

**PROJECT MILESTONE REVIEW PLAN
90% DESIGN REVIEW**

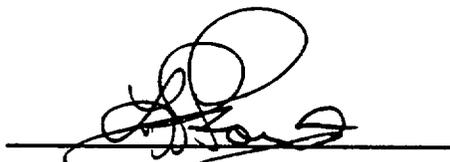
ESF

TITLE II DESIGN

SUBSURFACE FACILITIES

DESIGN PACKAGE 2A

NEVADA SITE MANAGER



DATE 7/16/93

REVIEW LEADER



DATE 7/15/93

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Attachment 1 Index of Design Output Documents

Attachment 2 Reference Documents Provided

Attachment 3 M&O QAP-3-14, Project Milestone Reviews, Revision 0

Attachment 4 M&O QAP-3-1, Technical Document Review, Revision 2

Attachment 5 Project Milestone Review Checklist

Attachment 6 Project Milestone Team Selection Record

Attachment 7 Example Document Review Record

**PROJECT MILESTONE REVIEW PLAN
ESF TITLE II DESIGN
SUBSURFACE DESIGN PACKAGE 2A**

1. INTRODUCTION

The CRWMS M&O subsurface design organization has documented the design of facilities associated with a portion of the first 160 meters of tunnel of the Exploratory Subsurface Facility (ESF) at Yucca Mountain, Nevada. This portion of the ESF was designed for construction using drill-and-blast tunneling techniques. Design documents, including drawings, specifications, and analyses, have been produced for the Title II design for this portion of the ESF. These documents constitute Package 2A of the Subsurface Facility Design for the ESF. This package of design drawings, specifications, and analyses, hereafter referred to as Package 2A, is the subject of this Project Milestone Review.

This review addresses "Design Reviews and Verification by Design Organizations", Section 4.2.7 of the Yucca Mountain Site Characterization Project Design Plan, Rev. 0, January, 1993, Document YMP/93-06, which requires "review of design output documentation prior to submission to the YMPO" (Yucca Mountain Site Characterization Project Office). This review also meets the requirements for a Management Review and an Independent Technical Assessment for the 90% design review stage called for in Section 8.0 Review of the Management and Operating Contractor Fiscal Year 1993 Exploratory Study Facilities Engineering Plan, Revision 3, Document B00000000-AA-01-00001-03, July, 1993.

2. PURPOSE

The general purpose of this review is to help M&O and DOE managers and other interested parties assess whether the ESF design is technically correct and if it is in compliance with project objectives.

The specific purpose is for the design organization of the M&O to ascertain the status of technical progress, cost, schedule, and attainment of project requirements documented in the Exploratory Studies Facility Basis For Design Document (BFD), CRWMS M&O Document No. B00000000-01717-6300-00002, Rev. 0, July 8, 1993. The degree to which the Basis for Design (BFD) implements upper tier requirement documents of the project is also a subject of this review. This review will be conducted under the auspices of M&O QAP-3-14, Project Milestone Reviews. Results of the review will be provided to the M&O Nevada Site Manager and the Manager of the MGDS Development Office. Decisions and communications by the M&O resulting from this review will occur at the discretion of the M&O Nevada Site Manager. This Project Milestone Review does not meet the QARD requirements for design verification.

3. SCOPE

The scope of this review is limited to comments on design output documents, i.e. design drawings, design specifications, and design analyses produced as part of Package 2A and the BFD. Review objectives are limited to assessing the compliance of the subject design documents with applicable sections of the BFD and assessing the appendices of the BFD. The primary deliverable of this review will be a Summary Report submitted to the Nevada Site Manager. This report and all other documents generated by this review will be submitted to the M&O records management system.

4. ATTACHMENTS

Attachments included and essential to this plan are:

Attachment 1 - Index of Design Output Documents

Attachment 2 - Reference Documents Provided

Attachment 3 - M&O QAP-3-14, Project Milestone Reviews, Revision 0

Attachment 4 - M&O QAP-3-1, Technical Document Review, Revision 2

Attachment 5 - Project Milestone Review Checklist

Attachment 6 - Project Milestone Team Selection Record

Attachment 7 - Example Document Review Record

5. REVIEW TEAM

Dr. Scott Sinnock is the Review Leader. The Review Secretary is Mr. Rick Fournier. Review team members, their organization and area of expertise are listed below.

5.1 Review Team Members

<u>Name</u>	<u>Organization</u>	<u>Expertise</u>
F. Afshar	M&O	Health & Safety
B. H. Anzai	RSN	Mechanical Engineering
R. B. Baumeister	DOE/SO	Safety
J. Blaylock	DOE/QA	QA
J. Blink	LLNL	Test Functions
J. M. Boak	DOE/RSED	Performance Assessment
S. J. Brocoum	DOE/RW-22	General Compliance
R. L. Bullock	RSN	Rock Mechanics

D. G. Buxton	M&O	Requirements
J. J. Clark	M&O	Conveyors
W. L. Clem	M&O	Requirements
R.A. Crawley	DOE/RSED	Geology
B. G. Cruz	M&O	Specialty Engineering
R. R. Dressel	M&O	Construction
D. Edwards	USGS	Testing
T. I. Fortner	DOE/EDD	Electrical
J. T. Gardiner	DOE/EDD	General Compliance
R. E. Howell	M&O	Electrical Engineering
R. J. Justice	M&O	Quality Assurance
H.N. Kalia	LANL	General Compliance
D. Kessel	SNL	Testing
R. G. Kovach	LANL	Testing
T. M. Leonard	REECO	Construction
W. P. Law	M&O	Requirements
R. Milner	DOE/RW-40	General Compliance
H. Montalvo	M&O	Civil Engineering
T. G. Nelsen	RSN	Electrical Engineering
S. A. Nordick	RSN	Structural Engineering
L. Ozdemir	CSM	Mining
T. H. Pysto	T&MSS	Environmental
R. C. Quittmeyer	M&O	SBT Interface
D. Rogers	M&O	Repository Interface
R. L. Schreiner	RSN	Systems Engineering
D.E. Shelor	DOE/RW-30	General Compliance
G. M. Teraoka	M&O	Requirements
B. J. Verna	DOE/EDD	Requirements
R. S. Waters	DOE/EDD	Mining
E. M. Weaver	M&O	Regulatory Requirements
J. M. White	DOE/EDD	Repository Interface
R. J. White	DOE/EDD	Site Engineering
W. A. Wilson	DOE/FO	Field

5.2 Observers

Individuals may request to be formal observers of the 90% Milestone Review. Such individuals should make their intentions known to the Review Secretary before or during the meeting of July 19, 1993. As observers, these individuals may, with the reviewers permission, accompany reviewers during the review process. Though comments may not be submitted directly by observers, they may submit comments through a sponsoring reviewer, at the discretion of the reviewer.

5.3 Additional Participants

Other individuals involved who are either associated with the M&O and DOE design team or are technically independent of the subject design process may serve as reviewers or formal observers at the discretion and acceptance of the Review Leader.

