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

Reply to:

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M E M O R A N D U M

DATE: February 15, 1990

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

FROM: John W. Gilray, Sr. OR - YMP

SUBJECT: YMP Site Report for the months of December, 1989, and January, 1990

The following report pertains to the QA, waste package and surface facility activities associated with the Yucca Mountain Project for the months of December, 1989, and January, 1990.

I. QUALITY ASSURANCE

A. Activities to Upgrade YMP QA Program

The YMP managers and staff are actively developing new and improved hierarchy control documents which identify and trace flow down requirements from the regulations to output documents and designs.

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Previous DOE headquarters and YMP hierarchy documents will be superceded by these improved control documents which should allow for a more efficient and effective process for managing, controlling, and implementing design technical and scientific investigation activities. I understand the DOE headquarters hierarchy documents have gone through the approval of the change control board and therefore these documents and the controlled process for generating these documents should be available for a review audit by either DOE and/or NRC.

Previously established technical, administrative and QA plans and procedures will then be re-reviewed against these improved controlled hierarchy documents and the necessary changes to assure consistency initiated. Internal reviews, surveillances and/or audits will be conducted by the YMP QA organization of these activities to determine compliance to program and QA requirements. This office will notify the NRC headquarter's office of the scope, depth and schedules for these reviews as soon as they become available in order to determine the merits for observing these reviews.

The YMP is scheduling these overall efforts in a manner which will enable them to be ready for a formal audit of the YMP QAP in September, 1990.

B. <u>YMP QA Organization</u>

The YMP QA organization under the recent leadership of Don Horton has consolidated and integrated the QA staff of SAIC, MacTech, and the YMP into one organizational unit with day to day activities being directed to the QA staff by Don Horton and YMP QA supervisors. This overall staff is located on the 6th floor of the Valley National Bank Building in Las Vegas. This organizational arrangement should increase the effectiveness of the QA staff and their interactions with the YMP's and participants' technical and scientific investigative staff. For

example, each QA Engineer within this new organization, when interacting with a participant, will be speaking from a DOE project viewpoint rather than from a SAIC or MacTech viewpoint. The proposed consolated YMP QA organization with responsibility for internal and external audits and surveillances, development and review of quality related procedures and documents, and QA site overview will have a technical QA staff of approximately 64. Since the YMP QA organization has taken a more active part in the day-to-day activities, the previous SAIC QA manager has been assigned other non-QA responsibilities.

Robert Constable, with in-depth QA nuclear experience from TVA, Arizona Power Services and Louisiana Power and Light has recently joined the YMP QA organization. Recruiting is underway for two more YMP QA Engineers. This office will closely monitor the activities of this new QA consolidated reorganization and report on its progress in improving the overall QA program and its implementation. Presently, however, it is apparent that Don Horton, with his in-depth QA commercial nuclear experience and background, has contributed substantially in initiating improvements in the QAP and further improvement looks encouraging.

C. Improved YMP Management of Participants

The YMP has assigned a dedicated on-site technical representative to each participant with responsibility for monitoring day to day activities and keeping the YMP informed of substantive technical and QA issues. This arrangement should significantly improve the effectiveness of the YMP management and control of technical and QA activities at each participant facility.

D. QA Program Activities

- H&N: The YMP QA organization will be conducting a QA surveillance of the H&N Design Package #1 the week of February 20, 1990. This design package was prepared using

QA and design controls that will be applied to future ESF design activities. Therefore the YMP would very much like to go through this design package and the QA and design controls applied to the design with the NRC (managers and reviewers) to gain a common understanding and agreement on the necessary design and QA controls to be applied in the design activity. The proposed date for this meeting is April 15th at White Flint.

- LLNL: LLNL is conducting readiness reviews of project activities prior to allowing work to start.

  The YMP QA organization has conducted a surveillance of their QA program and its implementation the week of January 8, 1990, and the results were satisfactory with the exception of two minor deficiencies.

- USGS: The YMP QA organization will be conducting a surveillance of the USGS QA software program the week of February 19, 1990. Teek Verma of the NRC and myself plan on participating in this surveillance as observers. The surveillance will include a review of six completed software programs and a sample of 45 software programs which are in process.

  USGS is performing extensive re-reviews of their calibration procedures to assure proper and correct inclusion of requirements. This action was percipitated as a result of a recent YMP surveillance of USGS calibration program.

- SANDIA: Sandia has established a separate QA Division in order to be more responsive to the QA program needs. The QA manager of this division is expected to be appointed by March, 1990.

  The YMP QA organization is resolving with Sandia the results of the YMP review of the Sandia QA software program.

Sandia continues to work on ESF alternative studies with assistance from the participants. Sandia's contractor, Parsons, Brinkerhoff, Quaide, and Douglas, is also providing engineering assistance to these ESF alternative studies. Their QA program has been found acceptable to Sandia and the YMP QA organization has participated with Sandia in an audit of the implementation of this program. No significant deficiencies were identified. This office will inform NRC headquarters of future surveillance and/or audit schedules of Parsons.

- LANL: LANL is reviewing and updating their QA program procedures to be consistent with the YMP QA program. The YMP QA organization intends on performing an audit of this updated QA program the week of March 26, 1990. LANL has an outside contractor revising their QA software program to be consistent with the YMP requirements.

- YMP: The YMP QA organization is actively reviewing and revising their QA program procedures to be consistent with the improved hierarchy controlled documents and requirements.

E. YMP Audit and Surveillance Schedules

The YMP QA organization plans on conducting 7 formal audits of the participants in 1990. A schedule for these audits is attached. Note that the YMP plans on conducting an audit of USGS the week of June 25, 1990. The YMP four month schedule for conducting internal and external surveillances is also attached.

F. Qualification of H&N Personnel

In my last monthly report (December 15, 1989) I addressed the issue of an H&N employee (Don Brown) questioning the

qualification of the H&N staff participating on YMP design activities. This issue was identified by Don Brown and other H&N QA engineers on an H&N deficiency report and subsequently corrected, resolved and verified as acceptably closed out by Don Brown. This is evidenced by Don Brown's signature on the close out portion of the deficiency report.

