Please Note: The enclosed letter to DOE documents a Quality Assurance and Key Technical Issue Status Management Meeting conducted on September 6, 2001.The meeting minutes are included as Enclosure 1 to the letter. Enclosure 2 provides the agenda of the meeting, Enclosure 3 is the attendance list. Due to the size of Enclosure 4 they are not included in this mailing. If you are interested in viewing or printing the Enclosure, it can be obtained from the NRC website (www.nrc.gov) under the ADAMS icon (or you can go directly to the ADAMS homepage at www.nrc.gov/NRC/ADAMS. If you don not have access to the website and/or are interested in getting a hard copy of Enclosure 4, please contact Ms. Darlene Higgs at 301-415-6711 or e-mail at gdh1@nrc.gov.

ENCLOSURE 1

Summary Highlights
U.S. Nuclear Regulatory Commission/U. S. Department of Energy
Quarterly Quality Assurance Meeting
and Key Technical Status Meeting
Las Vegas, Nevada
September 6, 2001

SUMMARY OF QUARTERLY QUALITY ASSURANCE MEETING/ATTENDEES

The September 6, 2001, Quarterly Quality Assurance (QA) Meeting was held at the U.S. Department of Energy (DOE) Yucca Mountain Site Characterization Office in Las Vegas, Nevada with participants from the U. S. Nuclear Regulatory Commission (NRC) Headquarters in Rockville, Maryland, NRC Region IV; DOE Headquarters in Washington, D.C.; and the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas.

PRESENTATION/DISCUSSION SUMMARY

Introduction

Lake Barrett, DOE, provided opening remarks and emphasized that DOE is implementing improvements to insure the QA adequacy of its products. Mr. Barrett indicated that, to date, emphasis was placed on scientific suitability. DOE is transitioning to the next step of becoming a Licensee. This transition will require an improvement in DOE's nuclear culture for DOE to demonstrate that it can effectively implement a successful QA program. During the transition, management attention will be heightened and will include metrics to measure the DOE's performance. Also, Mr. Barrett indicated that initiatives were underway to strengthen the organization. Specifically, effective Monday, September 10, 2001, Dr. William Boyle will become the interim DOE Director of Office of QA. Mr. Bob Clark will be detailed to the Office of the Project Manager as a senior advisor. The QA Director, a senior management position, will be posted and competitively filled. DOE will perform a national search to bring in a candidate having commercial nuclear industry QA experience.

NRC indicated that the individual filling the position of QA Director must meet DOE QARD requirements and the DOE job description for the QA Director. Mr. Barrett stated that Dr. Boyle was qualified to hold the position as interim QA Director. NRC requested documentation of Dr. Boyle's qualifications for that position.

Mr. Barrett indicated that another initiative to ensure the quality of products for licensing involves transitioning audits, surveillances, and ownership of the QA procedures from DOE to Bechtel SAIC Company (BSC). This proposed initiative is work in progress and will include refining the roles and responsibilities within DOE and BSC to improve overall performance.

William Reamer, NRC, questioned why audits and surveillances were being transitioned to BSC when DOE has indicated that their concerns are primarily with the line's implementation of the QA requirements. Mr. Reamer also asked if safety conscious work environment was the driver behind this proposed initiative. Mr. Barrett indicated that safety conscious work environment was not a driver for the above initiative, but was the driver for other enhancements in the QA program.

John Greeves, NRC, indicated that NRC remains skeptical of DOE's ability to effectively implement a successful QA program and that it will take time for DOE to demonstrate that improvements have been made. Mr. Greeves emphasized the importance of DOE to show positive results to overcome NRC's skepticism.

QA Program Overview

Robert Clark, DOE, discussed the current QA trend results, significant conditions identified, positive trends, and corrective actions regarding implementation of the DOE QA program. Mr. Clark also discussed the results of the two most recent audits, YMSCO-ARC-01-14 and BSC-ARP-01-04. Mr. Clark informed NRC that the potential OCRWM TSPA QA audit deficiency on transparency is not a significant condition and will not be written as a corrective action report item. Ken Hess, BSC, added to this presentation by discussing Quality and Safety Specific Initiatives.

Status of TSPA-SR Issues/Management Plan

Nancy Williams, BSC, discussed the Management Plan status and provided an overview of the Management Plan background, horizontal review of key documents, vertical review of SSPA, and TSPA vertical review. Ms. Williams also discussed the technical integrity of the TSPA-SR including the TSPA vertical review discrepancies, model validation findings, software verification concerns, and data quality concerns.

Proposed Path Forward/Corrective Action To Prevent Recurrence

Ms. Williams presented the Path Forward regarding corrective actions to prevent recurrence of quality-related problems identified during the investigation into DOE-issued Corrective Action Reports for model validation and software qualification, and errors identified in the TSPA-SR and other technical documents. DOE stated that it will develop a comprehensive corrective action plan that will address the causes of problems identified during its investigation and a Performance Improvement Transition Plan to improve the level of performance of QA program implementation. DOE will submit the Performance Improvement Transition Plan to NRC by December 15, 2001, which will specifically address the following items:

- Software and modeling results and corrective action report (CAR) root cause analysis results and recommendations including root, generic, and common causes
- TSPA root cause results and recommendations including root and common causes
- Review of results of vertical and horizontal document in process reviews conducted on the S&ER, PSSE, and SSPA for the purpose of ensuring that any additional adverse trends are included in the Plan.
- The results of the TSPA audit will be integrated into the Performance Improvement Transition Plan.
- Coordination of the DOE Integrated Safety Management System (ISMS) with QA Program Initiatives including closure of ISMS issues resulting from self-assessment(s).
- Results of self-assessments performed over the last six months.
- Lessons learned from previous corrective actions including what is different with this plan versus previous initiatives.
- QA Management Assessment (QAMA) Review Results.

Ms. Williams stated that DOE and BSC Senior Project Managers will be assigned to manage and monitor corrective action implementation. Performance measures will be defined to evaluate both the progress of implementation and the effectiveness of the actions taken to ensure continuous improvement. This will be part of the plan provided to the NRC on December 15, 2001.

BSC QA personnel will conduct performance based and compliance based audits and surveillances of in-process work to confirm that the corrective actions taken are implemented and effective. The DOE Office of QA will conduct audits, progressive reviews, and verification of corrective and preventive action implementation as it is completed. DOE committed to provide the scope and time frame of DOE and BSC oversight activities as part of the plan to be delivered on December 15, 2001. DOE will provide audit and review schedules for these DOE and BSC activities to the NRC as they are developed and updated.

Status of Model Validation

William Watson, BSC, discussed the status of Model Validation. Mr. Watson provided the background of the model validation effort and discussed the model validation review results and path forward for potential license application.

Progress Made in Qualifying Data

Dr. Robert Wemheuer, BSC, presented the status of DOE's verification and qualification activities for data used in Analysis Model Reports and Process Model Reports contained in the TSPA-SR. The original goal to qualify 80% of the data used for the Process Model Reports (PMRs) and associated AMRs supporting TSPA-SR, Rev. 0, ICN 1, has been met. As of September 5, 2001, 99.8 percent of data used to support the AMRs contained in the TSPA-SR is verified and 94.4 percent of that data is qualified. The results of 61 impact assessments of unqualified data concluded that the unqualified data had no significant impact on TSPA-SR results or conclusions.

Progress Made in Qualifying Software

Dr. Wemheuer also discussed software qualification status. Dr. Wemheuer noted that the original goal to qualify 80% of the software used in Revision 1 of the PMRs and associated AMRs supporting TSPA-SR, Rev. 0, ICN 1, has been met. Dr. Wemheuer reported that, as of September 5, 2001, 98 percent of software codes in support of TSPA-SR have been qualified. The remaining software code qualifications will be completed by the time of site recommendation. The results of software impact assessments show that DOE has not identified any impacts on TSPA-SR conclusions or support documentation.

Significance of Unqualified Data

Dr. Robert Andrews, BSC, presented the significance of unqualified data. An overview of the approach used for unqualified data impact assessments and a summary of the unqualified impact assessments were provided. Dr. Andrews reported that use of unqualified Data Tracking Numbers (DTNs) in output for Analysis Model Reports (AMRs) were determined to not significantly affect output of AMRs and that all 50 DTNs analyzed have no significant impact on

TSPA-SR results or conclusions. NRC requested that a future meeting be held with DOE to provide NRC subject matter experts with the information presented regarding the significance of unqualified data.

Action Item Status

During the meeting DOE agreed to provide additional information requested by NRC. These specific items are detailed in Attachment 1.

Closing Remarks

Dr. Russ Dyer, DOE, clarified the plans for QA audits and surveillances by indicating that, rather than a "transition," DOE was re-instituting prime contractor QA audits and surveillances. These functions had been removed from the previous contractor's scope and performed exclusively by the DOE Office of QA since 1996. While BSC, the current prime contractor, had contractual authority for self assessment activities, DOE believed that reinstituting the contractual authority to perform audits and surveillances would enhance the QA program by providing an additional layer of oversight, closer to the in-progress work. Dr. Dyer further emphasized that the DOE Office of QA and their QA support contractor had performed these functions well and that this initiative in no way reflected on that performance. Further, he indicated that DOE clearly retained and intended to fulfill the responsibility to fulfill the NRC's QA requirements for oversight of their contractor's activities in DOE's role as potential license applicant. Some re-alignment of resources is expected to avoid unnecessary redundancy in these activities but this planning has not yet been completed.

Mr. Reamer noted that the meeting was informative and that the approaches presented to improve the QA program seemed reasonable. Mr. Reamer added that the ongoing activities associated with data and software qualification also seemed appropriate. Mr. Reamer indicated that NRC did not have high confidence in DOE's ability to implement the proposed plan described to improve the QA program, based on DOE's previous QA track record. Mr. Reamer added that NRC would not prejudge DOE's ability to succeed based on DOE's track record. Mr. Reamer closed stating that NRC would continue to watch DOE's performance and that NRC would start by examining the impact assessments in detail.

Dr. Dyer stated that DOE understands that improvements are needed. He stressed his confidence in successful implementation of the proposed DOE/BSC transition plan.. Dr. Dyer also clarified an earlier comment with respect to transition of the audits and surveillances to BSC. Dr. Dyer emphasized that DOE is simply reinstituting the audits and surveillances within the BSC organization since the contractor is accountable for QA of their products. Dr. Dyer indicated that DOE will continue to provide oversight of the QA program.

SUMMARY OF KEY TECHNICAL ISSUE MEETING

Jim Anderson, NRC, provided an overview of the Key Technical Issue (KTI) issue resolution process. NRC provided the current status of each of the KTI Subissues and stated that with Igneous Activity Subissue 2 and Total System Performance Assessment and Integration Subissue 3 changing status to closed-pending as a result of a meeting held on September 5, 2001, of the 37 KTI Subissues, 32 are now closed-pending and 5 are closed. NRC noted that there is one remaining issue resolution meeting yet be to conducted in fiscal year 2001

associated with the range of thermal operating temperature presented in DOE's Supplemental Science and Performance Analyses. NRC then discussed the status of the KTI agreements and stated that there are currently 292 NRC/DOE agreements related to issue resolution. NRC stated that it is tracking each of the agreements and as DOE provides documents associated with the agreements, the NRC will formally document its review in a letter to DOE. NRC discussed four recent letters in which the NRC provided the results of its review of the DOE documents. DOE noted that it plans to respond to each of the letters. Finally, the NRC discussed a number of agreements for which the NRC expects DOE to provide documents in September 2001. DOE noted that in addition to the NRC list, it plans to: (1) submit the TOUGHREACT code to the NRC in September 2001, and (2) discuss a model abstraction issue related to the Thermal Effects on Flow KTI during the September 13-14, 2001, technical exchange on the range of thermal operating temperatures. NRC and DOE agreed to meet early in fiscal year 2002 to discuss: (1) the agreements with fiscal year 2002 due dates, and (2) a fiscal year 2002 KTI issue resolution meeting schedule.

William Reamer
Division of Waste Management
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission

Robert W. Clark
Office of Civilian Radioactive
Waste Management
U.S. Department of Energy

April V. Gil
Regulatory Interactions and Policy
Development Team
U.S. Department of Energy

Additional Information Requested by NRC

1. Safety Conscious Work Environment Report (September 11, 2001)
2. Information on the proposed QA Director (September 11, 2001)
   - Position description for proposed interim QA Director
   - Name of proposed interim QA Director
   - Qualifications of the interim QA Director
   - Comparison of interim QA Director qualifications to the position description and procedure requirements in the DOE QARD
3. A list of outstanding corrective actions that are over one year old (provided during the QA Meeting) (copy attached)
4. Inform NRC whether or not the OCRWM TSPA QA Audit deficiency on transparency remains a significant condition (provided during the QA Meeting) (copy attached)
5. A copy of the BSC visions and values (provided during the QA meeting)
6. Formal transmittal copies of both Root Cause Analysis reports (September 11, 2001)
7. A copy of the results of DOE's self-assessments over the last six months (September 2001)
8. The model validation review report (October 19, 2001)
9. DOE and BSC organization chart (provide following the QA meeting)
10. The QAMA results (September 2001)
11. Establish NRC/DOE dialogue on the Performance metrics prior to inclusion in the Transition Plan scheduled for submittal to the NRC in December 2001.

