



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

Reply to:  
1050 E. Flamingo Rd., #319  
Las Vegas, Nevada 89119  
Tel: (702) 388-6125  
FTS: 598-6125

M E M O R A N D U M

DATE: November 15, 1990

FOR: John J. Linehan, Director, HDPD, Division of High-Level  
Waste Management, M/S 4 H 3

FROM: John W. Gilray and Paul T. Prestholt, Sr. ORs - YMP

SUBJECT: YMP Site Report for the month of October, 1990

I. QUALITY ASSURANCE

A. YMP QA Program

1. ♦ As a result of the recent audit of the YMP QA program the YMP is actively pursuing corrective actions to remedy those deficiencies identified by this audit. The major corrective actions ongoing are:
  - A more thorough technical and QA review of the technical requirements document for Midway Valley/Calcite-Silica activities;
  - Improved training methods for the YMP personnel, and
  - Timely close out of outstanding deficiencies.

The YMP expects to conduct regularly scheduled surveillances of the above activities and the Midway Valley/Calcite-Silica activities to determine QA readiness to start site

102-7  
WM-11  
NH03/1

characterization work. A schedule of these surveillances has been submitted to Ken Hooks of NRC.

2. In discussions with Don Horton, OCRWM Director of the Office Quality Assurance, it was noted that part of his overall proposed plan to improve the effectiveness of the YMP QAP is to accomplish the following.

- ◆ Do away with the OCRWM Quality Assurance Requirements Document and rely on compliance to the OCRWM Quality Assurance Program Description Document.
- ◆ Do away with the participants individual Quality Assurance Program Plans and rely on compliance to the OCRWM Quality Assurance Program Description Document (QAPD) except for unique exceptions or additions which would be addressed in an appendix to the QAPD.
- ◆ Integrate the necessary controls in Section 19, "Computer Software", and Section 20, "Scientific Investigation Control" of the QAPD into Section 3, "Design Control" of the QAPD.
- ◆ Determine ways to improve the audit process possibly by reducing audit team size, increasing frequency of audits with a reduced scope and taking credit for surveillances.

B. Site Characterizations planning for Midway Valley Trenching/Calcite-Silica Activities.

The YMP is aggressively working in technical, engineering and QA areas in preparation of expected site characterization activities associated with Midway Valley Trenching/Calcite-Silica work (provided permits or relief of permits is granted). A major effort in this preparation is a more thorough technical and QA review of the technical requirements document for the Midway Valley Trenching and Calcite-Silica activities with emphasis on

requirements traceability to hierarchy documents. The plan to review this technical document is enclosed. (Enclosure 2). The previous review of this document was found deficient as a result of a QA audit.

A readiness review of the Midway Valley Trenching is expected to take place early January, 1991, and it is our understanding that NRC technical and QA representatives want to participate in this review. The process of the readiness review is described in the attached YMP Readiness Review Procedure, AP-5-13Q. (Enclosure 3).

As a side comment, if Midway Valley Trenching activities should commence at the site, NRC has office facilities at the site to monitor these site characterization activities if necessary.

#### C. Ratheon

Ratheon Services of Nevada (RSN) has recently acquired those YMP contract responsibilities for the engineering, technical, management and quality assurance responsibilities previously under contract by Holmes and Narver (H&N) and Fenix and Scisson (F&S). Accordingly, H&N and F&S have no responsibility within the YMP. RSN will be a new YMP participant. RSN has however hired the majority of the H&N and F&S employees who worked on the YMP. They are now RSN employees.

RSN has developed a Transition QA Plan which the YMP has approved (Enclosure 1) describing the merging of F&S and H&N QA Programs into a RSN QA Program (scheduled for mid December). This plan identifies those ongoing engineering and technical activities associated with Midway Valley and Calcite/Silica activities and the alternative studies. The YMP and RSN has decided to adopt and use as applicable the QA programs of F&S and H&N for these ongoing activities. The RSN QA Program when

approved. (with NRC acceptance), will apply to new work. We pointed out to the YMP office and RSN the importance in assuring the QA records generated by RSN clearly identify and distinguish which QA program they were governed by. Also we suggested that RSN clearly procedurally describe the above process and identify the organizational departments responsible for carrying out various aspects of activities described in the plan.

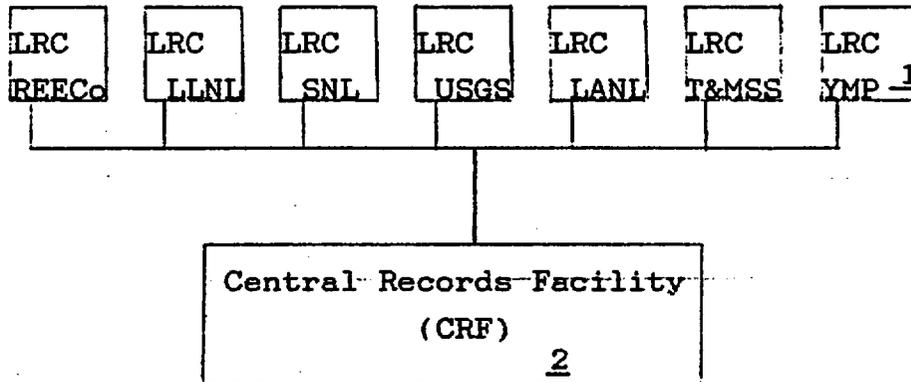
It may be worthwhile for the YMP and RSN to provide at the DOE/NRC monthly meeting a 30 minute presentation of the RSN transition plan and the extent RSN will utilize the F&S and H&N QA program prior to RSN development, approval and use of their QA program.

D. T&MSS (Technical & Management Support Services) Control of YMP records.

Some confusion has occurred relative to T&MSS use of two QA Programs (T&MSS and YMP) while performing activities associated with the control of records. This OR office has had several discussions with the YMP and T&MSS on this subject resulting in the following clarification.

T&MSS has responsibility for controlling, maintaining and managing the YMP Central Records Facility (CRF) which receives and files those records from each of the participant's Local Records Center (LRC) including the YMP LRC. T&MSS performs this YMP support function under the YMP QA program procedures and has received training and indoctrination to these QA procedures. T&MSS also controls, maintains and manages their own T&MSS LRC utilizing their own T&MSS QA program procedures when performing this function. Therefore an audit of the YMP CRF would involve an audit of T&MSS and the extent they all comply with the YMP QA program, while an audit of the T&MSS LRC would involve an audit of T&MSS and assessment of their compliance with the T&MSS QA program.

A chart explaining this follows:



LRC = Local Records Center

- 1 The YMP-LRC is managed by REECo. Reeco follows the YMP QA program.
- 2 The CRF is managed by T&MSS under the control of the YMP QA program.

#### E. SECOND YMP QA WORKSHOP

- ◆ DOE held a QA workshop at Las Vegas from October 10, 1990, through October 12, 1990. Participating in the workshop were the TPOs, scientists and QA personnel from the National Labs and USGS which support the YMP. The two NRC On-Site Representatives (P. Prestholt and J. Gilray) attended this workshop as observers.
- ◆ The goals for this workshop were:
  1. To identify specific issues associated with any real life problems experienced by the scientific community in implementing the QA Program; reach a consensus on the issues.
  2. To propose resolutions to those issues that can be solved at the workshop.

3. To develop recommendations for actions by upper management and others to resolve any remaining issues.

- ◆ The workshop was successful in that major issues were identified and recommended solutions were proposed. Time did not allow for the participants to formulate and consolidate these issues and recommendations into a workshop report and recommended action plan. The workshop will reconvene in the near future to complete these activities. Workshop attendees believe this workshop was very productive and worthwhile.
- ◆ In general the major recommendations will probably be keyed to:

Simplifying the complex hierarchy of requirement documents that are imposed on the participants particularly in the scientific research field.

Involving the scientist in the preparation and concurrence of implementing procedures.

Providing an educational seminar to the participants regarding the NRC licensing process and the rationale for the need for the Appendix B requirements for scientific and research activities.

## II. WASTE PACKAGE

The LLNL October monthly status report is enclosed. (Enclosure 4). It is encouraged that comments and/or questions regarding the contents of these reports be directed through this office for action and resolution in order to minimize the impact on the YMP.

