

**Administrative Procedure, Level 1 - Company Wide**

# **CPCC-PRO-EN-8336**

## **Design Verification**

Revision 1, Change 1

Published: 12/16/2025

Effective: 12/16/2025

Periodic Review Due Date: 04/29/2030

Program: Engineering

Topic: Engineering Program

Technical Authority: Baker, Rachel K

Functional Manager: Kujath, Brett A

# **Use Type: Administrative**



USQ Facility	USQ Review	Screeners
105 KW Facility	GCX-8 (Not in Safety Basis Compliance Matrices)	Meyer, Matthew F
324 Building	GCX-8 (Not in Safety Basis Compliance Matrices)	Hicks, Jarrod J
Below HazCat 3	<b>Exclusion Reason:</b> <i>N/A per PRC-PRO-NS-062, Section 1.3; LHC3F</i>	
Canister Storage Building/Interim Storage Area	<i>CSB-25-107</i>	Covey, Lori I
Capsule Storage Area	<i>CSA-25-144</i>	Covey, Lori I
D4ES-Central Plateau	GCX-8 (Not in Safety Basis Compliance Matrices)	Griebel, Scott D
Solid Waste Operations Complex	GCX-8 (Not in Safety Basis Compliance Matrices)	Masulonis, John U
Transportation	GCX-7 (Minor Change)	Bridges, Alvia E
Waste Encapsulation Storage Facility	<i>WSF-25-516</i>	Covey, Lori I

**JHA: Administrative**  
**Periodic Review Due Date:04/29/2030**  
 Rev. 1, Chg. 1

## Change Summary

### Description of Change

Added Step 9 to Section 3.1, General.

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**Design Verification****Published Date: 12/16/25****Effective Date: 12/16/25****1.0 INTRODUCTION****1.1 Purpose**

This procedure implements the requirements governing design verification measures established to verify that the design meets the applicable requirements for environmental, quality, safety, and performance. It provides an NQA-1 compliant method of checking a design and ensuring it meets all design requirements prior to installation and operation.

**1.2 Scope**

This procedure implements portions of the requirements of CPCC-MP-QA-599, *Quality Assurance Program*, and DOE/RW-0333P, *Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements and Description*.

**1.3 Applicability**

This procedure applies to Central Plateau Cleanup Company (CPCCo) team employees who perform new designs and modifications of Structures Systems and Components (SSC) prepared as part of the CPCCo.

**1.4 Implementation**

This procedure is effective upon publication.

**2.0 RESPONSIBILITIES**

Responsibilities are embedded in the process tables as actionees.

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### 3.0 PROCESS

Design verification process is outlined in Figure 1.

#### 3.1 General

Design verification should be completed before release for procurement, manufacture, construction, modification, or release to another organization for use in other design activities. In those cases where this timing cannot be met, such as when insufficient data exists, Engineering Management approval must be obtained prior to initiating the procurement, manufacture, construction, or modification activity. In those cases, identify and control the unverified portion of the design. In all cases, complete the design verification before relying upon the structure, system, or component (SSC) or computer program to perform its function.

When a significant design change is necessary because of an incorrect design; the design process and design verification methods and implementing documents shall be reviewed and modified, as necessary.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Design Originator/ Design Authority (DA)/ Engineering Manager (EM)	1.	<p>DETERMINE if design verification is required.</p> <p>a. Activities that require DV include issuing and revising Facility Modification Packages, Design Change Notices, Engineering Packages, Formal Design Reviews, Calculations, EDC's for design documents, Drawings and Design Requirements Documents. This also applies to designs submitted by subcontracted engineering services released through the CPCCo processes.</p>
	2.	<p><u>IF</u> design verification cannot be completed prior to release for procurement, manufacture, construction, modification document, <u>THEN</u> document EM approval and identify and control the unverified portion of the design to ensure DV has been completed before relying upon the structure, system, or component (SSC) or computer program to perform its function.</p>
DA / EM	3.	<p>ENSURE design verification is accomplished by a qualified individual(s) or group(s) other than the one who performed the original design.</p>
	4.	<p>In consultation with the verifier(s), and using Appendix A, SELECT the design verification method(s) to be used. For selection of the design verification method(s), consider:</p> <ul style="list-style-type: none"> <li>• Safety SSC designation of the design</li> <li>• Complexity of the design</li> <li>• State of development of the technology</li> <li>• Financial exposure</li> <li>• Consequences of failure</li> </ul>

