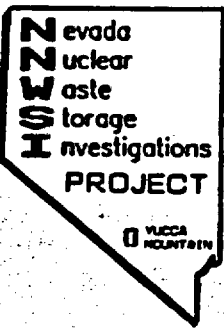


U.S. DEPARTMENT OF ENERGY

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NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT



MONTHLY REPORT

JUNE 1985

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PDR WASTE PDR
WM-11

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

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ABSTRACT

WBS X.2.1 SYSTEMS

The OGR Systems Engineering Management Plan has been revised and will be submitted for baselining in July, 1985. A request has been submitted for a document that will be a site-specific, baselined description of the physical geologic disposal system that the NNWSI Project would build to meet the requirements of Milestone M120.

Parametric modeling studies of the unsaturated-flow systems at Yucca Mountain progressed.

Three major changes were made in the problem definition of the COVE3 (code verification) because preliminary results showed that the rock near the edge of the dryout zone becomes saturated.

WBS X.2.2

Final total fractional radionuclide release results for first run series 2B tests were independently calculated at HEDL and LLNL with good agreement.

It appears that at low temperatures, where Ca^{++} is present in the solution, oxalic acid would be precipitated as insoluble oxalate, and thus would not be able to participate in corrosion and dissolution reactions.

The bent beam tests in J-13 water/steam are accumulating exposure time with no visible crack initiation. The slow strain rate testing is on schedule after minor problems.

Electrochemical potentiokinetic reactivation tests have been performed on several 316L stainless steel coupons. The results agreed with general trends associated with increasing degrees of sensitization.

A thermal analysis of a container with 16 BWR assemblies was completed. An investigation of the effects of uncertainties in spent-fuel thermal conductivity data on peak spent-fuel temperature calculations has been completed.

WBS X.2.3 SITE

Studies continue on using distilled water in determination of water permeabilities of core samples.

Short-term single well-tracer tests were conducted on each of the three UE-25c holes to provide information on the unstressed flow fields in each borehole.

Plutonium isotopic analyses were performed to differentiate global fallout from local fallout in soil collected from the crest of Yucca Mountain and from the Yucca Wash 6 site.

Work started on the equilibrations of samples to investigate the sorption ratios obtained with different ground waters and americium and plutonium. The extent of channeling in the G43-2359 Fracture Flow experiment was determined by the autoradiography of CS-137 tracer.

WBS X.2.4 REPOSITORY

Preliminary performance-assessment calculations were made, which will form the basis for the sealing requirements report. Statistical analysis of laboratory properties of tuff is continuing. Testing continues at Pacific Northwest Laboratories to measure saturated hydraulic conductivities and pressure heads near the residual saturation of selected tuffaceous samples.

The possibility of using gypsum for grouting the annulus between the borehole liners and the boreholes is being investigated.

WBS X.2.5 REGULATORY/INSTITUTIONAL

An information management task force was established to evaluate existing systems to prepare for instituting a Licensing Information Management System for the NNWSI Project.

The NNWSI Project Management Plan for preparation of the final Environmental Assessment was revised and is pending approval. Input to the Comment Response Appendix is nearing completion. The final EA schedule was changed to December 20, 1985.

WBS X.2.6 EXPLORATORY SHAFT

The review of the exploratory shaft facility subsurface facilities design drawings and specifications has been completed. A working draft of the Exploratory Shaft Test Plan, Rev. 1, is being reviewed by committee members.

Trial measurements with high-frequency electromagnetic geotomography methods proceeded this month. Tests of USBM borehole deformation gauges in a heated environment are being planned, but may be delayed.

WBS X.2.7 TEST FACILITIES

The pretest and post-test deformability measurements obtained at the Spent Fuel Test-Climax (SFT-C) are being used to evaluate the efficacy of the data-screening technique which was recently proposed as an ASTM Standard method.

Analysis began of geochemical data that were acquired during the three-year heating phase and six-month cooling phase of the SFT-C.

All canisterized fuel assemblies located in the Log Storage Pit are in safe configuration. A plan has been drafted for replacing the two B02 fuel rods which were removed prior to installations of the fuel assembly.

WBS X.2.8 LAND ACQUISITION

No activity to report this month.

WBS X.2.9 PROGRAM MANAGEMENT

The NNWSI Project Administrative Procedures manual will be revised as changes occur. Boiler plate changes will be made annually in January.

An updated list of NNWSI Project baselined milestones that reflects changes through May 30, 1985, was distributed to participants.

Work continues on the development of a quality assurance records management pilot system.

June 1985

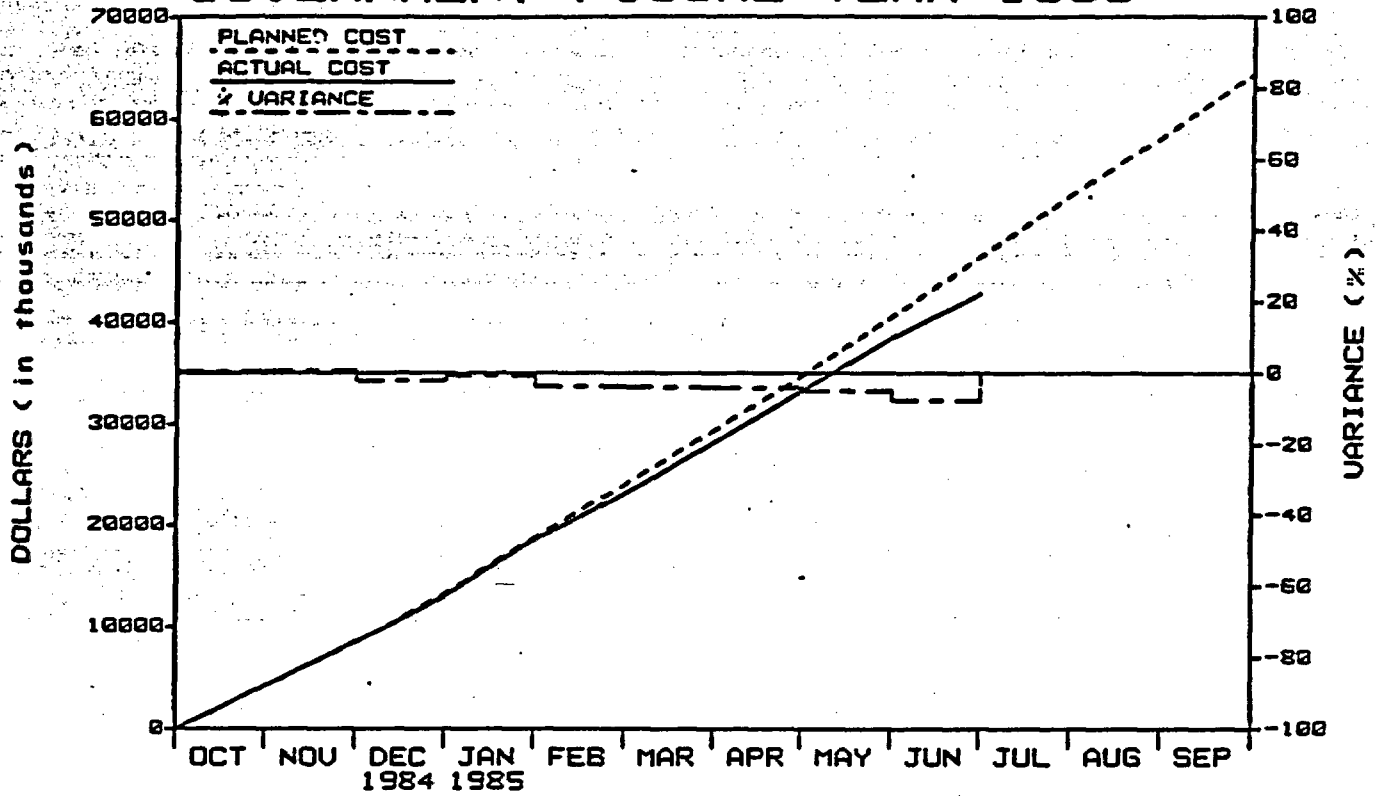
Funding Overview

The month-end programmatic estimated costs were \$42,759,000 against a plan of \$46,389,000 resulting in a cost underrun of \$3,630,000 which calculates to an 8% variance. The total FY 86 budget for the NNWSI Project was \$69,664,000 which breaks down to \$64,390,000 in operating funds and \$5,274,000 in capital equipment funds.

The following are the year-to-date plans, costs, and variances:

	<u>Plan</u>	<u>Cost</u>	<u>Variance</u>	<u>% Variance</u>
X.2.1 Systems	\$2,941,000	\$2,862,000	\$79,000	3
X.2.2 Waste Package	4,033,000	3,594,000	439,000	11
X.2.3 Site	13,548,000	13,050,000	498,000	4
X.2.4 Repository	8,384,000	7,224,000	1,160,000	14
X.2.5 Regulatory/Institutional	4,952,000	3,791,000	1,161,000	23
X.2.6 Exploratory Shaft	4,130,000	3,846,000	284,000	7
X.2.7 Test Facilities	1,265,000	1,374,000	(109,000)	(9)
X.2.9 Program Management	<u>7,136,000</u>	<u>7,018,000</u>	<u>118,000</u>	2
TOTAL	\$46,389,000	\$42,759,000	\$3,630,000	8

WBS X.2 NNWSI PROJECT GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	4217	8482	13238	18656	23973	29355	34734	40504	46389	52505	58226	64390
COST (x1000)	4241	8543	12955	18478	23077	28203	33266	38440	42759	0	0	0
VARIANCE (x1000)	-24	-61	283	178	896	1152	1468	2064	3630	0	0	0
% VARIANCE	1	1	-2	-1	-4	-4	-4	-5	-8	0	0	0

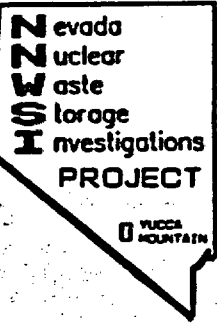
**NNWSI PLANNING AND SCHEDULING
BUDGET BASELINE**

JUNE 1985

<u>CONTRACTORS</u>	<u>(\$000) BEGINNING FUNDING</u>	<u>CHANGE</u>	<u>(\$000) ENDING FUNDING</u>
SNL	\$18,334	-	\$18,334
LLNL	8,565	-	8,565
LANL	10,130	-	10,130
USGS	9,922	-	9,922
SAIC	7,775	-	7,775
REECO	4,608	-	4,608
H&N	753	145	898
F&S	1,212	-	1,212
WSI	200	-	200
PAN AM	50	-	50
STATE GRANT	1,899	(155)	1,744
MISCELLANEOUS	530	-	530
NTS ALLOCATION	412	10	422
RESERVE	-0-	-	-0-
SUBTOTAL	\$64,390	-0-	\$64,390
CAPITAL EQUIPMENT	5,274	-	5,274
TOTAL	\$69,664	-0-	\$69,664

U.S. DEPARTMENT OF ENERGY

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PROJECT STATUS

X.2.1 SYSTEMS

OBJECTIVE

The objective of this task is to apply the concept of systems to the development and design of the repository, both the surface and subsurface facilities, and to the evaluation of the effectiveness of the geologic and hydrologic environment in isolating radionuclides.

ACTIVITIES

Systems Management and Integration

NNWSI Project representatives attended a workshop in Washington, DC, on June 18-19, to discuss OGR proposed changes to the draft OGR Systems Engineering Management Plan (SEMP) in response to comments from the four repository development projects. The NNWSI Project representatives concurred with the changes to the draft SEM. The final OGR SEM will be submitted to members of the OGR Change Control Board (CCB) for baselining in July.

As a result of planning for the NNWSI Project SEM, a request was submitted to the NNWSI Project CCB to change the scheduled date for Milestone M108 to August 30, 1986.

The Performance-Assessment Plan (PAP) is being rescheduled to January 1986 to correspond to the new date of the SCP.

System Description

Document revision of the Preliminary System Description continued. The requirements for 80 percent of the functions that make up the Yucca Mountain Mined Geologic Disposal System have been revised.

A request was submitted to the NNWSI Project CCB to establish a new Milestone, M261, entitled "Yucca Mountain Site-Specific MGDS Description." The document will be a site-specific, baselined description of the physical mined geologic disposal system that the NNWSI Project would build to meet the requirements presented in the Yucca Mountain Mined Geologic Disposal System Requirements (Milestone M120).

System Studies

SNL management review of the Retrieval Program Plan (Milestone M196) began.

Tuff Data Base

Tuff Data Base (TUFFDB) staff met with SNL staff to further define the purpose, content, and form of the Reference Information Base. It was determined that the structure and data requirements for the Reference Information Base are to correspond directly to the Issues Hierarchy. The outline of the Reference Information Base was presented at the NNWSI Project Technical Project Officer (TPO) meeting on June 26.

Enhanced report-production facilities were integrated into the TUFFDB INTERFACE software. Formal testing of the interface and revision of the user manual were started. The design, programming, and documentation of the interface system on the Network Operating System (NOS), which includes the PRIMER, was completed.

Flow and Radionuclide Transport

A contractor report from Lawrence Berkeley Laboratory (LBL) entitled "Hydrologic Mechanisms Governing Fluid Flow in Partially Saturated, Fractured, Porous Tuff at Yucca Mountain" (SAND84-7202), Milestone 103, was published. The report presents a conceptual approach to modeling the effects of discrete fractures on water movement through the unsaturated zone at Yucca Mountain.

Preliminary calculations using the SAGUARO unsaturated-flow code indicate that sufficient water is able to flow through the Topopah Spring unit to allow repository ventilation to remove significant quantities of water.

Parametric-modeling studies of the unsaturated-flow systems at Yucca Mountain progressed in the area of assembling the input data for the finite-element analysis. The saturated studies were continued by applying repeated runs to the current version of the assumed distribution of hydraulic conductivities for this inverse problem. It is not yet clear that local leakage is required to match the known head distribution.

Radionuclide Source Term

Participants from SNL, LLNL, Los Alamos, and LBL attended a meeting at LBL on June 14, to refine the definition of the COVE3 (code verification) problem and to discuss the results. Three major changes were made in the problem definition because some of the preliminary results showed that the rock near the edge of the dryout zone becomes saturated. The assumptions used in the previous definition did not allow water to flow in the fractures. The three changes were 1) the matrix relative-permeability curve was replaced with a composite curve that accounts for fracture and matrix liquid permeability, 2) a composite curve for the gas relative permeability was defined, and 3) matrix saturation as a function of pressure head was redefined. The results from the initial steady-state problem showed discrepancies that arose because the participants used different values for physical constants. Participants are now reporting, for comparison, all physical constants used in their models before proceeding with the analysis using the refined problem definition.

Development and Certification of Computer Codes

The report entitled "Benchmarking NNWSI Flow and Transport Codes: COVE1 Results" (SAND84-0996) was printed and distributed.

Radionuclide Releases from Total System

The Total System Performance Assessment Code (TOSPAC) is capable of handling radionuclide transport through the rock matrix. In these examples, a 1000-yr-old, 70,000-MTHM inventory has been placed in the center of the Topopah Spring welded unit and a 0.1 mm/yr vertical flux is assumed. The results of sample calculations show radionuclide concentration in kilograms per cubic meter as a function of time (in millenia) and distance (in meters) above the

water table; the dark line through the mesh marks the boundary between the Topopah Spring unit and the Calico Hills nonwelded unit. The examples show that there is no release of either plutonium or uranium by 200,000 yr (plutonium-240 disappears through decay). This particular sample calculation exhibits effects mainly of diffusion because of the very low percolation flux.

The papers entitled "Fluid Flow in Fractured Rock Masses" (SAND85-0855C) and "The Effect of Percolation Rate on Water-Travel Time in Deep, Partially Saturated Zones" (SAND85-0854C) have been through peer and editorial review.

The document entitled "Estimation of Hydrologic Properties for an Unsaturated, Fractured Rock Mass" (SAND84-2642) has been completed and submitted for peer review.

A letter report entitled "Disruption Scenarios for a High-Level Waste Repository at Yucca Mountain, Nevada" (Milestone M104) was received and is being reviewed for possible publication.

Work towards incorporating fracture transport of radionuclides into the TOSPAC transport module has begun.

PLANNED WORK

Systems Management and Integration

Further planning for the implementation of systems engineering in the NNWSI Project will be conducted in July, August, and September of 1985 to define the NNWSI Project systems-engineering procedures and establish the roles of the participant organizations.