6. SCHEDULE

The schedule for the 90% Design Review of Design Package 2A is as follows:

<u>Date</u>	<u>Responsible Agent</u>	<u>Activity</u>
July 19, 1993	Reviewers and Designers	Presentation of Design Package. Training and Distribution of Documents for Review.
July 20-26, 1993	Reviewers	Reviews in progress. Comments Due by COB JULY 26, 1993.
July 27-Aug 3, 1993	Designers	Prepare comment responses.
Aug 4-6, 1993	Reviewers	All reviewers meet to complete comment resolution.
Aug 9-23, 1993	Review Leader	Summary Report preparation.
Aug 26, 1993	Review Leader	Summary Report Briefing to M&O Nevada Site Manager
Aug 31, 1993	Review Leader	Summary Report submitted to M&O Nevada Site Manager

7. PROCESS

The procedure for performing the 90% Design Review of Package 2A is M&O QAP-3-14, Project Milestone Reviews, Rev. 0, July 17, 1992.

7.1 Pre-Review Activities

Prior to initiating any review activities, all reviewers will be trained in and be familiar with the latest versions of QAP-3-14, QAP-3-1, Technical Document Review, and this plan. Also the reviewers will attend a presentation of information by the design organization about the subject matter of the review. This information will be presented at a meeting on July 19, 1993 in Las Vegas, Nevada. At this meeting the documents to be reviewed, the materials to be trained on, and supporting reference material will be provided to the reviewers. Before beginning review of the design materials, all reviewers will review and concur on their assignment to areas of topical expertise by the Design Leader, and will confirm their independence or association with the design organization for Package 2A.

7.2 Review Activities

Reviewers shall review the design documents of Package 2A and the BFD, submit their comments to the Review Secretary using the Document Review Record (DRR) forms (attachment 7). Reviewers should use the design criteria listed in Section 9 to decide on the type and scope of review comments. Reviewers may review any part of the documents review, subject to, but are strongly encouraged to restrict their comments to their areas of assigned expertise. In addition to requirements for identifying the specific drawing or section of a design document for which a comment is provided, as specified in QAP 3-1, reviewers should identify the specific section of the BFD document controlled by the design component addressed by the comment, if appropriate.

Reviewers shall document and resolve all comments in accordance with QAP 3-1. Comments are to be resolved with the responsible design organization. Presenters of design information at the meeting on July 19 will serve as the primary points of contact for the reviewers. The Review Secretary will arrange meetings, as needed, between reviewers and design engineers to facilitate comment resolution. The reviewer and responsible design engineer shall sign the DRR forms upon resolution of comments.

If any part of the design uses unproven or beyond state-of-the-art approaches, the Review Leader may recommend to the Nevada Site Manager that a peer review be performed for that aspect in accordance with QAP-3-3, Peer Review. The recommendation and resulting actions shall be documented in the summary report. If a significant deficiency in a verified design is discovered, the Review Leader shall report this finding to the M&O QA Manager for appropriate action in accordance with QAP-16-1, Corrective Action Report.

Issues that remain open subsequent to completion of the review shall be recorded on an Open Items Report by the Review Leader. The Review Secretary shall monitor and track the open items to ensure resolution by using the Open Items Register. The Review Leader shall report monthly the status of open items or issues to the Nevada Site Manager.

As part of this review, the reviewers are requested to: 1) verify that the applicable comments deferred from the 50% Design Review are addressed; and 2) close those comments if appropriate. If the comment is part of this Design Review package and if the comment was satisfied, acknowledge resolution by signing the Open Items Report and closing out the comment. If the comment has not been satisfactorily addressed, sign the Open Items Register form stating that a new comment shall be entered as part of this 90% Design Review of the Subsurface Facilities Design Package 2A.

7.3 Review Summary Documentation

The Review Leader, with input from team members, shall prepare a Summary Report of the review. The report shall include:

- A. the scope of the review, including specific systems, structures, components, and items.
- B. the identity of review team members and any design organization personnel contacted during the review.
- C. a summary of the results of the review.
- D. any significant problems encountered or deficiencies identified and their respective resolutions, including any corrective action initiated.
- E. a list of open issues and/or actions to be taken.
- F. review team recommendations, such as the need for a verification or peer review on some unique aspect of a design.

The Review Leader shall coordinate a meeting at which the results of the reviews and any pertinent recommendations are presented to the Nevada Site Manager. Subsequent to the meeting, the Summary Report shall be signed by the Review Leader and forwarded to the Nevada Site Manager and responsible manager of the design organization.

A package consisting of the review plan, checklists, procedures, comment and resolution records, reviewer qualification records, and the Summary Report shall be submitted to the M&O records management system by the Review Secretary. Subsequent documentation regarding open issues and closures shall be added to the package as it is developed.

Upon completion of the Design Review as described above, and upon concurrence of the Nevada Site Manager, the Review Leader shall declare the review closed.

8. INSTRUCTIONS TO REVIEWERS

8.1 General Guidance

Attention should be given to the content and sentence structure of the reviewers' comments to provide the design engineer with constructive, referenced, and supported remarks. Comments should be concise and their intent should be clear, requiring no dialogue to determine their meaning. Reviewers should provide information which can be incorporated or expanded by the M&O to enhance the quality of the designs. Because the comment sheets are records which may become public information, comments should be structured in a professional manner.

8.2 Specific Guidance

- A. All comments shall be recorded on the Document Review Record (DRR) forms.
- B. The number of comments per DRR is limited to one.
- C. Comments should remain with the areas of expertise of the reviewers; if a reviewer has a comment in other areas, it should be passed along to another reviewer with the relative expertise.
- D. Editorial comments or comments on the contractual language in specifications shall not be submitted.
- E. Avoid comments in the form of questions. Make statements that can be acted upon by the design engineer to resolve your concerns. Questions such as, "What is the intent of ...?" are not comments requiring resolution. Most question-type comments can be structured into constructive comments. For example, "What is the intent of...?" can be restructured to "Provide an explanation in this section to support ...".
- F. Avoid comments such as "more detail required," "change," or "clarify." Instead, state what additional details or clarifications are considered necessary, or state "change to ..." and support the suggested change with reference or justification, or provide the additional text necessary to resolve the comment.
- G. Provide supporting evidence such as a reference, or attach verified information or rationale if a comment identifies a technical error or disagreement with a conclusion.
- H. If the document is a specification, list the page, paragraph, and sentence numbers on the Document Review Record.
- I. If the document is a drawing, give the specific zone number (i.e., drawing number, Zone A-1, Detail 1, etc.) on the Document Review Record.

- J. Comments must remain within the scope of the review, i.e., Package 2A.
- K. If a comment is about a design component that is based on the BFD, identify the applicable BFD section on the Document Review Record (attachment 7).
- L. Comments shall be written in black ink only. White-out or multiple strike-outs are not allowed. If a correction is necessary, draw a single line through the error, date and initial.
- M. Comments should be legible.
- N. Submit DRR sheets on each category of documentation, i.e., drawings, specifications, analyses. If there are no comments in a particular category, enter "no comment" on a DRR and submit it.
- O. Submit all Document Review Record forms, completed Project Milestone Review Checklists, and QA self-study records to the Review Secretary, Mr. Rick Fournier, Suite 527, 101 Convention Center Drive, Las Vegas, NV, 89109.

