

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD**

Before Administrative Judges:

**Thomas S. Moore, Chairman
Alex S. Karlin
Alan S. Rosenthal**

In the Matter of	Docket No. PAPO-00
U.S. DEPARTMENT OF ENERGY	ASLBP No. 04-829-01 PAPO
(High Level Waste Repository: Pre-Application Matters)	December 2, 2007

STATE OF NEVADA'S PREHEARING SUBMISSION OF INFORMATION

Nevada hereby submits a limited amount of additional information relevant to the subject matter of the scheduled December 5, 2007 hearing on Nevada's Motion to Strike. Attached Exhibits 56 through 69 have been provided to all the parties (the numbering of these 14 exhibits sequentially follows the 55 exhibits filed with Nevada's Motion to Strike). Moreover, in each case, the information has long since been in the possession of Respondent DOE (either authored or received by DOE or its YMP contractors). The additional exhibits were principally obtained from DOE's LSN document collection.

Respectfully submitted,

/s/
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Dated: December 2, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
U.S. DEPARTMENT OF ENERGY) Docket No. PAPO-00
)
(High-Level Waste Repository:)
Pre-Application Matters))

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Prehearing Submission of Information has been served upon the following persons either by Electronic Information Exchange or electronic mail (denoted by an asterisk (*)).

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/s/
Susan Montesi

Exhibit 56

Exhibit 56



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 24, 2001

OFFICE OF THE
SECRETARY

COMMISSION VOTING RECORD

DECISION ITEM: SECY-01-0039

TITLE: FINAL RULE TO AMEND 10 CFR PART 2,
SUBPART J, IN REGARD TO THE LICENSING
SUPPORT NETWORK

The Commission (with all Commissioners agreeing) approved the subject paper as noted in an Affirmation Session and recorded in the Affirmation Session Staff Requirements Memorandum (SRM) of April 24, 2001.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

Annette L. Vietti-Cook
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
EDO
PDR

COMMENTS OF COMMISSIONER DICUS ON SECY-01-0039

I commend the staff for doing an admirable job of making a highly technical, jargon rich, subject matter relatively understandable for the public. I approve the final rule, subject to one change. NEI, DOE, and the State of Nevada have all agreed that 6 months is an adequate time period for review of DOE documents prior to DOE submittal of a repository application. I believe we should accept the proposed timeframe on which all three of these commenters seem to agree. My approval, therefore, is contingent on changing the final rule to reflect that DOE certification related to document availability must occur 6 months prior to submittal of a repository application.

gpd
4-2-01

Commissioner McGaffigan's Comments on SECY-01-0039

I vote to approve publication of the Federal Register notice subject to the attached specific marked-up edits and subject to the final rule containing the requirement that DOE certify that it has made all its documents available at least 6 months before "submitting" (i.e. tendering) the application. I agree with the DOE, State of Nevada, and NEI comments that six months before DOE submits its license application appears to be an adequate amount of time for advance availability of DOE documents.

In order to clarify the Commission's statement in this notice regarding NRC's interpretation of the word "submission" in section 114(d) of the Nuclear Waste Policy Amendments Act, OGC should add a footnote in the location indicated in the attached mark-up of page 2 of the FRN explaining the Commission's interpretation and contrasting that usage with the other references in the FRN and the rule to the date DOE "submits" (i.e. "tenders) the license application in compliance with its NWPA requirement under § 114(b). The attached mark-up attempts to remove the word "submission," where possible, to avoid confusion, but OGC should review the usage of the words "submission" and "submits" in the Statement of Considerations and in the final rule language, to be sure the terms are used consistently and explained appropriately, or to determine whether another term may be more appropriate to avoid confusion.

Some of the attached edits have attempted to clarify, but OGC should review and confirm, that the "compliance" element in this rule, §2.1012, should state that the Director of NMSS may determine that the application is not acceptable for docketing review (preliminary acceptance review) until 6 months have passed since the DOE certification of availability of DOE documents. (The draft provision referred to acceptability for docketing. However, the decision about docketing the application will not be made at the time the DOE application is received, but instead, that decision would be made after the staff's acceptance review has been completed: after an additional estimated 60-90 days.) The addition of this concept may require additional explanation in the Statements of Consideration.

EMJ

TECHNICAL GUIDANCE FOR WASTE ACCEPTANCE PLANNING

1. INTRODUCTION

The purpose of this document is to provide a consistent set of technical guidance to the organizations involved in the planning for waste acceptance (WA). WA Planning focuses on identifying the scope of detailed design work required to complete construction of the initial phases modules of the repository. Much of the technical guidance for Plan B (BCP YMP 2002-015) is also applicable to WA planning, and is therefore retained in this guidance.

The approach to planning has been broken into three components. The first component is the overarching general guidance that must be considered in developing more detailed plans by all areas of the Project. The second component consists of the individual guidance related to Projects (Repository Design; License Application/Licensing/Preclosure Safety Assessment; Performance Assessment; Site Operations; Requirements and Configuration Management; and Special Projects) The third component is Bechtel SAIC Company, LLC (BSC) functional areas (ES&H; QA; ~~Site Operations~~; and Business, Technical Support, and Programmatic Areas) that must work together to support repository development.

Appendix A to this guidance contains a listing of the key assumptions upon which the planning of this work is based.

The overall goal of the Program is to begin emplacing waste by the year 2010, once the license is granted by the NRC. Based on preliminary planning done to date, in order to start waste emplacement by 2010, it is estimated that the LA would need to be submitted to the NRC by December 2004. Consequently, WA Planning is focused on developing an integrated plan to confirm the path between these two key milestones.

A strategic planning schedule is being issued separately as a companion to this technical guidance. That schedule is a top-down schedule that summarizes the key activities and milestones that serve as the overall framework for this planning, consistent with the DOE goal of waste acceptance in 2010. With the exception of the level 0 milestone MOAM, LA Submittal, on ~~17 December 2004~~ 23 December 2004, the dates in the strategic planning schedule should not be interpreted as the definitive dates for these activities and milestones. They are provided as guidance for planning purposes only, in order to put the work in perspective with the DOE goal. The actual dates for these activities and milestones will be determined as a result of this planning effort, including consideration of schedule contingency and possible impacts on the overall goal of waste emplacement by 2010.

2. GENERAL GUIDANCE

In general, the guidance prepared for Plan B (BCP YMP 2002-015) is applicable to this planning, and will not be reproduced here. The BCP presents a plan which meets that guidance. WA planning guidance supplements Plan B guidance for the period after LA.

~~29.25.~~ The schedule will accommodate early and phased review by NRC of programmatic, design, science, and analysis topics between SR and LA. Documentation shall be complete to the point that meaningful discussions can be held with the NRC. A detailed interactions schedule will be developed to show the relationships of the supporting work to the interactions. During the six month period prior to LSN certification, the schedule will accommodate early and phased review by NRC of completed programmatic, design, and science & analysis documentation. Approved documentation completed earlier than this time frame will be provided to NRC as soon as it is available. Documentation supporting the license application should be completed in time to support the initial certification process for the LSN. LSN certification will occur six months prior to the License Application submittal. (Note that in accordance with 10CFR 2.1012, the NRC will not docket the application until at least 6 months have elapsed from the time of certification.) This means technical products should be completed eight months prior to the scheduled LA date, to allow two months for entry into LSN. Changes to documentation can still be made after LSN certification and will be verified during LSN recertification at the time of LA submittal. Changes to documentation should be minimized and not incorporated in schedules unless deemed essential (e.g., resolves DOE or NRC review comments/issues, etc.). Input of ~~information existing and new records~~ to the LSN is anticipated to require a minimum duration of 18 months, which may be extended depending upon resource allocations and timing availability. Continued evolution of material used to support the license application will be utilized to support post-docketing interactions with the NRC.

~~30.~~ The License Application Project will prepare a Licensing Strategy that will include the characteristics of the preclosure safety assessment and the performance assessment. The performance assessment strategy will reflect a methodology for evaluating the attributes of the natural system and engineered system for determining significant contributors to performance. The strategy will also be guided by specific treatment of uncertainty.

~~31.26.~~ The LA review schedule will have a technical review early in the process that consists of the affected cognizant personnel (BSC, DOE, NR) associated with that section of the LA. The next phase of the LA review will be an integrated review (not a re-review of the technical information) of the entire LA by all affected parties. ~~This review is focused on ensuring the LA is an integrated document, not a re-review of the technical information.~~

~~32.27.~~ Commitments Action items in the LA shall be captured and tracked in the appropriate tracking system to ensure they commitments are completed. ~~Descriptive information is not considered a "commitment" and will be managed to ensure that the LA information is consistent with the supporting documents.~~

~~33.28.~~ Open safety items, if any, at time of LA submittal will be handled on a case-by-case basis and will be processed in accordance with 10 CFR 63.21(c)(16).

29. Land withdrawal will be completed prior to construction authorization.

~~34.10 CFR 63.21(e)(24) requires a description of controls that DOE will apply to restrict access and to regulate land use at the Yucca Mountain site and adjacent areas. To facilitate the~~



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



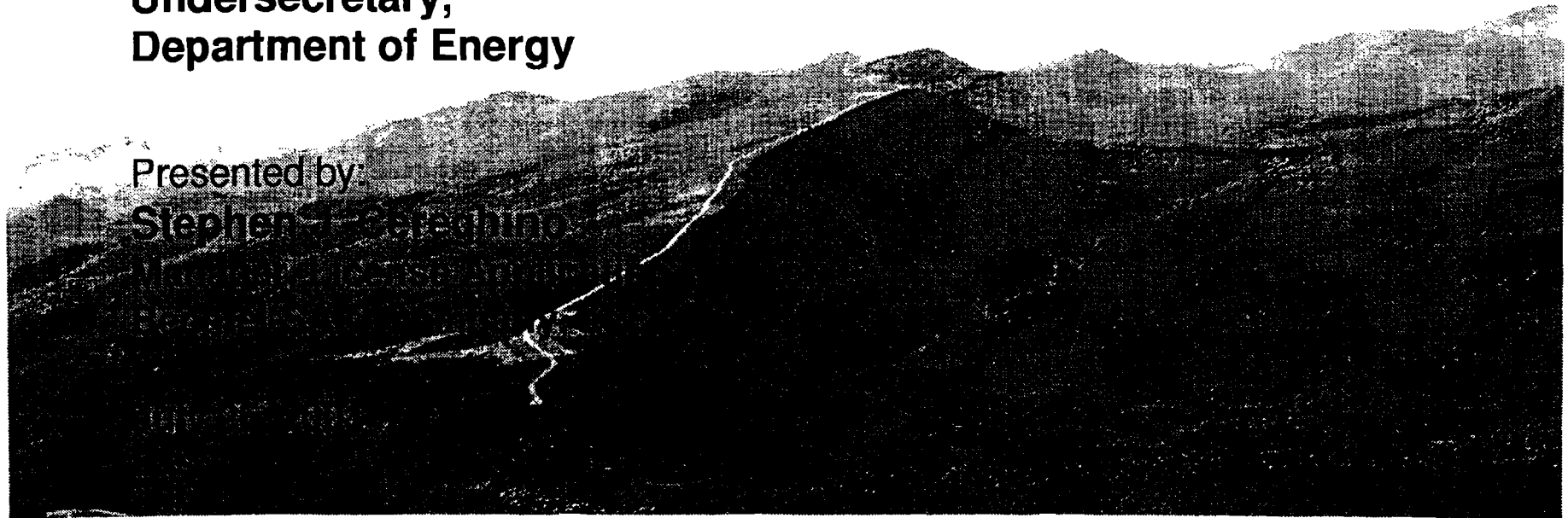
License Application Development

Presented to:

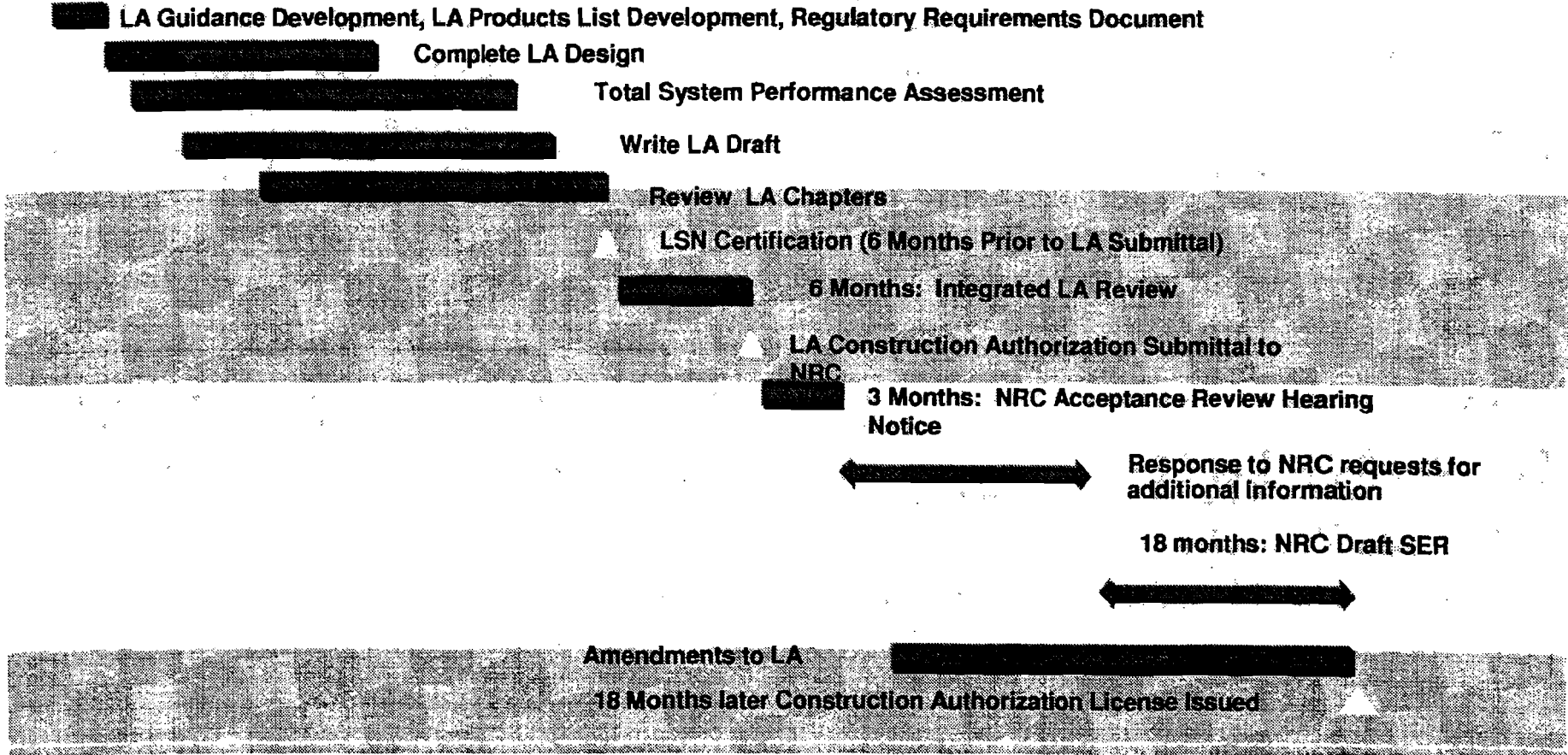
Robert G. Card
Undersecretary,
Department of Energy

Presented by:

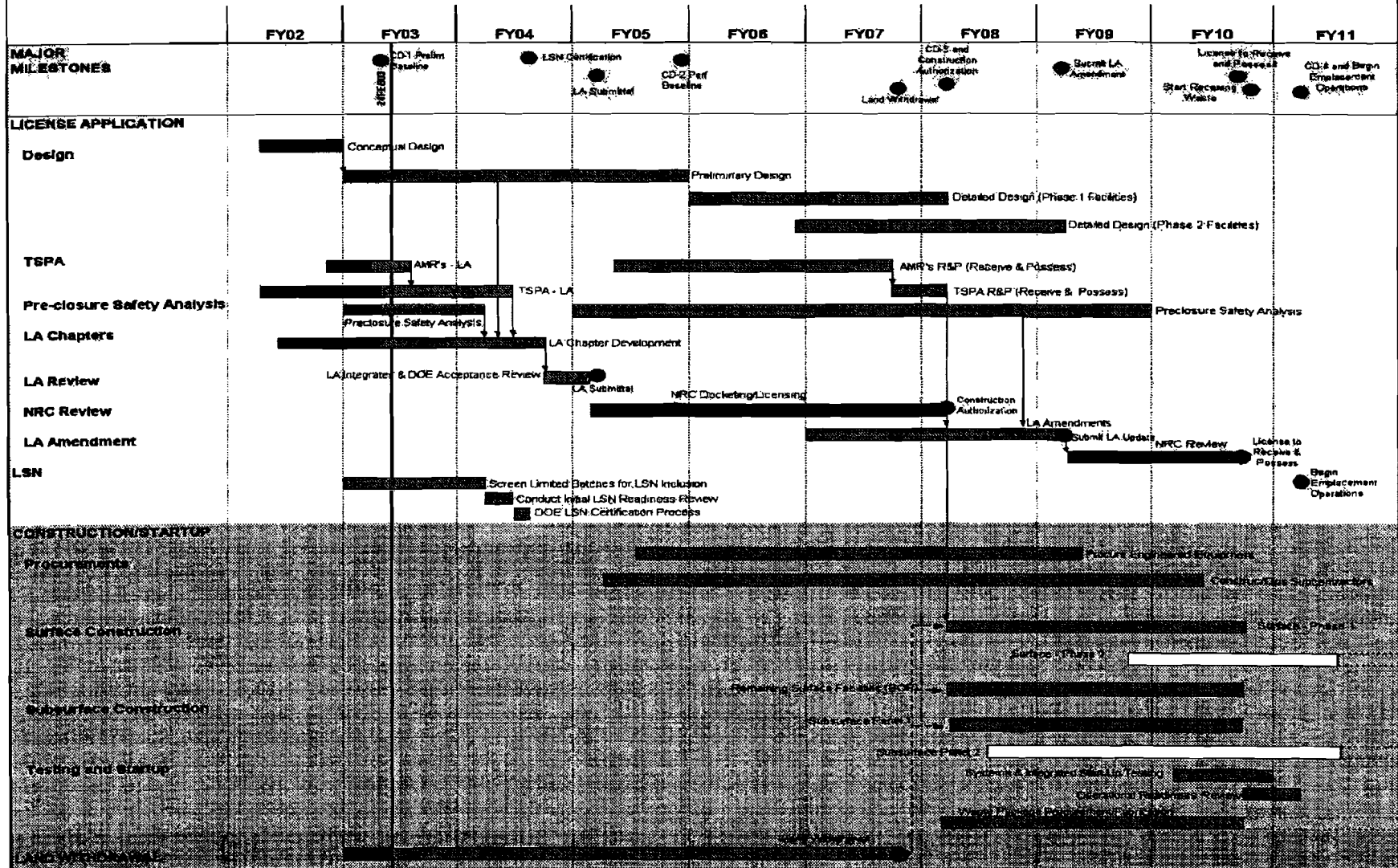
Stephen J. Cechino



DRAFT YMP Licensing Sequence

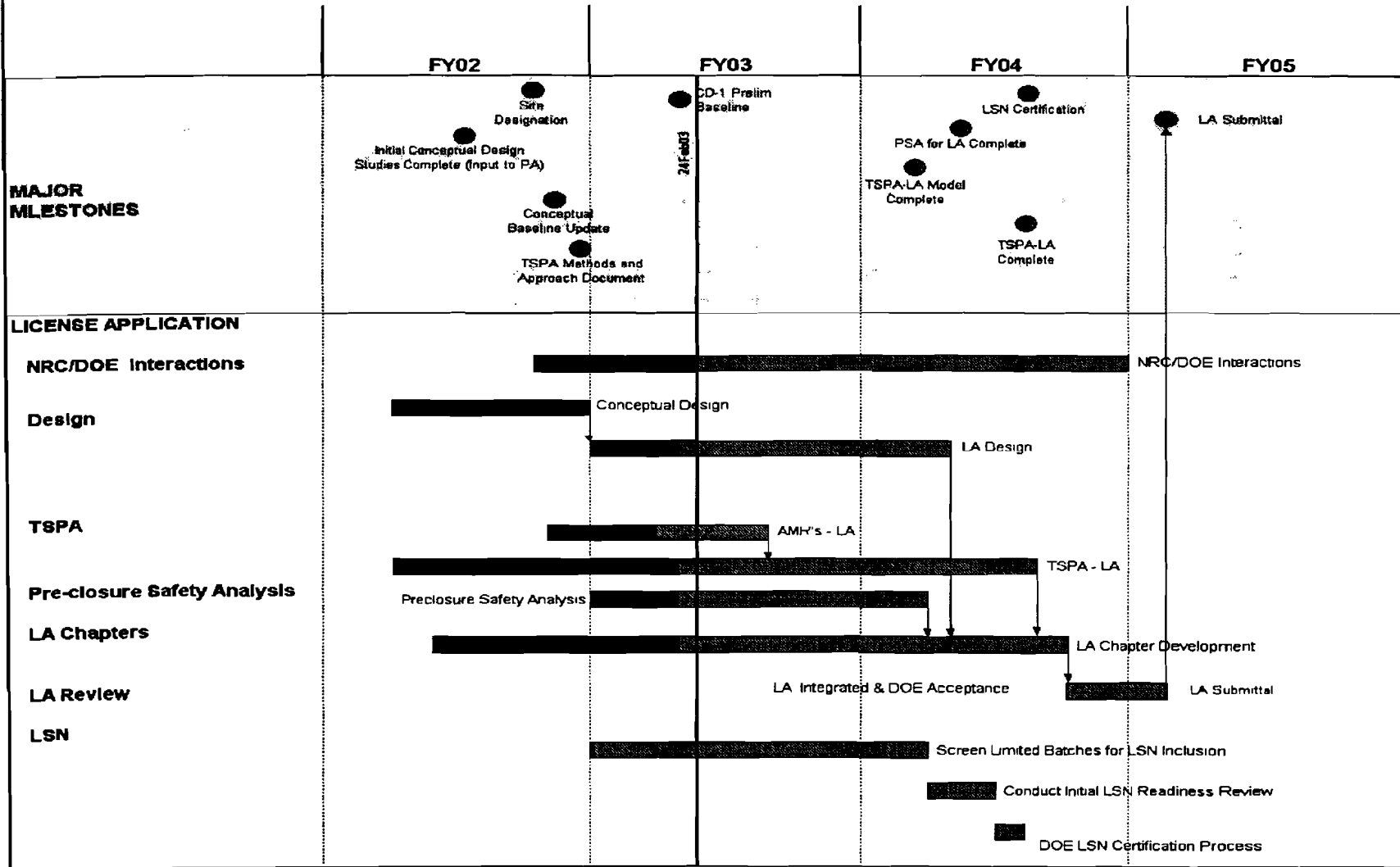


YUCCA MOUNTAIN PROJECT SUMMARY PLAN TO WASTE EMPLACEMENT



2/24/03

YUCCA MOUNTAIN PROJECT SUMMARY PLAN TO LICENSE APPLICATION



Data Date: 24FEB03
 Project Name: 023D

MILESTONES
 (Level 0, 1, & 2)
 YMP to License Application

ACTIVITY ID	DESCRIPTION	Level	BASELINE FINISH	FORECAST FINISH	VAR	COMMENTS
PAM2PB11	TSPA PBI 1 Submittal To DOE	2	17-Dec-02	17DEC02A	0	
RPM2AR	Complete Interim LA Design Review Preparation	2	31-Jan-03	09JAN03A	16	
PMM2CD1	DOE Field Submits CD-1 Package To OCRWM	2	6-Jan-03	15JAN03A	-7	
PMM1CD1	DOE OCRWM Submits CD-1 Package To ESAAB	1	10-Jan-03	30JAN03A	-14	
PAM2PB12	TSPA PBI 2 Submittal To DOE	2	10-Feb-03	11FEB03A	-1	
PMM0CD1	CD-1 Approve Preliminary Baseline Range	0	31-Jan-03	6-Mar-03	-23	Submitted by OCRWM to OECM for ESAAB action on 1/27/03
PAM2PB13	TSPA PBI 3 Submittal To DOE	2	31-Mar-03	28-Apr-03	-20	Report will be submitted per baseline. Impact of any late feeds will be discussed in report.
LAM2ME	Preliminary PSA Review Complete for LA	2	30-Jun-03	5-Aug-03	-25	Milestone to be revised with implementation of future BCP.
PAM2AA	Complete Site Description Doc. for LA YMSD	2	1-Aug-03	1-Aug-03	0	
RPM2MW	Complete Repository Design for LA	2	28-Jan-04	28-Jan-04	0	
LAM2JV	DOE Cert.Compliance with 10CFR Part 2, Subpart	2	22-Mar-04	4-Aug-04	-95	To be corrected with implementation of the LSN BCP.
LAM2KV	DOE Accepts Electronic Information System	2	22-Mar-04	4-Aug-04	-95	To be corrected with implementation of the LSN BCP.
PAM2NY	Complete TSPA for LA	2	10-May-04	21-May-04	-9	Numerous critical path activities being addressed by additional resources and work around plans.
LAM2LN	DOE LSN Certification Letter to NRC	2	20-May-04	5-Oct-04	-95	To be corrected with implementation of the LSN BCP.
LAM1KX	Begin LA Integrated Review	1	9-Jul-04	30-Jul-04	-15	Driven by AMR (S0055) feed to TSPA.
LAM1BC	Complete LA Integrated Reviews	1	3-Sep-04	27-Sep-04	-15	Driven by AMR (S0055) feed to TSPA.
PAM2RU	Begin Cross Drift Thermal Test Heating	2	28-Sep-04	22-Dec-04	-59	Deferred by Continuing Resolution.
LAM2LS	DOE LSN Re-certification Letter to NRC	2	18-Nov-04	13-Apr-05	-95	To be corrected with implementation of the LSN BCP.
LAM1NA	Complete DOE AP-7.5Q Review of LA	1	19-Nov-04	14-Dec-04	-15	Driven by AMR (S0055) feed to TSPA.
LAM1NB	DOE OCRWM Signs LA	1	30-Nov-04	21-Dec-04	-15	Driven by AMR (S0055) feed to TSPA.
RPM2PDC	Freeze Design for CD-2 Estimate	2	23-Dec-04	23-Dec-04	0	
LAM0AM	DOE OCRWM Submits License Application to NRC	0	23-Dec-04	21-Jan-05	-15	Driven by AMR (S0055) feed to TSPA.



Exhibit 57

Exhibit 57



PRECLOSURE SAFETY ANALYSIS PROCESS

1. PURPOSE

- 1.1. This procedure establishes the basic process for the preclosure safety analysis that demonstrates the conformance of the repository design to the applicable technical concepts, performance objectives, and requirements of 10 CFR 63.
- 1.2. This procedure applies to the analysis of applicable preclosure event sequences, considering human-induced and naturally occurring hazards, the categorization of event sequences, the calculation of radiological consequences, the analysis of preclosure criticality safety, the derivation of procedural safety controls, and the derivation of preclosure nuclear safety design bases and selection of structures, systems, and components (SSCs) that are important to safety (ITS). (ITS SSCs are documented in the *Q-List* in accordance with LS-PRO-0203). This PCSA process procedure provides process steps for development of calculations, analyses, or technical reports that document the following:
 - External and internal initiating event evaluations
 - Initiating event sequence development
 - Event sequence analysis and categorization
 - Radiological consequences
 - Criticality analysis
 - Nuclear safety design bases
 - Procedural safety controls
- 1.3. This procedure provides direction for the primary components of the Preclosure Safety Analysis process listed above. However, this procedure is not intended to provide direction for the preparation of other supporting studies, calculations, analyses, reports and references that may be necessary for completion of the Preclosure Safety Analysis. These other documents prepared by PCSA may be used to provide input to, or supplement the analyses covered by LS-PRO-0201, or may otherwise contribute to the completion of the Preclosure Safety Analysis. These other supporting studies, calculations, analyses, reports should be prepared under EG-PRO-3DP-G04B-00037, *Calculations and Analysis*, as applicable, for the performance of calculations and analyses, or PA-PRO-0313, *Technical Reports*, for the preparation of technical reports.



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



www.ocrwm.doe.gov

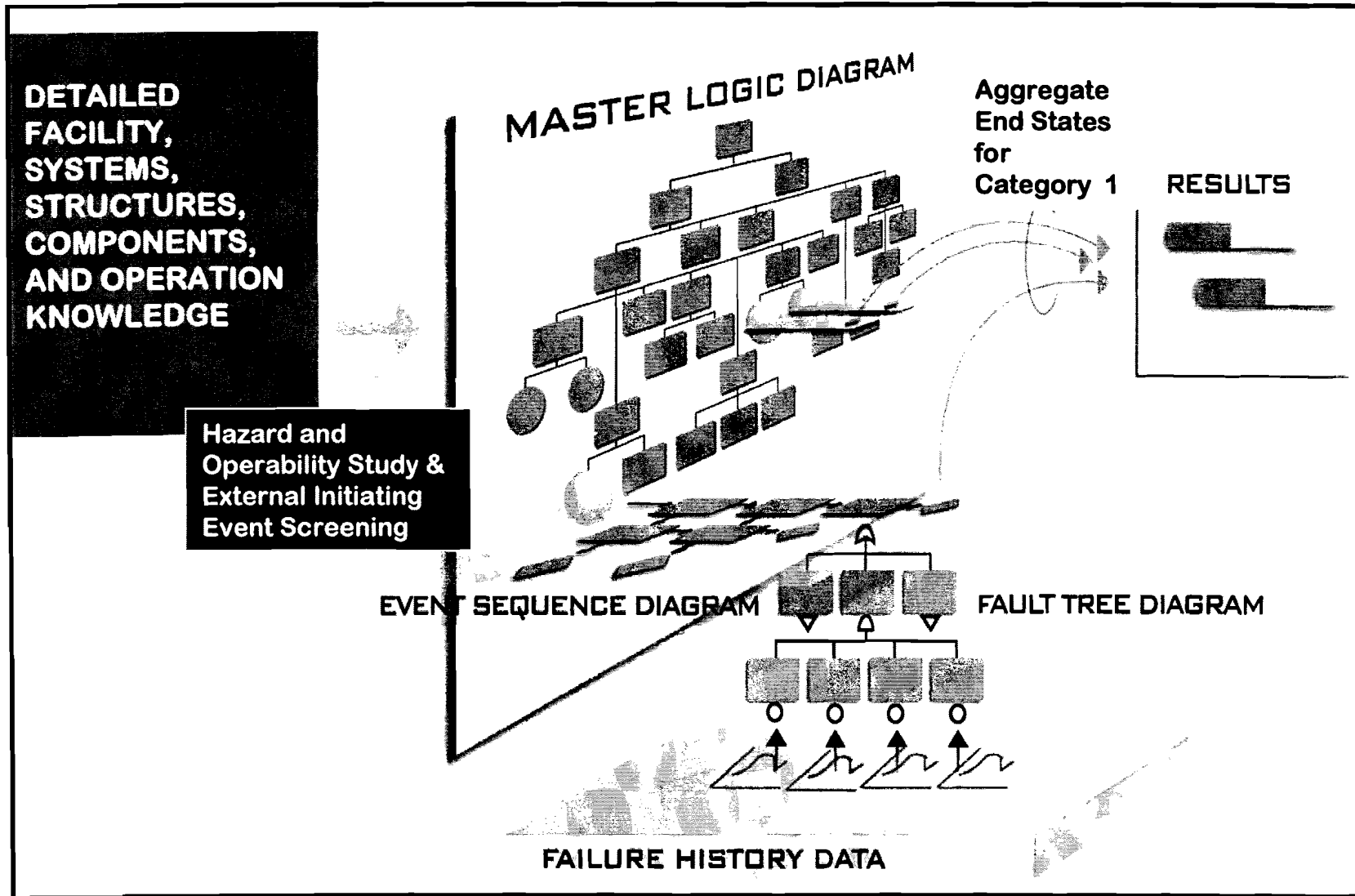
Preclosure Safety Analysis Event Sequence Analysis Summary

Presented to:
Nuclear Waste Technical Review Board

Presented by:
Michael V. Frank
LENS - Preclosure Safety Analysis
Bechtel SAIC Company

September 19, 2007
NWTB Meeting

Event Sequence Development Summary



Concept of Event Sequence Diagram (For illustration only – not actual result)

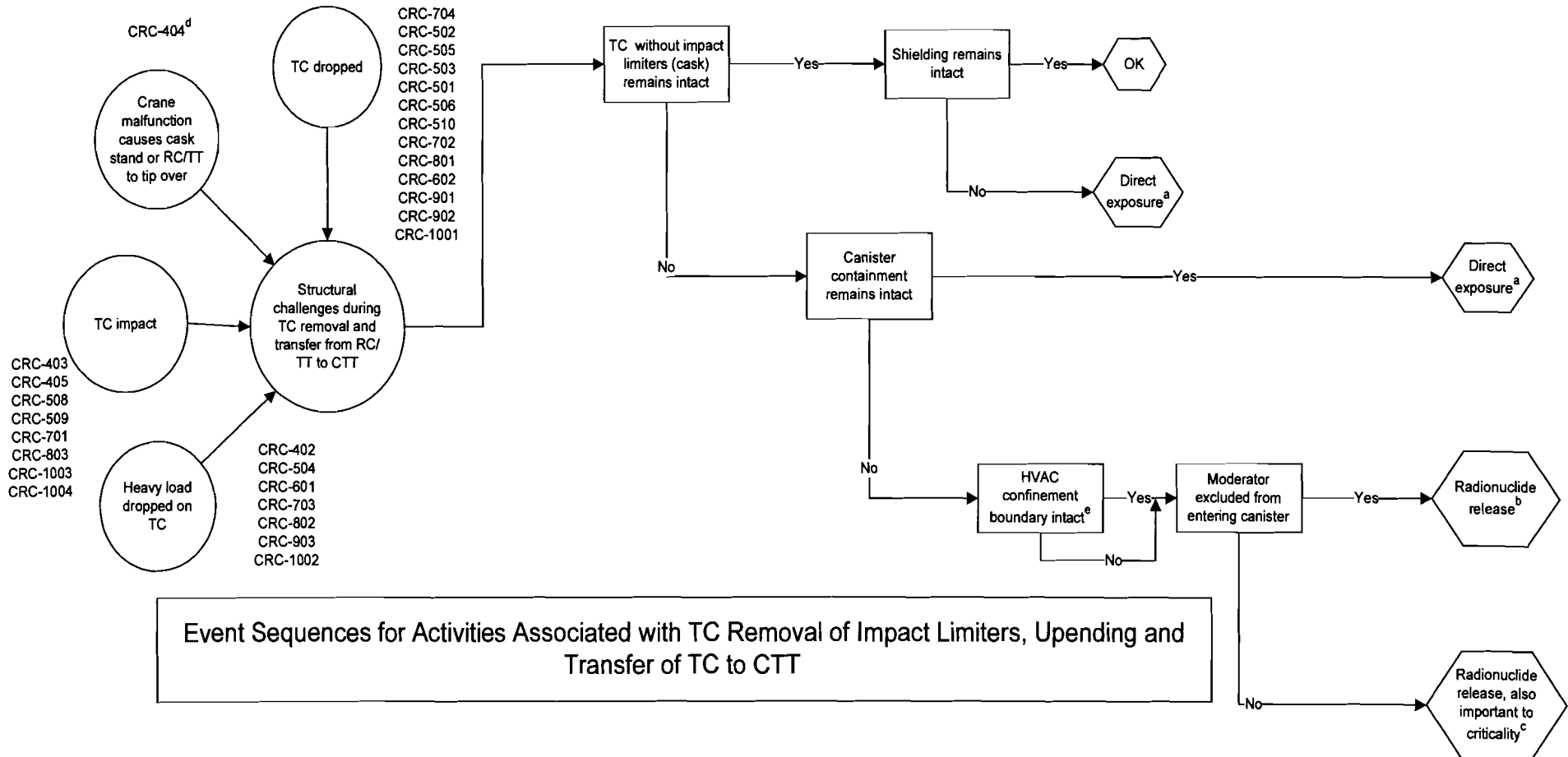


Exhibit 58

Exhibit 58

DN2002469638

BSC

Design Calculation or Analysis Cover Sheet

1. QA: N/A
2. Page 1

Complete only applicable items.