I have reviewed the close out package of this issue with the YMP and H&N staff and have determined that H&N and the YMP, including Don Brown, have reviewed the investigative and corrective actions and that the issue was found to be acceptably closed out by them. Don Brown has been recently laid off with approximately 40 other H&N employees due to budget cuts. The U. S. Department of Labor is investigating whether Don Brown was subjected to discrimination actions due to his interface actions with Congress and DOE Headquarters concerning the above issue. I was contacted by the Labor Department concerning this investigation and informed them that my involvement in the review of this issue in no way included a review of whether Don Brown was inappropriately treated.

G. DOE's Close-Out Report Concerning Signer's Allegation

As a result of reviewing DOE's close-out report of the Singer allegation I have commented to NRC headquarters that the YMPO's investigations, conclusions, and corrective action pertaining to the Singer allegations appear reasonable. The close-out report was previously sent to NRC headquarters by this office.

II. WASTE PACKAGE

A. Presentation to the NWTRB

I attended the LLNL presentation on the Waste Package Program to the Nuclear Waste Technical Review Board (NWTRB) on

January 18 and 19, 1990, at Pleasanton, California. Overall the technical discussions were meaningful, informative and well received.

Comment 1: The NWTRB was interested in how much QA effort was going into the scientific, experimental and investigative activities at the LLNL. The LLNL response was that the QA effort was accounting for approximately 40% of the overall program effort. However it was not made clear that this high percentage was due to the fact that LLNL had a stop work order imposed on their activities due to an inadequate QA program and that it would not be unreasonable to expect a large QA effort to be expended in order to get the QA program improved and the LLNL staff trained to these QA improvements. LLNL has since reported to the YMP that once the QA improvements have been made it is expected that the QA effort on the waste program to be around 25%. This percentage appears to be unusually high and may be attributed to the method of accounting for QA charges. Normal engineering and technical quality related activities such as design and procedural reviews are charged to the engineering budget, but if they are reported to the QA budget then of course the QA percentages goes up. In the NASA and nuclear industry the QA program development and QA organizational charges are in the range of 8 to 10%. This figure is in agreement with Don Horton of the YMP. Don intends to look into the QA accounting methods of the LLNL and other participants. This office will keep the NRC headquarters informed on the progress of this review.

Comment 2: During the presentation on the "Strategy for Container Material Selection" by Dr. Halsey it was noted that the selection criteria for material selection were divided into 34 separate criteria covering 7 topics (fabricability, previous experience with the material, cost, compatibility with other materials, predictability of performance, chemical performance, chemical performance and mechanical performance). When evaluating a particular candidate material the evaluation team assigns a weighting factor to each of the 34 separate criteria and the 7 topics. It was my impression that there were no procedural guidelines in determining the weighting factor and that the decisional process was based on subjective judgement.

This particular process appears to warrant additional discussions and understanding in order to determine if this process is sufficiently controlled and defined to enable the data results to be acceptable during licensing.

B. The YMP Waste Package Program Plan

I had an opportunity to review a recent draft of "The Yucca Mountain Project Waste Package Program Plan" which provides guidance for program implementation and describes the essential elements of the Waste Package Program including the objectives, technical plans and the management approach. The plan also identifies the mission needs and objectives which are keyed to identified requirements in the Nuclear Waste Policy Act of 1982 and Federal Regulations. The three major milestones identified in the plan are the start of the waste package advanced conceptional design, tentatively scheduled for October, 1992; the start of the waste package license application design, tentatively scheduled for June, 1996; and the submission of the repository license application to NRC, tentatively scheduled for October, 2001. Also, the tentative schedule for submitting waste package inputs to the draft environmental impact statement is October, 1995. The plan explains that because the final design analyses and performance assessments of the waste package and the engineered barrier system depend on information that will be obtained from both surface-based and underground Exploratory Shaft Facility testing, the milestones associated with these aspects of the YMP are keyed to the design of the waste package and the engineered barrier system. Similarly, it is stated that the performance of the engineered barrier system and emplaced waste packages cannot be established without reference to the overall repository design and vice versa.

Within the plan the waste package activities at the YMP are organized into a product-oriented Work Breakdown Structure that is established by OCRWM. The YMP Work Breakdown Structure Index

and Dictionary contains a matrix document referencing the SCP section numbers to these work breakdown numbers.

The Waste Package Plan is scheduled to be released in March, 1990.

C. LLNL Monthly Status Report

The LLNL December and January monthly status reports are enclosed. 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: With encs: J. Kennedy, J. Bunting, M/S 4 H3; J. Latz
Without encs: C. P. Gertz, R. R. Loux, M. Glora, G. Cook, D. M. Kunihiro, R. E. Browning, M/S 4 H3; K. Turner, S. Gagner, M/S 2 G5; L. Kovach, M/S NLS260; H. Thompson, M/S 17-G21, H. Denton, M/S 17 F2; R. Bernero, M/S 6 A4; K. Stablein, M/S 4 H3

Enclosures: YMPO FY 1990 QA Audit, Revision 2; YMPO QA Surveillance Schedule for FY 1990; YMP Status Report - January 1990; December Project Status Report (LANL)

FY-90 AUDIT SCHEDULE

AUDIT #	ORG.	ATL	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1
90-1	LANL	S. CRAWFORD																	
90-2	LLNL	F. KRATZINGER																	
90-3	USGS	D. KLIMAS	○		◆	◆	■		●										
90-4	SNL	S. CRAWFORD				▽		○		◆	■		●						
90-5	REECo	F. KRATZINGER			□				▽		○		◆	■		●			
90-6	H&N	S. CRAWFORD						□				▽		○		◆	■		●
90-7	FSN	S. DANA									□				▽		○		◆

FY 90 AUDIT SCHEDULE, REVISION 2

Date: 01/22/90

Approval:

Page 2 of 2

1. □ Scoping Visit
2. ▽ Transmit Notification Letter/Plan
3. ○ Transmit Audit Manuals
4. ◆ Perform Audit
5. ■ Transmit SDRs
6. ● Transmit Audit Report

