



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20553-0001

August 13, 2001

Dr. Stephan Brocoun, Assistant Manager  
for Licensing and Regulatory Compliance  
Yucca Mountain Site Characterization Office  
Office of Civilian Radioactive Waste Management  
U.S. Department of Energy  
P.O. Box 30307  
North Las Vegas, NV 89036-0307

SUBJECT: MINUTES OF THE JUNE 13, 2001, MANAGEMENT MEETING

Dear Dr. Brocoun:

Enclosed are the minutes of the June 13, 2001, Management Meeting between the U.S. Department of Energy (DOE) and the U.S. Nuclear Regulatory Commission (NRC) to discuss the status of various management and programmatic issues concerning Yucca Mountain, Nevada. The meeting minutes consist of the meeting minutes summary, agenda, attendance list, and the presentation material noted as enclosures 1, 2, 3, and 4, respectively.

The meeting was held at NRC Headquarters in Rockville, Maryland, with participation by video conference at the NRC Region IV office in Arlington, Texas; DOE Headquarters in Washington, DC; DOE in Las Vegas Nevada; and by telecon with the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas.

The meeting resulted in a good exchange of information and views between DOE and NRC. No response to this letter is required. If you have any questions regarding the enclosed meeting minutes, please contact Manny Comar of my staff. He can be reached on (301) 415-6074.

Sincerely,

A handwritten signature in black ink, appearing to read "C. William Reamer", is written over the typed name.

C. William Reamer, Chief  
High-Level Waste Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
And Safeguards

Enclosures: Summary Highlights  
Agenda  
Attendance List  
Briefing Materials

cc: See attached list

Letter to Dr. S. Brocoum from C. W. Reamer dated: August 13, 2001

cc:

R. Loux, State of Nevada	R. Massey, Lander County, NV
S. Frishman, State of Nevada	J. Pitts, Lincoln County, NV
L. Barrett, DOE/Washington, DC	M. Baughman, Lincoln County, NV
A. Brownstein, DOE/Washington, DC	A. Funk, Mineral County, NV
S. Hanauer, DOE/Washington, DC	J. Shankle, Mineral County, NV
C. Einberg, DOE/Washington, DC	L. Bradshaw, Nye County, NV
J. Carlson, DOE/Washington, DC	M. Murphy, Nye County, NV
N. Slater, DOE/Washington, DC	J. McKnight, Nye County, NV
A. Gil, YMPO	D. Weigel, GAO
R. Dyer, YMPO	W. Barnard, NWTRB
S. Brocoum, YMPO	R. Holden, NCAI
R. Clark, YMPO	A. Collins, NIEC
S. Mellington, YMPO	R. Arnold, Pahrump County, NV
C. Hanlon, YMPO	J. Larson, White Pine County
T. Gunter, YMPO	R. Clark, EPA
K. Hess, BSC	F. Marcinowski, EPA
D. Krisha, BSC	R. Anderson, NEI
S. Cereghina, BSC	R. McCullum, NEI
N. Williams, BSC	R. Henning, BSC
M. Voegele, BSC/SAIC	S. Kraft, NEI
S. Echols, Winston & Strawn	J. Kessler, EPRI
B. Price, Nevada Legislative Committee	D. Duncan, USGS
J. Meder, Nevada Legislative Counsel Bureau	R. Craig, USGS
D. Bechtel, Clark County, NV	W. Booth, Engineering Svcs, LTD
E. von Tiesenhausen, Clark County, NV	J. Curtiss, Winston & Strawn
A. Kalt, Churchill County, NV	N. Rice, NV Congressional Delegation
G. McCorkell, Esmeralda County, NV	T. Story, NV Congressional Delegation
L. Fiorenzi, Eureka County, NV	J. Reynoldson, NV Congressional Delegation
A. Johnson, Eureka County, NV	S. Joya, NV Congressional Delegation
A. Remus, Inyo County, CA	J. Pegues, City of Las Vegas, NV
M. Yarbrow, Lander County, NV	L. Lehman, T-REG, Inc.
I. Zabarte, W.S.N.C.	

ENCLOSURE 1

### **NRC/DOE Management Meeting Summary**

DOE Headquarters; DOE YMSCO, Las Vegas, NV; NRC Headquarters, Rockville, MD;  
NRC Region 4; CNWRA, San Antonio, TX  
June 13, 2001, 3:00 PM to 5:30 PM, EDT

The U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) met on June 13, 2001, to discuss the status of various management and programmatic issues. This meeting summary includes a brief description of the discussions, the meeting agenda (attachment 1), the attendance list (attachment 2), a copy of handouts used (attachment 3), and the list of action items being tracked with their status (attachment 4).

#### **Introductory Comments**

Opening the meeting, Mr. John Greeves (NRC) and Mr. William Reamer (NRC) acknowledged the recent release of EPA's final standards in 40 CFR Part 197 and NRC's intention to conform its proposed 10 CFR Part 63 repository licensing rule to these standards. NRC's Yucca Mountain Review Plan will be revised once 10 CFR Part 63 is finalized. Mr. Greeves expressed NRC's disappointment with the status of DOE's QA implementation reflected by NRC's identification of discrepancies in the Total Systems Performance Assessment Model Report and the Project's identification of model validation, software, and other quality problems. NRC would prefer that DOE be working to license application quality standards now, rather than in the future. NRC plans to comment on DOE's Supplement to its Draft Environmental Impact Statement (DEIS) within DOE's public comment period. NRC's current focus is its sufficiency review for DOE's site recommendation (SR) process. NRC plans to provide preliminary comments to DOE by October 1, 2001 on the sufficiency of DOE SR information.

NRC has released its final rule on the Licensing Support Network (LSN), and an Information Notice on the pilot program for electronic submittal of reactor licensing information is now on NRC's web site. NRC offered to meet with DOE to discuss the potential for electronic submittal of a repository license application.

In their opening remarks, Mr. Lake Barrett (DOE) and Dr. Russ Dyer (DOE) noted that the SR process is being implemented in accordance with the Nuclear Waste Policy Act as amended (NWPA.) Mr. Barrett indicated that DOE's proposed Part 963 is consistent with the final 40 CFR Part 197, and does not need to be revised. NRC stated that their concurrence process would continue to be based on the proposed Part 963 version submitted by DOE on May 4, 2000. DOE and Bechtel-SAIC, LLC (BSC) have initiated a broad review of the quality issues affecting SR-related products and assured NRC of the project's commitment to quality improvement. Dr. Dyer noted that the quality of DOE's work is acceptable for its intended SR-related purpose.

