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TO: NMSS

AUTHOR: Robert Loux

AFFILIATION: NV NWPO

ADDRESSEE: Dale Klein

SUBJECT: Copy of an Internal DOE presentation made to DOE management

CYS:  
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ACTION: Appropriate

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OFFICE OF THE GOVERNOR  
AGENCY FOR NUCLEAR PROJECTS

1761 E. College Parkway, Suite 118

Carson City, Nevada 89706

Telephone: (775) 687-3744 • Fax: (775) 687-5277

E-mail: [nwpo@nuc.state.nv.us](mailto:nwpo@nuc.state.nv.us)

June 21, 2006

The Honorable Dale Klein, Chairman  
U.S. Nuclear Regulatory Commission  
Washington DC 20555-0001

Dear Dr. Klein:

Enclosed please find a copy of an internal Department of Energy (DOE) presentation made to DOE management, "CR-6278 Requirements Management Root Cause Analysis", dated November 2005. This presentation paints a rather devastating picture of the management problems that the Department faces in attempting to move the Yucca Mountain project forward. It also has serious implications for DOE as a fit applicant, should they ever submit a license application for Yucca Mountain.

As I do not believe that you or the staff at the NRC have seen or evaluated the contents of this presentation, I thought it would be important to send it to you. Should you have questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert R. Loux", with a long horizontal flourish extending to the right.

Robert R. Loux  
Executive Director

RRL:njc

Enclosure

CHIEF OF STAFF REC'D  
06 JUL -5 PM 2:43



11-08

U.S. Department of Energy  
Office of Civilian Radioactive Waste Management

  
[www.ocrwm.doe.gov](http://www.ocrwm.doe.gov)

# CR-6278 Requirements Management Root Cause Analysis

Presented to:

**John Arthur III**

**Kenneth Powers**

Presented On Behalf of:

**Richard E. Sandoz**

**Strategic Planning and Policy**

**Office of Civilian Radioactive Waste Management**

**U.S. Department of Energy**

**Washington, D.C.**

**April 15, 2008**

**CR-6278**

**Requirements Management**

**Root Cause Analysis**

# Charter and Identified Conditions

# RCA Charter Purpose

- Why has the *Yucca Mountain Characterization Project Requirements Document* (YMP-RD) not been maintained current?
- The scope of this analysis should fully cover the question ... but the Team may find it necessary to expand the scope ...
- The team will also review the interface [with the] BSC contract and to the BSC Project Requirements Document.
- Scheduled to conclude on or before November 11, 2005.



# Methodology

- The Root Cause Team used the Phoenix Methodology<sup>©</sup> in analyzing the conditions identified in the Condition Report
- The following specific analysis tools were used:
  - Interviews
  - Detailed Comparative Timeline<sup>©</sup>
  - Ishikawa (Fishbone) Diagram
  - Why Staircase
  - Missed Opportunity Matrix
  - Eight Questions Matrix

# **Condition 1: YMP-RD Rev. 5 Never Issued**

(Page 1 of 3)

- **Facts**

- YMP-RD Revision 5 Draft issued for DOE review (7/02)
- Review never completed/recorded
- Rev. 4 DCN 2 (Effective 11/01) still active in CDIS but inaccurate
- Processes are inadequate to assure:
  - ♦ Work is completed
  - ♦ Issued documents are correct and current
  - ♦ Affected documents are initiated, tracked, and closed due to changes in a related document

- **Downstream Documents Created To Compensate for Inaccurate and out-of-date YMP-RD**

- BSC PRD created (7/02)
- DOE Level 2 F&OR created (3/03)
- BSC Level 3 F&OR created (4/03)



# **Condition 1: YMP-RD Rev. 5 Never Issued**

**(Page 2 of 3)**

- **Requirements Management Procedure (LP-REG-002-OCRWM) Created to Compensate for Inaccurate and out-of-date YMP-RD**
  - **OLAS issued LP-REG-002-OCRWM, Revision 00 (8/03)**
  - **OPMI took ownership of LP-REG-002-OCRWM (5/04)**
    - ♦ **Expanded Scope to Include ALL ORD Requirements**
    - ♦ **Revised process to control requirements through contract**
  - **OPMI developed Level 2 ORD Baseline for Laws, Rules, and Regulations and DOE Directives (7/05) per LP-REG-002-OCRWM**



# **Issue 1: YMP-RD Rev. 5 Never Issued**

**(Page 3 of 3)**

- **Requirements Management Task Group Recommendations**
  - **Submit Baseline Change Proposal to cancel YMP-RD and Level 2 F&OR and transfer management of data to ORD Requirements Management Baseline**
  - **Transmit Contractor Requirements to each contractor as List A, B & C of their Contract**

## **Issue 2: DOE Initiates Efforts Without Follow-through**

- **DOE Documents Still in Review (Date review began)**
  - Yucca Mountain Project Requirements Document (YMP-RD) Rev. 05 (7/02)
  - Major System Management Policy (7/02)
  - Project Execution Plan is now at draft revision 11 and is still not issued
- **DOE Documents Issued but Funding Cancelled**
  - ORD Strategic Plan For Licensee Transition (Transition Plan)
- **DOE Actions Set Example for Contractor Conduct**
  - BSC Project Requirements Document (PRD) not maintained



# Cause Analysis Results

# **Root Cause Team Findings**

(page 1 of 2)

- **Direct Causes:**

- Review of the YMP-RD draft Revision 5 was not completed by the organization assigned to coordinate the review.
- The procedure governing the review of YMP-RD draft Revision 5 does not contain requirements for closure of the process.