#	Number	Description	Days Open	Processing	Extended date	QAR	Current Action	Comment
1	LVMO-00-D-039	Inaccurate Documentation And Validation of Software Routines And/or Macros	552	Extended >365 days	09/18/2001	Sam Archuleta	QAR is Evaluating Amended Complete Response by 9/10/01	Software Quality Compliance has completed their portion of corrective actions; Remainder of work is to be assigned to Projects. QAR has verified the SQC portion of corrective actions, and has recommended reassignment of responsibility for this DR to BSC Projects. New assignments will be made for Sr. Mgr/AO Mgr/AORI. (SEA/8-8-01)
2	LVMO-00-D-118	Rationale for Excluding or Deviating from Uncertainty/Variability Values, Assumptions, and Alternative Models Established/Addressed in Process-Level AMRs are Not Being Documented at the Abstraction-Level. NRC IRSRs are Not Being Adequately Addressed in AMRs.	380	Extended	07/27/2001	Harvey Dove	QAR to Perform Verification by 9/21/01	
3	LVMO-00-D-119	Validation (Confidence Building) of Analyses and Models is Not Being Documented in Accordance with AP-3.10Q	380	Extended >365 days	10/10/2001	Harvey Dove	Corrective Action Completion Due by 10/10/01	
4	EM-00-D-139	MOA's to the National Laboratories Fail to Require the Implementation of QARD's Latest Revision; Laboratories' QARD Revision Levels are 6-9; Some MOA's Do Not Require Impact on QARD Revision to Programs and Procedures	371	Extended >365 days	09/30/2001	Don Harris	Corrective Action Completion due 9/30/01	
5	EM-00-D-143	Failure to Schedule and Perform Performance-Based Audits	371	Extended >365 days	10/15/2001	Ken McFall	Corrective Action Completion Due by 10/15/01	

Letter Already Sent

Letter in progress from the Director, OCRWM for these 4 DRs that have recently gone past the 365 day mark

✓ DRs OVER 365 DAYS

Attachment 1 #3

RESULTS OF
YMSCO AUDIT

AUDIT YMSCO-ARC-01-14

Potential DRs

1. AP-2.1Q, Indoctrination and Training of Personnel

   DR -The Individual Development Plan (IDP), Section 4, required/mandated "QA" training (only IDP Section subject to QA audit or review.

   WK - The IDP indicated Managing Lessons Learned completed 5/31/00. No objective evidence of training on the Training Records Report, Status of Report by Jobs, or Training Attendance Record for class conducted on 5/3/100.

   GF - The IDP indicated AP-5.1Q training not completed. AP-17.1Q training indicated as complete on IDP on 11/8/00. No objective evidence of completion of the yraining on the Training Record Report, or Status Report by Jobs.

   SR - The IDP indicated Supervisory Training completed on 3/01. No objective evidence of completion on the Training Records Report, or Status Report by Jobs.

2. AP-2.2Q, Establishment and Verification of Required Education and Experience of Personnel

   DR - The AP-2.2Q (effective 6/30/99) requires Attachment 2, Verification of Education and Experience (Federal Employee)) form to be completed. The verification was completed for Jeremiah G. Carter for the position of General Engineer, GS-801-13, in accordance with the U.S. Office of Personnel Management Qualification Standards Handbook and documented on a DOE letter dated June 11, 2001.

3. Procedure LP-4.1Q-OCRWM, paragraphs 5.1.2 and 5.1.3 require that comments and comment resolution resulting from review of the Requirements Package be documented. Paragraph 6.1 identifies review documentation as part of the records package.

   Contrary to the above requirements, there is no documentation of comments and comment resolution in the records packages for Requirements Packages DE-RP08-00NV12137 and DE-RP08-99NV12101. In the case of Requirements Package DE-RP08-00NV12137, OQA comments were marked up on a copy of the statement of work but no comment resolutions were documented.

4. Procedure AP-5.1Q, Attachment 9, states that for a Q Requirements Matrix for and existing procedure: "1. Run a 012 Report from the RTN Web . . . 2. Identify the Affected Organizations to which the procedures . . . 3. Identify the proposed revision/change number . . ."

   Contrary to the above requirements, procedure revision/change records packages for procedures AP-6.1Q, Rev. 6, ICN 0, and AP-17.1Q, Rev. 2, ICN 1, do not contain the correct information. For AP-6.1Q, a 014 Report was prepared which does not identify the Affected Organizations. For AP-17.1Q, a 012 Report was prepared which does not identify the Affected Organizations or the proposed revision/change number.

5. AP-6.1Q, paragraph 5.2, requires that, for controlled document submittal, the Document Owner/CCB Secretary submits the initiated DCAR in the DCAR package. The instructions for completing the DCAR (Attachment 2) requires that, for Block 18, the Document Owner, "Print and sign name indicating that the Document Owner has completed this section of the DCAR form accurately, and in accordance with the procedure."

   Contrary to the above requirements, for AP-17.1Q, the Document Owner is identified in the OCRWM Program Documents Database (OPDD) as Bob Wells, however, Dave Kellar signed and submitted the DCAR as the Document Owner.

6. Procedure AP-7.5Q, paragraph 5.3.1 requires that the Technical Monitor, or YMSCO COR if no designated Technical Monitor, review Q deliverables and record comments on a comment sheet (refer to AP-6.28Q for the comment sheet). Paragraph 6.1 identifies review documentation as part of the Records Package. Instructions for the Deliverable Acceptance Review form (YDAR), Attachment 3, require that the REV/ICN/Draft Date be indicated in Block 14a for a deliverable that is accepted or rejected.

   Contrary to the above requirements, there is no documentation of comments for reviews of Q deliverables TDR-MGR-PA-000001 or TDR-MGR-SE-000004. Note that Review Record forms were included in the Records Package for TDR-MGR-SE-000004 for all of the designated reviewers several of which indicated there were mandatory comments, however, no comment documentation was included in the Records Package. Also, the REV/ICN/Draft Date was not completed on the YDAR forms for TDR-MGR-SE-000004, TDR-MGR-PA-000001, or TDR-WIS-MD-000002.

7. AP-17.1Q, Record Source Responsibilities for Inclusionary Records

   CDA - AP-17.1Q, Section 5.1, requires creation and updating signature and initial list. The YMSCO Organization Signature and Initial List are dated 1999. The signature list is not reflective of the YMSCO organization.

LEADERSHIP COVENANTS

1. ***Treat BSC colleagues with mutual respect, trust, and dignity*** and believe they are acting in the best interest of the company.

2. ***Help each other;*** ask for and give help and welcome it freely (it is not a sign of weakness). Go out of the way to provide extra support to fellow employees. ***Share experiences and lessons learned,*** both successes and failures.

3. ***Communicate early, honestly, and completely*** with all who have a direct interest in the subject. Listen to others' points of view.

4. ***Earn trust*** by accepting and honoring agreements, keeping promises, and discussing needed changes before acting.

5. ***Work to understand BSC's goals and strategies*** and proactively support them through discussions, communications, and actions (for example, sharing resources).

LEADERSHIP COVENANTS

BECHTEL SAIC COMPANY, LLC

LEADERSHIP COVENANTS

6. ***Never undermine colleagues,*** directly or indirectly. .

7. ***Work jointly to resolve disagreements*** in good faith. If necessary, go to a higher authority together; then accept and support the solution.

8. ***Contribute constructively*** by exercising the highest level of professional and ethical behavior.

9. ***Promote continuous use of the covenants.***

LEADERSHIP COVENANTS

Attachment 1 #5

ENCLOSURE 2

Agenda
DOE/NRC Quarterly QA Meeting
September 6, 2001
DOE Hillshire Atrium Room
Las Vegas, Nevada
8:30 AM – 1:45 PM (PDT)
And via Videoconference to:

U. S. NRC	U. S. NRC	CNWRA, SWRI
Room O-3B4	Region IV	Building 189, Room A103
11545 Rockville Pike	611 Ryan Place Drive	6220 Colebra Road
Rockville, MD	Arlington, TX	San Antonio, TX

8:30 AM	Introduction	ALL
8:40 AM	QA Program Overview • Root Cause • Corrective Actions • Audit Results • Trend Results	R. Clark
9:00 AM	Status of TSPA-SR Issues/Management Plan	N. Williams
9:30 AM	Proposed Path Forward /Corrective Action To Prevent Reoccurrence	N. Williams
10:30 AM	Discussion	ALL
10:45 AM	Break	ALL
11:00 AM	Status of Model Validation	Watson
11:20 AM	Progress Made in Qualifying Data	Wemheuer
11:40 AM	Progress Made in Qualifying Software	Wemheuer
12:00 Noon	Lunch	ALL
1:00 PM	Significance of Unqualified Data	Andrews
1:30 PM	Action Item Status	Gunter
1:40 PM	Closing Remarks	ALL
1:45 PM	Adjourn	

ENCLOSURE 3

LIST OF ATTENDEES

NRC/DOE QUALITY ASSURANCE MANAGEMENT MEETING
SEPTEMBER 6, 2001

U.S. NUCLEAR REGULATORY COMMISSION
O3B-4

NAME	ORG	PHONE NO.	E-MAIL
Slater-Thompson, Nancy	DOE-RWS2	202/586-9322	Nancy.Slater@rw.doe.gov
MANNY COMAR	NRC	301-415-6074	MMC1@nrc.gov.
STEVE HANAUER PART TIME	DOE	202-586-3547	steve.hanauer@rw.doe.gov
ROB MACDOUGALL	BSC	202-479-2122	ROBERT.MACDOUGALL@RW.DOE.GOV
Larry Saraka	BSC	202-488-6745	Larry.saraka@rw.doe.gov
Christian Einberg	DOE-RWS2	202-586-8869	Christian.Einberg@HQ.DOE.GOV
King Stablein	NRC	301-415-7445	NKS@NRC.GOV
TED CARTER	NRC	301-415-6694	thc1@NRC.GOV
Kien Chang	NRC	301-415-6612	KCC@NRC.GOV
SANDRA WASTLER	NRC	301-415-8733	SLW1@NRC.GOV
DAN FEHRINGER	NWTRB	703-235-9132	fehringer@nwtrb.gov
DAVID SIEFKEN	BSC	202-479-2104	David.Siefken@rw.doe.gov
Stan Echols	Winston & Strawn	202-371-5777	fechols@winston.com
NICK DINUNZIO	DOE	202-586-8953	Nick.DiNunzio@RW.DOE.GOV
Elaine Hiruo	Platts	202-383-2163	Elaine_Hiruo@Platts.com
LARRY CAMPBELL	NRC	301 415-5000	LKC3@NRC.GOV
MITZI YOUNG	NRC	301-415-1523	MAY@NRC.gov

ATTENDANCE LIST
NRC/DOE QA/KIT MANAGEMENT MEETING
SEPTEMBER 6, 2001
RIV

Name	Organization	Phone
Blair Spitzberg	RIV	817-860-8191

QA: N/A

ATTENDANCE LIST

DOE - NRC Quarterly Quality Assurance, Key Technical Issues, ~~and Management Meeting~~

Atrium Room, 1551 Hillshire Drive, Las Vegas, Nevada

September 6-7, 1998

Name	Organization	Telephone
Alan Ross	BSC - SR Proj. Dir	702 295 4761
Russ Fray	BSC - Projects	702 295-0033
Dick Spence	DOE/OPE	(702) 254-5493
Bob Gamble	MTS/Booz Allen	702-794-1440
Floyd H. Dove	NQS	702-794-5025
Ralph Mayers	MTS/BAH	702-794-1415
Barbara McKinnon	MIS/BAH	4-5480
Pam Dath	BSC QA	5-1633
Mae Moss	BSC LAP	5-3810
James Andersen	NRC	301-415-5717
David Brooks	NRC	(301) 415 7284
Ron Kehn	BSC - LIC	702-295-5326
~~Robb Keele~~	~~BSC-QA~~	~~702-295-2506~~
Don Hill	BSC/IMTPID	702-295-4276
Tish Morgan	MTS/BAH	702 794 1463
George Pannell	BSC/LAP	702-295-5473
Robert Fish	MTS/BAH	702-794-5444
Richard Goff	MTS/BAH	202 626 1061
Jean Younker	BSC	702 295 5497
Jack Bailey	BSC	702 295-0518
Bruce Wells	BSC-PC	702-295-0407

QA: N/A

ATTENDANCE LIST

DOE - NRC Quarterly Quality Assurance, Key Technical Issues, ~~and Management Meeting~~
Atrium Room, 1551 Hillshire Drive, Las Vegas, Nevada
September 6-7, 1998

Name	Organization	Telephone
Susan Lynch	State of Nevada	775-687-3744

QA: N/A

ATTENDANCE LIST

DOE - NRC Quarterly Quality Assurance, Key Technical Issues, ~~and Management Meeting~~
Atrium Room, 1551 Hillshire Drive, Las Vegas, Nevada
September 6-7, 1998

Name	Organization	Telephone
E.J. Bissenmesser	Clark County	702 455-5788
K Michael Cline	MTS	794 5541
Len Skoblar	BSC	295-5324
William Boyle	YMSCO	702 794 5506
Jennivieve Novero	BSC	295-5312
William Watson	BSC	295-5550
Robert Wemheuer	BSC	295-7590
Veronica Cornell	BSC	295-5342
Bill Beckg	NRC	702-794-5047
R.M. Latta	NRC	702-794-5048
Thomas Matula	NRC	301-415-6602
Bill Reamer	NRC	301-415-6537
John Groeves	NRC	301.415.7437
Lake Barrett	DOE	202-586-6850
Russ Dyer	DOE	702-794-1300
Nancy Williams	BSC	702-295-5143
Bob Clark	DOE	702-~~295~~ 794-5226
Don Horton	DOE	702-794-1300
Stephan Brocoum	DOE	702-794-1359
Kennon Hess	BSC	702-295-0502
Tim Gunter	DOE	702-794-1343

QA: N/A

ATTENDANCE LIST

DOE - NRC Quarterly Quality Assurance, Key Technical Issues, ~~and Management Meeting~~
Atrium Room, 1551 Hillshire Drive, Las Vegas, Nevada
September 6-7, 1998

Name	Organization	Telephone
Charles J. Haughney	BSC - baa	x 51690
Marty Bryan	BSC - LAP	5-6273
Jake Woolay	MTS	4-5571
Jennifer		

QA: N/A

ATTENDANCE LIST

DOE - NRC Quarterly Quality Assurance, Key Technical Issues, ~~and Management Meeting~~
Atrium Room, 1551 Hillshire Drive, Las Vegas, Nevada
September 6-7, 1998

Name	Organization	Telephone
April Gil	OLRC/YMP/DOE	(702) 794-5578
George Helstrom	DOE	702-794-1419
Frank J Kraszewski	MTS	702-794-5057
Kristi A. Hodges	NQS	702-794-1464
Donald T. Krisha	BSC	702-295-6242
Robert Hasson	NQS	702-794-5023
Ram B. Murthy	DOE/OQA	702-794-5549
Dennis R. Williams	DOE/YM/OLRC	702-794-5526
Hal Wingate	Nye Cty Prog. Liaison Office	360-943-5610
Sam Hobbs	BSC	702-295-6620
Don Beckman	BSC	702-295-4392
GARY W Smith	DOE Employee Concerns	702 395-0297
S. J. CEREGHINO	BSC	702-295-4251
B John Garrick	Advisory Com on Nuc Waste	949 4976802
Bob Andrews	BSC	702 295 5549
Ernest Hardin	BSC	702 295 3963
Bob Clark	DOE/OQA	702 794 5583
ALI HAGHI	BSC/Duke	702-295-5318