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Actionee	Step	Action
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- NOTE:**
- *Different design verification methods may be used for different aspects of the design and at different stage(s) during the design process.*
  - *More than one Design Verification Method may be selected.*

DA / EM	5.	ENSURE the extent of design verification required for a particular design is governed by the importance and complexity of the design (see Appendix A). Depending on this some design verification activities may not be necessary.
Design Verifier(s) / Chairman	6.	Using the verification method(s) selected and in accordance with Section 3.2 and Appendix A of this procedure, VERIFY that the: <ul style="list-style-type: none"> <li>• Design inputs are adequately defined including functions, requirements and design criteria.</li> <li>• Design bases, performance requirements, regulatory requirements, codes, and quality standards are adequately defined.</li> <li>• The design meets all defined requirements and parameters.</li> <li>• Acceptance Criteria are adequate to confirm that the requirements for the design are met by the final product.</li> <li>• Where appropriate, review for manufacturability, operability and maintainability.</li> </ul>
	7.	VERIFY design methods, materials, parts, equipment, and processes that are essential to the function of the SSC or computer software for suitability of application. <ul style="list-style-type: none"> <li>• <u>IF</u> the N/A box is checked for any of the questions on Site Form A-6004-795, <i>Design Verification Record</i>, <u>THEN</u> a justification shall be documented in the comments section.</li> </ul>
Chairman/ DA/ EM	8.	IDENTIFY, CONTROL, RESOLVE, <u>AND</u> COMPLETE action items resulting from design verification processes before approval and implementation of the design.

- NOTE:** *Design verification should be completed before release for procurement, manufacture, construction, modification, or release to another organization for use in other design activities. In cases where design verification cannot be completed due to insufficient data, identify and control the unverified portion of the design. In all cases, complete the design verification before relying upon the structure, system, or component (SSC) or computer program to perform its function.*

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Actionee	Step	Action
Chairman/ Design Verifier(s) / EM	9.	Once action items have been resolved, REVIEW resolutions and approve Site Form A-6004-795, Design Verification Record.
Chairman / DA / EM	10.	<u>IF</u> design verification cannot be completed, such as when insufficient data exists, and disposition of certain issues are deferred to more appropriate design package, <u>THEN</u> OBTAIN Engineering Management approval prior to initiating the procurement, manufacture, construction, or modification activity.
Design Verifier(s) / Chairman	11.	DOCUMENT the design verification to provide evidence that verification has occurred in accordance with Appendix A.

### 3.2 Conduct of Design Verification

#### 3.2.1 Peer Design Review

Design verification by means of independent review refers to an evaluation of the design conducted by a qualified individual(s) other than the one who performed the initial design. The primary objective of the Independent Reviewer is to verify that the results of the design process adequately satisfy the functional requirements and design inputs.

Actionee	Step	Action
Reviewer(s)	1.	REVIEW the engineering documentation (e.g., the engineering specification, basic assumptions, applicable test data, calculations, drawings, proposed changes, and related information).

**NOTE:** *The reviewer(s) may be from another project, program, department, or division or an outside consultant. The reviewer may be the responsible DA if the individual did not perform the original design. The reviewer(s) may be the originator's manager, if the manager did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design.*

*For OCRWM-related activities, the reviewer(s) may be the originator's supervisor / manager provided:*

- *The supervisor / Manager is the only individual in the organization competent to perform the verification.*
- *The verification is not hastily and superficially done.*
- *The determination to use the supervisor / manager is documented and approved, in advance, with concurrence of the QA organization.*

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
DA / EM	2.	ENSURE that the individual(s) performing the independent (Peer) Review have the necessary expertise to perform an in-depth review (e.g. Fire Protection Engineering for fire system design, an HVAC SME for an HVAC design). When the design encompasses more than one discipline, use more than one Independent Reviewer to cover the entire design.
Reviewer(s)	3.	REVIEW the design for inclusion and/or adequacy of functional requirements, design inputs, assumptions, methods of calculations, structural integrity, interfaces, reasonable tolerance, use of standard materials and material sizes, etc., to verify that the results of the design process are consistent with the design basis and the design is adequate for the intended application. <ol style="list-style-type: none"> <li>a. DOCUMENT the results as outlined in Appendix A</li> </ol>

### 3.2.2 Alternate Calculations

Design verification by means of alternate calculations involves the use of one or more different methods of analysis to check and ensure the correctness and applicability of pertinent design calculations, both hand and computer calculations. Alternate calculations may consist of techniques, such as using simplified approximations to check lengthy or complicated methods, using more or less conservative assumptions in the analysis, using numerical analysis, or data extrapolations.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Reviewer(s)	1.	REVIEW the appropriateness of assumptions, input data used, and the computer program or other calculation method used in the original analysis.
	2.	DOCUMENT the results as outlined in Appendix A.