3. System Monitored Geologic Repository				4. Document Identifier xxx-PSA-xx00-00100-000-00Aa			
5. Title (XX) Facility Event Sequence Development Analysis							
6. Group Preclosure Safety Analyses							
7. Document Status Designation <input type="checkbox"/> Preliminary <input checked="" type="checkbox"/> Committed <input type="checkbox"/> Confirmed <input type="checkbox"/> Cancelled/Superseded							
8. Notes/Comments Check copy							
Attachments							Total Number of Pages
Attachment A XX Mechanical Equipment and Facility Description							xx
Attachment B XX Operational Summary							xx
Attachment C Process Flow Diagrams							x
Attachment D Master Logic Diagram							xx
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Attachment F Event Sequence Diagrams							xx
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9. No.	10. Reason For Revision	11. Total # of Pgs.	12. Last Pg. #	13. Originator (Print/Sign/Date)	14. Checker (Print/Sign/Date)	15. EGS (Print/Sign/Date)	16. Approved/Accepted (Print/Sign/Date)
00A	Initial Issue	xxx	xxx	xxx		M. Frank	M. Wisenburg

AUGUST 2007

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1. PURPOSE

This calculation is a systematic identification of potential event sequences that could occur during the lifetime of the [Facility name]. An event sequence is defined in 10 CFR 63.2 (*Energy: Disposal of High-Level Radioactive Waste in Geologic Repository at Yucca Mountain, Nevada*, Ref. 2.2.2) as follows: "...a series of actions and/or occurrences within the natural and engineered components of a geologic repository operations area that could potentially lead to exposure of individuals to radiation. An event sequence includes one or more initiating events and associated combinations of repository system component failures, including those produced by the action or inaction of operating personnel."

This calculation is the first of several reports that comprise the Preclosure Safety Analysis (PCSA) that supports the license application for the geologic repository operations area (GROA). This report documents the qualitative analysis of the initiating events and the development of potential event sequences. A second report, entitled *[Facility name] Reliability and Event Sequence Categorization Analysis*, (XXX-PSA-XX00-0200-000, Ref. 2.4.1) uses the event sequences developed in this report to perform a quantitative analysis of the event sequences for the purpose of categorization per the definitions provided by 10 CFR 63.2. Other reports that complete the PCSA are: please list (e.g. external event screening, ITS/non-ITS, construction hazards, NSDB, operational requirements, seismic analysis)

This report includes: a master logic diagram (MLD), a hazard and operability (HAZOP) study, event sequence diagrams (ESDs), and event trees. Initiating events considered in this analysis include internal events (i.e., events that are initiated within the [facility name]) as well as external events (i.e., events that are initiated from outside the [facility name]). However, seismic events (a type of external event) are not addressed here; those events and the associated event sequences are evaluated and documented separately.

Overview of Event Sequence Analysis

The PCSA uses the technology of probabilistic safety assessment (PRA) (for example, see references NUREG/CR-2300, ASME std, ANS std, HAZOP ref.). PRA answers three questions:

1. What can go wrong?
2. What are the consequences?
3. What are the probabilities?

PRA may be thought of as an investigation into the responses of a system to perturbations or deviations from its normal operation or environment. In a very real sense, the PCSA is a simulation of how a system acts when something goes wrong. The relationship of the methods of this PCSA are depicted in Figure 1. Phrases in *bold italics* in this section indicate methods and ideas depicted in Figure 1. Phrases in *italics* only indicate key concepts.

Identification of initiating events answers part of the question “What can go wrong?”. The PCSA uses two methods for identifying initiating events: Master Logic Diagram and HAZOP.

The basis of the PCSA is the development of *event sequences*. Simply stated, event sequences are thought of as strings of events which begin at initiating events and eventually lead to consequences. Between initiating events and end states, within a scenario, are *pivotal events* which determine whether and how an initiating event propagates to an end state. An event sequence completes the answer to the question what can go wrong and is defined by one or more initiating event, one or more pivotal events, and one end state. In the PCSA, event sequences end in *end states*. In this analysis, the end states of interest are: direct exposure to workers (without radionuclide release), radionuclide release, important to consider for criticality with not radionuclide release, important to consider for criticality with radionuclide release, and none of the above indicated by OK. The PCSA uses *event sequence diagrams*, event trees and *fault trees* to **diagram event sequences**.

The development of probabilities follows the development of event sequences, and answers the question what are the probabilities. The PCSA uses *failure history* records (e.g. from references such as NPRD-95, NUCLARR,) and structural reliability analysis, thermal stress analysis, and engineering and scientific knowledge about the design as the basis for development of probabilities. These sources coupled with the techniques of probability and statistics (e.g. NUREG on parameter estimation) result in the probabilities of initiating events, pivotal events, and event sequences.

Pivotal events are characterized by *conditional probabilities* because their value relies on

5. LIST OF ATTACHMENTS

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BSC

Study Cover Sheet

QA: N/A

YUCCA MOUNTAIN PROJECT

Preliminary Preclosure Nuclear Safety Design Bases

Page 1 of 94

DOE Contract No.:
DE-AC28-01RW12101

Rev.	Date	Reason for Revision	By Print Name and Sign	EGS/Lead Print Name and Sign	PE/RM Print Name and Sign	DEM Print Name and Sign
000	8/08/07	Initial Issue	Robert Garrett <i>RS/Garrett</i>	Michael Frank <i>MF</i>	Mark Wisenburg <i>MW</i>	N/A
Document No.:			Rev.:			
000-PSA-MGR0-01000-000-000			000			

1256 8/8/07

1. PURPOSE

The purpose of this document is to provide a preliminary identification of the structures, systems, and components (SSCs) that are important to safety (ITS) for the transportation, aging, and disposal (TAD) canister-based repository design during the Yucca Mountain Repository preclosure period and to identify and document the preliminary preclosure nuclear safety design bases associated with the ITS SSCs. This informal study was prepared in accordance with EG-PRO-3DP-G04B-00016, REV 4, *Engineering Studies*. The results of this study are subject to change as the preclosure safety analysis to support the license application is completed.

2. SCOPE

The *Q-List* documents the safety classification of repository SSCs (i.e. ITS or non-ITS) and identifies natural and engineered barriers important to waste isolation (ITWI). The structures, systems, and major components and their required preclosure safety functions are documented in *Preclosure Nuclear Safety Design Bases* in accordance with applicable quality assurance requirements. The process for the development of the *Q-List* and *Preclosure Nuclear Safety Design Bases* includes the identification of preclosure ITS SSCs and the development of the preclosure nuclear safety design bases required to meet the preclosure performance objectives of 10 CFR 63.111 [DIRS 173273] and the requirements of Sections 2.1.C.1.1.a and 2.1.C.1.2 of *Quality Management Directive* (BSC 2007 [DIRS 180474]).

Until such time as sufficient information for the TAD canister-based repository design can be developed to support the completion of a preclosure safety analysis in accordance with LS-PRO-0201, *Preclosure Safety Analyses Process*, that meets the requirements of 10 CFR 63.112 and demonstrates compliance with the 10 CFR 63.111 performance objectives, a preliminary identification of ITS SSCs and their nuclear safety design bases will be documented in this study in accordance with ENG-PRO-3DP-G04B-00016, *Engineering Studies*. The preliminary identification of ITS SSCs and their nuclear safety design bases is based on the analysis of previous designs, studies of the evolving TAD canister-based repository design, other hazard and nuclear safety analysis documentation prepared in support of the preclosure nuclear safety analysis, work in progress, and engineering judgment. Placeholders have been created for information that is not available at this time.

This study will be updated periodically to remain consistent with the evolving preclosure safety analysis. Following completion of the PSA in accordance with LS-PRO-0201, *Preclosure Safety Analyses Process*, the list of ITS SSCs will be documented in a revision to the *Q-List*. The final classification of SSCs will be based on risk-informed safety analyses completed in accordance with LS-PRO-0201. The nuclear safety bases will be documented in *Preclosure Nuclear Safety Design Bases*.

This study does not include the assignment of design requirements to SSCs or natural or engineered barriers that are ITWI. The preclosure nuclear safety design bases are used as input for design requirements found in *Basis of Design for the TAD Canister-Based Repository Design Concept* (BSC 2006a DIRS 177636) and *Project Design Criteria Document* (BSC 2006d [DIRS 178308]). These documents define how the repository design will meet the nuclear safety design

The safety functions and design criteria (which together are referred to as the nuclear safety design bases in the preclosure safety analysis) are developed from the applicable Category 1 and Category 2 event sequences for the SSCs that have been classified as ITS. In general, the design criteria can be grouped in, but are not limited to, the following six categories:

1. Mean frequency of SSC failure: It shall be demonstrated by analysis that the ITS SSC will have a mean frequency of failure (e.g., failure to operate, failure to breach), with consideration of uncertainties, less than or equal to the stated criterion value.
2. Mean frequency of the occurrence of an event sequence: It shall be demonstrated by analysis that the ITS SSC will have a mean frequency of causing the described event sequence (e.g., a drop, runaway, inadvertent motion, inadvertent actuation, collision), with consideration of uncertainties, less than or equal to the criterion value.
3. Mean frequency of seismic event-induced event sequence: It shall be demonstrated by analysis that the ITS SSC will have a mean frequency of a seismic event-induced event-sequence sequence (e.g., tipover, breach) of less than $1E-04$ over the preclosure period, considering the full spectrum of seismic events less severe than that associated with a frequency of $1E-07$ /yr.
4. High confidence of low mean frequency of failure (HCLPF): It shall be demonstrated by analysis that the ITS SSC will have a HCLPF associated with seismic events of less than or equal to the criterion value. The HCLPF value is a function of uncertainty, expressed as β_c , which is the lognormal standard deviation of the SSC seismic fragility.
5. Preventive maintenance and/or inspection interval: The ITS SSC shall be maintained or inspected to assure availability, at intervals not to exceed the criterion value.
6. Mean unavailability over time period: It shall be demonstrated by analysis that the ITS SSC or SSCs (e.g., HVAC and emergency electrical power) will have a mean unavailability over a period of a specified number of days, with consideration of uncertainties, of less than the criterion value.

These design criteria ensure that the ITS SSCs perform their identified safety functions such that the 10 CFR Part 63 performance objectives are met.

4.1.1.6 Technical Specification Development for ITS SSCs

In addition to nuclear safety design bases, technical specifications will also be developed for ITS SSCs. Examples of technical specifications are found in NUREG-1431, *Standard Technical Specifications, Westinghouse Plants, Specifications* (NRC 1995), which contains four categories of technical specifications:

1. Safety Limits: Limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. Exceedance of safety limits usually leads to facility shut-down.

2. **Limiting Condition for Operation (LCO) Requirements:** Limits placed on operation or unavailability of equipment, which if exceeded, would initiate a procedure to remedy the situation or shut-down the facility.
3. **Design Features:** Aspects of design which must be maintained to assure safe operation.
4. **Administrative Controls and Programs:** Procedural safety controls which prevent or mitigate event sequences and programs, such as a reliability-centered maintenance program, which assures that equipment reliability is maintained in a manner consistent with the preclosure safety analysis.

SSCs that have been classified as ITS are assigned licensing specifications to ensure that the ITS SSC will be available to perform its safety function when required.

4.2 METHODOLOGY

A comprehensive safety analysis has not been performed in this study. However, the results of the preliminary hazards analysis of the Critical Decision-1 repository conceptual design for the canister-based repository are presented in *Yucca Mountain Project Critical Decision-1 Preliminary Hazards Analysis* (DOE 2006b [DIRS 176678]). The results of the preliminary hazards analysis of the IHF are presented in Appendix A of *Yucca Mountain Project Conceptual Design Report* (DOE 2006a [DIRS 176937]). These results of these analyses, as well as the results of work associated with quantitative event sequence development and quantitative reliability analyses that is in progress to support the license application Safety Analysis Report, were used as input to this informal study.

The list of ITS SSCs for the TAD canister-based repository design was developed in *Preliminary Preclosure Safety Classification of SSCs* (BSC 2006b [DIRS 180422]). This list has been updated to reflect work in progress, including the expansion of SSCs that comprise the Mechanical Handling System that reflect advancement in the canister-based repository design.

The nuclear safety design bases for the ITS SSCs developed in this study are also based on the previous analysis of the canister-based repository design (DOE 2006a, DOE 2006b) as well as work in progress associated with quantitative event sequence development and quantitative reliability analyses.

Table A-1 in Appendix A presents a list of ITS and non-ITS SSCs, as well as the nuclear safety design bases for the ITS SSCs. At this time the assignment of the categories of the various technical specifications to be developed for the ITS SSCs has not been made. This portion of Table A-1 will be finalized at a later date.

4.3 ARCHITECTURE

4.3.1 Facilities

The list of facilities included in the current repository design is provided in *Basis of Design for the TAD Canister-Based Repository Design Concept* (BSC 2006a [DIRS 177636]). Of particular

Table A-1. Preliminary Preclosure Nuclear Safety Design Bases

Structure, System, or Subsystem	Component or Function	Preclosure Safety Class	Nuclear Safety Design Bases		Technical Specification Category
			Safety Function	Design Criteria	
A. Aging Facility					
Aging Facility	Aging Pad	ITS	In conjunction with AOs, prevent AO tipovers during seismic events	<p>A.1.1 The mean frequency of tipover of all aging overpacks on an aging pad shall be less than 1E-04 over the preclosure period, considering the full spectrum of seismic events less severe than that associated with a frequency of 1E-07/yr. The demonstration of a HCLPF of TBD, a Beta composite of TBD, and a Beta of TBD shall be sufficient to meet this criterion. (Reference TBD)</p> <p>A.1.2 The aging pad shall be located such that the mean frequency of a crash of a helicopter arriving at, or leaving from, the heliport into an AO or HAM located on an aging pad is less than TBD. A distance of at least one-half mile between the aging pads and the heliport shall be sufficient to satisfy this criterion. (Reference TBD).</p>	TBD
	Horizontal Aging Module (HAM) (170-HAC0-ENCL-00001)	ITS	Maintain structural integrity during a seismic event such that canisters inside do not breach	A.1.3 The mean frequency of breach of a canister within a HAM shall be less than 1E-04 over the preclosure period, considering the full spectrum of seismic events less severe than that associated with a frequency of 1E-07/yr. The demonstration of a HCLPF of TBD, a Beta composite of TBD, and a Beta of TBD shall be sufficient to meet this criterion. (Reference TBD)	TBD
	Mobile Platform (170-HAP0-PLAT-00001-2)	Non-ITS	None	Not Applicable. None of the SSC functions are credited for the prevention, reduction of frequency, or mitigation of an event sequence.	N/A
	Support Structures (including utility buildings, if applicable)	Non-ITS	None	Not Applicable. None of the SSC functions are credited for the prevention, reduction of frequency, or mitigation of an event sequence.	N/A

Preliminary Preclosure Nuclear Safety Design Bases

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A-3

August 2007

85 OF 85 ITS SSCs:
TECH. SPECS. - TBD

Table A-1. Preliminary Preclosure Nuclear Safety Design Bases (Continued)

Structure, System, or Subsystem	Component or Function	Preclosure Safety Class	Nuclear Safety Design Bases		Technical Specification Category
			Safety Function	Design Criteria	
Aging Handling/Cask Transfer	Cask Tractor (for use with the Cask Transfer Trailer) (170-HAT0-HEQ-00001)	ITS	In conjunction with the cask transfer trailer and horizontal STC, prevent canister failure during event sequences associated with runaway and/or collision	A.1.4 The mean frequency of each event sequence involving the cask tractor/transfer trailer that causes a release outside of a confinement area shall be less than 1E-04 over the preclosure period. (Reference TBD) A.1.5 The mean frequency of exceeding a speed of 2.5 mph shall be less than 1E-04 per trip divided by the number of trips over the preclosure period. (Reference TBD) A.1.6 The cask tractor shall not affect the integrity of the horizontal shielded transfer cask during seismic, drop, or tipover events. (Reference TBD)	TBD
	Cask Transfer Trailers (for use with Horizontal Shielded Transfer Cask) (PWR DPC: [170-HAT0-TRLY-00001]) (BWR DPC: [170-HAT0-TRLY-00002])	ITS	In conjunction with the cask transfer trailer and horizontal STC, prevent canister failure during event sequences associated with runaway and/or collision	A.1.7 The cask transfer trailer shall not affect the integrity of the horizontal shielded transfer cask during seismic, drop, or tipover events. (Reference TBD) A.1.8 The mean frequency of exceeding a speed of 2.5 mph shall be less than 1E-04 per trip divided by the number of trips over the preclosure period. (Reference TBD)	TBD
	Mobile Cranes (170-HAT0-CRN-00001-2)	Non-ITS	None	Not Applicable. None of the SSC functions are credited for the prevention, reduction of frequency, or mitigation of an event sequence.	N/A

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A-4

August 2007

Preliminary Preclosure Nuclear Safety Design Bases

SPROAT-PCSA



Department of Energy
Washington, DC 20585

QA: N/A

November 6, 2007

B. John Garrick, Ph.D.
Chairman
Nuclear Waste Technical Review Board
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201-3367

Dear Dr. Garrick:

Thank you for your April 19, 2007, letter providing the Nuclear Waste Technical Review Board's (Board) views on the Office of Civilian Radioactive Waste Management (OCRWM) Program, as presented to the Board at its January 24, 2007, meeting in Las Vegas, Nevada. As always, I appreciate the opportunity to interact with the Board.

The Program remains on track to complete the key milestones and meet its strategic objectives, as I outlined in my presentation.

In your letter, the Board raised some additional questions and asked for clarification of some of our plans. The enclosure to this letter provides detailed responses to the Board's inquiries.

If you have any questions concerning this letter, please contact Claudia M. Newbury at (702) 794-1361.

Sincerely,

A handwritten signature in black ink, appearing to read "E. Sproat, III".

Edward F. Sproat, III, Director
Office of Civilian Radioactive
Waste Management

Enclosure



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The PCSA process is iterative and includes analysis of evolving design information, site characteristics, and operational features to evaluate the potential hazards, potential event sequences, and calculate the radiological consequences for operations of the geologic repository operations area. As the design and the PCSA progress, there is continuous feedback from PCSA analysts to designers regarding the safety functions of SSCs and target reliabilities being modeled in the PCSA. PCSA analyses are revised, as necessary, to maintain consistency with repository design. When the LA is submitted, the design and PCSA will be based on the same design information.

Interface activities are coordinated to ensure the design of the repository is consistent with the PCSA. This includes inputs from designers that are necessary to perform the preclosure safety calculations and analyses. The products developed by design engineering (e.g., project design criteria, system description documents, and drawings) and by the PCSA analysts (e.g., radiological hazards analyses and event sequence categorization) are closely coordinated between the respective organizations, and are subjected to procedurally required interface and interdisciplinary review before their issue.

The technical interface requirements between PCSA and design engineering are formally documented in the Preclosure Nuclear Safety Design Bases. This quality-affecting document provides the classification of systems, structures, and components ITS or not important to safety along with the associated safety function based on the results of completed event sequence analysis for each nuclear structure, and for subsurface areas and intra-site operations.

Overview of PCSA Process

In the PCSA required by 10 CFR 63.21(c)(5) and 10 CFR 63.112, an assessment of the safety of the geologic repository operations area is made and the ITS SSCs that are required to ensure that the credited safety functions can meet the performance objectives of 10 CFR 63.111 are identified. The four major portions of the analysis are (1) initiating events identification and event sequence development, (2) event sequence analysis and categorization, (3) radiological consequence, and (4) identification of SSCs ITS and specification of the nuclear safety design bases and procedural safety controls. The nuclear safety design bases for ITS SSCs and the procedural safety controls provide means to (1) prevent or reduce the likelihood of event sequences and (2) mitigate or reduce the consequences of event sequences.

Initiating events are considered only if they are reasonable (i.e., based on the characteristics of the geologic setting and human environment, and consistent with precedents adopted for nuclear facilities with comparable or higher risks to workers and the public (10 CFR 63.102(f)).

Initiating Events Identification and Event Sequence Development

To assess potential external and internal hazards, PCSA evaluates the site and uses descriptions of the repository facilities (surface and subsurface), SSCs, operational process activities, and characteristics of the waste stream to identify applicable hazards that may result in reasonable, credible, initiating events to be considered in further analyses. Examples of the internal hazard categories analyzed include, but are not limited to, collisions, drops, system failures (e.g., HVAC), floods, and fires. Master logic diagrams and process flow diagrams are being used to identify internal hazards and initiating events. Examples of external hazard categories analyzed include, but are not limited to, natural phenomena such as tornadoes and seismic events, and human activity such as aircraft crashes that could impart sufficient energy to be hazardous to a waste form.

Event Sequence Identification and Categorization

Potential event sequences are developed by safety analysis and evaluated based on the identification of credible potential external and internal initiating events. The event sequence analyses process quantifies (determines the overall probability or frequency) the sequences of events that lead to a potential radiological release or criticality. Event sequences are categorized in accordance with definitions of Category 1 and Category 2 event sequences in 10 CFR 63.2. Event sequences that have less than one chance in 10,000 of occurring during the preclosure period are screened out and categorized as beyond Category 2 event sequences.

Radiological Consequence Analyses

Analyses of radiological consequences of potential radionuclide releases and direct exposures from normal operations of repository surface and subsurface facilities, Category 1 event sequences, and Category 2 event sequences are performed as required by 10 CFR 63.111(c). Radiological consequences are calculated for workers and members of the public during normal operations and are added to the radiological consequences from the Category 1 event sequences to demonstrate compliance with 10 CFR 63.111(a) and (b).

For Category 2 event sequences, offsite public radiological consequences are evaluated for each Category 2 event sequence, individually. No worker radiological consequences are required to be calculated for Category 2 event sequences to demonstrate compliance with 10 CFR 63.111(b)(2).

Identification of SSCs ITS and Specification of the Nuclear Safety Design Bases and Procedural Safety Controls

The SSCs that perform safety functions credited in event sequence analyses and radiological consequence analyses are classified as ITS. The credited safety functions are documented in preclosure nuclear safety design bases.



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April Gil Ltr re: The U.S. Department of Energy Report "Frequency Analysis of Aircraft Hazards for License Application."

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November 15, 2007

Dr. April V. Gil, Acting Director
Regulatory Authority Office
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1551 Hillshire Drive
North Las Vegas, NV 89134-6321

SUBJECT: THE U.S. DEPARTMENT OF ENERGY REPORT, *FREQUENCY ANALYSIS OF AIRCRAFT HAZARDS FOR LICENSE APPLICATION*

Dear Dr. Gil:

The purpose of this letter is to provide U.S. Nuclear Regulatory Commission (NRC) staff feedback (see Enclosure) on the U.S. Department of Energy's (DOE's) letter, dated July 24, 2007, regarding the U.S. Department of Energy report, "Frequency Analysis of Aircraft Hazards for License Application."

The NRC staff understands that DOE plans, in the Yucca Mountain License Application (LA) submittal, to screen out aircraft crashes into surface facilities, on the basis of probability, and thus DOE does not plan to evaluate the

consequences of such crashes. Also, DOE is deferring responses to items 2 through 5 of NRC's letter, dated December 15, 2006, related to issues concerning pilot actions, effectiveness of a flight-restricted airspace, future flight activities, and the Solomon model, until LA submittal. As indicated previously, the NRC staff believes that, if these issues are not adequately resolved, the screening out of aircraft crashes may not be appropriate and the consequences of such crashes may have to be evaluated. The NRC staff proposes having an Appendix 7 meeting to discuss these issues before LA submittal.

DOE should also note that the NRC staff intends to continue reviewing DOE information, related to aircraft hazards, for the purpose of preparing to review a potential LA. As such, the NRC staff would like to receive any updates to DOE supporting documents and related analyses.

I

In accordance with 10 CFR 2.390 of NRC's "Rules of General Applicability," a copy of this letter will be available electronically, in the NRC Public Document Room, or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). The ADAMS package accession number is ML072530854. ADAMS is accessible from the NRC Web site, at <http://www.nrc.gov/reading-rm/adams.html>.

A. Gil 2

If you have any questions about this matter, please contact David M. Dancer, at 301-492-3142, or by e-mail, at dmd@nrc.gov.

Sincerely,

/RA/ E. Peters for

Jack R. Davis, Deputy Director
Technical Review Directorate
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

Enclosure:

"U.S. Nuclear Regulatory Commission Staff
Feedback on U.S. Department of Energy's



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Enclosure: U.S. Nuclear Regulatory Commission Staff Feedback on U.S. Department of Energy's July 24, 2007, Letter on Aircraft Crash Frequencies.

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U.S. NUCLEAR REGULATORY COMMISSION STAFF FEEDBACK ON U.S. DEPARTMENT OF ENERGY 'S JULY 24, 2007 LETTER ON AIRCRAFT CRASH FREQUENCIES

1. **Implementation of Restricted Fly Zones:** U.S Nuclear Regulatory Commission (NRC) staff appreciates the update provided by the U.S. Department of Energy (DOE) on the implementation of the restricted fly zones and looks forward to further DOE updates on the outcome of the application to the Federal Aviation Administration (FAA) and the proposed legislative actions.
2. **Pilot Actions:** NRC staff understands that DOE is revising its rationale for its assertion that the DOE pilot actions model (i.e., the pilot ejects immediately after engine failure or the cause of the in-flight emergency that leads to a crash) is conservative. DOE does not plan to communicate to NRC its revised rationale until the time of the license application (LA) submittal.
3. **Effectiveness of a Flight-Restricted Airspace:** NRC staff understands that DOE plans to clarify its methodology for estimating the frequencies of aircraft crashes into surface facilities by revising the frequency analysis report. DOE does not plan to communicate to NRC its clarification until the LA submittal.
4. **Future Flight Activities:** NRC staff understands that DOE is revising its report to include additional FAA flight data in the Beatty Corridor and plans to provide this data at the time of LA submittal. However, DOE has not identified its plans to justify the assumption of the 2.5 percent growth factor for commercial aircraft landing in the Las Vegas area or the assumption of a uniform crash-frequency density for military flight activities in the Nevada Test

and Training Range, the Nevada Test Site, and the Military Operations Area surrounding the flight-restricted airspace, without accounting for future growth of activities at the Nellis Air Force Base or future aircraft designs.

5. **Solomon Model:** NRC staff understands that DOE is developing additional justification for its use of the Solomon Model to estimate aircraft crash frequencies for flights in the Beatty Corridor. DOE does not plan to communicate to NRC its justification for using the Solomon model until the LA submittal.





6. **Sensitivity Analysis:** DOE has addressed this issue in its July 24, 2007 response. NRC staff has no further comments on this issue at this time. NRC staff will continue to evaluate the effects of the sensitivity analysis on the aircraft crash frequency, and make a final determination on this issue, if it is still relevant to licensing, during the review of the LA.

Enclosure

Document Properties

Title:	Microsoft Word - ML072540473.doc
Author:	ORPUser

Currently displaying results 1-1 of 1 total hits

Select	Rel%	Source	Title/Accession Numbers/Description	Commands
	75%	DOE	Risk Register Docketing R5 LSN #: DN2002481013 Participant #: ALA.20070511.1674 Document Date: 01/02/2007 Risk Register Docketing R5 . PRIVILEGED AND CONFIDENTIAL Bechtel SAIC Company, LLC LA RISK REGISTER FOR DOCKETING LITIGATION WORK PRODUCT Strategy Document Responsible Responsible P3 Milestone Item# Bin/Issue LA Section CDR Source Risk/Issue Title	   

[Suggest More](#)

Currently displaying results 1-1 of 1 total hits

Query executed at Wednesday November 28, 2007 9:39 AM EST

Item#	CDR	Risk/Issue Title
6	PCSA Programmatic	Aircraft Hazard Analysis

Risk Impact
<p>If NRC staff thinks the PCSA has insufficiently considered the aircraft hazard; then, analysis of crash consequences may be necessary in the PSCA. Crash consequence mitigation has a high likelihood of requiring substantial surface facility design enhancement resulting in major cost and schedule impacts, and delay in docketing.</p>

LA RISK REGISTER FOR DOCKETING

Row	Section	LA Number	CBE	Design/Document Number	Phase	Reference File	Risk Category	Substrate Document	Identified by	Risk Issue	Risk Mitigation Approach	Responsible Individual	Responsible Organization	3.1 Milestone Date	3.1 Activity ID	Availability	Complete	Risk Mitigation	Reserve Paper
DOCKETING RISKS																			
1	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
2	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
3	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
4	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
5	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
6	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
7	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
8	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
9	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
10	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
11	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
12	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
13	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
14	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
15	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
16	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
17	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
18	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
19	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1
20	CS	1.3	1.3	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1	1.3.1



QA: N/A

MOL.20070731.0004

**SUMMARY OF
THE U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY
TECHNICAL EXCHANGE ON PRECLOSURE FACILITY LAYOUT AND OPERATIONS
LAS VEGAS, NEVADA
MAY 30, 2007**

INTRODUCTION

On May 30, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff and the U.S. Department of Energy (DOE) held a public Technical Exchange (TE) to further NRC's understanding of the status of DOE's preclosure facility design, layout, and operations. This meeting was held at the Las Vegas Hearing facility in Las Vegas, Nevada. The agenda for this meeting can be found in Enclosure 2.

To facilitate staff and stakeholder interactions, the NRC Headquarters, in Rockville, Maryland, and the Center for Nuclear Waste Regulatory Analyses, in San Antonio, Texas, participated in the TE via video links. Teleconference connections were also made available for interested stakeholders. Participants included representatives of NRC, DOE, State of Nevada, Affected Units of Local Government, Nuclear Energy Institute, and other members of the public. A list of attendees is provided in Enclosure 3.

The meeting agenda, list of attendees, and NRC/DOE presentations are available on the NRC High-Level Waste Disposal Meeting Archive web site:
<http://www.nrc.gov/waste/hlw-disposal/public-involvement/mtg-archive.html#KT1> (NRC ADAMS ML071370663).