## **DOE Site Recommendation Process**

Mr. Tim Sullivan (DOE) described DOE's Site Recommendation (SR) documentation and the path forward to a SR decision. Updates from previous DOE documents include the Science and Engineering Report (S&ER) and the SDEIS. DOE is also developing the Supplemental Science and Performance Analysis Report (SSPA) and the Preliminary Site Suitability Evaluation (PSSE), both of which will be released this summer. Mr. Sullivan emphasized that if DOE were to use any of the information in the SSPA in a license application, such information would meet all applicable quality assurance requirements for inclusion in the application. Mr. Greeves said that he understood that portions of the SSPA and the S&ER were not prepared to a licensing quality standard. NRC requested that DOE provide them with a more definitive schedule for SR-related products. DOE will make an effort to do so within two weeks.

## **TSPA-SR Issues Management Plan**

Dr. Dyer and Ms. Nancy Williams, Bechtel SAIC Corp. (BSC), provided an overview of recent quality concerns and the Project's initiatives to resolve them. An executive management team has been mobilized. A management action plan has been approved that will assure the quality and sustainability of technical work and establish process improvements for continuing work. Mr. Greeves requested a copy of root cause analyses at least 30 days before NRC submits sufficiency comments to DOE.

## **Management Issues from Morning's Quality Assurance Meeting**

Ms. Williams recapped the DOE presentations at this meeting, and Dr. Robert Andrews (BSC) presented a detailed response to NRC concerns detailed in a May 17 letter to DOE on QA and performance assessment issues. Mr. Reamer summarized the QA meeting from NRC's perspective, and asked DOE to provide an analysis of the significance and impacts of using unqualified data or models, including those in the SSPA. DOE plans to provide this analysis at the end of August.

## **OCRWM Concerns Program**

Dr. Dyer provided an overview of OCRWM's employee concerns program. The majority of concerns can be categorized as management-related, quality-related, or related to a safety-conscious work environment (SCWE). OCRWM retained the firm of Morgan Lewis to conduct an OCRWM-wide representative survey of SCWE concerns. DOE will brief NRC on the status of the Morgan Lewis effort within 30 days.

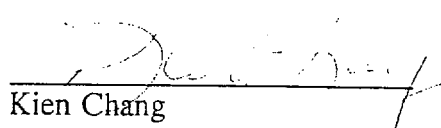
### Action Item Status


The current status of action items from previous Management Meetings, and proposed new items from this meeting were discussed. New action items agreed to at this meeting are:


1. NRC requests specific dates for DOE's SR-related products schedule. DOE set a goal of providing this within two weeks [combined with previous action #01/04-01].
2. DOE will provide the results of the management action plan, including the root-cause analysis, at least one month before NRC provides sufficiency comments.
3. DOE will provide a written response to NRC's May 17 letter that will include two attachments: (a) a copy of the management action plan; and (b) point-by-point responses to NRC's QA and performance assessment issues.
4. DOE's unqualified data and software impact analysis will include the SSPA, or explain why the SSPA is not included [combined with previous action #01/09-01].
5. DOE will update NRC on the status of the OCRWM Employee Concerns Program within 30 days.

### Closing Remarks

Mr. Barrett reiterated DOE's continuing commitment to quality, and Mr. Reamer noted that NRC would continue to emphasize quality during its sufficiency review.

  
Kien Chang  
Division of Waste Management  
Office of Nuclear Material  
Safety and Safeguards  
U.S. Nuclear Regulatory Commission

  
April V. Gil  
Office of Licensing and  
Regulatory Compliance  
Yucca Mountain Site  
Characterization Office  
U.S. Department of Energy

  
Nancy Slater Thompson  
Regulatory Coordination Division  
Office of Civilian Radioactive  
Waste Management  
U.S. Department of Energy

ENCLOSURE 2

**AGENDA**  
**DOE/NRC Quarterly Management Meeting**  
**June 13, 2001**  
**NOON - 2:30 PM (PT)**  
**3:00 PM – 5:30 PM (ET)**

**U.S. NRC**  
**T2B-5**  
**11545 Rockville Pike**  
**Rockville, MD**  
**And via Videoconference to:**

**BSC (M&O Contractor)**  
**9960 Covington Cross**  
**Room 915**  
**Las Vegas, NV**

**U.S. NRC**  
**Region IV**  
**611 Ryan Place Drive**  
**Arlington, TX**

**U.S. DOE**  
**Room 5A104**  
**1000 Independence Avenue, SW**  
**Washington, D.C.**

<b>3:00 PM</b>	<b>Introductions</b>	<b>All</b>
<b>3:10 PM</b>	<b>DOE Program/Project Update</b>	<b>DOE</b>
<b>3:20 PM</b>	<b>NRC Program Update</b>	<b>NRC</b>
<b>3:30 PM</b>	<b>DOE Site Recommendation Process</b>	<b>DOE</b>
<b>4:00 PM</b>	<b>DOE TSPA-SR Issues/Management Plans</b>	<b>DOE</b>
<b>4:30 PM</b>	<b>Management Issues from QA and KTI sessions</b>	<b>DOE/NRC</b>
<b>5:00 PM</b>	<b>DOE Employee Concerns Program</b>	<b>DOE</b>
<b>5:10 PM</b>	<b>Action Item Status</b>	<b>DOE/NRC</b>
<b>5:20 PM</b>	<b>Closing Remarks</b>	<b>All</b>
<b>5:30 PM</b>	<b>Adjourn</b>	<b>All</b>



ENCLOSURE 3

**DOE/NRC Management Meeting**  
**June 13, 2001**  
**Rockville, MD**

**Sign-In Sheet**

NAME	ORGANIZATION	TELEPHONE
S.J. CEREHINO	BSC	702-295-4251
Tim Sullivan	DOE	" 794-5589
Alan Brownstein	DOE	202 586-4973
NANCY WILLIAMS	BSC	702-295-5143
Russ Dyce	DOE	702-794-1300
Lake Barrett	DOE/RW	202-586-6850
JOAN GRIEVES	NRC	301 415-2437
Bill Redmer	NRC	301-415-6537
April Gil	DOE/YMP/OLRC	702 794-5578
TIM GUNTER	DOE/MSO	702-794-1343
Bob [unclear]	[unclear]	[unclear]
Bill Watson	BSC	702-295-5550
RM Krich	Exelon Nuclear	630-657-2813
ROBERT WEMHEUER	BSC	702-295-3966
LARRY CAMPBELL	NRC	(301) 415-5000
K. Michael Cline	Booz Allen & Hamilton	(702) 794-5481
KEISS CRISMAN	DOE/EM	301 903 8498
ROBERT E. Sweeney	IBEX	702-525-7503
BOB MURRAY	Booz Allen & Hamilton	702-794-5566
SANDRA WASTLER	NRC	301-415-8733
THOMAS MATULA	NRC	301-415-6602
Jim Carriss	Winstan, Spawn	(202) 371-5151
NICK D'AMICO	DOE	(202) 586-8953
ROB MACDOUGALL	BSC	202.479.2122

