MINUTES
U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY
QUARTERLY MANAGEMENT MEETING
August 19, 1998

On August 19, 1998, the U.S. Nuclear Regulatory Commission (NRC), Division of Waste Management met with representatives of the U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management for a quarterly management meeting. The meeting was a video conference between DOE headquarters in Washington, D.C., NRC headquarters in Rockville, Maryland, DOE office in Las Vegas, Nevada, and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas. The meeting was also attended by representatives of the State of Nevada; Nye County and Clark County, Nevada; Nevada Legislature, Nuclear Energy Institute; United States Nuclear Waste Technical Review Board; Nuclear Waste Task Force; and DOE contractors. This periodic meeting provides a forum for management level discussions of issues and concerns associated with the Yucca Mountain Site Characterization project and other aspects of the Civilian Radioactive Waste Management System program. Attachment 1 provides the meeting agenda and Attachment 2 lists the attendees.

OPENING REMARKS: The meeting was opened with comments by John T. Greeves, Division Director, Division of Waste Management (DWM), NRC emphasizing the fact that NRC and DOE have had a very busy, productive year with many important, successful interactions. Greeves also pointed out that unlike previous years, competing schedules and activities of both agencies resulted in NRC and DOE having only one management meeting in FY98. Emphasizing the importance of these meetings, John Greeves encouraged the participants to make every effort to resume these meetings on a quarterly basis and suggested that at the close of the meeting a date be set for the next NRC/DOE management meeting. The NRC Director indicated that the NRC would continue to maintain a focus on DOE's Quality Assurance (QA) program and will continue to followup on the issues raised in the May 6, 1998, QA meeting. No opening remarks were made by Lake Barrett, Acting Director, Office of Civilian Radioactive Waste Management, State of Nevada, or Nye and Clark Counties, Nevada.

STATUS OF NRC/NMSS/DWM ORGANIZATION: John Greeves notified the participants that Margaret Federline has moved on to a position in Research and Michael F. Weber will be the new Deputy Director of DWM. Mr Weber, however, was currently on vacation, but would be available for the next NRC/DOE management meeting.

STATUS OF DOE/OCRWM PROGRAM: Lake Barrett, DOE, announced that Mr. Bill Richardson was sworn in as the ninth United States Secretary of Energy on August 18, 1998. Revision 2 to the DOE Program Plan has been sent to Congress and is available on the DOE's home page. The Plan is based upon the FY99 budget request and incorporates DOE's new strategic planning efforts, which include fully integrating plans for the disposal of weapons-usable fissile materials into the OCRWM baseline. Mr. Barrett indicated that DOE Headquarters was undergoing a reorganization and this reorganization would probably be presented at the next NRC/DOE management meeting. DOE also indicated that it was working with NRC to develop a plan for the use of the $4 million dollars budgeted for use on activities related to multi-purpose canisters. Mr. Barrett provided a very brief summary of progress on the Viability Assessment and indicated that the Technical Basis Document, which provides all technical files and data supporting DOE's Total System Performance Assessment for Viability Assessment (TSPA/VA), will be made available to interested parties in the immediate future.

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Enclosure

NRC COMMISSION BRIEFING ON HLW PROGRAM: On August 26, 1998, Dr. Michael Bell, NRC, and Dr Wesley Patrick, Center for Nuclear Waste Regulatory Analyses (CNWRA) are scheduled to brief the Commission on the HLW program. In preparation for this briefing, Dr. Bell, gave a brief overview of the presentation to be made to the Commission. This overview included a reiteration of the goals, strategies, and highlights of the HLW program; a discussion of program elements, management and integration; and focus on accomplishments and outlook for the future.

SCHEDULE AND STATUS OF REGULATORY GUIDANCE:

10 CFR PART 63- NRC staff provided an overview of the development of the site specific Yucca Mountain HLW rule, the details of which are provided in Attachment 3. As a result of the presentation, NRC responded to DOE's questions regarding the basis for the selection of the location of the critical group and indicated that the NRC was looking for comment on the location of the critical group during the comment period. Draft Part 63 is due to the Commission by September 30, 1998, and upon Commission approval will be released for public comment. In addition, the Nuclear Waste Task Force questioned whether a dose cut off was considered for children due to their differing diet requirements, specifically milk, over that of the adult. The NRC indicated that the average diet cuts across all food groups and would take into consideration the differences in diet.

ISSUE RESOLUTION STATUS REPORTS-

- **Status and schedule of reports, revisions, and acceptance criteria:** NRC staff discussed the status of the Issue Resolution Status Reports (IRSRs) from the enclosed table, which includes the current issue date for Revisions 1 and 2 to the IRSRs (See Attachment 4).

- **DOE comments and questions on IRSR's:** DOE presented general comments on NRC's IRSR's, the details of which are provided in Attachment 5. DOE indicated that the IRSRs need to clarify that, at the staff level, new information itself is not sufficient to reopen an issue, unless the new information is important to a key technical issue (KTI). Another issue of concern for DOE is that the KTI's should be structured to more clearly link issues to the results of the performance assessment. NRC agreed with this statement and indicated that linkage will be provided in Revision 1 to the IRSRs coming out in the near future and specifically in the TSPA IRSR Revision 1. NRC indicated that it planned to set up a technical exchange on the TSPA IRSR Revision 1 in the near future. DOE also reiterated its concern about the proliferation of issues and subissues and the need to clearly state the basis for each.

- **July 6, 1998 TSPA Letter:** By letter dated July 6, 1998, the NRC provided DOE with a written account of the larger issues identified with TSPA-VA and an overview of these issues was provided at this meeting (See Attachment 6). DOE indicated that these comments were both useful and positive. DOE has put pointers in the Viability Assessment (VA) Technical Basis Document to these issues.

STATUS OF VA PRODUCTS: DOE provided an overview of the current status of the VA document, the details of which are provided in Attachment 7. NRC expressed concern that no date had been set for a meeting to discuss the contents of the LA Plan. As a result, NRC will not

be able to provide early comments on the document. DOE indicated that up until recently the document was not sufficiently developed to have the meeting but was now ready to schedule the meeting as soon as possible.

COMMITMENT MANAGEMENT: DOE provided a brief overview of their commitment management program as described in Attachment 8. NRC and DOE agreed to discuss what commitments have been made and need to be met between the agencies at the next management meeting. In addition, NRC committed to review YMP 30.60, brief Greeves on the review results, and provide a list of its commitments to DOE.

PROCEDURAL AGREEMENT: DOE and NRC have been jointly working to streamline, consolidate and update the NRC/DOE 1993 procedural agreement based on current practice. DOE presented an overview of the changes (See Attachment 9) and a draft of the document was provided (See Attachment 10). Although the agreement is between NRC and DOE, the State of Nevada and other affected units of local government were given an opportunity to review and comment on the proposed revision to this agreement. Comments on the Procedural Agreement were requested within two weeks.

STATUS OF DOE'S DECISION DOCUMENTATION INITIATIVE: DOE discussed its procedure for documenting decisions made in the course of developing a license application. The procedure will assist in providing traceability of both the decision process and the records generated, and will standardize the documentation for decisions. Although the NRC On-site representatives had a copy of the procedure, DOE was asked to provide a copy to NRC headquarters. The details of the presentation are provided in Attachment 11.

FOLLOWUP ON MAY 6, 1998, QA MEETING: DOE provided the status or an update on the issues of: 1) Length of time to close deficiencies; 2) increased deficiencies in scientific notebooks; 3) trending programs; and 4) supplier deficiencies. Of the 117 deficiencies that remain open, thirteen have been open for more than one year. DOE indicated, however, that none of these require immediate completion of corrective action because they do not represent an immediate impact on nuclear safety and waste isolation. DOE has proposed Corrective Action Procedure Revision that will, among other things, strengthen corrective action commitments and provide a process to require assessments of program impact if not closed within 100 days. At 100 days, the QA Project Manager will reassess the impact and NRC will be provided a copy of the reassessment. At 365 days, Lake Barrett will be notified and NRC will also receive a copy of this letter. These procedures are targeted for January 1999.

With regard to scientific notebooks (SN's), DOE is reviewing SNs to assure they comply with requirements, developing a draft procedure to be issued September 30, 1998, and plans to conduct training classes beginning September 30, 1998, on proper completion of SNs. DOE indicated that its assessment at this point indicates the problem is a discipline problem, not a procedural problem. DOE continues to monitor the situation and indicated it will keep NRC informed. NRC committed that NRC's On-site representative will monitor the Scientific notebook training program; review the M&O Corrective Action Plan and brief Greeves on the progress.

DOE indicated that the Trending process has been revised and became fully implemented on August 3, 1998. NRC committed to provide DOE with comments on the revised Trending Program.

Lastly, DOE provided the status of their investigation of the supplier deficiencies. In addition, DOE provided three detailed examples of supplier deficiencies as requested by NRC during a June 25, 1998, meeting with DOE. DOE indicated that the procurement process is a problem and it has handled the problem there where a trend had been identified. DOE also indicated that some problems stemmed from an accountability issue and DOE is taking the initiative to resolvethe
issue. Additional details of this presentation are provided in Attachment 12.

The representative from Clark County, Nevada, noted that DOE information on the supplier deficiency regarding the detailed analysis of corrosion testing was requested at the May 6, 1998, meeting had not been received. DOE indicated that it would provide this information.

PA QA PROGRAM TRANSITION/VERTICAL SLICE REVIEWS: DOE provided an overview of the background, objectives, results and road ahead regarding the vertical slice reviews and the transition of the TSPA into a QA program (See Attachment 13). DOE concluded that processes and work products are generally sufficient to support VA. From a regulatory perspective, DOE indicated that technical assumptions are adequate and that traceability and documentation will be improved. Currently, DOE is taking remedial actions for those results that impact VA quality, integrating lessons learned into the TSPA-VA Technical Basis Documents, and developing TSPA-VA Technical Basis Document in accordance with M&O QA requirements. For licensing, DOE will provide training on TSPA QA requirements; develop and implement TSPA procedures needed to support License Application (LA), and establish controls for model and software development and configuration.

STATUS OF ACTINIDE-ONLY BURNUP CREDIT TOPICAL REPORT: DOE and the Spent Fuel Program Office discussed the Actinide-only Burnup Credit Topical Report (TR) in context of the $4 Million dollars available for MPC related work. DOE indicated that some of this money could be directed at this topical report. DOE indicated that DOE and NRC needed to have a dialog on the best use of the $4 Million dollars. SFPO indicated that DWM and SFPO had developed a list of tasks that could be performed with the additional funds, but that SFPO was looking at others in NRC to keep the work on the TR going. However, SFPO indicated that the work would not be at the same pace because their focus was on the dual purpose canisters to avoid shutdown of utilities was taking first priority. The NRC was skeptical of its ability to use contractors due to conflict of interest issues. SFPO also indicate that DOE should take another look at the scope to keep it narrow and specific versus a broad scope. In addition, SFPO indicated that DOE should look at the benchmarking of codes or code-to-code comparisons, because if codes are not benchmarked NRC will not be able to approve. DOE indicated that it has been three years since the first version of the Actinide-only Burnup Credit Topical Report (TR) was issued to NRC, that the TR has been repeatedly de-scoped to make the NRC's review effort more manageable, and that there is a need to resolve this issue in a more timely manner. NRC and DOE indicated that this issue would be discussed further at the next management meeting.

CLOSING REMARKS: No specific closing remarks were made by Mr. John Greeves, NRC; Mr. Lake Barrett, DOE; or representatives of the State of Nevada, Nye and Clark Counties.

Mr. Greeves, NRC and Mr. Barrett, DOE indicated that their respective staff's would schedule the next management meeting for December, 1998.