System Description

Revision of the requirements for the 10 remaining mined geologic disposal system functions will be completed in early July, 1985. The document will be submitted for review within SNL in mid-August 1985 and submitted to DOE-NVO/WMPO by September 30, 1985 to meet the rescheduled milestone date.

An annotated outline for the Site-Specific System Description will be developed during July and August 1985 to meet the November 30, 1985, scheduled due date.

System Studies

Plans for the NNWSI Project fuel-consolidation study are proceeding on a schedule predicated on submitting a final report for management review by late November 1985. Bechtel National, Inc. (BNI) (for surface operations) and Parsons Brinkerhoff Quade & Douglas, Inc. (PBQD) (for underground operations) will provide estimates of capital and lifetime labor costs, for disposal scenarios with and without consolidation. To the extent possible, cost estimates prepared for the Monitored Retrievable Storage (MRS) repository comparative study will be used.

Three canister configurations and two emplacement modes will be considered. The reference case is based on 1) 100% consolidation (at the repository), with the consolidated-fuel rods packaged in reference NNWSI Project canisters; 2) no

consolidation, again with the fuel packaged in reference NNWSI Project canisters; and 3) no consolidation, but with the fuel packaged in "3/4 hybrid" canisters. Both vertical and horizontal canister emplacement will be considered.

Flow and Radionuclide Transport

Work during July and August 1985 will focus on continued modeling of the movement of fluids through the Yucca Mountain site. The use of the statistical method, kriging, on the heads for the saturated zone will continue in order to develop a potentiometric surface from the correlation among the experimentally determined water levels. Variograms are presently being derived for this purpose (using USGS Kriging Code 603). Trial runs will be made for the unsaturated-flow-system studies.

Writing will continue on the ground-water travel-time section of Chapter 8.3.5 of the SCP and some sections of the PAP.

Radionuclide Source Term

The coordination of the near-field hydrology problem (COVE3) activities will continue. After the physical constants are shown to be consistent, direction for the solution to the full problem will be given and a meeting will be organized to compare the initial results.

Radionuclide Releases from Total System

A new differencing method is being coded for the TOSPAC hydrodynamics module to stabilize the dynamics solution in low-storage-capacity rock units, thus allowing larger time steps and shorter running times.

PROBLEM AREAS

If DOE/HQ requires that all projects follow the draft outline for the PAP, the writers for the NNWSI Project would have to re-adjust their assignments; material would no longer follow the SCP closely. Furthermore, the draft outline may require substantial revision before the projects can agree to it. Attempts to achieve consensus can probably be met only by meetings with project personnel; these meetings will delay the beginning of text preparation.

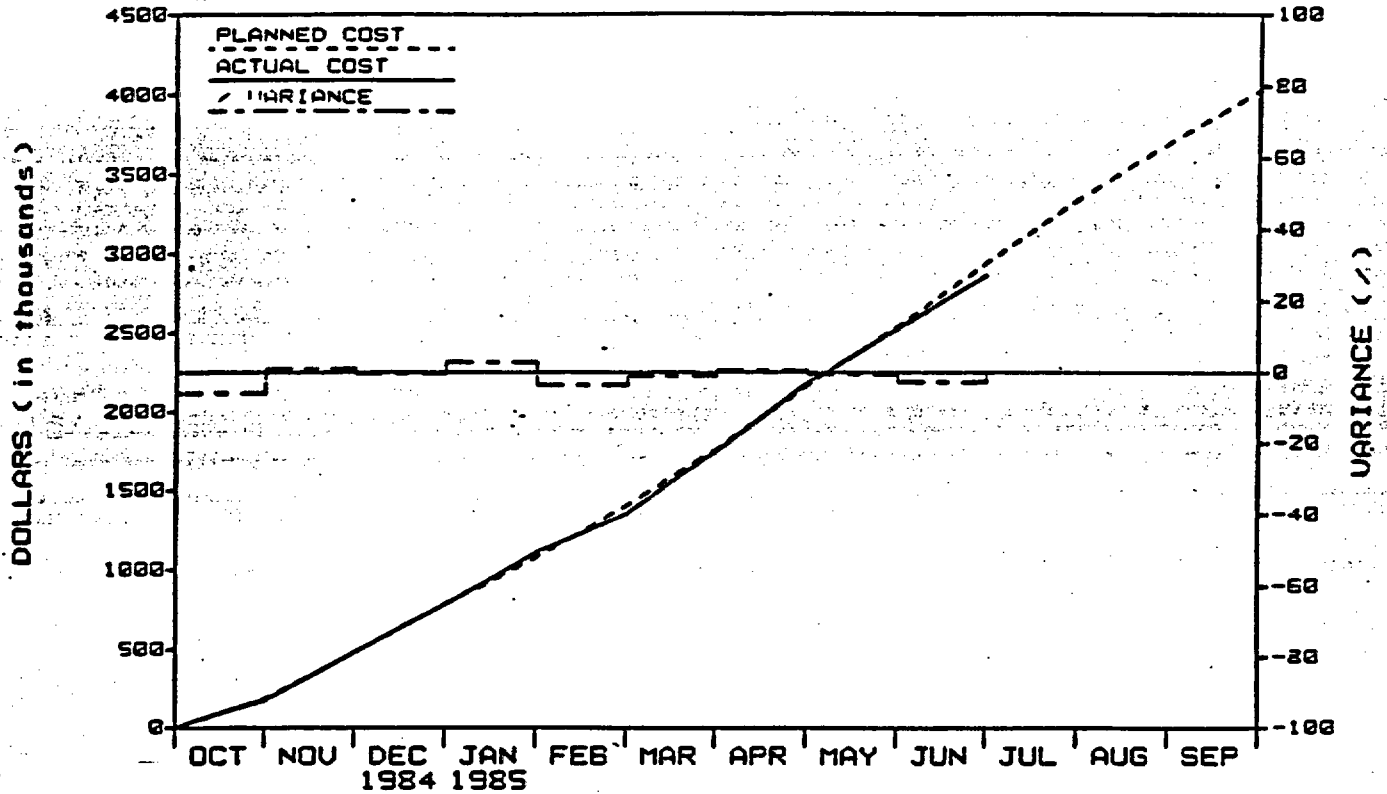
Because of delays associated with NNWSI Project systems engineering commitments, a request was submitted to the NNWSI Project CCB to change the scheduled date for Milestone M120 to September 30, 1985. The CCB action request also included a request to change the name of the document to "Yucca Mountain Mined Geologic Disposal System Requirements."

The priority commitment of the staff assigned to the radionuclide source term task being changed to the preparation of the SCP, PAP, and Reference Information Base will probably preclude the timely completion of any in-depth determination of the NNWSI Project Position Paper Describing Engineered Barrier System and Disturbed Zone Boundaries (Milestone M107).

Several technical activities are being delayed or postponed to accommodate requests for help in preparing the PAP, to draft responses to comments on the NNWSI Project draft EA, and to prepare Information Need Outlines for the NNWSI Project draft SCP.

**WBS X.2.1 SYSTEMS
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.1 SYSTEMS GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	185	477	786	1078	1401	1761	2164	2540	2941	3335	3690	4024
COST (x1000)	174	482	781	1108	1349	1741	2179	2522	2862	0	0	0
UARIANCE (x1000)	11	-5	5	-30	52	20	-15	18	79	0	0	0
UARIANCE	-6	1	-1	3	-4	-1	1	-1	-3	0	0	0

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
M120	SNL	12.1	YM Mined Geologic Disposal System Description (System Requirements)											△	
M108	SNL	12.1	System Engineering Management Plan												△
M113	SNL	12.1	Performance Assessment Plan												△

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.2 WASTE PACKAGE

OBJECTIVE

The primary objective of this task is to develop a technical basis and engineering capability to design, test, and fabricate a waste package that is compatible with the hydrological conditions and geochemical environment in the unsaturated zone beneath Yucca Mountain.

ACTIVITIES

Waste Package Environment

The SEM/EMP analyses continued of primary phases post-test and secondary minerals resulting from hydrothermal interaction from the two long-term (303d) core wafer tests (DB12 and DB13). These tests were:

DB12 = USW G-1 core wafer, J-13 water, 90 °C, plan 300d, terminated normally at day 303.

DB13 = USW G-1 core wafer, J-13 water, 150 °C, plan 300d, terminated normally at day 303.

Analyses were completed for test DB13; analyses continued for test DB12.

The short-term test which was restarted last month continued with no problems. This hydrothermal interaction test run in the Dickson-type gold-bag rocking autoclave is being done in conjunction with Dave Vaniman and Schon Levy (Los Alamos) to investigate the hydrothermal stability of vitric tuff from the Topopah Spring and underlying units. This cooperative research effort will complement previous field studies to evaluate the susceptibility of vitrophyre to thermal alteration by emplacement of high level waste in Yucca Mountain. The conditions for this test are:

DB21R = GU-3 1226 core wafer, J-13 water, 150 °C, plan 64d, presently at day 62.

After more than six months, testing on the larger fractured Topopah Spring tuff sample was completed on June 25. The sample is being removed from the pressure vessel to verify some speculations, e.g., fracture healing reported in past months, have been correct.

All impedance camera data collected on this sample have now been processed. Algorithms are being improved to minimize the effect of artifacts in the images. An automated system is being tested for collecting impedance camera data. The new system, using existing hardware, would automatically collect and store the necessary data, but a new display terminal would be required to process the images in real time within the lab.

The report on Rocking Autoclave studies using crushed Topopah Spring tuff and J-13 water was forwarded to WMPO on June 10.

Waste Form Testing

Hanford Engineering and Development Laboratory (HEDL) Chemistry and Analysis has been developing an activation analysis procedure for I-129. If successful, this procedure may reduce cost and turnaround time for I-129 analyses which are currently being performed by Pacific Northwest Laboratory (PNL). Four of the 150-day Series 2A solution samples will be analyzed using both methods to see if the new HEDL procedure can duplicate results obtained using the established PNL procedure.

Final total fractional radionuclide release results for first run Series 2B tests (Turkey Point fuel in J-13 water) were independently calculated at HEDL and LLNL with good agreement. These results are being incorporated into a paper to be presented at the MRS-85 Symposium in Stockholm, September 9-11, 1985.

An Invention Disclosure has been submitted to the WHC Patent Committee on the C-ring test apparatus. The system will be installed in the hot cell during the second week of July 1985. The report entitled "C-Ring Stress Corrosion Cracking Scoping Experiment for Zircaloy Spent Fuel Cladding", (HEDL-7546) has been completed and is in review.

Another set of dry runs with the Fluitron autoclaves has been completed. These tests included mockups of the spent-fuel bundles. All autoclaves operated at constant pressure and temperature, which indicates no leaking occurred. Fluid sampling procedures were successfully tested. The autoclaves will be installed in the hot cell during the second week of July 1985 (at the same time as the C-ring apparatus). The report entitled "Zircaloy Spent Fuel Cladding Electrochemical Corrosion Experiment at 170 °C and 120 psi H₂O" (HEDL-7545) has been completed and is in review.

The 12-month electrochemical corrosion scoping experiment was terminated on June 27 as scheduled.

An unirradiated Zircaloy-4 specimen is being prepared at HEDL for transmittal to LLNL for detailed ion probe evaluation. The specimen will be used to establish a baseline distribution of trace isotopes. This should allow isotopes such as C-14 in irradiated cladding to be mapped for potential use in determining corrosion mechanisms.

A Long-term Unsaturated Test matrix using defense glass (165 black frit) doped with uranium, cesium, and strontium started on June 14, 1984. The 52-week tests, F-7, F-8, and F-13, together with the 6.5-week continuous sampling tests F-9 and F-10, were terminated as scheduled on June 12, 1985. Tests F-11 and F-12, which are continuous sampling tests that were started on September 13, 1984, were sampled at the 39-week period and were continued. Thus, except for Tests F-11 and F-12, the matrix has been completed and the results will be compiled in a Topical Report, together with any modifications or clarifications that were added to the test procedure.

The parametric testing of the ATM-12 "aged" glass continued. The 56-day samples were pulled out of the 90 °C oven and the leachates are now being analyzed for plutonium, neptunium, and americium.

A leaching study was performed using the ATM-1c glass (uranium-doped PNL glass). The three types of J-13 water contained 13, 28, and 56 ppm silicon respectively; after seven days of leaching at 90 °C, the normalized mass losses for molybdenum were 5.1, 3.5, and 0.13 g/m² respectively. When these data are plotted against the silicon values, a regression line is obtained with a slope of -0.169, a normalized mass loss intercept of 9.52, and a correlation factor of 1.0. This kind of relationship between normalized mass loss and silicon content of the leachant was always assumed to exist but was never shown until now. Three additional samples of silicon contents of 8, 35, and 44 ppm are in progress to help ascertain this linear relationship between silicon in the leachant solution and normalized mass loss.

Metal Barriers Testing

The purpose of this work is to make a preliminary projection of the effects of gamma radiation on the chemistry of the fluid media expected to be present in a tuff repository in the unsaturated zone. The likely behavior of oxalic acid is being studied. Oxalic acid is reportedly formed upon irradiation of aqueous bicarbonate solutions. Bicarbonate is the principal anion in J-13 water, and oxalic acid, a chelating agent, can increase corrosion and dissolution.

It now appears that at low temperatures, where Ca⁺⁺ is present in the solution, oxalic acid would be precipitated as insoluble calcium oxalate, and thus probably would not be able to participate strongly in corrosion and dissolution reactions. This may explain why it was not detected in filtered J-13 solutions after irradiating. At temperatures approaching the boiling point of water, the Ca⁺⁺ concentration is expected to be lower because of the retrograde solubility of calcite. Oxalic acid does not decompose thermally until temperatures of about 160 °C are reached. At the boiling point of water it has a significant vapor pressure, and could be transported and concentrated by evaporation and condensation in a thermal gradient. More work is needed to determine the possible significance of radiolytically-produced oxalic acid in an unsaturated-zone tuff repository.

Two independent analyses were made of 100X concentrated J-13 water (obtained by boil-down). One was performed at LLNL and the other at Rocky Mountain Analytical Laboratory. Results from the two measurements are in reasonably good agreement, with the exception of the NO₃ analysis. Reasons for this discrepancy are being explored. These analyses will be used to make a synthetic batch of 100X concentrated J-13 water for use in corrosion studies.

The bent beam tests in J-13 water/steam continue to accumulate exposure time with no visible crack initiation to date. Each specimen was individually removed from the test rack, cleaned, and closely examined with the binocular microscope last month. This examination revealed neither surface cracks nor any other type of surface irregularities which would serve as precursors to cracking. However, there may be microcracks throughout the tensile region of the specimens. These would only be detectable by direct microstructural examination which would destroy the specimen. As each material condition is represented in triplicate, one specimen from each triad will be sacrificed for examination on the next scheduled survey.

The slow strain rate testing underway at PNL is back on schedule after minor problems with the vacuum system. Two 304 specimens are being tested at a strain rate of 1×10^{-6} /s, one in 95 °C J-13 water without a gamma flux and one with a gamma flux. These tests should be complete by the end of July.

Electrochemical potentiokinetic reactivation (EPR) tests were performed on several 316L stainless steel coupons. The EPR test is a non-destructive method for detecting relatively mild degrees of sensitization (in austenitic stainless steels) which match the metallographic ratings obtained using the oxalic etch test, ASTM A262-A. The method described by Majidi and Streicher [Corrosion Vol. 40, pp 393-408 (1984)] for suggested deaeration with nitrogen gas, which was not done for this series of tests. For this reason, and perhaps others, the results did not exactly reproduce those in the Majidi and Streicher paper. The results did, however, agree with the general trends associated with increasing degrees of sensitization. Majidi and Streicher show that the ratio of the maximum current generated by the reactivation scan to that of the anodic scan increases with increasing degrees of sensitization. The LLNL results also showed this trend. The next likely step in the EPR testing is to deaerate the solution and perhaps alter the solution chemistry to accommodate differences in electrochemical behavior between the 316 family of stainless steels and the 304 family used in the Majidi and Streicher paper.

A contract with the University of Minnesota Chemical Engineering and Materials Science Department was finalized on June 24. The contract calls for work on the study of electrochemical behavior of copper in irradiated environments. This work will include investigation of the cathodic processes in the gamma field in environments to simulate radiolyzed water and modeling of radiolysis product build-up in moisture films. This work will tie to work underway at LLNL and at Westinghouse-Hanford.