There are no new issues that this office has identified that have not been brought to management's attention.

cc: w/encs: K. Hooks, M/S 4H3; J. Bunting, M/S 4H3; J. Latz,  
K. Stablein, M/S 4H3

wo/encs: D. Shelor, C.P. Gertz, R.E. Loux, M. Glora,  
G.Cook, D.M. Kunihiro, D. Weigel, R.E. Browning, M/S 4H3;  
H. Denton, M/S 17F2, R. Bernero, M/S 6A4; H. Thompson,  
M/S 17G21; S. Gagner, M/S 2G5; L. Kovach, M/S NLS260

Enclosure I



Department of Energy  
Yucca Mountain Project Office  
P. O. Box 98608  
Las Vegas, NV 89193-8608

WBS 1.2.9.3  
QA

NOV 8 1990

Richard L. Bullock  
Technical Project Officer  
for Yucca Mountain Project  
ATTN: Michael J. Regenda  
Fenix and Scisson of Nevada  
101 Convention Center Drive  
Phase II, Suite P-250  
M/S 403  
Las Vegas, NV 89109

**QUALITY ASSURANCE (QA) PROGRAM TRANSITION PLAN**

Reference: Letter, Regenda to Gertz, dtd. 10/23/90 with Transition Plan

The referenced Transition Plan has been reviewed by the Yucca Mountain Project Office QA group (POQA). A question concerning POQA approval of any changes to existing Holmes & Narver, Inc. (H&N) or Fenix and Scisson of Nevada (FSN) Quality Assurance Program Plans (QAPPs) was discussed with Michael Regenda on November 6, 1990. Section II of the Transition Plan does not include the POQA in the approval cycle of such changes.

We have been assured by Michael Regenda that, contrary to the statement in Section II, the POQA will continue to have review and approval authority of FSN and H&N QAPP changes. He also emphasized that POQA approval of the Raytheon Services Nevada QA Program Description document is a milestone identified as Item (a) in the referenced letter.

Based upon this understanding, the submitted plan is considered to be approved.

If you have any questions, please contact either Nancy A. Voltura at 794-7972 or Peter J. Karnoski at 794-7736 of the Project Office QA staff.

*James Blaylock*  
Donald G. Horton, Director  
Quality Assurance  
Yucca Mountain Project Office

QA:NAV-752



FENIX & SCISSON OF NEVADA  
 YUCCA MOUNTAIN PROJECT  
 101 CONVENTION CENTER DRIVE • SUITE P250  
 LAS VEGAS, NEVADA 89109

I - 30746/r

(702) 794-7979

ADDRESS REPLY TO: FS-YMP-1483

WBS 1.2.9  
 QA

October 23, 1990

Carl P. Gertz, Project Manager  
 Yucca Mountain Project Office  
 U. S. Department of Energy  
 P. O. Box 98608  
 Las Vegas, Nevada 89193-8608

ATTN: D. G. Horton, Director  
 Quality Assurance Division

SUBJECT: TRANSITION OF QA PROGRAMS

REFERENCE: Letter FS-YMP-1472, M. J. Regenda to D. G. Horton, Dated October 2, 1990, Pertaining to Above Subject

Horton  
 Staylock  
 Valtun  
 Petrie  
 Gertz  
 Johnson  
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 \_\_\_\_\_  
 REC'D IN WMPO  
 10-23-90

Attached for your review and approval is the proposed Transition Plan whereby the FSN and H&N QA Programs will be merged into the Raytheon Services Nevada (RSN) QA Program.

The Transition Plan has been coordinated with Mr. R. L. Bullock, TPO and covers the four significant items of importance identified in the above referenced letter.

The milestone dates indicated in the Transition Plan are as follows:

- a. Submit RSN QAPD for DOE approval - December 14, 1990 or ten working days after the issuance of the QARD, whichever is later.
- b. Issue RSN QAPD - 30 days after DOE approval.
- c. Issue necessary RSN Procedures - March 31, 1991.

It is requested that your review be expedited and approval granted prior to November 5, 1990, when RSN becomes the prime contractor.

RECORD

C. P. Gertz  
FS-YMP-1483  
October 23, 1990

If there are any questions, please contact me at 794-7226.

  
M. J. Regenda  
MANAGER QUALITY ASSURANCE

MJR:jmc

Enclosure

cc: R. L. Bullock  
J. C. Calovini - H&N  
J. Blaylock - DOE/YMP QA  
N. A. Voltura - DOE/YMP QA  
T. Petrie - DOE/YMP  
G. Pratt - Raytheon  
D. J. Tunney  
FSN YMP Files  
LVRMC

**TRANSITION PLAN FOR THE RAYTHEON SERVICES NEVADA  
YUCCA MOUNTAIN PROJECT QUALITY ASSURANCE PROGRAM**

**I. ON GOING ACTIVITIES**

The following technical activities are on going or will soon be conducted by Holmes & Narver and Fenix & Scisson of Nevada.

**A. Fenix & Scisson of Nevada**

1. Development of Drilling Programs and Engineering Support of Workover Activities in existing boreholes.
2. Exploratory Shaft Facility (ESF) Alternatives Study.
3. Soils and Rock Properties Investigation Study Plan.
4. Revision of ESF General Arrangements based on ESF AS decision.

**B. Holmes & Narver, Inc.**

1. Design and Title III Inspection of Midway Valley Trenching.
2. ESF Alternatives Study (working under the Sandia QA Program).
3. Masterplanning effort for Area 25 and ESF SBT Commons Facilities.
4. Design and Title III Inspection of J-12 to J-13 Waterline.
5. Design and Title III Inspection of Area 25 Waterline.
6. Design and Title III Inspection of Building 4517 Modifications.
7. Design and Title III Inspection of Trench No. 14 Deepening and Widening.
8. Rubblized Core Testing.
9. Design and Title III Inspection of Area 25 Sanitary Land Fill.
10. Design and Title III Inspection of Information Data Acquisition Shelter.
11. Design and Title III Inspection of the Records Management Facility.
12. Revision of ESF General Arrangements based on ESF AS decision.

These activities will continue under the FSN or H&N approved Quality Assurance Program Plan (QAPP).

**II. ORGANIZATIONAL APPROVALS**

If changes are required to the existing H&N or FSN QAPP and Implementing Procedures, the following approvals will be obtained:

**A. Fenix & Scisson of Nevada**

**1. Project Procedures and Design Control Procedures**

**Approvals: RSN Technical Project Officer/Project Manager  
RSN YMP Quality Assurance Manager  
RSN General Manager or His Deputy**

**2. Quality Assurance Procedures**

**Approvals: RSN YMP Quality Assurance Manager  
RSN Quality Assurance Manager**

**3. Quality Assurance Program Plan**

**Approvals: RSN General Manager or His Deputy  
RSN TPO/PM  
RSN Quality Assurance Manager**

**4. Other Documents which require Management approvals**

Previous Approval Required

Current Approvals

**FSN Manager of QA  
FSN TPO/PM  
FSN General Manager**

**RSN YMP Manager of QA  
RSN TPO/PM  
RSN General Manager or His  
His Deputy**

**B. Holmes & Narver, Inc. (H&N)**

**1. Procedures**

**Approvals: RSN YMP QA Manager  
RSN TPO/PM**

**2. Quality Assurance Program Plan**

**Approvals: RSN General Manager or His Deputy  
RSN Quality Assurance Manager  
RSN TPO/PM**

3. Other Documents which require Management approvals

Previous Approval Required

H&N Supervisor of YMP QA  
H&N Manager of QA  
H&N TPO/PM  
H&N General Manager

Current Approvals

RSN YMP QA Manager  
RSN YMP QA Manager  
RSN TPO/PM  
RSN General Manager or His  
Deputy

III. QUALITY ASSURANCE PROGRAM DESCRIPTION

RSN will develop a Quality Assurance Program Document (QAPD) based on the DOE Quality Assurance Requirements Document (QARD). This QAPD will be submitted to DOE for approval by December 14, 1990 or ten working days after the issuance of the QARD, whichever is later. The QAPD will be issued 30 days after DOE approval.

IV. PROCEDURES

RSN will develop procedures to implement the requirements of the QAPD, the DOE Administrative Procedures and other DOE Requirements Documents. Existing FSN and H&N Procedures will be consolidated into RSN procedures. For those activities to be conducted under the RSN QA Program the RSN Procedures will be issued prior to initiation of the activities. The target date for issuing RSN Procedures is March 31, 1991.

V. TRAINING

Appropriate personnel will be trained to the RSN Plans and Procedures prior to implementation.

VI. ADDITIONAL WORK

If RSN is directed to perform additional work prior to DOE approval of the RSN QAPD, the work will be conducted under the FSN or H&N approved QAPP, as appropriate. Work initiated after the implementation of the RSN QAPD will be conducted under the RSN QAPD.