PURPOSE OF TECHNICAL EXCHANGE

In a letter dated May 2, 2007, NRC identified topics (see below) that the staff was interested in discussing at the May 30, 2007, technical exchange (ML071170593). Therefore, the purposes of this TE meeting were: (1) to advance NRC's understanding of the status of DOE's preclosure facility design, layout, and operations, and (2) to improve DOE's understanding of NRC expectations regarding the design of DOE's preclosure facilities, via discussion of these topics. The topics to be discussed were:

- An update on DOE's facility design and operations, focusing on the Canister Receipt and Closure Facility (CRCF) and Wet Handling Facility (WHF), including: (1) facility layout and operations, (2) mechanical handling, and (3) waste handling operations (across facilities and within buildings).
- An update on the status of incorporating the new facility design and operations into the preclosure safety analysis (PCSA); specifically, impact of the new design and operations on the identification of hazards and initiating events. Staff also requested an update of the status of DOE's efforts on identification and frequencies of event sequences, and important-to-safety (ITS) structures, systems, and components (SSCs). In particular, staff was interested in: (1) analysis and design methods used to evaluate facilities for the identified hazards, including technical bases for assumptions; (2) acceptance criteria (including codes and standards); and (3) results of the performance evaluations,

Waste-Handling Control Philosophy

DOE described its waste-handling control philosophy and provided an overview of control and monitoring systems being designed for the repository. Presentations included discussion of non-ITS control systems and ITS control functions. Examples of ITS functions and their implementation were provided as well. DOE emphasized that non-ITS control systems provide operator interface and normal control and monitoring functions for repository operations. Control functions determined to be ITS will be hardwired, independent of non-ITS control systems. No non-ITS control system, or operator commands, are able to override these hardwired ITS functions. The presentation also discussed control and monitoring locations and distinguished between remote, local-remote, and local locations.

Seismic Design Considerations

DOE's presentation clarified the seismic analysis approach to be followed that will establish the safety of the repository. Tier-1 analyses results, based on lumped mass multiple-stick models, will be presented in the license application (LA), and will be the basis of the safety evaluation. The presentation included an example based on the CRCF Tier-1 analysis results. DOE also stated that it will perform Tier-2 analyses, as appropriate, based on a finite-element model, including consideration of soil-structure interaction. The Tier-2 analyses are expected to be completed by May 2008. Once completed, the Tier-2 analyses will form the basis of detailed design calculations and are expected to confirm the results of the Tier-1 analyses. However, the Tier-2 analyses will not form the basis of the safety evaluation and will not be presented in the LA.

CLOSING COMMENTS

The TE meeting provided an update on the status of DOE's design, facility layout, and operations for the CRCF and WHF. It also provided staff with information on DOE's waste-handling control philosophy and some discussion of how DOE plans to incorporate seismic design considerations into the compliance determination, using its Tier-1 analysis. NRC highlighted the importance of continuing interactions with DOE on design and PCSA. DOE responded that the design and PCSA are currently under development and information would not be available until fall 2007. Both parties recognized that interactions on additional PCSA elements were in the planning stage. Specifically, NRC indicated the need to hold an additional TE to discuss completed preclosure facility design and operations. NRC also suggested a TE to discuss DOE's compliance determination using the PCSA for license application after DOE completes the design and corresponding PCSA. DOE agreed with this proposal.

DOE stated that the TE was a productive meeting and indicated that it looks forward to additional interactions with NRC on various elements of the PCSA, pending the availability of information.

UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD

FALL BOARD MEETING

September 19, 2007

Atrium Suites Hotel
4255 Paradise Road
Las Vegas, Nevada 89109

1 And, then, finally, the license application. What
2 I'll say about the license application is I've been very
3 clear, very public about putting out front that we're going
4 to get that license application into the NRC by Monday, June
5 30, 2008. And, I'm telling you we are ahead of schedule in
6 doing that. How ahead of schedule we'll be come March or
7 April remains to be seen, but we are ahead of schedule to
8 meet that date, and we will meet that date.

9 So, those are the reports and the deliverables that
10 you are going to see coming out of OCRWM over the next nine
11 months. And, I think you can see why I'm calling it the
12 Delivery Season. These are going to be clearly scrutinized
13 heavily. I'm sure there will be a lot of public posturing by
14 various people when they come out, but rest assured that we
15 are not producing these with the idea of we've got a schedule
16 and we've got to get out whatever we have. We are putting a
17 lot of time and a lot of effort to make sure we have very
18 high quality documents that meet the needs of both the
19 regulator and the stakeholders in defining this whole
20 program. And, so, I am very optimistic, well, I'm more than
21 optimistic, I'm certain we will make this happen on this
22 schedule.

23 So, if we can go to the next slide? Let me give
24 you an update on key issues that I'm paying attention to, and
25 the Board probably would be very interested in also.

1 GARRICK: Okay. One other question. In the
2 conventional engineering world, they have metrics for
3 indicating where the design is from the standpoint of
4 nearness to completeness, metrics like preliminary design,
5 Title 1, Title 2, Title 3, whatever metric you want to use.
6 Can you tell us where we are now with respect to the design
7 and where you expect to be, say, at the time of the filing of
8 the license application?

9 SLOVIC: At the time of the completion of the license
10 application, we expect to be, and don't quote me these
11 numbers, 35 to 40 percent done on important to safety system
12 structures and components, and probably in the 25 to 30
13 percent on the supporting systems. So, we will have a
14 structural design. We will have designs of the important to
15 safety systems. We will have designs of the electrical
16 systems that we need. We will have designs for things like
17 hot water cooling systems for the buildings, but they won't
18 be to the level of detail that they will for the important to
19 safety structure systems and components.

20 ARNOLD: Henry?

21 PETROSKI: Petroski, Board.

22 So, in all these guidelines and drawings that
23 you're showing us, are these just conceptual, or have any
24 calculations gone into--

25 SLOVIC: No, these are reflective of the design as it's

1 period, I no longer have to do a dose calculation.

2 MOSLEH: Not if your pinch point is the crane failure;
3 right?

4 FRANK: That is an initiating event, a successful crane
5 doesn't produce a drop, so I go off to the next initiating
6 event, yeah.

7 MOSLEH: So, if you base it on what matters, basically
8 the event of concern, you know, a malfunction that has a
9 consequence, then your choice of how far you go down in terms
10 of detail is a matter of, you know, a number of things,
11 including resources and modeling and things that are--you
12 know, data availability and other things, but not that
13 frequencies become smaller. I mean, you don't screen at that
14 level. You screen it at the level where the event has some
15 consequence; right?

16 FRANK: Agreed.

17 GARRICK: Okay, I have some questions, but I want to get
18 the whole Board in, so we're going to have to be reasonably
19 efficient here. I have Andy, Howard, David and Bill. Andy?

20 KADAK: Yes, thank you.

21 What you've described here is probably a four or
22 five year process. Now, is this going to be part of a
23 license application?

24 FRANK: Yes.

25 KADAK: Do you want to amplify?

1 FRANK: Do you want me to amplify?

2 KADAK: Yes. I mean, the analysis to support all of the
3 failures is not going to be insignificant. And, then,
4 assigning probabilities to the events is also quite a
5 challenge. And, even if you get a decent set of event
6 sequences, then you have all the fault trees to kind of build
7 up.

8 FRANK: You bet. So, tell that message to DOE and point
9 out that the BSC is performing a miracle here, because we
10 have really compressed the normal time period. In doing so,
11 there are great management challenges to keep everybody
12 together on the same page within the PCSA as well as working
13 with engineering. We have a very, very large team. This is
14 far and away the largest team, by maybe a factor of five or
15 six or seven, that I've ever had to assemble for a risk
16 assessment. We have about 60 people just in my area, and
17 with all of the, including criticality and dose, it's on the
18 order of 75 people doing this work. So, it is a very, very
19 large effort with a compressed schedule.

20 KADAK: And, Norm Rasmussen once said you can get 90
21 percent of the information with 10 percent of the effort.
22 Have you tried looking at it from that perspective to
23 identify what Ali was talking about? Where are the risk
24 significant issues that you should maybe focus in on with
25 much more detail than trying to cover everything in the

1 detail that you're worried about?

2 FRANK: Okay, first of all, I did not say that we're
3 covering everything in equal detail. I do believe in a risk
4 informed approach to a PRA. And, so, yes, things that are
5 much less important, I'm not, for example, in comparison to a
6 23 foot drop from a crane, I'm not going to worry too much
7 about. A collision of a canister into a wall, I'm not going
8 to put in the same level of effort at all.

9 KADAK: Okay, thank you.

10 GARRICK: Speaking of failures, the hotel warned us that
11 they're going to do a test of their emergency power
12 generator, and that we may be in darkness for a few moments
13 any time now, between 2:00 and 3:00. So, if that happens,
14 just relax. Wait until the lights come back on.

15 All right, Howard?

16 ARNOLD: My comment is related to Andy's. You told us
17 how you're going to do it, but we haven't seen any actual
18 results from your doing it, which raises a question. The
19 design is proceeding, and if you say well, you know, the
20 schedule of this is thus and so, but the design gets done,
21 then you're kind of saying the design--or this is irrelevant
22 to the actual performance of the design. I think that, in
23 fact, you've got to present some information to the designers
24 on a current basis, and I presume that's all paced so they
25 all come together at the L.A. point, huh, both the design and

1 the safety analysis?

2 FRANK: Let me reorient your paradigm here, because I
3 think we're doing something a bit different in this process.

4 It's really, the traditional way of thinking about
5 it is that you have a design and you evaluate the design.
6 Then, the next level of thinking about it is that you have a
7 design that takes you to--preliminary, evaluate that, you
8 give some feedback to the designers, and then you go to the
9 next level, tier two, or whatever it is, in design, and you
10 do that again. We're doing this almost continuously, where
11 at first, insights were given back to the design team based
12 on judgment. And, then, as the models developed a little
13 more, we could give them crude order of magnitude estimates,
14 and then as the models continued to evolve, those estimates
15 we hope get more accurate, or at least more down to the level
16 of detail that the design is at. And, yes, we hope at the
17 end, that it matches up right.

18 ARNOLD: And, the assumption is that when you find
19 something, it can be fixed by some tweaking of the design?

20 FRANK: Well, I think that's a big advantage of having a
21 risk assessment, going along right in parallel, in fact,
22 interwoven with the design. In the surface facilities, we
23 have that ability, it's just brick and mortar and steel and
24 we can change that. We know how to design things. So, it is
25 really just a question of time before it really does all come

1 together.

2 ARNOLD: Any idea of when that comes?

3 FRANK: Well, our stated due date for BSC delivery of a
4 licensing application, with all supporting analyses done, is
5 end of February 2008.

6 ARNOLD: Design and a supporting--

7 FRANK: Yes, Bob Slovic said roughly 35 percent of the
8 design for ITS components, that when the associated PCSA, at
9 that time.

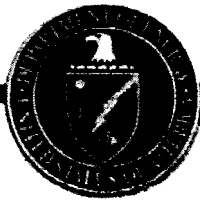
10 GARRICK: David?

11 DUQUETTE: Duquette, Board.

12 I'm not sure I want to flog a dead horse, or a
13 dying one, but I'm going to do it anyway. I'm a little bit
14 concerned about the safety case itself. I'm going to follow
15 up on what my colleague, Mark Abkowitz, said. We heard this
16 morning that there would be a time when the facility is being
17 constructed that there could be almost an excess of material
18 arriving at the site before it can be properly handled as far
19 as disposal is concerned, probably would have to be put on
20 some kind of pads, and so on and so forth. It's during that
21 period that if anything goes wrong at the site, a crane
22 failing, some delivery problem, or something like that after
23 a year or two, that would expose workers at the utility who
24 may be loading casks for delivery, will all of a sudden, all
25 the systems will have to be stopped, including trains perhaps

Exhibit 59

Exhibit 59



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



Seismic Design Considerations

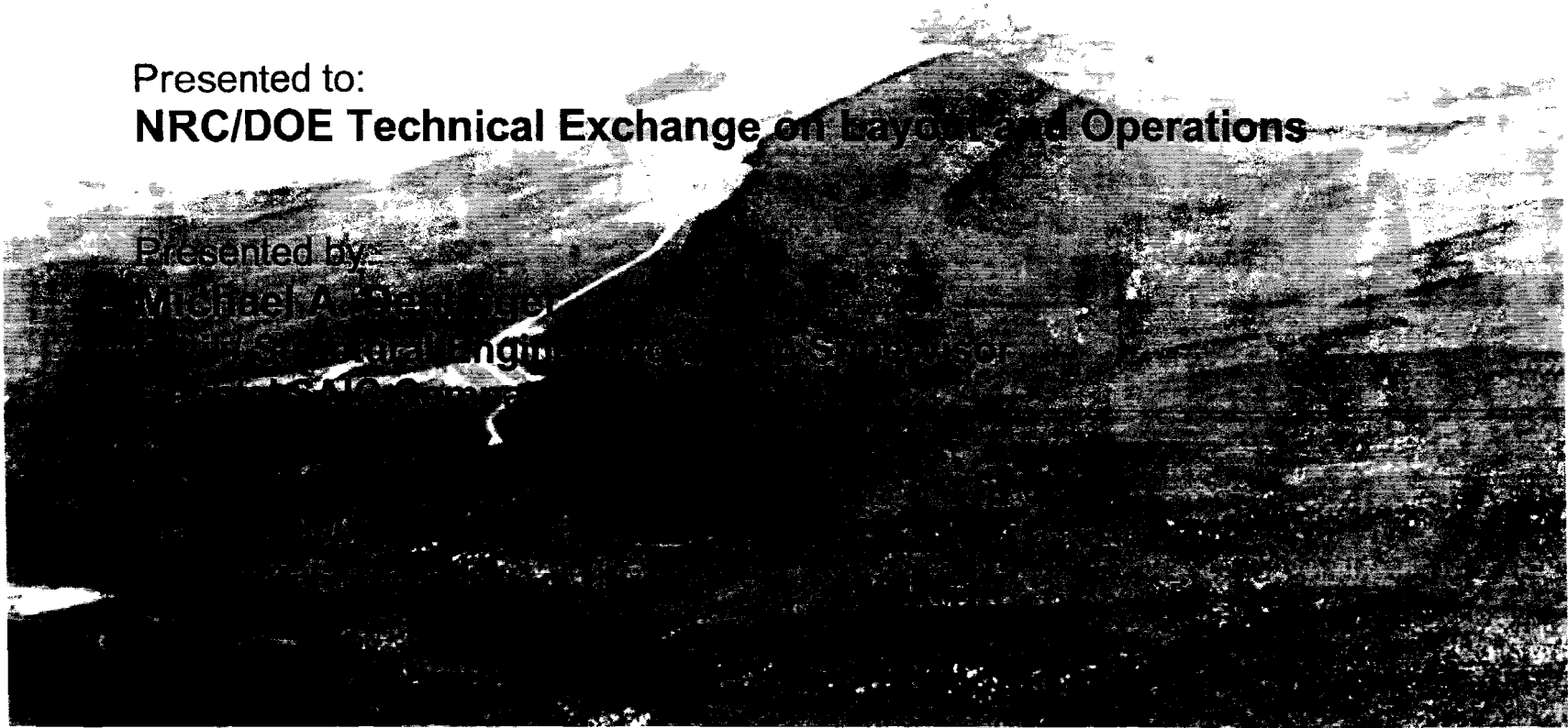
Presented to:
NRC/DOE Technical Exchange on Layout and Operations

Presented by:

Michael A. Bertoni

Senior Staff Engineer, Waste Management Systems

ORNL



Tier-1 Analysis

Determine response of structures for seismic loads

Determine seismic forces and design structural members

**Demonstrate Compliance with Nuclear Safety Design Bases
in License Application**

**Development of In-Structure Response Spectra (ISRS) for
component qualification**

Demonstrate safety of ITS facilities

Tier-2 Analysis

Basis of Detailed Design Calculations

Confirm Tier-1 Analysis Results

Available May 2008



Two tiered approach used for seismic analysis

License Application based on Tier-1 analysis results

Tier-1 analysis methodology consistent with NUREG-0800 and ASCE 4-98

Tier-1 analysis demonstrates safety of facilities

Tier-2 complete May 2008



DN2002 426873

PRIVILEGED & CONFIDENTIAL
 Attorney Work Product
 Attorney-Client Communication

Revision Date: 5/30/2007
 Print Date: 6/25/2007

INTEGRATION ISSUES - SURFACE / SUBSURFACE / PCSA

Item	Name	Subject	Issue Discussion	Priority
13	R. Bradbury	Aircraft Hazard	Establishment of documented flight restrictions around GROA - NRC expects to be documented in the LA	1
18	G. Sequeira	Configuration Management	The formal change process used for evaluating changes to preliminary LA design work is not clearly defined - Many of the LA supporting design products are based on preliminary sketches and design information. Over the past few months changes in the facilities have occurred, yet it is unclear what process will be used to evaluate the changes against these issued products. The configuration management plan to control the process and ensure the technical basis is kept current with the design presented in the LA is not clearly documented.	1
19	J. Cooper R. Bradbury	Design Maturity	Development of mean fragility curves of non-standard components (facility cranes, canister transfer machines, transfer trolleys, etc.) - Will sufficient specific design information be available for these components to develop the mean fragility curves.	1
16	G. Sequeira	Design Maturity	The planned suite of supporting calculations that demonstrate ITS SSCs meet derived NSDB requirements are not explicitly identified nor will the design of the SSCs be mature enough to provide a technical basis - A review of the preliminary design products (P&IDs, BFDs, MEEs, and MHDRs) raises concern that there are minimal calculations supporting the identified engineering products. The MHDR reviewed briefly described some design features, however the technical basis for these features were not supported by engineering calculations or analyses. The primary basis for the design features were derived from the design criteria cited in the Codes and Standards, which does not demonstrate the design will satisfy NSDB requirements.	2
17	G. Sequeira	Design Maturity	The approach of demonstrating compliance to safety requirements for representative cases of ITS SSCs rather than for each ITS SSC is not fully developed - The surface facilities have many ITS systems that are similar between the various facilities, however, the unique differences in the requirements can result in a very different design. The technical requirements such as the in-structure DBGM response spectra, girder spans, and mounting arrangements could create variations in the design that would be difficult to envelope in a representative bounding design analysis. Thus providing the technical basis that justifies why the representative case can be used to show compliance will be difficult and may not be acceptable to the NRC. It is likely that the NRC will require facility specific requirements be used to evaluate ITS SSCs operating within the respective nuclear facilities.	3
14	R. Bradbury	EPA	Revised 40 CFR 197 & 10 CFR 63 - Postclosure compliance period rejected by court	1
21	J. Cooper	Geotechnical	Current field boring program - Data being collected now will be "reviewed" and a judgement made as to whether it impacts project analyses - NRC will also review this data and may not agree with this judgement--risk to project	1

INTEGRATION ISSUES - SURFACE / SUBSURFACE / PCSA

Item	Name	Subject	Issue Discussion	Priority
8	R. Jackson	QA	ITS PLC Qualification - If there are going to be ITS PLCs there needs to be a description of how these devices will be qualified. This is beyond seismic and environmental when talking about electronics. How do you verify the device will do what it should when it should. Computers can fail in many ways. I believe there are a limited number of PLCs that have had SERs written for them. If we are going to use one of those we should say so and verify we are using it in the configuration in which it was approved.	3
5	G. Hellstrom	QA	Open CRs that affect LA	4
6	G. Hellstrom	QA	Issue of past legacy QA issues	5
4	G. Hellstrom	Schedule	Fragility work and convolution work is new for project and developed late. Potential issues of verifying that they meet compliance criteria (little margin) and recovery time if issues are identified and rework is needed.	1
	R. Bradbury			
3	G. Hellstrom	Schedule	Potential inconsistencies in Tier 1 and Tier 2 results that will not be determined until after LA finished	2
10	R. Bradbury	Schedule	Visibility of progress of event sequence analyses - 1st qualitative results done in September - no products before then to demonstrate progress of this critical path work	3
9	R. Jackson	Schedule	Design Schedule - Too much is happening in parallel. Its apparent that the electrical group is using best estimates and hopefully bounding assumptions and loads because final loads are not available at this time. The SAR is being written at the same time and the potential for a mismatch and rework is probably high. Thorough final reviews and checks should be made to ensure everything is consistent and complete.	4
15	G. Sequeira	Schedule	The schedule for the completion of engineering products needed to support LA SAR chapters and PCSA are not integrated with the SAR Chapter schedule - The schedule disconnects can lead to work arounds that may cause a loss of configuration control over the design information. Efforts are needed to re-establish an integrated schedule of the engineering/PCSA products/LA SAR Final Chapters.	5
1	G. Hellstrom	Schedule	New method to be finished late in the process. No recovery time if issues are identified	Merged with number 4
12	R. Bradbury	Schedule	Seismic Fragility analysis of structures - Completion schedule in early Feb - no time for rework to support LA	Merged with number 4
20	J. Cooper	Seismic	"Representative" sample of components for fragility analyses - BSC does not intend to generate a specific mean fragility curve for each of the SSCs mentioned in item 1 in its installed location but rather will do a representative sample (i.e., one 200-ton crane, one CTM, etc.)	1

See comment for item 7

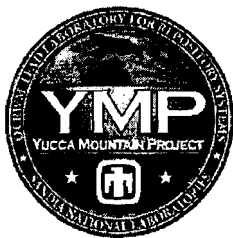
INTEGRATION ISSUES - SURFACE / SUBSURFACE / PCSA

Item	Name	Subject	Issue Discussion	Priority
23	J. Cooper	Seismic	Tier 1 Analysis presented in the LA will not be based on the latest building arrangement drawings and will prompt questions from the NRC.	2
2	G. Hellstrom	Seismic	Differences in use of different seismic hazard curves for different purposes within preclosure.	3
22	J. Cooper	Seismic	Current Tier 1 analyses use 2004 ground motions and data. Tier 2 analyses apparently will use new set of ground motions not submitted with the LA.	4
11	R. Bradbury	Seismic	Seismic fragility analysis of non-standard components: A. Need to have enough design info to do analysis B. Completion schedule in early Feb - no time for rework to support LA	Merged with number 4 and 19
24	H. Greenberg	Thermal	Naval waste package temperature following a postclosure drift collapse (due to seismic events with MAPE 10-5 or less) - Naval waste package source term has not been defined for event sequences where the temperature transients exceed the time-at-temperature profile analyzed to date. Preliminary analysis by Sandia (very conservative - conduction-only with closure after 50 years of ventilation) indicates exceedance of that profile under drift collapse with assumed thermal conductivity of the rubble bed. Drift collapse is expected in the lithophysal rock (comprising 85% of the repository emplacement area), but it is not postulated to occur in non-lithophysal. The path forward is not clear - one suggestion was to locate Naval waste packages only in non-lithophysal rock. The eastern half of Panel 1 is in the middle non-lith.	1
28	J. Mallay D. Niebrugge	YMRP Compliance	The first step in assuring LA section integration, compliance with requirements and docketability is the development of a Compliance Matrix to the YMRP. The String diagram, Story Boards and Quilt diagrams partially do this, however there are significant gaps. Namely that these have identified requirements (acceptance criteria) but do not define our expectations and what story we are trying to tell the NRC. Also there are additional NRC expectations and interpretations that must be addressed in the LA which have evolved from sources such as ISGs, Technical Exchanges and Appendix 7 meetings. A compliance matrix needs to be developed and approved by DOE which provides this further guidance.	1

Exhibit 60

Exhibit 60

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QA: QA
TWP-MGR-PA-000045 REV 01
February 2007

**Technical Work Plan for:
Total System Performance Assessment
FY 07 – 08 Activities**

Prepared for:
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Office of Repository Development
1551 Hillshire Drive
Las Vegas, Nevada 89134-6321

Prepared by:
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OCRWM Lead Laboratory for Repository Systems
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Under Contract Number
DE-AC04-94AL85000

1. WORK SCOPE

The active work packages in the Lead Laboratory Annual Work Plan authorize work to be performed by the Total System Performance Assessment (TSPA) Department for Fiscal Year (FY) 07-08. The work packages contain activities that are subject to the requirements of *Quality Assurance Requirements and Description* (QARD) (DOE 2006) and the applicable project Quality Assurance (QA) procedures. The work packages also include work activities not subject to the QARD. This technical work plan (TWP) was prepared in accordance with SCI-PRO-002, *Planning for Science Activities*, which implements these QARD requirements for modeling, scientific investigation, scientific analyses, and other science-related documents and technical products used to evaluate postclosure performance of the Yucca Mountain Repository.

This TWP replaces the following TWP:

- *Technical Work Plan For: Total System Performance Assessment-License Application (TSPA-LA) FY06-08 Activities (TWP-MGR-PA-000037).*

Procedures to be adhered to for this work scope and cited in this TWP are subject to version changes. All work conducted under this TWP will utilize the versions of procedures effective at the time the work is being performed.

The work described in this TWP will provide TSPA modeling, analysis, and documentation for a variety of topics as directed by the U.S. Department of Energy (DOE), but primarily for the Total System Performance Assessment for the License Application (TSPA-LA). The work scope for each of the work packages is briefly described below.

Work Package S30201 – TSPA Management and Integration

The work scope in Work Package S30201 provides management support, integration, and infra-structure support. Work Package S30201 will not be discussed in any further detail in this TWP because it is generally support to the main work being done in the other work packages.

Work Package S30202 – TSPA Documentation

The primary work scope in Work Package S30202 is to develop the TSPA-LA analysis/model report (AMR) (MDL-WIS-PA-000005). This work package includes the activities to document the TSPA-LA model and analyses for the Safety Analysis Report (SAR). This AMR will provide documentation of the TSPA-LA model developed for the SAR. The model will incorporate changes from previous modeling resulting from updated infiltration modeling, design changes, peak dose analyses, and Independent Validation Review Team (IVRT) comments. Support for other project documents is included in this work package, including the Supplemental Environmental Impact Statement (SEIS).

Work Package S30203 – TSPA Analyses and Support

Work Package S30203 provides TSPA model development and analysis to support various DOE-directed analyses, as well as the SEIS and SAR. The activities may include selected sensitivity analyses of design alternatives, one-on vulnerability analysis, subsystem performance,

As appropriate, the TSPA-LA model will support reviews conducted under AP-EM-010, *Environmental Baseline Review*, to evaluate the environmental baseline established by the Final Environmental Impact Statement (FEIS) and 10 CFR 63.24[c]. These analyses will be performed for management information and decision-making, and will use a preliminary version of the TSPA-LA model that has not completed validation. Thus, these analyses will be considered non-Q analyses.

Other Analyses Determined to Be Important by Management – The expectation is that analyses to support decision-making and evaluations will be required. Some of these analyses may be defined by other Performance Assessment (PA) departments to support their ongoing submodel development. These analyses will be conducted to the extent time and resources allow. These analyses will be conducted following Q processes, but may be non-Q analyses, unless Q analyses are required by PA management. If these analyses are required to be Q, the analyses will be conducted after validation of the TSPA-LA model.

Technical and management review of these additional analyses will be provided to ensure their suitability for any further distribution. TSPA-LA model documentation may be revised based on comments received from these technical and management reviews.

1.1.3 Performance Confirmation Integration Analysis (Work Package S30205)

The performance objective for Work Package S30205 is to prototype non-Q TSPA analyses in support of the documentation identified in *Performance Confirmation Plan* (BSC 2004). Work Package S30205 is expected to include analyses of approximately 20 activities identified in the PC plan and documenting the sensitivity of the results calculated with the TSPA-LA model with respect to the candidate parameters identified in these activities. The documentation produced may be incorporated into future updates of the PC plan. Technical and management review of the documentation of these analyses will be provided. The documentation will be revised based on comments received from these reviews.

1.2 PRIMARY TASKS AND PRODUCTS

1.2.1 TSPA Documentation (Work Package S30202)

1.2.1.1 Tasks

The primary tasks associated with development of the TSPA-LA model documentation will be as follows. To the extent practical, these activities will utilize information from the previous modeling and documentation initiated for the FEIS, which culminated in the draft TSPA-LA AMR (MDL-WIS-PA-000004 REV 01E), and update this draft document as appropriate.

- Based on the Annual Work Plan and corresponding updates from supporting models, develop and modify the TSPA-LA model consistent with the requirements of SCI-PRO-006, *Models*, and SCI-PRO-004, *Managing Technical Product Inputs*.
 1. Identify the sources for process models and model abstractions.

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2. Justify the use of models, input parameters, and model abstractions that were used in the TSPA-LA model.
 3. Update documentation and TSPA database for resolution of to-be-verified (TBV) items.
 4. Provide parameter listings and mathematical summary information.
 5. Modify model and documentation described in the draft TSPA-LA AMR (MDL-WIS-PA-000004 REV 01E) for process models and model abstractions.
- Integrate features, events, and processes (FEPs) developed in various abstraction activities into a defensible representation of the FEPs included in the TSPA-LA model. Develop a FEP “map” indicating where “included” FEPs are represented in the TSPA-LA model.
 - Combine all relevant abstracted model results, simplified process models, relevant design information and specific assumptions in the draft TSPA-LA AMR (MDL-WIS-PA0000004 REV 01E), and incorporate this information into a final TSPA-LA AMR (MDL-WIS-PA-000005). The draft TSPA-LA AMR was originally initiated as an update from the FEIS model.
 - Ensure that the TSPA-LA AMR (MDL-WIS-PA-000005) is consistent with current supporting references.
 - Incorporate results from the TSPA-LA model into the TSPA-LA AMR.

Work Package S30202 will be enhanced through the conduct of integration activities with supplying organizations to identify and integrate updated information, abstractions, and/or submodels into the TSPA-LA model. These integration activities will characterize the information, model abstractions, and/or submodels to be implemented in the TSPA-LA model. The TSPA-LA model will be used to perform analyses of the type that are expected to be used in support of an evaluation of compliance with the postclosure regulatory standards (Individual Protection Standards for the reasonably maximally exposed individual, Groundwater Protection Standards, Peak Dose, etc.).

Meeting Support – Provide direct support to U.S. Nuclear Regulatory Commission meetings, Technical Management Review Board meetings, and other interactions external to TSPA.

1.2.1.2 Products

The products of Work Package S30202 activities will be as follows:

- TSPA-LA AMR (MDL-WIS-PA-000005)
- SEIS documentation
- SAR documentation for Chapters 2.1 and 2.4
- Other non-Q documentation of scoping analyses, as appropriate.

1.2.2 TSPA Analyses and Support (Work Package S30203)

1.2.2.1 Tasks

The tasks associated with Work Package S30203 are as follows:

TSPA Analyses:

- Conceptualize the analyses to be conducted with the TSPA-LA model.
- Implement changes in the GoldSim model file for the TSPA-LA model.
- Conduct analyses using the TSPA-LA model, for both compliance and performance margin analysis.
- Check implementation of submodels, abstractions, etc., into the TSPA-LA model.
- After developing the TSPA-LA model, forecast repository performance for the parameters of the scenario classes of the TSPA-LA.
- Perform simulations for verification, validation, and compliance cases with the TSPA-LA model to generate confidence in the TSPA-LA model, as listed in Table 2.3.5-1.
- Generate a comprehensive set of system and sub-system uncertainty and sensitivity analyses including regression analysis to support risk insights, as listed in Table 2.3.5-1.
- Update the TSPA-LA model parameter database to provide a controlled source of TSPA-LA model file inputs, by incorporating TBV resolution and new or modified parameter values approved by PA management. TSPA desktop instructions will be utilized as appropriate (see TSPA-1 through TSPA-4 and TSPA-6). These desktop instructions provide the sequencing of activities required to ensure that inputs are checked prior to final calculations, and to help minimize time between calculations and checking.

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- Continue configuration management to control revisions to the TSPA-LA model and ensure that software development and usage are transparent, traceable, and reproducible.
- Conduct Monte Carlo simulations with the TSPA-LA model for the TSPA model scenario classes, including peak dose and human intrusion analyses.
- Use uncertainty and sensitivity analysis tools to analyze and interpret the results calculated with the TSPA-LA model.

Uncertainty and Sensitivity Analyses – Conduct uncertainty and sensitivity analyses of the process models, model abstractions, and submodels supporting the TSPA-LA model as previously noted.

Software Modification – Develop updated software and qualification documentation. Qualify/update TSPA Model software. Currently, this includes GoldSim, SEEPAGEDLL_LA, MkTABLE, GETTHICK_LA, SZ_CONVOLUTE, EXDOC, and PREWAP_LA. Other software that may be required for the peak dose analyses will also be qualified.

1.2.2.2 Products

The products of Work Package S30203 activities will be:

- TSPA-LA model, including performance margin analyses and human intrusion analyses.
- Documented uncertainty and sensitivity analyses including regression analyses in selected letter reports or memos as determined in discussions with DOE. The documents are expected to include the topics of the various analyses described above, with some further subdivision to enable the documents to be of a size that can be quickly produced after the results are analyzed. The non-Q scoping analyses will be performed using both Q and non-Q inputs and alternative conceptual representations to inform decision-making.
- Software qualification documentation for various dll's that support the TSPA-LA model including PREWAP_LA.dll, SEEPAGEDLL_LA.dll, and GETTHK_LA.dll.
- TSPA-LA model simulations (computer files) of the Yucca Mountain Repository postclosure performance.

1.2.3 Performance Confirmation Integration Analysis (Work Package S30205)

1.2.3.1 Tasks

The primary tasks associated with Work Package S30205 are currently expected to perform uncertainty and sensitivity analyses for parameters associated with activities identified in the PC plan (BSC 2004). These analyses will support the development of the analyses where condition limits related to PC parameters are developed and justified.