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES
MEETING ATTENDANCE

SUBJECT OF MEETING NRC/DOE Quarterly QA Meeting

DATE: Sept 6, 2001 LOCATION: SwRI - Bldg 189 VTC

PERSON	ORGANIZATION	TITLE/FUNCTION	TELEPHONE NUMBER
Bruce Mabrito	CNWRA	Dir QA	210-522-5149
Robert Bagley	SwRI - QA	Sr. QA Engr.	210-522-5537
Wesley C. Patrick	CNWRA	V-P	210-522-5158
Asad Chaudhury	CNWRA	Manager-MGFE	210-522-5151
Budhi Sagar	CNWRA	Tech. Dir.	210-522-5752
Tom Trebovich	CNWRA/SwRI	Staff Scientist	210-522-3145

CNWRA Form AP-5

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES MEETING ATTENDANCE

SUBJECT OF MEETING NRC/DOE Quarterly KTI Meeting

DATE: Sept. 6, 2001 LOCATION: SwRI Bldg. 189 VTC

PERSON	ORGANIZATION	TITLE/FUNCTION	TELEPHONE NUMBER
Bruce Mabrito	CNWRA	Dir QA	210-522-5149

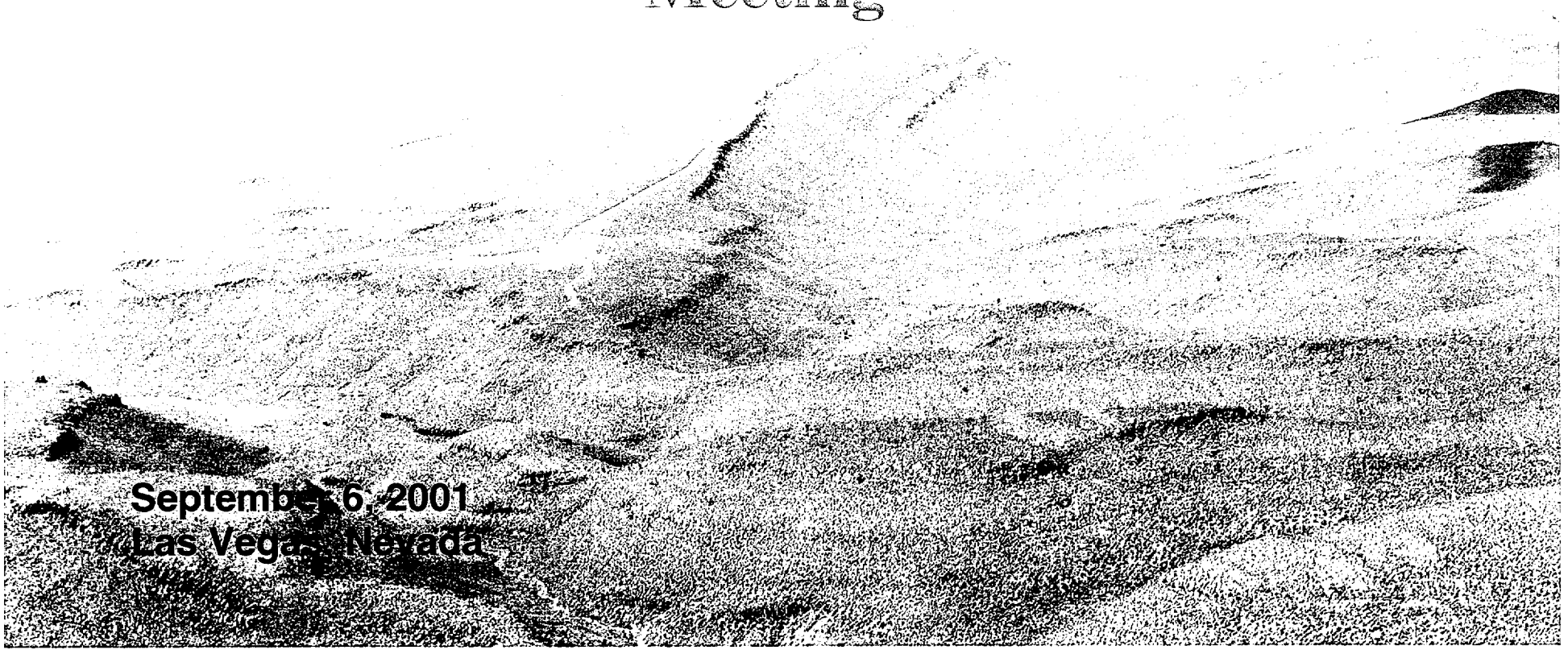
CNWRA Form AP-5

ENCLOSURE 4

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

YUCCA MOUNTAIN PROJECT

DOE/NRC Quarterly Quality Assurance / Key Technical Issues Meeting



September 6, 2001
Las Vegas, Nevada

Agenda
DOE/NRC Quarterly QA Meeting
September 6, 2001
DOE Hillshire Atrium Room
Las Vegas, Nevada
8:30 AM – 1:45 PM (PDT)
And via Videoconference to:

U. S. NRC	U. S. NRC	CNWRA, SWRI
Room O-3B4	Region IV	Building 189, Room A103
11545 Rockville Pike	611 Ryan Place Drive	6220 Colebra Road
Rockville, MD	Arlington, TX	San Antonio, TX

8:30 AM	Introduction	ALL
8:40 AM	QA Program Overview • Root Cause • Corrective Actions • Audit Results • Trend Results	R. Clark
9:00 AM	Status of TSPA-SR Issues/Management Plan	N. Williams
9:30 AM	Proposed Path Forward /Corrective Action To Prevent Reoccurrence	N. Williams
10:30 AM	Discussion	ALL
10:45 AM	Break	ALL
11:00 AM	Status of Model Validation	Watson
11:20 AM	Progress Made in Qualifying Data	Wemheuer
11:40 AM	Progress Made in Qualifying Software	Wemheuer
12:00 Noon	Lunch	ALL
1:00 PM	Significance of Unqualified Data	Andrews
1:30 PM	Action Item Status	Gunter
1:40 PM	Closing Remarks	ALL
1:45 PM	Adjourn	

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

YUCCA MOUNTAIN PROJECT

Quality Assurance (QA) Program

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Robert W. Clark
Director, Office of Quality Assurance
Yucca Mountain Project Office
Office of Civilian Radioactive Waste Management

September 6, 2001
Las Vegas, Nevada

QA Program

- Root Cause
- Trend Results / Corrective Actions
- Recent Audit Results

Trend Results

First Semester Trend Report 2001 (issued 8/8/01)

Emerging Issues:

1. Scientific Notebooks: An independent investigation has been initiated based on recurring and/or related issues

2. Control of M&TE: Although not yet considered an adverse trend, there are repetitive USGS issues regarding maintenance of a master list of calibrated M&TE

Significant Conditions

1. Model Validation: Corrective Action Report (CAR) BSC-01-C-001 was issued based on a Suspect Trend Investigation Report evaluation

2. Software Development/Control: CAR BSC-01-C-002 was issued based on results of an independent investigation

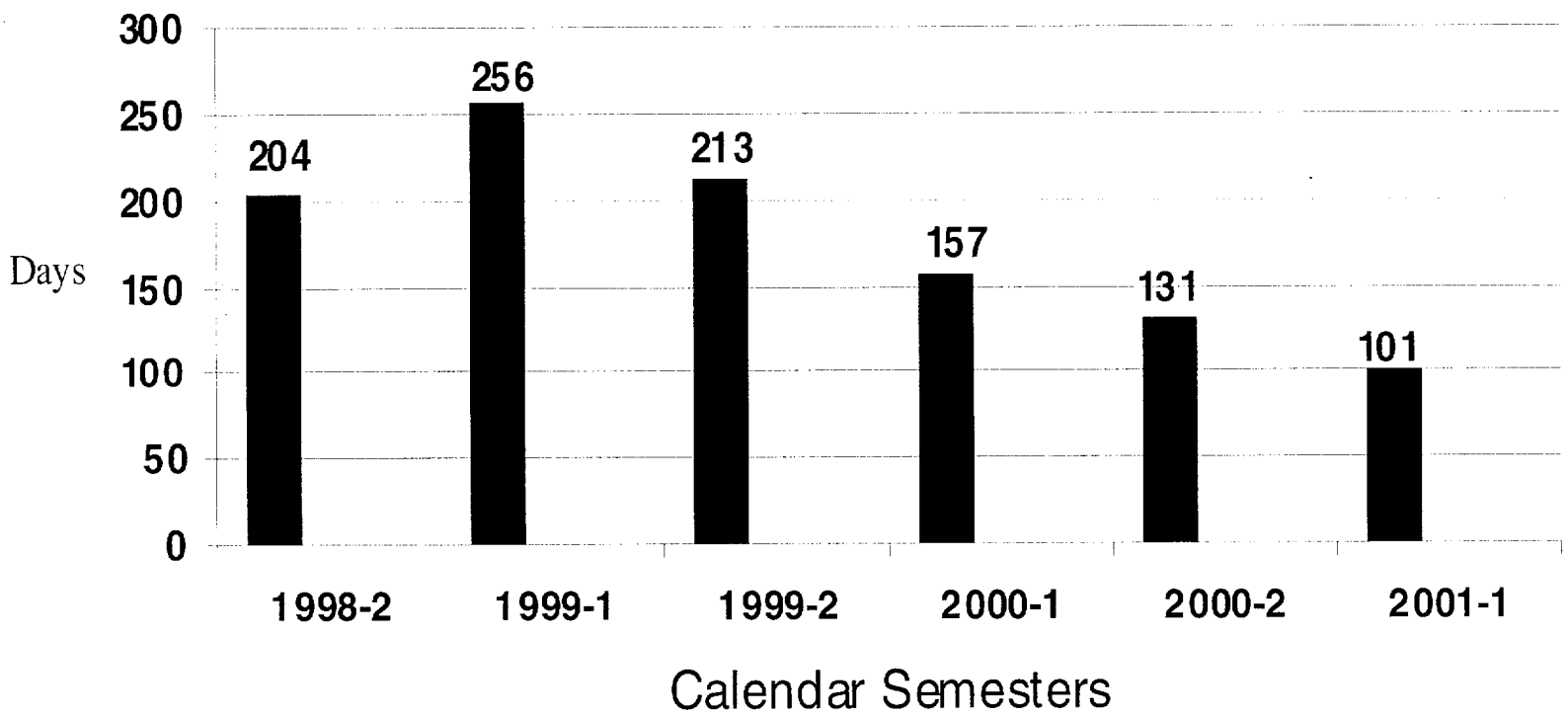
Positive Trend

- **Improvement in preparation and handling of QA records was reported as a positive trend**

Corrective Actions

- The average time to closure for deficiency documents decreased from 256 to 101 days over the past two years

Average Closure Days



Audit YMSCO-ARC-01-14

- Several programmatic deficiencies were Identified with respect to YMSCO implementation
- The QA program was not implemented in a satisfactory manner

Audit BSC-ARP-01-04
Total System Performance Assessment

- **Deficiencies identified in the following areas:**
  - **Significant condition in report transparency**
  - **Established calculation procedures were not followed for calculations**
  - **One deficient condition in software**

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

YUCCA MOUNTAIN PROJECT

Quality and Safety Specific Initiatives

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Ken Hess
General Manager
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Quality and Safety Specific Initiatives

QUALITY (IN PROGRESS)

1. Quality Topics at Staff Meeting
2. BSC Quality Assurance Plan
3. Employee Survey
4. Rewards Program - Money/Awards
5. Quality Steering Committee and/or Employee Quality Committee
6. Quality Policy
7. Quality Brochure

SAFETY (IMPLEMENTING)

1. Safety Topics at Staff Meetings
2. Integrated Safety Management Description Document (ISM/DD)
3. Zero Accident Philosophy (ZAP) Perception Survey
4. ZAP Incentive Program & Survival Guide

5a. ISM/ES&H Initiatives Working Group

5b. ZAP Steering Committee

6. ZAP
7. BSC Porcelain Press

Quality and Safety Specific Initiatives
(Continued)

QUALITY (IN-PROCESS)

8. Employee Annual Review (See Attributes Slide)
9. Introduction to Quality
10. Quality Suggestion Box
11. Quality Issues Web Site
12. Quality Improvement Days
13. Manager's Quarterly Quality Report
14. Co-location with Line Organization

SAFETY (IMPLEMENTING)

8. Employee Annual Review (See Attributes Slides)
9. Environmental Safety & Health Handbook
10. ZAP Campaign #1 (Accident-free 2001
11. ZAP Web Site
12. ZAP Days
13. Manager's Quarterly Safety Report
14. Co-location with Line Organization

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

YUCCA MOUNTAIN PROJECT

Status of Management Plan/TSPA-SR Issues

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Nancy Williams
Manager of Projects
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Status of Management Plan/ TSPA-SR Issues