TEMSS PLANS AND PROCEDURES DIVISION (PPD)  
DOCUMENT TRANSMITTAL/ACKNOWLEDGMENT RECORD

DATE: October 30, 1990  
FROM: Vincent F. Iorii, Project Control  
Branch Chief  
Return to Mailstop 517/T-26

DT/AR:VFI:leb:1130  
WBS #1.2.1.2.5  
QA

DOCUMENT IDENTIFICATION NUMBER: YMP/CM-0007 REVISION: 2  
TITLE: Technical Requirements for the Yucca Mountain Project (Midway Valley Trenching and Calcite/Silica Activities)  
AUTHOR/REQUESTER/CONTACT: George D. Dymmel, YMP, NV  
DRAFT: H DATED: 10/30/90  
ACTION REQUESTED: QMP-06-04 Review  
ACTION RETURN DATE: 11/2/90  
REVIEW AND COMMENT RESOLUTION MEETING:  
TUESDAY: 10/30/90 8:00 A.M. Training Center Room 10

Distribution:

- R. V. Barton, YMP, NV
- W. R. Dixon, YMP, NV
- W. A. Girdley, YMP, NV
- D. G. Horton, YMP, NV
- V. F. Iorii, YMP, NV
- S. B. Jones, YMP, NV
- E. H. Petrie, YMP, NV
- A. C. Robison, YMP, NV
- R. J. White, YMP, NV
- W. A. Wilson, YMP, NV
- R. C. Greenwold, H&N, Las Vegas, NV
- J. A. Catozzi, REECO, Las Vegas, NV
- H. Z. Dokuzoguz, SAIC, Las Vegas, NV, 517/T-39
- G. A. Fasano, SAIC, Las Vegas, NV, 517/T-11
- M. A. Glora, SAIC, Las Vegas, NV, 517/T-27
- T. A. Grant, SAIC, Las Vegas, NV, 517/T-13
- J. L. King, SAIC, Las Vegas, NV, 517/T-03
- K. T. McFall, SAIC, Las Vegas, NV, 517/T-06
- C. G. Pflum, SAIC, Las Vegas, NV, 517/T-27
- J. N. Stellavato, SAIC, Las Vegas, NV, 517/T-32
- T. E. Hinkebein, SNL, 6315, Albuquerque, NM

ACTION IORII  
 CC: BARTON -Dymmel  
 CC: DIXON  
 CC: Girdley  
 CC: HORTON  
 CC: JONES  
 CC: PETRIE  
 CC: ROBISON  
 CC: WHITE, R.J.  
 CC: WILSON  
 CC: Giertz-Dyer-Maxwell -4/0  
 end  
 10-31-90

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DATE  
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T&MSS PLANS AND PROCEDURES DIVISION (PPD)  
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cc w/encl: (for information purposes)

Dwight Shelor, HQ (FW-3) FORS  
G. D. Dymmel, YMP, NV  
Helen S. Matthews, SAIC, Las Vegas, NV, 517/T-19  
J. D. Waddell, SAIC, Las Vegas, NV, 517/T-21

cc w/o encl: (for status purposes)

C. P. Gertz, YMP, NV  
J. R. Dyer, YMP, NV  
F. R. Maxwell, YMP, NV  
J. C. Calovini, H&N, Las Vegas, NV  
R. E. Lowder, MACTEC, Las Vegas, NV  
J. C. Mattimoe, MACTEC, Las Vegas, NV  
R. F. Pritchett, REECO, Las Vegas, NV  
D. M. Boak, SAIC, Las Vegas, NV, 517/T-43  
E. H. Cathey, SAIC, Las Vegas, NV, 517/T-43  
E. M. Cikanek, Harza, Las Vegas, NV, 517/T-39  
George Dermer, Harza, Las Vegas, NV, 517/T-39  
T. E. Blejwas, SNL, 6313, Albuquerque, NM  
Rich Kalinski, SNL, 6311, Albuquerque, NM  
L. J. Klamerus, SNL, 6316, Albuquerque, NM  
A. C. Matthusen, SAIC, Las Vegas, NV, 517/T-10  
J. K. Prince, SAIC, Las Vegas, NV, 517/T-14  
T. H. Pysto, SAIC, Las Vegas, NV, 517/T-11  
R. R. Schneider, SAIC, Las Vegas, NV, 517/T-43  
G. K. Beall, SAIC, Las Vegas, NV, 517/T-36  
M. M. Dussman, SAIC, Las Vegas, NV, 517/T-14  
R. G. Helms, SAIC, Las Vegas, NV, 517/T-24  
J. H. Nelson, SAIC, Las Vegas, 517/T-04  
S. C. Matthews, SAIC, Las Vegas, NV, 517/T-07  
T. D. Tait, SAIC, Las Vegas, NV, 517/T-40  
J. L. Younker, SAIC, Las Vegas, NV, 517/T-10  
L. R. Hayes, USGS, Denver, CO

**T&MSS PLANS AND PROCEDURES DIVISION (FPD)  
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Branch Chief

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ACTION RETURN DATE: 11/2/90  
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TUESDAY: 10/30/90 8:00 A.M. Training Center Room 10

NOTE: A format and content check on this document was not performed by the Technical and Management Support Services Plans and Procedures Division.

Enclosed is a copy of the YMP/CM-0007, Technical Requirements for the Yucca Mountain Project (Midway Valley Trenching and Calcite/Silica Activities) (Rev. 2), for an QMP-06-04 review. Per Section 5.0, Step 10, of QMP-06-04, the persons listed in the distribution of this transmittal are responsible for reviewing the enclosed document.

Complete the enclosed Document Review Sheets (DRS) and return to Elaine L. Spangler, SAIC, by the scheduled review comment completion date of Friday, November 2, 1990. Per QMP-06-04, Section 5.0, Step 14, comments received after the comment due date will be held and considered for the next revision if extension of due date is not requested from reviewer(s) and approved by the PCB manager.

If the responsible reviewer determines that a review by his organization is not desired or required, then he is to return the DRS with that indicated on the DRS. Should a review not produce any comments, the reviewer is to return the DRS form marked "No Comments." The original signed and dated DRS form must be returned and should be completed in black ink. Please note that if you line through any information, you must initial and date that line-through per QMP-17-01.

All reviewers must attend, or have representatives present at, the review and comment meeting to be held beginning at 8:00 a.m. on Tuesday, October 30, 1990, in Training Center Room 10. Those representatives must have authority to resolve comments. Designees should be so noted on the Document Review Sheet.

Should you have any questions regarding the document under review, please get in touch with the Author/Requester/Contact, or John D. Waddell at 794-7828, or Deidre M. Boak at 794-7268. If you have any questions about the review process, contact Elaine L. Spangler at 702) 794-7640, or FTS 544-7640.

T&MS PLANS AND PROCEDURES DIVISION (PPD)  
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TUESDAY: 10/30/90 8:00 A.M. Training Center Room 10

**REVIEW CRITERIA:** Complete the review pursuant to the specific criteria for your type of review contained in Attachment 2, 3, 4, or 5 and to the general criteria provided below:

**General Guidance:** Since this is a pruned set of requirements, the sub-tier does not need to be sufficient to satisfy the upper tier requirement. However, the requirement must be derivable from the upper tier requirement or requirements starting with WMSR IV and must be sufficient with respect to the activities titled Midway Valley/Calcite Silica.

Inputs developed under other QA programs must be determined to be acceptable. Successful resolution of any comments generated during this review will serve as the basis for acceptance of inputs developed under other QA programs.

Checklists shall be prepared to show that all review criteria were evaluated.

Example Checklist:

Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Criterion: Technical #6

Section	Derivation Traceable	Logic/Rationale Acceptable	References Correct
_____	_____	_____	_____

In addition to these criteria, the technical review should cover the consistency of the document with the following:

1. The Office of Civilian Radioactive Waste Management system requirements document - Waste Management Systems Requirements, Rev. 1.
2. The applicable study plans (Midway Valley-"Study Plan for Evaluating the Location and Recency of Faulting Near Prospective Surface Facilities," 8.3.1.17.4.2; and, Calcite/Silica, Trench 14 -"Characterization of the Yucca Mountain Quaternary Regional Hydrology," Activity 8.3.1.5.2.1).
3. Functional analysis supporting the Midway Valley and Calcite/Silica activities.
4. Test and Evaluation Plan

10/29/90

REVIEW INSTRUCTIONS FOR REVIEW OF  
TECHNICAL REQUIREMENTS FOR THE YUCCA MOUNTAIN PROJECT  
REV. 1 TO BECOME REV. 2

1.0 GOAL

Issue Rev. 2 of the Technical Requirements for the Yucca Mountain Project.

2.0 THEME

To provide a document with zero defects where all inputs from laws and regulations been identified and there is clear and unambiguous flow down linkage among all requirements.

3.0 PROCESS

The major steps are shown below:

3.1. The EDD will place a hold on completion of verification of H&N design products (AP-5.20)

3.2. The review will be conducted under the QAG numbered EDD-001, Rev. 1. The review process will comply with QMP-06-04, Rev. 1. On October 29, 1990, a background briefing will be provided and all reviewers are to assure that their training records are current for QMP-06-04, Rev. 1. The review will start October 30, 1990. The end of the review comment period is targeted for completion by November 2, 1990.