9. Review Criteria

9.0 Review comments should be based on the following criteria:

9.1 Management Review Criteria

1. Are the management and administrative impacts acceptable?
2. Are interfaces between the DOE organizations, if any, consistent with lines of authority and organizational responsibilities?
3. Are interfaces between the DOE and Participants, if any, consistent with existing contracts, Memoranda of Understanding, or other agreements?
4. Does the document describe requirements or processes in a manner that can be understood and correctly followed by an infrequent user?
5. If the document addresses a management approach or methodology, is the approach reasonable?
6. Are requirements and management approaches or methodologies consistent with known YMP management or administrative policies?

9.2 General Technical Review Criteria

1. Are inputs and input sources current, correct, and usable under the requirement for qualified data?
2. Are those assumptions stated explicitly and are they reasonable?
3. Are analytical and/or design approaches and results reasonable and appropriate?
4. Was technical input correctly incorporated into the final document or design?
5. Were potential interfaces or interactions with non-design disciplines, such as Environmental, adequately addressed?
6. Were quality-relationship determinations clearly and correctly identified?
7. Are design packages reasonable from the standpoint of economy, as well as constructability and operability, and most importantly, safety?

9.3 Specific Design Review Criteria

(See Attachment 5, Project Milestone Review Checklist)

ATTACHMENT 1

DESIGN DOCUMENTS FOR REVIEW

PACKAGE 2A (Subsurface Design)

Mechanical Tasks

- Surface Conveyor System Design Analysis
- Subsurface Conveyor Design Analysis
- Chemical Tracer Injection System Analysis for Construction Process and Firewater Usage
- Chemical Tracer Injection System Analysis for Underground Compressed Air Usage

Mechanical Specifications

- Construction Water Supply
- Construction Ventilation System
- Construction Dewatering System
- Construction Compressed Air System
- Compressed Air Tracer Injection System for Construction
- Water Tracer Injection System for Construction Process and Firewater
- Surface Belt Conveyor for Overland Muck Handling
- Subsurface Conveyor System
- Conveyor Chutes, Hoppers, and Bins
- Radial Stackers
- Weigh Scales Surface Belt Conveyor
- Sound Cover Specifications for Mechanical Equipment
- Operations of Subsurface Chemical Tracer Injection System

Mechanical Drawings

- Surface and Subsurface Mechanical Flow Diagram
- Surface Conveyor System Routing Plan - GA
- Subsurface Conveyor - GA - Sheet 1 of 4
- Subsurface Conveyor - GA - Sheet 2 of 4
- Subsurface Conveyor - GA - Sheet 3 of 4
- Subsurface Conveyor - GA - Sheet 4 of 4
- Surface Conveyor - GA - Plan, Profile and Lower Sections - Sheet 1
- Surface Conveyor - GA - Plan, Profile and Upper Sections - Sheet 2
- Transfer Tower No. 1 - GA - Plans - Sheet 1
- Transfer Tower No. 1 - GA - Sections and Details - Sheet 2
- Subsurface Conveyor Booster Drive General Arrangement
- Subsurface Conveyor Intermediate Load Section, General Arrangement
- Subsurface Conveyor - Sections and Details

Civil/Structural Tasks

- Lattice Girder and Shotcrete Ground Support Calculations

Electrical Tasks

- Review Existing Engineering
- Electrical switchgear, transformers, and power center procurement specifications. Single line drawings for support of TBM operations.
- Performance Specifications for Construction

Electrical Drawings

- Single Line Diagram, Main & North Portal Switchgear, Subsurface
- Subsurface Electrical Equipment Layout Diagram
- Subsurface TS - Tunnel Substation, Single Line Diagram- Sheet 1
- Subsurface TS - Tunnel Substation, Single Line Diagram- Sheet 2
- Subsurface TS - Tunnel Substation, Single Line Diagram- Sheet 3
- Subsurface TS - Tunnel Substation, Single Line Diagram- Sheet 4
- Single Line Diagram, Electrical Notes & Legend, Subsurface

Electrical Specifications

- Construction Subsurface Lighting System
- Construction Telephone/Paging System
- Construction Subsurface Electrical Power
- Construction Subsurface Fire Detection
- basic Electrical Materials & Methods
- Dry-Type Transformers
- Medium Voltage Switchgear
- 600 V Power and Control Cable
- Conduit
- Cable Trays
- Medium-Voltage Power Cables
- 600 Volt Instrument Cable
- Wiring Devices
- Subsurface Power Center Enclosure
- Supporting Devices
- Electrical Identification
- Subsurface Medium Voltage Switchgear
- Medium Voltage Portal Load Interrupter Switch
- Low Voltage Switchgear
- Grounding
- Power Distribution Panels and Panelboards
- Subsurface Substation (Packaged Equipment)
- Emergency Lights
- DC Battery System

Mining Tasks

- Transportation of People and Supplies Study
- TS North Ramp Blast Design Calculations for Package 2A
- TS North Ramp Stability Analysis (Package 2A)
- Rockbolt Analysis and Calculations for Package 2A
- Dewatering System Analysis
- ESF North Ramp Layout Design Analysis

Mining Specifications

- Rockbolts and Accessories
- Shotcrete
- Subsurface Drilling and Blasting
- Welded Steel Lattice Girder Supports

Mining Drawings

- Overall Subsurface GA - Plan
- TS North Ramp GA - Plan
- TS North Ramp GA - Profile
- TS North Ramp GA - Plan
- TS North Ramp GA - Plan
- TS North Ramp GA - Sections
- TS North Ramp GA - Section
- North Ramp Rockbolt Patterns - Plan and Section
- North Ramp Solid Grouted Rockbolts - Sections and Details
- North Ramp Hollow Grouted Rockbolts - Sections and Details
- North Ramp Splitset Rockbolts - Details
- North Ramp Shotcrete Standards - Sections and Details
- North Ramp Lattice Girders - Sections and Elevations
- North Ramp Lattice Girders - Details
- North Ramp Excavation Sequence - Plan and Sections
- North Ramp Excavation Sequence - Sections and Details
- North Ramp Blasting GA - Sections and Details
- North Ramp Blasting GA - Details

General Information

- DIE for North Ramp

Miscellaneous Documents

- ESF Basis For Design (BFD) Document

ATTACHMENT 2

REFERENCE DOCUMENTS PROVIDED

Documents used as Reference Material

1. Exploratory Studies Facility Design Requirements (ESFDR), YMP/CM-0019.
2. Staff Technical Position on Regulatory Considerations in the Design and Construction of the Exploratory Shaft Facility (NUREG-1439).

ATTACHMENT 3

CRWMS M&O QAP-3-14

**CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM M&O CONTRACTOR
QUALITY ADMINISTRATIVE PROCEDURE**

Title: PROJECT MILESTONE REVIEWS

Procedure Number: QAP-3-14

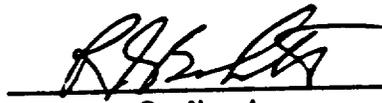
Revision: 0

Date: July 17, 1992

Approvals:

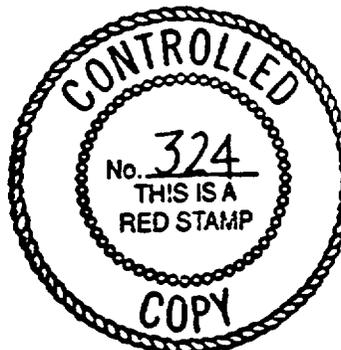


General Manager, CRWMS M&O



Manager, Quality Assurance

UNCONTROLLED



1. PURPOSE

This procedure establishes responsibilities and prescribes methods for conducting Project Milestone Reviews by the M&O Contractor. Project Milestone Reviews are for the purpose of ascertaining the status of technical progress, cost, schedule, and attainment of project objectives. These reviews do not meet the requirements for design verification as required by the OCRWM QARD.