Table 2.3.5-1. Summary List of Possible Analyses to Be Conducted for TSPA-LA Model Validation

Analysis Category		Analysis Description
TSPA-LA Model Checking	Checking	Range of validation exceptions from run logs will be saved and evaluated for each of the modeling cases.
TSPA-LA Model Validation	Verification of components and submodels	These include various test cases during and after development to ensure that the model is working correctly, saving results properly, and interfacing with the database appropriately. Examples include comparison of the results calculated with the TSPA-LA submodels with results from a particular AMR for specific conditions.
	Stability of Parameter Sampling Scheme	These include model test cases for each modeling case to determine stable sample sizes and replicates for the stable sample size to confirm adequacy of sampling.
	Temporal Stability	These include model test cases for different time-stepping schemes to determine appropriate time stepping for each modeling case.
	Spatial Stability	These include model test cases of spatial aspects of the model such as specification of environmental subregions (bins) and of environments within each subregion (bin).
	Sub-System Performance*	These include simulations to evaluate performance of the integration of individual TSPA-LA model components into subsystems (for example, seepage, in-drift environment, in-package environment, engineered barrier system release). These also include barrier capability analyses.
	Single Realization Analyses*	These include detailed analysis of a selected realization for each of the TSPA-LA modeling cases.
	Performance Margin Analyses	These include both individual component and a combined analysis with alternative component models representing potential different representations of components conservatively modeled in the compliance model.
Impact Analyses	TSPA Analyses to Evaluate Specific Issues*	These include full system or subsystem model simulations to quantify the importance of modeling simplifications and approximations as they relate specific issues regarding conservatism, potential non-conservatism, and inconsistency.
Uncertainty Analyses	Uncertainty, Sensitivity and Importance Analyses*	These include sensitivity analyses (e.g., regression analyses) to identify parameters dominating variance in system performance (annual dose at selected times) and subsystem performance (annual release from barriers at selected times).

* These analyses could be characterized as auxiliary analyses.

The analyses identified as impact analyses in Table 2.3.5-1 are intended to quantify the impact of various modeling choices, assumptions, and approaches made in the development of the TSPA-LA model. These analyses will not be considered compliance calculations. In order to perform these types of analyses, parameter distributions and possibly conceptual models will need to be modified. The design, parameterization, and data pedigree needed for these calculations will be determined by the TSPA Department with input from subject matter experts as required. These changes will not affect the TSPA-LA model used for compliance analysis, which will be used as the reference for evaluating the impact.

An important analysis in this regard is identified as a Performance Margin Analysis. This analysis will utilize revisions to selected component models in the TSPA-LA compliance model, including conceptual or uncertainty alternatives, to assess the performance margin in the compliance model, and to evaluate whether the compliance model dose is underestimated. The

Table 3.2-1. Linkage of Requirements to TSPA

Requirement	Comment
<p>10 CFR 63.113 (a) The geologic repository must include multiple barriers, consisting of both natural barriers and an engineered barrier system.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.113 (b) The engineered barrier system must be designed so that, working in combination with natural barriers, radiological exposures to the reasonably maximally exposed individual are within the limits specified at 10 CFR 63.311 of subpart L of this part. Compliance with this paragraph must be demonstrated through a performance assessment that meets the requirements specified at 10 CFR 63.114 of this subpart, and 10 CFR 63.303, 63.305, 63.312 and 63.342 of Subpart L of this part.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.113 (c) The engineered barrier system must be designed so that, working in combination with natural barriers, releases of radionuclides into the accessible environment are within the limits specified at 10 CFR 63.331 of subpart L of this part. Compliance with this paragraph must be demonstrated through a performance assessment that meets the requirements specified at 10 CFR 63.114 of this subpart and 10 CFR 63.303, 63.332 and 63.342 of subpart L of this part.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.303 DOE must demonstrate that there is a reasonable expectation of compliance with this subpart before a license may be issued. In the case of the specific numerical requirements in 10 CFR 63.311 of this subpart, and if performance assessment is used to demonstrate compliance with the specific numerical requirements in 10 CFR 63.321 and 63.331 of this subpart, compliance is based upon the mean of the distribution of projected doses of DOE's performance assessments which project the performance of the Yucca Mountain disposal system for 10,000 years after disposal.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.311 DOE must demonstrate, using performance assessment, that there is a reasonable expectation that, for 10,000 years following disposal, the reasonably maximally exposed individual receives no more than an annual dose of 0.15 mSv (15 mrem) from releases from the undisturbed Yucca Mountain disposal system. DOE's analysis must include all potential pathways of radionuclide transport and exposure.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.331 DOE must demonstrate that there is a reasonable expectation that, for 10,000 years of undisturbed performance after disposal, releases of radionuclides from waste in the Yucca Mountain disposal system into the accessible environment will not cause the level of radioactivity in the representative volume of ground water to exceed the limits in the following Table 1.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>
<p>10 CFR 63.341 To compliment the results of 10 CFR 63.311, DOE must calculate the peak dose of the reasonably maximally exposed individual that would occur after 10,000 years following disposal but within the period of geologic stability. No regulatory standard applies to the results of this analysis; however, DOE must include the results and their bases in the environmental impact statement for Yucca Mountain as an indicator of long-term disposal system performance.</p>	<p>The analysis presented in the TSPA-LA AMR will support the demonstration of compliance with this requirement.</p>

NOTE: The requirements may be modified to include peak dose requirements.

8.5 SPECIAL ENVIRONMENTAL CONTROLS

Not applicable. No special environmental controls are needed to conduct the work identified by this TWP.

8.6 PERSONNEL QUALIFICATION AND TRAINING

The individuals performing work in this TWP related to model simulations should have an understanding of the architecture of GoldSim and be familiar with the following reports:

- *Total System Performance Assessment for the Site Recommendation* (CRWMS M&O 2000)
- *Total System Performance Assessment (TSPA) Model for Site Recommendation* (BSC 2002a)
- *Performance Analyses* (BSC 2001)
- *Total System Performance Assessment Sensitivity Analyses for Final Nuclear Regulatory Commission Regulations* (Williams 2001a).

The individuals performing work in post-processing the results of the simulations should have sound knowledge in statistics and probabilistic methods and have familiarity with uncertainty and sensitivity analyses.

The reviewers must also have completed all training matrix requirements specific to their job assignment and discipline prior to initiating review activities. Additionally, they must have completed the following training:

- LPTEC00-010: SCI-PRO-004, *Managing Technical Product Input*
- LPTEC03-009: SCI-PRO-005, *Scientific Analyses and Calculations*
- LPTEC03-010: SCI-PRO-006, *Models*

9. SOFTWARE

A number of software codes will be implemented to support the TSPA-LA model. The codes will be used for both providing supporting information, and directly implementing the TSPA-LA model.

The TSPA-FEIS model was used as the starting point for the TSPA-LA model. Currently, the TSPA-FEIS model contains both qualified and unqualified software, and is the culmination of the work done for the TSPA-SR (BSC 2002a), *Performance Analyses* (BSC 2001), and *Total System Performance Assessment – Analyses for Disposal of Commercial and DOE Waste Inventories at Yucca Mountain – Input to Final Environmental Impact Statement and Site Suitability Evaluation* (Williams 2001b). During initial TSPA-LA model development, changes

to the TSPA-FEIS model and the associated software codes will occur. Some additional software may be developed or older versions of codes may be revised or updated. The software codes that are currently identified for potential use in the TSPA-LA model are listed in Table 9-1. The software required for the TSPA-LA is evolving, and as such, additional software may be utilized, and some of the software listed in the table may not be utilized. In particular, a revised version of the GoldSim code and architecture is expected to be used for the results to be presented in the TSPA-LA AMR. The version of GoldSim used to obtain these results will be qualified before use and the software qualification will be documented in accordance with the applicable quality assurance procedures.

Table 9-1. List of Software Codes That May Be Used for TSPA-LA Model

Code	Version	STN	Current Qualification Status
ASHPLUME_DLL_LA	2.0	11117-2.0-00	Qualified
CWD	2.0	10363-2.0-00	Qualified
EXDOC	TBD	TBD	To be qualified
FEHM	2.23	10086-2.23-00	Qualified
GETTHICK	1.0	11229-1.0-00	To be qualified
GoldSim ^a	TBD	TBD	To be qualified
InterpZdll_LA	1.0	11107-1.0-00	Qualified
IPPP_LA	1.0	11072-1.0-00	Qualified
LC_FAIL_DIST_LA.DLL	1.0	11130-1.0-00	Qualified
MFCP_LA	1.0	11071-1.0-00	Qualified
MkTABLE	1.00	10505-1.00-00	Qualified
MVIEW	4.0	TBD	To be qualified
PassTable1D	1.0	11142-1.0-00	Qualified
PassTable3D	1.0	11143-1.0-00	Qualified
PrePost_SATOOL_CT	2.0	TBD	To be qualified
PREWAP_LA	1.0	10939-1.0-00	Qualified
SATOOL	1.2	10084-1.2-00	Qualified
SCCD	2.01	10343-2.01-00	Qualified
SEEPAGEDLL_LA	1.2	TBD	To be qualified
SOILEXP_LA	1.0	10933-1.0-00	Qualified
SZ_CONVOLUTE	3.0	10207-3.0-00	Qualified
TSPA_Input_DB	2.2	TBD	To be qualified
WAPDEG	4.07	10000-4.07-00	Qualified

^a The final qualified version of GoldSim to be used for the TSPA-LA model will be determined at a later date. Other versions of GoldSim may be used for some of the analyses.

10. ORGANIZATIONAL INTERFACES

10.1 INPUT ORGANIZATIONS

PA currently performs the role of providing all direct inputs to the development of the TSPA-LA model. Their responsibilities in satisfying this role are to provide supporting documentation and data in a timely manner capable of sustaining efforts to complete the TSPA-LA model and the TSPA-LA AMR within the baselined schedule.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of) Docket No. PAPO-00
)
U.S. DEPARTMENT OF ENERGY) ASLBP No. 04-829-01 PAPO
)
(High Level Waste Repository:)
Pre-Application Matters) October 29, 2007

DECLARATION OF MIKE THORNE

My name is Mike Thorne. My *curriculum vitae* is attached as Exhibit A. I am over the age of 18 and have never been convicted of a crime. I am of sound mind and am fully qualified to make this Declaration. The facts stated herein are within my personal knowledge and true and correct.

1. I am one of the experts retained by the State of Nevada to review DOE's impending application to the NRC for a construction authorization for the proposed repository at Yucca Mountain in the State of Nevada, and to assist Nevada in the development and drafting of contentions. A statement of my qualifications and background is attached. I am qualified and experienced in performing risk assessments for nuclear waste disposal facilities. I have personal knowledge of the following facts, based on my education, experience, and my extensive review of documents relating to the Yucca Mountain project.
2. I have reviewed numerous documents placed by DOE on the LSN, and I am familiar with DOE's approach to developing its Total Systems Performance Assessment or "TSPA," which is its effort to assess quantitatively the combined performance of the natural and engineered systems at Yucca Mountain and compare the results with dose standards established or to be established by the EPA.
3. Analysis Model Reports or "AMRs," together with any necessary additional data files, are the basic building blocks of DOE's TSPA, and the TSPA cannot be fully evaluated without them. Several AMRs to be used in the TSPA, as of DOE's LSN certification on October 19, 2007, were not publicly available on the LSN, including the following especially important AMRs:
 - a. An AMR, or similar document, that justifies the final exclusion of various possible features, events and processes (or FEPs") from the TSPA. The TSPA analyzes the effects of FEPs on repository performance, and the wrongful exclusion of one or more FEPs could affect the TSPA dramatically.

- b. An AMR that supports the overall integration of models and analyses in the TSPA. This may be the most critical AMR because of its scope and obvious import for the validity of the entire TSPA.
4. In the absence of AMRs, the DOE is relying on identifying data for use in the TSPA using TDIPs. It is noted that these are not an adequate substitute for the AMRs, as they do not provide justification for the conceptual and mathematical models adopted, or for the specific parameter values or distributions used with those models. Rather, they are compilations of the information currently being used in calculations and are subject to revision.
5. An indication of the types of TSPA information that could be supplied in support of the TSPA in the license application (the "TSPA-LA") is that provided recently in support of the TSPA done specifically for DOE's Supplemental Environmental Impact Statement for Yucca or "TSPA-SEIS." This information has been provided directly to the State of Nevada on a hard drive including approximately 150 Gbytes of data. The type of information given on this hard drive will be fundamental to scrutinizing the adequacy of the TSPA-LA. However, it must be emphasized that the information given relates only to the TSPA-SEIS¹ and that it cannot be known the degree to which the information to be provided for the TSPA-LA will be the same as the TSPA-SEIS. Thus, for example, in the file 'README DOCUMENT FOR TSPA-SEIS file transmittal' (henceforth referred to as the README file), relating to the Input Database Software and Contents, it is stated that "[t]he TSPA_Input_DB Version 2.2 is not included in this submittal. The database has a check box that indicates that the values and the references have been confirmed. At this time, the parameters have not all officially completed this process." The admission that the parameter values and references have not all been officially confirmed shows that the input database is at an interim stage of development and changes can be anticipated in the database that will underpin the TSPA-LA.
6. Although extensive information has been provided, it is not comprehensive even in terms of the TSPA-SEIS. For example, in the README file a list is given of Source GoldSim Files used for GoldSim Files in this submission. GoldSim is a software tool that serves as the architecture for integrating the TSPA data and models and for performing the necessary multiple Monte Carlo simulations or calculations of dose (or runs). Under this heading, it is stated that Groundwater Model: v5.000_GS_9.60.100 is not included, whereas the corresponding Eruptive Model: vE1.004_GS_9.60.100 is included. No explanation is provided as to why the two models have been handled differently.
7. Also, the DLL (dynamic link library) files that are shared computational modules used in the calculations are not provided. The Groundwater Model cases/runs are stated to have used DLL_Set_34 and the Igneous Eruptive Model cases/runs used

¹ Section 6 of the README file states that the model is subject to the limitations documented in *Total System Performance Assessment Package for the Draft Supplemental Environmental Impact Statement* (TDR-WIS-PA-000014).

DLL_Set_35. The composition of these DLL Sets is listed in Section 7 of the README file. It is stated that this and other software listed as not included shall be obtained from the Software Configuration Management Organization in accordance with the current version of IM-PRO-003. This is an internal Sandia document that is available on the LSN. It does not appear to relate to the provision of software to third parties. As the DLL files are integral to the TSPA-SEIS, it is clear that the information package is incomplete, in that further actions would be required by the State of Nevada to acquire the additional material. Again, it is noted that these DLL files are subject to change. Thus, FAR_1-2.dll (official software name FAR) is listed as a prototype in DLL_Set_034, where it is stated not to be used by the Groundwater Model. However, it is also listed in DLL_Set_035 where it is not declared as a prototype and is stated to be used.

8. In summary, the information included on this hard disk demonstrates that comprehensive documentation on TSPA calculations can be generated and extensive information in support of the TSPA-SEIS can be provided on the LSN. However, the software required to access the documentation and perform calculations would need to be obtained separately and represented by a header on the LSN. The SEIS material that can be scrutinized includes the GoldSim case files and these provide both input data and a range of results. The cases provided relate only to the TSPA-SEIS and include preliminary information that will either be replaced or updated in the TSPA-LA. Furthermore, the model structures displayed in the GoldSim case files may also be modified for the TSPA-LA.
9. Currently, no GoldSim-based calculations have been provided that can be identified as being intended for use in support of the TSPA-LA. Thus, although the hard disk provides a great deal of information relevant to the TSPA-SEIS, it is not an appropriate basis for evaluating the adequacy, or otherwise, of the TSPA-LA. In order to provide a reasonably complete basis for evaluation, this material needs to be complemented with details of the changes that will be made to the models and data in the calculations to underpin the TSPA-LA. Mechanisms exist for recording such changes, e.g. in the change checklists associated with individual cases and provided for the TSPA-SEIS cases on the hard disk.
10. Millions of DOE documents are on the LSN. It is likely that some of these documents will be relied on in the TSPA-LA. However, using the LSN data base in its current form to predict what the TSPA-LA will look like, and to draft a reasonably complete set of TSPA contentions, would be analogous to trying to put a one thousand piece jigsaw puzzle together from a box of several million pieces, some from different puzzles or prior versions of the same puzzle, and with several important pieces known to be missing.



Mike Thorne

Exhibit 61

Exhibit 61

DN2002469578



QA: NA

TWP-CRW-RL-000002 REV 01

April 2007

Technical Work Plan for:

**Defensibility of Technical Products
Supporting the License Application**

Prepared for:
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Office of Repository Development
1551 Hillshire Drive
Las Vegas, Nevada 89134-6321

Prepared by:
Sandia National Laboratories
OCRWM Lead Laboratory for Repository Systems
1180 Town Center Drive
Las Vegas, Nevada 89144

Under Contract Number
DE-AC04-94AL85000

**OFFICIAL USE ONLY
PRIVILEGED AND CONFIDENTIAL
Litigation Work Product**

Model vulnerabilities that are identified through this process, or that are identified by the PASIT, will be prioritized on the basis of importance to quantitative requirements and barrier capability, in coordination with the PASIT, and in terms of potential adverse impacts to technical credibility, as discussed previously. The highest priority vulnerabilities will be addressed first. If there is enough time for the particular vulnerability to be corrected in time for the compliance analysis, this option will be chosen. It is anticipated that there will be some vulnerabilities that will be addressed later, in coordination with the appropriate subject matter experts and PA analysts, by addressing in the NGPA the particular aspect of the model or analysis that represents a vulnerability.

For example, interactions of personnel between the PA System Integration Department and the Licensing Department as a part of the current work scope have identified a vulnerability: the technical basis for calculating the probability of a volcanic event is not the same as the technical basis for calculating the consequences of the same volcanic event. The probability calculation (i.e., the results of the Probabilistic Volcanic Hazard Assessment) is about 10 years old, while the consequence calculation relies, in part, on more recent data. The significance of this inconsistency will be examined and quantified for the compliance assessment. A possible approach for the mitigation plan would be to use the results of the current Probabilistic Volcanic Hazard Assessment (when they become available) in future iterations of PA analyses during license defense (i.e., the NGPA) so that it reflects consistent technical bases for both the probability calculations and the consequence calculations.

Performance indicators for model review, depending on the phase of the VA, include the following: (1) the number of AMRs and TDIPs reviewed, compared to the total number of AMRs and TDIPs to be reviewed; (2) the number of vulnerabilities identified, compared to the number of AMRs and TDIPs reviewed; and (3) the number of high priority vulnerabilities for which mitigation plans have been written, compared to the number of high priority vulnerabilities identified.

Like the FEP process above, success for this activity is measured by whether the compliance analysis is successful. For LA submittal, successful technical review of the PA implementation and, specifically, of the system model, by a multidisciplinary set of peers, will be the measure as currently proposed by the LL. When there are known vulnerabilities, the path forward to address the important vulnerabilities must also be reviewed, and success for this VA activity is measured by whether the review of the PA implementation, in addition to the mitigation plans for the important vulnerabilities, is successful.

B.4. Mitigation Decisions

When each mitigation plan for a vulnerability that is not appropriate for entry into the CAP system is completed, a Decision Package will be developed for the consideration of the LL Senior Management Team. The Decision Packages will contain information relevant to certain decision attributes, including but not necessarily limited to the following:



PREPARER (e.g., author/Sandia contact):

Complete items 1-8.
Provide the DRC and review document to the reviewer.

PREPARER:

If there are comments requiring response, prepare response to each comment; complete item 11, and return to reviewer.

REVIEWER:

Review the document applying the criteria specified below and complete items 9 & 10.
Provide comments on following page(s) and return DRC to review requester/delegate.

REVIEWER:

Review responses to comments. Indicate acceptance or rejection on the DRC and complete item 12.

NOTES: REVIEWER and PREPARER are encouraged to discuss comments. If comment(s) cannot be resolved, refer the issue(s) to management.
Entries must be complete, legible, and in reproducible ink or completed electronically.

1. Document Title: LA Conceptual Design Report - Postclosure Analysis and Activities 2. Rev. #: 00D 3. QA Designation: QA N/A

4. Document Description (e.g., abstract, procedure, SAND report): Conceptual Design Report 5. Response due: 10/31/06

6. Type of Review and Criteria: Technical (Technical adequacy, accuracy, completeness) Information: Management (Completeness and correctness)
-Are objectives clearly stated and fulfilled? -Are there potential impacts on reviewing org. or -Is report consistent with policy?
-Is the technical activity clearly described? -Is reviewing organ. impacting document? -Is there consensus with other program documents?
-Are equations/calculations accurate? QA (Compliance and completeness) -Does the document meet applicable criteria?
-Does logic lead to reasonable conclusions? -Are applicable QA requirements adequately cited/incorporated and met (content, reviews)?
-Are the results drawn from the data supported by data presented? -Has the technical review been performed by someone who is "independent"?

Other type of review (please specify or leave blank if not applicable): _____

7. Additional criteria (if applicable): See attached Email 8. Review Preparer: Ralph Rogers 10/20/06
Responsible Manager Concurrence (Initials): _____ Printed Name Date

9. Reviewed by: Robert W. Andrews BSC-L&NS 10/30/06
Reviewer's Printed Name Reviewer's Signature Org. Date

10. One of the following boxes must be checked: No comments Decline to comment Comments on following pages Comments on markup

(This section to be left blank if there are no comments requiring a response.)

11. Response to comments prepared by: _____
Preparer's Printed Name Preparer's Signature Org. Date

35.	Y	Sec: 2.2.1, Pg 1 1st sentence	Change to "...a historical summary"	Comment accepted		CDR changed to reflect comment. (11/14/06, PMR)		
36.	Y	Sec: 2.2.1, Pg 1 4 th sentence	Identical to what? Suggest delete ".....identical and"	Comment accepted		CDR changed to reflect comment. (11/14/06, PMR)		
37.	Y	Sec: 2.2.1, Pg 2-1 1 st para	Because DOE has contracted with the USGS to develop a special version of the <i>Yucca Mountain Site Description</i> , it is useful to mention whether that is expected to be cited in GI Section 5 and whether additional information is being developed for inclusion in this document that would require revision of GI Section 5.	No CDR text change	X	According to Claudia Newbury, the USGS GSA Special Paper is to be slightly updated with more recent information but is not to be cited in the LA . Site Characterization ended. If necessary, we can state that we will not use it. I had noted things that we knew were changing, not thing that we did not intend to cite. This is a perplexing issue for LA defense space. The first volume MAY be issued in 2007 which may impact Geology, Structural, Tectonics, but the second volume which would split out geochemistry into a number of sections, and UZ and SZ hydrology would not be published until the unknown future. (11/14/06, RH)		
38.	Y	Sec: 2.2.1, Pg 2-1 1 st para	It is not clear what "will not be routinely revised" implies. Are any significant changes to GI Section 5 planned? It is also not clear where or if GI Section 5 will need to be revised to be consistent with additional information to be included in SAR Sections 2.2 and 2.3.x.	Revised CDR text		No significant changes are planned, except if the major drivers change an understand of the site. It means that no changes are anticipated other than consistency with Sections 2.2 and 2.3, and new demographics and land use data. (11/14/06, RH)		
39.	Y	Sec: 2.2.2, 1 st bullet	Delete as there is no new PSHA activity and the PVHA will not be completed until June 08. About all that can be said is that the PVHA will be updated and provided to the NRC during the hearing process. New TSPA runs with the updated PVHA results will be included the update to the LA.	No CDR text change		Verified that they will not be done and CDR table 17-2 lists the PVHA and PSIIA as not changing so any reference to a new PVHA or PSHA will be deleted. (11/14/06, RH)		

Exhibit 62

Exhibit 62

HLW-PAPO 00104
Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

July 14, 2005 (2:35pm)

Title: U.S. Department of Energy
High-Level Waste Repository
Pre-Application Matters

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Docket Number: PAPO-00; ASLBP No.: 04-8239-01-PAPO

Location: Rockville, Maryland

Date: Tuesday, July 12, 2005

Work Order No.: NRC-499

Pages 441-574

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Template = SECY-032

SECY-02

1 I'm afraid, Your Honor -- and we also have processes
2 ongoing now where the project people are looking at,
3 here's the ones that we are presumptively going to put
4 out in full text. We're giving you on the project a
5 month or so, speak now or forever hold your peace
6 before we release these - just privacy information or
7 other privileged information, because we recognize
8 once we release them, we're not going back.

9 JUDGE KARLIN: Can I ask, do you have any
10 circulated drafts that you're going to be putting on
11 the LSN, not of the license application, necessarily,
12 but of any other reports and other documents?

13 MR. SHEBELSKIE: Right. Well, we made
14 this decision, Judge Karlin, with respect to the
15 underlying technical documents, like the reports and
16 studies, and analyses and AMRs, that we could have
17 gone through -- I mean, all these documents go through
18 a lot of drafting iterations, as you might imagine.
19 And we could have gone through and said this one is
20 not a circulated draft, this one is not, this is not,
21 this one is not. We also recognize though that was,
22 in part, going to be a very time-consuming and
23 expensive process, and we said well, we have these
24 drafts in our record compilation system. We're not
25 culling them out because they do or do not meet the

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1 definition of circulated draft, so we are voluntarily
2 producing many, many drafts of these technical
3 underlying documents so people can see the development
4 of the science. You don't need to see the draft
5 license application. We're going to be producing all
6 the details, warts and all, for the development of the
7 science on the project.

8 CHAIRMAN MOORE: Well, I would like to
9 just add one caveat. It's the difference between the
10 numbers that have been bandied around - 5,800 pages
11 and 70 chapters, and millions of pages. That strikes
12 some of us as --

13 MR. SHEBELSKIE: Millions of pages for the
14 license application?

15 CHAIRMAN MOORE: Well, so that the public
16 can see how the science was developed.

17 MR. SHEBELSKIE: Oh.

18 CHAIRMAN MOORE: And you have, under your
19 view of the world, not making any of this public, so
20 everybody is going to have precisely six months,
21 that's a huge difference. And that's, I think, one of
22 the underlying tensions in all of this that we're
23 having. With that said --

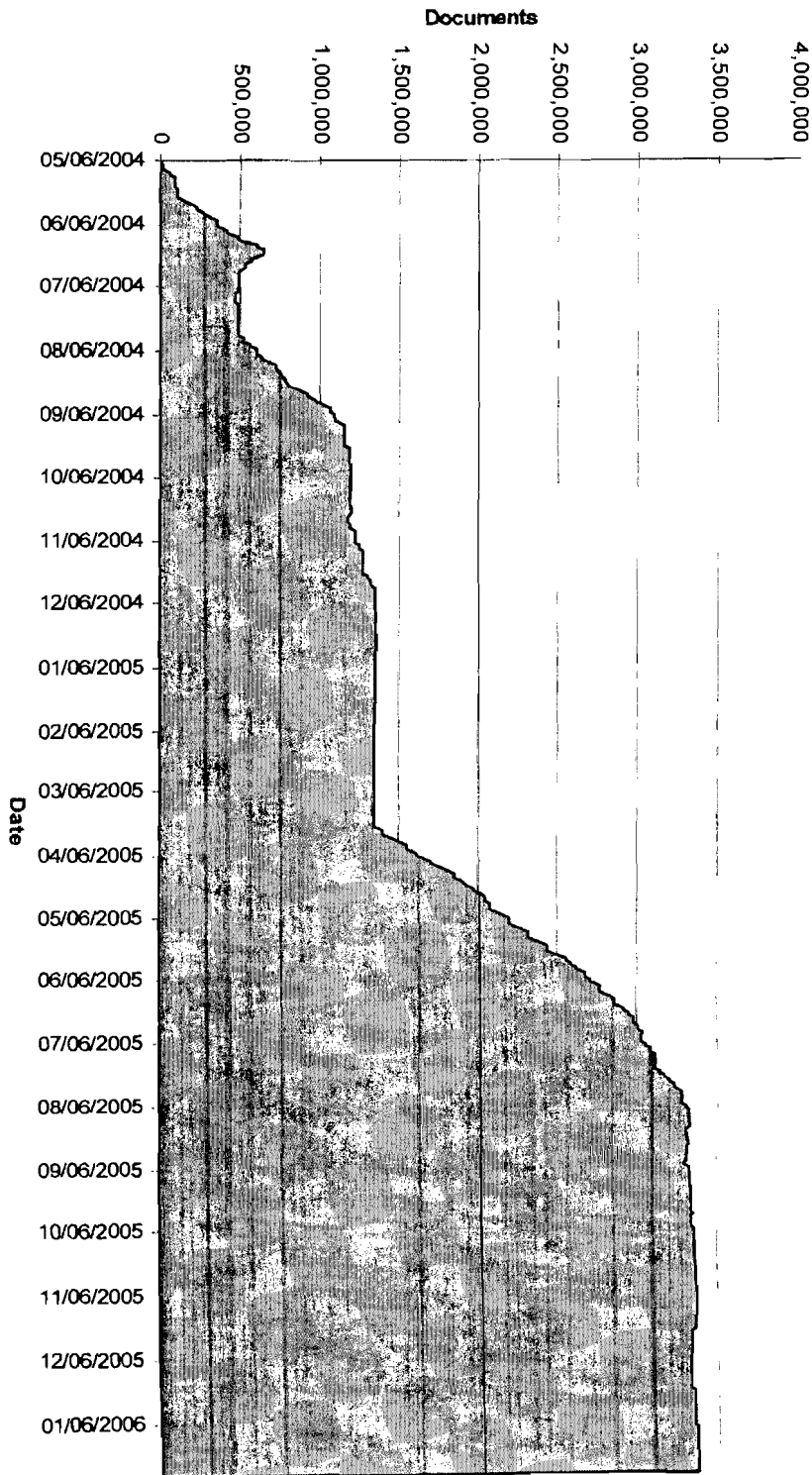
24 MR. SHEBELSKIE: That said, but there's
25 another point, keep in mind. You know, there has been

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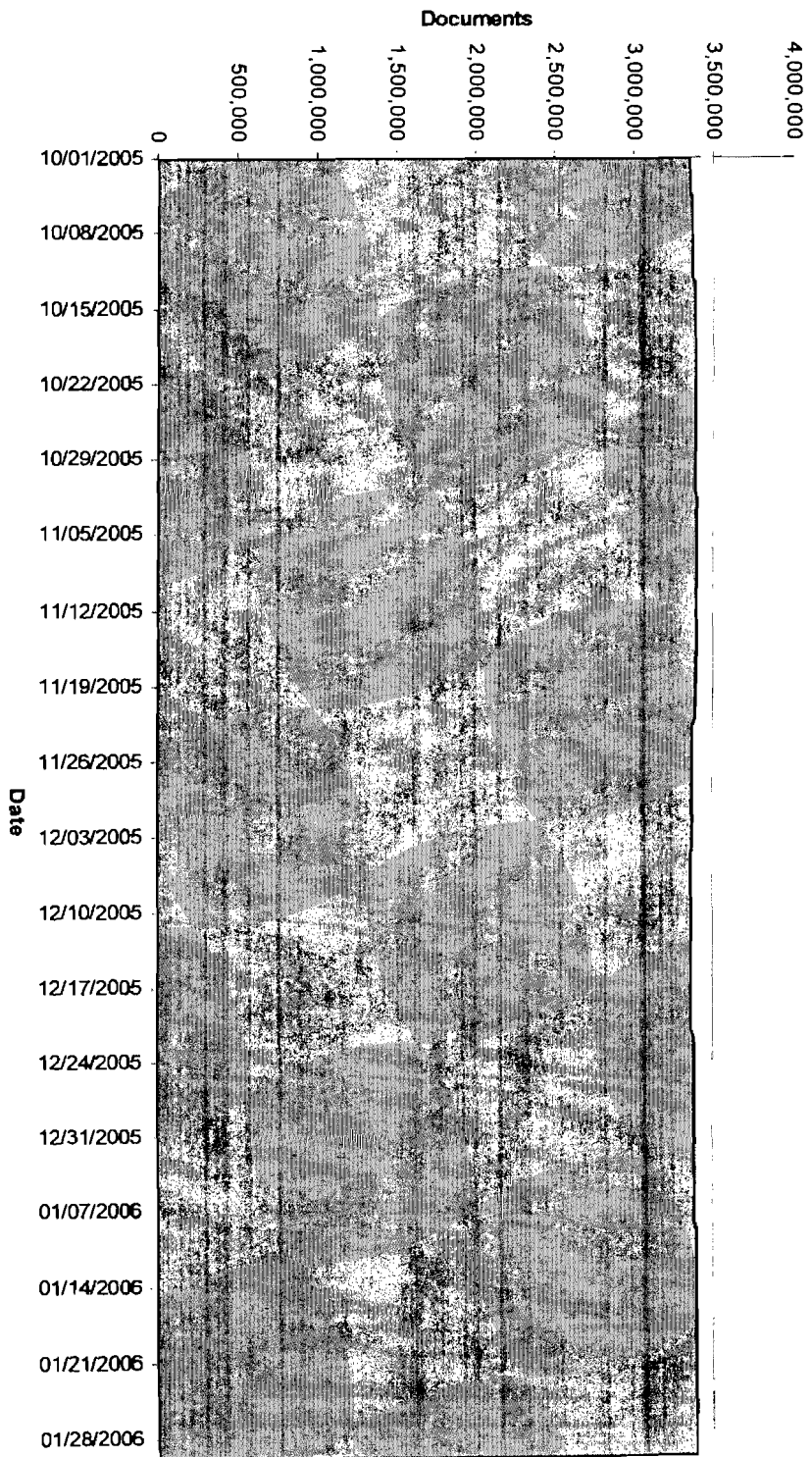
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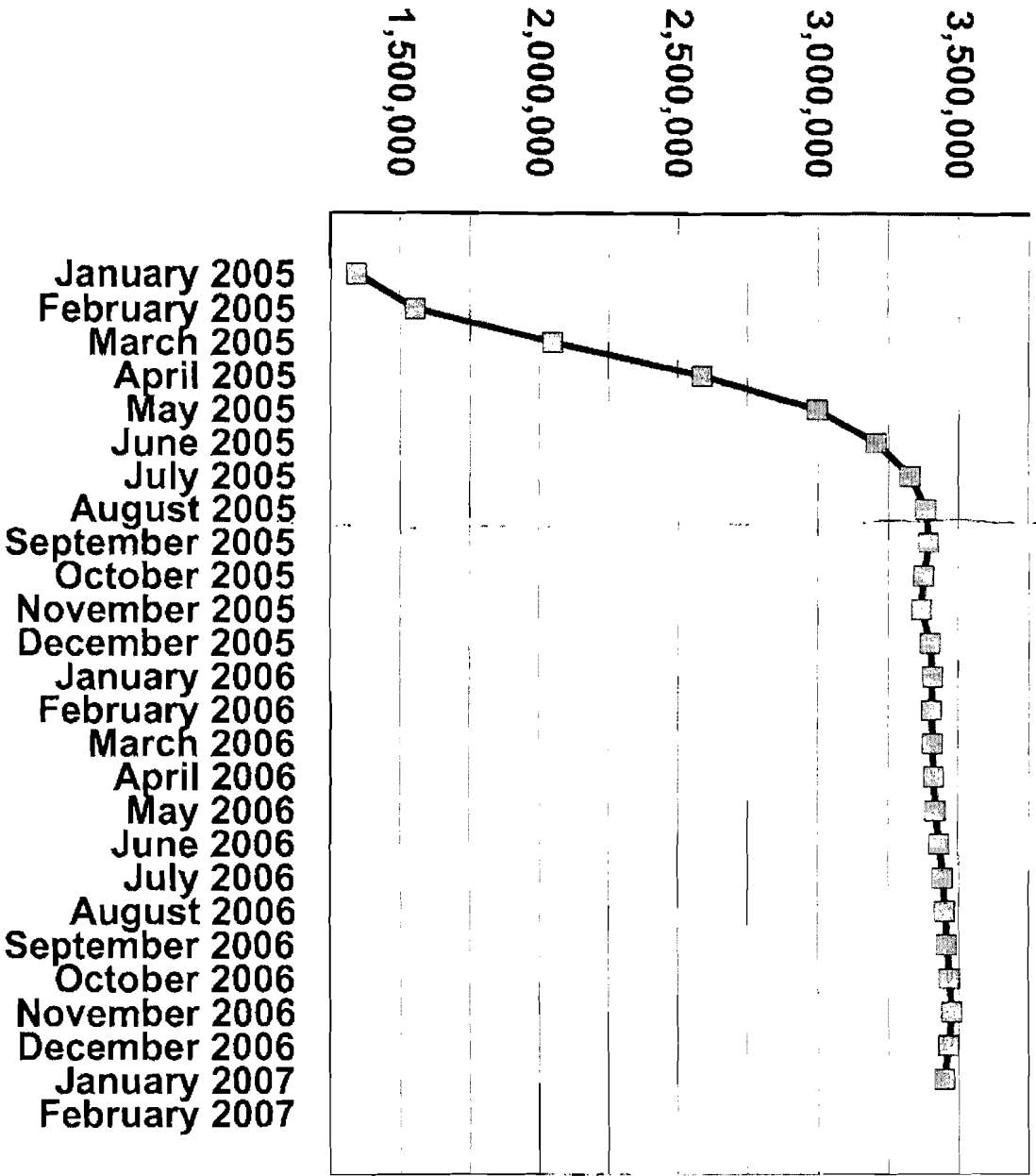
**LSN Load Statistics
DOE Collection**



LSN Load Statistics
Nov 05 - Jan 06



DOE Cumulative



DOE Cumulative





United States Department of Energy

Office of Public Affairs

Washington, D.C. 20585

News Media Contact:
Allen Benson, (702) 794-1322

FOR IMMEDIATE RELEASE
April 30, 2007

Additional Yucca Mountain Documents Made Available on NRC's Licensing Support Network to Facilitate Yucca Mountain Licensing Proceeding

Las Vegas, NV. -- The U.S. Department of Energy's (DOE) Office of Civilian Radioactive Waste Management (OCRWM) today made publicly available about 2.1 million additional Yucca Mountain-related documents through the Nuclear Regulatory Commission (NRC) Licensing Support Network (LSN). The LSN is an electronic database established by the NRC to support the agency's licensing proceeding for the nation's first spent nuclear fuel and high-level radioactive waste repository at Yucca Mountain, Nevada.