The lead organization for the review is the System Branch. The coordinators will be G. Dymmel, J. Waddell, D. Boak, and E. Spangler.

3.3. REVIEW ASSIGNMENTS

Regulatory Review

SPECIALTY

NWPA/NRC  
NEPA  
DOE Orders and others  
Safety Regulations

REVIEWERS

M. Glora  
G. Fasano  
C. Pflum  
R. White

Amended 10/30/90

*ETM*  
10/31/90

Technical Review

SPECIALTY

Engineering and Construction  
Seismic  
Faulting Hazards  
Sample Management  
Environmental  
Construction  
Systems\*\*  
Performance Assess.\*  
TE Process  
Testing Linkage

REVIEWERS

R. White, R. Greenwold, W. Wilson  
J. King  
T. Grant  
N. Stellavato  
G. Fasano  
J. Catozzi  
H. Dokozoguz  
T. Hinkebein  
S. Jones  
A. Girdley

Only Criteria  
1, 5, and 6

\* Assess magnitude of potential adverse impact of site activity and establish controls placed on the activity.

\*\*Criteria 4, review responsibility of Systems reviewer only.

Management Review

AREA

EDD  
POCD  
Site Operations  
RSED  
POCD  
Quality Assurance  
Institutional Affairs

REVIEWERS

Ted Petrie  
Wendy Dixon  
Winn Wilson  
Bob Barton  
Vince Iorii  
Don Horton  
Ace Robison, Only Criteria 1 and 5

Quality Assurance Review

AREA

QA

REVIEWERS

Ken McFall

3.4. After comment resolution the document will be revised and issued as a controlled document.

### 3.5. AUTHORS AND SUPPORT

George Dymmel, Lead Author  
John Waddell  
Ed Cikanek  
George Derner  
Hank Cathey  
Tom Pysto  
Kayce Prince  
Frank Maxwell  
Russ Dyer  
Augie Matthusen  
Rich Kalinski, SNL (LATA)  
Leo Klamerus, SNL  
Ralph Schneider  
Deirdre Boak

### 3.6 REVIEW SCHEDULE

Background briefing	10/29/90
- Review instructions	
- QARD and QAPD	
- QA Grading Package	
- QMP-06-04	
Document overview	10/30/90
- Review package handout	
Perform review	10/30/90 - 11/2/90
Comment resolution	11/3/90 - 11/9/90
Document revision	Goal to be complete mid November

MANAGEMENT REVIEW CRITERIA

1. Does any change to existing policy expressed in the document represent a conscious decision at the appropriate management level?
2. Does any condition with, or change to, organizational responsibility assignments represent a conscious decision at the appropriate management level?
3. Where the document affects the reviewing organization, are management and administrative impacts acceptable?
4. If interfaces between U.S. Department of Energy and participants are involved, is the interface consistent with existing contracts or agreements?
5. Is document content consistent with established HQ and Project Office objectives?

REGULATORY REVIEW CRITERIA

1. Is the document content consistent with applicable regulatory requirements, if any?
2. Does the document content affect existing regulatory commitments and, if so, is it consistent with such commitments?
3. If the document makes any commitments or addresses a topic of regulatory interest, is it consistent with existing or intended Program and Project policy?
4. Are the sources of information and data referenced and traceable?
5. Is there any contradiction between DOE Orders and regulatory requirements or commitments, and if so, what will be the method of resolution?

TECHNICAL REVIEW CRITERIA (S. Jones and A. Girdley only review to criteria  
1, 5, and 6)

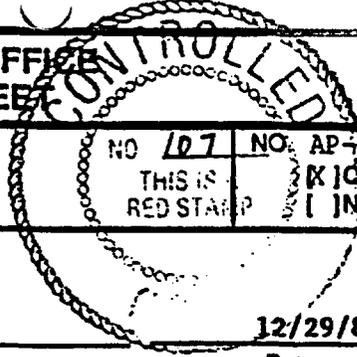
1. Are inputs and input sources current, correct, and adequate for the intended use?
2. Are those assumptions within the scope of responsibility of this organization stated explicitly? Are they reasonable?
3. Where applicable and where checked, are analytical approaches and results appropriate?
4. Is the document consistent with prescribed systems engineering requirements as defined in the Yucca Mountain Project Systems Engineering Management Plan?
5. Were potential interfaces or interactions, such as Environmental, adequately addressed?
6. Is there clear and unambiguous flow down and linkage among all requirements?

QUALITY ASSURANCE REVIEW CRITERIA

1. Does the document contain those QA requirements applicable to the controls or processes it addresses? (A flowchart or checklist of applicable QA requirements for the specific topic may be desirable for QA reviews).
2. Are responsibilities clearly delineated?
3. Are specified responsibilities and authority consistent with Project policy?
4. Where applicable, does the document clearly distinguish between performing, review, and verification activities?
5. Where verification activities are involved, does the document adequately address mechanisms for ensuring the necessary independence and technical competence of the verifier(s)?
6. If the document expresses requirements that exceed established QA program requirements, do such additional requirements reflect Project Office policy?  
Does the document contain qualitative and or quantitative data, and if so, are tolerance and parameters provided for this data?
8. Based on the source requirements, is there a need to provide QA interpretations or clarifications to the document requirements?

**YUCCA MOUNTAIN PROJECT OFFICE  
DOCUMENT APPROVAL SHEET**

Y-AD-002  
4/90



Title  
ADMINISTRATIVE PROCEDURE: READINESS REVIEW

NO 107	NO AP-5.13Q
THIS IS RED STAMP	K10 Non Q

APPROVAL

PROJECT MANAGER: Original signed by	<u>Carl Gertz</u> Signature	<u>12/29/88</u> Date
DIRECTOR OF QUALITY ASSURANCE:	<u>James Blaylock</u> Signature	<u>12/19/88</u> Date
<u>N/A</u> (OTHER, AS REQUIRED)	<u>N/A</u> Signature	<u>N/A</u> Date

REVISION 0 EFFECTIVE DATE: 12/29/88

REVISIONS

INITIAL AND DATE

	<u>REVISION 1</u>	<u>REVISION 2</u>	<u>REVISION 3</u>	<u>REVISION 4</u>
PROJECT MANAGER:	<u>E. L. Wilmot</u> 10/5/90	<u>[Signature]</u> 10/24/90	_____	_____
DIRECTOR, QA:	<u>N. Voltura for</u> D. G. Horton 10/4/90	<u>[Signature]</u> 10/24/90	_____	_____
<u>N/A</u> (OTHER, AS REQUIRED)	<u>N/A</u>	<u>N/A</u>	_____	_____
EFFECTIVE DATE:	<u>10/9/90</u>	<u>10/26/90</u>	_____	_____



# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## 1.0 PURPOSE AND SCOPE

### 1.1 PURPOSE

The purpose of this procedure is to define the method to be used and the responsibilities for Readiness Reviews for the Yucca Mountain Project (Project) activities.

### 1.2 SCOPE

Readiness reviews are performed as deemed appropriate by Management. Readiness reviews verify that specified prerequisites and procedure requirements have been satisfied prior to the start of major activities.

## 2.0 APPLICABILITY

This procedure applies to all Project Participants and to personnel of the Yucca Mountain Project Office (Project Office) when performing readiness reviews for the Project.

## 3.0 DEFINITIONS

NOTE: Terms in this procedure are used as defined in the Project Glossary. The following additional definitions are adopted for the purposes of this procedure.

### 3.1 READINESS REVIEW NOTICE

The Readiness Review Notification (Attachment 1) is a memorandum or document that provides the following:

1. Readiness review scope and purpose identifying areas and items to be reviewed, including an indication of the required depth
2. Planned readiness review date, time, location, and other logistical information for the review meeting
3. Identification of the Readiness Review Board Chairperson

### 3.2 READINESS REVIEW CHECKLIST

The Readiness Review Checklist is a list of prerequisites, requirements and other information that forms the basis for the Readiness Review and provides evidence for determining readiness. The Checklist will contain, at a minimum, the following:

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		2 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## 1. Checklist questions

Checklist questions must be focused so that, as a minimum, the following items are addressed:

- a. Work activity prerequisites have been satisfied. For example, the following items should be reviewed: plans, prerequisite lists, and requirements documents.
- b. Implementing line, Quality Assurance (QA), and administrative procedures related to the next phase of work have been developed and reviewed for adequacy and appropriateness
- c. Personnel have been suitably trained and qualified

## 2. Space for comments and resolutions

## 3. Approval signature of the Team Chairperson

## 4. Design Activities readiness reviews are performed to confirm, as a minimum, the following elements:

- a. Required systems engineering approach to design development has been factored into design schedules and related planning documents.
- b. Applicable regulatory requirements, codes, standards, and controls have been identified. Implementing line procedures and procurement documents reflect these required design inputs.
- c. Design responsibilities and interface responsibilities are defined in procedures and procurement documents.
- d. Design schedules identify milestone design reviews.
- e. Procedures exist for baselining design documents and controlling subsequent changes.