In addition the following list of action items was identified as resulting from the management meeting:

- NRC and DOE committed to discuss the $4 million MPC funds.
- NRC and DOE agreed to set a date for the technical exchange on the LA Plan within one week.
- NRC and DOE agreed that Actinide-only Burnup Credit Topical Report would be on the next management meeting agenda.
- NRC agreed to set the date for the technical exchange on the TSPA IRSR Revision 1.
- DOE committed to provide the details of the Yucca Mountain Project Office re-organization at the next meeting.
- DOE and NRC committed to maintain the quarterly management meetings.
- NRC and DOE agreed to discuss what commitments have been made and need to be met between the agencies at the next management meeting.
- Comments on the Procedural Agreement should be provided by all interested parties in two weeks.
- NRC committed to review YMP 30.60, brief Greeves on the review results, and provide commitments to DOE.
- NRC committed that NRC's On-site representative will monitor the Scientific notebook training program; review the M&O Corrective Action Plan and brief Greeves on the progress.
- NRC committed to provide DOE with comments on the revised Trending Program.

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ATTACHMENT 1

AGENDA
NRC/DOE MANAGEMENT MEETING
Video Conference
August 19, 1998
Hillshire Blue Room; NRC Headquarters T2B5; DOE Headquarters 7F091

10:00 AM PST (1:00 EST)

● **OPENING REMARKS**	ALL
● **PROGRAM STATUS**	
Status of NRC/NMSS/DWM Organization (Greeves)	NRC
Status of DOE/OCRWM Program	DOE
NRC Commission Briefing on HLW Program(Bell/Patrick)	NRC
Schedule and Status of Regulatory Guidance	DOE/NRC
10 CFR 63(McCartin)	NRC
Issue Resolution Status Reports	
- Status and schedule of reports, revisions, and acceptance criteria (Stablein)	NRC
- DOE comments and questions on IRSR's (Brocoum/Gil)	DOE
- July 6, 1998 TSPA Letter (McConnell)	NRC
Status of VA Product (Sullivan)	DOE
Committment Management	DOE
Procedural Agreement (Gil/Glenn)	DOE/NRC
Status of DOE's Decision Documentation Initiative (Morris)	DOE
Follow-up on May 6, 1998 QA Meeting (Spence/Bob Clark)	DOE/NRC
Status of Actinide-only Burn-up Credit Topical Report	DOE
● **CLOSING REMARKS**	ALL
● **ADJOURN**	

2:00 PM PST (5:00 PM EST)

ATTACHMENT 2

ATTENDANCE
NRC/DOE Management Meeting
NRC Videoconference T2B5
August 19, 1998

Name	Affiliation	Address	E-Mail Address	Telephone Number
Sandra Wastler	NRC		SLW1@nrc.gov	415-6724
Jim York	Booz, Allen, Hamilton	Washington, DC	jim_york@rw.doe.gov	202-626-1067
Giorgio Gnugnoli	NRC	Washington, DC	GNG@nrc.gov	301-414-7135
Lake Barrett	DOE	Washington, DC		202-586-6850
Alan Brownstein	DOE	Washington, DC		202-586-4973
Jack Bailey	OCRWM/M&O/ TRW	Las Vegas, NV	jack.bailey@ymp.gov	702-295-4251
Susan Klein	DOE/RW	Washington, DC	susan.e.klein@rw.doe.gov	202-586-6973
Steven Kraft	NEI	1776 I Street NW Washington, DC	spk@nei.org	202-739-8116
Ralph Anderson	NEI	1776 I Street NW Washington, DC	rla@nei.org	202-739-8111
Tim McCartin	NRC	Washington, DC	TJM3@nrc.gov	301-415-6681
Howard Larson	NRC	Washington, DC	HJL@nrc.gov	301-415-6805
Keith McConnell	NRC	Washington, DC	KIM@nrc.gov	301-415-7289
King Stablein	NRC	Washington, DC	NKS@nrc.gov	301-415-7282
John Greeves	NRC	Washington, DC	JTG1@nrc.gov	301-415-7437
Michael Bell	NRC	Washington, DC	MJB2@nrc.gov	301-415-7286
Ronald J. Stevens	M&O Licensing			702-295-4412
Dennis Richardson	M&O			702-794-4392
April Gil	DOE/YMP/AMP			702-794-5578
Sheryl Morris	DOE/AML			702-794-5487
Frank Kratzinger	MTS			702-794-5057

ATTENDANCE NRC/DOE Management Meeting NRC Videoconference T2B5 August 19, 1998				
Richard Peck	QATSS			702-794-1494
Bob Clark	DOE/OQA			702-794-5583
Jim Linhart	NSNFP			702-295-0366
Bill Belke	NRC			702-794-5047
E. Von Tiesenhausen	Clark County			702-455-5184
Steve Frishman	NV NWPO			702-687-3744
Judy Treichel	NNWTF			702-248-1127
Assemblyman Bob Price	Nevada Legislature			702-642-5669
Representative John Meder	Nevada Legislature			702-687-6825
Bob Andrews	M90-PA			702-295-5549
Mal Murphy	Nye County			360-945-5610
Chad Glenn	NRC			702-794-5047
Pete Gaillard	M&O Licensing			702-295-7570
Tim Gunter	YMSCO/AML			702-794-1343
Joe Price	YMSCO/AML			702-794-1441
Marty Bryan	M&O Licensing			702-295-2651
Mark Tynan	DOE/AML			702-794-5457
Myrle Rice	Intertech			702-263-6583
R. Gamble	MTS			702-794-1440
Mike Lugo	M&O/TRW			702-295-4761
Peter Hastings	M&O/PA			702-295-3961
English Pearcy	CNWRA			210-522-5540
Budhi Sagar	CNWRA			210-522-5252

ATTACHMENT 3

Staff Development

of

A Yucca Mountain Specific HLW Rule (Part 63)

BACKGROUND

- Scheduled to submit draft rule to Commission by September 30, 1998
- EPA Standards for Yucca Mountain are not available
- Part 63 developed taking into consideration:
  - Commission direction
  - Legislative direction
  - NAS Recommendations
  - EPA Standard will be forthcoming
  - Public comments will provide useful input

Key Aspects of Part 63

- Performance-based, risk-informed approach
  - overall performance objectives
  - compliance with performance objectives based on overall system analysis
  - no additional quantitative measures (e.g., quantitative subsystem requirements, ground-water protection)

- Geologic repository includes a system of multiple barriers

- Limit speculation
  - specification of reference biosphere and critical group
  - stylized calculation for human intrusion

- Emergency planning
  - reserved in Part 60
  - develop plan based on criteria of Part 72.32 (similar operations to ISFSI)

POST CLOSURE CRITERIA

PERFORMANCE OBJECTIVE

- Individual Dose Limit of 25 mrem/year
- Compliance period of 10,000 years
- Geologic repository includes a system of multiple barriers

COMPLIANCE DEMONSTRATION

- Performance Assessment used to Demonstrate Compliance
- Reference Biosphere and Critical Group used in PA
- Specified calculation used to evaluate the consequence of human intrusion

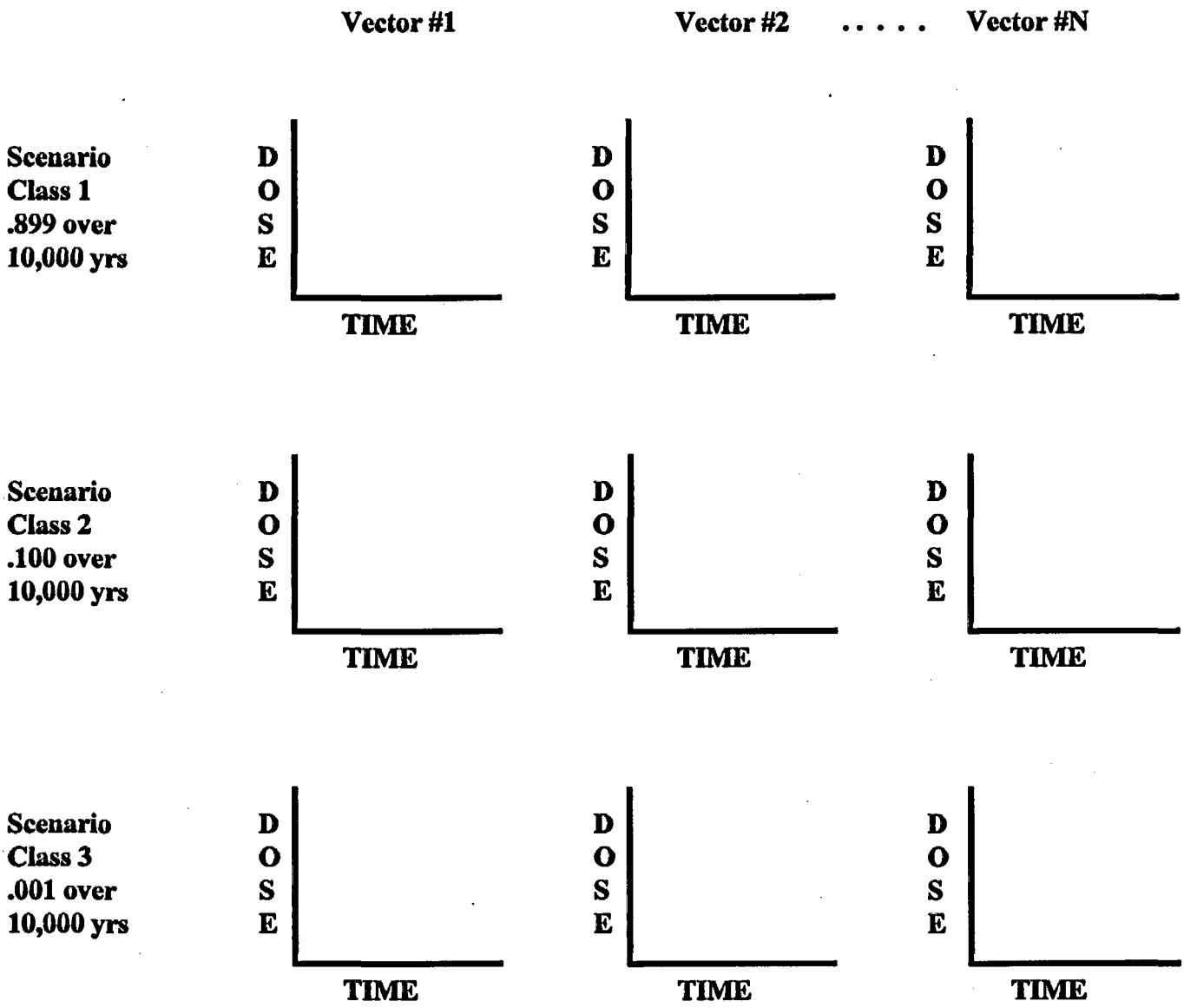
INDIVIDUAL DOSE LIMIT OF 25 mrem/yr

- Only quantitative limit for postclosure performance

- Consistent with Commission direction and regulation of other related activities
  - LLW specifies 25 mrem
    (approximate based on 25/75/25)
  - Decommissioning 25 mrem
  - international limits typically vary between 5 and 30 mrem
  - NAS recommended starting point of 2-20 mrem

- Expected annual dose
  - calculated for each year
    (a curve of expected annual dose versus time after closure)
  - accounts for probability of the scenarios and probability of the parameters
  - representative of risk to an individual

Sample Calculation of Expected Annual Dose Curve



Expected annual dose curve obtained by adding the family of dose curves each weighted by the probability of the scenario class and the probability of the parameter set (i.e., vector)

Example Expected Annual Dose Curve

COMPLIANCE PERIOD OF 10,000 YEARS

- provides for analysis of wide range of geologic conditions and degradation processes of the engineered barriers