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### 3.2.3 Qualification Testing

Design verification by means of qualification testing refers to those cases where design adequacy is to be verified by laboratory or field tests on prototype, pilot, or production hardware and/or computer software in accordance with CPCC-PRO-EN-286, *Testing of Equipment and Systems*.

<b>Actionee</b>	<b>Step</b>	<b>Action</b>
Reviewer(s)	1.	PERFORM design verification by means of qualification testing including: <ul style="list-style-type: none"> <li>• Preparation of test specifications and/or test procedures per CPCC-PRO-EN-286.</li> <li>• Final test results are evaluated to ensure that test requirements have been met.</li> </ul>
	2.	DOCUMENT the results as outlined in Appendix A.

### 3.2.4 Formal Design Reviews

Formal design reviews consist of a systematic overall review and evaluation of a design by a committee representing all affected disciplines, see CPCC-PRO-EN-40264, *Formal Design Review*.

A Design Review Chairman should be selected by the project, program, department, or division manager. The Design Review Committee should be designated by the Design Review Chairman in conjunction with the EM. Members of the Design Review Committee should have the necessary expertise to ensure that in depth review can be performed. Neither the Design Review Chairman nor the members of the committee should be individuals who performed the original design.

Preferably, the Design Review Chairman and the Design Review Committee are the same individuals for all design reviews conducted on a specific design.

<b>Actionee</b>	<b>Step</b>	<b>Action</b>
Reviewer/ Chairman/ DA/ EM	1.	SELECT a Design Review Chairman and a Design Review Committee, conduct reviews, and issue a Formal Design Review Report per CPCC-PRO-EN-40264.
	2.	DOCUMENT the results as outlined in Appendix A.

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**4.0 FORMS**

A-6004-795, *Design Verification Record*  
A-6004-835, *Review Comment Record (RCR)*

**5.0 RECORD IDENTIFICATION**

None

**6.0 SOURCES**

**6.1 Requirements**

10 CFR 830, *Nuclear Safety Management*  
CPCC-MP-QA-599, *Quality Assurance Program*  
CPCC-RD-EN-1819, *Engineering Requirements*  
CRD O 413.3A, *Project Management for the Acquisition of Capital Assets*  
CRD O 414.1C, *Quality Assurance*  
DOE/RW-0333P, *DOE Office of Civilian Radioactive Waste Management - Quality Assurance Requirements and Description*