FY-90 AUDIT SCHEDULE

AUDIT #	ORG.	ATL	2/5	2/12	2/19	2/26	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23	4/30	5/7	5/14	5/21	5/28	6/4
90-1	LANL	S. CRAWFORD	□			▽		○		◆	■		●							
90-2	LLNL	F. KRATZINGER							□				▽		○		◆	■		●
90-3	USGS	D. KLIMAS													□				▽	
90-4	SNL	S. CRAWFORD																		□
90-5	REECo	F. KRATZINGER																		
90-6	H&N	S. CRAWFORD																		
90-7	FSN	S. DANA																		

FY 90 AUDIT SCHEDULE, REVISION 2

Date: 1/22/90

Approval: James Blanford

Page 1 of 2

1. □ Scoping Visit
2. ▽ Transmit Notification Letter/Plan
3. ○ Transmit Audit Manuals
4. ◆ Perform Audit
5. ■ Transmit SDRs
6. ● Transmit Audit Report

AUDTSCHD 012/1-19-90

9

90-1673

Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

WBS 1.2.9.3.2.T.1
QA

FEB 01 1990

Distribution

YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) QUALITY ASSURANCE (QA) SURVEILLANCE SCHEDULE FOR FISCAL YEAR (FY) 1990

Enclosed is Revision 3 of the Project Office QA Surveillance Schedule for both internal and external surveillances planned for the next four months of FY 1990. This schedule may change without notice. The schedule will be revised on a monthly basis as required to reflect additional surveillances and any other changes that have occurred.

If you have any questions, please contact James Blaylock of my staff at (702) 794-7913 or FTS 544-7913, or Terry W. Noland of Technical and Management Support Services at (702) 794-7212 or FTS 544-7212.

Carl P. Gertz, Project Manager
Yucca Mountain Project Office

YMP:JB-1673

Enclosure:
FY 1990 Surveillance Schedule,
Revision 3 (3 pages)

Distribution—Memorandum dated FEB 01 1990

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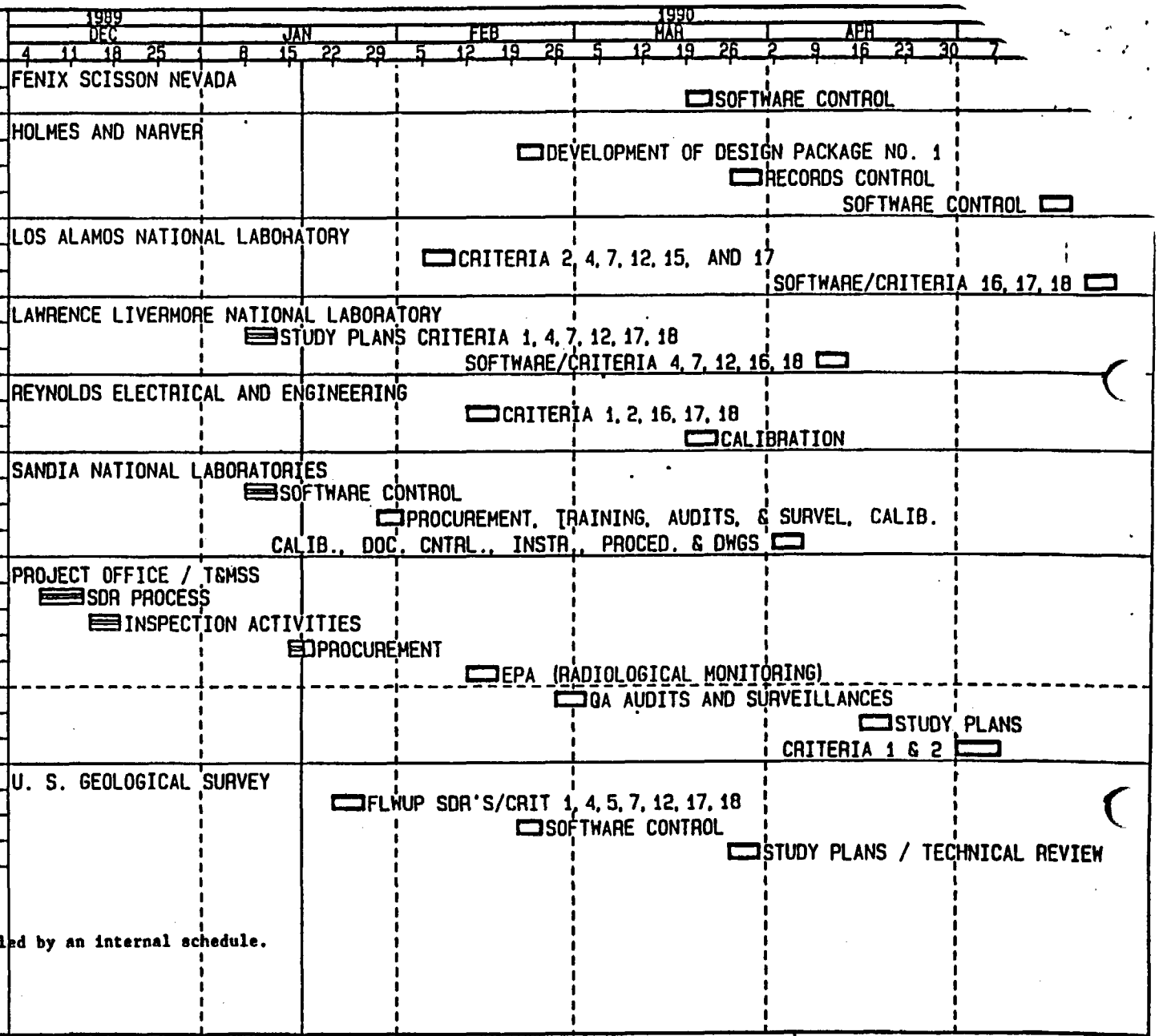
Richard J. Bahorich, W, Las Vegas, NV, 517/T-37
Terry W. Noland, W, Las Vegas, NV, 517/T-06
Ralph W. Gray, IMD, NV