### 3.3 READINESS REVIEW BOARD SELECTION RECORD

The Readiness Review Board Selection Record (Attachment 2) is a document that identifies the functions involved in the review and the names of qualified independent individuals selected to be on the Readiness Review Board.

The form shown on Attachment 2 may be used if so desired.

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		3 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## 3.4 REVIEW RECORD MEMORANDUM

The Review Record Memorandum is a documented summary of the Readiness Review prepared by the Readiness Review Team Secretary that includes

1. Readiness Review Notice
2. Readiness Review Board Selection Record
3. Completed Checklist with the signature of the Team Chairperson
4. Completed Readiness Review Comment Record form (Attachment 3) containing the Readiness Review Board comments and the Review Team's resolutions, including any open items as applicable
5. Evaluation and recommendation of readiness
6. Readiness decision documentation
7. Agenda of Readiness Review Team activities (if desired)

## 4.0 RESPONSIBLE PARTIES

The following Project Office individuals or organizations are responsible for the activities identified in Section 5 of this procedure:

1. Responsible Project Office Division Director (DD)
2. Appropriate Participant Technical Project Officer (TPO) (of the organization in which a subject is being reviewed)
3. Readiness Review Board Chairperson
4. Readiness Review Team Chairperson
5. Readiness Review Board
6. Readiness Review Team
7. Readiness Review Team Secretary

Effective Date

10/26/90

Revision

2

Supersedes

Page

4 of 12

No.

AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## 5.0 PROCEDURE

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1.

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
DD and TPO	1.	Identify those activities that require Readiness Reviews.
	2.	Select Readiness Review Board Chairperson.
	3.	Prepare and issue Readiness Review Notification to Readiness Review Board Chairperson and affected organization.

### SELECTION OF BOARD AND TEAM

Readiness Review Board Chairperson	4.	Complete, sign, and date Readiness Review Board Selection Record, or suitable alternate.
	5.	Ensure that members are trained in this procedure and other applicable documents.
	6.	Select Readiness Review Team Chairperson.
Readiness Review Team Chairperson	7.	Select Team members and Team Secretary and ensure they are trained in this procedure.

### PREPARE CHECKLIST

Readiness Review Team	8.	Prepare Readiness Review Checklist.
Readiness Review Team Chairperson	9.	Approve Checklist and forward to Board for approval.
Readiness Review Board	10.	Approve Checklist and forward to Readiness Review team for completion.

Effective Date

10/26/90

Revision

2

Supersedes

Page

5 of 12

No.

AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title  
ADMINISTRATIVE PROCEDURE: READINESS REVIEW

RESPONSIBLE PARTY	STEPS	PROCEDURE
<b>CONDUCT REVIEW</b>		
Readiness Review Team	11.	Complete Checklist based on objective evidence supporting readiness or documented commitments to close open items.
Appropriate Readiness Review Team Members	12.	Approve and date the completed Checklist and forward to Board.
Readiness Review Board	13.	Review the completed Checklist, and provide comments to Team for resolution.
<b>RESOLUTION OF COMMENTS</b>		
Readiness Review Team	14.	Prepare Disposition to the Board's comments.
Readiness Review Team Chairperson and Commenting Readiness Review Board Member	15.	Discuss the comments and dispositions and come to agreement and document the resolution. When agreement cannot be reached, the Readiness Review Board Chairperson shall decide on the resolution. If disagreement still exists, final resolution is provided by the responsible DD and TPO.
Readiness Review Board	16.	Approve completed Checklist.
Readiness Review Team Secretary	17.	Prepare Review Record Memorandum and forward to Team Chairperson.
Readiness Review Team Chairperson	18.	Approve and forward the Memorandum to Board.
Readiness Review Board	19.	Approve Review Record Memorandum and prepare and transmit written evaluation and recommendation of readiness to appropriate DD and TPO.
DD/TPO	20.	Review and approve or disapprove the recommendations submitted by the Board. Transmit the decision to the affected organization.

Effective Date 10/26/90	Revision 2	Supersedes	Page 6 of 12	No. AP-5.13Q
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# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
Readiness Review Team Secretary	21.	Incorporate record of decision in the final Readiness Review Memorandum.
	22.	Distribute copies to DD and TPO, Readiness Review Board Chairperson and affected organizations.
	23.	Submit to Project Records System in accordance with the Records Management Plan.

## 6.0 REFERENCES

NOTE: Refer to the latest revision of documents listed below unless otherwise stated.

### 6.1 REQUIREMENTS DOCUMENTS

Project Records Plan, YMP/88-15

Project Glossary, YMP/89-15

### 6.2 INTERFACE DOCUMENTS

QMP-17-01, Records Management: Record Source Implementation

## 7.0 FIGURES AND ATTACHMENTS

Figure 1, Readiness Review Flowchart

Attachment 1, Readiness Review Notice

Attachment 2, Readiness Review Board Selection Record

Attachment 3, Readiness Review Comment Record

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		7 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## 8.0 RECORDS

Records packages of documentation generated as a result of this procedure shall be assembled and submitted to the appropriate Local Records Center in accordance with requirements specified in approved procedures. QA records shall be those records so designated by the Project Office during the processes described in this procedure.

The following is a QA record and shall be maintained and processed in accordance with QMP-17-01, Records Management: Record Source Implementation:

Readiness Review Record Memorandum

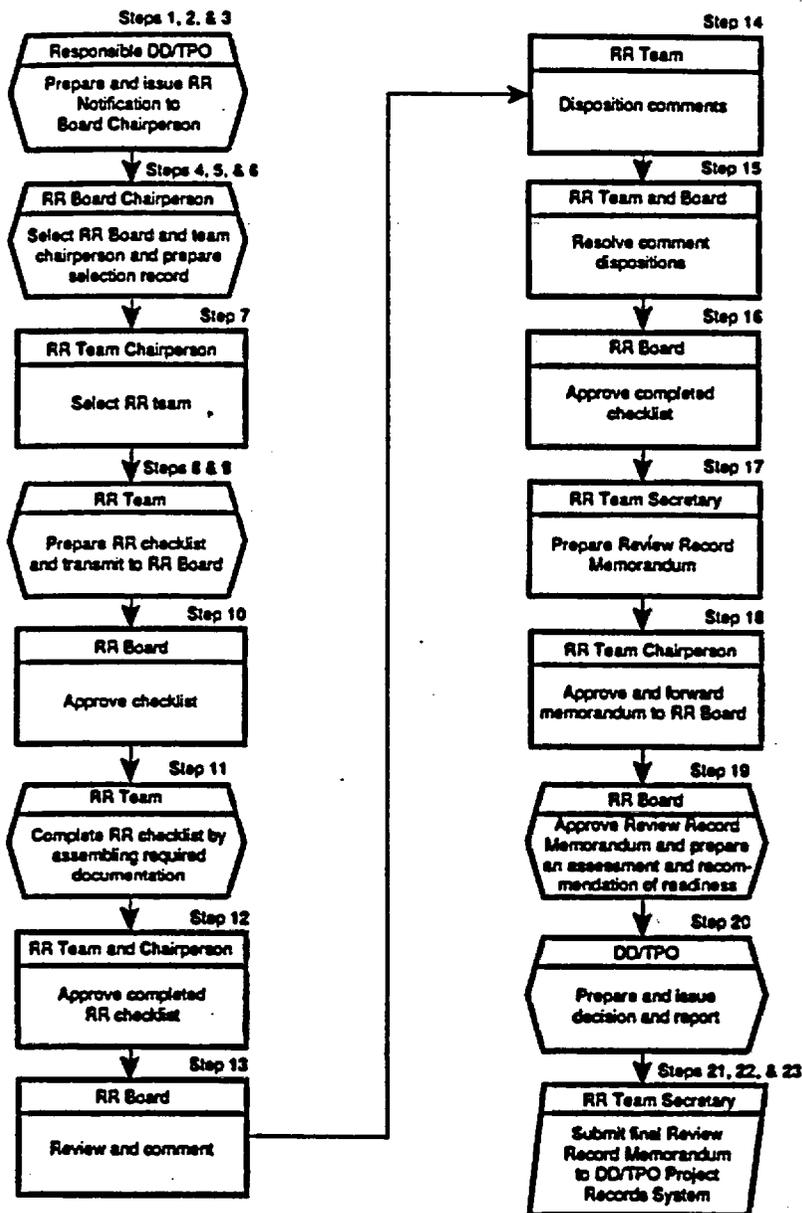
Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		8 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW



AP5.13Q.025/7-6-90

Figure 1 - Readiness Review Flowchart

Effective Date 10/26/90	Revision 2	Supersedes	Page 9 of 12	No. AP-5.13Q
----------------------------	---------------	------------	-----------------	-----------------

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## READINESS REVIEW NOTICE

N-QA-063  
9/90

To: \_\_\_\_\_ Date: \_\_\_\_\_

Activity To Be Reviewed: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WBS No.: \_\_\_\_\_

Review Date: \_\_\_\_\_ Location: \_\_\_\_\_

Readiness Review Board Chairperson: \_\_\_\_\_

Based on review of the qualification documentation, this Readiness Review Board Chairperson is qualified to execute the responsibilities defined in AP-5.13Q with respect to the scope and purpose of this Review.

