Lawrence Livermore National Laboratory

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October 15, 1992

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

10-15-92

SUBJECT: Yucca Mountain Project Status Report - September 992
SCP: N/A

Attached is the September 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 510-422-7854 or Jim Blink in Las Vegas at 702-794-7157.

Sincerely,

Barbara Bryan for
W. L. Clarke
LLNL Technical Project Officer
for YMP

DIST: Gertz
See Distribution
Lost (YMP)
Bradsky
Jones, S

WC/EC

cc:
Distribution

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RECEIVED
10/22/92

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.

ENCLOSURE 3

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LAWRENCE LIVERMORE NATIONAL LABORATORY YUCCA MOUNTAIN PROJECT
OCTOBER 1992 TECHNICAL HIGHLIGHTS AND STATUS REPORT
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LAWRENCE LIVERMORE NATIONAL LABORATORY
(LLNL)
YUCCA MOUNTAIN PROJECT (YMP) STATUS REPORT

SEPTEMBER 1992

EXECUTIVE SUMMARY
(Items Proposed for Reporting in YMPO or OGD Reports)

1) **WBS 1.2.1.4.2 (Waste Package Performance Assessment).** The manual entitled "PANDORA 1.1 User's Manual" by L. Lewis and C. Hardenbrook was submitted for internal LLNL-YMP review.

2) **WBS 1.2.2.2.1 (Chemical and Mineralogical Properties of the Waste Package Environment).** Calculations of the coupling between hydrology and geochemistry are being made for elevated temperatures in the saturated zone. Results show a promising suite of sorptive minerals would be formed, providing a new barrier to radionuclide transport.

3) **WBS 1.2.2.2.2 (Hydrologic Properties of the Waste Package Environment).** A new option to the EXTOOL postprocessor for V-TOUGH tracks variable changes in a Langrangian reference frame. This feature allows the user to specify a moving reference frame with a specified velocity and averaging volume to obtain the temperature history of moving packets of fluid. These data permit scoping calculations of geochemical changes which occur due to temperature changes.

4) **WBS 1.2.2.2.2 (Hydrologic Properties of the Waste Package Environment).** The impact of repository-heat-driven flow on hydrological performance has been described as a series of hydrothermal flow regimes (HFRs). Three major HFRs have been identified, with HFR 1 corresponding to when boiling (and possibly condensate flow) dominate hydrological performance, HFR II corresponding to the post-boiling period when the fluid distribution and intrinsic hydrological properties are still significantly altered by the repository heat, and HFR III which occurs when repository heat no longer affects hydrological performance.

5) **WBS 1.2.2.2.4 (Engineered Barrier System (EBS) Field Tests).** A draft plan for a laboratory 3x3x3 m heated block experiment was informally submitted to YMPO. The Fran Ridge test pits were identified as a potential source of 1-M^3 blocks to be used to conduct the experiment.

6) **WBS 1.2.2.3.1 (Waste Form).** A letter discussing the options of disposing of some MCC spent fuel testing materials in the hot cell of PNL Bldg. 324 was prepared. The letter provides a cost estimate of future archival activities at MCC.

1.2.1 SYSTEMS

1.2.1.1 Management and Integration

No significant activities.

1.2.1.2 Systems Engineering

1.2.1.2.4 Systems Engineering Implementation

No significant activities.

1.2.1.2.5 Configuration Management and Plans and Procedures Control

LLNL-YMP reviewed its controlled documents for the following Affected Document Notices (ADNs), and no LLNL-controlled documents are affected:

1) CR 92/096, YM MGDS Requirements, R1
2) CR 92/098, ESFDR, R 7/2/92
3) CR 92/100, YM MGDS RDR, R1 and
4) CR 92/109, RECMP, R4.

Comments by LLNL-YMP were submitted on the proposed "OCRWM Standards for Configuration Item (CI) and CI Identifiers/OCWRM Standard for Document Identifiers" to OCWRM on September 25.

The following IMOUs have been reviewed by LLNL-YMP staff, and no LLNL-controlled documents are impacted by these IMOUs and actions:

1) IMOU 330011, "Determine Impact of Materials, Fluids and Tracers Used During Construction and Testing of ESF Related Activities Only"
2) IMOU 630004, "Tracer Study Input",
3) IMOU 660015, " ESF Alternative Studies" and
4) IMOU 660025, "Title I Design Summary Report".