- **Management Plan Status**
- **Technical Integrity of TSPA-SR, Rev 0**

Management Plan Status

Management Plan

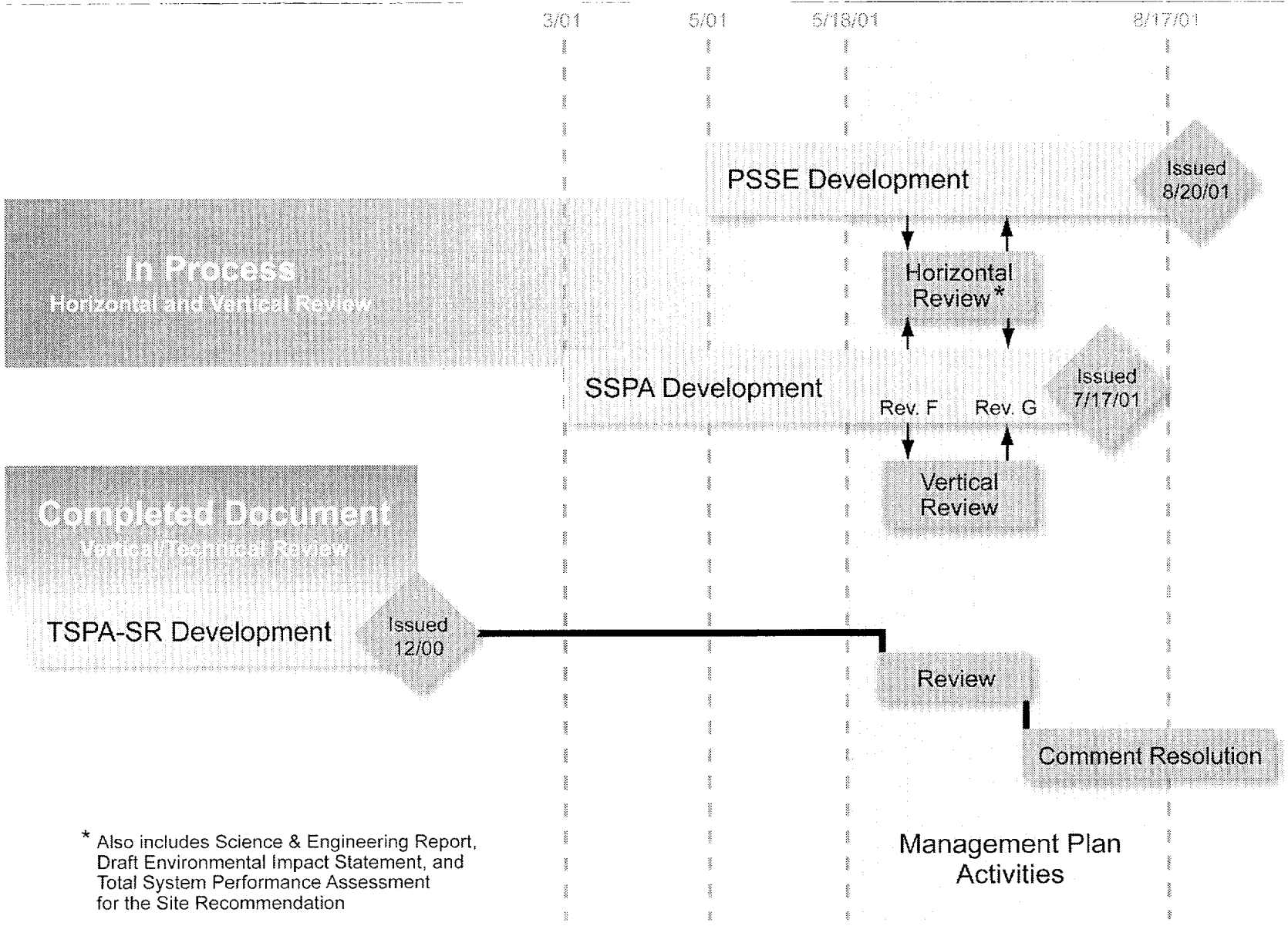
- Management Plan Background
- Horizontal Review of Key Documents
- Vertical Review of SSPA (2 Volumes)
- TSPA Vertical Review

Management Plan Background

- DOE / BSC Management Commitment
- Experience Leading to Management Plan
  - Model Validation and Software Qualification issues
  - TSPA Errors
  - Began on May 18, 2001 (BSC Board Meeting)
- Scope
  - Horizontal and Vertical Reviews of Documents
  - Root Cause Analyses (CARs and Document Errors)
- Status
  - Reviews complete except TSPA comment resolution is ongoing
  - Root cause analyses complete: August 17, 2001
- Followup / Corrective Action Development Ongoing

Horizontal Review

- **Document reviews (approximately 4,700 pages) included**
  - **Issued Documents**
    - **Supplemental Draft Environmental Impact Statement**
    - **Science and Engineering Report**
    - **Total System Performance Assessment-Site Recommendation**
  - **In-Process Documents (Still in Draft at time of review)**
    - **<u>Draft</u> Supplemental Science and Performance Analysis Volumes 1 and 2**
    - **<u>Draft</u> Preliminary Site Suitability Evaluation**
- **Evaluated consistency among documents**



* Also includes Science & Engineering Report, Draft Environmental Impact Statement, and Total System Performance Assessment for the Site Recommendation

Q/In Process/RonS/NRC Briefing/TimeLineChart.ai

Review Significance Categories

- Significant item (Category 1) — Item could affect a major calculation in support of the TSPA. May or may not impact TSPA supporting results. Items identified will be reviewed for validity
- Important item (Category 2) — Item could affect a supporting calculation but does not change the conclusions of the TSPA. Items identified to date are under review for validity
- Weak basis/assumptions/reference (Category 3) — Question requires the review or input of the technical author or checker to resolve. These items include incomplete references or text that is not clear
- Minor errors (Category 4) — Editorial items that are not quantified or tracked for resolution

Horizontal Review

(Continued)

- **Results**
  - Total discrepancies = 349
  - Significant items (Category 1) = 0
  - Important items (Category 2) = 6
- **Status**
  - Review complete
  - 5 of 6 Category 2 Items closed
  - No impact to date on technical results or conclusions

SSPA Vertical Review

- **SSPA Review Scope**
  - SSPA Vol 1 Rev E Draft - 1,200 pages
  - SSPA Vol 2 Draft - 200 pages
  - In parallel to document preparation and checking
- **Review Process**
  - Conducted like an engineering check
  - Yellow highlighter to mark material reviewed with comments in red
  - Four sections for reference traceability and input accuracy
  - Comments marked up and returned to authors for resolution
  - Comments collected into 13 bins

SSPA Vertical Review
(Continued)

- **Results**
  - 1,612 discrepancies
  - No category 1 findings
  - 65 in Category 2
- **Resolution**
  - Comments incorporated / findings resolved prior to publication

TSPA Vertical Review

- **Scope**
  - **TSPA-SR Rev. 00, ICN 1 and TSPA Model Document**
  - **Independent hand computations to verify values in tables and figures**
  - **Consistency, traceability, and transparency checks of technical inputs, text, and references**
- **Results**
  - **Total discrepancies = 904**
  - **Significant items (Category 1) = 16**
  - **Important Items (Category 2) = 58**

TSPA Vertical Review

(Continued)

- **Resolution**
  - Category 1 and 2 items are in the process of being resolved
  - Ongoing work between review team and document authors
  - No impact to date on conclusions
  - Review completed by external review team
  - TSPA response to review comments is completed
    - No discernible impacts on TSPA-SR results or conclusions
  - Review team concurred with response, but requested additional objective evidence
    - Objective evidence requested for 48 items
    - Objective evidence has been produced by TSPA team and is being reviewed by review team
    - Self assessment near completion

Root Cause

- **Part of the Management Plan**
  - Comprehensive and aggressive review
  - Independent Team
  - Executive Sponsorship
  - Considered prior root cause determinations
- **Root Causes on CARs 001 and 002**
  - Model Validation
  - Software Qualification
- **Document Error (TSPA) Root Cause**
- **Specific corrective actions recommended**

Technical Integrity of TSPA-SR, Rev 0

Technical Integrity of TSPA-SR

- **TSPA-SR, Rev 0 potentially impacted by:**
  - **TSPA Vertical Review Discrepancies**
  - **Model Validation Findings (CAR-001)**
  - **Software Verification Findings (CAR-002)**
  - **Data Quality Concerns**

Technical Integrity of TSPA-SR

(Continued)

- **TSPA Discrepancies**
  - Impact Assessment Complete
  - Documentation Nearly Complete
  - No Impact on Conclusions
- **Software Verification**
  - Impact Assessment Complete
  - No Impact on Conclusions
- **Data Qualification**
  - Impact Assessment Complete
  - No Impact on Conclusions
- **Model Validation**
  - Impact Assessment in process
  - No Impact on Results to date (forecast completion 9/10/01)

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

YUCCA MOUNTAIN PROJECT

Proposed Path Forward / Corrective Action to Prevent Recurrence (Performance Improvement Transition Plan)

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Nancy Williams
Manager of Projects
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Outline

- Transition Plan Objectives and Background
- Root Cause Results and Transition Plan Content
- What's Different

Transition Plan Objectives and Background

Objective

- Improve Performance
- Provide a joint DOE/BSC comprehensive plan to drive a transition to the next level of performance necessary to prepare for the potential pursuit of a license application

Background

- **Achieved significant milestones towards SR**
  - Culture supportive of scientific research
    - Collegial, multi-organizational, multi-process environment
    - Historical management decision to limit application of QA
- **Culture not adequate for LA**
  - Procedurally based, compliant minded environment
    - No plan developed for transition to QA

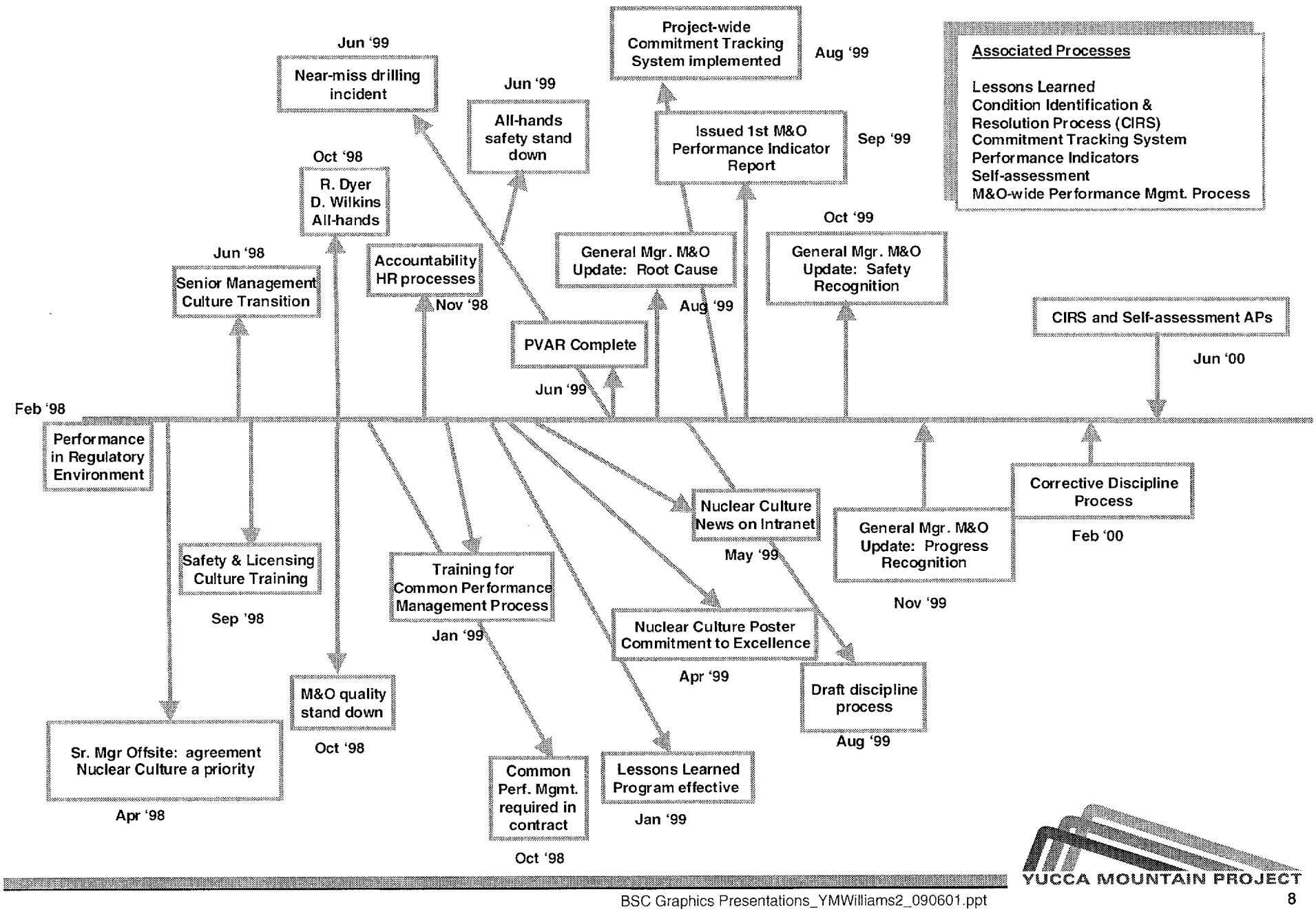
Background
(Continued)

- Need for culture change identified in 1997
- Initiated efforts toward establishing a "Nuclear Culture"

Nuclear Culture

- Management initiative to cause a pivotal change in the way of doing business
- Five Action Plans developed to address improvement in basic performance
  - Problem Identification and Resolution
  - Accountability
  - Quality Assurance
  - Sound Infrastructure
  - Self Assessment

Nuclear Culture – A Commitment to Excellence



Nuclear Culture (Continued)