**NRC/DOE MANAGEMENT MEETING  
NRC HEADQUARTERS  
JUNE 13, 2001**

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**NRC/DOE MANAGEMENT MEETING  
NRC HEADQUARTERS  
JUNE 13, 2001**

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Name	Organization	Telephone
Marty Bryan	BSC-LAP	702 295-6273
Sam Hobbs	BSC / LAP	702 295-6620
Rich Science	DOE / YMP / OPE	(702) 794-1455
Carol Houlton	DOE / YMP / OLRC	702-794-1324
DONALD HORTON	DOE / YMSCO	702-794-1301
Bob Clark	DOE - OPA	702-794-5583
DAVID LANIER	BSC - LAP	702 - 295-5331
Bob Gamble	MTS / BAH	702-794-1440
Kristi A. Hodges	OPA / NQS	702-794-1464
Susan Zimmerman	State of Nevada	775-687-3244
Nicola J. J. J.	BSC	702 295-5357
MYNLE RICE	InterTech / Lincoln County	702 263 6583
KENNEDY HESS	BSC	702 - 295-0500
George Hellstrom	DOE	702-794-5519
Dale Hammermeister	Nye County	775-727-7727
Walt Murphy	Nye County	360 913-5610
EV. T. E. E. E. E.	CHURCH COUNTY	702 455-5184
STEVE HANAUER	DOE	702-586-6850
Claudia Newbury	DOE	702-794-1361
Don BECKMAN	BSC - LAP	702-295-4392
M. A. HAGHI	BSC/Duke	702-295-5318
Jennifer Nalevo	BSC/Beckman	702-295-5312

**CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES  
MEETING ATTENDANCE**

SUBJECT OF MEETING: DOE/NRC Quarterly Management Meetings

DATE: June 13, 2001 LOCATION: Bldg. SWRI Bldg. 189, Conference Room A237

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# RC Management Meeting

## June 13, 2001

### Washington DC

## Sign-In Sheet

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6/13/01

R IV

Charles Hackney

RSL O NRC Region IV

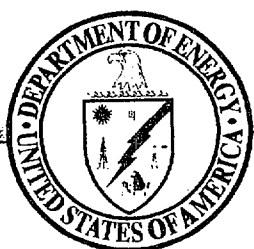
Vincent Everett

, Inspector

D. BLAIR SPITZBERG, CHIEF, F&DB



ENCLOSURE 4



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

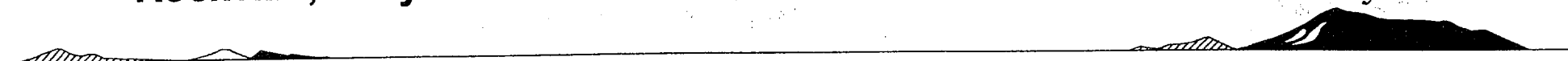
# DOE Site Recommendation Process

Presented to:  
**NRC/DOE Management Meeting**

Presented by:  
**Tim Sullivan**  
**Office of Licensing and Regulatory Compliance**  
**Yucca Mountain Site Characterization Office**

**June 13, 2001**  
**Rockville, Maryland**

**YUCCA  
MOUNTAIN  
PROJECT**



# Presentation Outline

- **Background**
- **Description of roles and relationships of SR Documentation**
- **Path forward to possible SR Decision**