1.2.1.2.6 YMP Support to Management Systems Improvement Strategy

No significant activities.

1.2.1.3 Technical Data Base Management

1.2.1.3.5 Technical Data Base Input

J. Blink attended the Technical Database Administrators meeting in Las Vegas on September 10.

1.2.1.4 Performance Assessment

1.2.1.4.2 Waste Package Performance Assessment

The manual entitled "PANDORA 1.1 User's Manual" by L. Lewis and C. Hardenbrook was submitted for internal LLNL-YMP review. This completes an internal deliverable.

The report entitled "Post-Closure Performance Assessment of Waste Packages for the Yucca Mountain Project" by W. O'Connell, T. Ueng and L. Lewis was submitted for internal LLNL-YMP review. This completes an internal deliverable.

1.2.1.4.5 Geochemical Modeling and Data Base Development

The first of the four geochemical code user manuals entitled "EQ3/6, A Software Package for Geochemical Modeling of Aqueous Systems: Package Overview and Installation Guide, Version 7.0, Part I" by T. Wolery was approved by YMPO on September 2 and will be published in October. The second geochemical code user manual (EQPT User's Guide) was revised in response to the reviewer's comments and is being re-reviewed. The third geochemical code user manual (EQ3NR Theoretical Manual and User's Guide) was sent to YMPO for programmatic approval. The fourth geochemical code user manual (EQ6 Theoretical Manual and User's Guide) is being reviewed internally.

An E-mail communication was received from B. McGrail (PNL) describing a potential problem with regard to the EQ3NR code. A response containing analysis and recommendations was sent via E-mail.

Transfer began of the GEMBOCHS database and software library from the local Sun 3/260 server (node s33 of the local Sun network) to a new, dedicated Sun SPARCstation2 (node s60). Completion of this transfer will result in dramatically improved performance for each database and software module of the GEMBOCHS system. The following activities were completed:

1) Node s60 was installed on the local network,
2) Ingres V6.4 was loaded, and
3) DBAPP and D0OUT were successfully ported to the new hardware platform.

Local beta testing of CNGBOCHS was completed and will be ported to node s60 for unrestricted local and outside use next month.

Seven element catalogs were generated that summarize current GEMBOCHS data for Am, Ni, Np, Pu, Tc, U and Zr species at the request of the Thermodynamic Data Determination task.

M. Schmidt (SAIC, Metairie, LA) visited LLNL on September 1 and was given an overview of the GEMBOCHS database and software library.

The document entitled "CNGBOCHS: an Integrated Ingres-Email-Interleaf System for Processing Change Requests Associated with the GEMBOCHS Thermodynamic Database and EQ3/6 Software Package" by S. Daveler, S. Lundeen and J. Johnson has been submitted for internal review.

1.2.1.4.7 Supporting Calculations for Postclosure Performance Analyses

This WBS element has not been funded in FY92.

1.2.2 WASTE PACKAGE

1.2.2.1 Management and Integration

W. Clarke, D. Ruffner and J. Blink participated in the Thermal Loading Task Force meetings held in Las Vegas on September 1.

J. Blink attended the Heater Test Duration meeting In Las Vegas on September 10.

B. Viani attended a meeting of the Geochemistry Integration Team (GIT) on September 17 in Las Vegas. Discussion centered around action items related to the December 1991 meeting dealing with performance assessment and geochemistry and on the colloid workshop to be held in May 1993.

1.2.2.2 Waste Package Environment

1.2.2.2.1 Chemical and Mineralogical Properties of the Waste Package Environment

Calculations of the coupling between hydrology and geochemistry are being made for elevated temperatures in the saturated zone. Results show a promising suite of sorptive minerals would be formed, providing a new barrier to radionuclide transport.