NRC's regulations for the Yucca Mountain licensing proceeding (10 CFR Part 2, Subpart J), require that all parties make their relevant documentary material publicly available on the LSN and certify their collections. The DOE must certify its LSN collection six months before the DOE submits its license application to the NRC

DOE currently plans to certify its LSN collection not later than December 21, 2007 and to submit its license application for authorization to construct the Yucca Mountain repository not later than June 30, 2008. DOE has already made about 1.3 million documents available on the LSN. As of today, DOE's collection of documents publicly available on the LSN now totals some 3.4 million documents, including scientific, engineering and other license related documents, and is estimated to exceed 30 million pages.

Today's early disclosure of additional documentary material in advance of DOE's LSN certification is intended to facilitate and expedite the Yucca Mountain licensing proceeding and to assist the NRC staff, the State of Nevada and potential parties to the Yucca Mountain proceeding in their review of DOE's documentary material. DOE will continue to add non-privileged documents to the LSN on an ongoing basis.

The NRC's LSN web site is at <http://www.lsnnet.gov>. Persons without access to the internet may use the public access computers at the following locations: DOE public reading room (1E-190), U.S. Department of Energy, Forrestal Building, 1000 Independence Ave. SW, Washington, D.C.; and most libraries worldwide.

-30-

YMP 07-03

Net Added Cumulative to Date

March 2005	209899	209899
April 2005	495175	705074
May 2005	540000	1245074
June 2005	407915	1652989
July 2005	210253	1863242
August 2005	125023	1988265
September 2005	64214	2052479
October 2005	10985	2063464
November 2005	-12018	2051446
December 2005	-7938	2043508
January 2006	30894	2074402
February 2006	9434	2083836
March 2006	-283	2083553
April 2006	4551	2088104
May 2006	2445	2090549
June 2006	6483	2097032
July 2006	15845	2112877
August 2006	10388	2123265
September 2006	8709	2131974
October 2006	5217	2137191
November 2006	11083	2148274
December 2006	7804	2156078
January 2007	8469	2164547
February 2007	-16699	2147848
March 2007	-17356	2130492
April 2007	-160	2130332
May 2007	36981	2167313
June 2007	23996	2191309
July 2007	8412	2199721
August 2007	34260	2233981
September 2007	48258	2282239
October 2007	21818	2304057
November 2007	10566	2314623

Net Added Cumulative to Date

Month	Net Added	Cumulative to Date
March 2005	209899	209899
April 2005	495175	705074
May 2005	540000	1245074
June 2005	407915	1652989
July 2005	210253	1863242
August 2005	125023	1988265
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October 2005	10985	2063464
November 2005	-12018	2051446
December 2005	-7938	2043508
January 2006	30894	2074402
February 2006	9434	2083836
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April 2006	4551	2088104
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August 2006	10388	2123265
September 2006	8709	2131974
October 2006	5217	2137191
November 2006	11083	2148274
December 2006	7804	2156078
January 2007	8469	2164547
February 2007	-16699	2147848
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May 2007	36981	2167313
June 2007	23996	2191309
July 2007	8412	2199721
August 2007	34260	2233981
September 2007	48258	2282239
October 2007	21818	2304057
November 2007	10566	2314623

(ADDED TO 1.4m FROM 6/04 CERT.)

+1.4m = 3,463,000

+1.4m = 3,704,000

DOE COLLECTION 2 YEARS AGO (10/05) - 3,463,000

DOE COLLECTION AT CERT. (10/19/07) - 3,703,000

Page 1990

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<input type="checkbox"/>	96%	DOE	<u>DRAFT C CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT & OPERATING CONTRACTOR ENVIRONMENTAL BASELINE FILE FOR BIOLOGICAL RESOURCES ATTACHMENT - MAPS OF BIOLOGICAL RESOURCES ALONG TRANSPORTATION CORRIDORS AND INTERMODAL TRANSFER STATIONS; Attach-(Pg2</u> LSN #: DN2001410439 Participant #: ALG.20050214.5841 Document Date: 12/22/1988 DRAFT C CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT & OPERATING CONTRACTOR ENVIRONMENTAL BASELINE FILE FOR BIOLOGICAL RESOURCES ATTACHMENT - MAPS OF BIOLOGICAL RESOURCES ALONG TRANSPORTATION CORRIDORS AND INTERMODAL TRANSFER STATIONS;
<input type="checkbox"/>	96%	DOE	<u>LANL tdif forms; SMF-UE25_b1</u> LSN #: DN2001881451 Participant #: ALB.20050324.3677 Document Date: 05/17/1982 LANL tdif forms; SMF-UE25_b1 . 1.3 Solid 3956.1 3956.4 Standard LANL ESS-1, Block Show: Solid 0.1 Solid 0.5 Solid 0.9 Solid 247 3959.1 3966.9 1.9 Solid 882 1.9 Solid 3966.9 LANL ESS-1, O.R.
<input type="checkbox"/>	96%	DOE	<u>SPALIB.FOR SUBPROGRAMS IN ALPHABETICAL ORDER IN FORTRAN-77; SPALIB</u> LSN #: DN2001242577 Participant #: ALA.20050503.8342 Document Date: 04/05/1989 SPALIB.FOR SUBPROGRAMS IN ALPHABETICAL ORDER IN FORTRAN-77; SPALIB . 4 SPWNDC (2*K*PI/(N-1))) RETURN 5 SPWNDO=0.54-0.46*COS(2*K*PI/(N-1)) RETURN 6 SPWNDO=0 (N-1))+0.08*COS(4*K*PI/(N-1)) RETURN END C-
<input type="checkbox"/>	96%	DOE	<u>SPALIB.FOR SUBPROGRAMS IN ALPHABETICAL ORDER IN FORTRAN-77; SPALIB</u> LSN #: DN2001252019 Participant #: ALA.20050503.8339 Document Date: 04/05/1989 SPALIB.FOR SUBPROGRAMS IN ALPHABETICAL ORDER IN FORTRAN-77; SPALIB . 4 SPWNDC (2*K*PI/(N-1))) RETURN 5 SPWNDO=0.54-0.46*COS(2*K*PI/(N-1)) RETURN 6 SPWNDO=0 (N-1))+0.08*COS(4*K*PI/(N-1)) RETURN END C-
<input type="checkbox"/>	96%	DOE	<u>ATTACHMENT A MULTI-DISCIPLINE GENERAL INSTRUCTION A-1.8/C-16.16 DESIGN STANDARD E-1.5.4/M-56/P-6 DIVISION OF RESPONSIBILITY FOR ENGINEERING AND DOCUMENTING EMBEDMENTS, AND PENETRATION OPENINGS AND SEALS; DORembedspeneseals</u> LSN #: DEN001170063 Participant #: ALD.20040617.3441 Document Date: 09/01/1977 ATTACHMENT A MULTI-DISCIPLINE GENERAL INSTRUCTION A-1.8/C-16.16 DESIGN STANDARD E-1.5.4/M-56/P-6 DIVISION OF RESPONSIBILITY FOR ENGINEERING AND DOCUMENTING EMBEDMENTS, AND PENETRATION OPENINGS AND SEALS; DORembedspeneseals . Embedment Metal to be
<input type="checkbox"/>	96%	DOE	<u>FIGURE 2.3-2 DEVELOPMENT AND SCREENING PROCESS FOLLOWED FOR FEPS RELATED TO WASTE FORM DEGRADATION. ALTHOUGH SHOWN AS SEQUENTIAL STEPS, ITERATION OCCURS AS NEW FEPS ARE IDENTIFIED.; Fig2.3_2</u> LSN #: DN2001995941 Participant #: ALA.20050428.5520 Document Date: 01/01/1901 FIGURE 2.3-2 DEVELOPMENT AND SCREENING PROCESS FOLLOWED FOR FEPS RELATED TO WASTE FORM DEGRADATION. ALTHOUGH SHOWN AS SEQUENTIAL STEPS, ITERATION OCCURS AS NEW FEPS ARE IDENTIFIED.; Fig2.3_2 . Obtain Universal FEP lists Generate site-specific FEP
<input type="checkbox"/>	96%	DOE	<u>DRAFT C CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT & OPERATING CONTRACTOR ENVIRONMENTAL BASELINE FILE FOR BIOLOGICAL RESOURCES ATTACHMENT - MAPS OF BIOLOGICAL RESOURCES ALONG TRANSPORTATION CORRIDORS AND INTERMODAL TRANSFER STATIONS; Attach-(Pg2</u> LSN #: DN2000820094 Participant #: ALB.20050324.4297 Document Date: 12/22/1988 DRAFT C CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT & OPERATING CONTRACTOR ENVIRONMENTAL BASELINE FILE FOR BIOLOGICAL RESOURCES ATTACHMENT - MAPS OF BIOLOGICAL RESOURCES ALONG TRANSPORTATION CORRIDORS AND INTERMODAL TRANSFER STATIONS;

HEADER VIEW: DN2001577045 - ALA.20040314.2268



OPERATORS TRAINING COURSE FOR MASTER- SLAVE MANIPULATORS (MSM) LESSON
PLAN 2

LSN Accession # DN2001577045

Information Source DN2

Participant Accession # ALA.20040314.2268

Title OPERATORS TRAINING COURSE FOR MASTER- SLAVE MANIPULATORS
(MSM) LESSON PLAN 2

Document Date 01/01/1978

Comments This document was undated or contained a partial date captured as
197801XX. A fictional date was created for the header in order to
accommodate LSN software requirements.

Non-Digital Media

QA Record Indicator

Of Images 10

Descriptors

Access Controls

Addressee Names

Addressee Orgs

Author Names GRAHAM EB

Author Orgs MSM

Document Numbers

Document Types DRAWING,LIST,MANUAL

Packages Ids BSC0832-2428-2469

Related Record #s

Related Record Codes

Traceabilities

Versions

HEADER VIEW: DN2002476647 - ALA.20060824.2646

LEAK SIP MEETING AGENDA (Redacted)

LSN Accession #	DN2002476647
Information Source	DN2
Participant Accession #	ALA.20060824.2646
Title	LEAK SIP MEETING AGENDA (Redacted)
Document Date	10/10/1978
Comments	Redacted version of LSN Accession Number: DN2002114363; Participant Accession Number: MOL.20011218.0070 due to privacy protected information.
Non-Digital Media	OPTIC
QA Record Indicator	N
# Of Images	2
Descriptors	
Access Controls	RED PRVCY
Addressee Names	DURRILL DC
Addressee Orgs	WESTINGHOUSE
Author Names	BOSI DM
Author Orgs	HANFORD ENGINEERING DEVELOPMENT LABORATORY
Document Numbers	7863311
Document Types	CORRESPONDENCE
Packages Ids	
Related Record #s	
Related Record Codes	
Traceabilities	7863311,I-75427
Versions	

HEADER VIEW: DN2002404914 - ALA.20040314.1946.



LEAD AUDITOR RECORD

LSN Accession # DN2002404914
Information Source DN2
Participant Accession # ALA.20040314.1946
Title LEAD AUDITOR RECORD
Document Date 10/21/1976
Comments
Non-Digital Media
QA Record Indicator
Of Images 2
Descriptors
Access Controls PRI PRVCY
Addressee Names
Addressee Orgs
Author Names LEE G,HAREN EC
Author Orgs ANSI,N/A
Document Numbers
Document Types FORM
Packages Ids BSC0149-0656-0661
Related Record #s
Related Record Codes
Traceabilites
Versions

HEADER VIEW: DN2002481933 - ALA.20071024.0017



101802.pdf

LSN Accession #	DN2002481933
Information Source	DN2
Participant Accession #	ALA.20071024.0017
Title	101802.pdf
Document Date	09/28/2007
Comments	
Non-Digital Media	
QA Record Indicator	
# Of Images	5683
Descriptors	
Access Controls	
Addressee Names	
Addressee Orgs	
Author Names	
Author Orgs	
Document Numbers	
Document Types	EFILE
Packages Ids	
Related Record #s	
Related Record Codes	
Traceabilities	
Versions	

**Department of Energy Programmatic
Spent Nuclear Fuel Management
and
Idaho National Engineering Laboratory
Environmental Restoration and
Waste Management Programs
Final Environmental Impact Statement**

Summary



April 1995

**U.S. Department of Energy
Office of Environmental Management
Idaho Operations Office**

From: CN=Steve Shapiro/OU=YM/O=RWDOE
PostedDate: 05/01/2006 01:29:32 PM
SendTo: CN=James Harding/OU=YM/O=RWDOE@CRWMS
CopyTo: CN=George Pannell/OU=YM/O=RWDOE@CRWMS;CN=Gordon Appel/OU=YM/O=RWDOE@CRWMS
ReplyTo:
BlindCopyTo:
Subject: LSN Completeness
Body:

Jim

I went to the "new" LSN website and could not locate several BSC/DOE documents that I would have thought would be present. Two specific documents having older Accession numbers are: MOL.20040520.0080 & ENG.20050805.0003. When searching by titles for these documents, either the response was 0 documents found or alternately greater than 22,000 documents found. How can a person indicate that they believe the LSN addresses appropriate documentation if you cannot locate documents in a random search?

Steve Shapiro
Regulatory Compliance
x 5-7436

Message Addressees

To:
James Harding/YM/RWDOE@CRWMS

Copy To:
George Pannell/YM/RWDOE@CRWMS;Gordon Appel/YM/RWDOE@CRWMS

10

PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT



QA: N/A

Office of Civilian Radioactive Waste Management

**Management Plan for Development
of the Yucca Mountain License Application**

YMP/04-01

REV 04, ICN 0

February 2007

*U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Las Vegas, Nevada*

PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT

ATTACHMENT 1 MARKING GUIDANCE

Draft LA CDRs, Draft LA, or Draft LA sections

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- Categorize as Not LSN Relevant

Emails (and other documents) transmitting copies of Draft LA CDRs, Draft LA, or Draft LA sections for comment

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- Also mark as Not LSN Relevant
- On Email Records Management System (ERMS) template (for emails), categorize as Not LSN Relevant and Privileged

Comments on Draft LA CDRs, Draft LA, or Draft LA sections

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- If comments include an attorney's comments, also mark as Attorney-Client Communication
- Categorize as LSN Relevant, unless
 - The comment merely states that you have no comments; or
 - The comments merely correct typographical errors
- For comments on Draft LA/Draft LA sections, also mark as Draft LA Comments

NOTE: Copies of comments on the Draft LA/Draft LA sections that are marked LSN Relevant are submitted to the LSN Project for review and production on the LSN as appropriate. Marking such comments as Draft LA Comments will assist the LSN Project identify these comments.

Emails transmitting comments on Draft LA CDRs, Draft LA, or Draft LA sections

- Body of the email should be marked as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- If the comments include an attorney's comments, also mark the body of the email as Attorney-Client Communication

ATTACHMENT 1 MARKING GUIDANCE (Continued)

- For comments on Draft LA/Draft LA sections, also mark the body of the email as Draft LA Comments
- On ERMS template, categorize as LSN Relevant and Privileged, unless the comments merely state you have no comments or merely correct typographical errors, in which case categorize the email as Not LSN Relevant and Privileged on the ERMS template

LA CDRs (approved issued versions)

- Mark as Privileged and Confidential, Litigation Work Product
- Categorize as LSN Relevant

In conjunction with an upcoming audit of the TSPA, the Lead Lab has asked whether the Draft TSPA-LA AMR and technical input documents for the TSPA (such as TDIPs) are privileged. The following provides guidance on these questions.

- Drafts of documents are subject to withholding under Exemption 5 of the Freedom of Information Act (FOIA) as preliminary, predecisional documents. Additionally, the NRC regulations for the Licensing Support Network (LSN) expressly exclude all drafts from the LSN (with the exception of "circulated drafts" of reports and studies, which does not apply to this context as a practical matter). 10 CFR 2.1019 (i) (2). Therefore, the Draft TSPA-LA AMR and drafts of any technical input documents are not required to be released under FOIA. Nor are they required to be made available on the LSN. The withholding of these documents from non-Yucca Mountain personnel during the audit of the TSPA would be consistent with the protected status of these documents.
- Once a technical document such as an AMR or TDIP is finalized under project procedures, it is no longer a draft and therefore no longer exempt from disclosure under exemption 5. Similarly, if the document meets the criteria for documentary material in 10 CFR 2.1001, the final version of the document must be included on the LSN at the time of DOE's certification. However, this applies to the final version of the technical document only. The drafts of the document remain exempt from FOIA and the LSN even though the document has been finalized.

LSN Accession # DN2002431184
Information Source DN2
Participant Accession # ALA.20070712.1698
Title Draft guidance on TSPA and DPP_v1
Document Date 05/22/2007
Comments
Non-Digital Media
QA Record Indicator
Of Images 1
Descriptors
Access Controls
Addressee Names
Addressee Orgs
Author Names
Author Orgs
Document Numbers
Document Types EMAIL-ATT
Packages Ids
Related Record #s ALA.20070712.1696
Related Record Codes ATT-TO
Traceabilities
Versions

Deliberative Process Privileged

Summary of the History and Status of TSPA for Yucca Mountain
March 12, 2007
Peter Swift

Brief history of TSPA for Yucca Mountain

Viability Assessment: Iterations of TSPA for Yucca Mountain began in the latest 1980s, and the first complete system analyses were in the early 1990s. These early TSPAs culminated in a large effort supporting the 1998 Viability Assessment (VA), which provided an assessment of the viability of the site that led to a decision by the DOE to proceed with the site recommendation process.

The TSPA-VA (1998) received a detailed external review by an external panel chaired by Chris Whipple, completed in 1999. Copies of that review will be provided to the panel.

Site Recommendation and Environmental Impact Statement: In 2000 and 2001, the DOE prepared a TSPA to support the Site Recommendation, TSPA-SR. The origins of the current TSPA are readily visible in the TSPA-SR. TSPA-SR was reviewed by an International Review Team (IRT) in 2001. Mel Gascoyne was a member of that review panel. The IRT review is available on the internet at http://www.ocrwm.doe.gov/documents/ymipr_a/index2.htm and copies will be provided to the IPAR.

This TSPA was updated in 2001 with supplemental science and performance analyses (SSPA) to provide a more realistic treatment of uncertainty (with relaxed conservatism), and the TSPA-SSPA provided the basis for the 2002 Final Environmental Impact Statement (FEIS) that accompanied the 2002 Site Recommendation. TSPA-SR and TSPA-FEIS together form the last published version of the TSPA.

TSPA work since 2002: All TSPA work since 2002 is unpublished, and all is categorized by the DOE General Counsel as privileged, in anticipation of future litigation. No results have been presented in public since 2002, and all TSPA-related material provided to this panel that postdates the TSPA-FEIS must be treated as privileged.

Following the Site Recommendation in 2002, DOE began a schedule of work that would lead to submittal of a license application (LA) to the NRC in December 2004. Preparation of the LA included an update to the TSPA-FEIS to fully qualify models used in the SSPA (the 2001 SSPA used a more realistic treatment of uncertainty that included a relaxing of the model validation requirements believed necessary for licensing). This work led to completion of a draft TSPA-LA Rev 00 in December 2004: however, the DOE chose, for multiple reasons, to delay submittal of an application until the fall of 2005, and work continued on updates to the TSPA. This eventually became TSPA-LA Rev 01E, which was archived in May 2006 without publication and which will not be used to support a license application.

Deliberative Process Privileged

provided to the IPAR after the March 26-28 meeting, in the form of draft Model and Analysis Reports (AMRs) and TSPA Data Input Packages (TDIPs).

We anticipate beginning system-level calculations with the new model in early April, and we anticipate having preliminary results in late May, available for the IPAR to review at their second meeting. We anticipate having final results in August 2007, ready for IPAR review at their third meeting.

The current project schedule calls for TSPA results to be released for public comment as part of the Draft Supplement to the Environmental Impact Statement in October 2007. Final documentation of the TSPA-LA will occur in the fall of 2007, and text and results will be incorporated in the Safety Analysis Report (the primary component of the License Application) for delivery to DOE in January 2008. DOE anticipates delivering the License Application to NRC no later than June 30, 2008.

Exhibit 63

Exhibit 63



Department of Energy
Office of Civilian Radioactive Waste Management
1551 Hillshire Drive
Las Vegas, NV 89134-6321

QA: N/A

SEP 13 2007

OVERNIGHT MAIL

Mr. Robert R. Loux, Executive Director
Nevada Agency for Nuclear Projects
1761 E. College Parkway, Suite 118
Carson City, NV 89706

Dear Mr. Loux:

This letter responds to your September 10, 2007, submittal to the Chairman of the U.S. Nuclear Regulatory Commission (NRC) regarding the U.S. Department of Energy's (DOE) licensing strategy for its Yucca Mountain License Application (LA). In that letter, you assert that:

- DOE intends to use a "next generation" performance assessment for license defense, rather than the Total System Performance Assessment (TSPA) modeling tool used to generate dose and release calculations for the LA.
- DOE is placing paramount importance on meeting the schedule for submittal of the LA, at the expense of consideration of safety and technical accuracy.
- The Technical Data Management System (TDMS) is "materially flawed."

None of those assertions are correct.

The LA that DOE will submit and defend will be based on the TSPA performed for the LA, and DOE believes that TSPA will be sufficient to support the grant of an authorization for construction. Your assertion that DOE will "[switch] midstream to its 'real' assessment" is simply wrong. DOE fully expects the TSPA to be examined thoroughly during the licensing process and, subject to any changes required as a result of that process, to be the basis for the NRC's decision on whether to grant construction authorization. DOE believes the state of Nevada will have ample opportunity to scrutinize this TSPA during the formal adjudicatory proceeding provided for in the Nuclear Waste Policy Act (NWPA).

DOE rejects the implication that adhering to a schedule and producing a quality application are mutually exclusive. After more than two decades of work, DOE does believe the time has come to submit the LA, recognizing that approval of an authorization to construct the repository must be based on the record developed during the licensing proceeding.

With respect to the assertion that the TDMS is "materially flawed," you cite a draft of a Technical Support self-assessment report. The state of Nevada's conclusion is premature.

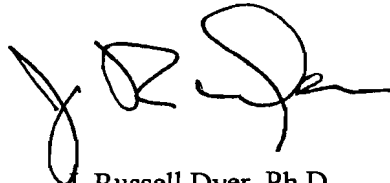
The Executive Summary of the final version of that document states: "The TDM Systems do not automatically support and in some cases inhibit the flow of the work. By not automatically supporting the flow of work, **humans must manually ensure the integrity, accountability, and traceability of the data.**" [Emphasis added]

DOE has taken and continues to take the steps necessary with its federal and contractor personnel to ensure the integrity, accountability and traceability of the data and, as noted above, the extent to which we do so will be fully examined during the licensing proceeding. We strongly disagree with the statement of the state of Nevada that reliance on humans makes the system materially flawed.

Finally, DOE believes that all potential participants in the licensing proceeding should refrain from speculation based on incomplete information regarding the TSPA, and should await the LA submittal and the formal adjudicatory proceeding provided for in the NWPA.

If you have any questions, please contact me at (702) 794-1448.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Russell Dyer". The signature is fluid and cursive, with a large initial "J" and "R".

J. Russell Dyer, Ph.D.
Chief Scientist

cc:

Honorable Dale E. Klein, NRC, Rockville, MD
Commissioner Jazko, NRC, Rockville, MD
Commissioner Lyons, NRC, Rockville, MD
Honorable James A. Gibbons, State of Nevada, Carson City, NV
Nevada Congressional Delegation
NRC O/R Representative, Las Vegas, NV
J. D. Parrott, NRC, Las Vegas, NV
W. D. Barnard, NWTRB, Arlington, VA
M. P. Lee, ACNW, Rockville, MD
M. T. Ryan, ACNW, Rockville, MD
Catherine Cortez Masto, Nevada Attorney General, Carson City, NV

OCRWM	Comment Sheet	1. QA: NA 2. Page 0 of 17
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3. Document Title: Yucca Mountain Repository License Application Conceptual Design Report, Postclosure Analysis and Activities NNPP Comments on SANDIA's comments provided in the "Response" column	
4. Document No. /Rev./ICN: XXX-XXX-XX-00000X REV 00A	5. Date: July 2006

6. Manager of Reviewing Organization (Print Name): Tito Bonano	7. Org./Discipline: Lead Laboratory Licensing Department
---	---

8. CODE	9. SECT./PAR	10. COMMENT/SUGGESTED RESOLUTION	11. RESPONSE (NNPP comments on SANDIA's comments)
1. PA (TSPA)	General	Lists of all tables and figures in the September 2005 version of the LA are provided for each section. These lists take up a lot of space for minimal added value. Consideration should be given to eliminating them. The attempt to identify all of the tables and figures that may change is a little more helpful, but still is probably not the optimum way of presenting this information. It would be much more informative to replace these extensive lists with text that describes the nature of the changes and the reasons for them. We probably cannot predict precisely which specific figures will change, nor should this be prescribed. Some flexibility in what figures and tables will best explain the results associated with changes presented in the SAR is appropriate and necessary.	Agree.
2. PA (TSPA)	General	Most of the lists of tables and figures anticipated to change provide no reason for the changes except something like "May change due to changes in _____." It would be helpful to list the specific reasons for the changes if they are known.	Agree. Need to evaluate Rev 0C for continued applicability of this comment—additional information added to Rev 0C may negate its applicability. (AS)
3.	General	Risks are presented in several different tabular formats. The format should be standardized and used throughout the document. The most helpful format is the one used in Section 12.6 on page 226, as it presents estimates of the probability and consequence components of the risk.	Agree. NNPP provided similar comment. Comment no longer applicable—table format has been standardized in Rev 0C (AS).

22. PA (TSPA)	General	The list of supporting products describes changes being made to certain documents and identifies other documents where no changes are being made. For the latter there is no indication as to why no changes to certain documents are required. It is not always obvious why this is the case so if this table is to be retained it is suggested that it be made more comprehensive by including reasons why no changes are required to those documents.	Agree. 2. Page 0 of 17
23. PA (Palmer Vaughn)	Section 2.2.1, pg. 4, 3 rd par., last sentence Now Sect. 3.2.1, Pg. 17, 3 rd Par., last sentence (AS)	It is not clear what the significance or purpose is of the sentence "To the extent practical, no NRC-sponsored research or analyses are discussed or presented, unless that information is used to support the technical basis or is different from the technical basis, and the reasons for the differences need to be present." Please clarify.	Agree. Recommend sentence be deleted.
24. PA (TSPA)	General	The phrases "best-estimate" and "realistic" should be replaced with the terms "performance margin analysis (PMA)" and "next generation performance assessment", as appropriate. PMA is intended to be a performance assessment using the TSPA architecture but with less bias in the characterization of uncertainty. It will be used to evaluate the performance margin associated with the compliance baseline in the summer 2007 time frame. The next generation performance assessment is not confined to the current TSPA architecture and is intended to incorporate state of the art algorithms, computational hardware, and new information as available. The next generation PA will support license defense activities after the 2008 LA submittal.	No comment.
25. PA (TSPA)	Section 2.2.5.1, pg. 8, 2nd par. Now Sect. 3.2.5.1, Pg. 21, 2 nd Par. (AS)	BSC and SNL should discuss Section 2.2.5.1 to make sure it is consistent with the approach that will be taken under the Lead Laboratory. For example, it is not clear what is meant by the following "The overall philosophy embodied in the scope of work for each technical work area is intended to ensure the postclosure performance assessment adequately incorporates the key aspects impacted by the changes and, as a first priority, to address any potential optimism in the TSPA. This approach uses sensitivity and impact analyses and supplemental calculations directly in the licensing basis without propagation through the TSPA." This does not seem to coincide with the Lead Laboratory approach.	Agree.

QA: NA

July 2007



Concept of Operations for the Yucca Mountain Project Technical Data Management System

Prepared for:
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Office of Repository Development
1551 Hillshire Drive
Las Vegas, Nevada 89134-6321

Prepared by:
Sandia National Laboratories
OCRWM Lead Laboratory for Repository Systems
1180 Town Center Drive
Las Vegas, Nevada 89144

Under Contract Number
DE-AC04-94AL85000

technical data management is complex because of the numerous applications used by the Technical Data Management System and Document Input Reference System. (See Section 4.0 for details of the current information systems architecture.)

The Technical Data Management System interfaces with at least seven other applications to support the input of technical data by the authors, the creation and input of metadata and indexing information associated with the technical data, and search and access to the information by authorized users. The Technical Data Management System is organized around three main functionalities: data entry, data quality assurance, and data retrieval/usage. These involve five separate sets of roles and responsibilities: originator, reviewer, data coordinator, database administrator, and records coordinator.