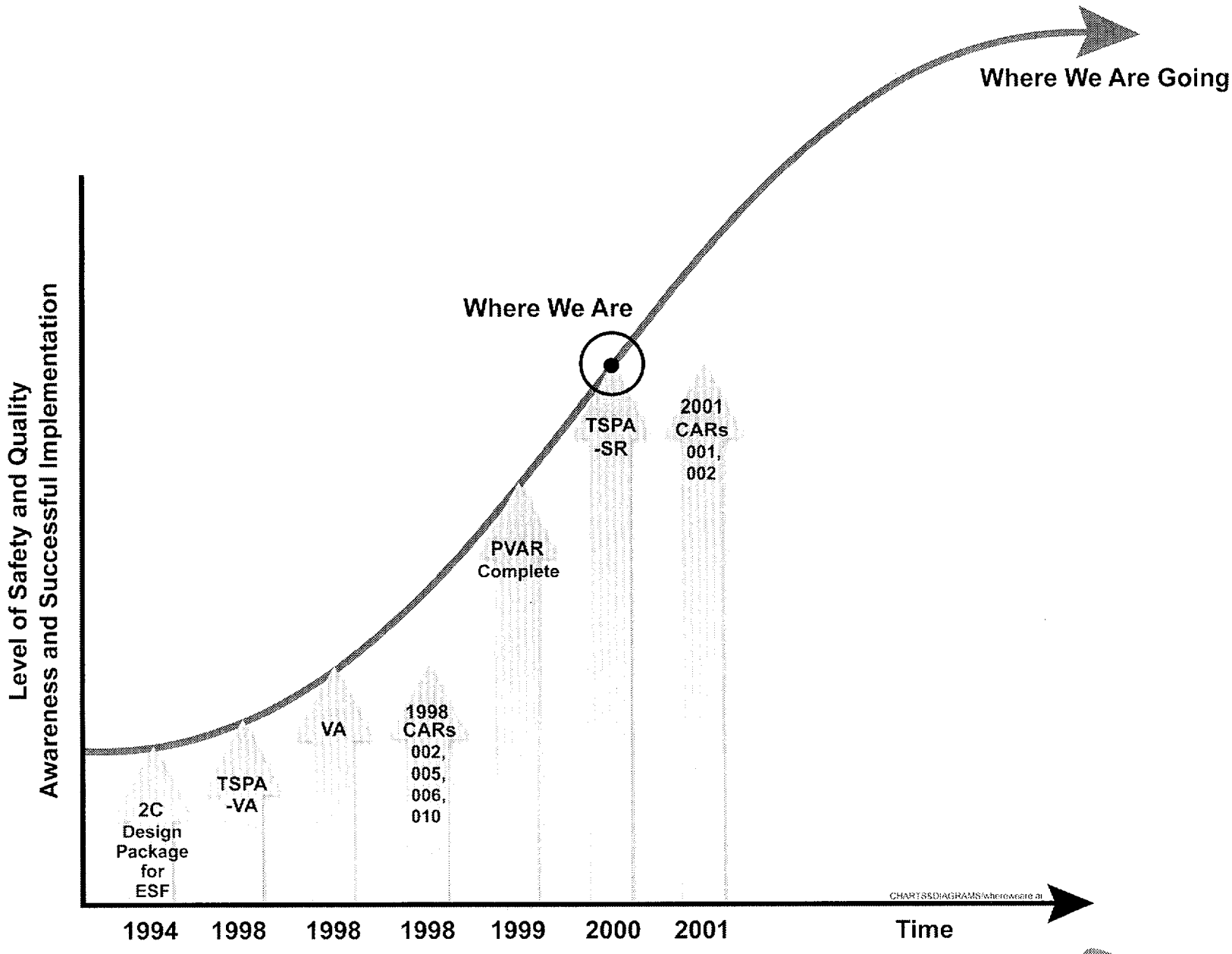
- **Improvements Needed**
  - Senior Manager involvement in implementation
  - Walking the talk
  - Improved Accountability Methods
  - Followed up on "Nuclear Culture" Surveys recommendations
  - Lack of Critical Mass

Background
(Continued)

- **Progress was made against initial expectations**
  - **Uniform Human Resources Accountability Process (11/98)**
  - **Self-assessments improved**
  - **Developed and implemented an issues identification and tracking program (8/99)**
  - **Lessons Learned Program (1/99)**
  - **Processes consolidated (PVAR) (6/99)**

Background
(Continued)

- **Process Validation and Re-engineering**
  - Response to "Super-CARs"
  - Uniform response to CARs
  - Consolidation of procedures
  - 25 new/revised procedures for technical work
  - Completed June 1999


Where We Are Going
Where We Are
Level of Safety and Quality
Awareness and Successful Implementation
2C Design Package for ESF
TSPA -VA
VA
1998 CARs 002, 005, 006, 010
PVAR Complete
TSPA -SR
2001 CARs 001, 002
CHARTSSDIAGRAMS\whereweare.ai
1994
1998
1998
1998
1999
2000
2001
Time

Background
(Continued)

- **Recent indicators that existing culture must be improved to support LA**
  - **Software and Modeling CAR's and Root Cause Analysis**
  - **TSPA Root Cause Analysis**
  - **Potential adverse trends associated with the in-process reviews on S&ER, PSSE, and SSPA**
  - **ISMS deficiency (2001)**
  - **Results of Self Assessments performed over the last 6 months**
  - **Lessons Learned from previous corrective actions**
  - **QAMA review results**

CAR Root Cause Results and Transition Plan Content

Root Cause Analysis (RCA)

- RCA performed on the 2 CAR's and on NRC identified TSPA-SR issues
- Root Causes, Common Causes, and Generic Causes determined
  - 2 Generic Causes - may be applicable across the Program
  - 5 Common Causes - applicable to both the Modeling CAR and Software CAR
  - 6 Modeling CAR Root Causes
  - 3 Software CAR Root Causes
  - 4 TSPA Root Causes
- Current cultural bias
  - activity vs results
  - schedule vs quality
  - blame vs accountability
- Specific corrective actions recommended for all causes

Modeling and Software CAR's Generic Causes

- **Management (DOE, BSC, USGS, and the National Labs) has not succeeded in setting expectations and implementing a consistent accountability model that will create the environment (culture) necessary for success in a complex technical project**
  - **Examples of missing elements**
    - **rigor and discipline**
    - **team behavior**
    - **passion for finding and fixing problems**
    - **a self critical management team**
    - **effective procedures that allow employee accountability**
    - **setting and communicating clear management expectations**
    - **accountability system with consequences linked to management expectations**
    - **management team that holds its own members accountable to one another**
    - **a set of clear performance indicators**

Modeling and Software CAR's Common Causes

- **Ineffective Program Management**
  - lack of appropriate contract management
  - inconsistent use of baseline schedules
  - management unwilling to change, unable to remove barriers, and uninvolved with the work
  - lack of fundamental understanding that quality should be built in vs. inspected in
- **Low Expectations for an Effective Issues Management Function**
  - Missing elements include:
    - a proactive approach for self-identification of problems
    - an appropriately low threshold for initiation of Root Cause Analysis
    - corrective action effectiveness and verification follow-up
    - a mature issues management trending program

Modeling and Software CAR's Common Causes

(Continued)

- **Lack of Clear Roles, Responsibilities, Authorities, and Accountabilities (R2A2's) within and between DOE and BSC**
- **Lack of an Effective Procedure Development, Change, and Ownership Function**
  - **Primary areas of concern**
    - **appropriate ownership of procedures**
    - **appropriate ownership of procedure development and change process**
    - **procedures do not promote employee accountability**

Modeling and Software CAR's Common Causes

(Continued)

- **Low Expectations for Training**
  - **Missing elements include:**
    - **measurement of training effectiveness**
    - **utilization of job task analysis to identify and develop appropriate training**
    - **management and subject matter expert involvement in development and presentation of training**

Modeling CAR Root Causes

- **Lack of clear criteria and expectations for model validation**
  - vague regulatory requirements
  - lack of definition in procedures, work plans, and model documentation
- **Lack of Roles, Responsibilities, Authorities, and Accountabilities (R2A2's) for model validation**
  - DOE OQA filled the void as model validation coach, evaluator, and approval authority
  - previously identified problems remained unresolved

Modeling CAR Root Causes

(Continued)

- **Lack of effective project planning and work management**
  - **lack of resource loaded schedule for validation, checking, packaging, and delivery**
  - **M&O management did not understand the National Lab culture and lacked skills to achieve change to achieve acceptable validations**
  - **M&O did not establish a team-oriented project management culture needed to facilitate change**

Modeling CAR Root Causes

(Continued)

- **Implementation of the QA program by DOE and the M&O was ineffective**
  - **self-identification of problems was ineffective**
  - **corrective actions were ineffective**
- **Ineffective process/procedure ownership (AP-3.10Q, Modeling)**
  - **procedure feedback, change, and training did not meet the needs of AMR authors**
  - **interpretation of the procedure was performed in an ad hoc manner**

Modeling CAR Root Causes

(Continued)

- **Ineffective training (AP-3.10Q, Modeling)**
  - **Verbal interpretation that differed from procedural requirements was sometimes expressed during training**
  - **training did not measure effectiveness (retention or proficiency)**

Software CAR Root Causes

- **Lack of Roles, Responsibilities, Authorities, and Accountabilities (R2A2's) for software management**
  - **procedure developed with minimal user involvement**
  - **inadequate enforcement of the procedure**
  - **ineffective differing opinion resolution process**

Software CAR Root Causes

(Continued)

- **Inadequate software management procedure**
  - no differentiation between commercial business software and scientific research code development
  - no graded approach for routines, macros, single-use codes, and major applications
  - the procedure was used to develop the process instead of defining a developed process
  - was not effectively understood (differed from the norm in scientific research environment)
  - implemented without being validated
  - implemented without a readiness review

Software CAR Root Causes

(Continued)

- **Inadequate software procedure communication feedback, and training**
  - software acceptance criteria not communicated to users
  - inadequate training on revision changes and full process training, including the need for software process control
  - ineffective resolution of previously identified issues
  - did not identify point-of-contact for interpretation
  - did not consider or provide feedback on comments during procedure development (AP-SI.1Q, rev 3)

TSPA Generic Causes

- DOE and the M&O believed meeting the timeline window (schedule) was more critical to project success than producing error free documents at this time in the life of the Project; consequently, the M&O and the DOE managed accordingly resulting in documents being issued with deficiencies

TSPA Root Causes

- **Ineffective Configuration Management**
  - scope and schedule changes forced checking and review (C&R) to be performed in a compressed period of time
  - checkers and reviewers signed off on documents even when C&R time was insufficient
  - lack of document section and subsection revision control
  - lack of final assessment after parallel C&R
- **Lack of clear expectation for error free documents**
  - C&R process cut short when modeling activities failed to meet schedule dates
  - Management belief that meeting schedule was more important than producing error free documents because the documents could be corrected before LA

TSPA Root Causes

(Continued)

- **Ineffective Program Management**
  - lack of appropriate contract management
  - inconsistent use of baseline schedules
  - management unwilling to change, unable to remove barriers, and lack of a critical mass of change management leaders
  - lack of fundamental understanding that quality should be built in vs. inspected in
- **Low expectation for an effective issues management process**
  - previously identified issues unresolved
  - corrective actions deferred until preparation for LA

The Plan

- Joint DOE/BSC comprehensive plan for transition to desired culture
- Specifically addresses RCA recommended corrective actions
- Additionally address:
  - Potential adverse trends associated with the in-process reviews on S&ER, PSSE, and SSPA
  - ISMS deficiency (2001)
  - Results of Self Assessments performed over the last 6 months
  - Lessons Learned from previous corrective actions
  - QAMA review results
- Modeled after proven performance improvement plans associated with NRC 'Watch List" plant shutdowns

Plan Development Process

- Root Cause Preventive Action Recommendations and NRC expectations used as starting point
- Objectives
- Strategies
- Action Plans

Objectives

- Preliminarily identified 4 Objectives that define performance improvement needs or initiatives
  - Quality
  - Safety
  - Project Execution
  - Human Performance
- Senior BSC and/or DOE manager will be assigned responsibility for each objective
- DOE and BSC will assign Senior Project Managers for overall plan management

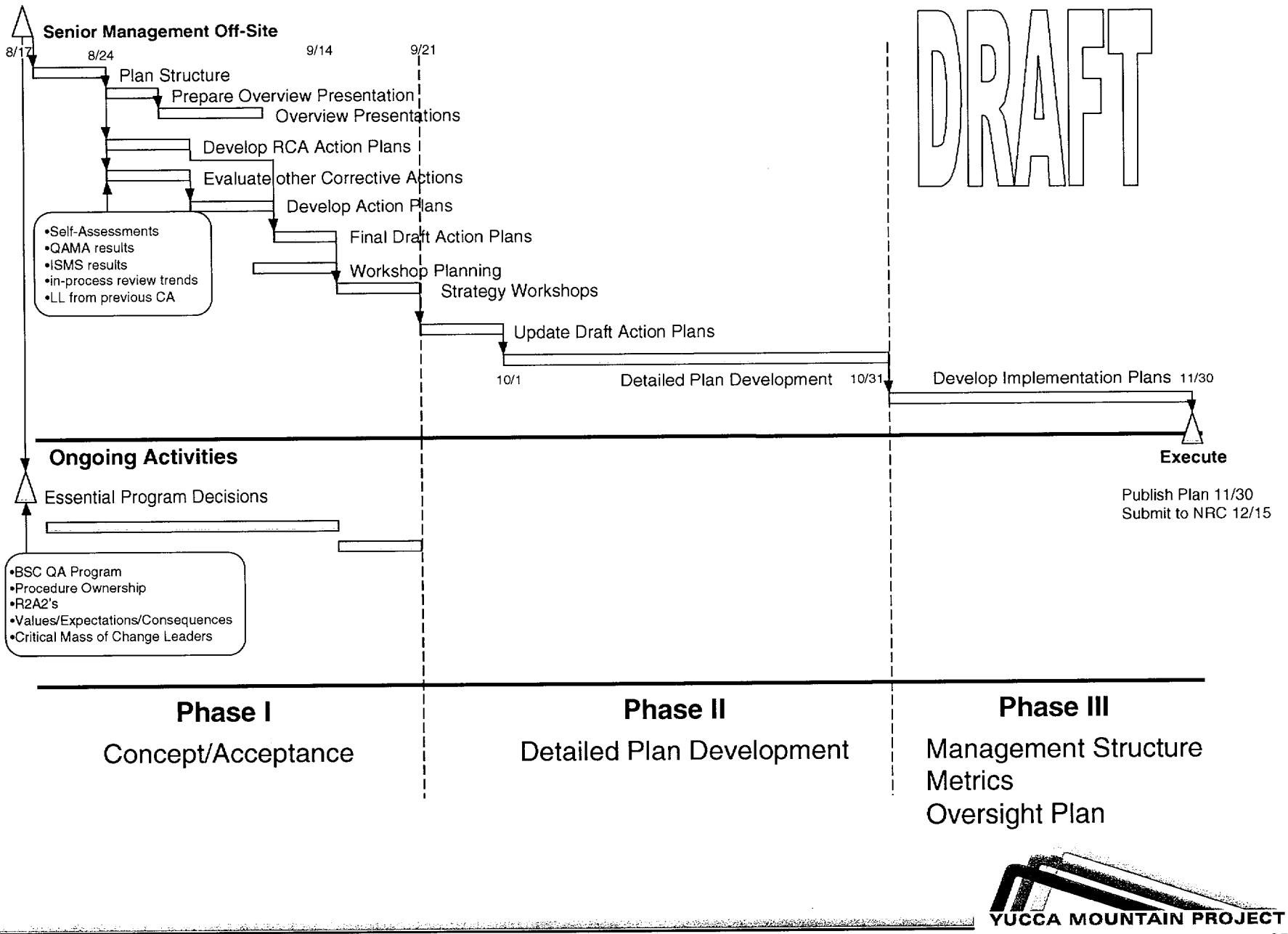
Strategies

- The broad actions to implement each of the established Objectives
- Strategies will address root cause preventive action recommendations, and
- Results of the "Extent of Condition" evaluation
  - Root cause results (TSPA and CARs)
  - NRC concerns
  - QAMA reviews
  - Horizontal and vertical document reviews
  - TSPA audit results
  - Doe Integrated Safety Management System Initiatives
  - Recent DOE and BSC self assessment results
  - Recurrent problems from prior corrective actions