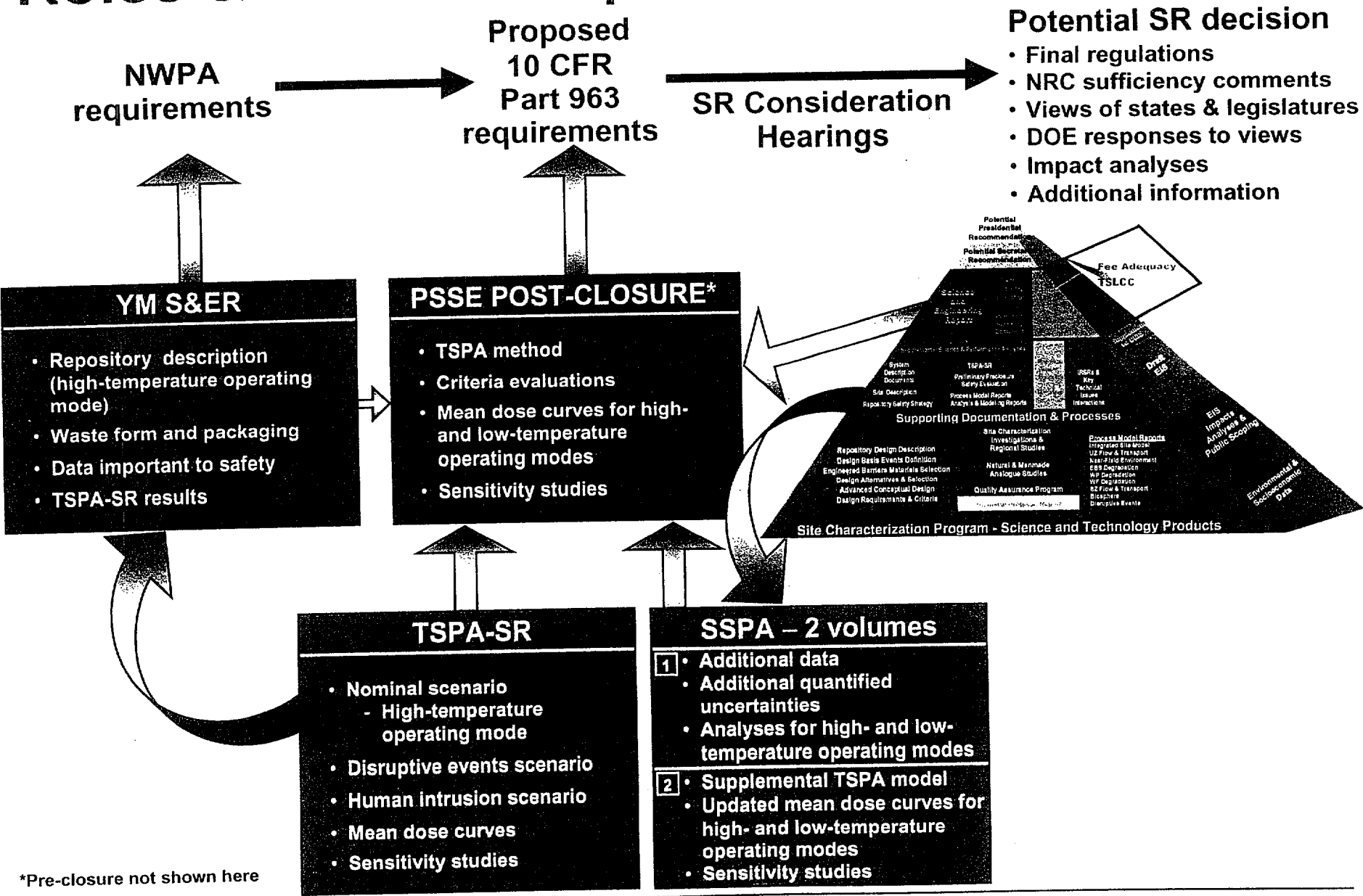
# Background

- **DOE had planned to release a Site Recommendation Consideration Report (SRCR) in late 2000**
- **SRCR was deferred to allow**
  - **Enhancement of the technical basis for a site recommendation decision**
  - **Completion of the Inspector General's investigation**
- **As a result, FY01 scheduled work was re-planned to address these needs**

# Background

- Revised SR strategy extended the SR process to allow for incremental release of SR documents
- **May 2001**
  - Release of the Science & Engineering Report (S&ER)
  - Release of the Supplement to the Draft Environmental Impact Statement (SDEIS)
- **Summer 2001**
  - Plan to release the Supplemental Science and Performance Analyses Report (SSPA)
  - Plan to release the Preliminary Site Suitability Evaluation (PSSE)
- Plan to hold SR Consideration Hearings following release of PSSE
- Provide basis for possible SR decision in early FY02

# Roles & Relationships of SR Documentation



\*Pre-closure not shown here

# **Total System Performance Assessment - Site Recommendation (TSPA-SR)**

- **TSPA - SR has forecast the performance of a repository for the proposed 10,000 year compliance period, and beyond**
  - **Provides integrated set of conceptual models reflecting the relevant features, events, and processes (FEPs) that could operate after permanent closure of a repository consistent with proposed 10 CFR Part 63**
  - **Includes nominal scenario, disruptive events (igneous activity) scenario, and human intrusion scenario consistent with proposed 10 CFR Part 63**
  - **TSPA-SR Rev. 00 assesses higher-temperature operating mode**

# Science and Engineering Report

- **Provides the information identified in Section 114 (a)(1)(A) - (C) of the NWPA**
  - Description of the proposed repository including preliminary engineering specifications
  - Description of the proposed waste form or packaging and relationship between waste form or packaging and the geologic medium
  - Discussion of data obtained in site characterization related to safety of Yucca Mountain
- **Plans for additional low-temperature evaluations**
- **YMSER will be revised as appropriate to address comments to support SR decision**
- **YMSER is a compilation and summary of existing information drawn from AMRs, PMRs, SDDs, and TSPA-SR**



# **Supplement to the Draft Environmental Impact Statement (SDEIS)**

- **Addresses the evolution of the potential repository design, reflecting**
  - **Evaluation of design options**
  - **Ways in which the repository could be operated (operating modes) that could reduce uncertainties and improve long-term performance and operational safety and efficiency**
- **Provides for public review of potential environmental impacts based on the current design with a higher- and lower-temperature operating mode**
  - **Initiates 45 day public comment period**
- **Three public hearings have been completed**

# **Supplemental Science and Performance Analyses Report (SSPA)**

- **SSPA planned for release in summer 2001**
  - **Volume 1 - Scientific Basis and Analyses**
    - ♦ New science and engineering data collected since completion of documents (AMRs) supporting the YM S&ER
    - ♦ Process-level analyses with revised ranges of uncertainties and quantified uncertainties
    - ♦ Process model modification to reflect the potential effects of a lower-temperature operating mode
  - **Volume II - Performance Analyses**
    - ♦ TSPA supplemental model built from TSPA Rev. 00, ICN 1
    - ♦ Evaluates performance assessment results for higher- and lower-temperature operating modes
    - ♦ TSPA sensitivity analyses investigate effects on predicted performance of revised ranges of uncertainty, quantified uncertainties, and lower-temperature operating mode
    - ♦ Compares results to the existing TSPA-SR results to better understand the potential effects of additional information and changes in thermal operating modes
- **Future use of the information in the SSPA in a License Application requires verification under the appropriate QA procedures**