ACTIVITY ID	ORG	EARLY START	EARLY FINISH
FN06 *			
FN04 *	FSN	19MAR90	22MAR90
HN06 *			
HN04 *	H&N	20FEB90	23FEB90
HN10 *	H&N	26MAR90	30MAR90
HN08 *	H&N	14MAY90	18MAY90
HN02 *			
LA06 *	LANL	5FEB90	9FEB90
LA08 *	LANL	21MAY90	25MAY90
LL04	LLNL	8JAN90A	12JAN90A
LL06	LLNL	9APR90	13APR90
RE02 *	REECO	12FEB90	16FEB90
RE04	REECO	19MAR90	23MAR90
SN02 *			
SN04	SNL	8JAN90A	12JAN90A
SN06 *	SNL	29JAN90	1FEB90
SN08 *	SNL	2APR90	6APR90
P018	T&MSS	6DEC89A	12DEC89A
P008	T&MSS	14DEC89A	18DEC89A
P012	T&MSS	15JAN90A	18JAN90
P010 *	T&MSS	12FEB90	16FEB90
P006	T&MSS	26FEB90	2MAR90
P020	T&MSS	16APR90	20APR90
P014 *	T&MSS	1MAY90	7MAY90
US08 *			
US06 *	USGS	22JAN90	26JAN90
US12	USGS	20FEB90	23FEB90
US10	USGS	26MAR90	30MAR90



Note: Supplier Qualifications are now controlled by an internal schedule.

Activity Bar/Early Dates
Critical Activity
Progress Bar

Primavera Systems, Inc. 1984-1989

DEPARTMENT OF ENERGY
YUCCA MOUNTAIN PROJECT OFFICE
FY-90 REV3 SURVEILLANCE SCH W/ORG

Project Start : 1DEC89
Project Finish: 25MAY90

Sheet 1 of 1

Data Date: 17JAN90
Plot Date: 19JAN90

YMP OFFICE SEMIANNUAL SURVEILLANCE SCHEDULE

Date	Revision	Checked	Approved

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ENCLOSURE

ACTIVITY ID	ACTIVITY DESCRIPTION	ORIG DUR	EARLY START	EARLY FINISH
P018	SDR PROCESS	0	6DEC89A	12DEC89A
P008	INSPECTION ACTIVITIES	5	14DEC89A	18DEC89A
LL04	STUDY PLANS CRITERIA 1, 4, 7, 12, 17, 18	5	8JAN90A	12JAN90A
SN04	SOFTWARE CONTROL	5	8JAN90A	12JAN90A
P012	PROCUREMENT	5	15JAN90A	18JAN90
US06 *	FLWUP SDR'S/CRIT 1, 4, 5, 7, 12, 17, 18	5	22JAN90	26JAN90
SN06 *	PROCUREMENT, TRAINING, AUDITS, & SURVEL. CALIB.	4	29JAN90	1FEB90
LA06 *	CRITERIA 2, 4, 7, 12, 15, AND 17	5	5FEB90	9FEB90
P010 *	EPA (RADIOLOGICAL MONITORING)	5	12FEB90	16FEB90
RE02 *	CRITERIA 1, 2, 16, 17, 18	5	12FEB90	16FEB90
HN04 *	DEVELOPMENT OF DESIGN PACKAGE NO. 1	4	20FEB90	23FEB90
US12	SOFTWARE CONTROL	4	20FEB90	23FEB90
P006	QA AUDITS AND SURVEILLANCES	5	26FEB90	2MAR90
FN04 *	SOFTWARE CONTROL	4	19MAR90	22MAR90
RE04	CALIBRATION	5	19MAR90	23MAR90
HN10 *	RECORDS CONTROL	5	26MAR90	30MAR90
US10	STUDY PLANS / TECHNICAL REVIEW	5	26MAR90	30MAR90
SN08 *	CALIB., DOC. CNTRL., INSTR., PROCED. & DWGS	5	2APR90	6APR90
LL06	SOFTWARE/CRITERIA 4, 7, 12, 16, 18	5	9APR90	13APR90
P020	STUDY PLANS	5	16APR90	20APR90
P014 *	CRITERIA 1 & 2	5	1MAY90	7MAY90
HN08 *	SOFTWARE CONTROL	5	14MAY90	18MAY90
LA08 *	SOFTWARE/CRITERIA 16, 17, 18	5	21MAY90	25MAY90