The Document Input Reference System, in conjunction with multiple applications, is primarily a reference management system that supports the formatting of bibliographies and cited works and cross-references document inputs and products to allow tracking of these references. The Document Input Reference System is organized around three main functionalities: reference entry, reference verification, and reference usage. These involve three separate sets of roles and responsibilities: originator, reference locator, and Document Input Reference System administrator. (See Section 3.0 for details of the current Technical Data Management Systems.)

We found serious issues and gaps in the technical data management (see Section 5.0) in our analysis. The Technical Data Management Systems do not automatically support and in some cases inhibit the flow of the work. By not automatically supporting the flow of work, humans must manually ensure the integrity, accountability, and traceability of the data. These issues and gaps include the following:

- Suboptimal business processes (e.g., no impact review action notification process for Qualified Supply List data in the Technical Information Center, no time limit on impact review action notification response, less than optimal quality control on U.S. Geological Survey data submitted directly into the Records Processing Center).
- Parts of the business processes are supported by the Technical Data Management System, the Document Input Reference System, and other peripheral systems while critical processes (e.g., impact review assessment notification, submission of technical products and product references, quality control, review of technical data, tracing developed data to source data) are accomplished manually.
- Most Technical Data Management System operating system software, middleware, database management system software, and programming languages are dated and are often unsupported technologies on the Bechtel SAIC Company network.
- Extensive manual manipulations are necessary to accomplish many of the operational procedures, which is time consuming and labor intensive, especially if errors are to be avoided.

- Each of the functional areas has supporting applications operating in a legacy infrastructure environment consisting of “stovepipe” systems and data.
- There are security and maintenance issues. For example, by design of the system, it is necessary for Technical Data Management System administrators to have full access to the file server and production database so that they can publish the static web pages, upload datasets, and update the database when they receive new or changed datasets. Because of this, administrators have the ability to accidentally manipulate production data without going through the application, thus bypassing access controls.

Recommendation for Moving Forward

We recommend that the current Technical Data Management System be replaced. The replacement system must automatically track data items through the system from end-to-end; conclusions developed and published for the Licensing System must be able to automatically verify how data was developed throughout the analysis and modeling process; and referential integrity must be maintained by the database system to ensure the consistency and accuracy of the data.

The goal is to create a streamlined optimal exchange and common understanding among various organizations and agencies that implement specific areas and to rid the process of duplicated efforts and manual manipulations. Enterprise Business Modeling and Value Stream Analysis is recommended to identify business areas that are either not addressed or are weak. This approach will also help the Information Technology Integration team target and prioritize business areas that need automation. Individual projects can then be evaluated with an understanding of how their effort fits into the overall business.

Redevelopment of the Document Input Reference System and the Technical Data Management System would provide the following desired changes (see Section 5.0 for a complete analysis of desired changes and recommendations):

- Overhauled longstanding outdated technology
- Reduced manual procedures (e.g., checking the accuracy and validity of data and references, change history, access control, and trace development)
- Integrated corresponding systems supporting the scientific investigation process (e.g., Technical Data Management System, Controlled Document Information System, Record Information System, Technical Information Center, Software Configuration Management, and Curatorial Sample Inventory and Tracking System)
- Enhanced data quality and integrity
- Enhanced system security and maintainability (e.g., access control and backups)
- Enhanced reporting capability

1.2 PROBLEM STATEMENT

Currently, the TDM Systems are a collection of six major databases, user interface screens, and processes requiring extensive manual manipulation. Although current functions can guarantee that current processes are being followed, the TDM Systems cannot guarantee the “correctness” of the process nor the “correctness” or authenticity of the data, and, consequently, accountability for license defensibility may fail in certain cases. Additionally, most of the TDM Systems hardware, operating system (OS) software, middleware, database management system software, and programming languages are outdated technologies. Furthermore, the requirements analysis of a replacement system must comply with both government and SNL quality assurance (QA) requirements.

2. QUALITY ASSURANCE DRIVERS

2.1 DOE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

The TDM Systems must comply with the DOE Office of Civilian Radioactive Waste Management (OCRWM), Office of Science and Technology and International (OSTI) Program guidelines, standards, and requirements for research, development, test, and analysis materials and methods for use in enhancing applications. The governing documents are as follows:

1. *Quality Assurance Requirements Document (QARD), DOE/RW-0333P*
2. Attachment 1, *Quality Assurance Requirements for Work Authorized by OCRWM Program and Funding Guidance Memorandum.*

SNL implemented the SNL OSTI QA Program to address OSTI requirements. The SNL OSTI QA Program is implemented via the SNL Quality Assurance Program Plan (QAPP) to satisfy the requirements of the QARD for the YMP. Of particular impact on the tasks discussed in this concept of operations are SNL guidelines for establishing processes, procedures, and responsibilities in the SNL QAAP, Supplement V, Control of Electronic Management of Data. The following guidelines apply to this supplement:

- *IM-PRO-002, Control of Electronic Management Information*
- *IM-PRO-003, Software Management*
- *IM-PRO-005, Software Independent Verification and Validation*
- *IM-PRO-006, Independent Verification and Validation*
- *SCI-PRO-002, Records Management*
- *SCI-PRO-004, Managing Technical Product Inputs*
- *TST-PRO-003, Scientific Notebooks.*

Exhibit 64

Exhibit 64



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



www.ocrwm.doe.gov

DOE/NRC Quality Assurance Technical Exchange



Conceptual Design Requirements

- **Establish the Scope and Content of the LA**
 - **Group 1 - Surface Design**
 - **Group 2 - Subsurface Design and Waste Package**
 - **Group 3 - Preclosure Safety Analysis**
 - **Group 4 - Postclosure Analysis and Activities**
 - **Group 5 - Programmatic**
- **Each CDR describes (for each LA section)**
 - **Regulatory requirements and NRC guidance (YMRP, etc.)**
 - **Planned content**
 - **Expected level of detail**
 - **Supporting products**
 - **Interfaces within LA**



PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT



QA: N/A

Office of Civilian Radioactive Waste Management

**Management Plan for Development
of the Yucca Mountain License Application**

YMP/04-01

REV 04, ICN 0

February 2007

*U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Las Vegas, Nevada*

PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT

5. LA ACTIVITY FLOW PROCESS

The LA activity flow process shown in Figure 1 commenced after DOE Energy Systems Acquisition Advisory Board (ESAAB) conditional approval of the Yucca Mountain CD-1 Package (July 2006). Approval of CD-1 for the Initial Handling Facility was received in February 2007. The following provides additional detail regarding key activities.

5.1 TECHNICAL ASSESSMENT AND GAP ANALYSIS

As part of the technical assessment, the requirements identification process systematically lists the regulatory and DOE requirements for the LA. The primary requirements for LA content and eventual submission to the NRC are provided in 10 Part CFR 2 and 10 CFR Part 63. NUREG 1804, Yucca Mountain Review Plan (YMRP) and NRC Interim Staff Guidance provide amplifying format and content guidance for the LA. NRC regulations and guidance are supplemented by OCRWM Director Guidance and project specific DOE requirements and commitments (e.g., CD-1 package). Based on the identified requirements, the technical assessment determines the product development activities necessary to support LA development.

LA requirements are allocated to individual LA sections in the LA CDRs. The LA requirements must be addressed and/or satisfied in the LA. A database will be maintained to reflect the associations between LA sections, regulations, YMRP, and other requirements. In addition, LA Requirements Traceability Maps are developed to identify and track requirements. For each LA section, the LA Requirements Traceability Maps will demonstrate the responsiveness of the LA sections with respect to 10 CFR 63.21 requirements and NUREG-1804 review methods and acceptance criteria.

Based on the results of the technical assessment and the LA requirements mapping, a gap analysis is performed to compare the September 2005 draft LA sections to the LA requirements, and identify necessary changes. The results from the technical assessment and the gap analysis are then used to develop the descriptions of LA and supporting product changes to be included in the LA CDRs.

5.2 LA CONCEPTUAL DESIGN REPORTS

The LA CDRs are organized into five groups (Surface Design, Subsurface Design and Waste Package, Preclosure Safety Analysis, Postclosure Analysis and Activities, and Programmatic). The template for CDRs is provided in Attachment 3.

The LA CDR activities facilitate early identification and resolution of LA issues to minimize the disruptive effects that changes could have in the final stages of the LA Project. The LA CDRs describe how the LA will satisfy the LA content requirements. This is achieved by describing the licensing approach for each LA section and the additional changes to be made in each LA section.

Development of Requirements Traceability Maps (crosswalk of regulatory requirements and YMRP acceptance criteria to LA sections) is worked concurrently with LA CDR development to ensure that requirements are captured and documented. A gap analysis is performed comparing the September 2005 draft LA sections to the LA requirements. Changes from the



Department of Energy

Washington, DC 20585

QA: N/A

NOV 15 2007

CERTIFIED MAIL 7000 1670 0005 4673 2396

Charles J. Fitzpatrick, Esquire
Egan, Fitzpatrick & Malsch, PLLC
12500 San Pedro Avenue, Suite 555
San Antonio, TX 78216

Dear Mr. Fitzpatrick:

This is in response to your September 25, 2007, Freedom of Information Act (FOIA) request for three of five of the Conceptual Design Reports. Please reference F2007-00727 in any future correspondence regarding this matter.

Under the provisions of the FOIA, documents held in U.S. government files will be disclosed to the public upon request unless withholdable under nine specific exemptions. One of those, Exemption 5 of 5 U.S.C. § 552(b), protects from disclosure attorney work-product privilege documents. We have determined that these documents meet the attorney work-product privilege criteria of Exemption 5 of the FOIA because they were prepared in anticipation of administrative litigation related to licensing the Yucca Mountain repository.

Exemption 5 of the FOIA also protects from disclosure inter-agency and intra-agency memorandums or letters which would not be available to a party other than an agency in litigation with the agency. We have determined that each of these responsive documents is exempt from disclosure under Exemption 5 of 5 U.S.C. § 552(b), because of the deliberative process privilege. Each document is a predecisional, deliberative communication requested by a U.S. Department of Energy official with responsibility for preparation of the License Application.

The general purpose of the deliberative process privilege is to prevent injury to the quality of agency decisions by encouraging open, frank discussions on matters of policy. The privilege also protects against the disclosure of proposed documents, agency positions, and decisions before they are finally adopted as well as the public confusion that might result from disclosure of reasons and rationales that were not in fact ultimately the grounds for an agency's decision. We have determined that releasing these documents could chill the deliberative process in the future, contrary to the purpose of the deliberative process privilege. Therefore, your request for a copy of these documents is denied.



Printed with soy ink on recycled paper

NOV 15 2007

In reviewing these documents, we also determined that any factual information cited in these documents are so intermingled with that material protected by FOIA Exemption 5, that it could not be segregated. Any information that could be segregated would result in meaningless words or phrases; therefore, there are no reasonably segregable documents we can provide.

I am the person responsible for the decision not to release the following documents:

1. Yucca Mountain Repository License Application Conceptual Design Report—Surface Design (MOL.20070227.0005; 200 pages)
2. Yucca Mountain Repository License Application Conceptual Design Report—Subsurface Design and Waste Package (MOL.20070227.0004; 154 pages)
3. Yucca Mountain Repository License Application Conceptual Design Report—Preclosure Safety Analysis (MOL.20070227.0007; 120 pages)

Our decision to withhold documents under the FOIA Exemption 5 may be appealed, in writing, within 30 days after your receipt of this letter, to the Director, Office of Hearings and Appeals, HG-1, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585. The written appeal must contain all other elements required by 5 C.F.R. § 1004.8. Judicial review will thereafter be available to you in the district where you reside, where you have your principal place of business, where the U.S. Department of Energy's records are situated, or in the District of Columbia.

In your August 2, 2007, letter you stated your willingness to pay fees in an amount not to exceed \$5,000. The following is an itemization of the fees associated with processing your request:

FOIA Officer --	\$46.98/hr
2 hrs @\$46.98	\$ 93.96
Plus 16%	<u>15.03</u>
Total	\$108.99

Exhibit 65

Exhibit 65



Department of Energy
Washington, DC 20585

QA: N/A

JUL 24 2007

Charles J. Fitzpatrick, Esquire
Egan, Fitzpatrick & Malsch, PLLC
1777 N.E. Loop 410, Suite 600
San Antonio, TX 78217

Dear Mr. Fitzpatrick:

This is in response to your July 2, 2007, Freedom of Information Act (FOIA) request for a copy of the "June 2007 integrated 'LA Product Baseline' mentioned by DOE representative April Gil at the June 26, 2007, DOE/NRC Technical Exchange Meeting in Las Vegas." Please reference F2007-000530 in any future correspondence regarding this matter.

In response to this request, enclosed is a CD-Rom containing the requested document.

In your July 2, 2007, letter, you stated your willingness to pay fees in an amount not to exceed \$500 for search and reproduction costs. The following is an itemization of costs associated with processing this request.

FOIA Officer GS 13/10 (\$46.98/hr)

1hr @ \$46.98	\$46.98
Plus 16%	<u>7.52</u>
Total	\$54.50

Upon receipt of the enclosed documents, please submit your check in the amount of \$54.50 made payable to the U.S. Department of Energy to: U.S. Department of Energy, Attn: Diane Quenell, 1551 Hillshire Drive, Las Vegas, NV 89134-6321. This completes our response to your FOIA request.

In addition to responding to your FOIA request of July 2, 2007, I am responding to your request to Mr. Michael Shebelskie of Hunton & Williams LLP for a copy of the current version of the Analysis Model Report (AMR) schedule. Enclosed is a copy of the AMR schedule noted above; this schedule differs from the License Application (LA) Product Baseline in that it includes the U.S. Department of Energy review and acceptance of the AMRs.



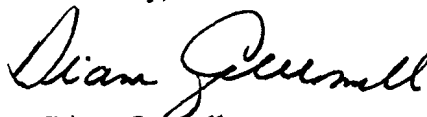
Charles J. Fitzpatrick

-2-

JUL 24 2007

If you have questions regarding our response to these matters, please contact me at (702) 794-5004 or at diane.quenell@ymp.gov.

Sincerely,

A handwritten signature in black ink that reads "Diane Quenell". The signature is written in a cursive style with a large, looping initial "D".

Diane Quenell
FOIA Officer

Enclosures:
As stated

Description	Document Number	Baseline Complete
Simulation of Net Infiltration for Present-Day and Potential Future Climates	MDL-NBS-HS-000023	06/17/07
Data Analysis for Infiltration Modeling; Extracted Weather Station Data used to Represent Present and Potential Future Climate Conditions within the Vicinity of Yucca Mountain	ANL-MGR-MD-000015	12/22/06
Data Analysis for Infiltration Modeling; Development of Soil Units and Associated Hydraulic Parameter Values	ANL-NBS-HS-000055	12/21/06
UZ Flow Models and Submodels	MDL-NBS-HS-000006	09/08/07
Calibrated UZ Properties	ANL-NBS-HS-000058	06/04/07
Radionuclide Transport Models Under Ambient Conditions	MDL-NBS-HS-000008	09/23/07
Particle Tracking Model and Abstraction of Transport Processes	MDL-NBS-HS-000020	09/23/07
Alcove 8 - Niche 3 Seepage and Transport Models	ANL-NBS-HS-000056	12/01/06
Saturated Zone Flow and Transport Model Abstraction	MDL-NBS-HS-000021	Concurrent with TSPA AMR
Hydrogeologic Framework Model for the Saturated-Zone Site-Scale Flow and Transport Model	MDL-NBS-HS-000024	04/19/07
Saturated Zone Site Scale Flow Model	MDL-NBS-HS-000011	05/20/07
Site Scale Saturated Zone Transport	MDL-NBS-HS-000010	06/30/07
Saturated Zone In-Situ Testing	ANL-NBS-HS-000039	05/16/07
Biosphere Model Report	MDL-MGR-MD-000001	10/07/07
Soil-Related Input Parameters for the Biosphere Model	ANL-NBS-MD-000009	Completed 10/11/2006
THC Sensitivity Study of Repository Edge and Heterogeneous Permeability Effects	ANL-NBS-HS-000047	09/03/07
Abstraction of Drift Seepage	MDL-NBS-HS-000019	Concurrent with TSPA AMR
Pitzer Database Expansion to Include Actinides and Transition Metal Species (DATA0.YPF.R1)	ANL-WIS-GS-000001	9/30/2007
In-Drift Precipitates/Salts Model	ANL-EBS-MD-000045	04/02/07
Thermal Testing Measurements Report	TDR-MGR-HS-000002	03/23/07
Drift-Scale THC Seepage Model	MDL-NBS-HS-000001	07/08/07
Near Field Chemistry Model	TBD	9/30/2007
Engineered Barrier System: Physical and Chemical Environment	ANL-EBS-MD-000033	09/30/07
Thermal Management Flexibility Analysis	ANL-EBS-MD-000075	09/14/06
Post-Closure Thermal Envelope Study	ANL-NBS-HS-000057	10/27/07
Analysis of Invert Hydrologic Properties	ANL-NBS-HS-000053	9/30/2007
Multiscale Thermohydrologic Model	ANL-EBS-MD-000049	09/30/07
In-Drift Convection and Condensation	MDL-EBS-MD-000001	09/10/07
Qualification of Thermodynamic Data for Geochemical Modeling of Mineral-Water Interactions in Dilute Systems	ANL-WIS-GS-000003	05/30/07

In-Package Chemistry Abstraction	ANL-EBS-MD-000037	8/1/2007
Dissolved Concentration Limits of Elements with Radioactive Isotopes	ANL-WIS-MD-000010	09/24/07
Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary	MDL-EBS-PA-000004	09/24/07
MOX Spent Nuclear Fuel and LaBS Glass for TSPA-LA	ANL-WIS-MD-000022	03/16/07
Radionuclide Screening	ANL-WIS-MD-000006	03/23/07
Waste Package Inventory Allocation Analysis	ANL-WIS-MD-000025	Concurrent with TSPA AMR
Stress Corrosion Cracking of the Drip Shield, the Waste Package Outer Barrier, and the Stainless Steel Structural Material	ANL-EBS-MD-000005	04/19/07
General Corrosion and Localized Corrosion of Waste Package Outer Barrier	ANL-EBS-MD-000003	05/05/07
HIC of Drip Shield	ANL-EBS-MD-000006	06/23/07
Analysis of Mechanisms for Early Waste Package/Drip Shield Failure	ANL-EBS-MD-000076	05/12/07
Analysis of Dust Deliquescence for FEP Screening	ANL-EBS-MD-000074	10/28/07
Cladding Degradation Summary	ANL-WIS-MD-000021	07/12/07
Mechanical Assessment of the Waste Package Subject to Vibratory Ground Motion	MDL-WIS-AC-000001	08/24/07
Seismic Consequence Abstraction	MDL-WIS-PA-000003	08/30/07
Criticality Input To Canister Based System Performance Specification for Disposal	TDR-DS0-NU-000002	01/02/07
Evaluate Probability of Post-Closure Criticality	ANL-DS0-NU-000001	10/26/07
Drift Degradation Analysis	ANL-EBS-MD-000027	02/25/08
Dike/Drift Interactions	MDL-MGR-GS-000005	05/04/07
Atmospheric Dispersion and Deposition of Tephra from a Potential Volcanic Eruption at YM NV	MDL-MGR-GS-000002	11/27/07
Number of Waste Packages Hit by Igneous Intrusion (Rev. 3)	ANL-MGR-GS-000003	07/27/07
Magma Dynamics at YM, Nevada	ANL-MGR-GS-000005	05/23/07
Magma Dynamics at YM, Nevada	ANL-MGR-GS-000005	03/10/08
Characterize Eruptive Processes at YM, Nevada (EPPR)	ANL-MGR-GS-000002	02/26/07
The Development of the TSPA-LA FEPs - Criticality	TDR-WIS-MD-000003	11/01/07
The Development of the TSPA-LA Features, Events and Processes	TDR-WIS-MD-000003	07/20/07
Postclosure Nuclear Safety Design Bases Document	ANL-WIS-MD-000024	08/31/07
TSPA Model/Analysis for the LA	MDL-WIS-PA-000004	TBD
WAPDEG Analysis of Waste Package and Drip Shield Degradation	ANL-EBS-PA-000001	05/31/07
EBS Radionuclide Transport Abstraction	ANL-WIS-PA-000001	08/01/07

Charles Fitzpatrick

From: Shebelskie, Michael [mshebelskie@hunton.com]
Sent: Friday, October 26, 2007 3:39 PM
To: Charles Fitzpatrick; Martin Malsch
Subject: AMR schedule

Charlie and Marty,

Attached is a chart that provides the current status of the 9 AMRs on the list you sent me yesterday. Please let me know if you have any questions.

Mike.

	<u>TITLE</u>	<u>STATUS</u>
1.	Waste Package Inventory Allocation Analysis	This document has been renamed. It is now the Initial Radionuclide Inventory, ANL-WIS-MD-000020 (DOC.20050927.0005). Rev 1-ACN1 was completed 9/27/07. On the LSN in full text (DN2002478989).
2.	Evaluate Probability of Post-Closure Criticality	Expected to be completed in about two weeks.
3.	Drift Degradation Analysis	This AMR will not be revised to support LA. The Drift Degradation Analysis to be cited in LA is Rev. 3, completed 7/28/06 (DOC.20060731.0005). On the LSN in full text (DN2002293941).
4.	Atmospheric Dispersal and Deposition of Tephra from a Potential Volcanic Eruption at YM NV	Revision completed early. Ash Plume AMR to be cited in LA is Rev. 3, completed 10/04/07 (DOC.20071010.0003). On the LSN in full text (DN2002479954).
5.	Magma Dynamics at YM, Nevada	A separate AMR will not to be completed to support LA. This analysis was included in Dike/Drift Interactions AMR. Rev 2 of this AMR was completed on 10/04/07. (DOC.20071009.0015). On the LSN in full text (DN2002480301).
6.	The Development of the TSPA-LA FEPs - Criticality	Replaced by Evaluate Probability of Post-Closure Criticality AMR, which is about to be completed. See #2 above.
7.	TSPA Model/Analysis for the LA	Version for draft Repository SEIS completed. (This is part of the Draft SEIS references that haven been provided to the State and are being processed onto the LSN.) Version for LA scheduled to be delivered for DOE acceptance review by 1/14/08.
8.	Near Field Chemistry Model	Included as appendix to EBS Physical and Chemical Environment AMR, Rev. 6, completed 8/31/07 (DOC.20070907.0003). On the LSN in full text (DN2002452948).
9.	Thermal Management Flexibility Analysis	Slated for completion 11/16/07. (Note: 2006 date in schedule was a typo.)

DN2002487964

QA: N/A

Total # of AMR's-TWP's To LA (no dups)

MOL.20070918.0491

Item #s	Document No	Rev No	ACN No	Document Title	SW Code Name	Ver	STN	Baselined Date	Legacy Code Date	OS-Software	ISSUES
1	ANL-CRW-GS-000003	00	00	Characterize Framework for Seismicity and Structural Deformation at Yucca Mountain, Nevada	Aldus Freehand	8	N/A		COTS	Not Listed in Document	
2	ANL-CRW-GS-000003	00	00	Characterize Framework for Seismicity and Structural Deformation at Yucca Mountain, Nevada	CMB_FRAC	1	Toro 1998	Not Baselined	Not on List, Not Tested	HP-UX 10.01	
3	ANL-CRW-GS-000003	00	00	Characterize Framework for Seismicity and Structural Deformation at Yucca Mountain, Nevada	DPREP88	1	10141-1.0-00	9/22/1999	Passed, 07-13-04	HP-UX 10.01	
4	ANL-CRW-GS-000003	00	00	Characterize Framework for Seismicity and Structural Deformation at Yucca Mountain, Nevada	DRISK88	1	10137-1.0-00	9/20/1999	Passed, 07-13-04	HP-UX 10.01	
5	ANL-CRW-GS-000003	00	00	Characterize Framework for Seismicity and Structural Deformation at Yucca Mountain, Nevada	MS Word	97	N/A		COTS	Not Listed in Document	
6	ANL-DSD-MD-000001	01	00	Probability analysis of Corrosion Rates for Waste Package Materials	MS Excel	97 SR-2	N/A		COTS	Win97	
7	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	Acc_with_decay	1	10499-1.0-00	05/06/02	On List, To Be Tested	Win2000	
8	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	EQ3/6	8.1	10813-8.1-00	5/9/2005	Not Legacy Code	Win2000	
9	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	EQ6	7.2bLV	10075-7.2bLV-02	8/9/2002	Passed, 05-18-05	WinNT 4.0	
10	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	EQ6	7.2bLV	10075-7.2bLV-02	8/9/2002	Passed, 10-27-04	Win2000	
11	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	GetEQData	1.0.1	10809-1.01-00	12/2/2002	Passed, 05-02-05	Win2000	
12	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	GetEQData	1.0.1	10809-1.01-00	1/24/2003	Passed, 03-24-05	WinNT 4.0	
13	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	GetEqPhases	1	10725-1.0-00	4/11/2002	Passed, 03-28-06	Win2000	
14	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	MinAcc	1	10724-1.0-00	6/4/2002	Passed, 03-27-06	Win2000	
15	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	MS Excel	97 SR-2	N/A		COTS	Win2000	
16	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	MS Excel	97 SR-2	N/A		COTS	WinXP	
17	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	PHREEQC	2.11	10068-2.11-00	2/24/2006	Not Legacy Code	Win2000	
18	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	PHREEQC	2.3	10068-2.3-01	5/10/2002	On List, In RM, 08-05-04	Win2000	
19	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	PHREEQC_Post	1.1	10723-1.1-00	4/8/2002	Passed, 01-05-05	Win2000	
20	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	Tecplot	10.0-2-24	N/A		COTS	WinXP	
21	ANL-EBS-GS-000002	01C	00	Geochemistry Model Validation Report: External Accumulation Model	TOUGHREACT	3.0	10396-3.0-00	12/23/2002	On List, In RM, 06-09-04	OSF/1 V5.1	
22	ANL-EBS-MD-000001	01	02	Environment on the Surfaces of Drip Shield and waste Package Outer Barrier	EQ3/6	8	10813-8.0-00	1/16/2003	On List, In RM, 05-17-05	Win2000	

(104 TOTAL)

Charles Fitzpatrick

From: Charles Fitzpatrick [cfitzpatrick@nuclearlawyer.com]
Sent: Wednesday, November 28, 2007 11:57 AM
To: 'Shebelskie, Michael'
Subject: Re-request

Mike...we are getting close to hearing, and your responses to my outstanding four requests become more urgently needed: (1) Where can I find the "2006 Drift Degradation AMR" which you said is on LSN and that DOE will rely on in the LA? (2) May we have the list of 150 AMRs (with LSN accession numbers) which you referred to in your PAPO Response; (3) may I have the LSN accession numbers of the three CDRs which I was refused in a FOIA request (as to which DOE copied you on their response to me); and (4) how many LSN document titles is DOE planning to revise/improve? (140,000?)

Charles J. Fitzpatrick
Egan, Fitzpatrick & Malsch, PLLC
Phone: 210.496.5001
Fax: 210.496.5011
cfitzpatrick@nuclearlawyer.com
www.nuclearlawyer.com

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11/28/2007



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Internet: sorrell@sandia.gov

S. Andrew Orrell
Senior Program Manager
OCRWM Lead Laboratory for Repository Systems

February 13, 2007

Dr. J. Russell Dyer
Director, Office of the Chief Scientist
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
1551 Hillshire Drive
Las Vegas, NV 89134-6321

QA: NA

RECEIVED BY BSC CCU

DATE: 02/13/2007

SUBJECT: CONTRACT NO. DE-AC04-94AL-85000 – SUBMITTAL OF DELIVERABLE TECHNICAL WORK PLAN FOR DRIFT DEGRADATION STUDIES, TWP-MGR-GS-000007 REV 00, WORK BREAKDOWN STRUCTURE 1.5.03.08; WORK PACKAGE PAD1015

Enclosed for your review and acceptance, in accordance with Sandia Contract No. DE-AC04-94AL-85000 is the *Technical Work Plan for Drift Degradation Studies, TWP-MGR-GS-000007, REV 00* (Enclosure 2).

The Annual Work Plan (AWP) and Deliverable Definition Sheet (enclosure 4) show this technical work plan (TWP) is due on February 13, 2007. We have provided a copy of this TWP to your staff during the formal review process.

The overall objectives of the work scope covered in this TWP are to evaluate new rock static-fatigue input data that were acquired post-2004 and to assess the impact of these new data on the analysis and modeling results documented in the *Drift Degradation Analysis* report last revised in 2004. In addition, the TWP describes work scope that will address three (3) OCRWM Condition Reports (CRs) including CR 7461, CR 8020, and CR 9537. Enclosure 3 describes the three CRs and summarizes their impact.

The following information is being provided:

- Enclosure 1 contains a completed Office of Civilian Radioactive Waste Management (OCRWM) Deliverable Review Form
- Enclosure 2 is a hard copy of *Technical Work Plan for Drift Degradation Studies, TWP-MGR-GS-000007 REV 00*
- There are three open OCRWM CRs related to this deliverable: Impacts of CRs 7461, 8020 and 9537 are provided as Enclosure 3
- Deliverable Definition Sheet with acceptance criteria is provided as Enclosure 4.

Exceptional Service in the National Interest

07_290_YMP-LL_02-07-2007

analysis of block sizes based on the full distribution of joint trace length data from the *Fracture Geometry Analysis for the Stratigraphic Units of the Repository Host Horizon*, ANL-EBS-GE-000006, supplemented by available small joint trace length data; (3) verify the results of the revised DRKBA analyses using: (a) appropriate boundary conditions for thermal and seismic loading; (b) critical fracture patterns from the DRKBA Monte Carlo simulations (at least two patterns for each rock unit); (c) thermal and mechanical properties for rock blocks and joints from a design parameters analysis report (or other document); (d) long-term degradation of joint strength parameters; and (e) site-specific ground motion time histories appropriate for post-closure period. This will be documented in a revision to the *Drift Degradation Analysis*, ANL-EBS-MD-000027, expected to be available to NRC in FY 2003. Based on the results of the analyses above and subsequent drip shield calculation revisions, DOE will reconsider the screening decision for inclusion or exclusion of rockfall in performance assessment analysis. Any changes to screening decisions will be documented in analyses prior to any potential license application.

Table 3. Mapping of Drift Degradation Scientific Reports to Yucca Mountain Review Plan Acceptance Criteria

Product Title	Product Number	YMRP Acceptance Criteria
Data Analysis for Drift Degradation: Time-to-Failure Data from Static-Fatigue Experiments on Welded Tuff	Not available	Mechanical Disruption of Engineered Barriers (Section 2.2.1.3.2.3) AC2: Data are Sufficient for Model Justification AC3: Data Uncertainty is Characterized and Propagated Through the Model Abstraction
Drift Degradation Analysis	ANL-EBS-MD-000027	Mechanical Disruption of Engineered Barriers (Section 2.2.1.3.2.3) AC1: System Description and Model Integration are Adequate AC2: Data are Sufficient for Model Justification AC3: Data Uncertainty is Characterized and Propagated Through the Model Abstraction AC4: Model Uncertainty is Characterized and Propagated Through the Model Abstraction AC5: Model Abstraction Output is Supported by Objective Comparisons

YMRP = Yucca Mountain Review Plan; AC = acceptance criterion.

3.3 OTHER ACCEPTANCE OR COMPLETION CRITERIA

The accuracy, precision, and representativeness of the work performed are assessed as part of the uncertainty analyses for each of the products developed for the overall activity, and the results will be documented in the corresponding technical products. The activities covered by this TWP will meet the level of detail and accuracy needed to support the Total System Performance Assessment for the License Application. Technical products that are not deliverables will be considered acceptable if they are developed, checked, reviewed, and approved in accordance with the appropriate implementing procedures (Section 4).

Exhibit 66

Exhibit 66

21 23. Also, as a result of the decision in *Nuclear Energy Institute, Inc. v. EPA*, 373
22 F.3d 1251 (D.C. Cir. 2004), EPA and NRC are promulgating new performance standards that the
23 Yucca Mountain repository must satisfy for the post 10,000-year period following the
24 repository's closure. See 70 Fed. Reg. 53313 (Sept. 8, 2005) (NRC); 70 Fed. Reg. 49014 (Aug.
25 22, 2005) (EPA). These new standards too will require additional work and analyses by DOE in
26 the license application.

Exhibit 67

Exhibit 67

**TECHNICAL GUIDANCE FOR
LICENSE APPLICATION PLANNING
(Plan B: Compliance-Focused Program)**

1. INTRODUCTION

The purpose of this document is to provide a consistent set of technical guidance to the organizations involved in the planning for the license application (LA) under the compliance-focused program (Plan B). Plan B focuses on identifying the minimum but sufficient scope of work required to submit an LA that is considered to be docketable, should the Yucca Mountain site be recommended and approved. This work scope will be sharply focused using a risk-informed, performance-based approach to define the work necessary to defend the preclosure and postclosure licensing arguments. This top-down approach to ensure regulatory compliance differs from the bottom-up approach used to develop the initial Detailed Work Plan (DWP). The approach is expected to result in a reduction in the amount of work necessary to prepare a docketable LA. Therefore, Plan B results will need to be communicated to the NRC in planned follow-on KTI-related technical exchanges to ensure that NRC understands and accepts the basis for any proposed changes.