2. SCOPE

This quality administrative procedure applies to M&O personnel involved in planning, performing, documenting, and reporting results of Project Milestone Reviews. These activities are related to designs considered to be quality affecting. Acceptance by the M&O Review Team does not constitute OCRWM approval of a design.

3. APPLICABLE DOCUMENTS AND DEFINITIONS

3.1 APPLICABLE DOCUMENTS

- 3.1.1 "Quality Assurance Requirements Document (QARD)," DOE/RW-0214.
- 3.1.2 QAP-3-1, Technical Document Review.
- 3.1.3 QAP-3-3, Peer Review.
- 3.1.4 QAP-16-1, Corrective Action Report.
- 3.1.5 QAP-17-1, Program Records Management.
- 3.1.6 "CRWMS M&O Quality Assurance Program Description" (M&O QAPD).

3.2 DEFINITIONS

- 3.2.1 The definitions of standard terms may be found in the glossaries of the documents referenced in paragraph 3.1.1.

- 3.2.2 System Conformance Review** - An in-depth technical review of a completed design phase conducted to confirm that technical requirements have been addressed and verified by competent personnel and that the results appear reasonable to experts in the field. This review does not meet the QARD requirement for design verification.
- 3.2.3 Project Milestone Review Package** - A collection of documents that provide information to be reviewed by the Review Team so that the review objectives may be achieved. The package contains such items as specifications, reports, plans, and drawings. The document review package also includes an index identifying all the documents in the package.
- 3.2.4 Design Verification** - The act of determining and documenting that the design is correct and conforms to all specified requirements.
- 3.2.5 Project Milestone Review** - A planned review conducted periodically during the design process to ascertain the status of technical progress, cost, schedule, and attainment of project objectives. The scheduling of a Project Milestone Review corresponds with predetermined project or program milestone points. A Project Milestone Review does not meet the QARD requirements for design verification.
- 3.2.6 Open Item** - A review comment that was not resolved prior to the completion of the review meeting. Open items must be closed to consider a review complete.

4. RESPONSIBILITIES

4.1 M&O GENERAL MANAGER

Reviews and gives final approval of this Quality Administrative Procedure (QAP).

4.2 M&O QUALITY ASSURANCE MANAGER

The M&O Quality Assurance Manager is responsible to the M&O General Manager for the review and approval of this QAP.

4.3 M&O ASSISTANT GENERAL MANAGER, OPERATIONS and NEVADA SITE MANAGER

- 4.3.1** Determine what designs within their area(s) of responsibility are subject to Project Milestone Reviews.
- 4.3.2** Schedule and monitor Project Milestone Reviews.

Civilian Radioactive Waste Management System

Management & Operating Contractor

- 4.3.3 Assign Project Milestone Review leaders.
- 4.3.4 Provide resources for implementing Project Milestone Reviews.
- 4.3.5 Chair Project Milestone Reviews.

4.4 MANAGER, SYSTEM INTEGRATION

The System Integration Manager is responsible for coordinating, developing, and maintaining this procedure.

4.5 PROJECT MILESTONE REVIEW LEADER

- 4.5.1 Establishes an agenda and schedule for completing the review.
- 4.5.2 Determines necessary qualifications for review team.
- 4.5.3 Selects review team members and designates a review secretary.
- 4.5.4 Leads the review team.
- 4.5.5 Documents qualifications of the review team members.
- 4.5.6 Prepares the review plan and assembles the review package.
- 4.5.7 Distributes copies of the review plan and review package.
- 4.5.8 Prepares a review report.
- 4.5.9 Prepares an Open Items Report.

4.6 PROJECT MILESTONE REVIEW TEAM MEMBERS

- 4.6.1 Prepare review criteria as requested.
- 4.6.2 Assist in the preparation of the review plan as requested.
- 4.6.3 Perform the review.
- 4.6.4 Complete Document Review Records and identify open items and observations.
- 4.6.5 Evaluate the adequacy of responses to Open Item Reports.

4.6.6 Assist in the preparation of the review report.

4.7 PROJECT MILESTONE REVIEW SECRETARY

4.7.1 Documents review team activities.

4.7.2 Records results of the review meetings.

4.7.3 Collects and consolidates Document Review Records.

4.7.4 Prepares an Open Item Register.

4.7.5 Prepares minutes of formal review meetings.

4.8 DESIGN ORGANIZATION

The Design Organization shall support the activities of the reviewers to facilitate the closure of the review.

5. PROCEDURE

5.1 M&O PROJECT MILESTONE REVIEWS

5.1.1 The M&O Project Milestone Reviews are conducted supplementary to OCRWM design reviews as the need is determined by the appropriate CRWMS M&O Assistant General Manager or Nevada Site Manager. OCRWM may elect to participate in these reviews sponsored by the M&O. In such cases, the OCRWM representative will perform in accordance with the M&O procedures.

5.1.2 Project Milestone Reviews are performed by the M&O contractor at milestones in the design process primarily to assess the status of the design effort relative to technical process and to provide assurance that specified requirements are being fulfilled. Project Milestone Reviews are typically conducted at established percentages of completion and at the end of each design phase.

5.1.3 The Project Milestone Review does not fulfill the needs of the QARD for design verification.

5.2 EXTENT OF PROJECT MILESTONE REVIEW

The rigor and detail required of the Project Milestone Review shall be a function of the importance to radiological safety or waste isolation, complexity, degree of standardization, state-of-the-art, degree of departure from accepted and proven engineering practices, and similarity with previously proven designs of the engineered system, structure, or component.

5.3 SCHEDULING

5.3.1 Each Assistant General Manager or Nevada Site Manager shall review program schedules at least semi-annually and determine what systems designs will be reviewed by the M&O contractor.

5.3.2 For each review scheduled, the responsible Assistant General Manager or Nevada Site Manager shall assign a Project Milestone Review Leader and determine the type and rigor of review required. The information concerning each review shall be promulgated by a Project Milestone Review Notice (Attachment I) and sent to the cognizant office manager.

5.4 PLANNING

5.4.1 The following instructions for planning a review may be selectively applied for Project Milestone Reviews.

5.4.2 The design organization shall identify all functionally and physically interfacing systems, structures, components, and items. The design organization shall also identify all information, data, and analytical tools that provided input to or support to the design.

5.4.3 The review leader shall develop a review plan. The plan shall document the following aspects of the review:

- A. Describe the exact scope of the review, including the specific system, structure, component, or item that will be the subject of the review.
- B. Identify all design output documents subject to review.
- C. Determine all disciplines that might affect or be affected by the system, structure, component, or item subject to review. Consideration will be given to operations, maintenance, environmental compliance, construction, radiological-safety, and materials engineering disciplines.