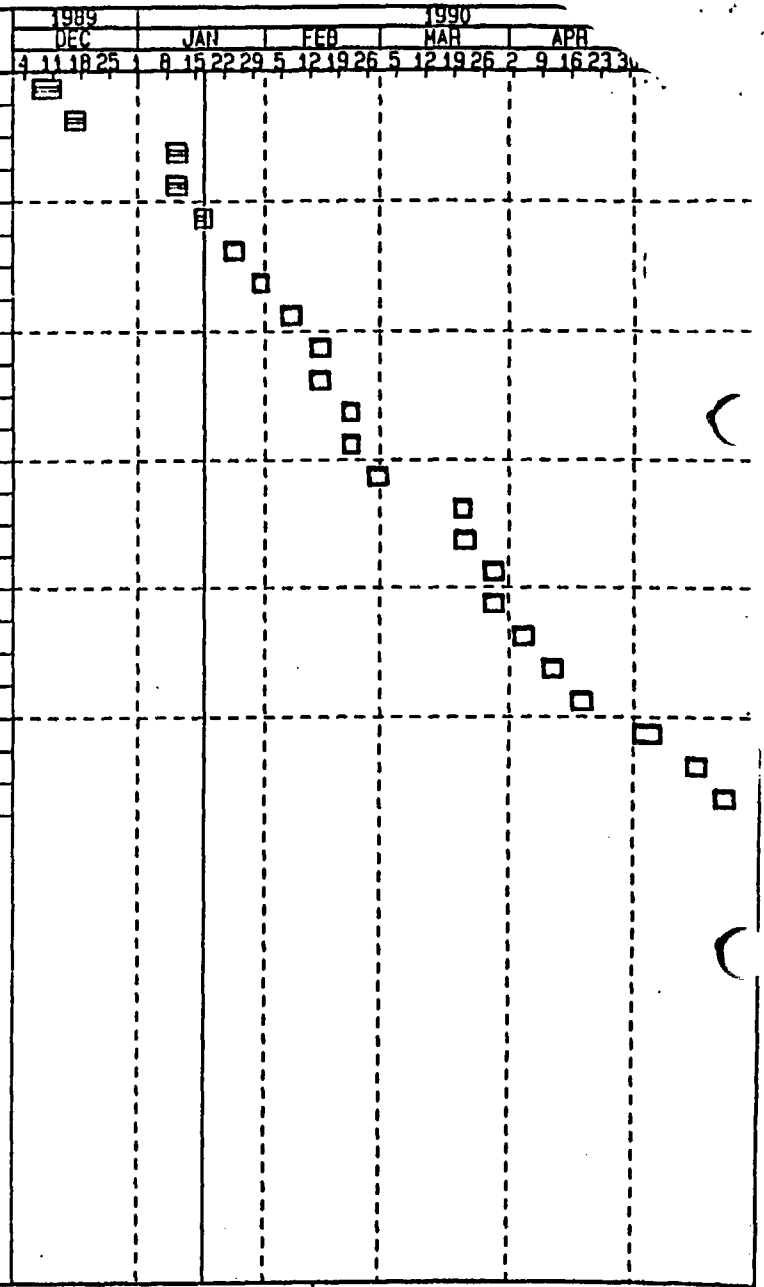
FN06 *

HN06 *

HN02 *

SN02 *

US08 *



Note: Supplier Qualifications are now controlled by an internal schedule.

Activity Bar/Early Dates
Critical Activity
Progress Bar

Primavera Systems, Inc. 1984-1989

DEPARTMENT OF ENERGY
YUCCA MOUNTAIN PROJECT OFFICE
FY90 REV3 SURVEILLANCE SCHEDULE

Project Start : 1DEC89
Project Finish: 25MAY90

Sheet 1 of 1

Data Date: 17JAN90
Plot Date: 19JAN90

YMP OFFICE SEMIANNUAL SURVEILLANCE SCHEDULE

Date	Revision	Checked	Approved

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Manpower requirements by SIP activity areas are being developed.

Developed strategy to deal with resource profile computational problems, and problems related to loading actual costs and progress of PACS Summary Activities. Also addressing issues related to baseline development of non-labor costs in out-years.

Continued development of resource categories. Current activity is profiling FY89 usage rates to eliminate occasional resource categories. Objective is to create a resource library using less than 10 resource categories.

A list of outstanding liens was assembled and will not be realized in FY 1990.

Developed account structures to support new WBS categories.

Work continued on PACS development for submission packages of WBS 1.2.2 areas. Currently focusing on Spent Fuel area. Modifying LRP networks by including Readiness Reviews and Authorization to proceed milestones.

Updated budget control spreadsheets with ceilings established for each cost account. Included new accounts for Systems M&I, Technical Database management. Processed TAL modifications to existing spreadsheet and Manpower matrix.

Contract with Venture Analytical will be closed out pending completion of on-site presentations of potential linkages between PrimaVera and PROSIM, a schedule risk assessment software. Discussions are scheduled for 2/6-7/90.

1.2.9.3 Quality Assurance

Revised Procedures QP 4.1 and QP 16.1 were approved and issued.

Document Review Sheets for Draft Interim Change Notice to Administrative Procedure AP5.4Q were transmitted to the Project Office on January 4, 1990.

A draft of a proposed revision to the Quality Assurance Requirements Specification for Calibration Services was transmitted for internal review on January 4, 1990.

Change Notice R -0-2 "Organization", was submitted to the Project Office on January 3, 1990 for review and approval.

Document Review Sheets for Draft Interim Change Notices to Administrative Procedures, AP-6.8Q and AP-6.11Q were transmitted to the Project Office on January 9, 1990.

Representatives from DOE-Yucca Mountain Project and SAIC-LV performed a Surveillance of activities on January 8 - 11, 1990 relating to organization/personnel qualification, procurement, calibration, quality assurance records, and preparation of study plans.

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

WBS #: 1.2.9
QA: N/A

January 18, 1990

TWS-EES-13-01-90-077

ACTION ✓
INFO
AMA
AVEDM
ADOE
OER

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

Dear Mr. Gertz:

SUBJECT: DECEMBER PROJECT STATUS REPORT

Attached is the December Project Status Report for Los Alamos participation in the Yucca Mountain Project.

Sincerely,

Karen A. West for

R. J. Herbst

ABC/em

Attachment: a/s

ACTION
cc Nortes
cc Livingston
cc Dobson / Dyer
cc Newbury / MacTec
cc EES, BC / Levich
cc Gilmore - Nice
cc Mitchell / Lee
cc Stewart / Wilke,
cc Hansen
cc McDonald / Karem
cc
Cloninger
310 end
McConville
Prater-MacTec
REC'D IN WMPC 1/23/90

Cy w/attachment:
R. Bullock, FSN, Las Vegas, NV
J. C. Calovini, H&N, Las Vegas, NV
V. J. Cassella, HQ/Washington, DC
C. Garvin, SAIC, Las Vegas, NV
L. Hayes, USGS, Denver, CO
T. Hunter, SNL, Albuquerque, NM
R. F. Pritchett, REECo, Las Vegas, NV
L. Jardine, LLNL, Livermore, CA
R. E. Lowder, MACTEC, Las Vegas, NV
J. Nelson, SAIC, Las Vegas, NV
T. Petrie, DOE/YMPO, Las Vegas, NV
M. Cloninger, DOE/YMPO, Las Vegas, NV
U. Clanton, DOE/YMPO, Las Vegas, NV
D. Dobson, DOE/YMPO, Las Vegas, NV
J. Robson, DOE/YMPO, Las Vegas, NV
V. Iorii, DOE/YMPO, Las Vegas, NV
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D. Hedges, SAIC, Las Vegas, NV
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I. Cottle, SAIC, Las Vegas, NV
J. Treadwell, SAIC, Las Vegas, NV
A. B. Caughran, IS-11, MS J521
R. J. Herbst, EES-13, MS J521
J. A. Canepa, EES-13, MS J521
W. Myers, EES-DO, MS D446
K. A. West, EES-13, MS J521
RPC File (2), MS M321
TWS-EES-13, MS J521
CRM-4, MS A150

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LOS ALAMOS NATIONAL LABORATORY

MONTHLY STATUS REPORT
DECEMBER 1989

1.2.1 SYSTEMS

MAJOR ACCOMPLISHMENTS:

Los Alamos staff attended a performance assessment meeting held in Las Vegas on December 13, at which the participants' roles in the performance assessment calculational exercise (PACE) were discussed. Staff also attended a performance assessment/Technical Integration Group meeting held in Las Vegas on December 14. A Los Alamos representative attended the Technical Data Advisory Group (TDAG) meeting held in Las Vegas on December 8, at which the future role of the TDAG in data management was discussed. The agenda included a tour of the records processing center at SAIC and a presentation of a management system, PRoMISE.