An ad hoc Corrosion Testing Panel under the auspices of the Materials Review Board (MRB) reviewed the work of the Metal Barriers subtask on June 20 and 21. The members of the panel were Chairman Martin Steindler and Executive Secretary Wally Seefeldt (MRB), Tom Jungling (NRC Waste Management Division), and Professors Dave Duquette (Rensselaer Polytechnic Institute), Jerry Kruger (Johns Hopkins University), Robert Wei (Lehigh University), Bryan Wilde (Ohio State University), Howard Birnbaum (University of Illinois), and William Gerberich (University of Minnesota). The purpose of the review was to determine whether all the likely operative corrosion mechanisms were being addressed, whether tests being developed by the Materials Characterization Center (MCC) or the projects were adequate to quantify the corrosion rates associated with the different mechanisms, and whether the MCC/project interactions were adequate to assure development and review of key data of sufficient scope and quality to show compliance with Federal regulations. Presentations on the different corrosion test areas for stainless steel and copper were made by the principal investigators at LLNL. The panel will make a report to the Materials Steering Committee and M. Frei's office (Geologic Repository Program) on their assessment of the efforts of each repository project.

Design, Fabrication, and Prototype Testing

The report entitled "Waste Package Advanced Conceptual Design Criteria for a Nuclear Waste Repository in Tuff" was forwarded to WMPO for review. This report is a Level I milestone.

Waste-package design characteristics have been forwarded to Weston for inclusion in the "Integrated MRS/Repository Comparative Study." The NNWSI Project was represented at a June 25-26 planning meeting for the Prototypical Spent Fuel Consolidation Equipment Demonstration Program (PCDP) in which MRS operating scenarios were discussed.

A detailed cost estimate for fabrication of PWR and BWR waste-package prototype designs is in progress.

A thermal analysis of a container with 16 BWR assemblies was completed. The container design consists of 12 assemblies of pre-consolidated 10-year-old BWR spent fuel arranged around the perimeter and rods from four BWR assemblies located in the center region of the container. This configuration has a total decay power of 3040 watts at time of emplacement. The 66 cm diameter container was emplaced vertically at a depth of 350 m in a 76 cm diameter borehole. The spacing between containers in a drift was assumed to be 8 m and drift spacing is 100 ft (30.5 m). The peak cladding temperature was calculated to be 277 °C occurring 3 years after emplacement. This temperature is well below the peak allowable temperature of 350 °C.

An investigation of the effects of uncertainties in spent-fuel thermal conductivity data on peak spent fuel temperature calculations has been completed. A recent report by Battelle PNL (EPRI NP-3764) presents a sophisticated analysis of spent-fuel rod arrays by modeling each individual rod using the COBRA code. The Battelle analytical results have recently been verified with experimental data. Also, the Battelle study shows that the present LLNL approach for modeling spent-fuel thermal conductivity yields slightly higher peak-fuel temperatures and is thus conservative with respect to peak temperature of the fuel.

A structural analysis of a fully-loaded spent-fuel container is underway utilizing the three-dimensional finite element code DYNA3D. The large deformation inelastic response of a fully loaded spent-fuel container dropped horizontally seven feet onto a mild steel tube was modeled. Preliminary results indicate that very large plastic strains will occur in the container wall, but it has not been confirmed whether failure would occur.

The first meeting for determining the quality level of a design, fabrication, prototype testing subtask activity took place on June 7. This meeting was held to determine the QA level for the fabrication of weld/NDE development parts at the Westinghouse E-MAD facility. It also served as a dry run of the procedure and identified some defects that have now been corrected. In accordance with draft procedure O33-NNWSI-P 20.0, a Quality Assurance Level II was assigned to the aforementioned activity because it involves evaluating alternative weld/NDE techniques. In the context of this determination, pertinent procedures will be written for several QA elements.

Performance Assessment

Work continued on the design and specifications of the NNWSI Project waste-package system model. Data flow diagrams and a data dictionary indexed to the existing WAPPA program documentation were developed for the WAPPA submodels whose content or framework can be adapted to the requirements of the NNWSI Project emplacement conditions.

Hydrothermal modeling activity centered on two problems. The first was the code comparison problem, now known as COVE3, involving SNL, LBL, LLNL, and Los Alamos. The second is a simulation of the fractured core resaturation using an impedance camera technique to characterize saturation distribution. It appears that both of these modeling efforts should be nearly complete next month.

Modeling of the fractured core experiment continued using WAFE. The problem is being solved as two-dimensional flow through matrix surrounding a central fractured zone. The solution will provide at least qualitative guidance to the development of the impedance camera to measure saturation distribution inside a relatively undisturbed sample.

LLNL completed a review of the DRI Draft Report #2: "Inventory of Numerical Codes Available for High-Level Nuclear Waste Repository Performance Modeling at Yucca Mountain, Nevada." Comments were forwarded to WMPO.

The standardized draft Performance Assessment Plan (PAP) Annotated Outline, prepared by DOE/HQ, was reviewed by LLNL waste package staff and comments were provided to SNL for inclusion in the formal NNWSI Project response.

The PNL request for "FY 85 Information Needs for PASS/Site Coordination" was reviewed by LLNL waste package staff and a comment summary was prepared for WMPO. PNL/PASS has been provided a copy of the draft version of the NNWSI Project SCP Chapter 7, including references, which address the areas of concern.

PLANNED WORK

"The report on Cladding Credit Testing of Spent Fuel in J-13 Water" is being revised and will be submitted to WMPO in mid-July.

Both of the long-term radiation exposure tests on CDA-102, -613, and -715 being performed at HEDL are now under way. The test environments are 150 ° air/steam and 95 °C J-13 well water/air. The 150 °C experiment will be examined on July 7. Approximately one-third of the samples will be removed at this time; the remainder will be removed at the three-month period. The samples removed will include weight loss coupons, stressed samples, and bolted crevice coupons. For these samples, corrosion rates will be determined and samples will be submitted for both Auger and x-ray diffraction analysis of the oxide films.

The 95 °C experiment was not initiated until July 1. Consequently, specimens from this experiment will not be examined until the first week in August. The C-ring test apparatus and Fluitron autoclaves will be installed in the LLNL hot cell in July.

Preparation for the review activities has delayed completion of Level II Milestone M235 "Corrosion Testing of Candidate Austenitic Stainless Steels in Tuff Geochemical Environments." Because of the importance of Level I Milestone M222 "Feasibility of Copper as a Waste Package Container Material," this milestone takes precedence over M235. The "copper" milestone (M222) will become a two-part deliverable: a short status report (5-10 pages) from the NNWSI Project to OCRWM (BWIP will write a similar contribution) and a longer technical report

on the same subject. The short report will be delivered to Nevada by July 31, 1985 with the longer report to follow on August 31, 1985, pending delivery of information from the Copper Development Association.

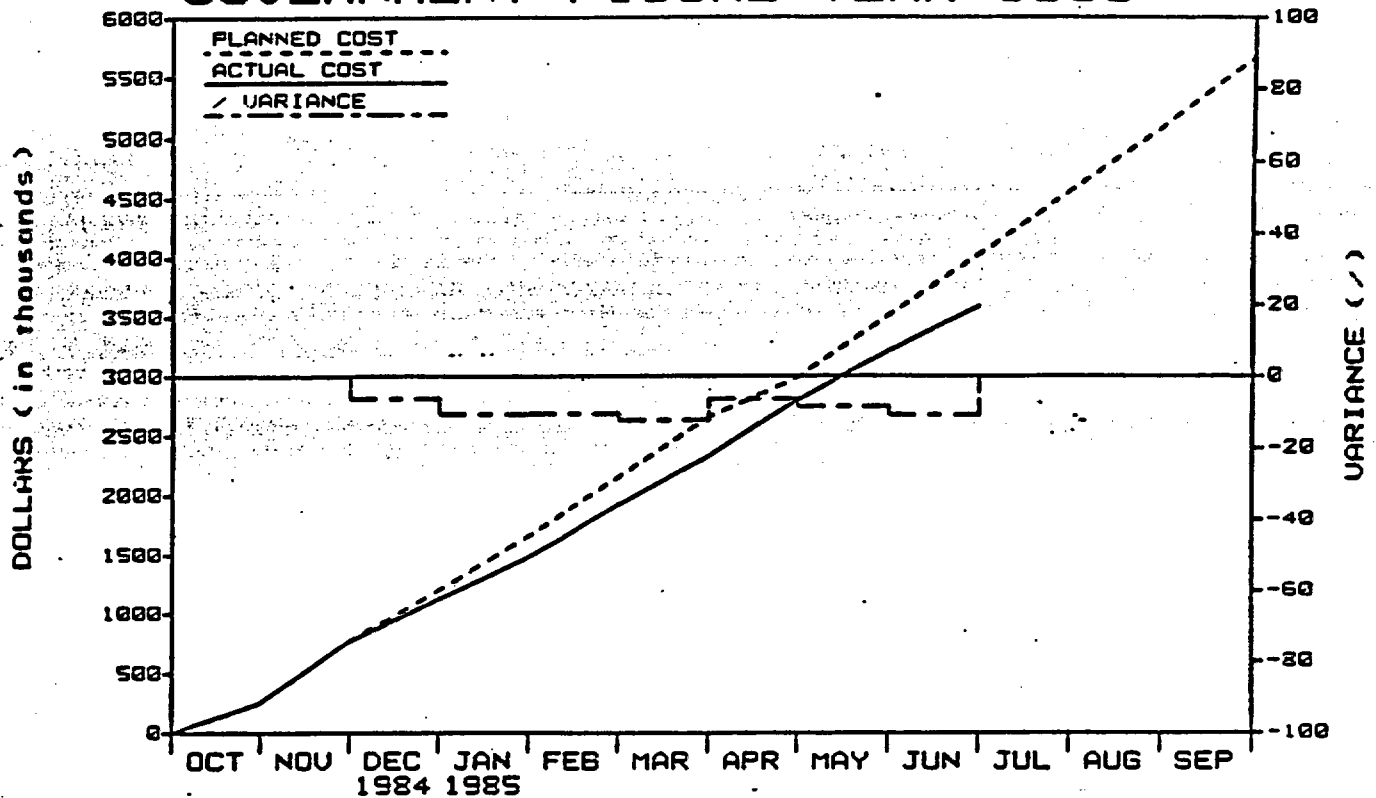
PROBLEM AREAS

The Materials Characterization Center (MCC) glass fabrication report was reviewed. A number of inconsistencies, both within the single document and between it and other information sent to us by letter on previous occasions, were identified. The information seems to be incomplete in several respects. A formal review was sent to the MCC on June 11 with a request for revision and publication in referenceable form. No response had been received as of July 8. This is causing a delay in several deliverables.

The report entitled "Evaluation of WAPPA Mechanical Submodel" will not meet the scheduled June 28, 1985 delivery date due to SCP priority. A preliminary draft has been completed and is being reviewed. Delivery to WMPO is expected by the end of the fiscal year.

**WBS X.2.2 WASTE PACKAGE
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.2 WASTE PACKAGE GOVERNMENT FISCAL YEAR 1985



PLAN (X1000)	252	771	1200	1657	2152	2657	2988	3511	4033	4554	5077	5662
COST (X1000)	252	769	1124	1480	1926	2333	2799	3216	3594	0	0	0
VARIANCE (X1000)	0	2	76	177	226	324	189	295	439	0	0	0
% VARIANCE	0	0	-6	-11	-11	-12	-6	-8	-11	0	0	0

VARIANCE EXPLANATION: Underrun is due to subcontractor costs not being received in time for June costing; and, the redirection of work effort to the SCP. Also, the need for additional manpower has just recently become available. The variance should decrease over the next few months.

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION												
				O	N	D	J	F	M	A	M	J	J	A	S
M250	LLNL	12.2	Establish Interim Product Specifications	<div style="display: flex; align-items: center;"> ◆ △ </div>											
M222	LLNL	12.2	Input to DOE/HQ Rpt. to Congress on Copper for WP	<div style="display: flex; align-items: center;"> ◆ △ </div>											
M251	LLNL	12.2	Pre-closure Analysis of selected Conceptual Designs	<div style="display: flex; align-items: center;"> ◆ △ </div>											
M231	LLNL	12.2	Complete WP Conceptual Design Criteria	<div style="display: flex; align-items: center;"> ◆ △ </div>											
M233	LLNL	12.2	Initiate WP Advanced Conceptual Design	<div style="display: flex; align-items: center;"> ◆ △ </div>											

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.3 SITE

OBJECTIVE

The objective of this task is to determine whether Yucca Mountain is a suitable location for a high-level waste repository. The effort is divided into two areas of study. The first is understanding the characteristics of the rock mass that lies below the surface of Yucca Mountain. This encompasses the geology (structure and stratigraphy), hydrology (both saturated and unsaturated zone), geochemistry (chemical reactions that can be expected when waste is emplaced), and mineralogy and petrology (the study of the materials that will control the isolation and engineering characteristics of the rock). The second is understanding the processes and events that could occur in the area surrounding Yucca Mountain that could serve as potential disruptive forces. These efforts include the study of tectonics, seismicity, and volcanism, and the regional hydrologic, paleohydrologic, and paleoclimatologic systems.

ACTIVITIES

Geologic Investigations

Work continued on the details of lateral variations in the subunits of the Topopah Spring Member of the Paintbrush Tuff in and adjacent to Yucca Mountain.

F&S submitted a paper on the fracture networks at Yucca Mountain to the International Symposium on Fundamentals of Rock Joints, Bjorkliden, Sweden on September 15-20, 1985. This paper uses fractal geometry to quantify the fracture trace patterns for two-dimensional slices through the three-dimensional fracture networks. This is the first time such fracture patterns have been so characterized and the effort has potential for input into numerical hydrologic models. The paper will be published in the Proceedings of the Symposium.

Three papers, "Tubular Structures on the Faces of Cooling Joints"; "Fracture Log of Topopah Spring Member, USW G-4"; and "Field Guide to Pavements in the Vicinity of USW G-4, Yucca Mountain, Nevada" were not completed in June as scheduled, but will be completed in July.

Site Geology

Exploratory borehole Ue25-RF9, located approximately 600 ft east of the northern part of Exile Hill in the preferred location for repository surface facilities, penetrated 65 ft of alluvium and colluvium and bottomed at 106 ft in red-brown nonwelded tuff, presumably reworked Tiva Canyon caprock. The drilling is helping to define the geometry of the alluvial wedge beneath the site to determine if adverse ground-motion amplification could occur.

Topographic Analysis

Work continued on the compilation of three 2-meter contour topographic maps with 1-meter supplemental contours of the Yucca Mountain area. The maps are nearly complete and will be submitted for open-file approval.

Seismic Investigations

Work began writing an open-file report on seismic refraction profiling in Crater Flat.

Rock Properties

A literature search was conducted on the effects of using distilled water in the determination of water permeabilities of core samples. A recent series of experiments on Topopah Spring basal vitrophyre cores from borehole USW G-3, using distilled water, showed sharply decreasing permeabilities with time in all cases. Results from the literature show that this behavior (with reactive distilled water as the permeant) is in contrast to the constant permeability yielded by samples when the permeant is natural equilibrium pore water. G-3 samples were saturated with J-13 water in an attempt to confirm the literature results. A similar curve of declining permeability with time was found, paralleling the results recorded with distilled water as the permeant. Future experiments will use new cores cut from pristine "wrapped" lengths of well core. The natural pore water will be left intact and J-13 water will be used as make-up water for the measurements.

Preparations were made for a field test of a hole-to-hole sonic system to identify fracture systems lying between holes. This is a sparker system with a 6-phone hydrophone cable in the second hole. Initial tests will be made on holes with spacing in the 100 m range. A paper was delivered before the national meeting of the Society of Professional Well Log Analysts in Dallas, to present a technique for correcting sonic logs for cycle-skipping which correlates the skipping with fracture zones that produce water.

Tectonics and Volcanism

The geologic map of the Quaternary and Tertiary deposits of the Big Dune quadrangle, Nevada-California was approved on June 18, 1985 and assigned the number I-1767.

Work continued on the logs of the trenches along the Beatty scarp. The present consensus is that much of the Beatty scarp is erosional rather than of fault origin. It is possible, but not certain that the entire geomorphic feature is due to side cutting by the Amargosa River.