- D. While considering the complexity and state-of-the-art of the design, establish the Project Milestone Review team member qualification requirements.
 - E. Give consideration to design requirements documents, safety analyses documents, calculations, computer code and hardware documentation, background information supporting advanced or state-of-the-art engineering techniques, codes, standards, and interface control documents from the information provided by the design organization.
- 5.4.4** The review leader shall contact the responsible design organization and establish a detailed schedule and location for the review. This information shall be included in the review plan.
- 5.4.5** The cognizant Assistant General Manager or Nevada Site Manager shall approve the review plan.
- 5.4.6** The review leader shall assemble the review team from the M&O organization, OCRWM, other program participants, and/or external sources (Attachment II). The reviewers' independence from the design organization or from the actual design shall also be documented Reviewer Qualification Statement (Attachment III).
- A. The team members supporting M&O contract Project Milestone Reviews shall have demonstrated competence in the disciplines required for the assigned aspects of the review. Documentation of competence should reference academic degrees, professional certifications and affiliations, and summarize relevant experience.
 - B. The team should include representation from applicable areas of specialty.
- 5.4.7** Cognizant Office Manager approval of team members shall be obtained prior to execution of the Project Milestone Review.

5.5 PREPARATION

- 5.5.1** The following instructions for preparing a review may be selectively applied for Project Milestone Reviews.
- 5.5.2** The review leader shall assemble the review team to prepare for the review. Preparation shall include the following:

- A. Familiarization with the scope, schedule, and plan for the review and the technical requirements of the particular design. Copies of applicable requirements documents shall be provided to the review team members.
 - B. Assurance that the reviewers have been trained and are familiar with this procedure.
 - C. Familiarization with the subject system, structure, component, or item designs. Design output, such as drawings and specifications, should be provided if available.
 - D. Assignment of responsibility to team members for areas of the design and preparation of checklists or instructions to be used in the review, as appropriate.
 - E. Review team members shall develop checklists of topics that will be considered in the review. Attachment VI is an example checklist for a review. It is important that items not related to the design, or that are not readily answerable, are not addressed mistakenly.
- 5.5.3** The review leader shall review and approve checklists and/or instructions developed by team members.
- 5.5.4** The review leader shall arrange for the responsible design organization to present an overview of the design and design processes and to make the responsible engineers available, as well as all information supporting the design.
- 5.5.5** The accomplishment of the preparation phase shall be documented by the review secretary prior to execution of the review.

5.6 EXECUTION

- 5.6.1** The following instructions are mandatory for Project Milestone Reviews.
- 5.6.2** The review team shall receive an overview of the design and design processes from the responsible design organization.
- 5.6.3** The review team shall conduct a review in the assigned areas according to the review plan and the checklists or instructions that have been developed.

- 5.6.4** If any major part of the design uses unproven or beyond state-of-the-art approaches, the review leader may recommend to the appropriate Assistant General Manager or Nevada Site Manager that a peer review be performed for that aspect in accordance with QAP-3-3, Peer Review. The recommendation and resulting actions shall be documented in the review report. It is left to the discretion of the review leader to consider similar action for minor portions of the design.
- 5.6.5** The review team members shall document review comments and comment resolutions in accordance with QAP-3-1, Technical Document Review, and resolve all comments with the responsible design organization. The review team member and responsible design engineer shall sign the Document Review Records (DRR) upon resolution of the comments.
- 5.6.6** Where a significant difference of opinion prevents resolution within the review team or resolution between the review team and responsible design organization, the review leader shall ensure that the difference is elevated for decision to the appropriate management level until resolution is reached.
- 5.6.7** If a significant deficiency in a verified design is discovered, the review leader shall report this finding to the M&O QA manager for appropriate action in accordance with QAP-16-1, Corrective Action Report.
- 5.6.8** Any issues that remain open subsequent to completion of the review shall be recorded on an open items report (Attachment V) by the review leader. The review secretary shall monitor and track the open items to ensure resolution by using the open items registers. The review leader shall report monthly the status of open items or issues to the appropriate Assistant General Manager, or Nevada Site Manager. The responsible Assistant General Manager shall monitor the status of all open items through closure.

5.7 REPORTING

- 5.7.1** The review leader, with input from team members, shall prepare a report of the review results. The report shall describe the following as appropriate:
- A. Scope of the review, including specific systems, structures, components, and items.
 - B. Identity of the team members and design organization personnel contacted during the review.
 - C. Summary of results of the review.

- D. Any significant problems encountered or deficiencies identified and the resolutions, including corrective actions initiated.
 - E. Identity of any open issues and actions to be taken.
 - F. Review team recommendations, such as the need for a reverification, or a peer review on some unique aspect of a design.
- 5.7.2** The review leader shall coordinate a formal meeting to present the results and recommendations of reviews to the General Manager or Nevada Site Manager and Assistant General Managers or Nevada Site Manager as appropriate.
- 5.7.3** The review report shall be signed by the review team leader and forwarded to the cognizant Assistant General Manager or Nevada Site Manager and responsible manager of the design organization.
- 5.7.4** A package consisting of the review plan, checklists or procedures, comment and resolution records, reviewer qualification records, and the review report shall be submitted to the M&O records management system by the review team leader. Documentation regarding open issues and closure shall be added to the package as it is developed.
- 5.7.5** The review team leader is responsible for declaring the review closed, with the approval of the Assistant General Manager or Nevada Site Manager.

6. RECORDS

- 6.1** Documents generated as a result of this QAP shall be collected, stored, and maintained in accordance with requirements specified in QAP-17-1, Program Records Management. At a minimum the following documents must be maintained:
- 6.1.1** Review Notices (Attachment I).
 - 6.1.2** Review Packages.
 - 6.1.3** Team Selection Record (Attachment II).
 - 6.1.4** Reviewer Qualification Statements (Attachment III).
 - 6.1.5** Review Plans.

- 6.1.6 Completed Document Review Records sheets.
- 6.1.7 Review Reports.
- 6.1.8 Completed Open Items Registers (Attachment IV).
- 6.1.9 Completed Open Items Reports (Attachment V).
- 6.1.10 Miscellaneous correspondence related to the Review.

7. ATTACHMENTS

- 7.1 ATTACHMENT I - Project Milestone Review Notice (Example).
- 7.2 ATTACHMENT II - Project Milestone Team Selection Record (Example).
- 7.3 ATTACHMENT III - Reviewer Qualification Statement (Example).
- 7.4 ATTACHMENT IV - Open Items Register (Example).
- 7.5 ATTACHMENT V - Project Milestone Open Items Report (Example).
- 7.6 ATTACHMENT VI - Suggested Project Milestone Review Topics.