1.2.2.2.2 Hydrologic Properties of the Waste Package Environment

Model Calculations

Staff continued the preliminary scoping calculations of the hydrothermal performance of the repository using the RIB Version 4 thermal conductivity data, and using the new model which includes hydrothermal flow in the upper 1000 m of the saturated zone (SZ) as well as within the unsaturated zone (UZ). Several pairs of cases having the same Areal Mass Loading (AML, expressed in metric tons of uranium per acre), but different Areal Power Density (APD, expressed in kW/acre) and fuel age were compared. As has been seen in earlier studies, the duration of boiling is primarily determined by the AML. For example, two cases having an AML of 156 MTU/acre were considered. For 30-yr-old fuel and an APD of 114 kW/acre, the duration of boiling (t_{bp}) is 11,500 years while for 60-yr-old fuel and an APD of 71.74 kW/acre, t_{bp} is 13,000 years. Incidentally, the peak repository temperature (T_{peak}) for the 30-yr-old 114 kW/acre case is 202°C while T_{peak} for the 60-yr-old 71.74 kW/acre case is only 180°C. For an AML of 78 MTU/acre, the 30-yr-old 57 kW/acre case has a t_{bp} of 3600 years while the 60-yr-old 36.23 kW/acre case has a t_{bp} of 3000 years.

Laboratory Experiments

The calibration of the resonant cavity designed to measure the relative humidity in a rock sample has been delayed due to an instrumentation problem.

The determination of the characteristic curves of the eight disc-type Topopah Spring tuff samples from the U3hg-1 hole at a depth of 1312 feet and of the five Grouse Canyon tuff samples from G-Tunnel (NTS) continued. A room-temperature constant humidity chamber was used. Measurements have been completed for the imbibition phase up to 98% relative humidity, at 20°C. The samples are in the draining phase at 75% relative humidity. Measurements will continue next month.

The sample holder to be used for measuring electrical resistivity as a function of moisture content at elevated temperatures has been fabricated. The purpose of the measurement is to generate calibration curves of electrical resistivity of Topopah Spring tuff samples with respect to moisture content so that the laboratory and field determined resistivity can be interpreted in terms of degree of water saturation. One of the four Topopah Spring tuff samples has been jacketed and mounted in the sample holder. The measurement of electrical resistivity will be started next month.

Model Development & Documentation

T. Quinn and S. Daveler corrected a minor bug in the time-history subroutine in the V-TOUGH code.

Problems continue with the poor turnaround time on the NERSC Crays. The NERSC recently added a new Cray YMP C90. V-TOUGH will soon be ported to the C90 to determine whether improved turnaround time can be obtained.

S. Daveler added new features to EXTOOL to improve its ease of use and to broaden the range of options. A notable new option is the ability to track variable changes in a Langrangian reference frame. This feature allows the user to specify a moving reference frame with a specified velocity and averaging volume (i.e., the volume of a moving packet). The initial purpose of this capability is to obtain the temperature history of moving packets of fluid in order to conduct scoping calculations of geochemical changes which occur due to temperature changes. The first application of this capability will be the upper saturated zone where significant temperature changes occur due to repository heating.

Hydrothermal Flow Regimes

T. Buscheck and J. Nitao met with W. Nelson (M&O/Intera) on September 22 at LLNL to discuss the development of a methodology for demonstrating that critically important features and processes are adequately represented in the detailed hydrological models which are the basis for performance assessment models. Nelson feels that it is imperative that the next iteration of the Performance Assessment Calculational Exercises (PACE) include the impacts of repository-heat-driven hydrothermal flow on hydrological performance.

The critically important hydrological processes, and the necessary level of detail required to represent them, change with time after waste emplacement because of the evolving impact of repository heat. The impact of repository-heat-driven flow on hydrological performance has been described as a series of hydrothermal flow regimes (HFRs). Three major HFRs have been identified, with HFR 1

corresponding to when boiling (and possibly condensate flow) dominate hydrological performance, HFR II corresponding to the post-boiling period when the fluid distribution and intrinsic hydrological properties are still significantly altered by the repository heat, and HFR III which occurs when repository heat no longer affects hydrological performance.

Each of the first two major hydrothermal flow regimes can be divided into two subregimes. HFR Ia pertains where boiling and condensate flow dominate (or significantly influence) hydrological performance. HFR Ib occurs when boiling conditions have extended sufficiently far away from the waste package (WPs) so that boiling conditions dominate the hydrological performance at the WP environment. For HFR Ib, liquid-phase fracture flow in the vicinity of the WP is extremely unlikely.