Isotope Geology

Two open-file reports on geochronology were published in June: "Uranium, Thorium Isotopic Analysis and Uranium-series Ages of Calcite and Opal and Stable Isotopic Compositions of Calcite from Drill Cores, UE-25a#1, USW G-2, and USW G-3/GU-3, Yucca Mountain, Nevada: U.S. Geological Survey Open-File Report OF 85-224"; and "Uranium-series Dating of Secondary Carbonate and Silica Precipitates Relating to Fault Movements in the Nevada Test Site Region, and of Caliche and Travertine Samples from the Amargosa Desert: U.S. Geological Survey Open-File Report OF 85-47.

Counting for uranium-trend age dating on the alluvial fan sample from the Beatty Trench #2 is nearly complete. All uranium-trend dating operations were completed on four deposits exposed in Beatty Trench #1.

Seismicity and Strain

The manuscript was submitted to and approved by DOE/WMP0: "A Study of Ground Motion Attenuation in the Southern Great Basin, California-Nevada Using Several Techniques for Estimates of Q_s , $\text{Log } A_0$, and $\text{Coda } Q$ ".

Streamflow

The manuscript, "Flood Evidence and Its Implications at North Fork Coyote Wash, Yucca Mountain, Nevada Test Site -- A progress Report," is nearly complete.

Ground-Water Flow Analysis

Short-term single well tracer tests were conducted in each of the three UE-25c holes during the period June 24 to June 27, 1985. The purpose of the tests was to provide information on the unstressed flow fields in each borehole. The short-term tracer tests were conducted in two zones in c#1 and c#3; above and below pip packers which isolate the most permeable zones above from the least permeable zones below as determined from tracejector surveys and in combination with packer injection tests for c#1. Only one zone, above the bridge plug, was tested in c#2. In each hole the zone above the packers or plug was tested in the interval between the bottom of a monitoring access line and the top of the packer or plug, a length of 120 to 200 ft. For each of the holes this zone is in the Bullfrog Member of the Crater Flat tuff. It was also possible to determine intra-wellbore flow directions and to estimate velocities in some cases.

Preliminary conclusions based on test results indicate: (1) The packer is no longer set, as the tracer was observed readily passing from below to above the packer elements. There appears to be a slight downward component of flow from the interval between the bottom of the access line and top of packer to the interval 2570 to 2580 feet. (2) In c#2 above the bridge plug, there appears to be a continuous dilution of tracer from 2400 to 2420 feet. This is the only interval within this section where fluid is readily moving across the borehole. (3) In c#3, fluid is entering the borehole at 2830 feet and moving upward at approximately 20 feet per hour to a zone from 2540 to 2550 feet where fluid is entering movement in the interval between the bottom of the access line and the top of the packer elements.

Unsaturated-Zone Hydrology

Lab experiments are being conducted in the squeezing of rock samples by means of triaxial compression.

Nine abstracts were prepared pertaining to drilling, characterizing and monitoring of the vadose zone for the National Water Well Association meeting in Denver on November 19-21, 1985.

Future Climates

A work plan was developed for the shallow, secondary-carbonate study at and near Yucca Mountain to determine if these deposits are of spring origin.

Work continued on interpretive analyses of the field descriptions of the trenches at Yucca and Frenchman Flats. A request has been made that the trenches be allowed to remain open through October 1985.

Natural Isotope Chemistry

The full text of the paper "³⁶Cl Measurements of the Unsaturated Zone Flux at Yucca Mountain" was prepared for publication in the proceedings of the DOE/ANS-sponsored International Topical Meeting on High-Level Nuclear Waste Disposal, to be held in Pasco, Washington, on September 24-26, 1985.

Plutonium isotopic analyses were performed to differentiate global fallout from local fallout in soil collected from the crest of Yucca Mountain and from the Yucca Wash 6 site. The isotopic analyses indicate that plutonium from Nevada Test Site activities is the dominant component at both locations. This finding complicates the interpretation of the ³⁶Cl infiltration data.

Hydrothermal Geochemistry

Literature was searched for data on the state of order of authigenic albite. Due to the generally fine-grained nature of authigenic albite, relatively little data are available for its state of aluminum-silicon order. However, most of the data agree with assumptions made in developing the thermodynamic model for analcime. The single exception is an authigenic albite from the Green River Formation that is apparently more disordered than expected. Efforts are also under way to obtain authigenic albite from Yucca Mountain for which an order determination can be made.

Further examination of the literature on the kinetics of the cristobalite to quartz transition has led to the conclusion that the rate of this reaction is probably controlled by the rate of defect diffusion in a disordered surface layer on quartz co-existing with cristobalite.

Solubility Determination

Responses have been written to State of Nevada comments concerning the geochemistry sections of the NNWSI Project Environmental Assessment. Changes and updates to the Information Needs and Chapter 4 of the Site Characterization Plan are under way. A meeting was held between Los Alamos and LLNL for discussions of the EQ3/6 database. Work is continuing on determination of formation constants of Pu(IV) with carbonate and on the solubility product of hydrous plutonium oxide.

Sorption and Precipitation

Work started on the equilibration of samples to investigate the sorption ratios obtained with different ground waters and americium and plutonium, separately. A third set of serial sorption measurements has started.

Dynamic Transport Process

The extent of channeling in the G43-2359 Fracture Flow experiment was determined by the autoradiography of CS-137 tracer. The tracer was found to be confined to one-third of the fracture area.

A bounding calculation was performed using TRACR3D to establish the sensitivity of retardation to channeling. A cylindrical flow geometry was found to provide almost no retardation in a 6-cm cylinder. Thus, transport will be extremely sensitive to channeling.

Retardation Sensitivity Analysis

A meeting was held on June 14 at LBL to discuss the status of the COVE3 benchmarking calculations, to settle small discrepancies in results, and to standardize equations of state.

Work continues on the development of the HDOC code. A comparison with TRACR3D indicates that the code is at least 30 times faster. Moreover, the code is ideal for following steep fronts, a situation that often occurs in transport calculations.

Three-dimensional TRACR3D simulations of B. Rundberg's fracture transport experiments showed significant channeling, which was also observed in the laboratory. Consideration of geometric effects and 3-D codes can be important for proper interpretation of lab and field experiments.

Statistical Analysis

Some modifications have been made to the code based on the fracture model of Sudicky and Frind, which was used in preliminary calculations last year of radionuclide transport times to the accessible environment. These include changes to increase accuracy when integral evaluation is potentially inaccurate due to rapid fluctuation of the integrand and to make the input/output interactive. Information on the uncertainty in this code's major parameters is being collected and sensitivity runs are beginning.

Work continues on pooling observations of several approximately conformable boundaries for better estimates both of the zero-th order planar approximation to these boundaries (reflecting the eastward tilt of the Yucca Mountain tuffs, interrupted by faulting) and of a variogram for kriging.

Applied Diffusion

The report "Fran Ridge Horizontal Coring Summary Report, Hole UE-25h#1, Yucca Mountain Area, Nye County, Nevada" has been written. Internal review should commence next month.

Geochemical Modeling Code

The performance of the EQ3NR code has been significantly improved by the change to unformatted data files. Typical run speeds have been increased by a factor of nine compared to runs using formatted files.

Mineralogy and Petrology

Initial data runs were obtained on calibration of the improved quantitative x-ray diffraction analysis system with quartz-corundum mixtures. X-ray diffraction studies were also made of samples from known spring localities in the NTS region; thin carbonate coatings occur on tuff from which Cane Spring

issues. Exploratory studies using cathodoluminescence were performed on fracture-filling minerals and minerals from trenches. Preliminary results suggest that this may be a useful method for determining growth episodes.

Meteorological Monitoring Plan

WMPO approved the Meteorological Monitoring Plan. The Quality Level Assignment Sheets (QLAS) for the monitoring program were revised and sent through the approval process. All approvals are expected by July 3, 1985. REECo erected the 10-meter towers this month, and the 60-meter tower should be up by mid-July 1985. SAIC has received the equipment which will be QA audited, calibrated, and installed in July 1985. The monitoring system is scheduled to be operational by August 1, 1985.

Socioeconomics Study Plan

Work on a framework for quantifying socioeconomic impacts is proceeding on schedule as provided in the February 1985 draft annual Socioeconomic Studies Plan. Alternative computer models are being evaluated.

PLANNED WORK

Los Alamos will complete a short summary paper on the tectonic setting of Quarternary basalt centers in the southern Great Basin for the Yucca Mountain tectonics workshop.

Reports on geochemistry simulation of Yucca Mountain, Milestones M323 and M324, are in draft form and should be available by July 31, 1985.

The report on the sensitivity of radionuclide transport times to uncertainties in chemical sorption and molecular diffusion, Milestone R377, and the report on kriging for interpolation of sparse and irregularly distributed geological data, Milestone R376, are scheduled to be completed on September 27, 1985.

Los Alamos will prepare a report on the thermodynamics of albite, extend modeling of kinetic controls on the distribution of silica polymorphs in Yucca Mountain, and make a detailed examination of the feasibility of using solubility measurements to determine thermodynamic properties for zeolites.

PROBLEM AREAS

Work on the Socioeconomic Field Activity Plan has been discontinued until a decision is made by DOE/HQ concerning the timing for the plan.

The report on the transport of radionuclides by fracture flow in Yucca Mountain tuff under saturated conditions, Milestone M318, has been delayed.

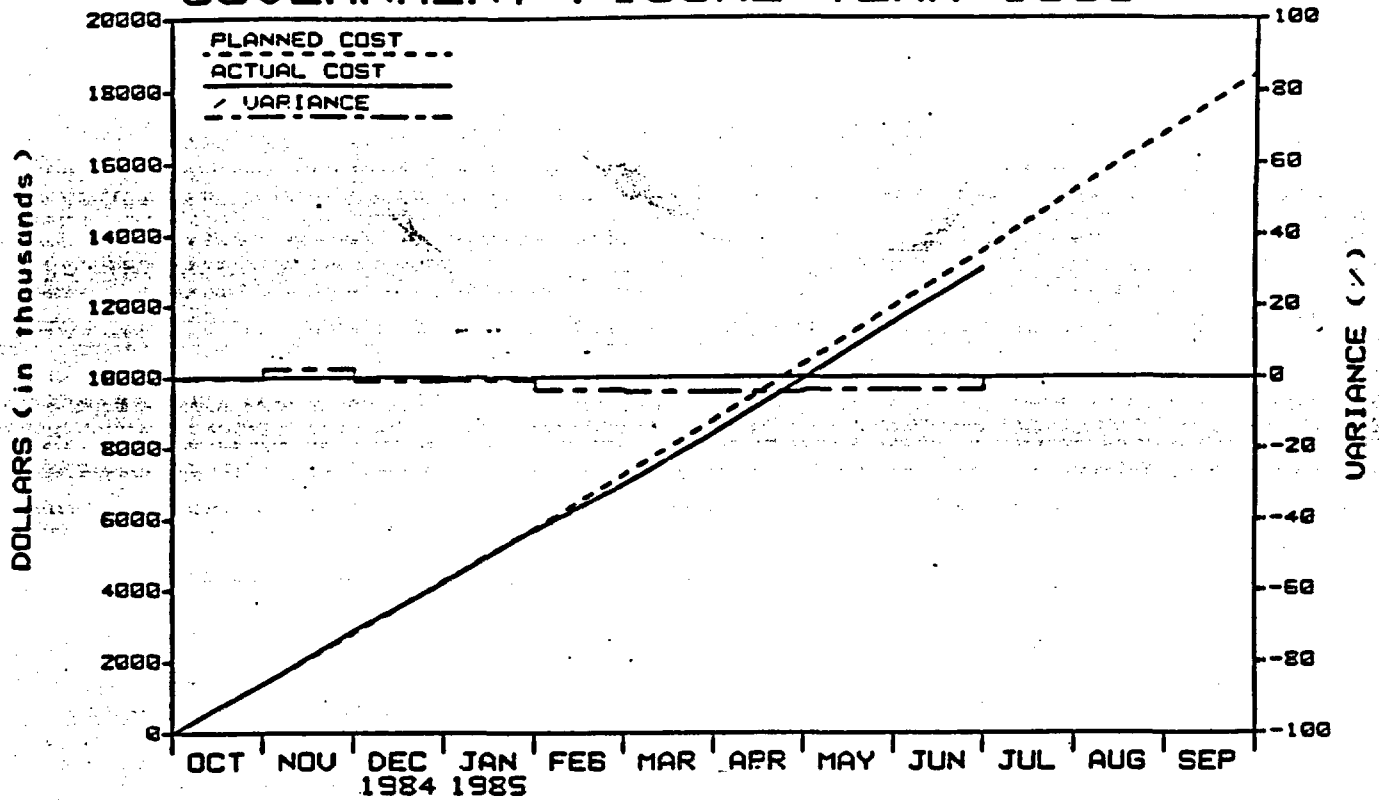
A second Performance Assessment Plan meeting was to have been held this past quarter. However, until the annotated outline is completed and distributed by Sandia (as promised in April), no further work on the procedure is expected.

In its present form, NNWSI-SOP-03-02 does not cover data acquisition or data management systems. The Committee felt different (and possibly less extensive) procedures could be applied to control such software (in comparison to scientific and engineering software).

The 4-inch core hole at USW UZ-6s was reamed to 8-11/32 inches from 396 feet to 495 feet. On June 10, the drill string parted above the guide, leaving the pilot bit, reamer, guide and part of the hammer in the hole. These units were successfully "fished" out of the hole on June 11. Because of the worn drive shoe at the base of the casing, a decision was made to terminate reaming operations. Attempts to pull the 7-5/8 inch casing out of the hole, using hydraulic jacks, were unsuccessful. At a pulling pressure of 140,000 pounds, the casing parted at a depth of 253 feet. This portion of the casing was removed. Using the Joy II rig, a spear was used in an attempt to pull the reaming part of the casing (253-495 feet). The spear was blocked at 361 feet by a bridge caused by rock cavings. Attempts to remove the casing were unsuccessful. Decisions on future fishing operations will be made after review of a TV camera run in the hole.

**WBS X.2.3 SITE INVESTIGATIONS
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.3 SITE INVESTIGATIONS GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	1392	2797	4244	5733	7262	8795	10361	11968	13548	15218	16826	18443
COST (x1000)	1386	2861	4200	5685	6996	8423	9939	11526	13050	0	0	0
VAR (x1000)	6	-64	44	48	266	372	-22	442	498	0	0	0
% VARIANCE	0	2	-1	-1	-4	-4	-4	-4	-4	0	0	0

MILESTONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S				
M354	LANL	123	Letter Rpt on Groundwater Chemistry along Flow Path	◆	■														
M357	SNL	123	Weapons Test Seismic Rpt				▲	■											
M356	LANL	123	Complete Rpt on Volcanic Hazards Analysis	◆	■														
M355	LANL	123	Progress Rpt on 3-D Mineralogic Model of YM	◆	■														
M364	SAIC	123	Implementation of Meteorological Monitoring Plan	■													▲		

▲ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◆ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.4 REPOSITORY

OBJECTIVE

The objective of this task is to develop the engineering capability to design, construct, operate, and decommission a repository in tuff. Four specific technical areas are involved that include (1) determination of the physical and mechanical properties of the rock matrix and rock mass that are important to the design and construction of an underground structure; (2) engineering analysis and evaluation of technical details that are important to the design and operation of a repository; (3) development of the techniques of sealing a repository as part of decommissioning; and (4) preparation of a site-specific design that will be accommodated within the development of the equipment to construct the repository, handle the waste and waste package, and transfer the waste and waste package within the repository.

ACTIVITIES

Repository Management and Integration

The revised Generic Conceptual Design Report Annotated Outline was issued on May 29, 1985. A scheduling network has been developed to conform with a revised completion date for the Conceptual Design Report (Milestone N432) of January 17, 1986, as well as blending with SCP commitments. The change orders and statements-of-work for the surface and underground A/E advanced conceptual design contracts were prepared and are being reviewed.

Rock Mass Analysis

The contract with RE/SPEC for thermomechanical calculational support was placed. The analysis work currently being undertaken by RE/SPEC is directed to analysis of the heated-block experiment and analysis of the proposed rock-mass-strength test. During July 1985 a problem-definition memo will be written that will detail calculational support of the proposed shaft convergence test in the Exploratory Shaft (ES).

Analysis of the slot-strength test (proposed for the ES) continued. The initial meshing was completed along with linear elastic analysis to determine the potential effects of slot cutting and pressurizing.

Two papers entitled, "Implication About In Situ Stress at Yucca Mountain" (SAND84-2021C) and "Analysis of the Elastic and Strength Properties of Yucca Mountain Tuff" (SAND84-2145C) were presented at the 26th U.S. Symposium on Rock Mechanics, Rapid City, South Dakota, on June 25-28, 1985.