Scope and Applicability of Readiness Review:

Other information:

Signed: \_\_\_\_\_

### Attachment 1 - Readiness Review Notice

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		10 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title

ADMINISTRATIVE PROCEDURE: READINESS REVIEW

## READINESS REVIEW BOARD SELECTION RECORD

N-QA-064  
5/90

READINESS REVIEW TITLE \_\_\_\_\_

FUNCTION	REPRESENTATIVE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
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_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

I have reviewed the qualifications of the above representatives and have determined that, for the indicated function, they are acceptable as board members to accomplish the scope and purpose of this review.

Signed \_\_\_\_\_  
Readiness Review Board Chairperson

Attachment 2 - Readiness Review Board Selection Record

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		11 of 12	AP-5.13Q

# YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001  
4/90

Title ADMINISTRATIVE PROCEDURE: READINESS REVIEW

<b>READINESS REVIEW COMMENT RECORD</b>		N-QA-065 5/90
Readiness Review Title _____ Reviewer _____ Organization _____ Date _____ Comments Resolved By _____ Organization _____ Date _____	Sheet _____ of _____	
<b>REVIEWER'S COMMENTS</b>	<b>RESOLUTION</b>	<b>REVIEWERS DISPOSITION</b>
Item Number _____ Document Identification _____ Comments _____	Accept _____ Reject _____ Accept _____ Reject _____ Accept _____ Reject _____	Accept _____ Reject _____

Attachment 3 - Readiness Review Comment Record

Effective Date	Revision	Supersedes	Page	No.
10/26/90	2		12 of 12	AP-5.13Q



Lawrence Livermore National Laboratory

LLYMP9010200  
November 2, 1990

WBS 1.2.9  
"QA: N/A"

Carl Gertz, Project Manager  
Department of Energy  
Yucca Mountain Project Office  
P.O. Box 98518  
Las Vegas, Nevada 89193-8518

SUBJECT: Yucca Mountain Project Status Report - October 1990

Attached is the October Project Status Report for LLNL's participation in the Yucca Mountain Project.

If further information is required, please contact Elizabeth Campbell of my staff at FTS 532-7854.

Sincerely,

  
Sr. Leslie Jardine  
LLNL Technical Project Officer  
for YMP

LJJ/EC/ec

cc:  
Distribution

DISCLAIMER

The LLNL Yucca Mountain Project cautions that any information is preliminary and subject to change as further analyses are performed or as an enlarged and perhaps more representative data base is accumulated. These data and interpretations should be used accordingly.

TABOKA

RENCE LIVERMORE NATIONAL LABORATORY YUCCA MOUNTAIN PROJECT  
MONTHLY TECHNICAL HIGHLIGHTS AND STATUS REPORT

OCTOBER 1990

TABLE OF CONTENTS

**1.2.1 Systems**

WBS 1.2.1.1 Management and Integration (Ballou)

WBS 1.2.1.2.4 Systems Engineering Implementation (Revelli)

**Performance Analyses (Chesnut)**

WBS 1.2.1.4.2 Waste Package Performance Assessment (Chesnut)

**Geochemical Modeling**

WBS 1.2.1.4.5 Geochemical Modeling & Database Development  
(Wolery/Johnson)

**1.2.2 Waste Package**

WBS 1.2.2.1 Management and Integration (Ballou)

**Waste Package Environment (Wilder)**

WBS 1.2.2.2.1 Chemical & Mineralogical Properties of the Waste Package  
(Glassley)

WBS 1.2.2.2.2 Hydrologic Properties of Waste Package Environment (Chesnut)

WBS 1.2.2.2.3 Mechanical Attributes of the Waste Package Environment (Blair)

WBS 1.2.2.2.4 EBS Field Tests (Ramirez)

**Waste Form & Materials Testing (Stout/Clarke)**

WBS 1.2.2.3.1.1 Waste Form Testing - Spent Fuel (Stout)

WBS 1.2.2.3.1.2 Waste Form Testing - Glass (Bourcier)

WBS 1.2.2.3.2 Metal Barriers (McCright)

WBS 1.2.2.3.4.1 Integrated Radionuclide Release: Tests and Models (ten Brink)

WBS 1.2.2.3.4.2 Thermodynamic Data Determination (Silva)

**Engineering & Systems Analyses (Ruffner/Clarke)**

WBS 1.2.2.4.1 Waste Package Design

WBS 1.2.2.4.2 Container Fabrication & Closure Development (Clarke)

WBS 1.2.2.4.3 Container/Waste Package Interface Analysis (Ruffner)

**1.2.5 Regulatory and Institutional (Emerson)**

WBS 1.2.5.2.1 NRC Interaction Support

WBS 1.2.5.2.2 Site Characterization Program

WBS 1.2.5.2.4 Technical Support Documentation

WBS 1.2.5.2.5 Study Plan Coordination

WBS 1.2.5.2.6 Semi-annual Progress Reports

**1.2.9 Project Management**

WBS 1.2.9.1.1 Management (Jardine)

WBS 1.2.9.1.4 Records Management (Bryan)

WBS 1.2.9.2 Project Control (Podobnik)

WBS 1.2.9.3 Quality Assurance (Short)

LAWRENCE LIVERMORE NATIONAL LABORATORY  
(LLNL)  
YUCCA MOUNTAIN PROJECT (YMP) STATUS REPORT

OCTOBER 1990

1.2.1 SYSTEMS

1.2.1.1 Management and Integration

L. Ballou attended the Testing Prioritization Task (TPT) Core Team and Integration Group at YMPO on October 17-18. He attended the follow up meeting on October 31-November 2.

1.2.1.2.4 Systems Engineering Implementation

Implementation of Technical Data Transfer procedures (AP5.1, 2, & 3Q) continues. The first Technical Data Information Form (TDIF) was prepared for submission to YMPO.

1.2.1.4.2 Waste Package Performance Assessment

Viewgraphs on the human intrusion scenario were prepared for presentation at the October 1-3 PACE meeting.

Staff attended a YMP PA Working Group meeting in Las Vegas on October 3-4. W. O'Connell gave a presentation on "Release Sensitivity and Uncertainty Analyses", D. Chesnut gave a presentation on Human Intrusion Problem Definition, and T. Buscheck gave a presentation on Preliminary Hydrologic Analysis of Human Intrusion.

D. Chesnut attended a meeting with Claudia Newbury and representatives from SAIC, LANL, SNL and USGS on October 4 at YMPO to discuss the Project response to the Unsaturated Zone Peer Review Record Memorandum.

D. Chesnut attended a meeting on October 5 at YMPO with R. Dyer, J. Boak and attendees from SAIC, SNL, Weston and PNL to discuss alternative organizations for managing and conducting Performance Assessment throughout the Yucca Mountain Project. Helped develop a joint SNL/LLNL proposal.

D. Chesnut attended a meeting on October 16 at YMPO with R. Dyer, J. Boak and representatives from SNL, PNL, and SAIC to discuss PA deliverables for FY91.

The following abstracts were accepted for presentation at the 2nd International High Level Radioactive Waste Management (IHLRWM) Conference to be held in Las Vegas, NV, April 28-May 2, 1991:

"Preliminary Calculations of Release Rates of Tc-99, I-129, Cs-135, and Np-237 from Spent Fuel for an Example Condition in a Tuff Repository"

"Disruptive Scenario Aspects Important to Source Term Performance"

"Diffusive Barrier Simplified Analysis: Design and Sensitivity Applications"  
"Sensitivity and Uncertainty Analysis of EBS System Performance"

Informal comments on the SNL PDM were prepared and submitted to SNL October 26.

#### 1.2.1.4.5 Geochemical Modeling and Database Development

Completed addition of standard molal volume data to the database for over 400 minerals from the extensive literature compilation recently completed by LLNL-YMP staff.