Action Plans

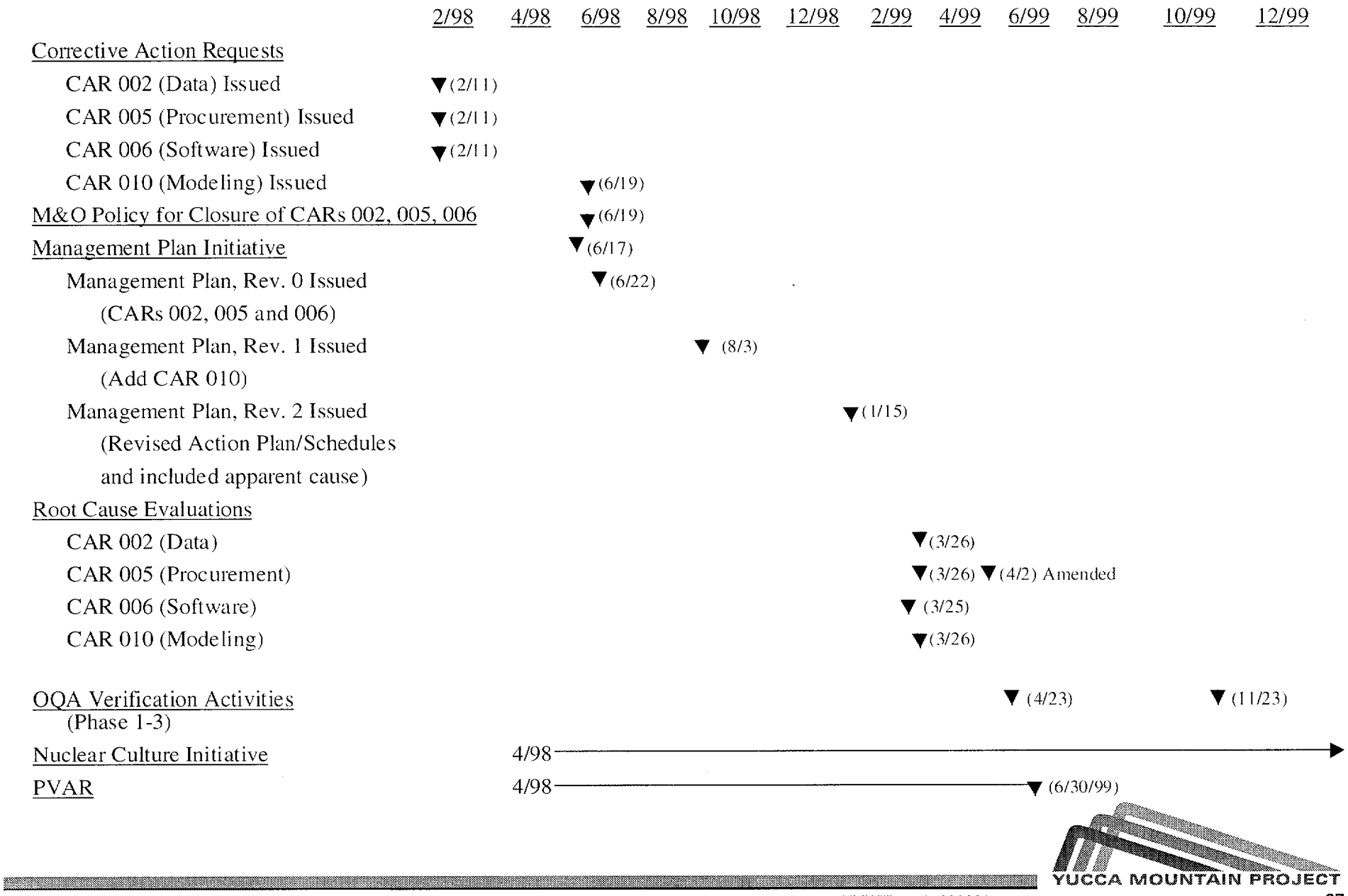
- **Execution of each strategy will be managed via detailed action plans**
  - Identification of responsible owner/manager
  - Documented at the activity and task levels
  - Accompanying PERT/CPM resource loaded schedule with measurable/identifiable progress milestones
  - Definition of two-level performance measure approach
    - Implementation progress
    - Effectiveness of actions

Performance Improvement Transition Plan Development

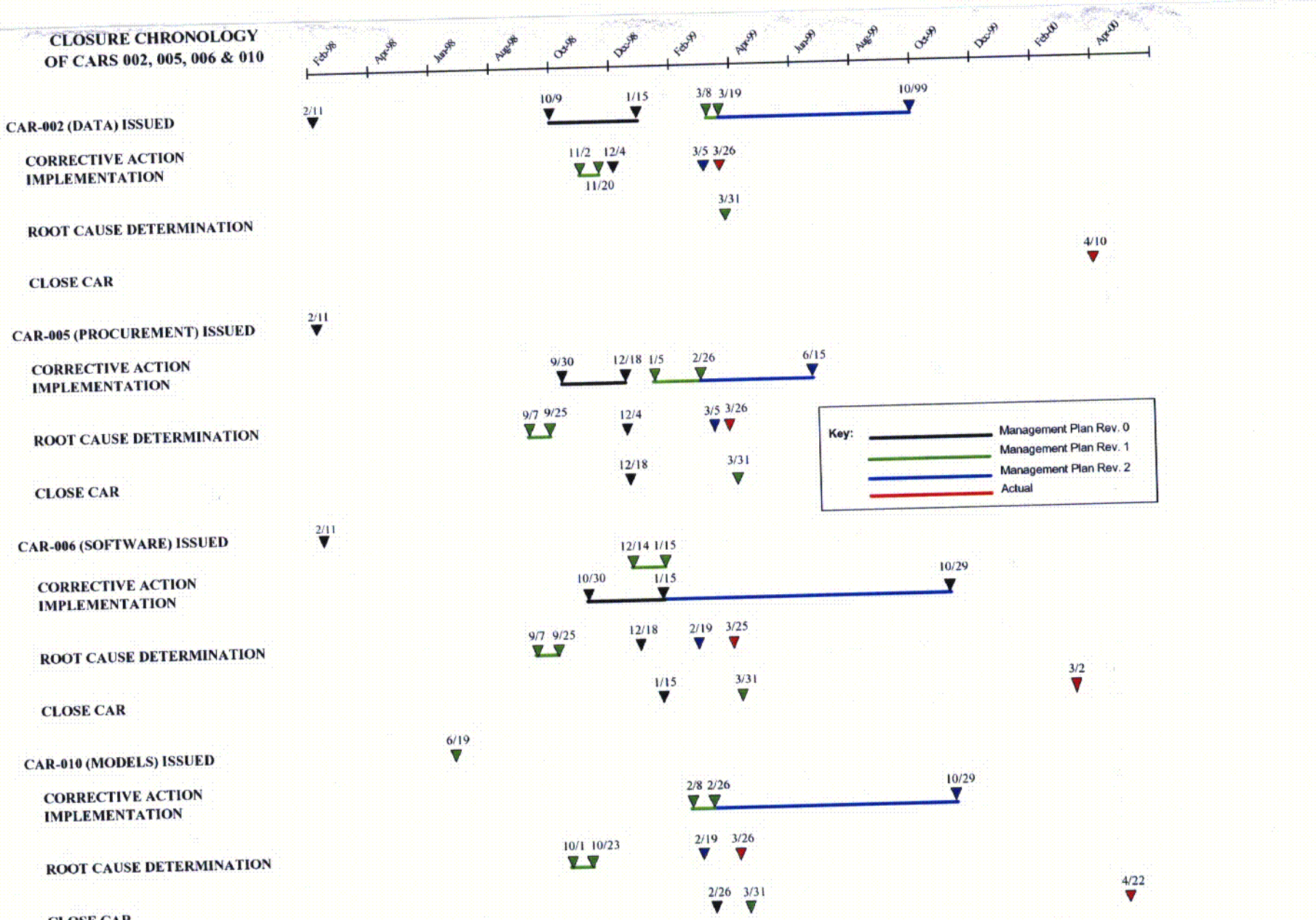


What's Different

History – Super CAR Schedule



CLOSURE CHRONOLOGY OF CARS 002, 005, 006 & 010



C01

Chronology

- 5/3/01 - Model Validation CAR 001 Issued
- 5/4-17/01 - Identification of errors by NRC and subsequent telephone calls / correspondence with NRC
- 5/17/01 - NRC letter regarding TSPA discrepancies
- 5/18/01 - BSC Board Meeting
- 5/22/01 - Bechtel mobilizes executive management team
- 5/29/01 - Bechtel mobilizes senior project management team from Oak Ridge and Denver to finalize action plan
- 6/4/01 - Bechtel executive management approves Quality Initiative action pan
- 6/4/01 - Initiated action for independent root cause evaluation team
- 6/4/01 - Mobilization to support plan
- 6/7/01 - Management Stand-down to control further software development

Chronology
(Continued)

- 6/11/01 - General Manager meeting to communicate quality expectations
- 6/11-8/10/01 - Model Validation Review (Extent of Condition)
- 6/11-6/25/01 - Software Verification Review
- 6/12/01 - Software Verification CAR-002 issued (Extent of Condition)
- 6/25-9/28/01 - Software Verification complete
- 8/8/01 - Model Validation CAR-001 and Software Verification CAR-002 Root Cause Report issued
- 8/16/01 - Site Hazardous Material Stand Down
- 8/17/01 - Performance Improvement Transition Plan Management Meeting
- 8/31/01 - Impact Analysis on TSPA of Data, Software and Model Validation Deficiencies
- 8/28-9/30/01 - Transition Plan Overview review with Project staff

Transition Plan Attributes

- Senior Management Commitment and Support
- Independent Root Cause Evaluation
- Detailed Integrated Planning
- Root Cause Evaluation Input to Plan
- Sound Baseline Management Processes
- Address Organizational Issues (BSC)
  - Accountability (including Reward and Disciplinary policy)
  - Roles and Responsibilities
  - Personnel Qualifications
- DOE and BSC Roles and Responsibilities
- New Contractor
  - Consolidated Company
  - Projectized Organizational Structure
  - Qualified Resource Pool
- Accountability Meetings (monthly CIRS and Project Reviews)
- Building on previous corrective actions

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

YUCCA MOUNTAIN PROJECT

Status of Model Validation

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Bill Watson
Integration Manager, Science and Analysis
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Outline

- Background
- Model Validation Review
- Path Forward
- Summary

Background

- Analysis Model Reports (AMRs)
- AMRs describe the development, testing, and use of models
- Model requirements, including validation, are procedurally controlled
- Models are not software, although implementation of the model may be through software

Background
(Continued)

- **CAR BSC-01-C-001**
  - Root Cause Report issued
  - Amended response submitted to DOE QA
  - Corrective actions for deficiency reports (DRs) being worked in parallel with development of CAR corrective actions
- **DRs LVMO-00-D-119, LVMO-01-D-007 and BSC-01-D-050**
  - Uniquely identify models
  - Review model validation (Binning)
  - Perform impact assessments as required
  - Revise procedure AP-3.10Q to clarify validation of models
  - Issue Scientific Processes Guidelines Manual

Model Validation Review

- Systematic review of AMRs containing models by an independent team
- Binning of models to identify model validation issues
  - Bin 1 - AMR document meets AP-3.10Q, Rev. 2, ICN 3
  - Bin 2 - Model validation does not meet specific criteria in AP-3.10Q but additional documentation exists to demonstrate adequate confidence in use of model (documentation problem)
  - Bin 3 - More work for License Application (LA) (testing, natural analog evaluation, etc.) is required to provide additional confidence in model
- Impact assessments underway on Bin 3 models
- Many Bin 3 issues are already identified in key technical issue (KTI) agreements

YUCCA MOUNTAIN PROJECT

Model Validation Review

(Continued)

- To date no model validation issues have been found which impact the conclusions of the TSPA-SR
  - Impact assessments will be documented in attachments to Model Validation Review Report
  - Model Validation Review Report to be submitted to NRC by October 19
- 128 Models identified and reviewed
  - Bin 1 = 17
  - Bin 2 = 77
  - Bin 3 = 34 (Includes 2 duplicate models - net Bin 3 = 32)

Path Forward for Potential LA

- **AP-SIII.10Q revision underway (replaces AP-3.10Q)**
  - **Procedure "ownership" in chief science office**
  - **Clarification of model validation requirements**
  - **Added requirements to document confidence building activities completed during model development (e.g., input selection, uncertainty identification and evaluation, initial/boundary/convergence run outcomes, etc.)**
  - **Interviews with AMR authors provided insight into required changes**
  - **Comments on draft procedure provided to author; comment resolution underway**

Path Forward for Potential LA

(Continued)

- **Chief Science Office to provide assistance to personnel performing scientific activities involving model development and validation**
  - **Senior scientist(s) available through chief science office who are not involved with development of subject model(s)**
  - **Includes, as appropriate, meetings with AMR authors and review of in-process work on model validation**
- **Preparation of Scientific Processes Guidelines Manual underway**
  - **TSPA KTI agreement to provide copy**
  - **Provides additional guidance on model validation techniques**

Path Forward for Potential LA

(Continued)

- **Training program to include results of model validation review (examples)**
  - **Training to be conducted by subject matter expert(s)**
- **Chief Science Office will review all model reports**
- **In-process self-assessments will track adequacy of future model validation efforts**