- radiological hazard of waste decreases significantly over 10,000 years (comparable to amount of 0.2% uranium ore used to produce fuel)
  - anticipate that peak dose would occur beyond 10,000

- consistent with court ruling, other regulations and NRC guidance
  - Court of Appeals upheld EPA selection of 10,000 year compliance period for 40 CFR 191
  - WIPP (40 CFR 191)
  - Draft BTP on PA for LLW

- Uncertainties of analyses beyond 10,000 years call into question the usefulness of these results for compliance determination

SYSTEM OF MULTIPLE BARRIERS

- geologic repository is required to include multiple barriers

- no quantitative limits placed on performance of individual barriers
  - consistent with NAS

- DOE has flexibility in presenting evidence for multiple barriers
  - identify barriers important to waste isolation
  - describe capability of these barriers, accounting for uncertainties in characterizing and modeling the barriers
  - provide technical basis for the description of the capability of the barriers

- Demonstration of multiple barriers will include
  - capability of individual barriers to perform their intended function
  - relationship of that function to limiting radiological exposure

- Understand the resiliency of the geologic repository to ensure defense in depth and increase confidence that postclosure performance objectives will be met

PERFORMANCE ASSESSMENT

Reliance on performance assessment necessitates a defensible and transparent analysis

Defensible

- include site data, as needed, to define all relevant parameters and conceptual models
- account for uncertainties
- consider alternative models
- provide technical basis for inclusion/exclusion of specific conditions or attributes (potentially adverse to performance, materially affect compliance)
- consider events with a 1 in 10,000 chance of occurring over 10,000 years
- consider degradation, deterioration, or alteration of engineered barriers
- provide basis for models used in the performance (reasonable and practicable measures to assure the PA is credible)
- support topics most important to performance with greatest rigor

Transparent

- use expected annual dose as basis for decision making
- explain how the estimated performance is achieved (including description of multiple barriers)

REFERENCE BIOSPHERE & CRITICAL GROUP

- Arid to semi-arid conditions

- Farming community located approximately 20 km from site
  - consistent with present knowledge and conditions (depth to water table, diet includes some locally produced food)
  - large water demand increases likelihood of intercepting radionuclides
  - involves more pathways (ingestion pathway through consumption of contaminated water, crops, and animal products; inhalation and direct pathways from surface contamination)

- Land use, lifestyle, diet, human physiology, and metabolics assumed constant over time
  - limits speculation

HUMAN INTRUSION

- Evaluate consequences of "stylized" intrusion in context of total system performance

- Assume a single vertical borehole that penetrates one waste package and creates a pathway to the saturated zone
  - limits speculation

- Consistent with NAS recommendations

PRECLOSURE CRITERIA

PERFORMANCE OBJECTIVE

- Geologic Repository Operations Area (GROA) designed such that radiation exposures within limits of Part 20 for category 1 design basis events
  - category 1: natural or human-induced events expected to occur one or more times before permanent closure

- GROA designed such that radiation exposures below 5 rem TEDE for category 2 design basis events
  - category 2: natural or human-induced events expected to have one chance in 10,000 of occurring before permanent closure

COMPLIANCE DEMONSTRATION

- Safety Analysis conducted to demonstrate compliance
  - similar approach as postclosure
- Retrievability
- Emergency planning

ATTACHMENT 4

ISSUE RESOLUTION STATUS REPORTS BY KTI
(Schedule as of August 1997)

TITLE OF KEY TECHNICAL ISSUES Title of Subissues	Actual/Planned Completion Dates
IGNEOUS ACTIVITY 1. Probability of future igneous activity* 2. Consequences of igneous activity**	03/27/98 (Rev. 0)[c] 07/16/98 (Rev. 1)[c]
STRUCTURAL DEFORMATION AND SEISMICITY 1. Fault Slip*,** 2. Seismic Motion** 3. Fracture and Site Discontinuities** 4. Tectonics and Crustal Properties*,**	11/12/97 (Rev. 0)[c] 09/30/98 (Rev. 1)
EVOLUTION OF THE NEAR FIELD ENVIRONMENT Effects of Coupled Processes on: 1. Seepage*, ** 2. Waste Package Lifetime*, ** 3. Rate of Release*, ** 4. Radionuclide Transport*, ** 5. Criticality in the Near Field**	11/07/97 (Rev. 0)[c] 08/31/98 (Rev. 1)
ACTIVITIES RELATED TO DEVELOPMENT OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY YUCCA MOUNTAIN STANDARD AND NRC RULE No IRSRs planned, since rulemaking is product.	

*REV 0 FOCUS
**REV 1 FOCUS

TITLE OF KEY TECHNICAL ISSUES Title of Subissues	Actual/Planned Completion Dates
REPOSITORY DESIGN AND THERMAL EFFECTS 1. Effectiveness of design control process*,** 2. Design of Geological Repository Operations Area (GROA) to withstand seismic events.* 3. Thermal/Mechanical effects on underground facility.** 4. Design of repository seals to enhance performance.	10/29/97 (Rev. 0)[c] 09/30/98 (Rev. 1)
RADIONUCLIDE TRANSPORT 1. Radionuclide Transport fractured rock* 2. Radionuclide Transport through porous rock* 3. Radionuclide Transport through alluvium * 4. Criticality in Far Field*	09/30/98 (Rev. 0)
CONTAINER LIFE AND SOURCE TERM 1. Effects of corrosion on engineered barrier system (EBS) design and performance*,** 2. Effects of materials stability and mechanical failure on EBS design and performance** 3. Effects of spent fuel performance on EBS source term** 4. Effects of glass performance on EBS source term** 5. Adequacy of waste package design for criticality control** 6. Radionuclide transport within the EBS**	03/13/98 (Rev. 0)[c] 09/30/98 (Rev. 1)

*REV 0 FOCUS
**REV 1 FOCUS

TITLE OF KEY TECHNICAL ISSUES Title of Subissues	Actual/Planned Completion Dates
THERMAL EFFECTS ON FLOW (TEF) 1. Is the DOE thermal testing program, including performance confirmation testing, sufficient to evaluate the potential of thermal reflux that occurs in the near field?*,** 2. Is the DOE thermal modeling approach sufficient to predict the nature and bounds of TEF in the near field?*,** 3. Does the DOE total system performance assessment (TSPA) adequately account for TEF?*,**	11/13/97 (Rev. 0)[c] 08/31//98 (Rev. 1)
TOTAL SYSTEM PERFORMANCE ASSESSMENT AND INTEGRATION 1. Model abstraction in TSPA (will include joint development of sensitivity study plan)* 2. Scenario Analysis** 3. Transparency and Traceability of the Analysis	05/11/98 (Rev. 0)[c] 09/30/98 (Rev. 1)

* REV 0 FOCUS
** REV 1 FOCUS

TITLE OF KEY TECHNICAL ISSUES Title of Subissues	Actual/Planned Completion Dates
UNSATURATED AND SATURATED FLOW UNDER ISOTHERMAL CONDITIONS 1. What is the likely range of future climates at YM?*** 2. What are the likely hydrologic effects of climate change?*** 3. What is the estimated amount and what is the spatial distribution of present-day shallow groundwater infiltration?* 4. What is the estimated amount and what is the spatial distribution of present-day and projected future groundwater percolation through the proposed repository horizon?** 5. What are the ambient flow conditions in the saturated zone?** 6. To what degree does matrix diffusion occur in the saturated and unsaturated zones?**	11/07/97 (Rev. 0)[c] 09/30/98 (Rev. 1)

* REV 0 FOCUS
** REV 1 FOCUS
*** COMPLETED 6/97

ATTACHMENT 5

YUCCA
MOUNTAIN
PROJECT

DOE General Comments on NRC Issue Resolution Status Reports (IRSRs)

Presented to:
NRC/DOE Management Meeting

Presented by:
Dr. Stephan J. Brocoum
Assistant Manager for Licensing
Yucca Mountain Site Characterization Office

August 19, 1998

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

Outline

- Introduction
- KTIs and System Performance
- Treatment of Uncertainty
- Acceptance Criteria and LA Review Plan
- Role of KTIs and Consideration of "Resolved" Issues in Licensing

Introduction

- DOE has reviewed the 8 IRSRs issued to date and provided comments to NRC on 6
- DOE believes that the issue resolution process documented in the IRSRs will aid in developing a mutual understanding of:
  - Areas of agreement and disagreement on important issues
  - Expectations for information to be presented in the license application
- Although the process has potential benefits, DOE has some general comments about the structure of the KTIs, the related IRSRs, and their use in licensing

KTIs and System Performance

- KTIs identify issues NRC considers to be most important to performance
  - KTIs have been subdivided into subissues and in some cases lower-level components, all of which require consideration and resolution
  - Linkage among issues, subissues, components and performance is not clear
- DOE believes the KTIs should be structured to more clearly link issues to the results of performance assessments
  - Use TPA and TSPA to guide revisions to IRSRs
  - Identify technical factors and develop acceptance criteria based on significance to performance
- DOE's goal is to focus work where needed based on significance to conclusions about performance

Treatment of Uncertainty

- DOE would like to see the IRSRs recognize that substantial uncertainties are expected, and that some issues may remain open after construction authorization

- IRSRs should acknowledge role of R&D for resolution of open safety issues [60.21(c)(14)] and of performance confirmation to confirm the assumptions that are the basis for licensing review [60.140(a)]

Acceptance Criteria and LA Review Plan

- NRC intends to use the IRSR acceptance criteria to
  - Resolve KTIs prior to DOE's submittal of the LA
  - Develop a review plan for the LA
- Acceptance criteria should permit flexibility in dealing with performance issues in a system context for licensing
- Timely availability of NRC guidance is important
  - NRC letter of 7/6/98 indicates that postclosure sections of LA review plan will be delayed until FY 2001 and that preclosure sections may not be complete until after LA submittal

Role of KTIs and Consideration of "Resolved" Issues in Licensing

- DOE believes licensing review should focus on NRC licensing requirements for system performance
- DOE would like to have a better understanding of:
  - –The relationships among the framework for NRC regulations for Yucca Mountain (SECY-97-300, Attachment 2), the flow down for TSPA (IRSR on TSPA, Fig. 1), and the other KTIs/IRSRs
  - –How IRSRs may be used and referenced in licensing relative to NRC licensing criteria

Role of KTIs and Consideration of "Resolved" Issues in Licensing

(Continued)

- DOE recommends that criteria for re-opening issues resolved in IRSRs be based on:
  - Existence of new information
  - Information outside bounds considered in resolution
  - Significance of information to conclusions about performance and public health and safety