Field Testing

The paper entitled, "Evaluation of the Accuracy of Continuum-Based Computational Models in Relation to Field Measurements in Welded Tuff" (SAND85-0261A) was presented at the 32nd Joint ASCE/ASME Mechanics Conference in Albuquerque, New Mexico, on June 24, 1985.

The paper entitled, "Thermal Cycle Testing of the G-Tunnel Heated Block" (SAND84-1808C) was presented at the 26th U.S. Symposium on Rock Mechanics on June 28, 1985.

The heater was successfully retrieved from the emplacement hole that was used for the third small-diameter heater equipment. The hole had been heated to over 300 °C and no structural damage was visible.

Laboratory Properties

Statistical analysis of laboratory properties of tuff is continuing. Analysis of mechanical-property data is approximately 95 percent complete and that of thermal-conductivity data is approximately 30 percent complete. Analyses of bulk-property and thermal-expansion data have concentrated on results for the Topopah Spring Member and are approximately 80 and 50 percent complete, respectively, for the Topopah Spring.

Water-Migration Analysis

Testing continued at Pacific Northwest Laboratories (PNL) to measure saturated hydraulic conductivities and pressure heads near the residual saturation of selected tuffaceous samples. The level of work to be performed by PNL in FY 86 was discussed and tentative agreement was reached.

A meeting was held with the USGS personnel to discuss laboratory testing of hydrologic properties. Areas of responsibility were discussed and overlap areas of testing resolved. An inventory of the laboratory hydrologic testing previously performed and to be performed by SNL was provided to the USGS.

Recommendations were made on the implementation of a continuum approach to flow in a fractured, porous medium. The approach is to be used in COVE3, a near-field hydrothermal problem being numerically solved by participants from SNL, Los Alamos, and Lawrence Berkeley Laboratory (LBL). A meeting was held at LBL on June 14 to define the approach to the participants.

Gas-permeability data have been analyzed and the Knudsen diffusion coefficient was estimated. A value of 3.2×10^{-7} m²/s was estimated for water vapor.

The codes PETROS and ARRAYF are continuing to be used to investigate near-field hydrothermal effects. A CRAY version of PETROS has been supplied by Lawrence Livermore National Laboratories.

Equipment Engineering

The first draft of the horizontal, waste emplacement, equipment conceptual design report has been completed.

Fabrication of the development prototype horizontal drill will begin following contract placement.

An advertisement has been placed in the Commerce Business Daily soliciting engineering support for the design of the equipment sets for vertical and horizontal waste emplacement. The result of this engineering effort will be a design in detail sufficient to ensure equipment function, predict performance, and estimate costs.

The possibility of using gypsum for grouting the annulus between the borehole liners and the boreholes is being investigated. This material exhibits a number of attractive features: a neutral pH, easy pumpability, and low adhesion. SNL staff visited the firm that produces this gypsum to obtain additional information.

Seal Performance Requirements

The report entitled, "Hydrologic Calculations to Evaluate Backfilling Shafts and Drifts for a Prospective Nuclear Waste Repository in Unsaturated Tuff" (SAND83-2465) was published.

Preliminary performance-assessment calculations were made using the radionuclide-release model developed to determine the amount of water that can enter the repository without exceeding the applicable criteria. This calculation will form the basis for the sealing-requirements report.

Seal Materials Evaluation

Pennsylvania State University (PSU) has (1) completed a draft revision of the report, "Preliminary Survey of the Stability of Silica-Rich Cementitious Mortars [82-22, 84-12] with Tuff," which contains a considerable amount of new material; (2) completed revision of the report, "Mechanical Compatibility of Seal Materials with Tuff"; and (3) continued work on the "Position Paper on Seal Degradation." The first report describes the stability of materials at elevated temperatures in contact with J-13 ground water and in contact with tuff. Concerning the "Position Paper on Seal Degradation," further testing of the computer model for fluid flow in porous media was completed. The model was evaluated for the dependence upon initial porosity, temperature, and fluid pressure.

Operations and Maintenance

At a June 25-26 planning meeting for the Prototypical Spent Fuel Consolidation Equipment Demonstration Program (PCDP), two MRS operating scenarios were discussed. In the first, consolidated-fuel rods would be loaded in a repository-specific disposal container and stored at the MRS until shipment to the repository. In the second scenario, fuel rods would be stored in modular (probably wedge-shaped) canisters that would later be shipped to the repository, where they would be loaded in the disposal containers. The NNWSI Project spent-fuel canister design is not well suited to either of these scenarios because the central void of the container would not be used for hardware waste (from the fuel-disassembly operation). This is one of the principal features of the NNWSI Project design.

Repository Performance Code Development and Certification

Papers entitled, "Measurement and Calculation of the Mechanical Response of a Highly Fractured Rock" (SAND84-2020C) and "Calculation of Laboratory Stress-Strain Behavior Using a Compliant-Joint Model" (SAND84-7210C) were presented at the 26th U.S. Symposium on Rock Mechanics, Rapid City, South Dakota on June 25-28.

PLANNED WORK

Upcoming work for the MRS/Repository Interface Task Force includes: (1) exchange general design drawings from all A/Es (07/02/85); (2) prepare and distribute final network schedule (07/09/85); (3) design reviews (07/09/85-07/10/85); (4) complete A/E engineering design and draft of facilities description (07/18/85); (5) estimate cost of A/E reports completed (08/15/85); and (6) complete final report (08/30/85).

As part of the Seismic Study for this WBS task, exploratory borehole UE 25-RF3, located approximately in the center of the preferred location for repository surface facilities, will be deepened until a definitive stratigraphic marker is identified. The hole bottomed in a tuffaceous rock in the 1984 exploratory-drilling effort, but the stratigraphic position relative to other units is unknown.

Seismic-refraction studies in the preferred surface-facility site will start in late July 1985, concentrating on the definition of the subsurface geometry and velocity profiles.

Ten of the 12 holes that are being drilled from the U12g.12 drift into the welded-tuff mining area have been completed. G-Tunnel will be closed for the first two weeks of July 1985. It is expected that the remaining two holes will be completed during that month.

Work on Laboratory Properties of Tuff planned for July through September 1985 includes (1) continuation of parameter-effects testing at RE/SPEC and SNL, (2) completion of a draft report on the laboratory-determined bulk, thermal, and mechanical properties of the Topopah Spring Member, (3) preparation of a draft report on the thermal conductivity and thermal expansion of lithophysae-rich Topopah Spring Member, (4) continuation of the heat-capacity study of tuff samples from Yucca Mountain, and (5) revision of Chapter 2 (Geoengineering) of the SCP.

Contracts for laboratory services to measure relative permeability and determine pore-size distributions are in the process of being placed. Samples of tuff have been identified for testing which will begin after the completion of contract placement and review of quality-assurance procedures.

The study on the use of a trolley-wire system for powering the waste transporter will be completed in July 1985.

The "Horizontal Waste Emplacement Equipment Development Plan" (Milestone N406) has an estimated completion date of September 30, 1985.

The report entitled, "Reactivity of a Tuff-Bearing Concrete: C1-40 Con 14" is being revised by PSU and is expected in late July 1985. The "Letter Report on the Identification of Low Temperature Mineral Phases Compatible with Sealing Material" is being written and completion is expected by August 1985.

Bechtel National Inc. is preparing a plan for the Bow Ridge (and other) fault characterization (Milestone N447, WBS 1.2.4.1). This plan, which has a scheduled completion date of September 30, 1985, will form the basis for the work for this WBS task, the preliminary validation of faults and the tectonic environment for the repository surface facility.

A contractor report on the various options for mining and removal of mined material is under way. This report is scheduled for completion before September 30, 1985. It will be used as a reference for the Site Characterization Plan and Conceptual Design Report.

PROBLEM AREAS

The MRS Repository Interface Task Force network schedules were issued by SNL on June 21. During development of these networks, a problem appears to have surfaced. All A/E firms will have draft facility descriptions completed by July 18, 1985 and the engineering work will also be completed except for some schedules. However, the cost information will not be available until mid-August 1985. Therefore, the group responsible for the final report will not have sufficient time to assess cost and schedule impacts, and develop and publish the report by August 30, 1985. To provide sufficient time, it was suggested that the A/E firms have their report text material available by July 19, 1985 and the schedule and cost information available in sufficient form for use by July 31, 1985. It was further suggested that the design-concept group meet early the week of August 5, 1985 to prepare their input for the report preparation group.

Milestone M444, Update on Rockmass Properties for Conceptual Design, will probably be delayed past the due date of September 30, 1985.

Work has continued on the final report for the heated-block experiments, but progress has been slowed because of the unavailability of help. It is expected that the first draft will be complete near mid-July 1985. It is doubtful that reviews of a document of this size can be completed and that corrections can be made to meet the July 31, 1985, date for Milestone M433. It was requested that the deadline be extended one month.

Since the same principal investigator is involved in preparing the final report for Milestone N444, G-Tunnel Small-Diameter Heater Experiments, it was requested that the due date for this milestone be extended the same amount of time.

Equipment problems at RE/SPEC and a shortage of experienced technicians at SNL have resulted in delays in the testing program to determine the effects of variation in testing parameters (pressure, temperature, strain rate, and saturation) on the mechanical properties of the welded Topopah Spring Member. Completion of the test series is now anticipated to be in early FY 86.

Involvements with the SCP and the response to Los Alamos on Quality Assurance levels for the Exploratory Shaft (Milestone N411) will delay completion of the sealing-requirements report by at least 3 months.

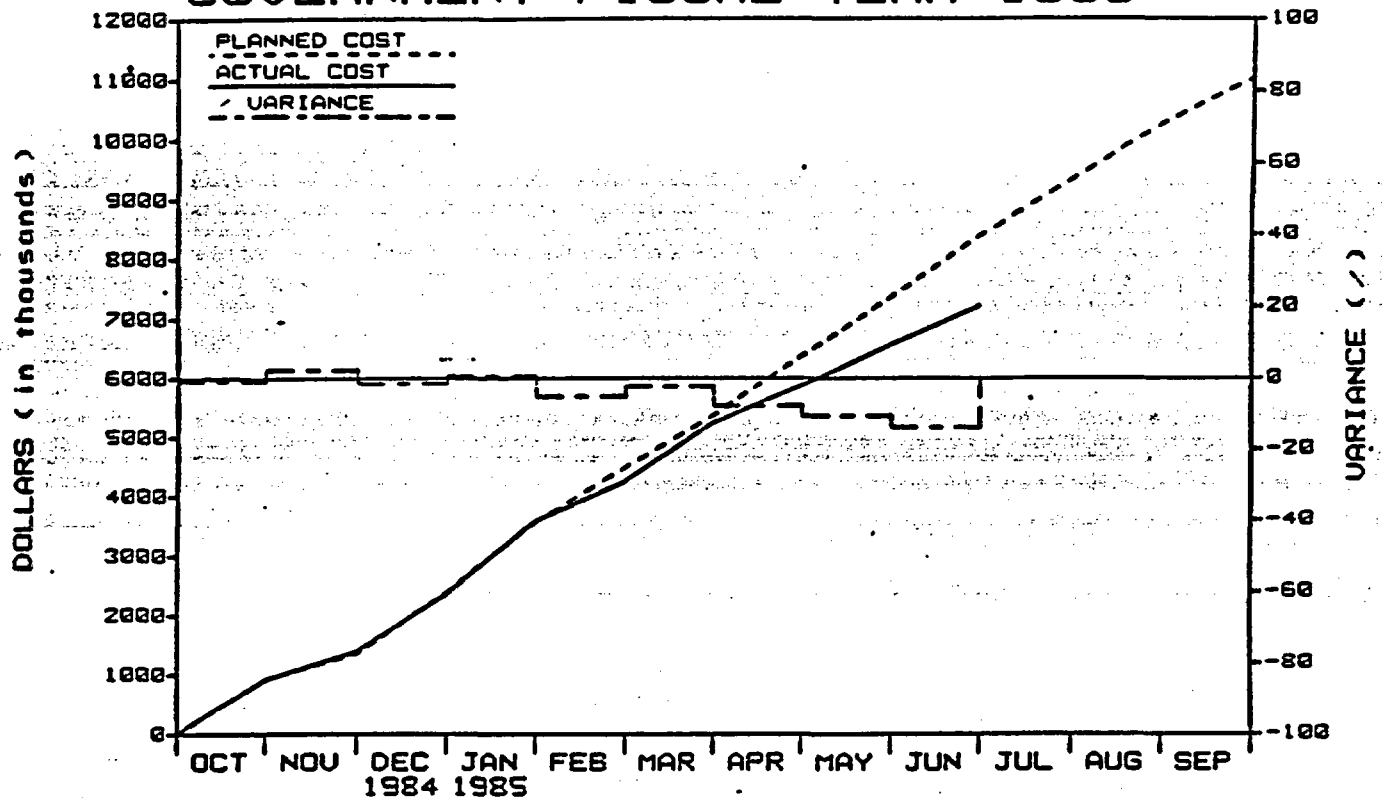
Work by RE/SPEC on repository performance code development and certification is being delayed until FY 86 because of budgetary constraints.

Papers entitled, "Measurement and Calculation of the Mechanical Response of a Highly Fractured Rock" (SAND84-2020C) and "Calculation of Laboratory Stress-Strain Behavior Using a Compliant-Joint Model" (SAND84-7210C) were presented at the 26th U.S. Symposium on Rock Mechanics in Rapid City, South Dakota on June 25-28, 1985.

A delay is expected in preparation of the report entitled, "Summary Report on Thermomechanical Analysis as SCP Reference" (M491) due September 30, 1985.

**WBS X.2.4 REPOSITORY INVESTIGATIONS
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.4 REPOSITORY INVESTIGATIONS GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	917	1359	2388	3565	4492	5388	6374	7362	8384	9329	10253	11011
COST (x1000)	909	1392	2344	3592	4256	5256	5876	6575	7224	0	0	0
VARIANCE (x1000)	8	-33	36	-27	236	124	498	787	1160	0	0	0
% VARIANCE	-1	2	-2	1	-5	-2	-8	-11	-14	0	0	0

VARIANCE EXPLANATION: Underrun is due to subcontractor costs not being received in time for June costing and the redirection of work effort to the SCP. Also, no final consolidation study has been done. The variance should decrease over the next few months as subcontractor costs are received.

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
N406	SNL	12.4	Horizontal Waste Emplacement Equipment Development Plan										△		
M447	SNL	12.4	Seal Development Plan for Repository		◆										
M430	SNL	12.4	Start Repository Conceptual Design												△
M432	SNL	12.4	NWWSI Project Site Specific Repository Design Concept Rpt.												△

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.5 REGULATORY/INSTITUTIONAL

OBJECTIVE

The objective of the Regulatory/Institutional task is to provide the capability for interfacing with all the institutions and to meet the requirements identified in various laws and regulations pertaining to the siting, design, and construction of a nuclear waste repository and a test and evaluation facility. The principal laws and regulations which govern the licensing of these include the Atomic Energy Act of 1954, the National Environmental Policy Act (NEPA) of 1969, and the Nuclear Waste Policy Act (NWPA) of 1982, 10 CFR Part 60, and 40 CFR Part 191.

ACTIVITIES

Site Characterization Plan

The internal review of SCP Chapter 2 (Geoengineering) was completed on June 19. Chapter 7 (Waste Package) was reviewed by the Working Group coordinator, revised by the author, and distributed to the Internal Review Committee (IRC). A review meeting has been scheduled for July 17-19. Chapter 3 (Hydrology) has been reviewed by the coordinator and returned to the author for completion. The internal review cycle has been started for chapters 3 and 5, as well as sections 8.4 and 8.7, with the Internal Review Committee meetings scheduled for the end of July. As of June 30, twenty-one Information Need Data Outlines had been received from the participants. The number represents 19 percent of the 109 Information Needs that will be discussed in Section 8.3 of the SCP.

SCP schedule changes have been suggested which will hold the schedule to the March 28, 1986, DOE/HQ approval date. The suggestions included grouping chapter reviews and limiting the length of time required for HQ reviews.

Regulatory Analysis and Control Program

Input to the EA Comment Response Appendix (CRA) is nearing completion. A findings analysis workshop has been scheduled for July 15 and 16 to discuss the findings on geohydrology, climatic changes, and tectonics. The workshop will include only NNWSI Project participants.