**ATTACHMENT II
 PROJECT MILESTONE TEAM SELECTION RECORD (EXAMPLE)**

Civilian Radioactive Waste
 Management System
 Management & Operating
 Contractor

**Project Milestone
 Team Selection Record**
 Complete only applicable items.

WBS: _____
 QA Class: _____
 Page: _____ of _____

Project Milestone Review Subject:

Function:	Yes	No	Team Member
Secretary	<input type="checkbox"/>	<input type="checkbox"/>	_____
Civil Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Construction Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Electrical Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Environmental	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fuel Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Geology	<input type="checkbox"/>	<input type="checkbox"/>	_____
HVAC	<input type="checkbox"/>	<input type="checkbox"/>	_____
Instrumentation and Controls	<input type="checkbox"/>	<input type="checkbox"/>	_____
Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	_____
Manufacturing Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Mechanical Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Nuclear Safety	<input type="checkbox"/>	<input type="checkbox"/>	_____
Operations	<input type="checkbox"/>	<input type="checkbox"/>	_____
Quality Assurance	<input type="checkbox"/>	<input type="checkbox"/>	_____
Radiation Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____
Radiation Waste Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Reliability Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Safety and Health	<input type="checkbox"/>	<input type="checkbox"/>	_____
Security	<input type="checkbox"/>	<input type="checkbox"/>	_____
Systems Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Structural Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Startup and Test Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Others: _____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

*I have reviewed and approved the above functions and find they encompass the subject area.
 I have reviewed "Reviewer Qualification Statements" of personnel identified above and approve
 their participation in the Review process.*

Review Team Leader _____ Date _____

**ATTACHMENT III
REVIEWER QUALIFICATION STATEMENT (EXAMPLE)**

Civilian Radioactive Waste
Management System

Management & Operating
Contractor

Reviewer Qualification Statement

Complete only applicable items.

WBS _____
QA Class: _____
Page of _____

1. Reviewer's Name: _____	Date: _____
2. Address: _____	
3. Telephone: _____	Position/Title: _____
4. Document/Work to be Reviewed: _____	
5. Independence _____	
6. Education and Experience	
a) Education: _____	

b) Related experience, scientific publications, and professional licenses:	

c) Membership in related professional organizations:	

7. Is Resume Attached? Yes <input type="checkbox"/> No <input type="checkbox"/>	
8. Reviewer's Signature _____	Date _____
9. Review Team Leader's Approval _____	Date _____

ATTACHMENT IV
OPEN ITEMS REGISTER (EXAMPLE)

**Civilian Radioactive Waste
Management System**
**Management & Operating
Contractor**

**Open Items
Register**

WBS: _____
QA Class: _____
Page: _____ of _____

Complete only applicable items.

Review Subject:				
Open Item No.	Action and Responsibility for Closure	Scheduled Closure	Date Closed	Verifier's Initials

ATTACHMENT VI
SUGGESTED PROJECT MILESTONE REVIEW TOPICS

1. Were the design inputs correctly selected, verified, and approved?
2. Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
3. Was an appropriate design method used?
4. Were the design inputs correctly incorporated into the design?
5. Is the design output reasonable compared to design inputs?
6. Are the necessary design input and verification requirements for interfacing organizations specified in the design documents or in supporting procedures or instructions?
7. Are the applicable codes, standards, and regulatory, functional and technical requirements, including issue and addenda, properly identified and are their requirements for design met?
8. Have all computer codes used in the design analysis been validated and verified on the computer systems used in the analysis?
9. Were design, design verification, and peer review (as applicable) procedures correctly implemented?
10. Have qualified and certified materials and parts been specified where appropriate?
11. Is the design specified producible by conventional means?
12. Does the design adequately consider maintainability, operability, reliability, and radiological safety?
13. Are the appropriate quality and QA requirements satisfied?
14. Have applicable construction and operating experiences been considered?

ATTACHMENT VI (Continued)
SUGGESTED PROJECT MILESTONE REVIEW TOPICS

15. Have the design interface requirements been satisfied?
16. Are the specified parts, equipment, and processes suitable for the required application?
17. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?
18. Have adequate maintenance features and requirements been specified?
19. Are accessibility and other design provisions adequate for performance of needed maintenance, in-service inspection, and repair?
20. Has the design properly considered radiation exposure to the public and plant personnel?
21. Are the acceptance criteria incorporated in the design documents sufficiently detailed and specific to allow verification that design requirements have been satisfactorily accomplished?
22. Have adequate preoperational and subsequent periodic test requirements been appropriately specified?
23. Are adequate handling, storage, cleaning, and shipping requirements specified?
24. Are adequate identification requirements for control of items and materials specified?
25. Are requirements for record preparation, submitted review, approval, and retention, adequately specified?

ATTACHMENT 4

CRWMS M&O QAP-3-1

**CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM M&O CONTRACTOR
QUALITY ADMINISTRATIVE PROCEDURE**

Title: TECHNICAL DOCUMENT REVIEW

Procedure Number: QAP-3-1

Revision: 2

Date: July 17, 1992

Approvals:


General Manager, CRWMS M&O


Manager, Quality Assurance

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1. PURPOSE

The purpose of this procedure is to establish the process for the review of technical documentation prepared by M&O personnel.

2. SCOPE

This procedure applies to those quality affecting technical documents not otherwise covered by applicable QAPs for which review by M&O groups external to the originating organization is required by OCRWM or the M&O contractor. For review and processing of software documentation, this procedure or other applicable QAPs may be used as determined and documented by the cognizant office manager. When the M&O Contractor is directed by OCRWM to review technical documents prepared by other CRWMS participants, specific OCRWM review instructions shall apply.

3. APPLICABLE DOCUMENTS AND DEFINITIONS

3.1 APPLICABLE DOCUMENTS

3.1.1 OCRWM Quality Assurance Requirements Document (QARD), DOE/RW-0214. |

3.1.2 M&O Quality Assurance Program Description (QAPD). |

3.1.3 QAP-2-2, Verification of Personnel Qualifications. |

3.1.4 QAP-3-5, Development of Technical Documents. |

3.1.5 QAP-3-13, Document Identifiers. |

3.1.6 QAP-17-1, Program Records Management. |

3.2 DEFINITIONS

3.2.1 The definitions of standard terms may be found in the glossary of the document referenced in paragraph 3.1.1.

3.2.2 Technical Document - A document that specifies scientific or engineering requirements, presents scientific or engineering information or data, or describes scientific or engineering processes.

4. RESPONSIBILITIES

4.1 QUALITY ASSURANCE MANAGER

The Quality Assurance (QA) Manager is responsible for reviewing all quality affecting technical documents subject to the provisions of this QAP to ensure OCRWM QARD requirements are satisfied.

4.2 DEPARTMENT MANAGERS

4.2.1 Assign specific review responsibility for technical documentation prepared within the functional area, including the designation of the lead document preparer and document coordinator.

4.2.2 Establish the review/approval/release schedule and maintain document review status.

4.2.3 Coordinate the review with QA and the appropriate department manager(s).

4.2.4 Provide specific review instructions to the reviewers.

4.2.5 Coordinate, control, distribute, and obtain resolution of all comments.

4.3 LEAD DOCUMENT PREPARER

The lead document preparer is the primary technical point of contact for a document and is responsible for the development and accuracy of that document. The lead document preparer is also responsible for receiving, consolidating, and maintaining technical review comments for a specific document and for compiling the required records.

4.4 TECHNICAL REVIEWERS

Technical reviewers are responsible for reviewing documentation as assigned and providing comments in accordance with this procedure.

4.5 SYSTEM INTEGRATION MANAGER

In addition to the above responsibilities of a Department Manager, the System Integration Manager is responsible for preparing and maintaining this procedure.

