Preparer/DA	DMCS/IDMS	Lifetime
FDC	Preparer/DA	DMCS/IDMS	Lifetime
CDR	Preparer/DA	DMCS/IDMS	Lifetime
Design Reports	Preparer/DA	DMCS/IDMS	Lifetime
SDD	Preparer/DA	DMCS/IDMS	Lifetime
VI Files	Preparer/DA	DMCS/IDMS	Lifetime
Supporting Documents	Preparer/DA	DMCS/IDMS	Lifetime

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6.0 SOURCES**6.1 Requirements**

10 CFR 830, *Nuclear Safety Management*

CRD O 414.1C, *Quality Assurance*

CRD O 433.1A Supplement Rev 1, *Maintenance Management Program for DOE Nuclear Facilities*

PRC-RD-EN-1819, *CHPRC Engineering Requirements*

6.2 References

DOE-STD-3024, *Content of System Design Description*

PRC-PRO-EN-2001, *Facility Modification Package Process*

PRC-PRO-EN-8016, *Design Change Notice Process*

PRC-PRO-EN-8336, *Design Verification*

PRC-PRO-IRM-10588, *Records Management Processes*

PRC-PRO-IRM-9679, *Administrative and Technical (Non-Engineering) Document Control*

PRC-PRO-NS-062, *Unreviewed Safety Question Process*

PRC-PRO-QA-19579, *OCRWM Records Management*

PRC-PRO-QA-20765, *OCRWM Personnel Training*

PRC-PRO-WKM-12115, *Work Management*

PRC-STD-EN-40254, *Functional Requirements Document*

PRC-STD-EN-40255, *Functional Design Criteria*

PRC-STD-EN-40258, *Preliminary/Final Design Report*

PRC-STD-EN-40259, *Engineering Calculations*

PRC-STD-EN-40261, *Conceptual Design Report*

PRC-STD-EN-40279, *Engineering Drawing Standards*

PRC-STD-EN-40280, *Engineering Specifications*

PRC-STD-EN-40281, *Engineering Test Documentation*

7.0 APPENDIXES

Appendix A - ENGINEERING DOCUMENT CHANGE (EDC) FORM

Appendix B - RECORD OF REVISION

Appendix C - ENGINEERING VENDOR INFORMATION (VI) FORM

Appendix D - COMPOUND DRAWING CREATION

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Appendix A - ENGINEERING DOCUMENT CHANGE (EDC) FORM

An EDC form may be used when releasing or revising standalone engineering textual documents. An EDC form is available on Site Form A-6004-684.

EDC are typically issued for single documents. If warranted, multiple related documents may be issued with a single EDC.

NOTE: *EDC page numbers are for the form only. Included documentation is paginated separately from the form.*

The following instructions provide guidance for preparing an EDC:

Block Number	Block Title	Instructions
Header	ECR-__-_____	Enter the EDCs ECR number obtained from the Document Management and Control System (DMCS).
1	Title/Key Words	Enter a Title that describes the action being made by this EDC (e.g. "Initial Release of CHPRC-XXXX"). Provide related Key Words that will aid future searches or queries in DMCS/IDMS.
2	Project No. / Work Package No.	Identify the Project Number and/or associated Work Package Number(s) if applicable. If not, enter NA.
3	Area	Identify the associated Area(s).
4	Building	Identify the associated Building(s).
5	Facility	Identify the associated Facility(s).
6	System No.	Identify the associated System(s). Use the SystemID from the CHPRC Central Engineering web site.
7	Release	For use by the Document Control Station. The Document Control Station release stamp shall be placed here.
8	USQ Required?	If within the scope of the USQ process (see PRC-PRO-NS-062, <i>Unreviewed Safety Question Process</i>), check either the USQ or CX box, enter the USQ or CX Number, and the name/initials of the person performing the determination. If not within the scope of the USQ process, enter NA and have the DA/TA initial and date.
9	Distribution	Enter the names and MSIN of persons on distribution for the EDC.
10	Description	Provide text that describes the purpose of the EDC (e.g. initial release, change, void). If the EDC is for the initial release of a document, provide a summary. If the EDC changes a document, describe the reason for the change.
11	Approvals	Identify the Approvers needed for the EDC. Minimum approvals needed are the Author (or Change Originator), DA/TA (Design Authority/Technical Authority), and the Engineering Manager/TA Manager (or DA/TA Manager). Add additional approval rows as needed.