During HFR II, fluid flow is dominated by the residual effects of rock dry-out and condensate buildup. These residual thermally-driven effects can also be divided into two categories; HFR IIa involves the impact of fluid redistribution (i.e., the residual dry-out and condensate zones), and HFR IIb involves the repository-heat-driven alteration of the intrinsic properties of the hydrologic-geochemical system (e.g. alteration of matrix permeability due to dehydration). HFR IIa persists as long as fluid saturations are in the process of being re-equilibrated back to a distribution which is dominated by ambient conditions. HFR IIb persists as long as some of the intrinsic hydrologic-geochemical properties (e.g. matrix permeability) have not been restored to their pre-emplacement values. The final hydrothermal flow regime, HFR III, pertains to when the fluid saturation distribution is dominated by ambient conditions, and the intrinsic hydrological-geochemical properties have been restored to pre-emplacement values. If the climatic conditions have not changed, HFR III is the same as the pre-emplacement ambient flow. It is likely that conditions for HFR III will never be attained.

For thermal loading conditions which generate marginal boiling performance, conditions for HFR Ib will never be attained. Instead there will be a transition from HFR Ia to HFR IIa. For thermal loading conditions which do not result in boiling conditions at any location within the repository horizon, HFR I will not occur. However, HFR IIa, IIb, and III pertain as they did for the scenarios with either boiling-dominated performance (HFR Ib) or mixed boiling/condensation conditions (HFR Ia).

1.2.2.2.3 Mechanical Attributes of the Waste Package Environment

Study Plan 8.3.4.2.4.3, "Characterization of the Geomechanical Attributes of the Waste Package Environment" was sent to the M&O for completion of the records package and for transmittal to OCRWM and NRC.

Input was prepared for issues assigned to the Thermal/Mechanical Effects Task Force for summarizing of repository thermal load issues.

1.2.2.2.4 Engineered Barrier System (EBS) Field Tests

A draft plan for a laboratory 3x3x3 m heated block experiment was informally submitted to YMPO. The Fran Ridge test pits were identified as a potential source of 1-M^3 blocks to be used to conduct the experiment.

The first draft of Study Plan 8.3.4.2.4.4 "Engineered Barrier System Field Tests" has been completed. The internal review process will be started soon.

1.2.2.2.5 Characterization of the Effects of Man-Made Materials on Chemical & Mineralogical Changes in the Post-Environment

This WBS element has not been funded in FY92.

1.2.2.3 Waste Form and Materials Testing

1.2.2.3.1 Waste Form

1.2.2.3.1.1 Waste Form Testing - Spent Fuel

R. Stout, S. Steward (LLNL), W. Gray, L. Thomas and R. Einziger (PNL) participated in the Atomic Energy of Canada Limited (AECL) meeting in Pinawa, Canada on September 17-18. Progress was reported on work completed since the previous meeting in February of this year.

R. Einziger and PNL staff met with R. Stout, J. Podobnik (LLNL) and B. Fisher on September 25 at PNL to discuss the Mission 2001 spent fuel oxidation budget and scope for the next five years. Preparations were made for the dry run for the upcoming NWTRB meeting scheduled for Las Vegas October 14-15.

Spent Fuel Dissolution

Work began on UO_2 dissolution experiments at LLNL at 75°C, 20% oxygen and various pH's and carbonate concentrations. These experiments are part of the existing test matrix. Work also began on the long-term studies of UO_2 powder dissolution in carbonate solutions with and without sodium chloride (0.1M). Dissolution experiments on UO_2 crystals at oxygen concentrations less than 20% will begin in October.

Flow-through testing with spent fuel specimens at reduced oxygen fugacities continues to progress normally at PNL under the approved test matrix.

W. Gray (PNL) visited the spent fuel research laboratory at Studsvik, Sweden on September 21 and participated in the International Spent Fuel Workshop at Visby, Sweden on September 23-25. A growing feeling is shared by researchers from the various participating countries that important spent fuel dissolution issues are becoming better focused and are being resolved to ensure safe disposal of spent fuel.

Spent Fuel Oxidation

The drybaths continue to run. No new work is being initiated at this time.

Technical papers discussing spent fuel oxidation were sent to C. Frost (Ontario Hydro) by PNL as requested.

Materials Characterization Center (MCC) Hot Cell Activities

A letter discussing the options of disposing of some MCC spent fuel testing materials in the hot cell of PNL Bldg. 324 was prepared. The letter provides a cost estimate of future archival activities at MCC.

Work continues to complete the report "Spent Fuel Acquisition Plan".

1.2.2.3.1.2 Waste Form Testing - Glass

D-20-27 Unsaturated Testing of WVDP and DWPF Glass

The N2 tests (SRL actinide-doped glass) continue with no sampling period occurring this month. These tests have been in progress for 340 weeks. The N3 tests (ATM-10, a West Valley actinide-doped glass) continue and have been in progress for 258 weeks.