**6.2 References**

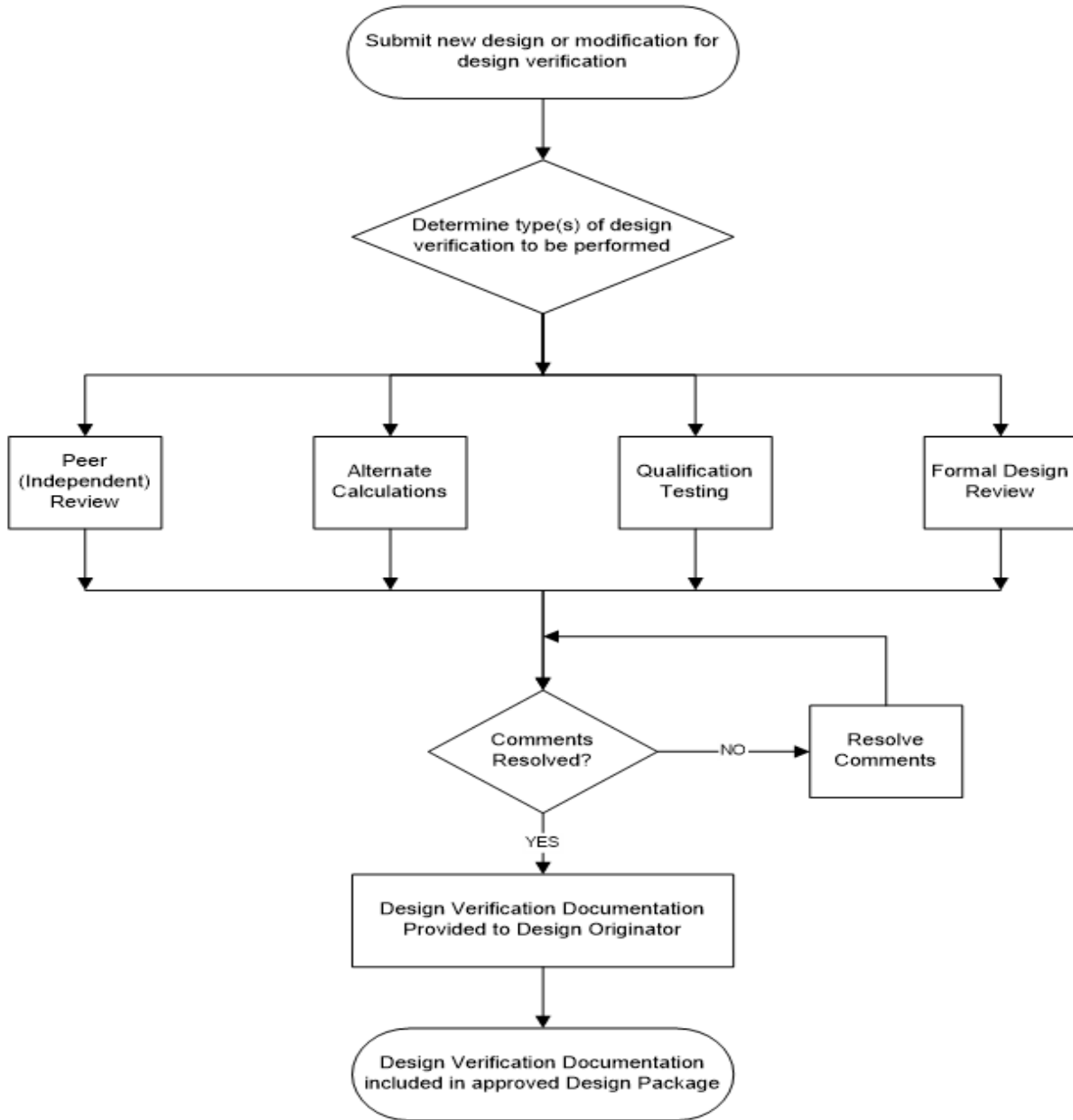
CPCC-PRO-EN-286, *Testing of Equipment and Systems*  
CPCC-PRO-EN-40264, *Formal Design Review*

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Figure 1. Design Verification Process



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**Appendix A - Guidance for Selecting Appropriate Type of Design Verification**

<b>Design to be Verified</b>	<b>Peer (Independent) Review</b>	<b>Alternate Calculation</b>	<b>Qualification Testing</b>	<b>Formal Design Review</b>
Change to Safety Class and/or Safety Significant Structures, Systems, and Components or New or Prototype Safety Design	New or repeat design with relatively low risk/complexity/cost	Verification of the adequacy of a completed calculation.	Known process, new application, or prototype design designated for testing by the responsible Engineering manager	New design with relatively high risk/complexity/cost
Documentation Requirements	Site Form A-6004-795  For Calculations use CPCC-PRO-EN-40259, <i>Engineering Calculations</i> .	Site Form A-6004-795  For Calculations use CPCC-PRO-EN-40259, <i>Engineering Calculations</i> .	Formal Test Report per CPCC-PRO-EN-286 And Site Form A-6004-795	Design Review Report per CPCC-PRO-EN-40264 And Site Form A-6004-795 or A-6004-835
Change to General Service Structures, Systems, and Components or New or Prototype General Service Design	New or repeat design with relatively low risk/complexity/cost	Verification of the adequacy of a completed calculation.	Known process, new application, or prototype design designated for testing by the responsible Engineering manager	New process/design with relatively high risk/cost/complexity
Documentation Requirements	Site Form A-6004-795  For Calculations use CPCC-PRO-EN-40259, <i>Engineering Calculations</i> .	Site Form A-6004-795  For Calculations use CPCC-PRO-EN-40259, <i>Engineering Calculations</i> .	Formal Test Report per CPCC-PRO-EN-286, And Site Form A-6004-795	Design Review Report per CPCC-PRO-EN-40264 And Site Form A-6004-795 or A-6004-835