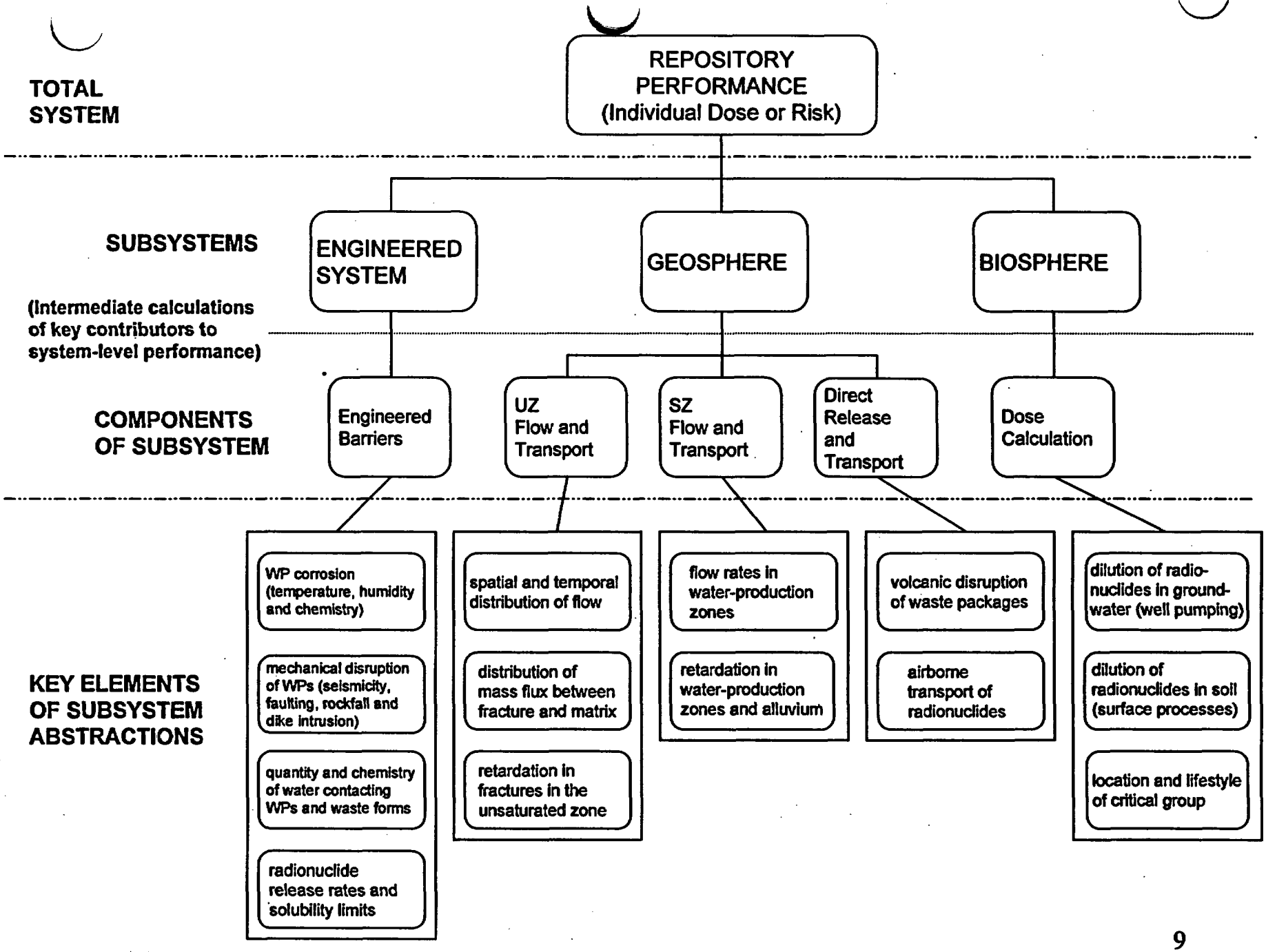


Figure 1. Flowdown diagram for total system performance assessment.

ATTACHMENT 6

NRC COMMENTS ON DOE'S TSPA-VA

BACKGROUND:

- Comments based on three technical exchanges and DOE's presentation at April 1998 NWTRB meeting.
- Staff believes exchanges were very productive; facilitated staff review by providing an integrated look at the TSPA-VA in its early stages.
- Intent of staff providing comments is to aid in defining future work necessary to support a defensible license application.
- Staff believes that DOE's flexibility in modifying approach in response to exchanges of information and technical discussions is positive.

SPECIFIC CONCERNS:

- Total System Performance Assessment Modeling and Documentation:
  - Radionuclides tracked in the PA
  - Consideration of all significant features and processes
  - Model Abstraction (applying assumptions consistently)
  - Documentation of Assumptions
  - Transparency and Traceability of the Analysis

- Engineered System Performance:
  - Container life
  - Role of rockfall in assessing waste package lifetime
  - Effectiveness of EBS in the event of volcanic activity

- Natural System Performance:
  - Neptunium solubilities
  - Matrix diffusion
  - Saturated zone transport
  - Radionuclide retardation
  - Treatment of colloids

- Procedural Issues:
  - Basis for assigning probabilities to corrosion potential values
  - Uncertainty in the results of expert elicitation
  - Development of expert elicitation results for use in PA

ATTACHMENT 7

YUCCA MOUNTAIN PROJECT

Viability Assessment Status

Presented to:
NRC/DOE Management Meeting

Presented by:
Tim Sullivan
Viability Assessment Team Lead
Yucca Mountain Site Characterization Office

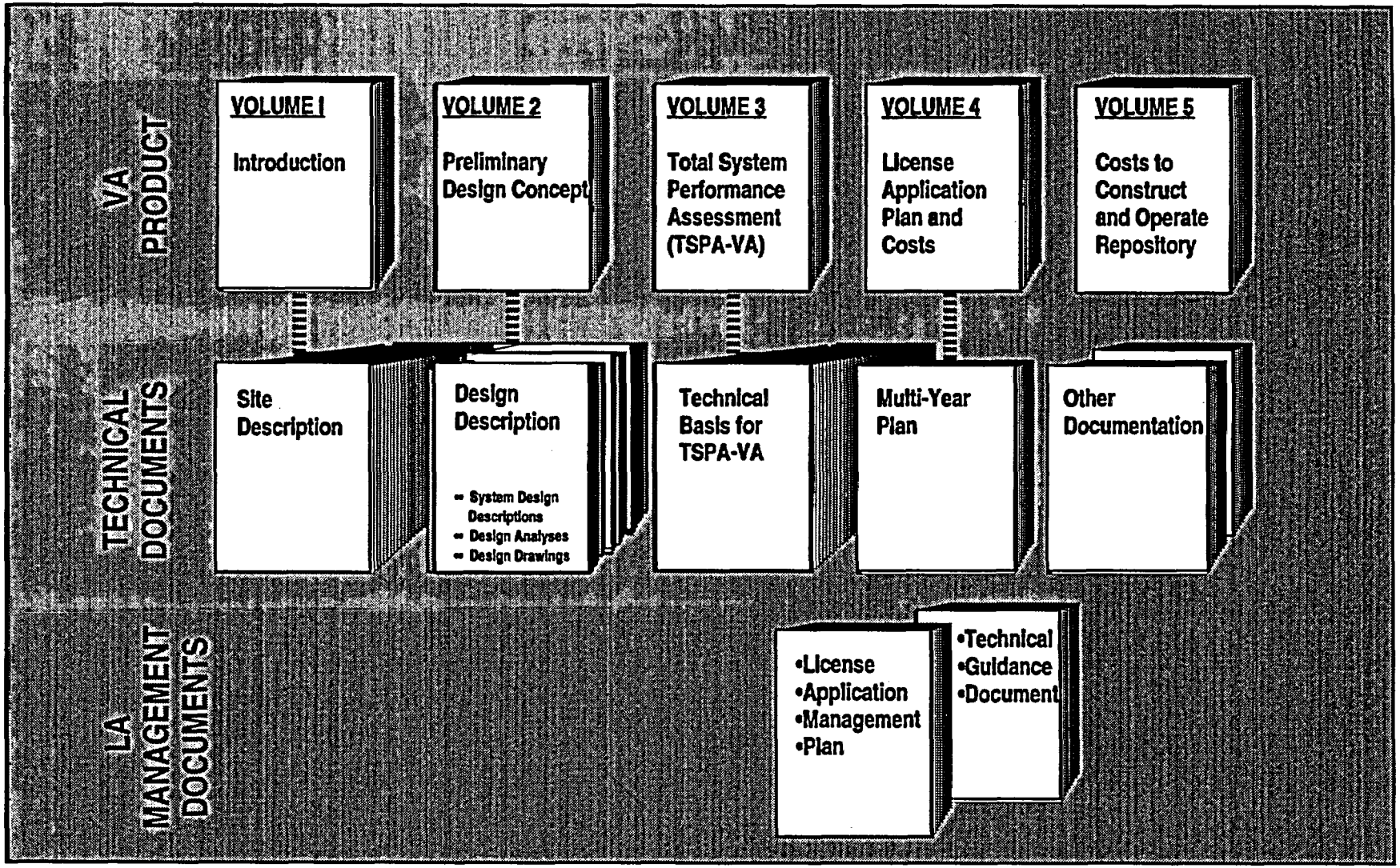
August 19, 1998

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

VA Status

- Forecasting completion of VA Document on time: August 28, 1998
- Initial Review (Draft A) conducted from April through June
- DOE-Wide Review of the VA Product (Draft B) began July 7 and closed July 17
- Final production in progress

Program Documentation for VA



VA Product: Volume 1

- **Overview, Introduction, and Site Characteristics**
  - **Overview**
    - » **High-level summary**
    - » **Separately bound and in Volume 1**
  - **Introduction**
    - » **Scope and objectives**
    - » **Review of applicable statutory and regulatory requirements**
    - » **Description of site characterization process**
  - **Site Characteristics**
    - » **Summarizes *Yucca Mountain Site Description***

VA Product: Volume 2, VA Design

- Reference repository design
  - Surface facilities
    - » Incorporates design concepts and procedures already in use at other NRC-licensed facilities to the maximum extent practicable
  - Subsurface facility
    - » Discusses operational concepts for waste emplacement
    - » Addresses role of EBS and its relationship to the geologic setting in postclosure performance
  - Waste packages
    - » Role of cladding in protecting the waste form
    - » Use of dual-barrier material
  - Performance monitoring

VA Product: Volume 2, VA Design

(Continued)

- Engineered barrier system (EBS) design options
  - Backfill
  - Drip Shields
  - Ceramic Coating
- Design alternatives such as:
  - Smaller waste packages, varying thermal loads
- Concepts for construction and operations
  - Simultaneous drift excavations and emplacement operations
- Design flexibility and operations
  - Accommodates additional drifts
  - Extended monitoring period

VA Product: Volume 3, TSPA-VA

- Methodology and approach
- Principal factors of expected repository performance and their importance to TSPA-VA results
- Summary of Base Case results for 10,000, 100,000, and 1,000,000 years using single value estimates for parameters (means)
- Summary description of TSPA-VA component models

VA Product: Volume 3, TSPA-VA

(Continued)

- Base Case definition and results both single value deterministic and probabilistic
  - Effects of Disruptive Events on the Base Case results (igneous, seismic, criticality, human intrusion)
  - Effects of design options (ceramic coating, drip shields, and backfill)
- Sensitivity studies for component models
- Documentation of process models, sensitivity analyses, and model abstractions presented in TSPA-VA Technical Basis Document (currently in review)

VA Product: Volume 4, LA Plan

- Identifies process to further develop preclosure and postclosure safety cases
- Identifies principal factors of expected repository performance and uses the factors to prioritize work for LA/SR
- Addresses statutory activities and support services leading to LA
- Provides cost estimate & schedule to 2002 (submittal of the LA)

Principal Factors

- 19 factors important to postclosure performance, termed principal factors, have been identified in performance assessment sensitivity studies for the VA base case with the reference design
- DOE has identified and prioritized its remaining technical work related to postclosure repository performance based on:
  - The relative importance of each factor
  - The degree of confidence in the current representation of each factor in the performance assessment models
  - The confidence that could be obtained by the time of LA submittal through further testing and analysis

VA Product: Volume 5, Cost

- Provides the life cycle repository cost using the VA reference design
  - Timeframe begins with license application submittal (3/02)
- Includes cost estimates for EBS design options
- Estimate provided in constant FY1998 dollars

VA & the KTIs

- How technical work relates to the NRC KTI Sub-Issues is addressed in Volumes 1, 2, and 3
- Status of NRC KTI Sub-Issues and further work needed is addressed in Volume 4
- NRC concerns with TSPA-VA approach (as expressed in July 6 correspondence) will be addressed in Volumes 3 and 4, and the TSPA-VA Technical Basis