The seismic/tectonic working group met on June 5, 20, and 21. The preparation plan for the completion of the seismic/tectonic position paper was drafted at the June 5 meeting.

A study of SNL record-management needs was completed and a proposal for an interim records-management system was drafted and sent to SAIC. The proposal details the major tasks to be accomplished.

An Information Management Task Force was established to evaluate existing information management systems in anticipation of instituting a Licensing Information Management System (LIMS) for the NNWSI Project. A meeting with two systems and licensing representatives from SAIC/Clearwater was held from June 26 to 28 to assist in determining the LIMS requirements.

Several draft sections of the Regulatory Compliance Plan were received for internal review and integration. A representative of the T&MSS Regulatory Compliance staff met with SAIC/McLean staff members in Washington to evaluate progress and begin work on the remaining sections of the plan.

A NRC proposed rule on the use of radioactive material in well logging and tracer studies (10CFR39) was reviewed and comments were submitted to DOE/HQ. Applicability of the proposed rule to DOE site characterization activities is questionable. If applicable, the rule could result in delays in mitigating certain logging activities since NRC or state permission may be required.

A draft of NNWSI Project procedures for implementation of the DOE/NRC agreement has been completed and is in review.

Environmental Assessment

The NNWSI Project Management Plan for preparation of the final Environmental Assessment was revised and sent to WMPO for review and approval on June 28. The first draft of the EA Comment Response Appendix (CRA), reviewed by the TOC in May, was sent to DOE/HQ for review on June 3. The final EA schedule was changed to December 20, 1985.

PLANNED WORK

The draft Comment/Response Appendix to the final Environmental Assessment will be sent to DOE/HQ by August 8, 1985.

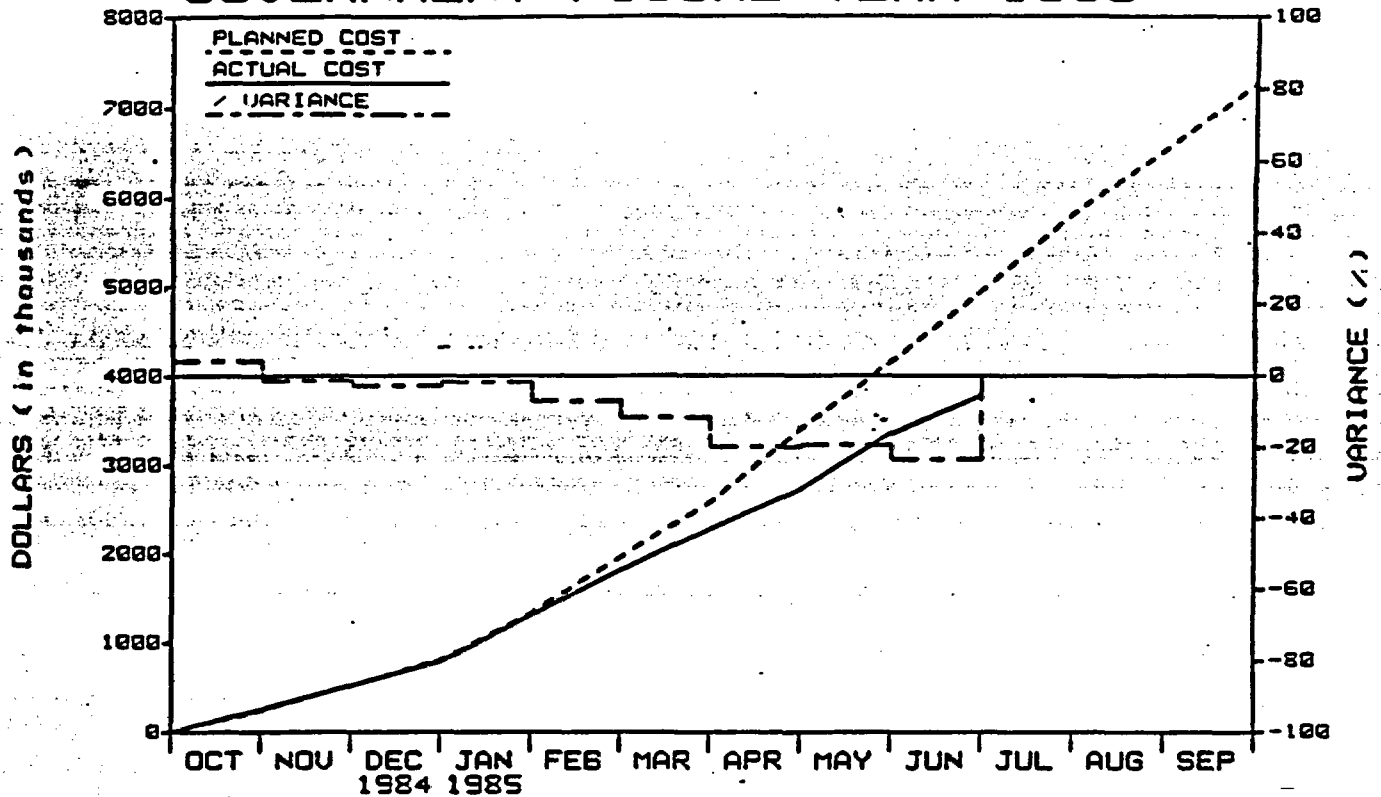
Work continued on the Environmental Permitting Plan that is being prepared to identify permits for the site characterization activities and explain the procedures necessary for WMPO to follow to obtain each permit. A draft of the plan will be sent to WMPO for review in July 1985.

PROBLEM AREAS

None.

**WBS X.2.5 REGULATORY & INSTITUTIONAL
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.5 REGULATORY & INSTITUTIONAL GOVERNMENT FISCAL YEAR 1985



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PLAN (x1000)	245	522	805	1328	1953	2576	3406	4164	4952	5810	6522	7255
COST (x1000)	255	515	783	1306	1816	2275	2734	3361	3791	0	0	0
VARIANCE (x1000)	-10	7	22	22	137	301	672	803	1161	0	0	0
VARIANCE (%)	4	-1	-3	-2	-7	-12	-20	-19	-23	0	0	0

VARIANCE EXPLANATION: Underrun is due to being behind schedule on the SCP and laboratories are not meeting their deliverables. Also, costs for the State Grant are well below the planned amount.

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
M523	SAIC	12.5	NWWSI Project References for EA Complete		◆										
M502	SAIC	12.5	Draft Environmental Assessment		▲										
M504	SAIC	12.5	Final Environmental Assessment								△				
M503	SAIC	12.5	EA Comment/Response Document								△				

△ PLANNED MILESTONE COMPLETION DATE
 ▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
 ◆ COMPLETED AS REVISED

X.2.6 EXPLORATORY SHAFT

OBJECTIVE

The objective of this task is to identify and plan the tests that need to be conducted at the repository horizon as a part of detailed site characterization and to design and construct the Exploratory Shaft (ES) and the underground test area in Yucca Mountain. The primary focus of this effort will be to establish the basis for evaluating the unsaturated zone in a welded tuff formation. In addition, an effort will be made to define the nature of the unsaturated zone with regard to water content and water movement, and the nature of the natural barriers between the repository horizon and the static water level.

ACTIVITIES

Exploratory Shaft Facility (ESF)

Los Alamos finished the review of the ESF subsurface facilities design drawings and specifications issued to date. Most comments center around poor drafting practices that make it hard to follow the design; but some comments do concern major issues such as the adequacy of the shaft steel design, the ventilation system, and the hoisting system. Los Alamos is also having Stearns-Catalytic (Denver) independently review the design. A Design Review Comment Resolution Meeting on the ESF subsurface facilities design is planned for July 1-2, 1985, at DOE/NTSO in Mercury.

The plan to pipe the ESF liquid waste (mine waste water and sewage) off the repository block is still being evaluated. USGS has requested that this be done to prevent downward seepage of the liquid waste because it could affect their hydrological test results.

A meeting was held on June 17 in Mercury to discuss the status of the shaft sinking subcontract with Wendall Marrs, REECO.

The joint DOE/NRC workshop on the NNWSI ESF design, originally planned for June 11-12, has been rescheduled to August 27-28.

Exploratory Shaft Test Plan

A working draft of the ESTP Rev. 1 was delivered to the ESTP Committee members on June 18. Except for Chapter 5 (Rationale) and Appendix B (Costs and Schedules), drafts of all sections of the Rev. 1 document are complete and are being reviewed.

Exploratory Shaft Integrated Data System

Los Alamos sent a letter to SAIC, beginning formal coordination of the weather monitoring system. The weather system installed by SAIC as a part of the meteorological monitoring plan will also supply required data to the IDS for use by the PIs.

Engineered-Barrier Design Testing

Trial measurements with high frequency electromagnetic (HFEM) geotomography methods proceeded this month. Continuous wave and time delay spectroscopy methods are being examined for their ability to detect an approximately planar anomaly in a pit of moist sand. Comparison of tomographs before and after removal of the anomaly indicate that the HFEM technique can effectively detect such features without systematic errors.

Tests of USBM borehole deformation gauges in a heated environment are being planned, but may be delayed. Design calculations of gauge and test fixture deformations under thermal loads are nearly complete. The test fixture will retain the gauge contact buttons while the gauge is subjected to a controlled cycle of heating and cooling over a period of several weeks. The observed gauge behavior will provide a basis for possible modification of the gauge design.

Analysis of the rock mass response to heating and cooling during the Waste Package Environment Tests will require that the rock mass modulus of deformation be determined at actual test locations. An NX borehole jack is being evaluated as a means of making these measurements.

The draft conceptual test plan for the Waste Package Environment Tests has been approved by LLNL for use in ESTP Rev. 1, and has been submitted to WMPO. Thermomechanical scoping calculations using a finite element code were also completed this month. The results supersede the analytic solutions that were used in preparation of the initial drafts of the conceptual test plan.

Revised budget estimates were prepared at WMPO request in anticipation of a possible six-month delay in the start of the Exploratory Shaft.

The abstract entitled, "Conceptual Plan for Tests of the Waste Package Environment at Yucca Mountain" was withdrawn from the agenda of the "International Symposium on Coupled Processes Affecting the Performance of a Nuclear Waste Repository." The Symposium format had been changed to preclude presentation of contributed papers by their authors. Members of the professional staff did, however, participate in the 26th U.S. Symposium on Rock Mechanics. A paper entitled, "Preliminary Evaluation of Alterant Geophysical Tomography in Welded Tuff" was presented at the meeting.

PLANNED WORK

The completion date for the NRC/DOE ES design workshop (Milestone M026) is August 30, 1985; the date is tentative since it is subject to Headquarter control. Milestone M248 tracks with this milestone. (Milestone M613) The revised subsurface Title II design for subcontractor bid package and revised surface Title II design (Milestone M642) are scheduled to be completed on August 30, 1985.

A draft of Chapter 5 of the ESTP will be completed and sent for committee review in early July. A first draft of Appendix B (Costs and Schedules) will also be prepared and sent for review. A revised executive summary will be

completed by July 11 for review and comment. Final comments/changes to the Rev. 1 draft will be incorporated as appropriate into the final Rev. 1 document scheduled for completion on July 22, 1985.

Work will begin on the draft Final IDS Hardware Design Document. This document will describe the ES IDS hardware by location within the complex, and the design will match the requirements of the Rev. 1 Test Plan.

Plans for tests of USBM gauges will be completed and implemented as soon as possible. Tests of HFEM techniques in the sand pit will continue. More conventional geophysical techniques will be screened for possible use in the ES Tests.

Work on the test plan for the Waste Package Environment Tests will proceed in parallel with development of Revision 1 of the ESTP. As ESTP Rev. 1 is completed, the focus of test plan development will switch to preparation for the upcoming NRC/DOE workshop on the ESTP.

PROBLEM AREAS

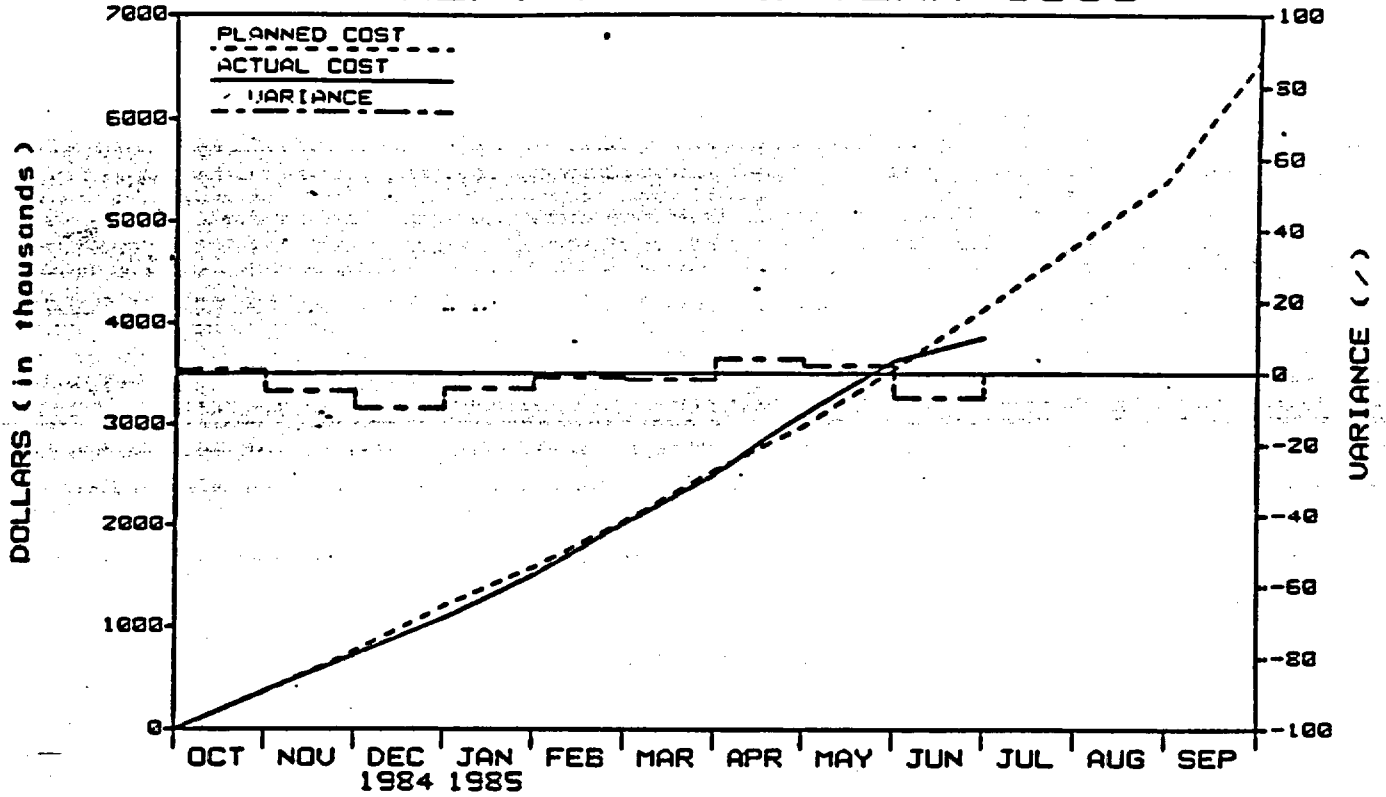
The adequacy of the structural steel in ES-1 is being investigated by Stearns-Catalytic. There is a difference of opinion between F&S and REECO on the analysis of the structure. Stearns-Catalytic investigated the matter as an independent third party at the request of DOE/NTSO. Stearns-Catalytic preliminary conclusion was that the structure is adequate, although several practices were not followed in the design.

The draft ESTP Rev. 2, Milestone M665, has been delayed, because Rev. 1 has not been completed.

Instrument evaluations that support test plan development have been delayed because some personnel have been diverted to other NNWSI Project activities.

**WBS X.2.6 EXPLORATORY SHAFT
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.6 EXPLORATORY SHAFT GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	366	762	1194	1573	2042	2546	2978	3542	4130	4747	5384	6555
COST (x1000)	370	724	1076	1504	2020	2502	3095	3619	3846	0	0	0
VARIANCE (x1000)	-4	38	118	69	22	44	-117	-77	284	0	0	0
% VARIANCE	1	-5	-10	-4	-1	-2	4	2	-7	0	0	0

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION														
				O	N	D	J	F	M	A	M	J	J	A	S		
M666	LANL	12.6	Issue Exploratory Shaft Test Plan														△

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.7 TEST FACILITIES

OBJECTIVE

The major objective of this task is the design, construction, and operation of the test facilities that support technology development for other waste management programs and other geologic repository projects. The two major facilities operated under this WBS element are the Climax Spent Fuel Test Facility and the E-MAD Facility.