D-20-31 Studies of Glass Surface Layers and Precipitation

Detailed analyses of a suite of four low-temperature vapor-hydrated samples have been completed. The glass composition studied was SRL 131 which is one of the less durable formulations. The samples had been reacted for time periods up to three years. For each sample, a hydrated layer was found, and the composition and crystallinity of the layer was determined. While it is not possible to define a kinetic relationship for the low-temperature vapor alteration of glass from this limited number of samples, it is clear that the reaction in vapor proceeds at about the same initial rate as in liquid water and that alteration of glass will occur at 75°C.

1.2.2.3.2 Metal Barriers

The paper entitled "Selection of Candidate Container Material for the Conceptual Waste Package Design for a Potential High Level Nuclear Waste Repository at Yucca Mountain" by R. Van Konynenburg, W. Halsey, R. McCright, J. Farmer, W. Clarke and G. Gdowski is in internal technical review.

The paper entitled "Modeling Pitting Corrosion Damage of High-Level Radioactive Waste Containers, with Emphasis on the Stochastic Approach" by G. Henshall, W. Halsey, W. Clarke and R. McCright is in internal technical review.

1.2.2.3.3 Other Materials

This WBS element has not been funded in FY92.

1.2.2.3.4 Integrated Testing

1.2.2.3.4.1 Integrated Radionuclide Release

Operational Safety Procedures (OSPs) for the x-ray diffractometer and the flow-through apparatus were amended and finalized.

Determination of Elemental Profiles in Rocks, Minerals, and Glasses using the Ion Microscope

Because of the low level of alpha activity in the tuff core wafers, it has been difficult optimizing exposure and development times. An alpha sample with sufficient activity (lantern mantle) was obtained and its alpha emission measured. This sample will be used to optimize the autoradiography technique.

Samples of clinoptilolite single crystals to be used in elevated temperature diffusion experiments were evaluated using light microscopy.

Interactions of Actinide-bearing Solutions with Rock Core Samples

Samples of the inflow and outflow solutions from the core flow apparatus were examined using TEM to look for evidence of organic and inorganic particles. Based on particle morphology, outflow solutions collected at two flow rates at room temperature contained both inorganic and organic particles. The organic particles were all similar and appeared to be bacteria. Their concentration was significantly greater at the higher flow rate. Thus, the reduction in permeability in the core (previously noted in August 1992) is apparently due to plugging caused by microbial growth. Samples of the outflow solution from the apparatus run at 150°C were also examined. In addition to particles with bacterial morphology, other particles indicative of pieces of organic material were also present. The inorganic particles present in all the outflow solutions were similar in morphology to the particles identified previously in J-13 and other NTS waters.

1.2.2.3.4.2 Thermodynamic Data Determination

This WBS element has not been funded in FY92.

1.2.2.3.5 Nonmetallic Barrier Concepts

This WBS element has not been funded in FY92.

1.2.2.4 Design, Fabrication, and Prototype Testing

1.2.2.4.1 Waste Package Design

This WBS element has not been funded in FY92.

1.2.2.4.2 Container Fabrication and Closure Development

This WBS element has not been funded in FY92.

1.2.2.4.3 Container/Waste Package Interface Analysis

Electronic and paper copies of drawings made in FY92 were prepared for transition to the M&O.

1.2.5 REGULATORY AND INSTITUTIONAL

1.2.5.2 Licensing

1.2.5.2.1 NRC Interaction Support

At the direction of W. Simecka (YMPO) Version 7.1 of the EQ3/6 software package and a set of the pre-release code manuals were transmitted to R. Luce of the technical staff of the Nuclear Waste Technical Review Board (NWTRB).

T. Buscheck, W. Glassley and other LLNL staff members met with NWTRB member P. Domenico and NWTRB staff member R. Luce on September 29 at LLNL for informal discussions on repository-heat-driven hydrothermal flow. Topics included details of LLNL's models and assumptions, the sensitivity of hydrothermal performance to the hydrological and thermal system properties as well as the sensitivity of hydrological performance to thermal loading conditions. Also discussed was the validation of critical aspects of hydrologic performance models through hypothesis testing using in situ and laboratory experiments.