Summary

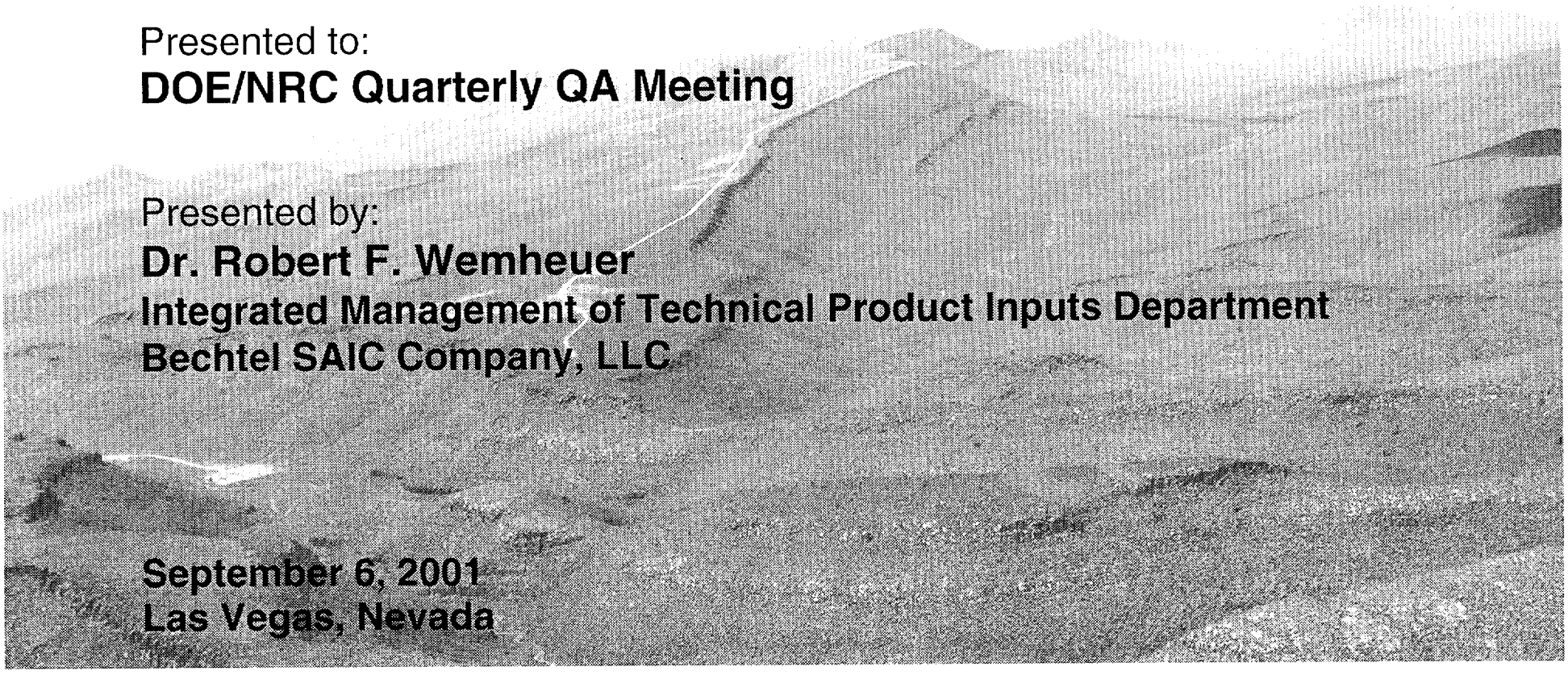
- To date no model validation issues have been found which affect the conclusions of the TSPA-SR
  - Impact assessments will be documented in attachments to Model Validation Review Report
  - Model Validation Review Report to be submitted to NRC by October 19, 2001
- DR corrective actions address specific model validation issues
- CAR corrective action plan will address wide-ranging issues identified in the Root Cause Report

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

YUCCA MOUNTAIN PROJECT

Data Qualification Status

Presented to:
DOE/NRC Quarterly QA Meeting



Presented by:
Dr. Robert F. Wemheuer
Integrated Management of Technical Product Inputs Department
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Data Qualification Objectives

- Conduct verification and qualification activities for the data used in Analysis Model Reports (AMRs) and Process Model Reports (PMRs) contained in the Total System Performance Assessment - Site Recommendation, Rev. 00, ICN 01 (TSPA-SR)
- The 80% data qualification commitment has been met for the Rev. 00 PMR supporting AMRs (and ICN updates) used in TSPA-SR Rev. 00, ICN 01
- Overall objective is to assure the integrity, fidelity and confidence in data and process procedures

Data Qualification Status by PMR

PMR	06/04/01 Percent Data Qualified	06/04/01 Percent Data Verified	08/27/01 Percent Data Qualified	08/27/01 Percent Data Verified
Biosphere	97	100	97	100
Disruptive Events	91	100	91	100
EBS	90	100	94	100
ISM	85	100	87	100
Near Field	90	100	96	100
SZ F&T	82	90	90	100
UZ F&T	91	96	94	98
Waste Form	95	100	100	100
Waste Package	91	100	98	100
Total	89	96	93.2	99.5

Note: Percent complete statistics reflect the multiple use of a DTN in different AMR/PMR products.

Verification/Qualification Status - 8/27/01

	Total*	Completed	To-Go	
VL1 DIRS (Verif. Checklists)	248	246	2	(Q-TBV) ("actual citations")
VL1 Sources (Verif. Checklists)	332	332	0	(Q-TBV) ("daughters")
VL2 (No Verification Checklists)	184	184	0	(Q-TBV)
Accepted Data (Fact)	78	78	0	(e.g., handbooks, textbooks)
Accepted Data approved by Assistant Manager, Office of Project Execution	32	32	0	(e.g., journal articles)
Qualified by procedures established after 6/30/99	33	33	0	
DTNs yet to be Qualified	330	282	48	
Totals	1237	1187	50	
Percent of Total Unique Data Citations		96%	4%	

*Above totals are based upon the unique number of DTNs for all AMRs/PMRs.

Note: Document Input Reference System VL1+VL2+AP-SIII.2Q+Accepted+PVAR (905)
+ Source VL1 (332) = Total Data Citations (1237)

Data Confirmation Results - 8/27/01

ORG	Completed Checklists	Verified Q	Verified UQ	Rejection Rate**	
USGS (U. S. Geological Survey)	295	281	14	4.8%	
LANL (Los Alamos National Laboratory)	107	107	0	0.0%	
LBNL (Lawrence Berkeley National Laboratory)	7	6	1	14.3%	(20%) 06/04/01
LLNL (Lawrence Livermore National Laboratory)	37	37	0	0.0%	
BSC* (Bechtel SAIC Company, LLC)	53	51	2	3.8%	
SNL (Sandia National Laboratories)	79	78	1	1.3%	
Total	578	560	18	3.1%	

* Data (DTNs) generated by previous Yucca Mountain Site Characterization Project (YMP) organizations are included in the BSC totals.

** Rejection is defined as a determination that the data submitted under the associated DTN cannot be qualified. There are two principal causes for failure. Either the data acquisition/development process did not meet QARD requirements or data-/record-related issues discovered during checklist preparation could not be resolved.

Significance of Verification Rejects

- Overall verification rejection rate for Q-TBVs ~ 3.1%
- Individual rejects are either qualified per AP-SIII.2Q, or replaced, having the authors rely on an alternative qualified data set(s), or use the data as corroborative information/reference
- Data and input management process controls are in place to evaluate specific impacts should any data sets fail the qualification process

Data Impact Assessments

- **Number of impact assessments required = 61**
  - Represents only 50 unique DTNs (11 were used more than once)
  - Less than 5% of total unique data citations
- **Impact assessments affect 28 AMRS and 1 PMR**
- **Impact assessments by PMR**

UZ = 30	SZ = 13	EBS = 7	ISM = 5
NF = 2	WP = 2	BIO = 1	DE = 1

- **All data impact assessments have been completed**

Summary - Data Qualification Status

- The 80% qualification commitment for SR has been met
- The status as of 8/27/01
  - 99.5% of data is verified
  - 93.2% of data is qualified
- Qualification of 100% of the data used to support the AMRs contained in the TSPA-SR is on track for completion
- Data qualification and impact assessment activities that support the TSPA-SR conclusions remain valid from a data quality, traceability and retrievability standpoint

Path Forward

- The responsibility for assuring fully qualified data is used in potential LA products will be focused on the product authors, checkers and their management
- The future role of Integrated Management of Technical Product Inputs Department will change to that of assisting key line personnel and managers with:
  - Proper data selection and usage
  - Preparation of necessary data verifications/qualifications
  - Preparation and review of related documentation
  - Resolution of records traceability and retrievability issues

Conclusion

- The corrective actions contained in CAR-LVMO-98-002 to verify data generated prior to June 30, 1999 or qualify the unqualified data used in the TSPA-SR is approaching a successful conclusion
- The path forward will continue to assure the quality of the data used

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

YUCCA MOUNTAIN PROJECT

Software Qualification Status

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Dr. Robert F. Wemheuer
Integrated Management of Technical Product Inputs Department
Bechtel SAIC Company, LLC

September 6, 2001
Las Vegas, Nevada

Software Qualification Objectives

- Conduct qualification activities for the software used in Analysis Model Reports (AMRs) and Process Model Reports (PMRs) contained in the Total System Performance Assessment - Site Recommendation, Rev. 00, ICN 01 (TSPA-SR)
- The 80% software qualification commitment has been met for the Rev. 00 PMRs supporting AMRs used in the TSPA-SR

Software Qualification by PMR - 08/27/01

• Biosphere	100%
• Disruptive Events	100%
• Engineered Barrier System	99%
• Integrated Site Model	100%
• Near Field Environment	99%
• Saturated Zone	93%
• Unsaturated Zone	98%
• Waste Form	100%
• Waste Package	100%

Software Qualification Status - 08/27/01

- Codes requiring qualification = 472 (includes variants of 402 unique codes)
- Over 98% of software is currently qualified
- Codes yet to be qualified = 7 (one code is on two platforms)
- Code as well as routine & macro (DR-39) related impact assessments are complete
- 100% of the software supporting the TSPA-SR will be qualified

Unqualified Software

- INFIL V2.0 - PC platform and VA2.a1 - DEC alpha platform (Unsaturated Zone)
- UDEC V3.0 (Engineered Barrier System)
- GoldSim V6.03 (Saturated Zone)
- TOUGHREACT V2.3 (Near Field Environment)
- PETROSYS V7.60d (Saturated Zone)
- ERMA Site Geologist V6.0.1 (Saturated Zone)
- FEHM V2.10 - NT Windows Version (TSPA-SR)

( ) = principal product utilizing codes

Software Impact Assessments

- Software assessments on unqualified software were used to support evaluation of any impacts to the TSPA-SR
- Impact assessments for software included
  - How and where the software was used and what the software does
  - What testing was done to determine that correct results were obtained from the unqualified software
  - Whether lack of software qualification impacts the technical adequacy of the input feeding the TSPA-SR
  - What remaining steps are needed to qualify the code
  - Test cases were run where necessary to verify that the software produced the expected results
- The impact assessments have not identified any impacts on TSPA-SR conclusions or support documentation

Software Deficiency Reports (DR)

- **DR-39; Inaccurate Documentation and Validation of Software Routines and/or Macros**
  - Most issues relate to documentation although some routines have required some testing
  - On schedule for closure
- **DR-54; Incorrect/Incomplete Processing of Software**
  - TSPA-SR issues have been resolved. DR in verification
- **DR-99; Software Code Installation**
  - **Closed, 7/18/01**

Summary - Software Qualification Status

- 98% of software codes used in support of TSPA-SR have been qualified
- The 80% software qualification commitment has been met
- 7 software codes (1 code on 2 platforms) required assessments for impact to TSPA-SR
- Remaining software code qualifications supporting TSPA-SR are on schedule to be completed by SR
- Software deficiency corrective actions are being completed
- The software qualifications and impact assessments show that no changes to the TSPA-SR conclusions/outputs are necessary

YUCCA MOUNTAIN PROJECT

Path Forward

- The responsibility for assuring fully qualified software is used in potential LA products will be focused on the software developers and their management
- The future role of Integrated Management of Technical Product Inputs Department will change to that of assisting key line personnel and managers with:
  - Qualified software selection and usage
  - Preparation of necessary software qualifications
  - Preparation and review of related documentation

Conclusion

- The 80% software qualification commitment has been met for the Rev 00 PMRs supporting AMRs used in the TSPA-SR
- Qualification of 100% of software used in the TSPA-SR is approaching a successful conclusion
- The path forward will continue to assure the quality of the data used in documents supporting potential LA

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

YUCCA MOUNTAIN PROJECT

Significance of Unqualified Data

Presented to:
DOE/NRC Quarterly QA Meeting

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

September 6, 2001
Las Vegas, Nevada

Outline

- Objectives of Unqualified Data Impact Assessments
- Overall Approach to Unqualified Data Impact Assessments
- Detailed Approach for Unqualified Data Impact Assessments
- Summary of Unqualified Data Impact Assessments
- Summary of Supplemental Science and Performance Analysis (SSPA) Data Impact Assessments

Objectives of Unqualified Data Impact Assessments

- **Background**
  - Analysis Model Reports (AMRs) are foundation of TSPA-SR
  - AMRs use data, software and models as their principal inputs
  - Some data used in support of AMRs have not yet been qualified per QA procedures
- **Types of unqualified data**
  - Literature information not yet qualified per AP-SIII.2Q
  - Pre-PVAR data not yet verified per AP-3.15Q
  - Technical product output tied to unqualified software
- **Objective is to determine extent to which any unqualified data may have impacted TSPA-SR, Rev. 00 ICN 01 results or conclusions**

Overall Approach to Data Impact Assessments

- **Three major activities**
  - Develop list of Data Tracking Numbers (DTNs) which are used as input to AMRs which support TSPA-SR [NOTE: AMRs provide basis for inputs to TSPA-SR and also are basis for Process Model Reports (PMRs)]
  - Qualify those DTNs to reduce the number of DTNs requiring impact assessments
  - Conduct Impact Assessments on DTNs remaining unqualified (as of 8/22/01)
- **First two activities gave 50 unique unqualified DTNs used in 28 AMRs as of 8/22/01 (61 impact assessment conducted due to repeat usage of DTNs in multiple AMRs and one PMR)**

Overall Approach to Data Impact Assessments

(Continued)

- **Impact assessments considered a risk-informed approach conducted at 3 levels of potential impact**
  - **Level 1: Assess impact of input DTN on output from AMR**
  - **Level 2: If necessary, assess impact of output from AMR on input to TSPA-SR**
  - **Level 3: If necessary, assess impact of input to TSPA-SR on output from TSPA-SR**

Approach for Evaluation of Level 1 Impact Assessments — Impact of Input DTN on Output from AMR

- Mapped DTNs into appropriate AMRs
- Developed series of questions related to DTN use
  - What is the output of the AMR?
  - What part of the DTN is unqualified or to be verified (TBV)?
  - How was the part of the DTN that is unqualified or TBV used in the AMR?
  - What was the impact on the output of the AMR from the use of the unqualified or TBV data?
  - What was the significance of using the unqualified or TBV data on the AMR output?