1.2.3.2 GEOLOGY

MAJOR ACCOMPLISHMENTS:

Work is continuing on fracture coatings in the Topopah Spring Member, with emphasis on samples from USW GU-2.

Cathodoluminescence work began for the study of calcite in fractures. The work is focused on determining whether this technique is worth developing for use on calcite as well as opal in laminated deposits from Trench 14.

Scanning electron microscope study of hydrogenic deposit samples continued, and both bedrock breccias and volcanic ash-bearing fault fillings were examined.

The Los Alamos internal letter report "Evaluation of the Feasibility of Applying $^{40}Ar/^{39}Ar$ and Rb/Sr Dating Techniques to Clays and Zeolites" has been completed.

DOE/HQ comments on the study plan for Stability of Minerals and Glasses were received. Study Plan 8.3.1.5.8.1, Characterization of Volcanic Features, has been revised and submitted to DOE/LV. The revision was based on review comments from DOE/LV, SAIC, YMP participants, and DOE/HQ.

Uranium-thorium (U-Th) mass spectrometric analysis was completed for a second sample of a lava flow from the Lathrop Wells volcanic center (Q13 lava, northeast of the main cone). The analytical measurements were successful, but we were unable to separate mineral phases with differing U/Th ratios. Helium (He) was also extracted from a second sample of the Lathrop Wells volcanic center. The analytical measurements were successful, and the rock yielded $^{3}He/^{4}He$ ratios that are about the same as the measured ratios for the Q15 lavas.

PLANNED WORK:

Develop Exploratory Shaft Sampling Plan using data from the Solitario Canyon outcrop. Evaluate revised x-ray diffraction data using multivariate methods. Work on image analysis methods to generate porosity distribution maps and in trace-mineral analysis. Develop statistical methods, especially the tools for handling compositional data. Continue examination and analysis of fracture-coating minerals in the Topopah Spring Member.

Characterization of the hydrogenic deposit samples will continue. Staff intend to prepare papers for inclusion in a USGS bulletin covering the hydrogenic deposits around Yucca Mountain. Revision of quality assurance procedural citations to the Alteration History study plan will be completed.

Prepare a milestone report on the smectite/illite transition.

Field work will be conducted at the Sleeping Butte volcanic centers as soon as field escorts can be arranged with the Air Force. The U-Th data will be evaluated to determine how to proceed with future work.

Revisions to Study Plan 8.3.1.8.1.1, Probability of Magmatic Disruption of the Repository, are starting.

1.2.3.3 HYDROLOGY

MAJOR ACCOMPLISHMENTS:

Chlorine-36 studies at Yucca Mountain that pertain to matrix and fracture flow in the unsaturated zone were presented at the U.S. Nuclear Waste Technical Review Board meeting in Denver on December 11-12.

The prototype diffusion test equipment was removed from G-Tunnel and was placed in temporary storage at the NTS Los Alamos warehouse.

The Reactive Tracer Testing staff met with Devin Galloway (USGS), Mark Pabst (US Bureau of Reclamation), Klaus Stetzenbach (Univ. of Nevada, Las Vegas), and Kenzi Karasaki (Lawrence Berkeley) at the WIPP site near Carlsbad, NM, on December 12-13 to discuss packer design for the C-Wells field tests. The USBR is doing packer design and development for the USGS for the C-Wells. WIPP was selected as the meeting site to review the experiences of INTERA, Inc., in conducting convergent flow tracer tests. George Saulnier, Wayne Stenrud, and Garry Grisak represented INTERA. After presentation by INTERA on their tests, D. Galloway and M. Pabst made informal presentations on the planned C-Wells tests. Several ideas were discussed, but no final design was suggested.

PLANNED WORK:

Continue working on the milestone report on FEHMN, review detailed technical procedures for requirements and increase their documentation, and support achievement of a qualified quality assurance program.

1.2.3.4 GEOCHEMISTRY

MAJOR ACCOMPLISHMENTS:

Additional review comments on the draft of Study Plan 8.3.1.3.1.1 are being resolved, and the text is being revised.

Data from J. Kerrisk and A. Ogard, "Groundwater Chemistry Along Flow Paths Between a Proposed Repository Site and the Accessible Environment," LA-10188-MS (1984), was compiled and will be submitted to the SEPDB.

Experiments involving pure mineral separates contacted with neptunium (Np)-spiked J-13 water have continued. Anther set of experiments has been initiated to investigate the sorption behavior of technetium (Tc) on pure mineral phases appropriate to the Yucca Mountain site. The Stanford Group has initiated a set of experiments involving the sorption of Np onto hematite as a function of pH.

An overview of the Sorption program was presented to the U.S. Nuclear Waste Technical Review Board meeting in Denver on December 11-12. Solubility staff also attended that meeting and presented a talk on "Waste Element Solubility at Elevated Temperatures: Colloid Formation, Characterization, and Stability."

The Solubility staff also attended the International Chemical Congress of the Pacific Basin Societies meeting in Honolulu, Hawaii, December 18-22. H. Nitsche was the co-organizer for a symposium entitled "The Chemical Behavior of Radioactive Substances in the Environment," and D. Hobart served as chairman of the opening session of this symposium.

Installation and testing of the large-frame argon ion laser system for the speciation task have been completed. The new optical table for the wavelength calibration spectrophotometer has also been delivered and installed. This system will be used to very precisely determine the wavelength accuracy of the pulsed dye laser used in the photothermal spectroscopy system. Instrumentation-development activities continue while awaiting a resolution of the stop work order related to software. Recent experimental work has focused on preliminary data acquisition of aqueous Pu^{4+} spectra in dilute mineral acid media to test instrumentation sensitivity and identify the appropriate pulsed laser dyes for investigating Pu^{4+} speciation.