The area of greatest challenge in this planning effort is the area of performance assessment (PA), which includes the testing program as well as process model analyses and modeling. Recent organizational changes at Bechtel SAIC Company (BSC) will facilitate the planning in this area. The PA Strategy/Scope organization is currently developing a postclosure compliance strategy to be used in defining and conducting the total system performance assessment (TSPA) and identifying the information needs. This strategy will be reviewed by a new TSPA Oversight Group that reports directly to the BSC Manager of Projects, and will be subsequently validated by the Postclosure Strategy Board recently formed. This strategy will drive the planning for the scope of work to be conducted to fulfill the needs of the TSPA.

The approach to planning has been broken into eight components. The first component is the overarching general guidance that must be considered in developing more detailed plans by all areas of the Project. The next seven components consist of the individual guidance related to the different areas of the Project (License Application/Licensing; Design; Preclosure Safety Assessment; Performance Assessment; Special Projects; Site Operations; and Business, Technical Support, and Programmatic Areas) that must work together to support development and submittal of a docketable LA.

This guidance also contains two appendices. Appendix A contains a listing of the key assumptions upon which the planning of this work is based. Appendix B discusses the strategic approach to be used in identifying the information to be contained in the Licensing Support Network (LSN) and activities required to support LSN certification. A strategic planning schedule is being issued separately as a companion to this technical guidance. That schedule is a top-down schedule that summarizes the key activities and milestones that serve as the overall framework for this planning, consistent with the DOE goal of an LA submittal in December 2004. The dates in the strategic planning schedule should not be interpreted as the definitive

carefully evaluated based on the final NRC requirements to ensure that the plan described in the LA is limited to what is adequate and necessary to satisfy these regulatory requirements. If the YMRP is issued by June 2002, an evaluation will be made as to the best method of presenting the information in the LA that takes into account the YMRP. This will be captured in the Management Plan for the Development of the Yucca Mountain License Application. Significant changes to the LA Guidance, LA Products List, and LA format and content due to the YMRP are not included in the plan.

To support the DOE goal of submitting the LA to the NRC by December 2004, inputs to the LA will be conducted in a phased manner. As illustrated in the strategic planning schedule, the first drafts of the programmatic sections of the LA need to be completed by December 2003. The draft sections on design, science, preclosure safety assessment, and total system performance assessment need to be completed by March 2004. The LA review schedule has been shortened to 38 weeks. Technical and regulatory reviews of draft LA sections by the affected offices within the DOE, as well as Naval Reactors, must occur in parallel to make the initial review process as efficient as possible. The review of draft sections must be sufficiently complete along with the essential supporting technical basis documents before the initial BSC LSN certification process begins, eight months prior to LA submittal. DOE management review of and concurrence on the integrated LA, and production of the final document, will take place during the six months following initial LSN certification. Changes and additional information developed during the DOE management review will be included in the LSN with a supplementary certification at the time of LA submittal.

In addition to having overall responsibility for LA development, the BSC License Application Project will also be the prime author for selected sections of LA Chapters 1 (Introduction), 2 (Conformance with Technical Criteria), and 11 (Conduct of Operations and Related Topics).

To help ensure docketing of the LA and completeness of the LSN for significant safety matters, plans will be developed for phased NRC review of project technical documentation that provide the basis for the safety case. Pre-licensing interactions with the NRC will be clearly linked to the completion of documentation to address the KTI agreement items. Additional meetings will be considered, as appropriate, to reach early agreement with the NRC on the LA format and content, resolution of preclosure safety and design-detail issues, and selected approaches and methodologies critical to the licensing case. Interactions will continue on the topical reports currently under NRC review or for which DOE has committed to provide additional information (e.g., seismic design basis, criticality).

With respect to the LSN, Appendix B discusses the approach to be used to streamline the identification and loading of the documentary material required by 10 CFR Part 2, Subpart J, as well as the timing for the different activities needed to ensure LSN certification by June 2004.

The License Application Project will develop a Licensing Strategy and a Regulatory Guidance Matrix to ensure consistent approaches to design and analysis. The Licensing Strategy will incorporate the postclosure compliance strategy discussed in Sections 1 and 6.

**SUMMARY OF THE
U.S. NUCLEAR REGULATORY COMMISSION / U.S. DEPARTMENT OF ENERGY
QUARTERLY MANAGEMENT MEETING
IN ROCKVILLE, MARYLAND
NOVEMBER 22, 2004**

Introduction

The U.S. Nuclear Regulatory Commission (NRC) and U.S. Department of Energy (DOE) held a public quarterly management meeting on November 22, 2004. The purpose of this meeting was to discuss the overall progress of the project at the proposed geologic repository site at Yucca Mountain (YM), Nevada. The meeting was hosted at the NRC Headquarters in Rockville, Maryland, with audio connections to the Center for Nuclear Waste Regulatory Analyses (CNWRA) in San Antonio, Texas, and to the DOE offices in Las Vegas, Nevada. Other participants included representatives from NRC Region IV, the State of Nevada, the Nevada Nuclear Waste Task Force, Public Citizen, the press, and interested members of the public.

The NRC issued the notice for this public meeting on November 4, 2004. The meeting notice is available in the NRC Agencywide Documents Access and Management System (ADAMS) at Accession No. ML043090582.

NRC Opening Remarks

Mr. Jack Strosnider, Director, Office of Nuclear Materials Safety and Safeguards, NRC started the meeting by welcoming DOE managers, members of the public, and all other stakeholders.

He acknowledged that DOE might not be able to submit a license application (LA) for a geologic repository at Yucca Mountain, Nevada, by December 2004. He said that EPA had not specifically stated when and how it would revise its YM standard. He also said NRC would amend 10 CFR Part 63 to be consistent with any EPA revisions to the YM standard and that interested parties would have the opportunity to submit public comments in any rulemaking.

Mr. Strosnider noted that in August 2004 the Pre-license Application Presiding Officer (PAPO) Board granted the State of Nevada's motion to strike DOE's licensing support network (LSN) certification, and in September 2004, DOE filed a Notice of Appeal with the Commission to overrule a portion of the PAPO Board's August 31, 2004 order. He said DOE had indicated it would comply with those portions of the order that it did not appeal. On November 10, 2004, the Commission issued an order holding DOE's appeal in abeyance. Mr. Strosnider reminded the audience that, according to NRC regulations in 10 CFR Part 2, the staff cannot docket the LA until at least 6 months have elapsed from the time of DOE certification. He said NRC is interested in hearing from DOE about DOE's schedule for completing activities leading up to a DOE LSN certification and for submitting an LA.

Mr. Strosnider concluded by noting that the President's budget request for FY 2005 includes significant increases for the NRC's LA review, for the high level waste information technology and information management (IT/IM) metasystem, and for the NRC public hearing. He stated

Enclosure 1

and the complete text of the ASLB decision. Since then, new internal requirements have been established, the budget has been realigned, and DOE is proceeding with additional work. DOE expects to recertify the LSN in the spring of 2005 timeframe.

Mr. Arthur noted that DOE would not submit the LA in 2004. In September 2004 DOE and Bechtel SAIC Company (BSC) completed a major management review of the draft LA. This review indicated that the science and design work completed in support of the LA was technically sound, was adequate for its intended purpose, and meets quality assurance requirements. This work supports robust safety analyses for the preclosure (operational) period through 10,000 years after permanent closure and was thoroughly cross-referenced against the requirements in 10 CFR Part 63 and the guidance in the YMRP.

Mr. Arthur said that DOE needs to refine the presentation of this technical work for licensing. Also, DOE needs to assure the transparency, traceability, and the self-sufficiency of the LA; and if necessary, clarify the presentation of technical, analytical, and compliance information; improve the readability of the document; provide more details, particularly in distinguishing structures, systems, and components that are important to safety or important to waste isolation; verify document-to-document consistency between the LA and underlying technical documents that were in revision during the development of the draft LA (principally Analysis and Modeling Reports, System Description Documents, Facility Description Documents, and the Preclosure Safety Analysis); and document some additional preclosure and design detail, consistent with discussions between DOE and NRC in the September 2004 technical exchange and based in part on DOE internal design reviews (in particular, important-to-safety Electrical Systems and the Aging Facility.)

Following the September management review, DOE and BSC produced an interim consolidated draft LA. This will form the basis for the final application. By the next NRC/DOE quarterly management meeting, DOE expects to discuss detailed plans and present a revised estimate for completing and submitting the LA to the NRC.

With respect to key technical issues, Mr. Arthur stated that on August 31, 2004, DOE submitted the remaining 17 of the 293 agreement item responses to the NRC. With this submission of information, the intended purpose of the KTI process has been met and the process completed for DOE. The KTI process has served an important role in facilitating resolution of many of the NRC staff's questions and concerns. Although the NRC has not yet evaluated and closed all of the agreements, DOE expects that any additional NRC staff questions or concerns regarding these agreement topics will be addressed during the licensing process.

With respect to Analysis and Model Reports (AMRs) supporting the LA, Mr. Arthur said that Phase II of the Regulatory Integration Team's (RIT) phase activities were almost complete. DOE has reviewed and is revising the AMRs to assure that they are suitable for the intended technical and regulatory audiences. To date, 87 of the 89 AMRs have been approved. The remaining two documents are scheduled for completion in November 2004. Quality metrics and quality assurance oversight indicate that this process has been effective based on the number of insignificant issues and unresolved items found during checking. Overall Mr. Arthur noted that the intent of DOE letter of May 28, 2004, to the NRC was being achieved.

Mr. Arthur then reported that for preclosure analyses, a Preclosure Design Integration Team was initiated to ensure that the preclosure safety basis is well defined, understandable,

Exhibit 68

Exhibit 68

DRIFT DEGRADATION
AMR

Charles Fitzpatrick

From: Shebelskie, Michael [mshebelskie@hunton.com]
Sent: Thursday, November 29, 2007 5:11 PM
To: Charles Fitzpatrick
Subject: FW: Second Response to Fitzpatrick

Charlie:

This responds to your query regarding the Drift Degradation Analysis AMR. The accession numbers I provided you are for the latest administrative change notice (ACN) to REV 3 of that AMR, which is the current version. REV 3 was issued in September 2004. It had three subsequent ACNs, the most recent represented by the accession numbers I gave you. The full text of REV 3 and each of its ACNs is on the LSN. Their accession numbers are in the related record field of the header for the ACN that I identified for you. Those numbers are: DOC.20040915.0010; Doc.20050419.0001; Doc.20051130.0002. Please let me know if you have any questions.

Mike.

P.S. I ascertained this on the LSN in about 7 minutes (once I finally got an opportunity to look). I think you owe me a steak dinner.

160,000 + TITLES
("ENHANCED")

Charles Fitzpatrick

From: Shebelskie, Michael [mshebelskie@hunton.com]
Sent: Thursday, November 29, 2007 4:55 PM
To: Charles Fitzpatrick
Subject: Header Titles

Charlie:

As we have discussed, DOE is in the process of providing additional titles in the bibliographic headers for two groups of electronic files. This is in response to your request for additional information about those files:

1. The first group constitutes the Draft Geologic Repository SEIS and its references. There are about 800 documents in this group. I am told that the enhanced titles for these documents are complete and that a scan file that includes these enhanced headers will be provided to the NRC. The current titles in the bibliographic headers for these documents are the file path names under which they were stored on the CD-ROM provided to CACI (and I believe to Nevada as well). The enhanced headers for the documents in this group will include in the title field any title that appears on the face of the document.

2. The second group constitutes electronic files (either stand-alone files or email attachments) that predate December, 2006. The titles for these electronic documents are these documents' file path names. Most of these documents with these titles have been available on the LSN since last May, and in many cases since 2004, without complaint by anyone. Nonetheless, DOE has undertaken to add an additional title to the bibliographic headers for these electronic files where possible. In doing so, DOE has not removed the file path name for the document in the title field, but has added a second title in the header. I mentioned that the enhanced headers for the last of the electronic files in this group--about 160,000 documents--were ready for crawling. I understand that all of these have been crawled with the exception of about 28,000 that are in the crawling process now.

DOE will look at the electronic files from 2007 to ascertain if an additional title can be provided for any of them. There are about 6 1,000 electronic files in this group. Only a subset of these would end up having additional titles.

I'll send separate emails responding to your other queries of November 21.

Mike.

150 AMRs

Charles Fitzpatrick

From: Charles Fitzpatrick [cfitzpatrick@nuclearlawyer.com]
Sent: Wednesday, November 21, 2007 8:44 AM
To: 'Shebelskie, Michael'
Subject: Outstanding Requests

Mike...I am sure you are busy, as we all are. However, it is important that we receive very expeditiously certain information which we have requested. In each instance, the information we have requested is simple and readily available, from DOE's standpoint. Again, please provide the LSN accession numbers for (1) the Drift Degradation AMR of 2006, which you said DOE would rely on in the LA, but as to which the LSN accession number you previously provided (on October 26) was to a three page comment on an AMR, not an AMR; (2) the LSN accession numbers for the three DOE CDRs (Conceptual Design Reports) which I requested by FOIA, but which Kenneth Powers refused, stating in a Nov. 15 letter (copied to you) that the three CDRs requested are privileged; (3) a list (which has been requested by Mr. Loux from Mr. Dyer) of the 150 AMRs (together with their LSN accession numbers) which DOE said in its recent PAPO Response are complete and on the LSN and will be relied upon by DOE in its LA (previously, Mr. Dyer supplied Mr. Loux, and you supplied me, with AMR lists which only contained 58 AMRs; we found most of those 58, but are having severe difficulty in finding the nearly 100 more: and (4) an answer to my question requesting an estimate of how many document "Titles" on its LSN Headers Doe is planning to revise or improve. Please provide responsive information as soon as possible.

Charles J. Fitzpatrick
Egan, Fitzpatrick & Malsch, PLLC
Phone: 210.496.5001
Fax: 210.496.5011
cfitzpatrick@nuclearlawyer.com
www.nuclearlawyer.com

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11/21/2007

In-Package Chemistry Abstraction	ANL-EBS-MD-000037	8/1/2007
Dissolved Concentration Limits of Elements with Radioactive Isotopes	ANL-WIS-MD-000010	09/24/07
Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary	MDL-EBS-PA-000004	09/24/07
MOX Spent Nuclear Fuel and LaBS Glass for TSPA-LA	ANL-WIS-MD-000022	03/16/07
Radionuclide Screening	ANL-WIS-MD-000006	03/23/07
Waste Package Inventory Allocation Analysis	ANL-WIS-MD-000025	Concurrent with TSPA AMR
Stress Corrosion Cracking of the Drip Shield, the Waste Package Outer Barrier, and the Stainless Steel Structural Material	ANL-EBS-MD-000005	04/19/07
General Corrosion and Localized Corrosion of Waste Package Outer Barrier	ANL-EBS-MD-000003	05/05/07
HIC of Drip Shield	ANL-EBS-MD-000006	06/23/07
Analysis of Mechanisms for Early Waste Package/Drip Shield Failure	ANL-EBS-MD-000076	05/12/07
Analysis of Dust Deliquescence for FEP Screening	ANL-EBS-MD-000074	10/28/07
Cladding Degradation Summary	ANL-WIS-MD-000021	07/12/07
Mechanical Assessment of the Waste Package Subject to Vibratory Ground Motion	MDL-WIS-AC-000001	08/24/07
Seismic Consequence Abstraction	MDL-WIS-PA-000003	08/30/07
Criticality Input To Canister Based System Performance Specification for Disposal	TDR-DS0-NU-000002	01/02/07
Evaluate Probability of Post-Closure Criticality	ANL-DS0-NU-000001	10/26/07
Drift Degradation Analysis	ANL-EBS-MD-000027	02/25/08
Dike/Drift Interactions	MDL-MGR-GS-000005	05/04/07
Atmospheric Dispersal and Deposition of Tephra from a Potential Volcanic Eruption at YM NV	MDL-MGR-GS-000002	11/27/07
Number of Waste Packages Hit by Igneous Intrusion (Rev. 3)	ANL-MGR-GS-000003	07/27/07
Magma Dynamics at YM, Nevada	ANL-MGR-GS-000005	05/23/07
Magma Dynamics at YM, Nevada	ANL-MGR-GS-000005	03/10/08
Characterize Eruptive Processes at YM, Nevada (EPPR)	ANL-MGR-GS-000002	02/26/07
The Development of the TSPA-LA FEPs - Criticality	TDR-WIS-MD-000003	11/01/07
The Development of the TSPA-LA Features, Events and Processes	TDR-WIS-MD-000003	07/20/07
Postclosure Nuclear Safety Design Bases Document	ANL-WIS-MD-000024	08/31/07
TSPA Model/Analysis for the LA	MDL-WIS-PA-000004	TBD
WAPDEG Analysis of Waste Package and Drip Shield Degradation	ANL-EBS-PA-000001	05/31/07
EBS Radionuclide Transport Abstraction	ANL-WIS-PA-000001	08/01/07



Description	Document Number	Baseline Complete
Simulation of Net Infiltration for Present-Day and Potential Future Climates	MDL-NBS-HS-000023	06/17/07
Data Analysis for Infiltration Modeling: Extracted Weather Station Data used to Represent Present and Potential Future Climate Conditions within the Vicinity of Yucca Mountain	ANL-MGR-MD-000015	12/22/06
Data Analysis for Infiltration Modeling: Development of Soil Units and Associated Hydraulic Parameter Values	ANL-NBS-HS-000055	12/21/06
UZ Flow Models and Submodels	MDL-NBS-HS-000006	09/08/07
Calibrated UZ Properties	ANL-NBS-HS-000058	06/04/07
Radionuclide Transport Models Under Ambient Conditions	MDL-NBS-HS-000008	09/23/07
Particle Tracking Model and Abstraction of Transport Processes	MDL-NBS-HS-000020	09/23/07
Alcove 8 - Niche 3 Seepage and Transport Models	ANL-NBS-HS-000056	12/01/06
Saturated Zone Flow and Transport Model Abstraction	MDL-NBS-HS-000021	Concurrent with TSPA AMR
Hydrogeologic Framework Model for the Saturated-Zone Site-Scale Flow and Transport Model	MDL-NBS-HS-000024	04/19/07
Saturated Zone Site Scale Flow Model	MDL-NBS-HS-000011	05/20/07
Site Scale Saturated Zone Transport	MDL-NBS-HS-000010	06/30/07
Saturated Zone In-Situ Testing	ANL-NBS-HS-000039	05/16/07
Biosphere Model Report	MDL-MGR-MD-000001	10/07/07
Soil-Related Input Parameters for the Biosphere Model	ANL-NBS-MD-000009	Completed 10/11/2006
THC Sensitivity Study of Repository Edge and Heterogeneous Permeability Effects	ANL-NBS-HS-000047	09/03/07
Abstraction of Drift Seepage	MDL-NBS-HS-000019	Concurrent with TSPA AMR
Pitzer Database Expansion to Include Actinides and Transition Metal Species (DATA0.YPF.R1)	ANL-WIS-GS-000001	9/30/2007
In-Drift Precipitates/Salts Model	ANL-EBS-MD-000045	04/02/07
Thermal Testing Measurements Report	TDR-MGR-HS-000002	03/23/07
Drift-Scale THC Seepage Model	MDL-NBS-HS-000001	07/08/07
Near Field Chemistry Model	TBD	9/30/2007
Engineered Barrier System: Physical and Chemical Environment	ANL-EBS-MD-000033	09/30/07
Thermal Management Flexibility Analysis	ANL-EBS-MD-000075	09/14/06
Post-Closure Thermal Envelope Study	ANL-NBS-HS-000057	10/27/07
Analysis of Invert Hydrologic Properties	ANL-NBS-HS-000053	9/30/2007
Multiscale Thermohydrologic Model	ANL-EBS-MD-000049	09/30/07
In-Drift Convection and Condensation	MDL-EBS-MD-000001	09/10/07
Qualification of Thermodynamic Data for Geochemical Modeling of Mineral-Water Interactions in Dilute Systems	ANL-WIS-GS-000003	05/30/07



Russ Dyer → Bob Lux
3/30/07

THREE CDR'S

Charles Fitzpatrick

From: Shebelskie, Michael [mshebelskie@hunton.com]
Sent: Friday, November 30, 2007 3:04 PM
To: Charles Fitzpatrick
Subject: CDRs

Charlie:

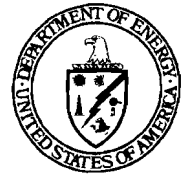
This is in response to your request for accession numbers for the conceptual design reports (CDRs) for surface design, subsurface design, and preclosure safety analysis. The surface design and preclosure safety CDRs are not on the LSN because they are not documentary material. They are not documents that DOE intends to cite or rely on; they do not contain non-supporting information; and, they do not qualify as a report or study as that term is used in 10 CFR 2.1001. The Commission held in its decision denying the State's motion to compel that a report or study collects and analyzes data and reaches conclusions on that data. The two CDRs do not do that. They discuss the potential format and structure of the Draft LA.

Bibliographic headers are on the LSN for two versions of the subsurface CDR. The accession numbers for these headers are ALA.20070711.6417 (Rev. 1) and ALA.20070711.7273 (Rev. 2). These documents are privileged, and entries for them are on the DPP and LWP privilege logs. While the two versions of this CDR are not documentary material either, DOE is not at this point allowed to remove their headers from the LSN without leave of the PAPO Board.

Please let me know if you have any questions.

Mike.

PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT



QA: N/A

Office of Civilian Radioactive Waste Management

**Management Plan for Development
of the Yucca Mountain License Application**

YMP/04-01

REV 04, ICN 0

February 2007

*U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Las Vegas, Nevada*

PRIVILEGED AND CONFIDENTIAL - LITIGATION WORK PRODUCT

ATTACHMENT 1 MARKING GUIDANCE

Draft LA CDRs, Draft LA, or Draft LA sections

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- Categorize as Not LSN Relevant

Emails (and other documents) transmitting copies of Draft LA CDRs, Draft LA, or Draft LA sections for comment

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- Also mark as Not LSN Relevant
- On Email Records Management System (ERMS) template (for emails), categorize as Not LSN Relevant and Privileged

Comments on Draft LA CDRs, Draft LA, or Draft LA sections

- Mark as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- If comments include an attorney's comments, also mark as Attorney-Client Communication
- Categorize as LSN Relevant, unless
 - The comment merely states that you have no comments; or
 - The comments merely correct typographical errors
- For comments on Draft LA/Draft LA sections, also mark as Draft LA Comments

NOTE: Copies of comments on the Draft LA/Draft LA sections that are marked LSN Relevant are submitted to the LSN Project for review and production on the LSN as appropriate. Marking such comments as Draft LA Comments will assist the LSN Project identify these comments.

Emails transmitting comments on Draft LA CDRs, Draft LA, or Draft LA sections

- Body of the email should be marked as Privileged and Confidential, Predecisional Deliberative Process, and Litigation Work Product
- If the comments include an attorney's comments, also mark the body of the email as Attorney-Client Communication

ATTACHMENT 1 MARKING GUIDANCE (Continued)

- For comments on Draft LA/Draft LA sections, also mark the body of the email as Draft LA Comments
- On ERMS template, categorize as LSN Relevant and Privileged, unless the comments merely state you have no comments or merely correct typographical errors, in which case categorize the email as Not LSN Relevant and Privileged on the ERMS template

LA CDRs (approved issued versions)

- Mark as Privileged and Confidential, Litigation Work Product
- Categorize as LSN Relevant

QA: NA

Office of Civilian Radioactive Waste Management

**Yucca Mountain Repository
License Application Conceptual Design Report**

Subsurface Design and Waste Package

PLN-MGR-AD-000020 REV 02A

March 2007

*U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Washington, DC 20585*

1. INTRODUCTION

Development of the Yucca Mountain Repository License Application (LA) is guided by the requirements of 10 CFR Part 63 and by the U.S. Nuclear Regulatory Commission (NRC) review strategies and acceptance criteria provided in NUREG-1804, *Yucca Mountain Review Plan (YMRP)* (NRC 2003). This report is one of five conceptual design reports (CDRs) that describe the technical changes to the Surface Design, Subsurface Design and Waste Package, Preclosure Safety Analysis, Postclosure Analysis and Activities, and Programmatic sections of the LA. The CDRs describe changes from the predecisional draft versions of LA sections prepared as of September 2005, and identify specific supporting products (e.g., drawings, technical reports, calculations, and analysis and model reports) required for the LA development.

Appendix A to each CDR contains a list of the U.S. Department of Energy (DOE) requirements set forth by the *Civilian Radioactive Waste Management System Requirements Document* (DOE 2006a), the *Monitored Geologic Repository Systems Requirements Document* (DOE 2006b), and Volume 1 of the *Integrated Interface Control Document* (DOE 2006c). This appendix identifies which of the internal DOE requirements are being reflected within the LA.

The requirements for the LA CDRs are described in YMP/04-01, *Management Plan for Development of the Yucca Mountain License Application*. The management plan outlines the responsibilities and controls used during the completion, review, and approval process to produce an LA document that is complete and accurate in all material respects, consistent with the requirements contained in 10 CFR Part 63, responsive to the YMRP, and considered to be suitable for NRC docketing.

The purpose of *Subsurface Design and Waste Package* CDR is to present the plan for developing the subsurface and waste package design sections of the LA. The plan starts from the predecisional draft LA sections prepared as of September 2005, sets forth the licensing approach for each section, and outlines revisions to the draft that are necessary to address the licensing approach and the principal change drivers. The principal change drivers are:

- Revisions to waste package designs to accommodate transportation, aging, and disposal (TAD) canisters.
- Revisions to the emplacement drift loading plan because of the different thermal configuration of the TAD canister-loaded waste packages and a revised approach to thermal management.
- Revision to the total length of emplacement drifts required because of the change in length of the DOE spent nuclear fuel (SNF)/high-level radioactive waste (HLW) codisposal waste packages of approximately 9 inches due to the addition of a radiation shield plug.
- Revision of the waste package transporter and waste package emplacement gantry to an integrated transport and emplacement vehicle (TEV).

2. SAR SECTION 1.3 – SUBSURFACE STRUCTURES, SYSTEMS, AND COMPONENTS AND OPERATIONAL ACTIVITIES

2.1 REQUIREMENTS

Requirements for the subsurface facility SSCs are described in the CDR text for SAR Sections 1.3.1 to 1.3.6 (CDR Sections 3 through 8).

2.2 SCOPE

SAR Section 1.3, “Subsurface Structures, Systems, and Components and Operational Activities,” provides an introduction to SAR Sections 1.3.1 through 1.3.6.

2.2.1 Licensing Approach

The licensing approach for this section is to provide and discuss the following information related to the subsurface facility:

- Describe how the subsurface facility will be designed so that taking into consideration Category 1 event sequences and until permanent closure has been completed, the aggregate radiation exposures and the aggregate radiation levels in both restricted and unrestricted areas, and the aggregate releases of radioactive materials to unrestricted areas, will be maintained within limits specified in 10 CFR Part 20 and in 10 CFR 63.204.
- Describe how the subsurface facility will be designed so that taking into consideration any single Category 2 event sequence and until permanent closure has been completed, radiological dose exposures to individual located on, or beyond, any point on the boundary of the site will be maintained within the limits of 10 CFR 63.111(b)(2).
- A general description of the SSCs, equipment, and process activities at the subsurface facility.
- Information related to the materials of construction of the subsurface facility (including geologic media, general arrangement, and approximate dimensions), and codes and standards that will apply in the design and construction of the subsurface facility.

This section also describes those controls and the measures taken to ensure the availability of safety systems.

In the aggregate, SAR Sections 1.3.1 through 1.3.6 will provide the following information:

- Descriptions of analyses of performance of the SSCs identified as ITS
- Descriptions and discussions of the designs of the subsurface facility SSCs, including: (1) the relationship between design criteria and the requirements specified at

3. SAR SECTION 1.3.1 – SUBSURFACE OPERATIONS OVERVIEW

3.1 REQUIREMENTS

SAR Section	Section Title	10 CFR Part 63 References	YMRP Section
1.3.1	Subsurface Operations Overview	63.112(a) 63.113(b) 63.113(c) 63.21(c)(2) 63.21(c)(3)	—
1.3.1.1	Major Subsurface Facility Structures and Equipment	—	2.1.1.2.3 AC 3
1.3.1.2	Subsurface Facility Operations	—	2.1.1.2.3 AC 3(1) 2.1.1.2.3 AC 6
1.3.1.3	Subsurface Facility Interfaces with Facilities and Systems	—	2.1.1.2.3 AC 6
1.3.1.4	Design Bases and Conformance of Design to Criteria and Bases	—	2.1.1.6.3 AC 1(1) 2.1.1.7.3
1.3.1.5	General References	—	—

*SAR section number and title per updated outline; see CDR Section 3.2.5 for further description.

3.2 SCOPE

SAR Section 1.3.1, “Subsurface Operations Overview,” provides an overview of the subsurface facility operations and includes a description of the major SSCs and their interfaces with other facility SSCs and with surface facility SSCs.

3.2.1 Licensing Approach

The licensing approach for this section is described in CDR Section 2.2.1. Operations supporting emplacement that satisfy thermal requirements will be discussed in SAR Section 1.3.1.

It will also be demonstrated that the subsurface facility supports emplacement operations for a representative waste stream that meets the statutory waste inventory, in addition to supporting programmatic project requirements such as a capability for waste retrieval and monitoring of the repository natural and engineered barriers throughout the preclosure period.

The safety case for the entire subsurface facility will be discussed, as well as the implications of phased construction of the subsurface facility.

3.2.2 September 2005 Table of Contents

- 1.3.1 Subsurface Operations Overview
 - 1.3.1.1 Major Subsurface Facility Structures and Equipment
 - 1.3.1.2 Subsurface Facility Operations
 - 1.3.1.3 Subsurface Facility Interfaces with Facilities and Systems

4.2.3 September 2005 List of Tables

Table	Title
1.3.2-1	Seismic Design Requirements for Structures, Systems, and Components
1.3.2-2	Seismic Use Group and Importance Factors of Structures, Systems, and Components Designed to International Building Code
1.3.2-3	Damping Values
1.3.2-4	Vertical Ground Response Spectral Acceleration for 5% Damping for an Annual Exceedance Probability of 5×10^{-4} at Repository Horizon
1.3.2-5	Horizontal Ground Response Spectral Acceleration for 5% Damping for an Annual Exceedance Probability of 5×10^{-4} at Repository Horizon
1.3.2-6	Codes and Standards and Regulatory Guidance Documents Used in the Design of Subsurface Important to Safety and Important to Waste Isolation Structures, Systems, and Components

4.2.4 September 2005 List of Figures

None.

4.2.5 Changes from September 2005 Draft

The following information will be considered in revising this section:

- The nuclear safety design bases and their implementation
- Descriptions of safety functions, procedural safety controls, design criteria and design bases, design methodologies, consistency of materials with design methodologies, and load combinations for ITS SSCs
- Logic diagrams that display the parameters sensed, gate logic (if applicable), number of channels, and safety signals generated for ITS automatic functions
- P&IDs, V&IDs, electrical single line diagrams, and logic/loop diagrams that include enough component and/or appurtenance information to allow modeling for the reliability assessment
- The environmental conditions during and following the event sequences
- The points of control on P&IDs and V&IDs for ITS functions.

SAR Section 1.3.2.2.1 will be revised in accordance with revised requirements and criteria on subsurface standoffs and engineered barrier–natural barrier protection considerations.

SAR Section 1.3.2.3 will be updated in accordance with revised requirements and criteria for subsurface mechanical handling equipment to accommodate new design concepts and revised criteria for withstanding, preventing, or limiting event sequences.

In SAR Section 1.3.2.3.1, information on design basis ground motions will be updated to the new criteria, if the seismic criteria are revised in the *Project Design Criteria Document*.

SAR Section 1.3.2.3.3 will be updated in accordance with revised requirements and criteria applicable to subsurface mechanical handling equipment due to revised layout, revised waste package design concepts, and the new TEV concept that performs both waste package transportation and emplacement functions. The change from a locomotive-driven powered waste package transporter and an emplacement gantry to a self-propelled TEV integrated design using a wider track gauge will require a revised set of design bases and a new set of requirements, criteria, and design considerations that will replace the current set and a revised set of design bases.

SAR Section 1.3.2.4.1.4 will be revised in accordance with revised requirements and criteria for configuration of emplacement drifts and emplacement panels. New criteria applicable to the turnout-~~emplacement~~ drift interface will be included for an at-grade interface and for access main-~~emplacement~~ drift drainage design considerations.

SAR Section 1.3.2.4.4.3 will be revised to incorporate any revisions to applicable criteria in the *Project Design Criteria Document* associated with applicable design basis ground motions.

SAR Section 1.3.2.4.4.8 will be revised in accordance with revised railway design criteria for the subsurface facility railway in support of the new TEV design concept and revised loads for new waste package design concepts.

SAR Section 1.3.2.4.7 will be revised according to applicable revisions to the layout configuration, emplacement panel configuration revisions, and construction sequencing.

SAR Section 1.3.2.4.8 will be revised to delete text on magma bulkheads, which are no longer a feature for the repository closure design.

SAR Sections 1.3.2.5.1 through 1.3.2.5.5 (seismic, criticality, shielding, as low as is reasonably achievable, materials and design methodologies) will be revised, as applicable, in accordance with revisions and additions to the *Project Design Criteria Document* and other relevant cited references or new references.

In SAR Section 1.3.2.7, design codes and standards presentation will be updated in accordance with expanded lists in the *Project Design Criteria Document* and other relevant sources, and new codes and standards will be added as applicable to the new TEV concept and rail design.