TSPA-VA, Principal Factors, and KTIs

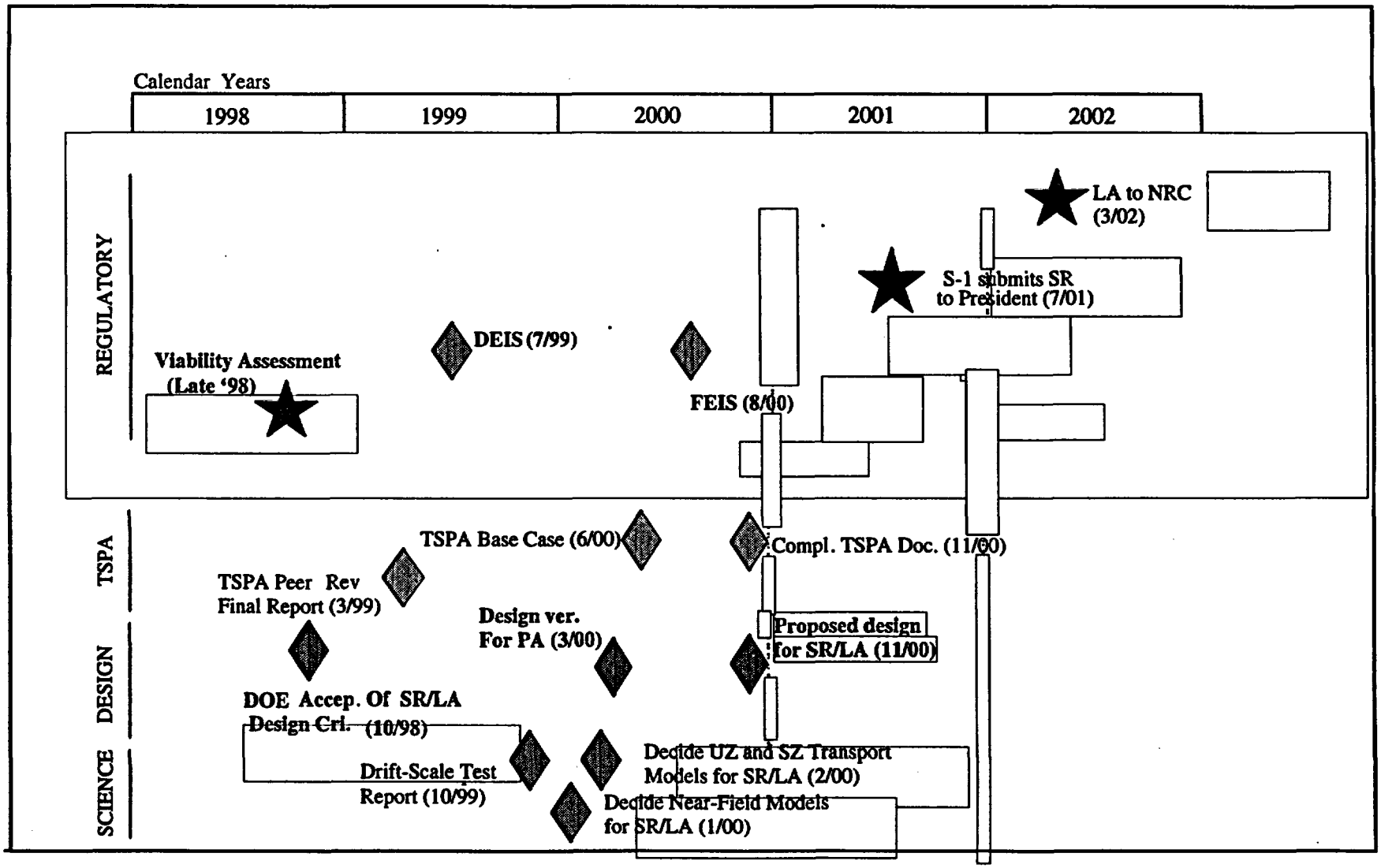
ATTRIBUTES OF THE REPOSITORY SAFETY STRATEGY	PRINCIPAL FACTORS	TSPA MODEL COMPONENTS	NRC KEY TECHNICAL ISSUES
Limited Water Contacting Waste Packages	Precipitation and Infiltration of Water into the Mountain	Climate	Unsaturated and Saturated Flow under Isothermal Conditions
		Infiltration	
	Percolation to Depth	Unsaturated Zone Flow	
	Seepage into Drifts	Seepage	
	Effects of Heat and Excavation on Flow		Repository Design and Thermomechanical Effects
	Dripping onto Waste Package	Thermal Hydrology - Mountain Scale - Drift Scale	Thermal Effects on Flow
	Humidity and Temperature at Waste Package		
Long Waste Package Lifetime	Chemistry on Waste Package	Near Field Geochemical Environment	Evolution of the Near Field Environment
	Integrity of Waste Package Outer Barrier	Waste Package Degradation	Container Life and Source Term
	Integrity of Waste Package Inner Barrier		
Low Rate of Release of Radionuclides from Breached Waste Packages	Seepage into Waste Package		
	Integrity of Spent Fuel Cladding	Cladding Degradation	
	Dissolution of UO_2 and Glass Waste-form	Waste Form Degradation	
	Solubility of Neptunium-237	Radionuclide Mobilization and Engineered Barrier System Transport	
	Formation of Radionuclide-Bearing Colloids		
	Transport within and out of Waste Package		
Radionuclide Concentration Reduction during Transport from the Waste Packages	Transport through Unsaturated Zone	Unsaturated Zone Transport	Unsaturated and Saturated Flow under Isothermal Conditions and Radionuclide Transport
	Transport in Saturated Zone	Saturated Zone Transport and Dilution	
	Dilution from Pumping		
	Biosphere Dilution	Biosphere Transport	

NRC KTIs LACKING DIRECTLY CORRESPONDING PRINCIPAL FACTORS		
<THE TSPA AND INTEGRATION KTI APPLIES TO ALL PRINCIPAL FACTORS>	Disruptive Events - Volcanic	Igneous Activity
	Disruptive Events - Seismic	Structural deformation and Seismicity
		Total System Performance Assessment and Integration
		Activities Related to the EPA Standard

Summary

- Forecasting completion of VA Document on time
- DOE's near term objectives remain
  - Submit the VA to Congress in 1998
  - Complete EIS in 2000
  - Complete the SR process in 2001
  - If Yucca Mountain is suitable, submit a docketable LA in 2002
- The DOE will continue to iterate the repository safety strategy and focus on remaining technical issues for the SR and LA
- Overall goal remains to begin operation of a repository in 2010

Major Repository Program Milestones



ATTACHMENT 8

YUCCA
MOUNTAIN
PROJECT

Commitment Management Program

Presented to:
NRC/DOE Management Meeting

Presented by:
Sheryl Morris
Yucca Mountain Site Characterization Office

August 19, 1998

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

Overview

- Commitment Program - today
  - Process, Procedure, Database
- Commitment Program - tomorrow
  - Process, Procedure, Database

Commitment Program
- today -

- Process
  - YAP 30.3 - Disposition of the Comments on the Site Characterization Program
  - Commitments opened and closed through agreement between DOE and NRC
- Database
  - Electronically tracked through database
- Regulatory Compliance and Technology Group Member

Commitment Program
- tomorrow -

Process

- Continue to follow NEI guidelines
- Two DOE managers with authority to make commitments - one at HQ, one at YMP
- Licensing staff members to coordinate with functional areas to manage commitments
- Identify functional area points of contact within DOE and NRC
- Enhance process and develop AP Procedure

Commitment Program
- tomorrow, (Continued) -

- **Database**
  - **Update DOE Database**
  - **Add information to link initial commitment to compliance (procedural change, report, etc.)**
  - **Provide viewing access for all of OCRWM**
- **Regulatory Compliance and Technology Group Member**

Summary

- Enhance process and procedure (AP)
- Update existing database
- Provide online accessibility for viewing
  - Improve retrievability
  - Simplify traceability

ATTACHMENT 9

YUCCA
MOUNTAIN
PROJECT

DOE/NRC Procedural Agreement Proposed Revisions

Presented to:
NRC/DOE Management Meeting

Presented by:
April Gil
Site Recommendation and Licensing Team Lead
Yucca Mountain Site Characterization Office

August 19, 1998

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

Revised Procedural Agreement

- Prelicensing Procedural Agreement intended to support ability of DOE OCRWM and NRC to communicate effectively
- Objective: Update, consolidate and streamline 1993 Agreements

Revised Procedural Agreement

- **Proposed revisions necessary because the agreements did not:**
  - **reflect current practices**
  - **were complicated and cumbersome**

Proposed Revisions

- **Revisions included:**
  - **combining information and eliminating redundant information**
  - **consolidating the types of meetings**
  - **reflects NRC and DOE policies regarding unscheduled communications to facilitate general information exchange**
  - **defining the role of observers at DOE OCRWM internal meetings**

Proposed Revisions

(Continued)

- Revisions included:
  - emphasizing the requirement to document commitments in subsequent official DOE OCRWM/NRC correspondence
  - clarifying the nature of scheduled Site Visits versus OR Field Trips
  - adding a new section: "Definitions"

COMPARISON

OLD	NEW
. Program and Project Agreement	. One Combined Agreement
. App. 1 - Points of Contact	. App. 1 - Provisions for Activities and Communications
. App. 2 - Samples	
. App. 7 - NRC OR Agreement	. App. 7 - NRC OR Agreement (Retained)

COMPARISON
(Continued)

Types of Interactions

1993 VERSION	COMMITMENTS	1998 VERSION	COMMITMENTS
Management Meeting	YES	Management Meeting	YES
Technical Exchange	NO	Technical Exchange	NO
OR Meeting (App. 7)	NO	OR Meeting (App. 7)	NO
Technical Meeting	YES		
Licensing Meeting	YES		
Site Visit	NO	Site Visit	NO

Summary

- Proposed revision reflects current practices for interactions
- Points of contacts, roles and responsibilities, and definitions are clarified
- Revision streamlined from 42 pages to 12
- Revision is simpler, clearer and maintains an effective structure for regulatory interactions

ATTACHMENT 10

AGREEMENT BETWEEN DOE/OCRWM AND NRC/NMSS REGARDING PRELICENSING INTERACTIONS

1 PURPOSE

1.1 This Prelicensing Agreement describes general guidelines for communications between the staffs and management organizations of the Department of Energy (DOE) Office of Civilian Radioactive Waste Management (OCRWM) and the Nuclear Regulatory Commission (NRC) Office of Nuclear Material Safety and Safeguards (NMSS), including senior management and contractors designated by either agency, during the prelicensing period with respect to all activities preparatory to DOE's submission of an application for authorization to construct and operate a geologic repository under section 114 of the Nuclear Waste Policy Act (NWPA).

1.2 This Prelicensing Agreement supersedes the "Procedural Agreement and the Project-Specific Agreement", as revised in 1993.

1.3 No action taken pursuant to this agreement shall be deemed to constitute a commitment to issue any authorization or license, or in any way affect the authority of the Commission, its officers, and staff, in any licensing proceeding.

1.4. Nothing in this agreement shall be construed to confer rights to any party other than to DOE and NRC.

2 DEFINITIONS

Appendix 7 Meeting – An Appendix 7 Meeting is a meeting between the NRC On-Site Representative (OR), including any NRC personnel assigned to the OR, and DOE-Yucca Mountain Site Characterization Office (YMSCO), including contractors and subcontractors. These meetings, described in Appendix 7 of this Agreement, do not constitute interactions within the intent of Section 3 of this agreement and will not require the preparation of written reports or meeting summaries. These meetings are intended to be focused discussions of technical topics on site characterization and related activities. At the discretion of DOE and NRC, external parties may observe Appendix 7 meetings and field trips subject to identification requirements and compliance with applicable access control measures for security, radiological protection, and personnel safety. No commitments may be made at Appendix 7 Meetings.