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Block Number	Block Title	Instructions
12	Document Index	<p>Identify the document(s) released, changed, voided, superseded or cancelled by this EDC.</p> <p>Indicate in the <u>Action</u> column which of the following actions is being performed by the EDC for each item listed in the Document Index:</p> <ul style="list-style-type: none"> • New (N) -- The EDC issues a new text document into the DMCS. • Direct Revision (DR) -- The EDC issues a complete revision of the document in its entirety. • Page Change (PC) -- This EDC changes only individual pages of a document. Only the individual changed pages are provided with the EDC. • Cancel (C) -- This EDC cancels another EDC. • Supersedure (S) -- This EDC supersedes another EDC. • Void (V) – The EDC voids the document. <p>Provide the <u>Number</u> and <u>Title</u> of the affected document.</p> <p>Provide the <u>Rev (being issued)</u> revision number of the document being issued or changed. New document are Rev. 0, revised documents use the next higher revision number.</p> <p>For a "Page Change" EDC, identify the pages being changed in <u>Change Page(s)</u> (NOTE: leave this field blank for other Actions).</p> <p>Check the <u>Config Baseline</u> box if the document is to become part of CM SSCs configuration baseline. Leave the box unmarked if it is not part of a configuration baseline. (NOTE: To be included in a CM SSCs configuration baseline, the correct SystemID must be identified in Block 6).</p>
13	Potentially Affected Documents	<p>Identify other documents that may be affected by the EDC. If no documents are identified, enter NA.</p> <p>Completion of this block is not mandatory but is encouraged. Information included will assist Technical Authorities for documents affected by this.</p>

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Appendix B - RECORD OF REVISION

A *Record of Revision* (Form A-6004-786) shall be prepared in accordance with the following instructions for each revision to an engineering text document.

Block Number	Block Title	Instructions
1	Document Number	Enter the Number of the Engineering Document.
2	Title	Enter the Title of the Engineering Document.
3	Revision	Enter the revision number of the revised document. The revision number for the initial issue of a document is Rev. 0. Page Changes use the current revision number plus alpha characters (e.g. Rev. 0A, Rev. 0B, Rev. 1A, Rev. 1B, etc.). Direct Revision use the next numerical number in the sequence (e.g. Rev. 1, Rev.2, etc.).
4	Description of Change	Provide a brief summary of the change(s) made to the document. Identify page changes, addition, and deletions.
5	DA/TA Date	Obtain the Design Authority/Technical Authority approval signature and date.

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Appendix C - ENGINEERING VENDOR INFORMATION (VI) FORM

An Engineering VI Form may be used when releasing or revising Vendor Information Files. A VI form is available on Site Form A-6004-969.

The following instructions provide guidance for preparing an Engineering VI Form:

Block Number	Block Title	Instructions
1	VI No.	Enter the VI Number obtained from the Document Control Station.
2	FMP/EDC No.	Enter the FMP or EDC number authorizing release of the VI data into DMCS.
3	Rev. No.	Enter the revision number of the FMP/EDC.
4	Cost Center	Provide the number of the Cost Center funding the entry of the VI data into DMCS.
5	CACN/COA	Provide the charge code for entry of the VI data.
6	Date	Enter the date.
7	Page	Enter the page number and total number of pages of the form. Page numbers are for the form only. Included VI data is paginated separately from the form.
8	Supplemental No.	If the VI action is to supplement or add to an existing VI file, enter the supplemental or addendum number. IRM Central Files can provide this number if needed.
9	Project Number	If associated with a formal EPC project, enter the Project Number.
10	PO Number	Identify the Purchase Order (PO) Number authorizing the purchase.
11	Equipment No./Title	Enter the equipment number and title.
12	Bldg./Area No.	Enter the building number(s) and Area(s) where the equipment is installed.
13	System No.	Enter the SystemID of the system(s) in which the equipment is installed.
14	Manufacturer/Vendor Name	Enter the complete name of the manufacturer (NOTE: The supplier name is not entered).
15	DA/SE Name	Print the Design Authority/System Engineers (DA/SE) name. The DA/SE signs and enters the date the form is signed.
16	Distribution	Provide the number of copies, Name, and MSIN of those on distribution for the VI File.
17	Item	Provide a sequential number for Items in the VI File.