In SAR Section 1.3.2.8, sections on ~~revised~~ seismic ground motions will be revised if seismic criteria in the *Project Design Criteria Document* is revised. Information on ~~for the subsurface~~

5.2.6 Other Changes under Consideration

None.

5.3 OCRWM SUPPORTING PRODUCTS TO BE REFERENCED IN THE SECTION

Reference	In September 2005 SAR	To Be Revised	New
[DIRS 163439] BSC 2003. <i>Input Parameters for Ground Support Design</i> . 800-KOC-TEG0-00500-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20030515.0002.	X		
[DIRS 165572] BSC 2003. <i>Underground Layout Configuration</i> . 800-POC-MGR0-00100-000-00E. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031002.0007.	X		
[DIRS 165727] BSC 2003. <i>Repository Subsurface Construction Methodology</i> . 800-KMR-MGR0-00100-000-000. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031002.0003.	X	X	
[DIRS 166083] BSC 2003. <i>Portals Preliminary Design Calculation</i> . 800-KMC-SSD0-00300-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031110.0002.	X	X	
[DIRS 166217] BSC 2003. <i>Access Mains and Ramps Preliminary Design Calculation</i> . 800-KMC-TUN0-00100-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031028.0001.	X	X	
[DIRS 166422] BSC 2003. <i>Performance Confirmation Facilities Preliminary Design Analysis</i> . 800-KMC-MGR0-00100-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031215.0006.	X	X	
[DIRS 166660] BSC 2003. <i>Subsurface Geotechnical Parameters Report</i> . 800-KOC-WIS0-00400-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040108.0001.	X	X	
[DIRS 167772] BSC 2004. <i>Shafts Preliminary Design Calculation</i> . 800-KMC-SSD0-00400-000-00B. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040212.0004.	X	X	
[DIRS 168178] BSC 2004. <i>Ground Control for Non-Emplacement Drifts for LA</i> . 800-KMC-SSD0-00700-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040302.0022.	X	X	

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Reference	In September 2005 SAR	To Be Revised	New
[DIRS 168508] BSC 2004. <i>Bounding Characteristics of Credible Rockfalls of Preclosure Period</i> . 800-00C-MGR0-00200-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040315.0009.	X	X	
[DIRS 168726] BSC 2004. <i>Subsurface Repository Fire Hazard Analysis</i>. 800-30R-PF00-00100-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040303.0043.	X	X	
[DIRS 168963] BSC 2004. <i>Rockfall Impact on Waste Package Transporter Shield</i>. 800-K0C-SSD0-00100-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040601.0050.	X	X	
[DIRS 170488] BSC 2004. <i>Shaft Liner Design</i> . 860-KMC-SSD0-00100-000-00B. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040721.0004.	X	X	
[DIRS 172094] BSC 2005. <i>Concepts for Waste Retrieval and Alternate Storage of Radioactive Waste</i>. 800-30R-HER0-00100-000-002. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20050329.0002.	X	X	
[DIRS 174467] BSC 2005. <i>Categorization of Event Sequences for License Application</i>. 000-00C-MGR0-00800-000-00C. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20050808.0003.	X	X	
[DIRS 174942] BSC 2005. <i>Project Design Criteria Document</i>. 000-3DR-MGR0-00100-000-005. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20050826.0001.	X	X	
[DIRS 174997] BSC 2005. <i>Closure and Sealing Calculation</i> . 800-KMC-MGR0-00200-000-00B. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20050829.0003.	X	X	
[DIRS 101536] CRWMS M&O (Civilian Radioactive Waste Management System Management and Operating Contractor) 1996. <i>ESF Layout Calculation</i> . BABEAD000-01717-0200-00003 REV 04. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.19960930.0095.	X		

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Reference	In September 2005 SAR	To Be Revised	New
[DIRS 153738] CRWMS M&O 2000. <i>Shielding Calculation for Emplacement Operations and Subsurface Layout</i> . CAL-SFS-NU-000001 REV 00. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.20001026.0085.	X		
[DIRS 167858] Shideler, G.L. 2004. <i>Ground Support Maintenance Plan</i>. 800-30R-WIS0-00100-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20040113.0008.	X	X	
[DIRS 164102] Wang, J.H. 2003. <i>Selection Guide for Materials, Components, and Equipment in Radioactive Environments</i> . 000-30R-MGR0-00100-000-000. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20030618.0003.	X		
Process and Instrument Diagrams for Transport and Emplacement Vehicle			X
[DIRS 166299] BSC 2003. <i>Evaluation of Fault Displacement Effects on Repository Openings</i> . 800-KOC-WIS0-00300-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20031021.0005.	Note: This is an existing document not cited in Section 1.3.3 of the September 2005 SAR.		
Underground Layout Configuration for LA 800-KMC-SS00-00200-000-00A			X
Transport and Emplacement Vehicle Design Development Plan			X
Transport and Emplacement Vehicle ITS Study			X
Transport and Emplacement Vehicle Block Flow Diagram Level 2			X
Transport and Emplacement Vehicle Block Flow Diagram Level 3			X
Equipment Qualification Emplacement and Retrieval Equipment			X
Transport and Emplacement Vehicle Gap Analysis			X
Transport and Emplacement Vehicle Mechanical Equipment Envelope			X
Transport and Emplacement Vehicle Shielding Design Calculation			X
Transport and Emplacement Vehicle Off-Normal Retrieval Operations Study			X
Transport and Emplacement Vehicle Mechanical Handling Design Report			X

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Reference	In September 2005 SAR	To Be Revised	New
Basis of Design for the TAD Canister Based Repository Design Concept			X
[DIRS 165078] BSC (Bechtel SAIC Company) 2003. <i>Dose Rate Calculation for Emplacement Drift Turnout Configurations</i> . 800-00C-WISO-00200-000-00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20030904.0005; ENG.20050816.0008.	X	X	
Dose Rate Calculation for Subsurface Ventilation Isolation Barrier 800-00C-SS00-00400-000-00A			X
Turnout Drift Update Calculation (Replaces DIRS 166102 & DIRS 163966)			X
Repository Subsurface Backfill Locations (Drawing—Replaces DIRS 175116)			X
Repository Backfill Locations—Details (Drawing—Replaces DIRS 175115)			X
Access Mains Invert and Rails Drawings			X
Turnout Drifts Invert and Rails Calculation			X
Access Mains Invert and Rails Calculation			X
Turnout Drifts Invert and Rails Drawings			X
Subsurface Electrical Single-Line Diagram			X
Geologic Repository Operations Area Worker Dose Calculation			X
Subsurface Concept of Operations 800-30R-MGR0-00500-000			X

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Reference	In September 2005 SAR	To Be Revised	New
Repository Subsurface Waste Emplacement Transporter Routes (Replaces DIRS 174464)			X
Repository Subsurface Waste Emplacement Transporter Routes (Replaces DIRS 174466)			X
Exhaust Main Shielding			X
Mining Drawings Panel 3 Update			X
Mining Drawings Panel 4 Update			X
Radiation and Contamination Zone Drawings			X
Subsurface Facility Shielding Requirements			X
Subsurface Layout Drawings Update – 4 Panels			X
Subsurface Layout Drawings Update – Panel 1			X
Subsurface Layout Drawings Update – Panel 2			X
Instrumentation & Controls TEV-ITS Logic Sketches			X
Turnout Drifts Ventilation Door and Bulkhead Plan – Rev A			X
Turnout Drifts Ventilation Door and Bulkhead Plan – Rev B			X
Turnout Drifts Ventilation Door and Bulkhead Sections and Details – Rev A			X
Turnout Main Access Shielding			X
Estimate of Rockfall in Non-emplacement Openings		X	

5.4 INTERFACES WITH OTHER LICENSE APPLICATION SECTIONS

SAR Section 1.3.3 interfaces with the following SAR sections:

- SAR Section 1.1, “Site Description as it Pertains to Preclosure Safety Analysis”
- SAR Section 1.2, “Surface Facility Structures, Systems, and Components and Operational Process Activities”
- SAR Section 1.4, “Infrastructure Structures, Systems, and Components and Operational Process Activities”
- SAR Section 1.5, “Waste Form and Waste Package”
- SAR Section 1.6, “Identification of Hazards and Initiating Events”
- SAR Section 1.7, “Event Sequences”
- SAR Section 1.8, “Consequence Analysis”

9. SAR SECTION 1.5 – WASTE FORM AND WASTE PACKAGE

9.1 REQUIREMENTS

None.

9.2 SCOPE

SAR Section 1.5, “Waste Form and Waste Package,” is an introductory section for the discussion of waste forms and waste packages. It contains a crosswalk between the SAR sections and the regulatory requirements of 10 CFR Part 63 and the regulatory guidance of the YMRP.

9.2.1 Licensing Approach

The licensing approach for SAR Sections 1.5.1 and 1.5.2 is to provide and discuss the following information related to the waste form and waste package:

- Describe how the designs of components and associated systems meet the requirements of 10 CFR Part 20
- Describe how the Project intends to ensure that during normal operations and Category 1 event sequences, the annual total effective dose equivalent to any real member of the public located beyond the boundary of the site will be maintained within limits specified in 10 CFR Part 20 and in 10 CFR 63.204~~not exceed the preclosure standard in 10 CFR 63.204~~
- Describe how the waste form and waste package will be designed so that taking into consideration Category 1 event sequences and until permanent closure has been completed, the aggregate radiation exposures and the aggregate radiation levels in both restricted and unrestricted areas, and the aggregate releases of radioactive materials to unrestricted areas, will be maintained within limits specified in 10 CFR Part 20 and in 10 CFR 63.204
- Describe how the waste form and waste package will be designed so that taking into consideration any single Category 2 event sequence and until permanent closure has been completed, no individual located on, or beyond, any point on the boundary of the site will receive, as a result of the single Category 2 event sequence, the more limiting of a total effective dose equivalent of 5 rem or the sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) of 50 rem
- Describe in general the waste form and waste package SSCs, equipment, and process activities (10 CFR 63.112)
- Describe the analysis of the performance of the SSCs to identify those that are important to safety (10 CFR 63.112)

- Describe and discuss the design of the waste form and waste package, including the relationship between design criteria and the requirements specified at 10 CFR 63.111(a) and (b), and the design bases and their relation to the design criteria
- Information related to the materials of fabrication of the waste form and waste package (including general arrangement and approximate dimensions), and codes and standards that the Project proposes to apply in the design and fabrication of the waste form and waste package
- The design criteria used and their relationships to the preclosure and postclosure performance objectives to support the analyses performed as specified at 10 CFR 63.111(b), 10 CFR 63.113(b), and (c)
- The design bases and their relation to the design criteria
- A description of the kind, amount, and specifications of the radioactive material proposed to be received and possessed at the geologic repository operations area (GROA).

The waste form includes DOE HLW, commercial HLW, DOE SNF, naval SNF, and commercial SNF. Because the HLW and SNF typically arrive at the repository in canisters, the canisters are also considered to be an element of the waste form. All disposable canisters received containing naval and DOE SNF will have been evaluated to demonstrate that they meet applicable disposability requirements for disposable canisters.

SAR Section 1.5.1 describes the characteristics of the HLW and SNF, as well as the design of HLW canisters, DOE SNF canisters, naval SNF canisters, and TAD canisters. The design of the waste package and is described in SAR Section 1.5.2.

Waste forms that are not fully addressed in the initial LA can be incorporated into the LA after the initial submittal. 10 CFR 63.44 provides the regulatory requirement for the evaluation and reporting of changes. The incorporation of a new waste form would be evaluated and reported in accordance with 10 CFR 63.44, based on analyses already existing in the LA. The LA would then be updated as appropriate with commensurate action by the NRC.

9.2.2 September 2005 Table of Contents

1.5 Waste Form and Waste Package

9.2.3 September 2005 List of Tables

None.

9.2.4 September 2005 List of Figures

None.

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APPENDIX A
LICENSE APPLICATION REQUIREMENTS MAPPING—DOE INTERNAL
REQUIREMENTS

Appendix A License Application Requirements Mapping—DOE Internal Requirements

The purpose of this appendix is to provide the LA requirements mapping from internal DOE requirements documents to the LA sections that reflect the content of each requirement. The specific requirements are tracked by the Requirements Management System to ensure that they are incorporated into the appropriate project implementing document. These implementing documents provide the basis for the information that is then reflected in the LA. The DOE documents included in this mapping are the *Civilian Radioactive Waste Management Systems Requirements Document*, the *Monitored Geologic Repository Systems Requirements Document*, and the *Integrated Interface Control Document*, Volume 1.

Definitions

LA Content Requirements—The requirement is specifically addressed in the LA if the table cell contains a “yes” answer. A “no” answer does not indicate the requirement is not addressed somewhere in the Yucca Mountain project; the requirement is simply not a requirement that has regulatory implications required to be submitted for NRC review in the LA. In many cases, the requirement may influence the information presented in the LA (e.g., requirements on how units of measure should be presented on drawings); however, it is not the purpose of the LA to specifically address the requirement.

Applicable CDRs—Identifies the LA Conceptual Design Reports that include the LA sections that specifically address the requirement. If multiple CDRs address all or part of the requirement, each CDR will be listed.

Applicable LA Sections—Identifies the specific LA sections that are expected to address the requirement. If multiple LA sections address all or part of the requirement, each LA section will be listed.

Global—Use of the term “global” indicates that the requirement affects most of the CDRs and numerous LA sections. In most cases these are general requirements that globally affect the LA content.

Exhibit 69

Exhibit 69

The evolution of the LSN (originally denominated the "Licensing Support System") is instructive and confirms the intention of NRC from the inception of the program to establish an orderly sequence for the preparation of databases first by DOE, then by NRC, and finally, by Nevada and other parties and potential parties, containing all the documents considered relevant to the licensing proceeding by those parties. This sequence is captured in 10 C.F.R. Section 2.1003(a), which provides that DOE, the party with the burden of proof to establish its entitlement to an NRC license, would be the first to file its LSN database. The section goes on to prescribe deadlines of 30 days after DOE for the NRC, and 90 days after DOE for Nevada and other parties to file their respective LSN databases, all triggered by DOE's certification of its own database.

It is clear from the preamble of NRC's Proposed Rule that the foregoing step-wise approach was carefully calculated to (1) enable the parties to the anticipated proceeding other than DOE to have a reasonable time to review the DOE LSN database before preparing and filing their own and (2) make sure that the filing of all the respective databases was complete substantially prior to the docketing of DOE's License Application. Thus, NRC emphasizes in its preamble that the provisions of 10 C.F.R. 2.1003(a) "require the DOE to make its documentary material available to other potential parties and the public in electric form via the LSN no later than six months in advance of DOE's submission of its License Application to the NRC." (68 Fed. Reg. 66,373). Likewise, NRC made clear its intention that the entire sequence of LSN database filings was (akin to document production before trial in civil litigation) intended to be complete well before the time of DOE's License Application, and was intended to expedite the licensing process by supplanting what otherwise could be lengthy document production initiatives between and among the parties: "The Commission believed that the LSN could facilitate the timely review of DOE's License Application by providing for electronic access to relevant documents via the LSN before the License Application is submitted, rather than the traditional, and potentially time consuming, discovery process associated with the physical production of documents after a license application is submitted. In addition, the Commission believed that early access to these documents in an electronically searchable form would allow for a thorough and comprehensive technical review of the license application by all parties and potential parties to the HLW licensing proceeding, resulting in better focused contentions in the proceeding." (Vol. 68 Fed. Reg. 66,372-73) (emphasis supplied). NRC reiterates this point later in the Proposed Rulemaking, confirming its expectation that the LSN "would provide potential participants with the opportunity to frame focused and meaningful contentions and to avoid the delay potentially associated with document discovery, by requiring parties and potential parties to the proceeding to make all their Subpart J-defined documentary material available through the LSN prior to the submission of the DOE application. These purposes still obtain." (Vol. 68 Fed. Reg. 66,376) (emphasis supplied).

Given the desired goals of the sequential filing of databases by licensing proceeding participants - to avoid chaos and to ensure orderly preparation for the licensing proceeding by completing document exchange among the parties prior to the docketing of DOE's License Application, Nevada is deeply concerned that the present wording of the Proposed Rulemaking will fail to achieve NRC's goal. Specifically, it is very apparent to Nevada, from public pronouncements by DOE forecasting inclusion of over 40 million pages in its LSN database, and due to the necessary



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MOL.20040712.0109

QA: N/A

June 16, 2004

RECEIVED BY BSC CCU
DATE: 06/21/2004

Mr. Joseph Ziegler, Director
Office of License Application and Strategy
Office of Repository Development
U.S. Department of Energy
1551 Hillshire Drive
Las Vegas, NV 89134-6321

SUBJECT: MEETING SUMMARY FOR THE MAY 11, 2004, U.S. NUCLEAR REGULATORY
COMMISSION/U.S. DEPARTMENT OF ENERGY QUARTERLY MANAGEMENT
MEETING

Dear Mr. Ziegler:

Enclosed is the summary of the May 11, 2004, Quarterly Management Meeting between the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE). The purpose of the meeting was to discuss the status of various management and programmatic issues concerning Yucca Mountain, Nevada.

The meeting was held at the Bechtel SAIC offices in Las Vegas, Nevada, with video and audio connections with NRC offices in Rockville, Maryland, and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas.

If you have any questions regarding the enclosed meeting summary, please contact Omid Tabatabai at (301) 415-6616.

Sincerely,

A handwritten signature in black ink, appearing to read "C. William Reamer".

C. William Reamer, Director
Division of High Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

Enclosures:

1. Management Meeting Summary
2. Consolidated Action Items
3. Agenda
4. Presentations
5. List of Attendees

cc: See attached list

License Application Schedule Status

<u>COMPONENT</u>	<u>PERCENT COMPLETE JANUARY 2004</u>	<u>PERCENT COMPLETE APRIL 2004</u>
KTI Agreement Addressed*	70%	70%
LA Document	14%	33%
Preclosure Safety Assessment	45%	62%
Total System Performance Assessment (TSPA)-LA	76%	81%
Design	<u>56%</u>	<u>79%</u>
TOTAL WEIGHTED % COMPLETE	54%	68%

100 percent of Key Technical Issue (KTI) Agreements will be addressed prior to submission of the LA

* Status reflected as percent of 293 agreements with DOE submittals (complete + 1/2 credit for partial)



	<u>TITLE</u>	<u>STATUS</u>
1.	Waste Package Inventory Allocation Analysis	This document has been renamed. It is now the Initial Radionuclide Inventory, ANL-WIS-MD-000020 (DOC.20050927.0005). Rev 1-ACN1 was completed 9/27/07. On the LSN in full text (DN2002478989).
2.	Evaluate Probability of Post-Closure Criticality	Expected to be completed in about two weeks.
3.	Drift Degradation Analysis	This AMR will not be revised to support LA. The Drift Degradation Analysis to be cited in LA is Rev. 3, completed 7/28/06 (DOC.20060731.0005). On the LSN in full text (DN2002293941).
4.	Atmospheric Dispersal and Deposition of Tephra from a Potential Volcanic Eruption at YM NV	Revision completed early. Ash Plume AMR to be cited in LA is Rev. 3, completed 10/04/07 (DOC.20071010.0003). On the LSN in full text (DN2002479954).
5.	Magma Dynamics at YM, Nevada	A separate AMR will not to be completed to support LA. This analysis was included in Dike/Drift Interactions AMR. Rev 2 of this AMR was completed on 10/04/07. (DOC.20071009.0015). On the LSN in full text (DN2002480301).
6.	The Development of the TSPA-LA FEPs - Criticality	Replaced by Evaluate Probability of Post-Closure Criticality AMR, which is about to be completed. See #2 above.
7.	TSPA Model/Analysis for the LA	Version for draft Repository SEIS completed. (This is part of the Draft SEIS references that haven been provided to the State and are being processed onto the LSN.) Version for LA scheduled to be delivered for DOE acceptance review by 1/14/08.
8.	Near Field Chemistry Model	Included as appendix to EBS Physical and Chemical Environment AMR, Rev. 6, completed 8/31/07 (DOC.20070907.0003). On the LSN in full text (DN2002452948).
9.	Thermal Management Flexibility Analysis	Slated for completion 11/16/07. (Note: 2006 date in schedule was a typo.)

**Shebelskie, Michael**

From: Charles Fitzpatrick [cfitzpatrick@nuclearlawyer.com]
Sent: Thursday, October 25, 2007 3:41 PM
To: Shebelskie, Michael
Cc: 'Charles J. Fitzpatrick'; 'Martin Malsch'; EGANPC@aol.com
Subject: Missing AMRs
Attachments: Missing AMRs.pdf

Mike – Charlie asked me to forward this to you. It is a list indicating (with arrows in the right margin) those AMRs which we cannot locate on LSN. Please let us know if, and where, we can find any of them on LSN.

Thank you.

Susan Montesi

Assistant to Charles J. Fitzpatrick
Egan, Fitzpatrick & Malsch, PLLC

Phone: 210.820.2669

Fax: 210.820.2668

smontesi@nuclearlawyer.com

www.nuclearlawyer.com

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9

Shebelskie, Michael

From: Shebelskie, Michael
Sent: Friday, October 26, 2007 5:39 PM
To: 'Charles Fitzpatrick'; Martin Malsch
Subject: AMR schedule
Attachments: DOC014.PDF

Charlie and Marty,

Attached is a chart that provides the current status of the 9 AMRs on the list you sent me yesterday. Please let me know if you have any questions.

Mike.

SIGNATURE

Cc w Enclosures: NRC
OGC
Cc w/o Enclosures: BSC folks

Enclosure: - Serials Analysis and Background



Joe/Bill/Claudia: if Margaret wants an earlier LA date – then we'll just have to do some smart software queries and sorts, and then dump all of RMS, DIRS, and TDMS into LSN – nothing much more...

.....

Office of Civilian Radioactive Waste Management (OCRWM)

Licensing Support Network Strategic Approach (LSNSA)

DOE POC: DOE/RW-0535

October 5, 2001

Job Control Number: 01-2939

The Office of Civilian Radioactive Waste Management³ (OCRWM) opportunity to identify and define OCRWM's approach to the issues associated with meeting the Nuclear Regulatory Commission's (NRC) requirements for the OCRWM Licensing Support Network

compliance with this NWPA mandate. The issues associated with definition, development, implementation, and maintenance of the OCRWMILSN are especially challenging because of the immense amount of information that will be provided and the requirement that all interested parties have access to the information.

Section 114(d) of the NWPA requires the Commission to issue a final decision approving or disapproving issuance of the construction authorization for a geologic repository for high-level-waste (HLW) within three years of the "submission" (i.e., docketing) of the DOE license application. The Commission anticipated that the HLW proceeding would involve a substantial number of documents created by well-informed parties regarding numerous, complex issues. The Commission believed that the LSN could facilitate the timely NRC technical review, and the timely petitioner "discovery type" review, of DOE's license application by providing access to relevant documents before DOE submits its license application. Additionally the NRC believed the LSN could supplant the need for the traditional discovery process used in NRC proceedings involving the physical production of these documents after the license application is docketed. The NRC also believed that early provision of these documents would allow for a thorough, comprehensive technical review of the license application by all parties and potential parties to the HLW licensing proceeding, resulting in better-focused contentions in the proceeding.⁴ The LSN could also facilitate agency response to other requests by providing the public with electronic access to documentary material. The rule requires DOE to certify the contents of the OCRWMILSN six months prior to the submittal of the LA.

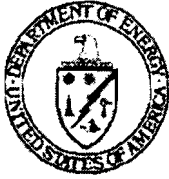
OCRWM has successfully completed publication of the Viability Assessment and its associated supporting documentation, publication of the Draft Environmental Impact Statement (DEIS), Supplement to the Draft Environmental Impact Statement (SDEIS), Science and Engineering Report (S&ER), Preliminary Site Suitability Evaluation (PSSE), and associated supporting documentation. Identification of other documentary material that will need to be reprocessed prior to screening for transmission of information to the OCRWMILSN has been completed.

1.3 REQUIREMENTS

The LSN and associated electronic information systems are governed by NRC's 10 CFR 2, Subpart J, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders." Additional guidance for the OCRWMILSN functions are contained in the Statement of Considerations accompanying 10 CFR 2, Subpart J as well as staff memos to the Commission. For example, according to SECY-00-0135, June 23, 2000, the primary functions of such a system (as stated in 10 CFR 2, Subpart J) are:

1. To provide full text search and retrieval access to the relevant documents of all parties and potential parties to the HLW repository licensing

⁴ Amendment to 10 CFR Part 2, Subpart J, Supplementary Information, May 31, 2001, 66 Fed. Reg. 29453



Department of Energy
Washington, DC 20585

QA: N/A

AUG 17 2007

CERTIFIED MAIL 7000 1670 0005 4673 2327

Charles J. Fitzpatrick
Egan, Fitzpatrick & Malsch, PLLC
1777 N. E Loop 410, Suite 600
San Antonio, TX 78217

Dear Mr. Fitzpatrick:

This is in response to your April 26, 2007, Freedom of Information Act (FOIA) request for various documents itemized below. Please refer to F2007-00276 in any future correspondence regarding this matter.

Our responses to the individual items of your FOIA request are itemized as follows:

1. The documents **and** CD-ROMs transmitted to Ms. **Claudia Newbury** in accordance with the correspondence attached to this request as **Exhibit A** (March 28, 2000) from Mr. Eric Zwahlen, including:
 - a. **Simplified Total System Performance Assessment (STSPA)** (on CD-ROM); and
 - b. **All instructions on how to install, browse, and execute the model.**

In response to this item of your request, enclosed is a CD-ROM identified as MOL.20010614.0182.

2. Any and all transmittal correspondence from any [U.S. Department of Energy] DOE employee or representative to any employee or representative of the Nuclear Waste Technical Review Board or any other third party or entity, providing such third party with any information pertaining, in whole or in part, to the STSPA.
 - a. Letter, S. Brocoum to W. D. Bamard, dated April 7, 2000, with Enclosure 1. Enclosure 2 is the same item identified in response to Item 1.a. above. We cannot determine what map was sent with this letter, therefore, this enclosure is not provided. Enclosure 4 is an Analysis



EXHIBIT F

- Evaluate the effects of volcanic ash injection into the biosphere, and consider the effects of ash on short term and long term climate, and radioactive ash accumulating in soil and dunes in the vicinity of the repository.
- Evaluate the effects of a dike or eruption occurring near the repository. This near miss scenario includes changes in ground water flow paths, rock alteration and thermal effects related to dike emplacement. Evaluate the mechanics and probability of fault activation (or re-activation) by dike emplacement.
- Evaluate tectonic models for the formation of Crater Flat, Bare Mountain and Yucca Mountain.
- Examine the evidence for Holocene faulting in the Yucca Mountain area.
- Assess seismic hazard studies for Yucca Mountain.
- Examine extremely large motion, low probability seismic events and questions created if the compliance period is extended.
- Examine smaller motion events with magnitudes up to 7 to 7.5 and their effects on repository and surface facilities for post- and pre-closure periods.
- Determine the cumulative effects of intermediate ground motions (\$500,000).

3. Design, Engineering, Pre-closure Performance, and Criticality

The DOE approach to criticality safety assessment will be carefully reviewed in respect to waste storage on site prior to emplacement, the emplacement process, the period after emplacement during which the repository remains open, and the long-term (to approximately 1×10^6 years after present) following closure of the repository. For the long-term, particular attention will be given to the possibility of criticality events within the first 1×10^4 years.

- For the waste storage period and emplacement process, particular consideration will be given to external events, e.g. aircraft impact, seismic shocks and drop accidents, that have the potential to disrupt storage casks/disposal packages, taking into account the potential for introduction of moderator either at the time or subsequently.
- For the period after emplacement when the repository remains open, consideration will be given to external events, e.g. rock fall, and corrosive penetration of the storage containers. Over this period, it is likely that the emphasis will be on the potential for in-container criticality.
- For the period after closure, while external events will continue to be considered, the emphasis will be on corrosive penetration of the canisters, the distribution of water as moderator within and around them, the differential movement and chemical mobilization of neutron poisons and fissile isotopes and the potential for both in-canister and ex-canister criticality events.
- The evaluation will include, but will not be restricted to:
 - The comprehensiveness of the identified classes of criticality events;
 - The techniques used to assess the likelihood or frequency of the various classes of events, including evaluation of fault and event tree approaches, and hydrogeochemical modeling;
 - The techniques used to define geometrical and compositional configurations of interest;
 - The adequacy of the methods used to determine the k_{eff} of those geometrical and compositional configurations;

8. Overall Performance Assessment Issues and TSPA Support

Nevada will undertake the examination of Overall Performance Assessment Issues and TSPA Support, including:

- Review of the overall scope of the post-closure radiological performance assessment submitted by DOE in respect of Yucca Mountain to determine whether there are deficiencies with respect to comprehensiveness and adequacy of argument; and
- Evaluation of whether the post-closure radiological performance assessment submitted by DOE with respect to Yucca Mountain is adequate to underpin the safety case for disposal of spent nuclear fuel and other high level radioactive wastes.

In support of this effort, detailed top-down reviews will be undertaken of the performance assessment documents submitted in support of the LA by DOE. In addition, reviews will be undertaken of responses to those documents and the LA by interested parties, including, but not limited to, the NRC.

In support of these review activities, Nevada will acquire, install, review, modify as appropriate, run and evaluate output from the version of TSPA model used by DOE in support of its LA. This will require familiarization both with the GoldSim simulation package in which the TSPA model is implemented and with the TSPA model itself. In addition, Nevada's TSPA team will acquire, install, review, modify as appropriate, run and evaluate output from the version of the Total-System Performance Assessment ("TPA") model used by the NRC as a support tool in evaluating submissions from DOE.

Nevada will also acquire, install, review, modify as appropriate, run and evaluate output from other overall performance assessment models relevant to Yucca Mountain, e.g. the model

developed by Electric Power Research Institute (“EPRI”), in so far as the use of such models is helpful in evaluating the adequacy of DOE’s LA.

Nevada’s TSPA team will advise its other specialist teams as to how their particular areas of expertise are described in the overall performance assessment and how those areas of expertise are represented in the various overall performance assessment models, with an emphasis on the DOE TSPA model. In modifying the overall performance assessment models and in selecting input data sets for variant calculations, Nevada’s TSPA team will take advice from the various specialist teams with respect to their particular areas of expertise and interfaces between those areas of expertise. It is anticipated that these interface issues will map closely onto the interfaces between modules in the overall performance assessment models.

Nevada’s TSPA team will advise the specialist teams of priority areas for review and modeling as determined by their significance in the overall performance assessment and relevance to the overall safety case for the facility. It will also evaluate whether DOE has performed model abstraction on these process models in such a way that the abstracted models are fit-for-purpose in the context of the overall performance assessment.

Nevada’s TSPA team will keep track of any changes to the EPA and NRC rules relating to Yucca Mountain under review and will advise the specialist teams, legal team and representatives of Nevada of the implications of any such rule changes for performance assessment and the overall safety case.

In all its activities, Nevada’s TSPA team will have due regard to the state of the art in post-closure radiological performance assessment internationally, both with respect to the criteria and standards adopted, and in terms of the methodologies used.

The preparation and evaluation of such a TSPA involves an array of complicated, highly scientific and technical issues, requiring the talents of a body of experts from diverse

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December 2006

arena and adequately protect Nevada's Interests is likely to be the most complex and costly activity in which the Agency has engaged to date.

To carry out its responsibilities in this regard, the Agency has assembled a first-rate team of legal and technical experts with experience and expertise in the highly specialized NRC legal, regulatory and adjudicatory arenas and in critical scientific and technical disciplines directly related to key areas of site waste isolation system performance and overall Yucca Mountain licensability.

During the past two years, the State's legal team has been heavily engaged with the NRC's Pre-Licensing Application Presiding Officer (PAPO) Board in defining the policies and procedures that would govern any actual licensing proceeding. In addition, Agency staff, assisted and guided by the legal team, has been incrementally assembling documents and materials for loading on the NRC's licensing support network information database, a task that is both costly and extremely labor intensive."

One of the most important - and frustrating - areas of the State's pre-licensing activities has been gaining access to current information and technical materials on the Yucca Mountain repository facility and system design being proposed for licensing and on DOE's key performance models and related information essential for licensing. DOE has, to date, refused to provide information on the current repository design and models used to assess repository system performance (i.e., waste isolation capabilities) and has rebuffed State efforts to obtain a copy of the draft license application, even though that document has been shared with others.

The Agency has also been engaged in a sustained and concerted research effort to address key technical and scientific issues that are expected to be important to the State's licensing intervention. To that end, the Agency has engaged nationally and internationally recognized scientists and experts in fields of hydrology, geochemistry, volcanism/seismicity, and health physics. These scientists are working closely with the State licensing team, compiling data from over two decades of Agency-sponsored research on the Yucca Mountain site, carrying out new research and preparing scientific reports and papers to be published in peer-reviewed journals - work that will support the State's contentions in any licensing proceeding. They will also be available as expert witnesses during any future licensing proceeding.

¹² The State of Nevada, as a participant in the licensing process, is also required to have all of the documents and materials it will rely on in licensing loaded into the NRC web-based information system. In addition, NRC also requires the State and other participants to include in the database Agency materials that DOE or other licensing parties might be reasonably expected to need to respond to contentions made by the State. This places an extraordinary burden on the State in that it means that thousands of documents must be converted to electronic files and loaded onto the web-based system, at considerable cost and effort.