The same tuff column utilized for tritium elution (made with Topopah Spring Member tuff) was used to study the retardation of cesium-137, strontium-85, and barium-133. Batch sorption coefficients for these tracers were obtained. The strontium elution required a dispersion with a dependence on time of a power less than one (n=0.04). Dispersivities for the sorbing tracers are significantly greater than dispersivities for tritiated water in the same tuff column. The observation of time-dependent dispersion in laboratory-scale migration experiments provides new insight into the effect of heterogeneity on the retardation of sorbing radionuclides.

The vapor-phase transport portion of FEHMN has been tested, and additional capabilities were added. The first application has been directed to explaining the large velocities observed in wells UZ-6 and UZ-6S at the top of Yucca Mountain. This work is being done so that the code has the capability of calculating vapor-phase transport and unsaturated flow for the PACE problems. Two new boundary conditions were added to CTCN. The code is being used to simulate the Dynamic Transport task's experiments with colloid transport in fractures. Three-dimensional transport calculations with spatially

distributed sorption coefficients are being run. These calculations will be included as expected case scenarios for the PACE problems.

PLANNED WORK:

Attend the Site Structures and Hydrochemistry meeting in Las Vegas, January 29-31 as part of the Technical Exchange Program between DOE and the Swedish Waste Management Program (SKB)SKB.

Continue the study of Np sorption on pure minerals in J-13 water, Tc sorption studies on pure minerals, and development of a thermodynamic framework for the interpretation and integration of sorption data.

Work will continue on the preliminary experiments with Pu^{4+} to assess system performance with the existing photoacoustic detection apparatus and will begin implementing the photothermal detector apparatus.

Continue solid rock experiments, rock beaker experiments, and transport work with pure minerals.

1.2.5 REGULATORY AND INSTITUTIONAL

No significant action.

1.2.6 EXPLORATORY SHAFT

MAJOR ACCOMPLISHMENTS:

Work emphasis has shifted from coordinating test activities to supporting the Alternates Study for the construction of the Exploratory Shaft Facility. Los Alamos staff are preparing input for the eight tasks identified in the Implementation Plan and met with Sandia and SAIC to define work scopes, schedules, and task definitions and to train on Sandia's quality assurance procedures.

The draft of the Engineering Management Plan is undergoing internal Los Alamos review.

Work continued to phase-out EG&G's role in the design of the IDS.

PLANNED WORK:

Effort will be concentrated to support the Alternates Study. Staff will also develop a presentation of the ESF and prototype testing for the Swedish Waste Management Program (SKB).

Complete EG&G phase-out by the end of January.

1.2.9 PROJECT MANAGEMENT

MAJOR ACCOMPLISHMENTS:

Work on internal Stop Work Order No. SW0-LA01 continued. Additional staff are preparing the Software Quality Assurance Plan and working to lift the stop work order. The Project Office continued its surveillance of the Los Alamos software program through December.

90-1698

Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

JAN 26 1990

WBS 1.2.9.3.2.T.1
QA

Carl P. Gertz, Project Manager, YMP, NV

YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) FISCAL YEAR (FY) 1990 QUALITY ASSURANCE (QA) AUDIT, REVISION 2

Enclosed is a copy of the Project Office FY 1990 Audit Schedule, Revision 2. If you have any questions, please contact James Blaylock of my staff at 794-7913, or Stephen R. Dana of Science Applications International Corporation at 794-7176.

Donald G. Horton, Director
Quality Assurance Division
Yucca Mountain Project Office

YMP:JB-1698

Enclosure:
FY 90 Audit Schedule, Revision 2

cc w/encl:
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D. E. Shelor, HQ (RW-3) FORS
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T. W. Noland, W, Las Vegas, NV, 517/T-06

7

* EXPLANATION OF CHANGES TO SCHEDULE

FN06	Delayed indefinitely due to delay in ESF schedule.
FN04	Delayed due to lack of software activity.
HN06	Delayed indefinitely due to lack of procurement activity.
HN04	Scope changed from Site Preparation and Mobilization Package to Development of Design Package No. 1. Also schedule moved up.
HN10	Delayed due to schedule conflict.
HN08	Delayed due to lack of software activity.
HN02	Delayed indefinitely due to delay in ESF schedule.
LA06	Scope expanded.
LA08	Scope expanded and delayed due to schedule conflict.
RE02	Scope expanded.
SN02	Delayed indefinitely due to delay in ESF schedule.
SN06	Delayed due to schedule conflict.
SN08	Delayed due to schedule conflict.
PO10	Delayed due to request from Program and Operations Organization.
PO14	Delayed due to Privacy Act. Scope expanded.
US06	Scope changed to exclude software.
US08	Canceled because of coverage in US06.

Lawrence Livermore National Laboratory

LLYMP9002059
February 7, 1989 90 BA

WBS 1.2.9
"QA: N/A"

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

SUBJECT: Yucca Mountain Project Status Report - January 1990

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

If further information is required, please contact Deborah A. Kiraly of my staff at FTS 543-4571.

Sincerely,

Leslie Jardine /for
Leslie Jardine
LLNL Technical Project Officer
for YMP

LJJ/DK/dk
Enclosure

YMPO, M. Cloninger
YMPO, V. Iorii
YMPO, L. Little
SAIC, B. McKinnon
SAIC, D. Morissette

DISCLAIMER

QA checks on data contained here have only been performed to determine that the data has been obtained and documented properly. The LLNL Waste Management 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.

ACTION
CC: SIMMONS/MCDONALD
CC: Harrison-G
CC: Morley/Dobson
CC: Valentine -w/o encl
CC: Dyer/Newbury
CC: Waters/Livingston
CC: Cloninger
CC: Rodriguez/Lerich/Little
CC: Kiraly-NRC/Dymmel/10R11
CC: Royer/Svenar/Mukherjee
White R
Maxwell
Lorenz

REC'D IN WMPO 2/12/90

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

JANUARY 1990

1.2.1 SYSTEMS

1.2.1.1 Management & Integration

Planning was started for a short course to be taught to YMP personnel on software engineering approaches to meeting the recently approved Software QA Plan.