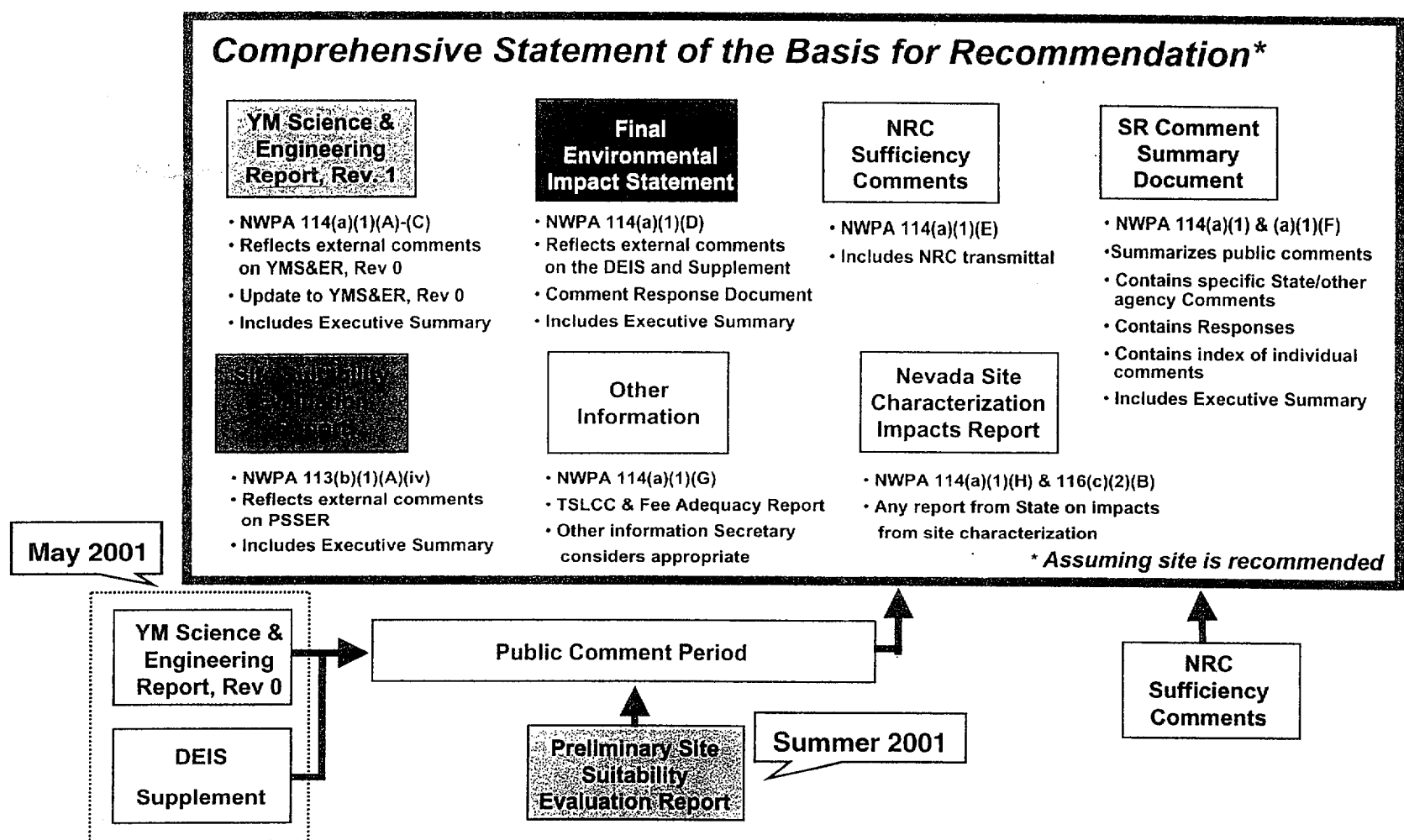
# Preliminary Site Suitability Evaluation (PSSE)

- Preliminary evaluation against pre and post-closure site suitability guidelines in DOE's proposed 10 CFR Part 963
- Post-closure evaluation includes
  - ♦ TSPA methodology
  - ♦ Barrier analyses
  - ♦ Criteria evaluations and sensitivity studies
  - ♦ Evaluation of repository performance for a higher temperature and a lower temperature operating mode
  - ♦ Comparison of mean annual doses with standards (10,000 years)
  - ♦ Consideration of uncertainties and variabilities
  - ♦ Sensitivity studies
  - ♦ Alternative features and processes
- Release of the PSSE will be accompanied with dates, times, and locations for public hearings, and dates for the close of the public comment period

# Path Forward to Possible SR Decision

- **After release of PSSE, SR consideration hearings will be held - Location TBD**
- **After public comment period and SR Consideration Hearings, DOE will prepare materials to support a Secretarial decision whether to recommend the site**
- **Our planning basis is to provide materials to support a possible Secretarial decision in early FY 02**

# Proposed SR Documentation Concept



# EPA Standard (40 CFR Part 197)

- **EPA standard for a potential repository at Yucca Mountain has been finalized**
  - **Compliance point is 18km instead of 20km**
  - **Representative volume is 3000 ac. ft. instead of 1285 ac. ft.**
  - **Treatment of human intrusion different from that in NRC proposed rule (10 CFR Part 63)**
  - **Minor differences in the treatment of REMI**