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<i>Block Number</i>	<i>Block Title</i>	<i>Instructions</i>
18	Format	Identify the format of the VI data: <ul style="list-style-type: none">• DWG = AutoCad drawing file• MSFT = Microsoft Format file (Word, Excel, Access, PowerPoint)• PDF = Portable Document Format• HC = Hardcopy
19	Document Description	Enter the description of the Vendor Information
20	Reference	Identify the engineering document detailing where the item is installed/schematically located or the specification and paragraph that authorized the procurement.

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Appendix D - COMPOUND DRAWING CREATION

Compound Drawings are a combination of a raster image and vector data for a specific electronic drawing. Compound Drawings are created from manual drawings and provide a cost effective method for converting manual drawings into electronic drawings when needed for CHPRC activities. Compound Drawings are stored as .tif files (raster image) and .dwg files (vector data) in a common folder. Once created, Compound Drawings are configuration controlled within the Document Management and Control System (DMCS).

AutoDesk's Raster Design is imaging software that extends AutoCAD so that it can display and plot raster images along with a CAD files vector data. While the normal AutoCAD image is vector data, raster images are obtained by scanning a manual drawing and saving the file in a raster image format (e.g. .tif, .jpg, etc.). One can use various raster image editing software to change, modify, or use these scanned drawings but Raster Design allows editing and viewing of both the vector and raster image together transparently within AutoCAD, giving the appearance these images are one file. The AutoCAD command used will determine which image is edited.

AutoDesk does not provide a method to "bind, explode, or convert" these two files into one image file. Therefore the final output will be a Compound Drawing consisting of two files:

- One .dwg file containing the vector image/data.
- One .tif file containing the raster image/data.

These two files are combined into one folder and stored in DMCS as the Compound Drawing. The raster image part of a Compound Drawing is quite large and will take longer to "Final Plot" as compared to a conventional AutoCAD drawing. Compound Drawings can be viewed and plotted on any AutoCAD workstation but can only be revised using Raster Design.

Creation of a Compound Drawing

The following steps provide guidance on creating a Compound Drawing:

Actionee	Step	Action
Designer/ Drafter	1.	OBTAIN the manual drawing to be converted to a Compound Drawing from IRM Central Files.
	2.	SCAN the manual drawing with a high resolution scanner (300 pixels/inch or higher) to obtain a scanned image. The scanned image may be saved as .tif, .jpg, or other similar file type. Compressed .tif is preferred.
	3.	CREATE a new drawing in AutoCAD using the appropriate discipline template.
	4.	IMPORT/INSERT the raster image into AutoCAD. This will start Raster Design.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Designer/ Drafter	5.	<p>SAVE this drawing <u>AND</u> RASTER image to a common folder using the drawing number less extension for the folder name (e.g., H-4-123456). SAVE the two image files to this folder using the drawing name and appropriate file extension for each file (e.g., H-4-123456.dwg and H-4-123456.tif).</p>
	6.	<p>PERFORM the following actions, saving often as AutoCAD's autosave only saves the AutoCAD file and not the image file:</p> <ol style="list-style-type: none"> CLEAN UP the image using Raster Design Cleanup commands Deskew and Despeckle. RESIZE the raster image to 28"x40" and move origin to 0,0 using AutoCAD commands. REMOVE raster image of title, drawing number and sheets, building numbers, index numbers and last revision number. REPLACE these items with AutoCAD text and metadata using HTP. MOVE around the image removing speckles, unwanted lines, and smudges captured in the scan using Raster Design Remove commands. CHECK the image for unreadable geometry and text. USE AutoCAD vectors, text, and lines to replace raster data, <u>OR</u> USE Raster Design to copy readable raster images.
	7.	REVISE the drawing as needed.
	8.	When revision is complete, then these two files are released into DMCS as a "Compound Drawing" with HTP.