1.2.1.2 Systems Engineering Implementation

LLNL staff completed a review of the draft (January 1990) OCRWM Waste Management System Description document and forwarded comments to the Yucca Mountain Project Office (YMPO).

Donald Emerson represented Lawrence Livermore National Laboratory (LLNL) at the January 25-26, 1990 TDAG Meeting at the U.S. Geological Survey in Denver, Colorado. Major topics of discussion included: PARATRAC and IDAS briefings, status report on the revised Technical Data Management Plan (TDMP) and the formation of technical data working groups.

1.2.1.4 Waste Package Performance Assessment

Performance Assessment staff attended a YMP meeting on planning for performance assessment. Network changes and interconnects to match the new OCRWM long-term schedule discussed.

The conference paper "Status of Integrated Performance Assessment of the Waste Packages and Engineered Barrier System," W. O'Connell was approved after comments were resolved and was submitted to the Proceedings for the International High Level Radioactive Waste Management Conference to be held in Las Vegas, NV, April 8-12, 1990.

The scope/budget guidance letter covering performance assessment was received from YMPO on 1/5/90. Detailed planning for work to match the guidance was developed. Budget and scope detailed information was transferred to LLNL management on 1/30/90.

In response to Action Item NN1-1990-0330 on NRC's request for waste package computer programs, LLNL wrote a letter to YMPO summarizing why we found the program WAPPA (written for the salt repository program) unsuitable for use in the Yucca Mountain Project. We are not using or further evaluating this program.

1.2.1.4 Geochemical Modeling and Data Base Development

Technical Implementing Procedures for implementing the Software Quality Assurance Procedures were updated.

Verification of the Data Base continued.

1.2.2 WASTE PACKAGE

1.2.2.1 Management and Integration

Staff revised the Waste Package Program Plan (WPPP) text and responded to the YMPO's written comments, and attended the comment resolution meeting at YMPO on 1/11-12/90. Final draft, with all comments resolved, was delivered to the YMPO on 1/19/90.

W. Clarke made a presentation to the LLNL Lab Directors on 1/17. The presentation covered progress on the YMP container development activities.

1.2.2.2 Near Field Environment Modeling and Testing

Staff continued working on horizontal prototype test reports.

Staff completed International High Level Radioactive Waste Management Conference paper on G-tunnel Prototype Test which was submitted to the YMPO and approved.

1.2.2.3.1 Waste Form and Materials Testing

J. Bates, Argonne National Laboratory visited LLNL to discuss existing glass dissolution activities at ANL, as well as to plan future work scope activities at both LLNL and ANL.

Working with Project Control staff on PACs input for spent fuel. To complete the technical area's input to PAC system, this will require extensive detailed planning.

Five test plans for Glass Waste Form were sent out for review. Test plans for C-14 release and the pressurized tube tests are not back yet.

Draft of LLNL Unirradiated UO_2 Dissolution Tests report is almost compete.

Participated in MCC (PNL) Glass Testing meeting held on 1/16.

Glove box procurement papers were completed as part of the unirradiated UO2 dissolution testing activity at LLNL.

Completed responses to the YMP comments on LLNL Spent Fuel SIP.

Material Characterzation Center, PNL (MCC) funding as of 1/4/90 will be part of LLNL subcontracts (G. Mellinger, PNL notified).

QA requirements are being worked on at PNL. Amount of LLNL management not clearly defined. PNL will provide Technical Program Plan (TPP) for the work scope in agreement with contract.

1.2.2.3.2 Metal Barrier Selection and Testing

Staff participated in DOE dry runs on 1/9-10 in preparation for the Nuclear Waste Technical Review Board (NWTRB) meetings scheduled for 1/18-19, and on preparation of laboratory areas for the tour on 1/18.

Staff participated in the NWTRB meeting; including two days of presentations and the conduct of a laboratory tour with demonstrations for both the NWTRB panel, and NRC staff plus their subcontract researchers.

Staff participated in a TRG meeting at Savannah River for the High Level Waste report under preparation.

1.2.2.3.4 Integrated Radionuclide Release

QA-training of staff was completed.

Work continued on the SIP for Integrated Testing.

Staff participated in Laboratory cleanup to prepare for new Hazards Control and Environmental Safety Specification which is part of planned DOE inspection in February 1990.

1.2.2.4 Design, Fabrication and Prototype Testing

The friction welded, 18-inch cylinders fabricated from alloy 825 and CDA 715 were received from B&W, Alliance, Ohio. These cylinders will be used to characterize the microstructures (effects of welding), and to remove specimens for laboratory corrosion testing.

1.2.5 REGULATORY AND INSTITUTIONAL

1.2.5.2.1 Interaction Support

Staff prepared materials and participated in the Nuclear Waste Technical Review Board meeting which was held January 18-19, 1990 at the Sheraton Hotel, Pleasanton, California. Technical Review Board members and staff expressed their view that this was a very successful meeting.

1.2.5.2.5 Study Plan Coordination

Study Plan 8.3.1.17.4.1, R0 "Historical and Current Seismicity" technical review was completed and the comments were carried to L.V. on 1/9/90.

1.2.9 PROJECT MANAGEMENT

1.2.9.1 Management

Due to reductions in funding, two supplemental labor employees who supported Records Management were released at the end of December. Carol Neal was named the new Records Manager. She subsequently terminated on 1/19. Efforts to replace her are in progress.

Records Management area was subjected to a DOE surveillance on 1/9-10. No SDRs or observations were found.

1.2.9.2 Project Control

Extracted external interfaces from existing networks. Information provided to SAIC for initiation of Interface Control Working Group (ICWG) activity. Extensive future work anticipated.

Attended YMPO Interface Control meeting. Delivered and discussed listing of LLNL and Sandia interfaces contained in LRP networks. Also attended Interface Control Working Groups charter meeting.

Completed modifications to the Long Range Plan section of the Information Technology Report.

Training continues on PrimaVera system. Leveling/manpower requirements using existing LRP and PACS data are presenting some minor problems that are software related. Alternatives are being explored.

Monthly costs reports were completed and transmitted to YMPO.