ACTIVITIES

Spent Fuel Test-Climax

Efforts continued to focus on analysis of the results of post-test thermal and thermomechanical calculations and reporting on the results of post-test laboratory and field studies.

Instrumentation Report No. 3: "Performance and Reliability of Instrumentation Deployed for the SFT-C" has been submitted to the printer.

Geological Investigations

Final peer reviews were completed for a report on the results of in situ deformability measurements at the SFT-C. This report documents nearly 250 deformability measurements which show the effects of loading direction, heat, proximity to major geologic features, and the general spatial variability of the deformability throughout the region of the test.

The pretest and post-test deformability measurements obtained at the SFT-C are also being used to evaluate the efficacy of a data screening technique which was recently proposed as an ASTM Standard method. The draft report on this subject was prepared this month and is being reviewed and revised.

Post-Test Instrumentation Evaluations

Peer and project reviews were completed for a draft report, "Laboratory Evaluations of the U.S.B.M. Gauge," on USBM overcore gauge (2.7.2.1-85-IV-2). The report was submitted to the WMPO/NV for programmatic review on June 11.

In support of the continuing investigation of a proposed ASTM deformability data-screening criterion, two computer codes were written and tested to digitally simulate how the criterion operates. The study shows that, for typical data sets, the screen retains a significant percentage of data which should have been rejected while discarding a significant percentage of data which should have been retained. This finding adds further support to earlier assessments that the screening criterion should not be recommended for use in high-modulus materials such as granitic rocks.

Post-Test Calculations

A draft report summarizing the results of recently completed ADINA/ADINAT calculations of the thermomechanical response of the SFT-C neared completion this month. The calculations use ranges of deformability and in situ stress values to assess how well the rock mechanical response was modeled with the input data obtained from both pretest and post-test measurements at the site.

Work began on analyses of geomechanical data that were acquired during the three-year heating phase and six-month cooling phase of the SFT-C. Plots of all the data to be used in these analyses were prepared. An annotated outline was developed to guide the report preparation. Trends that have been discerned in data plots from individual instruments are now being integrated in order to understand overall rock mass behavior.

Data Management

Plotting production files were developed and modified for use by an automated plotting routine. These plots are being prepared for the dual purposes of data analysis and for release to the technical community in a composite data report.

Public Information Activities

Photographs and background materials were forwarded to F. Baum, Mechanical Engineering Magazine, at his request. This journal is beginning a series of special issues on the management of hazardous and nuclear wastes.

Background materials on the SFT-C were forwarded to WMPO for use in preparing a presentation to the LBL Symposium on Coupled Processes in Geologic Materials.

E-MAD

All E-MAD fuel assemblies are now stored in the Hot Bay Lag Storage Pit. No canister temperatures were recorded on fuel assemblies B02, B03, B43, D01, D04, D09, D15, D16, D18, D22, D34, D40, D46, and D47, and fuel rods G9 and J8 from fuel assembly B02.

All canisterized fuel assemblies located in the Lag Storage Pit are in a safe configuration. The maximum recorded canister temperatures are well below the canister design limits. All monitored fuel assemblies reflect a normal profile over the past month. Thermal monitoring of two fuel assemblies took place from May 29 through June 25.

Post-test characterization was performed on fuel assembly B02, which was utilized in the two-year metal cask simulation test. The fuel surfaces were videotaped, photographed, and visually examined; and surface contamination swipe samples were acquired and are being analyzed. PNL representatives were at E-MAD for special examination of the fuel assembly.

An operational plan has been drafted for replacing the two B02 fuel rods which were removed prior to installation of the fuel assembly in the fuel temperature test assembly. These activities are tentatively scheduled for late July.

Post-test characterization has been completed on fuel assemblies D18 and D35 to document their current condition. There are now four fuel assemblies at E-MAD to be removed from weld-sealed canisters and characterized.

Evaluation of calorimeter data was completed and changes have been made to the operating and heat rate calculation methods. The calorimeter system is operational.

The consolidated procedure for decay heat-rate measurement of fuel assembly D34 was revised to reflect direction of the E-MAD Health and Safety Committee that the calorimeter system be attended and the HVAC be in operation at any time the total system heat input is above 0.6kW (boiling). The operations were indefinitely postponed from June 25/26 because of higher priority activities.

PLANNED WORK

Spent Fuel Test-Climax

Efforts will focus on analysis of geomechanical data obtained at the SFT-C. Draft reports on the post-test thermal and thermomechanical analyses will be prepared. A report evaluating proposed data screening criteria for the NX borehole jack will be drafted.

E-MAD

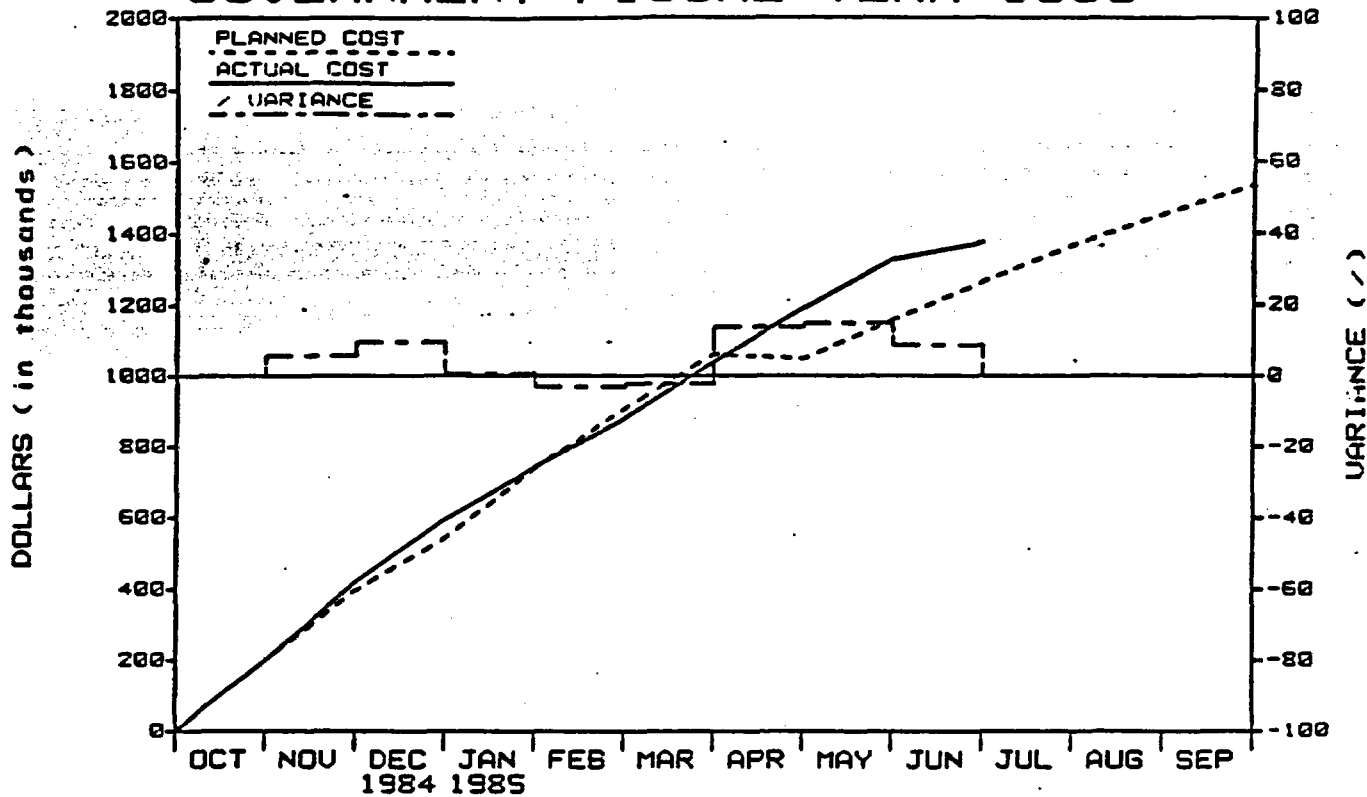
Plans are to continue monitoring fuel assemblies D06 and B41, to replace B02 fuel rods removed prior to metal cask simulation tests, to decanisterize fuel assemblies D40 and D46, perform characterization, and install the fuel assemblies in temporary canisters, issue Contract Deliverable letter report of integrity monitoring results and assessment for the first half of FY 85, and to perform decay heat rate measurement of fuel assembly D34.

PROBLEM AREAS

None.

**WBS X.2.7 TEST FACILITIES
GOVERNMENT FISCAL YEAR 1985**

WBS X.2.7 TEST FACILITIES GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	197	397	543	737	907	1061	1048	1157	1265	1365	1452	1535
COST (x1000)	197	420	595	742	879	1038	1191	1328	1374	0	0	0
VARIANCE (x1000)	0	-23	-52	-5	28	23	-143	-171	-109	0	0	0
VARIANCE	0	6	10	1	-3	-2	14	15	3	0	0	0

MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
M708	LLNL	12.7	Final Report on the SFT-C												△

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

X.2.8 LAND ACQUISITION

OBJECTIVE

The objective of this task is to maintain access to land adjacent to the Nevada Test Site that is controlled by the U.S. Air Force and the Bureau of Land Management and to protect land that could be used for a high-level waste repository and the surrounding buffer zones.

ACTIVITIES

None

PLANNED WORK

To be included in future NNWSI Project Monthly Reports.

PROBLEM AREAS

None

X.2.9 PROGRAM MANAGEMENT

OBJECTIVE

The objective of this task is to manage all activities of the NNWSI Project by all contractors. The five major areas identified are Project Management, Project Control, Interface Activities, Quality Assurance, and Generic Requirements Document (GRD) Support.

ACTIVITIES

Project Monitoring System

The report entitled, "Performance Measurement System Study, Final Report" dated June 8 was released on June 18. The report completed Milestone 716 and Phase I of the earned value project. Phase II began May 31.

Updates of WBS Baselines were forwarded to participants during June.

An updated list of NNWSI Project baselined milestones that reflects CCB approved changes through May 30, 1985, was distributed to participants.

Project Documentation System

A copy of the draft PMP was sent to Vince Cassella at the request of M. Kunich on June 30. The copy is unofficial and is not intended to elicit DOE/HQ comment.

Administrative procedures for the NNWSI APM will be updated and submitted for review and approval as changes occur. The boiler plate changes will be made annually in January of each year. The existing August 1985 update has been changed to January 15, 1986.

Quality Assurance

WMPO approval was granted for T&MSS QAPP (Rev. 2) and twenty (20) QPs on June 28. The QAPP and QPs will be issued as controlled documents early next month.

The status of the unissued NNWSI Project-wide implementing procedures (SOPs) are as follows:

NNWSI-SOP-17-01, QA Records Management

Work is proceeding on schedule at USGS/Denver on the development of a QA Records Management pilot system. One working session between USGS and ESI was completed and several more sessions are scheduled.

NNWSI-SOP-03-02, Quality Assurance Software

A committee meeting was held on June 18 to thoroughly review the draft written by John Evans based on the committee recommendations and decisions from the May 16, 1985, meeting in Livermore. The result is a consensus document that meets the requirements of the NUREG 0856.

The final SOP has been drafted to incorporate the final committee recommendations and decisions from the June 18 meeting. Committee members will review the draft and submit comments for discussion at the next meeting that will be held on July 29, 1985, in Denver. A copy of the draft was sent to DOE/HQ OGR for comment. A copy was also sent to the NRC with an invitation to observe at the next committee meeting.

NNWSI-SOP-03-03, Non-NNWSI QA Plan Data for Interpretation Acceptance

A decision is pending regarding the status of public domain documents. The concern is whether the documents (technical journal articles, theses, reports) should be processed in accordance with the procedure.

NNWSI Project Audits

Status of FY 85 audits is as follows:

5-1 WMPO Internal - Audits & Surveillances

The audit was conducted on April 10 and 11, 1985. Three audit findings and two observations were reported. The findings are presently being resolved.

85-2 WMPO Internal - Organization and Training

The audit was conducted on May 1 and 2, 1985. Three audit findings and two observations were reported. The findings are presently being resolved.

85-3 WMPO Internal - NCR and CAR

The audit was conducted on May 8 and 9, 1985. One audit finding and three observations were reported. The finding is being resolved.

85-4 WMPO Internal - Document Control and Records

The audit was conducted on May 22, 1985. There were three observations reported that do not require a response. The audit is closed.

85-5 WMPO Internal - Document Review

The audit was conducted on May 23 and 30, 1985. There was one observation reported that does not require a response. The audit is closed.

85-6 The LLNL audit will be conducted on July 9, 10, and 11, 1985.

85-7 The WTSD-Westinghouse audit will be conducted on July 23, 24, and 25, 1985. A letter of notification has been sent and audit plans have been written.

Review of Project Participants QAPPs and Implementing Procedures

The status of reviews is as follows:

- LLNL The LLNL QAPP and procedures received by WMPO to date have been reviewed and approved.
- USGS The review was completed by SAIC on February 11, 1985. WMPO sent comments to USGS on February 20, 1985, requesting resolution of comments within thirty days. A response from USGS was received in a letter dated March 22, 1985. The letter responded to the comments but indicated that the USGS would prefer to take additional time to prepare a new QAPP that includes the QPs and meets the requirements of NVO-196-17. At that time, the expected date of completion of the new documents was in June. The comment resolutions were reviewed and a letter was issued to USGS on April 20, 1985, requesting clarification on several responses and accepting the June 1985 resubmittal date. WMPO has not received a response as of this date.
- Los Alamos The review was completed and sent to LANL on February 25, 1985. A letter from Los Alamos dated March 6, 1985, was received by WMPO that transmitted a complete new plan. The new plan was reviewed and comments were sent to Los Alamos on May 7, 1985. WMPO has not received a response as of this date.
- Westinghouse The QAPP and QA procedures that have been received by WMPO have been reviewed and approved.
- REECo A meeting was held on June 14 during which many open items were resolved; a letter that outlined the resolutions was sent to REECo. WMPO requested that REECo revise their completion dates for their QAPP and procedures. The request was to be discussed by REECo management.
- SNL The WMPO comments to the SNL QAPP and procedures were sent to SNL on June 6.
- F&S A meeting was held with F&S on June 19 to resolve the open items that were a result of the QAPP and QAP review conducted by WMPO. The open issues were discussed with Mike Regenda and most were resolved; however, the issue of the performance of Level I activities will be reviewed by F&S management. The subject of a time table was also discussed. A request was made that a more favorable time table be established by F&S for submittal of revisions to their QAPP and procedures which would allow WMPO enough time to review and approve them prior to the close of FY 85.

SAIC-T&MSS The QAPP and QA procedures that have been received by WMPO have been reviewed and approved.

H&N The review has been completed and comments were sent to H&N on May 10, 1985. WMPO and T&MSS met with H&N on May 31, 1985, to discuss proposed resolution of comments.

PLANNED WORK

The T&MSS FY 85 Audit Program will be revised early next month because of the delay in issuance of the T&MSS QAPP (Rev. 2) and its supporting procedures. A T&MSS Internal Audit is planned for August 1985.

The NNWSI QA Plan and four SOPs (02-01, 02-02, 03-01, and 15-01) are being revised and will be sent to WMPO for review in July.

PROBLEM AREAS

The WBS Dictionary was not baselined during June as planned. The action was postponed until the Change Control Board (CCB) meeting in July so that participants would have additional time for comments.

Comments on the draft Project Management Plan (PMP) have not all been received from within the Project. A new due date for final approval has been established as July 31, 1985.

The Project Plan (PP), is still in the final approval stage.