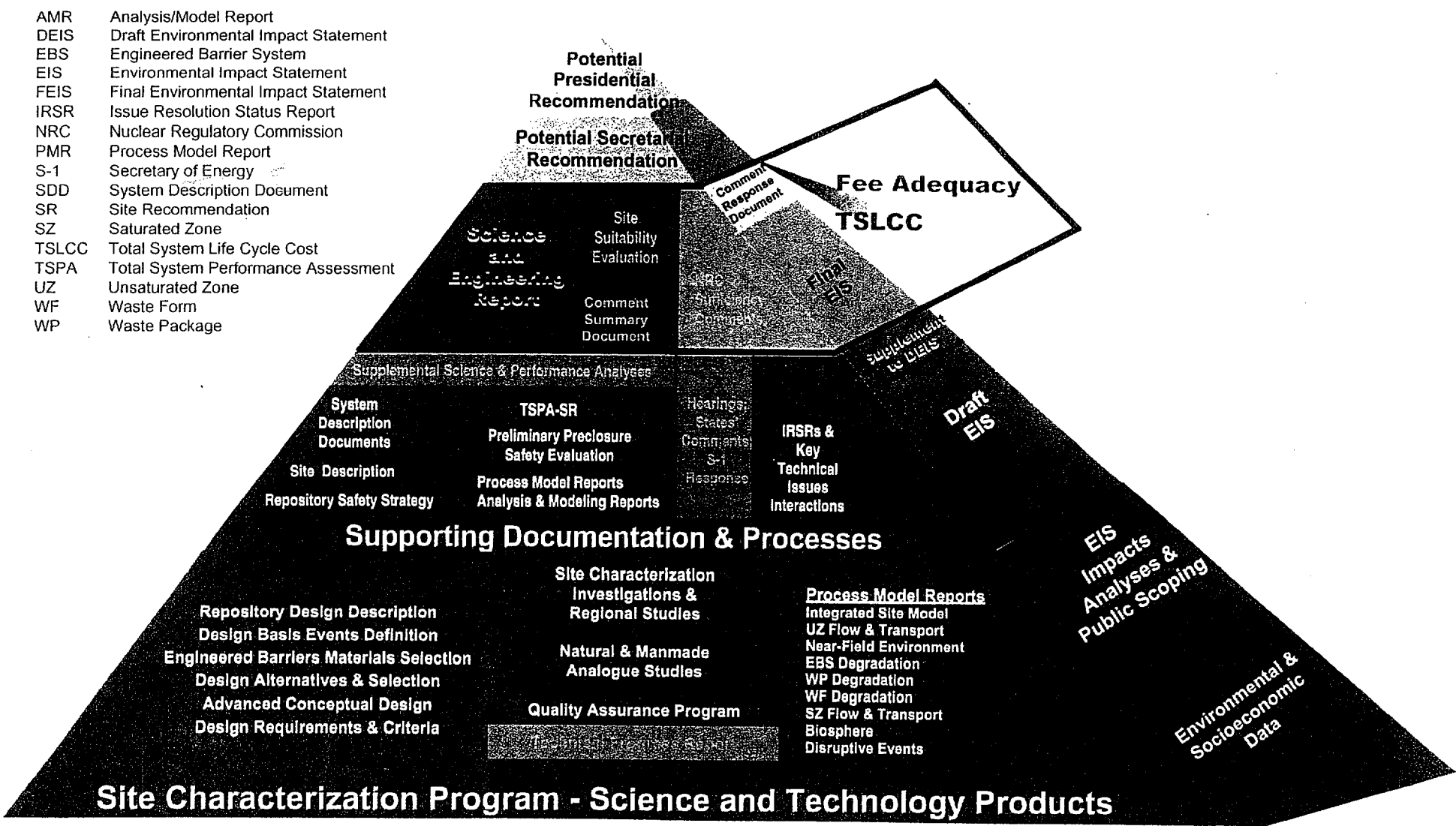
# Summary

- **SR process was expanded to enhance the technical basis for a possible SR decision**
- **The S&ER and Supplement to DEIS are available for public comment**
- **DOE is evaluating impact of final EPA regulation on SR documents**
- **DOE has announced initiation of the comment period for a possible SR decision**
- **PSSA and SSPA will be released during the comment period to support the technical basis for a possible SR decision**

# Backup



# Site Recommendation Documentation Structure





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

# TSPA-SR Issues Management Plan

Presented to:

**DOE/NRC Quarterly Management Meeting**

Presented by:

**J. Russell Dyer, Project Manager  
Yucca Mountain Site Characterization Office**

**Nancy Williams, Manager of Projects  
Bechtel SAIC Company, LLC**

**June 13, 2001**

**YUCCA  
MOUNTAIN  
PROJECT**

# Introduction

- **Recent Quality Concerns**
  - **2 CARs**
    - ♦ **Model Validation**
    - ♦ **Software**
  - **TSPA-SR Quality Concerns**
    - ♦ **NRC Telecons (May 4 and 9, 2001)**
    - ♦ **NRC Letter (May 17, 2001)**

# Systematic Continuing Issues

- **February 12, 2001 - BSC Assumed Prime Contractor Role on YMP**
- **Evidence of Continuing Quality Problems**
- **Initiated Management Plan to Correct Quality Problems**

# Quality Initiative Issues

- **Document Integrity**
  - Quality and traceability of documents and analytical models that will be subject to the public process
- **Root Cause Determination (2 CARs)**
  - Root cause assessment and action plan for
    - ♦ Model Validation
    - ♦ Software Verification

# Chronology

- **5/4-17/2001 - Identification of errors by NRC and subsequent telephone calls / correspondence with NRC**
- **5/18/2001 - BSC Board Meeting**
- **5/22/2001 - Bechtel mobilizes executive management team**
- **5/29/2001 - Bechtel mobilizes senior project management team from Oak Ridge and Denver to finalize action plan**
- **6/4/2001 - Bechtel executive management approves Quality Initiative action plan**
- **6/4/2001 - Mobilization to support plan**

# Quality Initiative Goals

- **Assure the quality/sustainability of technical reports/analyses supporting the YMP work**
- **Establish process improvements to improve project performance for continuing phases of work**

# Overview

- **Systematic Approach**
- **Regular Reporting on Progress and Results**
- **Immediate Corrective Actions**
- **Short Term Corrective Actions**
- **Longer Term Corrective Actions (Based on Quality Initiative Investigations)**
- **Highly Experienced Diverse Team**



# Action Plan Scope

- **Immediate/Short Term Actions**
- **Short Term (through end of FY01)**
  - Document Integrity
  - Management Stand-Down on Software Development
  - Root Cause Assessments
- **Long Term and Ongoing Actions**
  - Process Improvements
  - Responsibility/Accountability

# Document Integrity Strategy

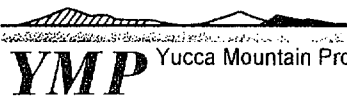
- **Horizontal review across key documents**
  - assure consistency of inputs and conclusions
- **Vertical reviews of the SSPA documents and supporting analysis (both volumes)**
  - assure consistency and traceability
- **Vertical review of TSPA Rev. 0, ICN 1**
  - assure traceability, consistency, linkage to supporting models

# **Quality Initiative Results of Initial Investigation**

- **Programmatic/Process Issues**
  - 4 Deficiency Reports
  - 3 CIRS Items
- **Technical Issues**
  - were mostly known to technical personnel
  - further assessments still in progress
  - all assessed to date have minimal or no impact

# Corrective Action Requests

- **Institute Immediate Actions**
- **Conduct Root Cause Determinations**
  - **Model Validation (May 3, 2001)**
  - **Software Verification (June 2001)**



# Corrective Action Requests

- **Initial Immediate Actions**
  - BSC Management stand-down to control the further development of software (June 7, 2001)
  - Initiated teams to begin model validation and software verification actions immediately
  - Initiated formal root cause analysis in compliance with procedural requirements (June 4, 2001)
  - General Manager Meeting to Emphasize Expectations (June 11, 2001)

# Corrective Action Requests

- **Formal Root Cause Analyses**
  - **Single Team Will Conduct Both Root Cause Analyses to Ensure Integration of Common Causes**
    - ♦ **Model Validation**
    - ♦ **Software Verification**
  - **Utilize TapRoot Process (Mandated by Project Procedures)**

# Longer Term Actions

- **Procedure Revisions/Enhancements**
- **Baseline Management/Controls**
- **Corrective Actions Identified by Root Cause Determination**



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

# **Response to NRC/DOE Conference Call Regarding QA and Performance Assessment Issues**

Presented to:  
**DOE/NRC Quarterly QA Meeting**

Presented by:  
**Robert Andrews**  
**Science and Analysis Project Manager**  
**Bechtel SAIC Company, LLC**

**June 13, 2001**

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# 1. Section 6.3.4.2 In-Package Chemistry

1.1 page 265, Table 6-42

- **NRC Finding**

- Calculated pH fell outside of expected range
- pH bounds and pH values, though correct, apply to different time periods
- Potential error in in-package chemistry abstraction for “early” chemistry conditions

- **DOE Response**

- Calculated pH values for CDSP waste packages are correct for calculation times indicated (98,000 and 100,000 years) but are incorrectly labeled as “early” time phase; should be “late” time phase
- Correct pH range for this “late” time should be as follows:

<u>Seepage environment</u>	<u>pH range</u>
Always Drip (t=98,000 yrs)	8.5 - 9.2
Intermittent Drip (t=100,000 yrs)	8.5 - 9.2
No Drip (t=98,000 yrs)	8.6 - 9.2
- Calculated and observed values are within this range

# **1. Section 6.3.4.2 In-Package Chemistry**

1.1 page 265, Table 6-42 (cont)