J. Blink, W. Bourcier, W. Halsey, W. O'Connell, S. Steward, R. Stout and T. Wolery (LLNL); J. Bates (ANL); and R. Einziger and W. Gray (PNL) attended the NWTRB dry run in Las Vegas on September 30.

1.2.5.2.2 Site Characterization Program

M. Revelli completed a review of the draft Integrated Test Evaluation (ITE) task Executive Summary which was developed at the August 27th ITE meeting. This material was discussed in a telecon with ITE task members on September 9.

LLNL prepared a draft response to the Lincoln County, NV comment regarding the Early Site Suitability Evaluation (ESSE) Preclosure Rock Characteristics Guideline evaluation. LANL staff also reviewed and concurred with the proposed response. This material was forwarded to the M&O (Las Vegas) for inclusion in the NRC/State/County ESSE Comment Response package.

1.2.5.2.4 Technical Support Documentation

No significant activities.

1.2.5.2.5 Study Plan Coordination

D. Carpenter reviewed the USGS Study Plan 8.3.1.17.4.4, "Quaternary Strike-Slip Faulting Proximal to the Site within Northeast-Trending Fault Zones".

1.2.5.2.6 Semi-Annual Progress Reports

Guidance for the 7th Progress Report (PR) was received by LLNL on September 15. The reporting period to be covered is April 1-September 30, 1992.

1.2.9 PROJECT MANAGEMENT

1.2.9.1 Management and Integration

1.2.9.1.1 Management

W. Clarke attended Technical Advisory Group meetings in Denver on September 8-9. W. Clarke and J. Blink attended the TPO meeting on September 11. J. Blink attended the TPO meeting with J. Bartlett on September 24.

J. Blink attended the Quality Integration Group meeting in Las Vegas on September 9.

J. Blink, as a reviewer, met with M&O representatives to resolve LLNL comments on the YMP Tracers, Fluids, and Materials Management Plan, Rev. 1.

J. Blink (LLNL) and E. Harle (SAIC) presented a public outreach program on energy and nuclear waste to K-8 students at Armagosa School in Nye County on September 4.

J. Blink (LLNL), E. Harle (SAIC), and T. Kaish (M&O/Duke Power) conducted a Boy Scout Atomic Energy Merit Badge Workshop at the Yucca Mountain Information Office in Las Vegas on September 12. Fourteen scouts earned the Merit Badge.

J. Blink attended a LESSON-NV organizational meeting in Las Vegas on September 15. LESSON is a science education program for K-8 teachers.

1.2.9.1.4 Records Management

Document Control issued one new revision and four Change Notices under controlled distribution. Routine follow-up for receipt acknowledgments continues.

A total of 183 items were logged into the LLNL-YMP tracking system. This includes 92 records/records packages that were processed through to the CRF. Four action items were closed.

The records inventory was completed by the records staff and was submitted by the September 18th deadline. A Corrective Action in Document Control was corrected by inventorying all on and off-site records.

Work continues on cross-referencing the 1989 records from the database to microfilm. Work also continues on backlog records.

1.2.9.2 Project Control

Representatives from the Information Resources Management (IRM) team visited LLNL on September 1.

Work continued to scrub Mission 2001 budgets with M&O representatives. A site visit was made to PNL on September 25 by R. Stout and J. Podobnik. The workscope and budgets were redefined for a resultant savings of approximately $1 million over the duration of the project.

The August FTE report was submitted to YMPO. The August actual schedule progress and costs were submitted to YMPO via PACS workstation.

The August cost plan was prepared.

J. Podobnik attended the PACS steering committee meeting in Denver, CO on September 30. The schedule for the FY93 budget process was distributed, and interim funding arrangements for the first month of the fiscal year were discussed. The M&O representative presented report formats now available for participant use. Discussions were held on improvements suggested by various participants which primarily focused on the reduction of report content. Emphasis was suggested on graphics vs. tabular data. Also discussed were issues associated with elements in the new WBS that are components of the Laboratories' indirect cost pools. Difficulties in collecting costs as well as being able to receive funding in areas that are currently covered by overhead rate applications were brought to the attention of the DOE representative. Subcommittees were formed and names of participant representatives were provided.

J. Podobnik attended the briefing for the FY95 Information Resources Long Range Plan in Las Vegas on September 30. Changes to previous instructions were explained, and a schedule for plan development was provided.