Commitments – An explicit statement to take a specified action agreed to or volunteered by the OCRWM or NMSS to one another, an external governmental agency or entity identified in the NWPA as having a right to participate. Commitments require action within a specified period or by a specified date. All commitments will be documented in correspondence by the party(ies) making the commitment. Unless expressly provided in writing, no commitments made to NRC

pursuant to this prelicensing agreement are to be interpreted as becoming licensing commitments or conditions.

Interactions – Technical Exchanges, Management Meetings, or Site Visits. Management Meetings and Technical Exchanges are planned interactions open to public observation subject to the *NRC Policy Statement: Staff Meetings Open to the Public*. Technical Exchanges or Management Meetings include but are not limited to planned or scheduled DOE/NRC face-to-face meetings as well as alternative forms of planned or scheduled DOE/NRC interactions such as videoconferences. These interactions will comply with the *NRC Policy Statement: Staff Meetings Open to the Public* whether conducted by NRC or DOE. Certain interactions require written reports, as described in Section 3.5, and are subject to public notification and participation.

Management Meeting – A scheduled interaction held whenever necessary to review the summary results of Technical Exchanges; to review the status of outstanding items and issues; to discuss plans for resolution of outstanding items and issues; to update the schedule of Technical Exchanges and other actions needed for staff resolution of open items regarding the site characterization program; and to consult on what guidance is advisable and necessary for NRC to prepare. Unresolved management issues will be promptly elevated to upper management for resolution. Management Meetings are conducted to discuss programmatic issues related to program policy, schedules, scope, and major assignments of resources. Any commitments that are made during these meetings will be documented in correspondence by the party(ies) making the commitment. These meetings are subject to the *NRC Policy Statement: Staff Meetings Open to the Public* whether conducted by NRC or DOE.

Observers – A representative(s) sent to primarily observe but not participate substantially in an activity (as in a meeting, audit, or surveillance). Observers may furnish questions, observations, and recommendations generally at the beginning and end of meetings, audits or surveillances. Direct communication between observers and meeting participants during a meeting, audit, or surveillance is generally discouraged in order to minimize disruption.

Programmatic Issues – Issues discussed primarily at Management Meetings related to program policy, schedules, scope, and major commitments of resources.

Site Visit – A scheduled interaction held between DOE and NRC technical staff to: explain technical information related to ongoing field or laboratory site characterization and related activities; and visit locations at the site for field briefings and discussions of preliminary data and interpretation derived from field work. The primary purpose of a Site Visit is for both agencies to benefit from discussion of technical topics in the field. Site Visits will not require the preparation of written reports or meeting summaries. Site Visits will not be used as a forum to officially establish or change technical and/or regulatory positions, establish commitments, nor agree to courses of action. Proceedings covered by Appendix 7 of this agreement do not apply to

Site Visits.

Technical Exchange – A scheduled interaction between DOE and NRC technical/licensing staff expected to focus primarily on technical or regulatory issues and to: review and consult on interpretations of data; identify potential licensing issues; discuss specific technical and/or regulatory topics, the sufficiency of available information and data, methods and approaches for the acquisition of additional information, and data as needed to facilitate NRC reviews and evaluations and for staff resolution of such potential licensing issues. Technical Exchanges may be the forum for gaining an understanding and discussing technical or regulatory issues and the acceptability of actions on the part of both agencies, however, they can not be used to officially establish or change positions or make commitments. These meetings are subject to the *NRC Policy Statement: Staff Meetings Open to the Public* whether conducted by NRC or DOE.

3 GUIDELINES TO CONDUCT OCRWM AND NMSS INTERACTIONS

3.1 OCRWM and NMSS may conduct interactions on topics of mutual agreement at the request of either agency. Open, scheduled interactions may be either Management Meetings, Technical Exchanges, or Site Visits (see Section 2, "Definitions"). Proceedings covered by Appendix 7 of this agreement do not constitute interactions within the context of this agreement.

3.2 Technical Exchanges are expected to focus on technical or regulatory issues, and are intended to be staff-to-staff interactions, with respective contractor staff included as needed. Technical Exchanges may be the forum for gaining an understanding and discussing technical or regulatory issues and the acceptability of actions on the part of both agencies, however, they can not be used to officially establish or change positions or make commitments.

3.3 Management Meetings are generally expected to focus on programmatic issues. Verbal commitments can be made by the managers attending Management Meetings; however, any commitments will be documented in accordance with Section 3.5 of this agreement.

3.4 A teleconference between OCRWM and NMSS should be held approximately two weeks before each Technical Exchange and Management Meeting to reach agreement on an agenda.

3.5 Technical Exchanges and Management Meetings shall have bilateral minutes that summarize and document the meeting. The concise bilateral minutes shall include: a) brief summaries of the presentations made and the discussions held; b) regulatory or technical interpretations or positions; c) identification of points of agreement and disagreement; and d) documentation of commitments made at Management Meetings by either organization. Attachments are to include a list of attendees and copies of presentation materials and any view graphs used at the meeting. Copies will be provided to the State, affected units of local government, affected Indian Tribes, and the NRC and DOE Public Document Rooms.

3.6 Representatives from the State of Nevada, affected units of local government, any affected Indian tribes, the public, and other interested parties may observe the proceedings of Technical Exchanges or Management Meetings consistent with security access, logistical arrangements, and safety rules. Such representatives may provide comments at the opening and ending of the meeting.

3.7 Consistent with *NRC Policy Statement: Staff Meetings Open to the Public*, the NRC will assume the lead to keep all parties informed about schedules for all OCRWM and NMSS Technical Exchanges, Management Meetings, and Site Visits.

3.8 Unscheduled OCRWM-NMSS communications may occur by telephone, electronic mail, or in person. Unscheduled communications shall not be a substitute for an interaction as defined in Section 2 of this procedure.

3.9 Closed, scheduled interactions between OCRWM and NMSS may also be held, according to the limited exemptions and circumstances described in the *NRC Policy Statement: Staff Meetings Open to the Public.*

3.10 At the invitation of OCRWM and consistent with NRC policy, NRC staff may attend OCRWM sponsored or conducted meetings as observers and may participate by providing comments. An OCRWM meeting attended by NRC staff as an observer shall not be a substitute for an interaction as defined in Section 2 of this procedure.

3.11 Both OCRWM and NMSS will identify management points of contact who have signature authority for correspondence to the other organization. Each organization will identify points of contact for informal communications and questions and will update these points of contact as necessary.

3.12 NMSS staff, and consistent with security access and safety rules, representatives from affected units of state, local governments, and Indian Tribes, may participate as observers at OCRWM quality assurance audits and surveillances provided that such participation does not unreasonably interfere with or delay such audits and surveillances. The OCRWM audit team leader is responsible for the direction of the audit. Observers are encouraged to participate fully by furnishing their questions, observations, and recommendations to the team leader (or sub-team leader). All inquiries will be addressed. In order to minimize disruption of ongoing work or of the audit process the number of observers may be restricted. Direct communication between observers and the auditee is generally discouraged, consistent with OCRWM=s Quality Assurance Requirements Document. NMSS may perform audits of OCRWM and OCRWM contractor quality assurance programs. Quality assurance audits and surveillances are not considered interactions in the context of this agreement.

3.13 Interactions between NMSS and DOE program offices other than OCRWM concerning

activities preparatory to DOE's submission of an application for authorization to construct and operate a geologic repository under section 114 of the NWPA will be conducted in accordance with the provisions of this agreement.

3.14 Guidelines specific to project activities are included in the appendices to this Agreement.

3.15 The terms of this Agreement regarding these interaction guidelines may be amended at any time by mutual consent, in writing. This agreement and subsequent revisions will become effective upon the date of issuance.

3.16 Appendix 7, "Agreement Concerning the Nuclear Regulatory Commission On-Site Representatives for the Repository Project Prior to Licensing", provides a description of activities of the NRC On-Site Representatives.

_____ _____

Lake Barrett, Acting Director Date
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

_____ _____

Carl Paperiello, Director Date
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission

APPENDIX 1

AGREEMENT BETWEEN YMSCO AND NMSS EFFECTIVE PRIOR TO THE SUBMITTAL OF A LICENSE APPLICATION

Appendix 1 specifies and implements provisions for activities and communication during the prelicensing period that may occur between the DOE Yucca Mountain Site Characterization Office (YMSCO) and the NRC Office of Nuclear Material Safety and Safeguards (NMSS) under the "Agreement Between DOE/OCRWM and NRC/NMSS Regarding Prelicensing Interactions." The activities include: 1) identifying YMSCO and NMSS points of contact for formal communications and informal points of contact for other communications and questions; 2) accessing data, documents, and records by YMSCO and NMSS; and, 3) accessing YMSCO site characterization samples and collection of samples by NMSS and contractor staff. Nothing in this Appendix shall be construed either to modify the "Agreement Between DOE/OCRWM and NRC/NMSS Regarding Prelicensing Interactions" in any way or to confer rights on any party other than YMSCO and NMSS.

1.0 Identification of YMSCO and NMSS Points of Contact

Points of contact identified by YMSCO and NMSS, for formal and informal communications, will be transmitted to the other organization through the point of contact designated for formal communication. Point of contact information will include the names of all points of contact, designation for formal or informal communication, their mailing and e-mail addresses, and telephone and fax numbers. YMSCO designates the following individual as the point of contact for formal communications with NMSS:

Assistant Manager for Licensing
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

NMSS designates the following individual as the point of contact for formal communications with YMSCO:

Director
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Two White Flint North

Rockville, MD 20850

2.0 Access to Site Data, Documents and Records

2.0.1 Written responses will be provided to written questions, comments, requests for data, samples, or documents, and requests for evaluations that are made by either YMSCO or NMSS. Requests by either organization for large data sets are subject to negotiation of a schedule for availability. The requesting organization is responsible for obtaining and providing to the responding organization any clearances needed for internal reproduction of published documents covered by copyrights.

2.0.2 YMSCO has developed and will maintain a data base identifying site characterization technical data collected by YMSCO, except those data excludable by law. The information contained in this data base includes a description of the data, dates when the data were acquired or developed, the quality assurance status of the data, and the storage location of the data.

2.0.3 Data sets from the YMSCO technical data management system are available to the NMSS upon written request. Requests must specify the data sets= identifications to enable retrieval from YMSCO=s Technical Data Base, and format parameters, such as hard copy or electronic format, and any other applicable format items, needed to assemble and provide the data. All data provided by the DOE to the NRC prior to the submittal of the License Application are given with the following caveat: "CAUTION: Interpretations based upon these data are subject to change as more data are acquired, developed, or evaluated."

2.0.4 Upon request, either organization will provide the other at least one controlled copy of any specially developed or modified computer program used to conduct site characterization and related activities evaluations, performance assessments, design analyses and drawings subject to resolution of proprietary, privileged, licensing concerns, and availability of the code.

2.0.5 OCRWM records or documents must be authorized as available by YMSCO staff. Generally, records and documents that have completed a final DOE review shall be made available to the ORs upon request; however, DOE shall only provide access to view but not to copy or retain materials that are in preparation, if such access is specifically requested by the ORs. Records or documents may not be authorized as available by contractor staff.

3.0 Sample Access, and Sample and Data Collection by NMSS and Contractor Staff

Written requests from NMSS for collection of samples or field data will be reviewed for acceptance by YMSCO to ensure that the collection will not compromise site characterization and related activities, that procedures have been established for the collection of the sample(s) or data and provided that such requests do not unreasonably interfere with site characterization and

related activities. Once a request has been accepted, YMSCO will arrange for timely collection of the sample(s) or data according to applicable YMSCO procedures, and prepare and ship the sample(s) or transmit the data. If collection and/or transport of the sample(s) or collection and/or transmittal of the data will be delayed, YMSCO will notify NMSS of the proposed schedule for collection and delivery.