- **DOE Response (cont)**

- **Weighted-/moving-average of in-package chemistry was selected to assure the chemistry was appropriate at times when the rate of waste package failure is increasing; these are of greater significance during the 10,000 year compliance period.**
- **At long times (~100,000 years) this may be a non conservative representation**
- **Further discussion of this is planned for the TSPAI KTI Technical Exchange**
- **Table will be revised with next version of document**

# 1. Section 6.3.4.2 In-package Chemistry

1.2 page 266, Table 6-43

- **NRC Finding**

- Hand and model predicted total carbonate concentrations are the same, but inconsistent with equation in Table 6-38
- TSPA model input file used the wrong equation
- Equation in Table 6-38 is correct based on input AMR
- Impact to risk is unknown

- **DOE Response**

- Equation used to calculate in-package carbonate concentration in the model input file should be that presented in Table 6-38
- Using correct equation would decrease carbonate concentration by ~ 1,000
- Based on relationship between carbonate concentration and CSNF dissolution rate given in eqn. 6-2, this would decrease the dissolution rate by ~ 10% (~ 0.4 mg/m<sup>2</sup>/day) - - this is insignificant and conservative
- Correct exponent used in subsequent analyses and will be documented in next revision of report

## **2. Section 6.3.4.3 Cladding Degradation Model**

- **NRC Finding**

- Triangular distribution noted states minimum, mean and maximum values
- GoldSim triangular distribution uses minimum, most likely, and maximum values
- Information in the document appears incorrect

- **DOE Response**

- Text in the document is incorrect
- Input triangular distributions use minimum, most likely and maximum values
- Correct terminology will be used in next revision of document

### 3. Section 6.3.4.4 Dissolution Rate Model

- **NRC Finding**

- Calculated values of glass dissolution rate in Table 6-54 are not identical to observed values
- Differences cannot be explained by round off error

- **DOE Response**

- Difference is due to fact that R value used in hand calculation was  $8.314 \times 10^{-3} \text{ kJ/(mol K)}$ , while R value in GoldSim is  $8.31451 \times 10^{-3} \text{ kJ/(mol K)}$ ; when using the R value to 6 significant figures, the table is correct to 5 significant figures
- Difference is insignificant
- Clarification regarding round off error will be added in next revision of document

## **4. Section 6.3.4.5 Dissolved Concentration Limits**

### **4.1**

- **NRC Finding**

- Calculated concentration limits are not identical to observed values
- Informal hand calculations provided by DOE had different environmental parameters
- Degree of precision required during model component verification is unknown

- **DOE Response**

- Discrepancy is in the 5th significant figure
- Informal hand computations used slightly different water chemistries
- Precision at the 5th significant figures is not required for verification
- Clarification of degree of significance required for verification will be presented in the next revision of the document

## **4. Section 6.3.4.5 Dissolved Concentration Limits**

### **4.2 page 316, Table 6-60**

- **NRC Finding**

- Hand calculations could not be verified

- **DOE Response**

- Informal hand computations provided electronically to NRC used different environmental conditions; they do not correspond to the conditions identified in Table 6-60
- Further examination conducted during the project review reverified the values in Table 6-60 as being correct

## 5. Volcanic Releases - Table 6-133

- **NRC Finding**

- Values in Table 6-133 could not be verified and are inconsistent with those in Table 6-132

- **DOE Response**

- Table 6-133 is incorrect; it was a remnant of a previous version of the table that was not discovered in the checking process as the document was revised
  - Analyses conducted for TSPA-SR correctly weight the risk of volcanic release by probability of occurrence
  - Figure 6-193, which contains the probability-weighted doses, correctly shows the probability-weighted dose from the unweighted doses illustrated in Figure 6-192
  - Table 6-133 will be revised in next version of document



## 6. GoldSim Error Messages

- **NRC Finding**

- GoldSim run log file contains numerous error messages that need to be addressed
- Error messages do not appear to be addressed in the TSPA-SR documents

- **DOE Response**

- Run log error messages were known and examined by analysts; however they were not documented
- Some errors relate to slight numerical non-convergence that was evaluated by analysts and determined to be insignificant
- Non-convergence errors create mass and thus, although small, conservatively increase the dose
- Evaluation of the error messages and their significance will be documented in the next revision of the document

## 7. Use of Conditions Outside of Intended Range

- **NRC Finding**

- Staff identified several cases where model was using physical-chemical conditions outside the range of the observation

- **DOE Response**

- Instances of this were noted in the text and were discussed with the AMR authors to assure the appropriateness of the abstraction, even if not documented in the AMR
- Deficiency documented as BSC-01-D-078
- Supporting AMRs will be revised to extend range of applicability

## 8. Incorporating Intrusive Event Probability

- **NRC Finding**

- Probability over 50,000 years incorrectly reported as  $8 \times 10^{-3}$  rather than the correct value of  $8 \times 10^{-4}$
- It is unclear if this is a typographical error or was used to calculate the results

- **DOE Response**

- This is a typographical error
- Correct values were used in the analysis
- Correct values will be included in the next revision of the report
- Incorrect value has not been cited elsewhere



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

# OCRWM Concerns Program

Presented to:

**Nuclear Regulatory Commission  
Quarterly Management Meeting**

Presented by:

**Dr. J. Russell Dyer**

**Project Manager**

**Yucca Mountain Project Office**

**Office of Civilian Radioactive Waste Management**

**June 13, 2001**

**Rockville, Maryland**

YUCCA  
MOUNTAIN  
PROJECT

# OCRWM Concerns Program

- **Background**

- **NRC expressed interest in OCRWM Concerns Program activities during contractor transition at the December 20, 2000 Management Meeting**
  - ♦ **At the April 18, 2001 Management Meeting, DOE indicated that the project was still evaluating the OCRWM Concerns Program exit interview results.**
  - ♦ **On May 10, 2001 DOE provided metrics on OCRWM Concerns Program to NMSS Office Director.**

# OCRWM Concerns Program

- **Contract Transition Interview Data**
  - 1931 employees completed OCRWM Concerns Program transition interview process from January 4 through February 9, 2001.
    - ♦ 1659 employees from M&O (TRW) & subcontractors
    - ♦ 128 employees from USGS & subcontractors
    - ♦ 144 employees from the National Laboratories
  - 142 concerns received during transition period