5. PROCEDURE

5.1 GENERAL INSTRUCTIONS

- 5.1.1 Quality affecting technical documents within the scope of this QAP shall be reviewed for technical content, compliance with QA and system requirements, consistency with controlling baseline documentation, and potential program impacts.
- 5.1.2 The review team is chosen by the cognizant Department Manager and the lead document preparer. Documentation of competence should reference academic degrees, professional certifications and affiliations, and summarize recent experience in accordance with QAP-2-2, Verification of Personnel Qualifications.
- 5.1.3 The review team shall include, but is not limited to, the QA manager and reviewers knowledgeable in the technical area(s) addressed in the document. Reviewers shall not review any portion of the technical document that they directly participated in developing or were responsible for preparing.
- 5.1.4 Before a document is issued for technical review, a unique document identifier shall be assigned in accordance with QAP-3-13, Document Identifiers. This identifier must appear on the upper right hand corner of the document.

5.2 INITIATING THE REVIEW

- 5.2.1 The following review process begins upon completion of a technical document developed in accordance with QAP-3-5, Development of Technical Documents. The Department Manager, in coordination with the lead document preparer, initiates the technical review by:
 - A. Designating the review team
 - B. Establishing the review schedule
 - C. Establishing or referencing evaluation/acceptance criteria as documented in program requirements documents, industry codes, standards, NUREGs, Federal regulations, and interfacing technical documents

D. Initiating the Document Review Record (Attachment I) and completing the top portion

E. Providing to the review team the document with a Document Review Record, the above information, and any other pertinent instructions.

5.3 TECHNICAL DOCUMENT REVIEW

5.3.1 In accordance with the guidance provided by the requesting Department Manager, the reviewers shall conduct their review.

5.3.2 Comments shall be recorded on the Document Review Record (see Attachment I). Mandatory comments shall be indicated by an asterisk (*).

5.3.3 When a reviewer has completed the review, the comments must be forwarded to the lead document preparer. If there are no comments, it shall be noted on the DRR and returned to the document preparer.

5.4 TECHNICAL DOCUMENT VERIFICATION

If this Review is to be used as the verification of the document as required by QAP-3-5, the following provisions apply.

5.4.1 The technical document shall be verified by qualified individual(s) other than the preparer or approver.

Individuals verifying technical documents shall not have:

A. Immediate supervisor responsibility for the individual preparing the document

B. Specified a single design approach

C. Ruled out certain design considerations

D. Established the design inputs for any particular design aspect being verified.

Exceptions to these limitations for document verification shall be restricted to special situations where the supervisor is the only individual in the organization competent to perform the verification. Justification for such use shall be documented and signed by the Assistant General Manager, Operations; Assistant General Manager, Systems; or the Nevada Site Manager, as applicable, with QA concurrence.

Civilian Radioactive Waste Management System

Management & Operating Contractor

5.4.2 When performing the review of a document that is not a design document, the following shall be addressed where applicable:

- A. Were the inputs correctly selected, verified, and approved?
- B. Are assumptions necessary to perform the activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed activities are completed?
- C. Were the inputs correctly incorporated?
- D. Are the necessary input and verification requirements for interfacing organizations specified in the documents or in supporting procedures or instructions?

5.4.3 When this procedure is used as the method of verification of a design document, the following shall be addressed where applicable:

- A. Were the design inputs correctly selected?
- B. Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
- C. Was an appropriate design method used?
- D. Were the design inputs correctly incorporated into the design?
- E. Is the design output reasonable compared to the design input?
- F. Are the necessary design input and verification requirements for interfacing organizations specified in the design documents or in supporting procedures or instructions?

5.5 COMMENT RESOLUTION

5.5.1 The technical reviewers shall ensure return of all DRRs to the lead document preparer.

5.5.2 The lead document preparer shall review the comments and, in coordination with the cognizant Department Manager, determine whether a comments review meeting should be held. A meeting is not necessary if there are no comments or if the comments are only editorial or administrative in nature, if comments are accepted by the writers without question, or if resolution can be reached between the reviewer and the lead document preparer. If substantive changes have been made to the document, the Department Manager shall determine and document whether another review cycle is necessary.

5.5.3 If a meeting is required, the lead document preparer and Department Manager shall determine the format (meeting, teleconference, etc.) and forward the package of comments to the reviewers. During the meeting, comments will be discussed, resolved, or designated for further action. Any mandatory comments that cannot be resolved during the meeting shall become formal action items and shall be brought to the attention of the appropriate management level until resolution is reached.

5.5.4 The records package for the document shall be updated by the lead document preparer to reflect the resolutions.

5.5.5 When all the mandatory comments have been resolved, the lead document preparer shall be responsible for ensuring that all accepted comments have been incorporated into the final document in accordance with appropriate QAPs.

6. RECORDS

Documents generated as a result of this procedure shall be collected, stored, and maintained in accordance with QAP-17-1, Program Records Management. As a minimum, this includes any Document Review Records and the document reviewed.

7. ATTACHMENTS

7.1 ATTACHMENT I - Document Review Record.

**ATTACHMENT I
 DOCUMENT REVIEW RECORD (EXAMPLE)**

Civilian Radioactive Waste
 Management System
 Management & Operating
 Contractor

WBS: _____
 OA Class: _____
 Page: _____ of _____

Document Review Record

Document Title: Document Identifier: Revision: Date:	Review Instructions/Acceptance Criteria: Quality Affecting? Yes <input type="checkbox"/> No <input type="checkbox"/>	Forward Results to:		
Review Instructions/ Criteria Prepared by: _____ Signature _____ Date: _____	Review Instructions/ Criteria Approved by: _____ Signature _____ Date: _____			
Comments that are annotated with an asterisk (*) are MANDATORY and require immediate response and				
Comment No.	Section/ Paragraph	Comment	Response	Accept/ Reject
Reviewed by: _____ Signature _____		Response by: _____ Signature _____	Date _____ Date _____	

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ATTACHMENT 5

PROJECT MILESTONE REVIEW CHECKLIST

PROJECT MILESTONE REVIEW CHECKLIST

		Yes	No	N/A
1.	Were the design inputs correctly selected, verified, and approved?			
2.	Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?			
3.	Was an appropriate design method used?			
4.	Were the design inputs correctly incorporated into the design?			
5.	Is the design output reasonable compared to design inputs?			
6.	Are the necessary design input and verification requirements for interfacing organizations specified in the design documents or in supporting procedures or instructions?			
7.	Are the applicable codes, standards, and regulatory, functional and technical requirements, including issues and addenda, properly identified and are their requirements for design met?			
8.	Have all computer codes used in the design analysis been validated and verified on the computer systems used in the analysis?			
9.	Were design, design verification, and peer review (as applicable) procedures correctly implemented?			
10.	Have qualified and certified materials and parts been specified where appropriate?			
11.	Is the design specified producible/constructable by conventional means?			
12.	Does the design adequately consider maintainability, operability, reliability, and radiological safety?			
13.	Are the appropriate quality and QA requirements satisfied?			
14.	Have applicable construction and operating experiences been considered?			
15.	Have the design interface requirements been satisfied?			
16.	Are the specified parts, equipment, and processes suitable for the required application?			
17.	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?			