- **Contributing Causes:**

- Instability of organizational roles and responsibilities
- Instability of ORD technical baseline
- Failure to meet and implement DOE 413.3 requirements management, in particular, and systems engineering in general
- Failure to conduct Root Cause Analysis when major trend showed breakdown in management and flowdown of requirements since Summer 2004.

# **Root Cause Team Findings**

(page 2 of 2)

- **Root Cause:**

- **Failure to fund, maintain, and rigidly apply a requirements management system as part of a configuration management process**



# Team Recommendations

# Consequences

- **Rework**
  - Forces Contractor Staffing and Resources to Increase
  - Inefficient resource allocations for design, science, all project aspects
- **Corrective Actions (by definition Rework)**
  - 135 CRs directly related to Requirements Management
    - ♦ Cost: \$472,500 (135 x \$3,500/ CR) - 6,922 total CRs at a cost of \$24M
    - ♦ Costs include only CR analysis, plan development and processing
    - ♦ Costs DO NOT include correction of deficiencies, revising procedures, etc.
- **Minimizes Return on Investment for Mission Attainment**
  - Hotel Loads grow to point that contractor cannot afford to accomplish “real” work (design, science)
  - Churn (Unnecessary Work or Work Created due to Inaction of Others)
    - ♦ Project Requirements Document (due to DOE inaction on YMP-RD)
    - ♦ Level 2 and 3 F&ORs (due to DOE inaction on YMP-RD)
    - ♦ Procedure Revisions



# Major Needs

- **Processes**
  - Establish single owners for each management process
  - Implement software-based management systems
  - Implement Transition Plan
- **Discipline/Process Closure**
  - Accountability, Responsibility and Consequences
  - Software Forces Discipline (Does not allow work-arounds)
  - Efficiencies (Electronic Signatures and Records)



# **NRC Licensee Culture is Needed**

- **OCRWM has executed its operations without the rigor expected by the NRC**
- **Management control systems are bypassed regularly**
- **There is currently no consequence for bypassing processes, work-arounds, or failure to follow processes**
- **NRC Regulations are prescriptive requirements. OCRWM cannot interpret NRC regulations like it does DOE Directives**
- **Currency of requirements documents are driven by external events (VA/SR/LA) rather than routinely maintained**



# Immediate Management Actions

- **Management Action #1 – RM/CM System:**
  - Fund, direct & hold OPMI accountable through implementation to immediately develop, implement and rigidly apply an electronic requirements management system as part of an overall configuration management system.
- **Management Action #2 – Roles and Responsibilities:**
  - Restructure roles and responsibilities within ORD to collocate the requirements and configuration management processes to be within the same organization.
- **Management Action #3 – Implement Task Group Recommendations:**
  - Submit Baseline Change Proposal to cancel YMP-RD and Level 2 F&OR and transfer management of data to ORD Requirements Management Baseline
  - Transmit Contractor Requirements to each contractor as List A, B & C of their Contract

# Management Actions to Prevent Recurrence

- **Management Action #4 - Trending:**

- Direct OPMI to analyze and recommend procedural corrections or management actions which will facilitate changes to MRC, MOR and/or other trend reporting structures to *better identify* recurrence of requirements management/flowdown issues in the future.

- **Management Action #5 – Contract Control:**

- Direct the OBS to compile and maintain a complete itemized list of all issued TDLs and COLs and a summary of each document's contained actions. Trace the status of each as closed, active or fulfilled.

- **Management Action #6 – Design Control:**

- Direct OPME to analyze and recommend procedural corrections and/or management actions which will impose design control and project management regimen based on accepted system engineering principles. These recommendations/actions will be integrated with the institutionalized RM/CM system referred to above.

- **Management Action #7 – Management Model:**

- Direct the appropriate ORD and/or OCRWM organizations to develop a consolidated document to house and control organizational roles and responsibilities. OPMI's recent benchmarking trip to Exelon Corporation resulted in some excellent recommendations which might be considered.

- **Management Action #8 – Project Execution Plan:**

- Direct OPME to finalize and publish the Project Execution Plan. This will solidify project management requirements associated with DOE O 413.3 relating to how ORD will implement requirements and configuration management

- **Management Action #9 – Transition Plan:**

- Fund and implement the Transition Plan

# Remedial Actions

- **Action #1**
  - Submit record of review/comment resolution of YMP-RD Rev. 5 draft.
- **Action #2**
  - Update AP-5.1Q and LP-6.1Q-OCRWM to require the submittal of review records when a review is cancelled or otherwise not completed.
- **Action # 3**
  - Update the following documents to assure missions, roles and responsibilities are consistent with current OCRWM goals, especially with respect to requirements management: MSMP, PMP, LP-1.1Q-OCRWM. Review related Project documents and update as appropriate.
- **Action#4**
  - Review existing DOE document hierarchy and look for opportunities to simplify.
- **Action #5**
  - Review active but obsolete requirements documents and archive as appropriate (numerous).
- **Action #6**
  - Update CRWMS Requirements Document (CRD) revision history to include a description of all DCNs and revisions (one is missing).

# CONCLUSIONS

# **Implementing Team Recommendations Will:**

- **Solve the YMP-RD Currency Issue**
- **Implement Electronic Management Systems to Prevent Recurrence for YMP-RD, other RD's, management plans and other required products**
- **Force NRC Culture Shift in accordance with the Transition Plan**
- **Position ORD to Successfully Interact with NRC as a Licensee**