If samples must be collected by NMSS or contractor staff, NMSS or contractor staff will follow applicable YMSCO, DOE Nevada Operations Office, and Nellis Air Force Base procedures and fulfill specified training requirements for access to the sample site(s), including surface and underground access control, site security, radiological safety, personnel safety, and protection of wildlife and the environment. For example, if samples or data are to be collected by NMSS or contractor staff, the NMSS and contractor staff will use YMSCO=s sample acquisition and handling procedures to obtain samples acquired as part of the site characterization program. Requests will be made in writing for samples for which no process of acquisition has been identified in a YMSCO procedure. YMSCO will review the request with NMSS staff to ensure that the location of the sample or the amount of sample material does not adversely impact the needs of the site characterization program. If no adverse impacts are identified, YMSCO will arrange for the NRC to receive or collect the requested materials. NMSS will request, through the YMSCO Project Manager, use of DOE rights-of-way for access to sample collection sites and will comply with the land access and environmental protection requirements.

_____ _____

J. Russell Dyer, Project Manager — Date
Yucca Mountain Site Characterization Office
Office of Civilian Radioactive Waste Management
U.S. Department of Energy

_____ _____

John T. Greeves, Director — Date
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission

APPENDIX 2 – OWAST [RESERVED]

This appendix is reserved for any future agreement applying to communications between the Department of Energy (DOE) Office of Civilian Radioactive Waste Management (OCRWM) and the Nuclear Regulatory Commission (NRC) Office of Nuclear Material Safety and Safeguards (NMSS) related to spent fuel storage or transportation authorized under the Nuclear Waste Policy Act (NWPA) and any future amendments to the NWPA. Such an agreement will become effective upon an exchange of letters between the parties agreeing to adopt this agreement for such activities.

APPENDIX 3 - OTHER DOE PROGRAM OFFICES [RESERVED]

APPENDIX 4 - NRC POLICY STATEMENT: STAFF MEETINGS OPEN TO THE PUBLIC

APPENDIX 5 - RESERVED

APPENDIX 6 - RESERVED

APPENDIX 7

AGREEMENT CONCERNING THE NUCLEAR REGULATORY COMMISSION ON-SITE REPRESENTATIVES FOR THE REPOSITORY PROJECT PRIOR TO LICENSING

The purpose and objective of the on-site representative (OR) is to serve as a point of prompt informational exchange and consultation, to preliminarily identify concerns about investigations relating to potential licensing issues, and to serve as a point of contact for informal communications between NMSS and YMSCO.

This appendix is intended to supplement the base agreement and to detail the guidelines which will govern communication between the NRC OR, including any NRC personnel assigned to the OR, and DOE and its contractor personnel (prime and sub) through the project's Assistant Manager for Licensing. Any communications between the OR and DOE, its contractors, or subcontractors identified in this appendix will not constitute interactions within the intent of Section 3 of the base agreement and will not require the preparation of written reports or meeting summaries. These meetings are intended to be focused discussions of technical topics on site characterization and related activities. At the discretion of DOE and NRC, external parties may observe OR meetings and field trips subject to identification requirements and compliance with applicable access control measures for security, radiological protection, and personnel safety. Communication between the OR and DOE and its contractors and subcontractors are not intended to interfere with or replace other channels of NRC/DOE communications and procedures for information release identified in the base agreement and Appendix 1.

The following points are agreed to:

1. The OR can attend any meetings on-site or off-site dealing with technical questions or issues related to prelicensing work following notification of the cognizant DOE project representative responsible for the meeting as discussed below. Such notification shall be by memorandum, telephone or personal contact and will be given at least 24 hours in advance where DOE has provided adequate prior notification to the OR. The meetings may involve solely DOE or solely DOE's contractors (prime and sub), or any combination of DOE with their contractors.

   If objections to the OR attendance are voiced for any reason, the reason should be specified. Such objections will be infrequent and will be exceptions to the rule. If the OR does not agree with DOE objections, it will be raised to a higher management level for resolution. If resolution cannot be achieved, the OR will not attend the meeting in question.

2. The OR may communicate orally (in person or by phone) with persons employed by DOE, DOE's prime contractors or the prime's subcontractor, (on-site or off-site), providing that the

following procedures are followed. If practicable, the OR will arrange for all individual sessions with prime contractor and subcontractor staff by contacting the YMSCO point of contact, or designee. If they cannot be contacted, the OR will attempt to contact the proper prime contractor, section, or department manager. As a minimum, the OR will give timely notification of all such sessions to DOE and the affected contractor or participant(s) management as soon as possible. The OR will avoid discussions with personnel when it would appear to disrupt important duties and will seek to schedule meetings at a mutually convenient time. It is at the option of DOE, in consultation with participant management, as to whether or not a staff member, supervisor, or third party is to be present. No record of such discussions is required; however, questions that are raised or other issues that arise as a result of these interactions will be reported by the participant to the YMSCO point of contact, or designee.

When NRC headquarters or contractor staff is temporarily assigned to the OR office, the NRC Chief, Performance Assessment and HLW Integration Branch, or designee, will notify DOE's Assistant Manager for Licensing of the assignment at least one week prior to the assignment.

3. The DOE project office, DOE prime contractors, and their subcontractors will provide the OR access to records which would be generally relevant to a potential licensing decision by the Commission as follows. Upon request by the OR, DOE or the DOE contractor or subcontractor shall provide: 1) copies of any records of data; 2) records which document the analyses, evaluations, or reduction of data; or 3) records which contain information deduced by reason. These records will be made available to the OR, after the documentation has been reviewed and approved in accordance with the appropriate project office administrative procedure. Records that have not been reviewed and approved by the project office shall be made available for viewing, but not to copy or to retain, at any stage of completion. Requests by the OR for release of such records shall be made through and authorized by the YMSCO point of contact, or designee.

4. Copies of pre-decisional and preliminary drafts of documents required by the Nuclear Waste Policy Act of 1982 as amended, or related to prelicensing activities, which have not been approved by DOE, will not be provided to the OR without DOE approval. Documents of this type may be made available by authorized DOE personnel, for review in DOE or DOE contractor offices. Such documents may not be authorized as available by a DOE contractor alone. Any such documents made available are for the use of the OR and shall not be placed in any NRC public document room.

5. The OR does not have the authority to direct DOE, its contractors or subcontractors to perform any work nor does the OR have stop work authority. Any formal identification of questions or issues for investigation by DOE that could result in contractor or subcontractor work must be formally presented to DOE through the NRC Performance Assessment and

HLW Integration Branch in writing.

6. The OR will attend on-site meetings upon request by the DOE project office or prime contractor on-site whenever possible. The OR will provide any records which would normally be available under 10 CFR Part 2.790 of the Commission's regulations to project participants upon request to copy. If convenient, copies of such records will be provided by the OR.

7. The OR shall be afforded access to the site, research facilities, and other contractor and subcontractor areas to observe testing or other data gathering activities, in progress, as part of site characterization and related activities subject to compliance with the applicable requirements for identification, and applicable access control measures for security, radiological protection and personnel safety, provided that such access shall not interfere with the activities being conducted by DOE or its contractors and that any discussions conducted during such access shall comply with Point 2 above.

   Such access shall be allowed as rapidly as it is for DOE or DOE contractor employees upon display of an appropriate access identification badge, or, if badging is not possible for national security reasons, upon prior notification to DOE or cognizant contractor supervisory personnel (by memorandum, telephone, or personal contact). When an access identification badge is available to DOE or DOE's contractors and subcontractors on a routine basis, it shall be made available to the OR upon completion of the required security clearances and appropriate radiological and personnel safety training. DOE will ensure that any training required is provided to the OR.

8. NRC can videotape or photograph any inanimate objects or geologic features associated with site characterization and related activities at the Yucca Mountain Site consistent with Nevada Test Site security. Additionally, upon request from the OR, DOE will provide NRC videotape footage of personnel performing site characterization and related activities. If requested, the OR and other NRC staff will be permitted to accompany DOE during the videotaping.

9. DOE YMSCO may provide, to the NRC OR, the information required to execute DOE responsibilities under Appendix 7 of this agreement by informal note, by telephone, or by personal contact. Such communications shall adhere to the procedures for communication and information release specified elsewhere in this agreement.

10. Meetings and field trips conducted as described in this section are not to be considered as opportunities to establish or alter regulatory positions or commitments. No agendas, minutes, or records of these meetings or field trips are required. Matters that arise may be (1) reported to YMSCO management by the ORs or other NRC representatives assigned to the OR's office through the YMSCO points of contact, or designees, or (2) discussed in internal

meeting summaries prepared for each organization's management.

11. Prior notification of external parties, including State, affected units of local government, any affected Indian Tribes, or the general public, is not required for field trips or meetings under this Appendix. At the discretion of DOE and NRC, external parties may observe OR meetings and field trips subject to identification requirements and compliance with applicable access control measures for security, radiological protection, and personnel safety.

12. NMSS may station on-site representatives at any OCRWM project office or work site to serve as points of prompt information exchange and consultation. At such time as the NRC ORs are stationed at the site, they are to be provided with office space that is near the DOE project office and site activities.

ATTACHMENT 11

YUCCA
MOUNTAIN
PROJECT

Documenting Decisions

Presented to:
NRC/DOE Management Meeting

Presented by:
Sheryl Morris
Yucca Mountain Site Characterization Office

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

August 19, 1998

Overview

- Documenting Decisions process / procedure is online, 29 Jun 98
- YAP 30.60 Procedure / Process
- YAP 30.60 Integration
- Assessment of Past Documentation

YAP 30.60
- Documenting Decisions -

- **Purpose:**
  - to document decisions management believes are, or could become, part of the licensing basis (SR, LA, EIS) not covered by existing processes to document decisions - in such a manner as to make them defendable and traceable
  - standardize documentation for licensing based decisions regardless of procedure used

YAP 30.60
- Decision Package -

- **Decision Elements**: Specific elements DOE agreed on to address the who, what, and why of decisions, based on industry experience
    - Statement for Consideration
    - References to other related material
    - Reasonable Alternatives Considered
    - Criteria used to evaluate alternatives
    - Recommendation
    - Decision, signed

YAP 30.60
- Documenting Decisions -

- **Process:**
  - Invoked by Management for licensing based decisions
  - Staff member develops Decision Package
    - » Decision Analysis
    - » Executive Summary
  - Decision is made
  - Decision Package retrievable through:
    - » Records Center (RISWeb)
    - » Decision Database (RW / Lotus Notes)

Integration of YAP 30.60

- **Linkages to Related Procedures / Processes**
  - **Planning Procedure - Managers can direct certain deliverables have a Decision Package included - already decided for FY99**
  - **Change Control Procedure - Decision Packages can initiate or close CCB actions**
  - **QAP 5.8, Technical Document Preparation - ensures the decision elements are included within supporting documents**

Assessment of Past Documentation

- In FY98, M&O assessed documentation of 15 past "key" decisions - none requiring supplemental documentation

- In FY99, M&O will assess the documentation of next 15

Summary

- Used Industry experience and regulatory / legal counsel to define documentation requirements

- Developed a process for:
  - capturing internal meeting decisions
  - standardizing documentation in a graded approach
  - documenting the process in making decision
  - easy retrievability with traceability
  - stressing personal and managerial accountability

- Assessing and supplementing documentation of past key decisions related to licensing

ATTACHMENT 12

YUCCA
MOUNTAIN
PROJECT

OQA Status/Update

- Length of Time to Close Deficiencies
- Increased Deficiencies in Scientific Notebooks
- Trending Program
- Supplier Deficiencies