Initiated and completed numerous modifications designed to augment and improve the readability of comments embedded in the data0 files; comprehensive clearly stated summaries of relevant data and extrapolation algorithms are now given for each species block in each data0 file.

Verified the accuracy of routines that implement several algorithms used to extrapolate the standard molal Gibbs free energies of minerals, gases, and aqueous species to elevated temperatures and pressures.

Work continues for the upcoming EQ3/6 Code/Database release. This work consists of resolving a number of maintenance issues and known errors, and testing of the codes and new data files using a large set of standard input sets, which is being augmented as part of this work.

The EQ3/6 codes were modified to read nominal temperature limits from the data files, and to write warnings to the user when these limits are exceeded.

In partial response to a Non-Conformance Report (NCR-021) pointing out deficiencies in EQ3/6 documentation regarding error processing, a sweep was made through the source codes of EQLIB, EQPT, EQ3NR, and EQ6 to standardize the format, and in some cases improve the content, of all error messages.

An unified source code file was created for the utility program CON3IF, which converts 3245.0888 level old-style EQ3NR input files to the newer, menu-style format. A corresponding utility program called CON3NF was created to convert present level old-style input files to the newer format. Other than dealing with a slightly different old-style input file, this program differs from CON3IF in that it provides for handling pHCl-type (pH plus pCl) inputs. Both of these utilities will be included in the Code/Database release to assist users in adapting to the new package. Similar work was completed on corresponding routines (CON6IF and CON6NF) for converting EQ6 input files.

### 1.2.2 WASTE PACKAGE

#### 1.2.2.1 Management and Integration

Transmitted to YMPO the review comment resolution records for the Waste Acceptance Preliminary Specifications for High-Level Waste Glass.

Thirty staff members attended an in-house introductory course on software quality methods.

#### **1.2.2.2 Waste Package Environment**

Continued work on the Preliminary Waste Package Environment report. The draft report is expected to be completed in November.

##### **Chemical and Mineralogical Properties of the Waste Package Environment**

Design of reconnaissance validation experiments using natural and laboratory systems continued.

Modeling of zeolite solid solution/sorption processes continued.

Revision of the Geochemistry Study Plan (8.3.4.2.4.1), based on headquarters comments, continued.

Review of the proposed new Study Plan for Man-Made Materials (Geochemistry Study Plan Sections 8.3.4.2.4.1.2 and .6) is in progress.

##### **Hydrologic Properties of the Waste Package Environment**

The fracture flow experiment continued to determine the effect on permeability with steam flowing through the Topopah Spring tuff sample. The test results showed that even after only one week, the gas permeability had decreased by more than an order of magnitude.

Work continued on preliminary analysis of the radionuclide diffusion experiments conducted by M. ten Brink using analytical double porosity models developed by A. Rasmussen and I. Neretnieks. The V-TOUGH code was used to model radionuclide diffusion and adsorption. Preliminary work continued on a dual porosity fracture/matrix model.

In the area of code development, work continued in debugging and enhancing pre- and post-processing codes for the V-TOUGH code. The use of PVWAVE was also extended to color graphical representation of pressure and saturation contour plots.

##### **Mechanical Attributes of the Waste Package Environment**

Continued to revise the Study Plan for Characterization of Mechanical Attributes of the Waste Package Environment (Study Plan 8.3.4.2.4.3) incorporating the review comments received.

##### **EBS Field Tests/ESF Test Design**

Editing and review of three papers continues.

### 1.2.2.3 Waste Form and Materials Testing

#### Waste Form Testing - Spent fuel

Some modifications to the PACS network and associated cost account numbers for spent fuel activities were made.

Letter reports arrived from PNL:

"Characterization of Oxidized Spent Fuel from Dry Bath Ovens" by L. Thomas

"Results of Statistical Characterization of Spent Fuel Grain Boundaries, Grain Volumes and Fragments" by L. Thomas

"Documentation of Scoping Dissolution Tests of Oxidized Spent Fuel" by C. Wilson

A draft report "Preliminary Waste Form Characteristics" ORNL/TM-11681 arrived and is being reviewed at LLNL. This report will provide data for the Waste Form Characterization Report.

The temperature calibration testing of one fixture in the dry bath oxidation hot cell was initiated in October.

A brief description of on-going spent fuel flow-through dissolution tests supported by PASS funding at PNL was received; incremental funding of these flow-tests to augment LLNL-YMP data needs is being planned.

A manuscript by S. Nguyen, R. Silva, H. Weed and J. Andrews entitled "Standard Gibbs Free Energies of Formation at 30°C of Four Uranyl Silicates: Soddyite, Uranophane, Sodium Boltwoodite and Sodium Weeksite" has completed the technical review at LLNL and has been sent to YMPO for acceptance.

It has become clear that reported values for dissolution rates of both  $UO_2$  and spent fuel vary enormously. This is also true for reported solubilities of uranium oxides, especially in the pH regime above  $pH=7$ . The reasons for this are almost certainly due to inadequate control of variables to which both dissolution rate and equilibrium solubility are extremely sensitive, namely pH, eH and carbonate/bicarbonate/ $CO_2$  activities. These variables are difficult to control adequately, and particularly in the case of older work, the need for scrupulous control was not fully recognized or was not possible given experimental limitations.

For this reason, LLNL has acquired a state-of-the-art environmental control system to carry out flow-through dissolution tests on  $UO_2$  using a statistical matrix of tests. The purpose of these experiments is not merely to clarify the muddle of literature values and establish baseline performances, but is mainly intended to expose the intrinsic differences between spent fuel and unirradiated fuel. Differences in behavior may be caused by several factors:

- 1) Segregation of fission products at grain boundaries.
- 2) Changes in chemical behavior of  $UO_2$  due to the presence of several percent of fission products as impurities that are either dissolved in the  $UO_2$ , present as secondary phases, or both.
- 3) Changes in reactivity of the aqueous phase due to radiolysis effects.

In order to achieve these goals, it is necessary that identical, carefully controlled measurements be done on spent fuels. Ideally, the whole matrix of tests should be done with spent fuel, but even a partial matrix will prove to be useful if done properly. Of course, what can be done with spent fuel depends on the limitations of working in the hot cells.

Spent fuel work will be done at PNL (or ANL) where appropriate hot cell facilities exist and trained personnel are available. LLNL is best able to carry out  $UO_2$  dissolution studies given the quality of environmental control and the analytical capabilities available. Consequently, flow-through tests done at PNL will deal exclusively with spent fuel and will be done using the solutions described in the experimental matrix rather than J-13 water. It has been shown that the constituents of J-13 water, especially silica and calcium, complicate the dissolution results beyond the point of quantitative interpretation at the present state of understanding. It is essential to study the intrinsic difference between spent fuel and  $UO_2$  before adding the complexities of the "real" world.

Review of two PNL reports of dissolution of spent fuel and  $UO_2$  in deionized water (DIW) and  $25^\circ C$  (and in equilibrium with air) shows that the steady state dissolution rates of spent fuel and  $UO_2$  are similar. The implication is both clear and important. The matrix dissolution behavior of spent fuel is the same as that of  $UO_2$ , at least to a first approximation. If this observation is confirmed by future results, modeling the behavior will be less difficult than anticipated since the presence of fission products and a radiation field may be of secondary importance.

#### Waste Form Testing - Glass

Some modifications of PACS network associated cost account numbers for glass waste form were made.

A draft Test Plan for Glass Dissolution Work was completed.

Work continues on the auto-titrator. Several bugs have been found in the software to run the auto-titrator, and the software author has been notified. Trial test runs are being done while waiting for the new software package.

Papers on glass dissolution modeling for the MRS meeting are being completed.

Chemical compositions of the simulated redox glasses were calculated, and tests will be carried out to synthesize batches of these glasses.

#### Container Materials Modeling and Testing

The Activity Plan for the Materials Selection Process (E-20-15) completed an internal technical review.

Two sections of the Survey of Degradation Modes of Nickel-Chromium-Molybdenum alloys have started technical review. These include: Section 1: Introduction; and Section 2: Phase Stability.

The final copies were received for distribution of the Westinghouse-Hanford report WHC-EP-0188, "Corrosion Behavior of Copper-Base Materials in a Gamma-Irradiation Environment."

Staff worked with the Resource Planning and Project Control group on revision and account structuring of our technical area PACS submissions.

D. McCright visited the Yucca Mountain site as part of the TRG team for Glass Reprocessing on October 9.

J. Farmer attended the Electrochemical Society Meeting in Seattle, WA on October 17.

W. Clarke traveled to Las Vegas for a Performance Assessment proposal presentation by Dr. Roger Staehle on October 22.

R. Van Konynenburg gave a presentation on carbon-14 release to the ACNW at Bethesda, MD on October 26.

#### Integrated Radionuclide Release

Presented a poster paper on "Heterogeneities in Radionuclide Transport: Pore-Size, Particle-Size, and Sorption" at the meeting on Concepts in Manipulation of Groundwater Colloids for Environmental Restoration at Manteo, NC on October 16-18.