The conversion of LLNL activities to accommodate the new WBS structure continued. Conversion of old cost accounts, PACS accounts, and workscopes are being coordinated with internal systems and with YMPO. Most cost accounts have been revised, and a chart of accounts together with a Responsibility Assignment Matrix will be issued to LLNL-YMP staff.

Staff attended LLNL briefings on the year-end close activity. The process is beginning to close out all accounts, clear pending payables, and issue SANLs for FY93.

1.2.9.3 Quality Assurance

Surveillance Report S92-11 (QA Records) was issued.

The LLNL-YMP response to Corrective Action Requests YM-92-064 through -068 was transmitted to YMPO. These CARs were generated as a result of Yucca Mountain Quality Assurance Division Audit YMP-92-21 of LLNL-YMP.

Corrective Action Report LLNL-025 was issued to the Waste Form Characterization Technical Area.

Closure notification of Corrective Action Reports LLNL-015, 016, and 017 (Software Quality Assurance) were transmitted to YMPO.

Quality Procedure 033-YMP-QP 12.0, Rev. 3 (Control of Measuring and Test Equipment), Change Notice 17.0-4-1 (Quality Assurance Records), and Change Notice 2.1-4-1 (Preparation, Approval & Revision of Procedures, Requirements, Plans, & the Quality Assurance Program Description) were completed and distributed.

Change Notice QARS-001B-0-3 (Quality Assurance Requirements Specification) for Argonne National Laboratory and Change Notice QARS-001C-0-3 (Quality Assurance Requirements Specification) for Pacific Northwest Laboratory were completed and distributed.

Two auditors from YMPO visited LLNL on September 29-October 1 to perform Surveillance 92-028 "Grading". As part of the surveillance, the auditors verified that CARs YM-92-048 and -049 have been completed and are ready to close.

D. Wolfe attended the DOE/EPA Quality Symposium and Committee Meeting in Kansas City, MO on August 30-September 2.

D. Wolfe attended the 19th Annual National Energy and Environmental Quality Division Conference held in Orlando, FL on September 20-23 and presented two papers, "Making the Transition to ANSI/ASQC E4" and "Measuring Success: Performance Matrices for an ANSI/ASQC E4 Based QA Program". He also attended the NQA-1 Committee Meeting.

Sandia National Laboratories

YUCCA MOUNTAIN

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

Monthly Status Report

September 1992

DISCLAIMER

Quality assurance checks on data contained in this report have been performed only to determine that the data have been obtained and documented properly. The SNL Project Department 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. Milestones have not been baselined and are included only to show status.

Sandia National Laboratories

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

Monthly Status Report

September 1992

Sections At-A-Glance

WBS Elements Without Reportable Activity This Period

1.2.1.2.2	System Studies
1.2.1.2.4	Systems Engineering Implementation
1.2.1.2.6	Yucca Mountain Site Characterization Project (YMP) Support to the Management Systems Improvement Strategy (MSIS)
1.2.1.4.3.4	Seal Performance Requirements and Analyses
1.2.4.2.1.1.1	Excavation Investigations
1.2.5.2.1	NRC and NWTRB Interaction Support
1.2.6.1.1	Exploratory Shaft Management, Planning, and Technical Assessment

Highlights

SNL staff hosts a meeting to discuss near-field performance assessment in the U.S. and abroad. SNL staff discussed WIPP and YMP modeling. Swedish Nuclear Power Inspectorate representatives presented a survey of international treatments.

See ***1.2.1.4.1 Total System Performance Assessment*** on page 5

SNL staff publishes the results of the study that addressed the thermal design problem of bounding the induced thermomechanical responses.

See ***1.2.1.4.3.1 Postclosure Repository Design Analysis*** on page 6

SNL staff calculates an estimate of surficial water use in the controlled zone effects on repository performance. The calculations complete technical review.

See ***1.2.1.4.7 Supporting Calculations for Postclosure Performance Analyses*** on page 10

SNL staff published LLUVIA-II, a computer program that models two-dimensional transient flow through partially saturated porous media.

See ***1.2.1.4.9 Development and Verification of Flow and Transport Codes*** on page 10

SNL staff drafts the report on thermal effects on instrumentation. A survey of available instruments and an examination of potentially useful technologies are included.

See ***1.2.4.2.1.1.2 In Situ Thermomechanical Properties*** on page 19

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YMPO	J. M. Boak
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