Approach for Evaluation of Level 1 Impact Assessments — Impact of Input DTN on Output from AMR

(Continued)

- **Provided questions to each responsible department and PMR manager**
- **Responsible managers had responsible individuals provide technical responses**

Results of Level 1 Impact Assessments

- **Of 61 DTNs for which impact assessments were required, 41 were determined not to have significantly affected the output of the AMR**
  - **Unqualified or TBV DTN has been superceded with equivalent qualified data, with no difference in input or output to AMR**
  - **Unqualified or TBV DTN is generally corroborative or adds to cumulative body of scientific information to support parameter uncertainty distributions**
  - **Unqualified or TBV DTN does not significantly affect output of AMR**
- **Remaining 20 DTNs required assessment at the Level 2: Input to TSPA-SR**

Approach for Evaluation of Level 2 Impact Assessments — Impact of AMR Output on TSPA-SR

- **Developed a series of questions related to AMR use in support of input to TSPA**
  - **What is the potentially affected TSPA input parameter?**
  - **How was the AMR output used to develop the TSPA input parameter?**
  - **What is the potential level of change in the TSPA input parameter?**
- **Provided questions to responsible PMR and TSPA managers**
- **Responsible managers provided technical responses**

Results of Level 2 Impact Assessments

- **Of 20 unqualified DTNs that had a significant affect on the AMR output, 8 were determined to not significantly affect the TSPA input**
  - **TSPA-SR model does not directly or indirectly use output of AMR**
  - **TSPA-SR input parameter is not significantly affected by AMR output due to additional uncertainty or response surfaces incorporated during abstraction process**
- **Remaining 12 DTNs required assessment at Level 3: Output from TSPA-SR**

Approach to Results of Level 3 Impact Assessments

- Provide questions to TSPA analysts regarding potential significance of TSPA input on TSPA output
- TSPA analysts reviewed TSPA document to evaluate significance
- 12 unqualified DTNs were identified that could have affected TSPA output
- All of these were determined to be insignificant based on sensitivity or barrier importance analyses documented in the TSPA-SR Rev. 00, ICN 01

Example Explanations for Insignificance of DTN on TSPA Output

- **SZ colloid facilitated transport AMR**
  - 3 unqualified DTNs provide basis for colloid transport in fractured volcanic units
  - DTNs affect irreversibly sorbed radionuclides on colloids
  - Irreversible colloid transport is less significant than non-colloidal transport of Tc and Np during regulatory time period
  - Delay of transport through alluvium is more significant than delay in fractured volcanics
  - Dose is not sensitive to colloid transport in fractured volcanic units

Example Explanations for Insignificance of DTN on TSPA Output

(Continued)

- **Analysis of hydrologic property data AMR**
  - 4 unqualified DTNs provide basis for properties used in UZ flow model calibration
  - DTN information affects UZ flow model results
  - UZ flow model used in TSPA-SR considers expanded uncertainty (due to infiltration uncertainty)
  - Dose is not sensitive to UZ flow model uncertainty

Example Explanations for Insignificance of DTN on TSPA Output

(Continued)

- **Recharge and lateral groundwater flow boundary conditions AMR**
  - **4 unqualified DTNs provide basis for boundary conditions used in site scale SZ flow model**
  - **DTN information could affect flow field and SZ radionuclide transport breakthrough curves**
  - **SZ flow path lengths and orientations have not significantly affected TSPA-SR results**
  - **TSPA-SR results are more sensitive to transport characteristics and alluvium uncertainty than flow path uncertainty**
  - **Dose is not sensitive to SZ flow path uncertainty**

Impact of SSPA Data

- SSPA used some data not qualified
  - Literature values
  - Preliminary data
- SSPA conducted, in part, to provide insights and test significance of models and parameters used in TSPA-SR
- If models and parameters, and associated DTNs, are used in any subsequent AMR revision, then they will be appropriately qualified

Summary of Results

- **Use of unqualified DTNs in output for AMRs were determined to not significantly affect output of AMR**
  - **67% of impacts are insignificant at AMR output level**
  - **80% of impacts are insignificant at TSPA-SR input level**
  - **100% of impacts are insignificant at TSPA-SR output level**
- **All 50 DTNs have no significant impact on TSPA-SR results or conclusions**

Agenda
DOE/NRC Quarterly KTI Meeting
September 6, 2001
DOE Hillshire Atrium Room
Las Vegas, Nevada
2:00 PM– 3:00 PM (PDT)

And via Videoconference to:

U. S. NRC Room O-3B4 11545 Rockville Pike Rockville, MD	U. S. NRC Region IV 611 Ryan Place Drive Arlington, TX	CNWRA, SWRI Building 189, Room A103 6220 Colebra Road San Antonio, TX

2:00 PM	Status of KTI Subissues	NRC
2:30 PM	KTI Progress and Status Overview	Gunter
3:00 PM	Adjourn	

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

YUCCA MOUNTAIN PROJECT

Key Technical Issues Progress and Status Overview

Presented to:
DOE/NRC Quarterly QA Meeting

Presented by:
Timothy C. Gunter
Yucca Mountain Project Office
Office of Civilian Radioactive Waste Management

September 6, 2001
Las Vegas, Nevada

Key Technical Issue Update

KTI	Subissue 1	Subissue 2	Subissue 3	Subissue 4	Subissue 5	Subissue 6
USFIC	**Closed**	**Closed**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**
IA	**Closed-Pending**	Open	**N/A**	**N/A**	**N/A**	**N/A**
CLST	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**
SDS	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed**	**N/A**	**N/A**
RT	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**N/A**	**N/A**
TEF	**Closed-Pending**	**Closed-Pending**	**N/A**	**N/A**	**N/A**	**N/A**
ENFE	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**Closed-Pending**	**N/A**
RDTME	**Closed**	**Closed-Pending**	**Closed-Pending**	**Closed**	**N/A**	**N/A**
TSPAI	**Closed-Pending**	**Closed-Pending**	Open	**Closed-Pending**	**N/A**	**N/A**

Remaining FY01 Agreement Items

KTI Agreement Number	KTI Agreement Description	Proposed Due Date
CLST 5.4	Provide the list of validation reports and their schedules. DOE stated that the geochemical model validation reports for "Geochemistry Model Validation Report: Degradation and Release" and "Geochemistry Model Validation Report: Material Accumulation" are expected to be available during 2001. The remainder of the reports are expected to be available during FY 2002 subject to the results of detailed planning and scheduling. DOE understands that these reports are required to be provided prior to LA A list of model validation reports was provided during the technical exchange and is included as an attachment to the meeting summary.	September-01
CLST 5.5	Provide information on how the increase in the radiation fields due to the criticality event affects the consequence evaluation because of increased radiolysis inside the waste package and at the surfaces of nearby waste packages or demonstrate that the current corrosion and dissolution models encompass the range of chemical conditions and corrosion potentials that would result from this increase in radiolysis. DOE stated that the preliminary assessment (calculation) of radiolysis effects from a criticality event will be available to NRC during February 2001. The final assessment of these conditions will be available to NRC prior to LA.	September-01
RT 4.3	Provide the applicable list of validation reports and their schedules for external criticality. DOE stated that the geochemical model validation reports for "Geochemistry Model Validation Report: Degradation and Release" and "Geochemistry Model Validation Report: Material Accumulation" are expected to be available during 2001. The remainder of the reports are expected to be available during FY2002 subject to the results of detailed planning and scheduling. DOE understands that these reports are required to be provided prior to LA. A list of model validation reports was provided during the technical exchange and is included as an attachment to the meeting summary.	September-01
ENFE 5.3	Provide the list of validation reports and their schedules. DOE stated that the geochemical model validation reports for "Geochemistry Model Validation Report: Degradation and Release" and "Geochemistry Model Validation Report: Material Accumulation" are expected to be available during 2001. The remainder of the reports are expected to be available during FY 2002 subject to the results of detailed planning and scheduling. DOE understands that these reports are required to be provided prior to LA. A list of model validation reports was provided during the technical exchange and is included as an attachment to the meeting summary.	September-01
ENFE 2.12	Provide the documentation and analysis of the column crush tuff experiments. The DOE will provide documentation of the results obtained from the crushed tuff hydrothermal column experiment, and of post-test analysis, in new reports specific to the column test, expected to be available by September 2001.	September-01
ENFE 4.1	Provide the executable version of the most recently qualified version of TOUGHREACT. The DOE will provide the executable TOUGHREACT Rev 2.2 to the NRC by February 2001, subject to the NRC obtaining any applicable agreement for usage of the software.	September-01
RDTME 3.1	Provide the technical basis for the range of relative humidities, as well as the potential occurrence of localized liquid phase water, and resulting affects on ground support systems. The DOE will provide the technical basis for the range of relative humidity and temperature, and the potential effects of localized liquid phase water on ground support systems, during the forced ventilation preclosure period, in the Longevity of Emplacement Drift Ground Support Materials, ANL-EBS-GE-000003 Rev 01, and revision 1 of the Ventilation Model, ANL-EBS-MD-000030, analysis and model reports. These are expected to be available to NRC in September and March 2001, respectively.	September-01
SDS 1.2	Consistent with proposed 10 CFR Part 63, the NRC believes the use of the mean is appropriate, however, DOE may use any statistic as long as it is consistent with site data and technically defensible. DOE will either provide technical justification for use of median values or another statistical measure, such as the mean, or will evaluate and implement an alternative approach. The DOE-proposed approach and its basis will be provided to NRC prior to September 2001. The approach will be implemented prior to any potential LA.	September-01

Remaining FY01 Agreement Items

(Continued)

KTI Agreement Number	KTI Agreement Description	Proposed Due Date
SDS 2.3	Consistent with proposed 10 CFR Part 63, the NRC believes the use of the mean is appropriate, however, DOE may use any statistic as long as it is consistent with site data and technically defensible. DOE will either provide technical justification for use of median values or another statistical measure, such as the mean, or will evaluate and implement an alternative approach. The DOE-proposed approach and its basis will be provided to NRC prior to September 2001. The approach will be implemented prior to any potential LA.	September-01
SDS 3.1	The ECRB long-term test and the Alcove 8 Niche 3 test need to be "fractured-informed" (i.e., observation of seepage needs to be related to observed fracture patterns). Provide documentation which discusses this aspect. DOE responded that for the passive test, any observed seepage will be related to full periphery maps and other fracture data in testing documentation. The documentation will be available by any potential LA. For Niche 3, fracture characterization is complete and a 3-D representation will be included in testing documentation. The documentation will be available August 2001.	September-01
SDS 3.4	The NRC needs DOE to document the discussion of excavation-induced fractures. DOE responded that observations of excavation-induced fractures will be documented in a report or AMR revision by June 2001.	September-01
SZ 5.9	Provide additional information in an updated AMR or other document for both the regional and site scale model (for example, grid construction, horizontal and vertical view of the model grid, boundary conditions, input data sets, model output, and the process of model calibration). The updated USGS Regional Groundwater Flow Model is a USGS Product, not a Yucca Mountain Site Characterization Project product. It is anticipated that this document will be available in September 2001. DOE believes that the requested information is now available in the current version of the Calibration of the Site-Scale Saturated Zone Flow Model AMR and will be carried forward in future AMR revisions.	September-01
TEF 2.7	Provide the Ventilation Model AMR, Rev. 01 and the Pre-Test Predictions for Ventilation Test Calculation, Rev. 00. The DOE will provide the Ventilation Model AMR (ANL-EBS-MD-000030) Rev 01 to the NRC in March 2001. Note that ventilation test data will not be incorporated in the AMR until FY02. Test results will be provided in an update to the Ventilation Model AMR (ANL-EBS-MD-000030) in FY02. The DOE will provide the Pre-test Predictions for Ventilation Tests (CAL-EBS-MD-000013) Rev 00 to the NRC in February 2001..	September-01
TEF 2.9	Provide the Multi-Scale Thermohydrologic Model AMR, ICN 03. The DOE will provide the Multi-scale Thermohydrologic Model AMR (ANL-EBS-MD-000049) Rev 00 ICN 03 to the NRC. Expected availability July 2001.	September-01
TEF 2.10	Represent the full variability/uncertainty in the results of the TEF simulations in the abstraction of thermodynamic variables to other models, or provide technical basis that a reduced representation is appropriate (considering risk significance). The DOE will discuss this issue during the TSPAI TE tentatively scheduled for April 2001.	Was not discussed at TSPAI TE and needs to be rescheduled
TSPAI 3.20**	Provide access to data supporting the synthetic meteorologic records (4JA.s01 and Area12.s01) (UZ1.3.2). DOE will provide data supporting the synthetic meteorologic records (specifically, data files 4JA.s01 and Area12.s01). These data files will be provided to NRC September 2001.	September-01

** Added at TSPAI TE

Status of KTI Agreements*

KTI Title	Agreements Reached	Documentation Received for Agreement	Documentation Partly Received for Agreement	Documentation Not Received for Agreement	Need Additional Information	Agreement Complete
USFIC	27	0	1	22	0	4
IA	18	0	1	10	0	7
CLST	58	22	2	34	0	0
SDS	10	2	1	4	3	0
RT	29	5	1	23	0	0
ENFE	41	13	6	22	0	0
TEF	15	3	4	7	0	1
RDTME	23	0	2	21	0	0
TSPAI	58	0	0	58	0	0
PRE-C**	9	0	0	9	0	0
Totals	288	45	18	210	3	12

- * As of August 29, 2001
- ** Pre-closure is not a Key Technical Issue but is listed here for completeness.