# OCRWM Concerns Program

- **Current Status**

- **Employees continue to use OCRWM Concerns Program**
- **189 Concerns received Jan 2001 through end of May 2001**
  - ♦ **47 concerns received 2/12/01 - 5/31/01**
- **Ten concern categories (number of concerns):**
  - ♦ Differing Professional Views (4)
  - ♦ Environmental & Health (2)
  - ♦ Fraud, Waste & Abuse (1)
  - ♦ ***Management (55)***
  - ♦ Personnel Policy (25)
  - ♦ ***Quality-Related (61)***
  - ♦ ***Safety-Conscious Work Environment (26)***
  - ♦ Security (0)
  - ♦ Worker Safety (15)
  - ♦ Workplace Violence (0)

# OCRWM Concerns Program

- **Selected Concern Categories:**

- **Management Concerns**

- ♦ **Definition** - Related to a management policy, budget allocation, & use of personnel & resources
    - ♦ **41 Management-Related Concerns - January 4 to February 9**
    - ♦ **14 Management-Related Concerns - February 12 to May 31**

- **Management Review Results To Date (Management Concerns)**

- ♦ **3 substantiated management concerns through May 2001**
    - ♦ **18 management concerns not substantiated through May 2001**
    - ♦ **34 management concerns in process (neither substantiated nor not substantiated, but under investigation)**



# OCRWM Concerns Program

- **Selected Concern Categories (continued):**

- **Quality-Related Concerns**

- **Definition** - Condition alleging that activities have not met either technical or quality requirements regarding:
      - » The radiological health & safety of workers and/or the public
      - » Work that either provides direct input to the license application or the radiological safety sections of the EIS.

- ♦ **49 Quality-Related Concerns - January 4 to February 9**

- ♦ **12 Quality-Related Concerns - February 12 to May 31**

- **Concerns Program Investigation Results To Date (Quality)**

- ♦ **15 substantiated concerns through May 2001**

- ♦ **1 not substantiated concern through May 2001**

- ♦ **45 concerns in process**

# OCRWM Concerns Program

- **Selected Concern Categories (continued):**
  - **Safety-Conscious Work Environment (SCWE) Concerns**
    - ♦ **Definition** - A concern alleging harassment, intimidation, retaliation or discrimination (HIRD) or any other act of reprisal by management, supervision or a coworker regarding an employee's efforts to raise a concern or document a work-related issue for resolution. (Ref. NRC Policy Statement dated May 14, 1996)
    - ♦ **12 Safety-Conscious Work Environment Concerns - January 4 to February 9**
    - ♦ **14 Safety-Conscious Work Environment Concerns - February 12 to May 31**
  - **Concerns Program Investigation Results To Date (SCWE)**
    - ♦ **4 SCWE concerns substantiated through May 2001**
    - ♦ **4 SCWE concerns not substantiated through May 2001**
    - ♦ **18 SCWE concerns in process**

# OCRWM Concerns Program

- **Results From Exit Interviews**

- **Among the 1931 employees interviewed during transition (January 4 to February 9, 2001):**
  - ♦ **Approximately 8% expressed concerns (Total Concerns Received: 142)**
  - ♦ **Approximately 10-12% hesitant - Reasons:**
    - » **Organizational trust issue**
    - » **“Will submit as follow-up or anonymous”**
    - » **“If identified, management will not address/resolve condition”**
  - ♦ **This information factored into the management decision for independent SCWE Survey**
- **Lack of understanding of SCWE concepts**
- **Employees continue to use the Concerns Program**

# OCRWM Concerns Program

- **Results From Exit Interviews (Continued)**
  - Staff added to augment Concerns Program
  - Concerns Program aggressively investigating concerns
  - Concerns Program's priority for addressing concerns:
    - ♦ Safety-Conscious Work Environment
    - ♦ Quality Concerns
    - ♦ Differing Professional Views

# OCRWM Concerns Program

- **Preliminary Concern Investigation Results**
  - **15 Quality Concerns on Software - Substantiated**
    - ♦ **CAR-YMSCO-01-C-002 generated 5/31/01; Final Report In-Process**
  - **1 Quality Concern on QA Record Submittal Process - Not Substantiated**
  - **4 SCWE Concerns - Substantiated**
    - ♦ **Concerns Program, BSC HR, and BSC/DOE management addressing 'sexual harassment' and 'hostile work environment' concerns**

# OCRWM Concerns Program

- **Concerns Status**

- **Quality**

- ♦ (15) Substantiated, (1) Not Substantiated, (45) In Process

- **SCWE**

- ♦ (4) Substantiated, (4) Not Substantiated, (18) In Process

- **Differing Professional Views**

- ♦ (4) In Process

- **Management, Worker Safety, Environmental & Health, Fraud Waste & Abuse, & Personnel Policy**

- ♦ (59) In Process

- **Total In Process: 126**



# Management Actions

- **Safety-Conscious Work Environment Survey (SCWE)**
- **To ensure continued improvement of the SCWE, OCRWM has retained the firm of Morgan Lewis**
  - **Morgan Lewis will conduct representative survey of SCWE across entire OCRWM program**
  - **In-depth survey within QA organization's SCWE**
  - **Survey will require several months to complete**
  - **Results will be used to augment and enhance DOE/BSC initiatives underway regarding SCWE**

# Management Actions

- **Path Forward**

- **Communication Initiatives**

- ♦ **Augment communications program to convey management expectations for:**
      - » **Problem & concern identification through supervisors**
      - » **Problem & concern identification through use of available programs**
        - » **OCRWM Concerns Program**
        - » **Condition/Issue Identification & Reporting/Resolution System (CIRS)**
        - » **Deficiency Reports**
        - » **Corrective Action Reports**
    - » **Improving communications & available programs**



# Management Actions

- **Path Forward (Continued)**

- **Training**

- ◆ **Develop multilevel training program for workers & supervisors/managers covering:**
      - » **Management expectations for employee problem concern identification - appropriate & inappropriate behavior**
      - » **Protected activities as defined by the NRC**
      - » **Employee/Employer responsibilities**

- **Program Enhancements**

- ◆ **Evaluate effectiveness & identify need for enhancements to existing programs (CIRS, Deficiency Reports, etc.) to improve employee accessibility & use.**

- **Metrics**

- ◆ **Measure effectiveness of above initiatives**

# Management Actions

- **Conclusions**

- **The OCRWM Concerns Program is successfully dealing with concerns with appropriate follow-up action**
- **The backlog resulting from the exit interview process during transition is being addressed**
  - ♦ **Prioritization of concerns**
  - ♦ **Staff augmentation**
- **Long-term plans**
  - ♦ **Communication, Training, Program Enhancements, & Metrics**
  - ♦ **FY 02 planning includes budget to address these SCWE enhancements**
- **Management is continuing to evaluate metrics regarding SCWE**