Staff attended conference of the Geological Society of America and a short course on Mineral-Water Interface Geochemistry.

Discussed modeling of colloids in fracture-flow as it relates to YMP with E. Nuttal of the University of New Mexico.

Further refined the use of optical imaging software on the Scanning Electron Microscope (SEM) for pore-size characterization.

Continued investigating methods for three-dimensional imaging of pore-spaces and micro-fractures.

Completed compilation and corrections of existing Scanning Ion Mass Spectroscopy (SIMS) data from 1987-1990 analyses of wafer experiments.

Uranium and thorium implants for sensitivity standards of trace elements in YMP materials were completed.

#### Thermodynamic Data Determination

Two manuscripts on the Pr-diglycolate experimentation were prepared and submitted for YMP review. The first was an abridged paper for presentation at and publication by the Symposium on the Scientific Basis for Nuclear Waste Management XIV (Materials Research Society) in Boston in November, 1990. The other is a comprehensive document intended for submittal to the Journal of Physical Chemistry and LLNL's Nuclear Chemistry Division Annual Report.

The U(IV)/carbonate complexation experiments are continuing using the remote photoacoustic spectroscopy system. Measurements are complete of the 0.5 M  $\text{HCO}_3^-$  series at  $\text{CO}_2$  partial pressures of 10%, 30%, 50% and 100%. The 460 nm absorption peak is observed to increase as a function of total carbonate concentration. Development of a second remote photoacoustic spectroscopy system has begun. This system will be located in the Pu glovebox.

Solubility Studies will apparently receive funding in FY91. Work is beginning to reassemble and calibrate the equipment.

The UV/Visible Spectrophotometer was calibrated. In this area, three manuscripts, one UCID, and one abstract were submitted for review.

#### 1.2.2.4 Design, Fabrication, and Prototype Testing

##### Waste Package Design

No significant activities.

##### Container Fabrication and Closure Development

No significant activities.

##### Container/Waste Package Interface Analysis

A systems analysis has been completed for the Waste Management System (WMS) program and physical functions. This effort has identified the functions, requirements and has proposed a constrained architecture down to the EBS level. Mission requirements have been allocated to the EBS in preparation for the design synthesis and trade studies of alternate designs. The first cut of design selection factors has been made for this effort.

### 1.2.5 REGULATORY AND INSTITUTIONAL

##### NRC Interaction Support

Staff is preparing for the November 1-2 NWTRB Quality Assurance Panel in Arlington, VA and the Technical Interchange on Performance Assessment in Albuquerque on November 28-29.

##### Site Characterization Program

No significant activities.

##### Technical Support Documentation

No significant activities.

##### Study Plan Coordination

Technical review was completed for the USGS Study Plan 8.3.1.17.3.1, "Relevant Earthquake Sources".

### Semi-Annual Progress Reports

The LLNL portion of the draft Third Technical Status Report (TSR) was completed and submitted to YMPO on October 19.

## 1.2.9 PROJECT MANAGEMENT

### 1.2.9.1 Management

On October 10-12, D. Wilder, R. Van Konynenburg and D. Short attended a QA workshop in Las Vegas. The focus was on scientific issues and how to allow for more flexibility in QA. (QA software was not discussed but will be in a later workshop).

On October 25, the second QA workshop was held in Las Vegas. D. Wilder and D. Short attended.

The internal QA grading procedure was issued. Twelve grading packages (covering the WBS at the fourth level) were submitted to the QRB.

### 1.2.9.2 Project Control

Completed year-end closing for FY90. Determined liens outstanding and verified adjustments to accounts.

Continuing to refine the FY91 detailed budget and Schedule 1 data.

Closed several FY89 SANLs that will not be extended through FY91.

Revised the account structure to accommodate cost collection on the basis of new work breakdowns and PACS network schedules. Refining PACS Summary Account data to reflect evolving LLNL strategy.

Completed the September FTE and Milestone reports and submitted them to YMPO.

Submitted the critical path analysis contained in the LLNL PACS/LRP database to YMPO.

### 1.2.9.3 Quality Assurance

Completed Audit 90-07 "Near Field Environment Modeling" and Audit 90-08 "Geochemical Modeling".

Submitted to YMPO copies of completed Nonconformance Reports (NCRs 038, 040, and 042) initiated by LLNL-YMP during Audit 90-12.

Submitted to YMPO proposed changes to the ESF Alternatives Study Memorandum of Understanding (MOU 660015, Rev. 0).

Submitted LLNL-YMP QA Audit Schedules for both internal and external audits planned for Fiscal Year 1991.

Distributed Draft Quality Procedure 2.1, "Preparation, Approval, and Revision of Procedures, Requirements, Plans, and the Quality Assurance Program Description".

Distributed Draft Quality Procedure 3.4, "Scientific Notebook", for internal review.

Distributed Draft Quality Procedure 12.0 "Control of Measuring and Test Equipment", for internal review.

**LLNL PROJECT STATUS REPORT  
DISTRIBUTION**

**EXTERNAL**

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## RAYTHEON SERVICES NEVADA

WBS-1.29  
QA

RSN-YMP-1002

TO: R. L. Bullock

FROM: M. J. Regenda *M. J. Regenda*

SUBJECT: MINUTES OF THE MEETING TO DISCUSS THE TRANSITION TO  
THE RSN QA PROGRAM

DATE: November 14, 1990

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A meeting was held on November 11, 1990, to present the status of the Transition from the Fenix & Scisson of Nevada (FSN) and Holmes & Narver (H&N) QA Programs to the Raytheon Services Nevada (RSN) Quality Assurance Program. Personnel from Raytheon Services Nevada, the U.S. Department of Energy (DOE), the U.S. Nuclear Regulatory Commission (NRC) and Science Application International Corporation (SAIC) participated in the meeting.

An informal presentation of the QA Program was presented utilizing the enclosed agenda. Information was exchanged on these topics. As a result of the meeting the following action items were identified:

1. RSN needs to identify in the records package what QA Program was utilized.
2. In lieu of the transition letters, a procedure should be developed by RSN defining the transition of FSN & H&N into the RSN QA Program.
3. Former FSN and H&N employees who as RSN employees are given responsibilities for quality-affecting activities for which they have not been trained require training. For example, the RSN TPO has been given the responsibilities of H&N TPO and the RSN QA Manager YMP has been given the responsibilities of the H&N QA Manager. Although this was not discussed, one solution to this would be to delegate the responsibilities of H&N and FSN QA Program activities to personnel qualified under the respective programs. This is possible since qualified H&N and FSN personnel have been maintained by RSN.

R. L. Bullock  
RSN-YMP-1002  
Page 2

4. RSN may be requested to provide input and/or give a formal presentation on the transition to the RSN QA Program at the next DOE/NRC bi-monthly meeting. Mr. Blaylock has the action to advise RSN if a presentation will be given.

The presentation was well received by the NRC and DOE personnel.

Enclosures:

1. Agenda
2. Attendees

cc: D. Horton, DOE  
J. Blaylock, DOE  
N. A. Voltura, DOE  
T. Petrie, DOE  
F. Hemmes, DOE  
J. Gardiner, DOE  
P. Prestholt, NRC  
J. Gilray, NRC  
G. Pratt, RSN  
R. L. Bullock, RSN  
D. J. Tunney, RSN  
J. L. Rue, RSN  
P. J. Karnoski, SAIC  
RSN YMP QA Files  
LVRMC

# AGENDA

## RSN TRANSITION PLAN TO DOE/NRC

1. ORGANIZATION
2. TRANSITION PLAN - Letters - FS-YMP-1472 - 10/02/90  
FS-YMP-1483 - 10/23/90
3. INTEGRATION OF FSN/H&N PROCEDURES -  
Letter D: J. Tunney - M. J. Regenda - QA-90(L)-0149
4. LIST OF PROJECT PROCEDURES INTEGRATING FSN AND H&N

M. J. REGENDA  
R. L. BULLOCK  
November 9, 1990

ATTENDEES

## RSN TRANSITION PLAN TO DOE-NRC-YMP

November 9, 1990

<u>NAME</u>	<u>ORGANIZATION</u>	<u>TELEPHONE</u>
M. J. Regenda	YMP-QA Manager - RSN	794-7226
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D. J. Tunney	Manager QAE - RSN	794-7227
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K. Lobo	SAIC/Eng. Integration	794-7509
R. Taylor	SAIC/Eng. Integration	794-7044
T. Petrie	DOE E&DD	794-7961
J. Gardiner	DOE	794-7583
B. Foster	SAIC/NRCD	794-7136
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