Presented to:
NRC/DOE Management Meeting

Presented by:
Bob Clark, Acting Director
Office of Quality Assurance
Office of Civilian Radioactive Waste Management

August 19, 1998

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

Topics

1. Length of Time to Close Deficiencies (NRC Open Item 98-1)

2. Increased Deficiencies in Scientific Notebooks (SN) (NRC Open Item 98-2)

3. Trending Program

4. Supplier Deficiencies (NRC Open Item 97-2)

Length of Time to Close Deficiencies

- As of August 18, 1998, there were a total of 117 open deficiency documents
- Thirteen deficiency documents have been open in excess of one year
- Of the thirteen deficiency documents open in excess of one year:
  - Closure letters are in process for two;
  - Verification for closure is in process for one;
  - Verification for closure is scheduled within one month for five others; and
  - The remaining five are in various stages of completion, (the latest corrective action due date is January 11, 1999), and are being monitored, as appropriate, by assigned QARs

Length of Time to Close Deficiencies

(Continued)

- OQA reviews every deficiency document for immediate impact to nuclear safety and waste isolation. None of the deficiency documents open in excess of one year identifies deficiencies that required immediate completion of corrective action

Length of Time to Close Deficiencies

(Continued)

- DOE and the Affected Organizations are actively pursuing the timely closure of open deficiency documents
- Proposed Corrective Action Procedure Revision
  - Process to be revised to enhance communications through use of electronic media
  - Process for obtaining corrective action commitments to be strengthened
  - Process to provide for enhanced management involvement to improve timely performance
  - Process to require assessments of program impact if not closed within 100 days
  - Procedure revision targeted for January 1999

Increased Deficiencies in Scientific Notebooks

- The DOE and its Affected Organizations are actively pursuing corrective action. Some of the actions being taken are:
  - OQA is reviewing SNs to assure that they comply with requirements
    - LANL - Surveillance revealed one out of two SNs checked were deficient, and Deficiency Report (DR) is being processed
    - LBNL - Per disposition of DRs LBNL-97-D-048/98-D-029, all active SNs were reviewed; open pending verification
    - LLNL - Per disposition of DR LLNL-98-D-007, all active SNs were reviewed; open pending verification
    - USGS - Two surveillances of activities at USGS revealed five out of five SNs checked were deficient, and DR USGS-98-D-116 was issued on July 28, 1998

Increased Deficiencies in Scientific Notebooks

(Continued)

- YMSCO/M&O is in the process of developing a draft procedure (YAP-SIII-XQ, *Control of Scientific Investigation*). This procedure is scheduled to be issued September 30, 1998
- Plan to conduct training classes on the proper completion of SNs. Lesson Plan being developed by OQA. Scheduled to begin training on September 30, 1998
- M&O developed SN Corrective Action Plan
  - Developed a database that identifies all SNs being used on the projects
  - Prepare a SN Review Criteria checklist (scheduled to be complete August 28, 1998)
  - Determining which SNs support TSPA/VA/LA (Coordinated with Corrective Action Request (CAR) LVMO-98-C-002)

Increased Deficiencies in Scientific Notebooks

(Continued)

Examples of Recent Deficiencies

Deficiency #	Deficiency
YM-97-D-048 (Closed)	Two SNs for ESF thermal test did not consistently meet the requirement of LBNL. Procedure YMP-LBNL-QIP-SI3.0, Rev. 1
LLNL-98-D-016 (Closed)	SN #00342 for the SEAMIST data collection did not contain the required information
LANL-98-D-022 (Open - issued 1/27/98)	No SN or implementing documents describing process, controls or documentation could be identified with respect to the development of the Saturated Zone Radionuclide Transport Model in accordance with QARD, Rev. 7, Supplement III

Increased Deficiencies in Scientific Notebooks

(Continued)

Deficiency #	Deficiency
LBNL-98-D-029 (Open - issued 3/2/98)	Procedure YMP-LBNL-QIP-SIII.0, Rev. 1, does not meet the full requirements of the QARD, Rev. 7, Supplement III
LLNL-98-D-093 (Open - issued 6/19/98)	Three SNs (SN-00274, SN-00290 and SN-00322) did not identify calibration equipment used in addition to several other requirements of 033-YMP-QP-3.4, Rev. 4, ICN 2
USGS-98-D-116 (Open - issued 7/27/98)	Five SNs (SN-0011, SN-0102, SN-0103, SN-0106, and SN-0108) found to deficient in various areas relative to YMP-USGS-QMP-5.05

Actions to Improve Trending Process

- Revised Trend Codes and developed new trend database (Complete)
- Re-evaluated deficiency documents for last two years (Complete)
- Validated the revised approach to trending (Complete)
- Prepared and issued a report on the results of the trend re-evaluation (Complete)
- Revised Procedure AP 16.3Q, *Trend Evaluation and Reporting* (Complete)
- New process fully implemented August 3, 1998 (Complete)

Revised Trend Program

- Identifies trends as part of the corrective action process
- Provides a second opportunity to identify trends during trend code input
- Semi-annual evaluation can detect subtle trends
- Identifies potential weak areas as "Emerging Issues"
- Trend data used to support other verification activities

Supplier Deficiencies

- In May of this year, the NRC provided a list of 63 Suppliers that OQA had performed an audit, surveillance, or survey within the past three years
- The NRC has identified 19 of these suppliers that they would like to be kept informed of actions taken to resolve the deficiencies identified during the audit, surveillance, or survey
- During the meeting of June 25, 1998, a status of these 19 suppliers was provided to the NRC
- The following are three detailed examples of Supplier Deficiencies:

Supplier:	**PACIFIC NORTHWEST NATIONAL LABORATORY (PNNL)**
Product/Services:	**Dissolution and Fuel Oxidation Testing for Lawrence Livermore National Laboratory (LLNL)**
Audit Number:	**OQA-SA-97-011**
Date Performed:	**2/13-14/97**
Results:	**One deficiency issued - CAR YM-97-C-002**

Problem: PNNL Quality Assurance Plan was not kept current and was not being maintained. Personnel were not trained to the latest revisions of implementing procedures. Significant conditions adverse to quality when identified, were not being documented as required. Internal audits were not being performed. The M&O placed an administrative hold on all project activities 3/14/97.

Impact: The M&O has performed an evaluation of prior PNNL work in accordance with M&O QAP-3-3, "Peer Review." This Peer Review established prior work was valid. A restriction was placed on the QSL stating: *PNNL is restricted from starting any new quality affecting work until CAR YM-97-C-002 is resolved.* This restriction was removed when the CAR was closed.

Supplier:	**ACTIVATION LABS**
Product/Services:	**Geochemistry Analytical Services for the Natural Resource Evaluation for the M&O**
Audit Number:	**OQA-SA-96-021**
Date Performed:	**7/29-30/96**
Results:	**One deficiency issued - CAR YM-96-C-009**

Problem: Inadequate QA Program and Implementation. Activation Labs has a QA program that needed improvement, e.g., procedure development review/approval, document control, procurement document control, supplier evaluation, calibration control, QA records and audits. Program was not adequately implemented.

Impact: 800 samples had been processed prior to the audit. The data from these samples was determined to be unqualified. An additional 800 samples were analyzed under M&O approved procedures and qualified. A restriction was placed on the Qualified Suppliers List stating no quality affecting work be performed until the CAR was closed. The CAR was closed based on Activation Labs performing all future quality affecting work in accordance with the M&O approved procedures.

Supplier:	**SCOTT SPECIALTY GASES**
Product/Services:	**Provide Standard Gases and Specialty Gases for Calibration of and use with the Gas Sample Analyzer used in the Unsaturated Zone Test Holes for U. S. Geological Survey (USGS) and Lawrence Berkeley National Laboratory (LBNL)**
Audit Number:	**OQA-SA-96-029**
Date Performed:	**9/25-26/96**
Results:	**One deficiency issued - DR YM-97-D-002**

Problem: "Implementing" procedures not in place for Vendors QA Program. Not all elements being implemented, e.g., no documented training, no vendor lists, procurement document deficiencies, no internal audits, calibration documentation deficiencies. During audit, supplier was in process of developing a full QA program meeting ISO9000 requirements. The supplier is to furnish NIST Traceable documentation for gases.

Impact: No impact: 1) USGS verifies the incoming gas standards with gas chromatography. The gas chromatography is further checked by sampling known atmospheric samples to further assure its accuracy. Regression curves are developed for incoming specialty gas and the gas accepted if consistent with other standards. 2) LBNL procurements (initial procurement was in FY98) with Scott Specialty Gases require source surveillance to supplement the program inadequacies. This DR remains open until program improvements are developed and implemented.

ATTACHMENT 13

YUCCA MOUNTAIN PROJECT

PA QA Program Transition
Vertical Slice Reviews

Presented to:
NRC/DOE Management Meeting

Presented by:
Bob Andrews
M&O Operations Manager
Performance Assessment Operations
Yucca Mountain Site Characterization Office

August 19, 1998

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

Vertical Slice Reviews

- Background
- Objectives
- Results
- Road Ahead

Background

- Two Vertical Slice Reviews of TSPA Activities done late-97 thru early-98 using NRC assessment model
- Reviewed Waste Form Degradation (TSPA-95) & Site Scale UZ Flow Model (TSPA-VA, 1997)
- Evaluated quality-related characteristics of work products, including sampling of technical content, and their development processes

Vertical Slice Objectives Met

- Evaluated program needs for application of QA to TSPA
- Assessed the pre-QA state of PA documentation and inputs for defensibility, traceability, and transparency
- Provided planning basis for initial TSPA QA implementation

Results

Process Controls, Worker Knowledge, and Implementation Needed Substantial Improvement to Support LA

- Analysis Input Data Manipulation & Control
- Technical Data Base Usage Control
- Management of data shortcomings & needs
- Document control implementation
- Conduct of Analysis & Calculations
- Input Assumption Control
- Analysis interface Control
- Controls for Analytical Derivation & Development of Models & Analyses
- Software Quality and Configuration Management
- Analysis Output Control
- Scientific Notebook Content & Review Process
- Reference Identification & Traceability

Evaluation of Results

- Conclusions:
  - Results consistent with OQA findings
  - Processes and work products generally sufficient to support VA
- Actions Taken:
  - Remedial actions taken for specific results that impact VA quality
  - Integrated lessons learned into TSPA-VA Technical Basis Document
  - Developed TSPA-VA Technical Basis Document in accordance with M&O QAP-3-5 and Technical Document Preparation Plan

ROAD AHEAD - General

- **Training on TSPA QA Requirements and NRC Standards, Document Preparation Ongoing for LA Activities**

- **TSPA Procedures Needed to Support LA In Development & Initial Implementation**
  - Conduct of Performance Assessment (AP-3.1Q) Approved 6/29/98
  - Model Management (AP-SIII.1Q) In development
  - Documenting and Tracking Product Inputs (M&O QAP-3-17) In review
  - Analysis Control (M&O QAP-3-16) In review
  - Interface Control (NLP-3-34) Approved and in use
  - Calculation Control (M&O QAP-3-15) In review
  - Software Configuration Management (AP-SI.1Q) In development

ROAD AHEAD - Models & Software

- Codes used for TSPA-VA Technical Basis Document identified, and controls being established
- Integrated Product Team established for OQA Corrective Action Requests:
  - Ineffective Software Development and Configuration Systems and Processes (LVMO-98-C-006)
  - Lack of Controls for Model Development and Use (LVMO-98-C-010)
  - Technical Data Qualification Status Questionable Due to Vendor Qualification Inadequacies (CAR LVMO-98-C-002)
- Corrective actions being coordinated with other Integrated Product Teams (e.g., Interface Control and Technical Information Management Integrated Product Teams) assembled as part of Process Validation and Re-Engineering effort