PROJECT MILESTONE REVIEW CHECKLIST

		Yes	No	N/A
18.	Have adequate maintenance features and requirements been specified?			
19.	Are accessibility and other design provisions adequate for performance of needed maintenance, in-service inspection, and repair?			
20.	Has the design properly considered radiation exposure to the public and plant personnel?			
21.	Are the acceptance criteria incorporated in the design documents sufficiently detailed and specific to allow verification that design requirements have been satisfactorily accomplished?			
22.	Have adequate pre-operational and subsequent periodic test requirements been appropriately specified?			
23.	Are adequate handling, storage, cleaning, and shipping requirements specified?			
24.	Are adequate identification requirements for control of items and materials specified?			
25.	Are requirements for record preparation, submitted review, approval, and retention, adequately specified?			
26.	Are detailed regulatory considerations implemented in this design?			
27.	Are detailed site characterization test considerations implemented in this design?			
28.	Is this design in compliance with Mine Safety and Health Act (MSHA) and Occupational Safety and Health Act (OSHA) requirements?			
29.	Are detailed reliability, maintainability, and operability considerations implemented in this design?			
30.	Are detailed environmental considerations implemented in this design?			
31.	Are detailed socioeconomic considerations implemented in this design?			
32.	Are detailed constructability considerations implemented in this design?			

ATTACHMENT 6

PROJECT MILESTONE TEAM SELECTION RECORD

Project Milestone Team Selection Record

WBS: _____

Management & Operating Contractor

QA Class: _____

Complete only applicable items.

Page: _____ of _____

Project Milestone Review Subject:

Function:	Yes	No	Team Member
Secretary	<input type="checkbox"/>	<input type="checkbox"/>	_____
Civil Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Construction Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Electrical Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Environmental	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fire Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fuel Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Geology	<input type="checkbox"/>	<input type="checkbox"/>	_____
HVAC	<input type="checkbox"/>	<input type="checkbox"/>	_____
Instrumentation and Controls	<input type="checkbox"/>	<input type="checkbox"/>	_____
Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	_____
Manufacturing Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Mechanical Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Nuclear Safety	<input type="checkbox"/>	<input type="checkbox"/>	_____
Operations	<input type="checkbox"/>	<input type="checkbox"/>	_____
Quality Assurance	<input type="checkbox"/>	<input type="checkbox"/>	_____
Radiation Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____
Radiation Waste Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Reliability Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Safety and Health	<input type="checkbox"/>	<input type="checkbox"/>	_____
Security	<input type="checkbox"/>	<input type="checkbox"/>	_____
Systems Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Structural Design	<input type="checkbox"/>	<input type="checkbox"/>	_____
Startup and Test Engineering	<input type="checkbox"/>	<input type="checkbox"/>	_____
Others: _____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____

I have reviewed and approved the above functions and find they encompass the subject area. I have reviewed "Reviewer Qualification Statements" of personnel identified above and approve their participation in the Review process.

Review Team Leader _____ Date _____

ATTACHMENT 7

EXAMPLE OF DOCUMENT REVIEW RECORD

Document Review Record

WBS: 1.2.6
 QA Class: QA

Project Milestone 90% Review - Design Package 2A

Page: of

Document Title: Document Identification: Revision: Date:	Review Instructions/Acceptance Criteria: Quality Affecting? Yes <input type="checkbox"/> No <input type="checkbox"/>	Forward Results to: Mr. Rick Fournier Suite 527 101 Convention Center Drive Las Vegas, NV 89109
---	---	--

Review Instructions/ Criteria Prepared by: _____ Date: _____ <div style="text-align: right; margin-right: 50px;"> <i>Signature</i> R.J. Fournier, Review Secretary </div>	Review Instructions/ Criteria Approved by: _____ Date: _____ <div style="text-align: right;"> <i>Signature</i> S. Sinnock, Review Leader </div>
---	---

Comments annotated with an asterisk (*) are MANDATORY (All comments for this 90% Design Review are Considered Mandatory)

Comment No.	Section/ Paragraph	Comment Reference BFD Section: _____	Response	Accept/ Reject
(6)	(7)	(8)	(9)	(10)

Reviewed by: _____ <div style="text-align: right; margin-right: 50px;"> <i>Signature</i> (Print Name and Sign) </div>	Response by: _____ <div style="text-align: right;"> <i>Signature</i> (Print Name and Sign) </div>
_____ Date	_____ Date

Document Review Record (Continued)

Project Milestone 90% Review - Design Package 2A

Document Title:	Revision:	Date
------------------------	------------------	-------------

Comments annotated with an asterisk () are MANDATORY (All comments for this 90% Design Review are Considered Mandatory)*

Comment No.	Section/ Paragraph	Comment Reference BFD Section: _____	Response	Accept/ Reject

Reviewed by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> <i>Signature</i> <small>(Print Name and Sign)</small> <i>Date</i> </div>	Response by: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> <i>Signature</i> <small>(Print Name and Sign)</small> <i>Date</i> </div>
---	---

DOCUMENT REVIEW RECORD (DRR) — INSTRUCTIONS
90% Design Review, Design Package 2A

- (1) Title, identification number, revision, and publication or issuance date of the document, analysis, specification, or drawing on which the comment is made. To be filled out by the reviewer
- (2) Mark the appropriate "Yes" or "No" box to indicate whether the document listed in (1) is a quality affecting document: to be filled out by the Design Secretary.
- (3) Reviewers are to return all completed form DRR's to the Review Secretary at the address indicated. The Review Secretary will then assign a comment number, log the comment, and forward the comment form to the appropriate design organization for response. After completing responses, the design organization should also return the DRR's to the Review Secretary for logging and further disposition, if necessary.
- (4) Review instructions and criteria were prepared by the Review Secretary and are listed in the Project Milestone Review Plan.
- (5) Review instructions and criteria were approved by the Review Leader and are listed in the Project Milestone Review Plan.
- (6) -- REVIEWERS -- PLEASE DO NOT FILL THIS COLUMN; THE REVIEW SECRETARY WILL ASSIGN COMMENT NUMBERS. Please use each DRR for only one comment; i.e. one comment per sheet. Use the DRR continuation sheets for comments that require more than one page.
- (7) Indicate the document section number or drawing zone addressed by the comment.
- (8) Legibly write your comments in black ink in this column, using the DRR continuation sheets if necessary. Note: typed comments can be pasted or taped on the DRR and the DRR can then be copied, signed, and submitted to the Review Secretary.
- (9) The design engineer responsible for the document or drawing on which the comment is made will legibly write in black ink a response to the reviewer's comment in this column. If the designer agrees with the comment, please write "accept" in this column.
- (10) For comments with responses other than "accept" (see item 9 above), the reviewer should legibly write in black ink either "accept" or "reject" and initial and date the entry to indicate the reviewer's acceptance or rejection of the design engineer's response. If a response is rejected by the reviewer and cannot be resolved by discussion between the responsible reviewer and the design engineer, the Review Leader will escalate the comment to the proper management level for further consideration.
- (11) Reviewer should print their names, sign, and date the bottom of the form after a comment has been written on the DRR form and before the comment is returned to the Review Secretary.
- (12) Design engineers who respond to reviewer comments should print their names, sign and date the bottom of the form after the response has been written on the DRR and before the form is returned to the Review Secretary.