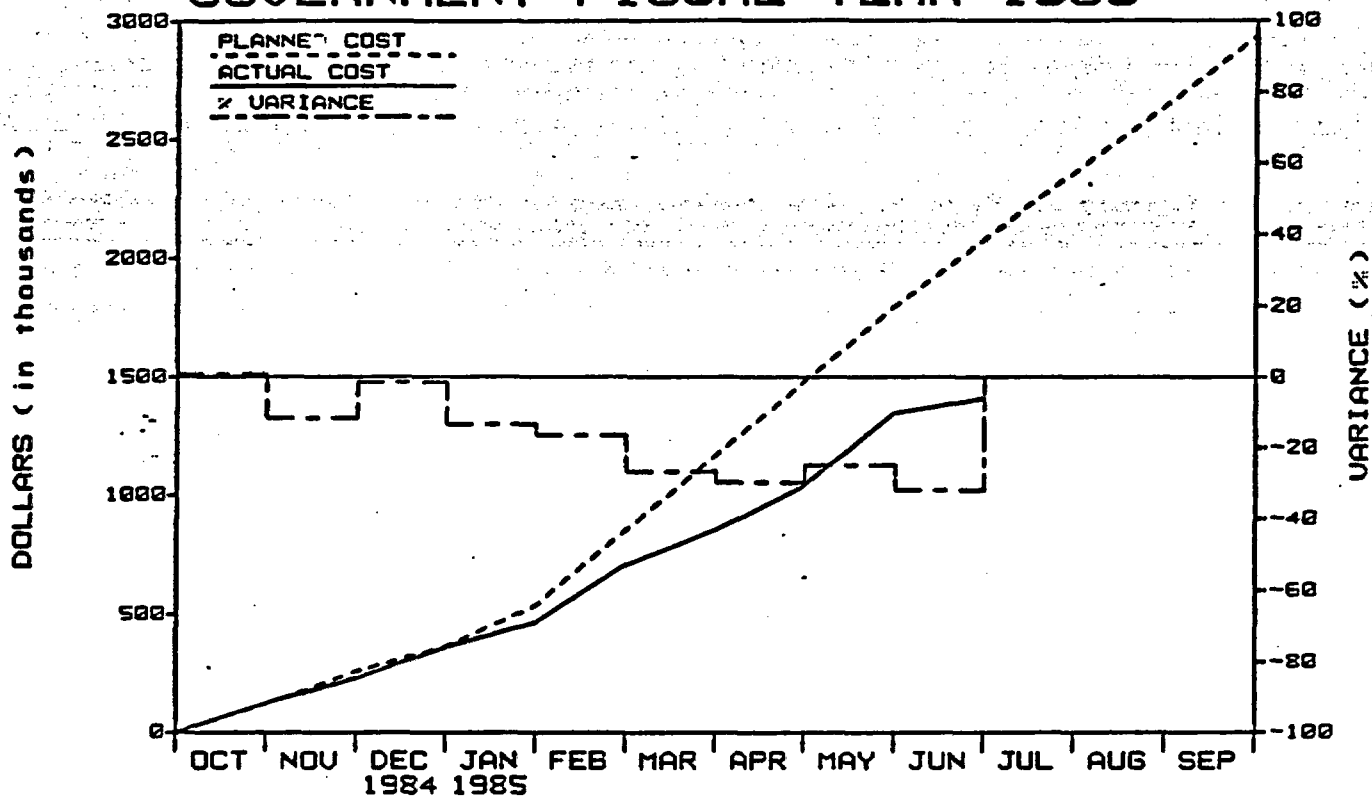
SAIC Nonconformance Report (NCR) SAIC-1 was issued on June 3 against Esterline Angus Instrument Corporation for failure to meet instrument specifications for MMP equipment. Disposition was effected on June 5, approved by the dispositioner and the principal investigator on June 6, and approved by the WMPO Branch Chief on June 26. Verification will be accomplished by Project QA (PQA) upon receipt of a copy of the acceptance test results.

NCR SAIC-2 was processed by the PQA on June 25 for failure to have an approved Quality Level Assignment Sheet (QLAS) and for proceeding with implementation of the Meteorological Monitoring Plan (MMP). Disposition has been approved by the dispositioner, the PQA, and the WMPO Branch Chief and a stop work order was requested.

NCR SAIC-3 was processed by the PQA on June 25 for failure to issue the Environmental Assessment Management Plan (EAMP) and for failure to have an approved QLAS for EAMP activities while their activities are in progress. Disposition has been approved by the dispositioner, the PQA, and the WMPO Branch Chief.

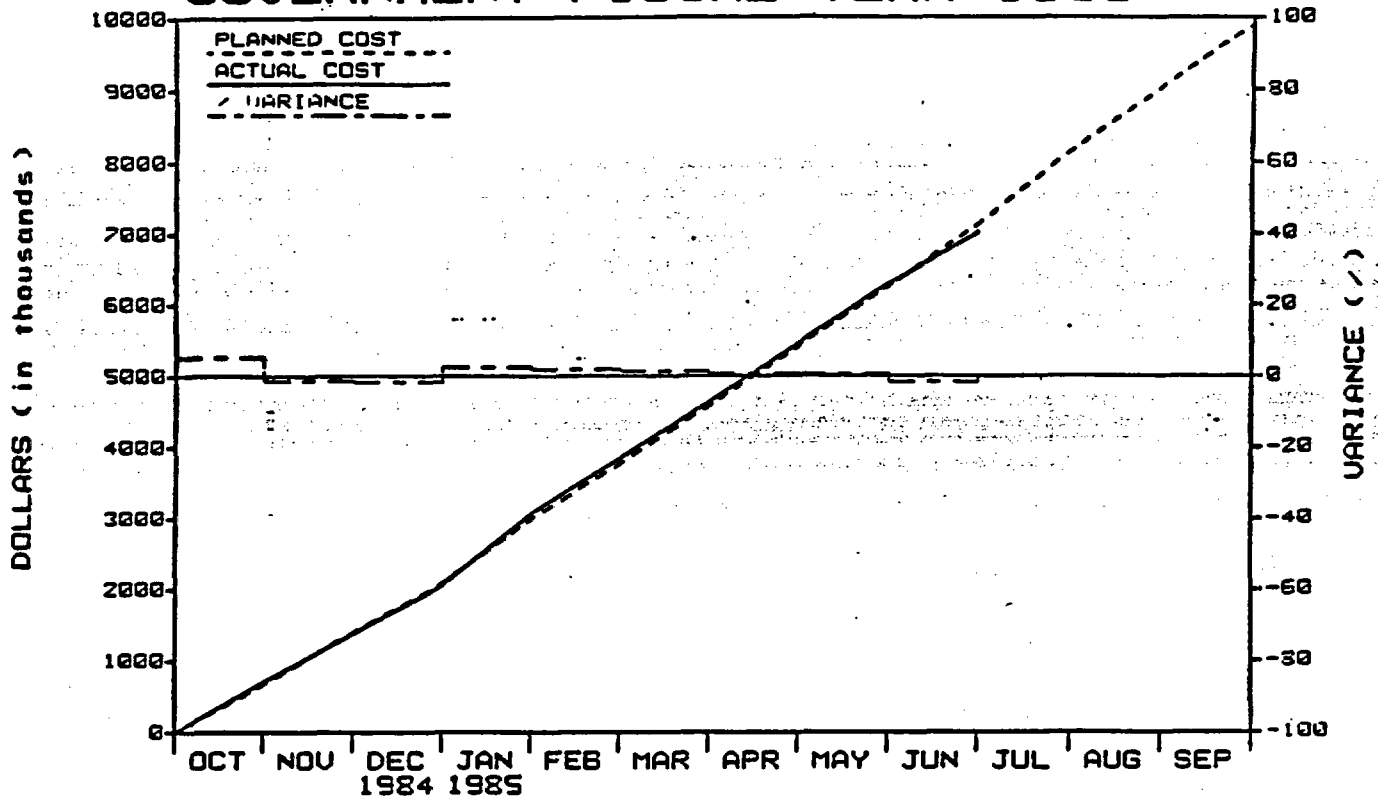
**WBS X.2.9 PROJECT MANAGEMENT
GOVERNMENT FISCAL YEAR 1985**

MISCELLANEOUS CONTRACTORS GOVERNMENT FISCAL YEAR 1985



PLAN (X1000)	122	258	366	536	851	1167	1483	1799	2078	2359	2640	2936
COST (X1000)	123	228	361	463	709	854	1040	1348	1410	0	0	0
VARIANCE (X1000)	-1	30	5	73	142	313	443	451	668	0	0	0
% VARIANCE	1	-12	-1	-14	-17	-27	-30	-25	-32	0	0	0

WBS X.2.9 PROJECT MANAGEMENT GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	663	1397	2086	2985	3764	4579	5415	6260	7136	8147	9022	9905
COST (x1000)	698	1380	2052	3061	3835	4635	5453	6293	7018	0	0	0
VARIANCE (x1000)	-35	17	34	-76	-71	-56	-38	-33	118	0	0	0
% VARIANCE	5	-1	-2	3	2	1	1	1	-2	0	0	0

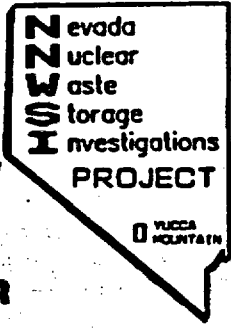
MILE- STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION													
				O	N	D	J	F	M	A	M	J	J	A	S	
M901	SAIC	12.9	Submit FY 1985 NWWSI Project Plan to DOE/HQ	██████████				▲								
M915	SAIC	12.9	Submit NVO-196-18 (Rev. 2) to DOE/HQ	▲												
M907	SAIC	12.9	Draft Project Management Plan					△								

△ PLANNED MILESTONE COMPLETION DATE
▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE
◆ COMPLETED AS REVISED

U.S. DEPARTMENT OF ENERGY

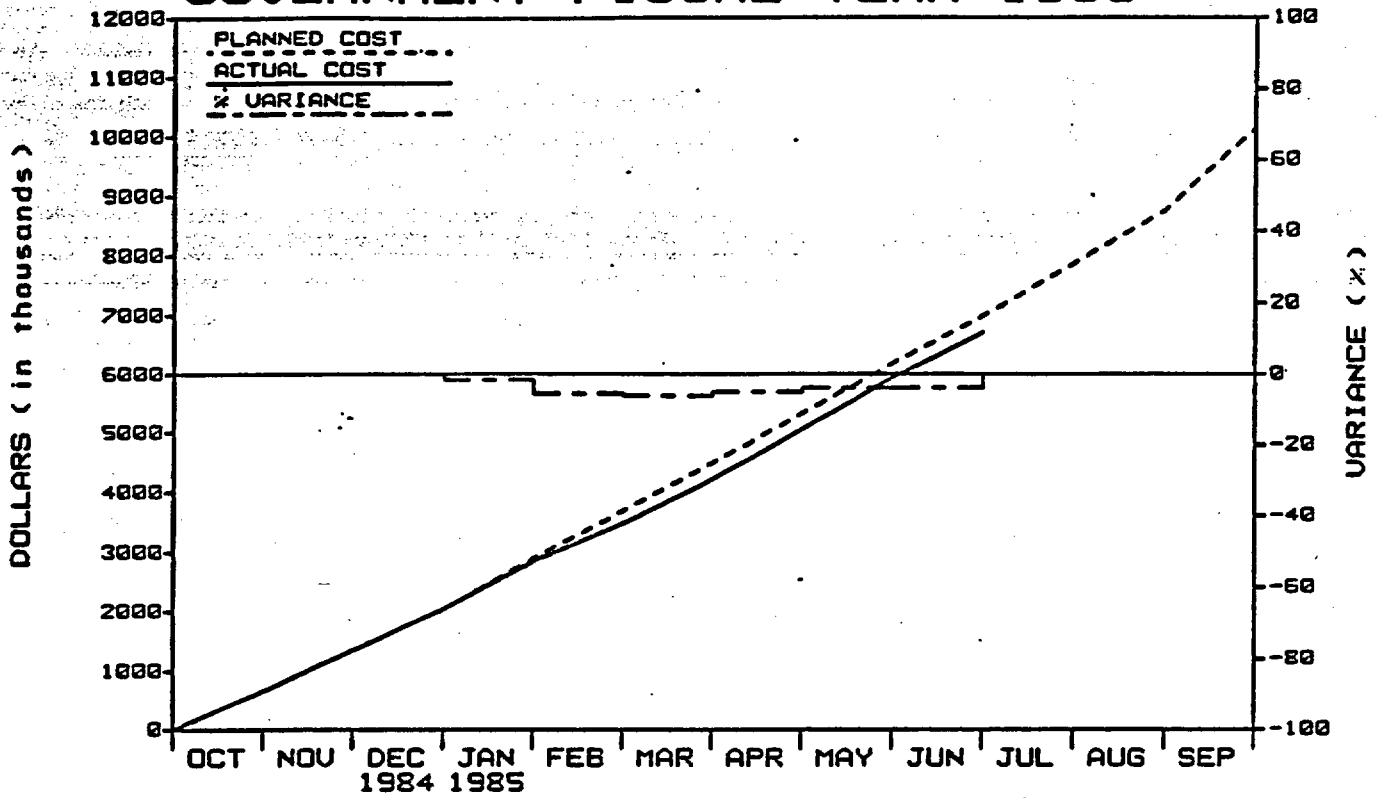
**DOE
OR
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OGR**



PARTICIPANT

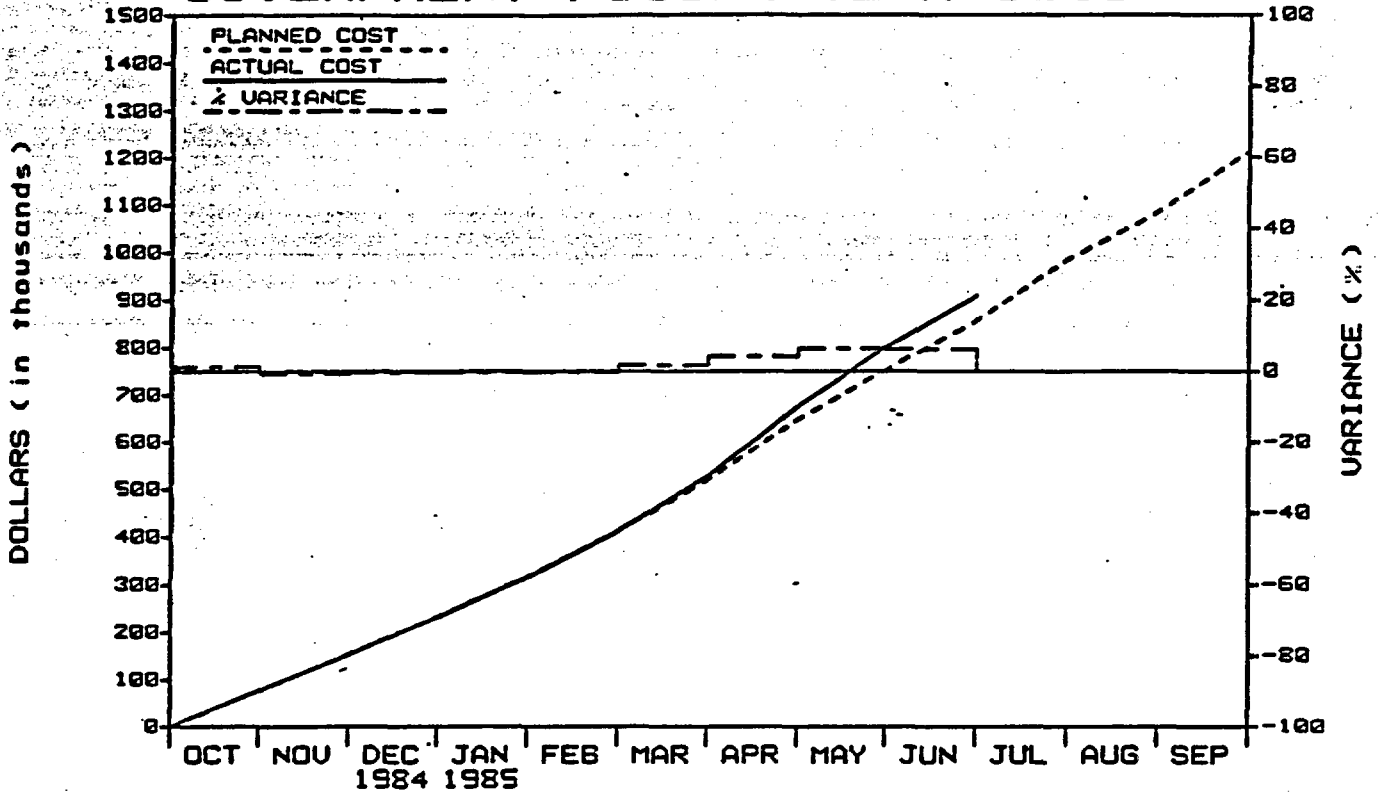
BUDGET vs COST

LOS ALAMOS NATIONAL LABORATORY GOVERNMENT FISCAL YEAR 1985



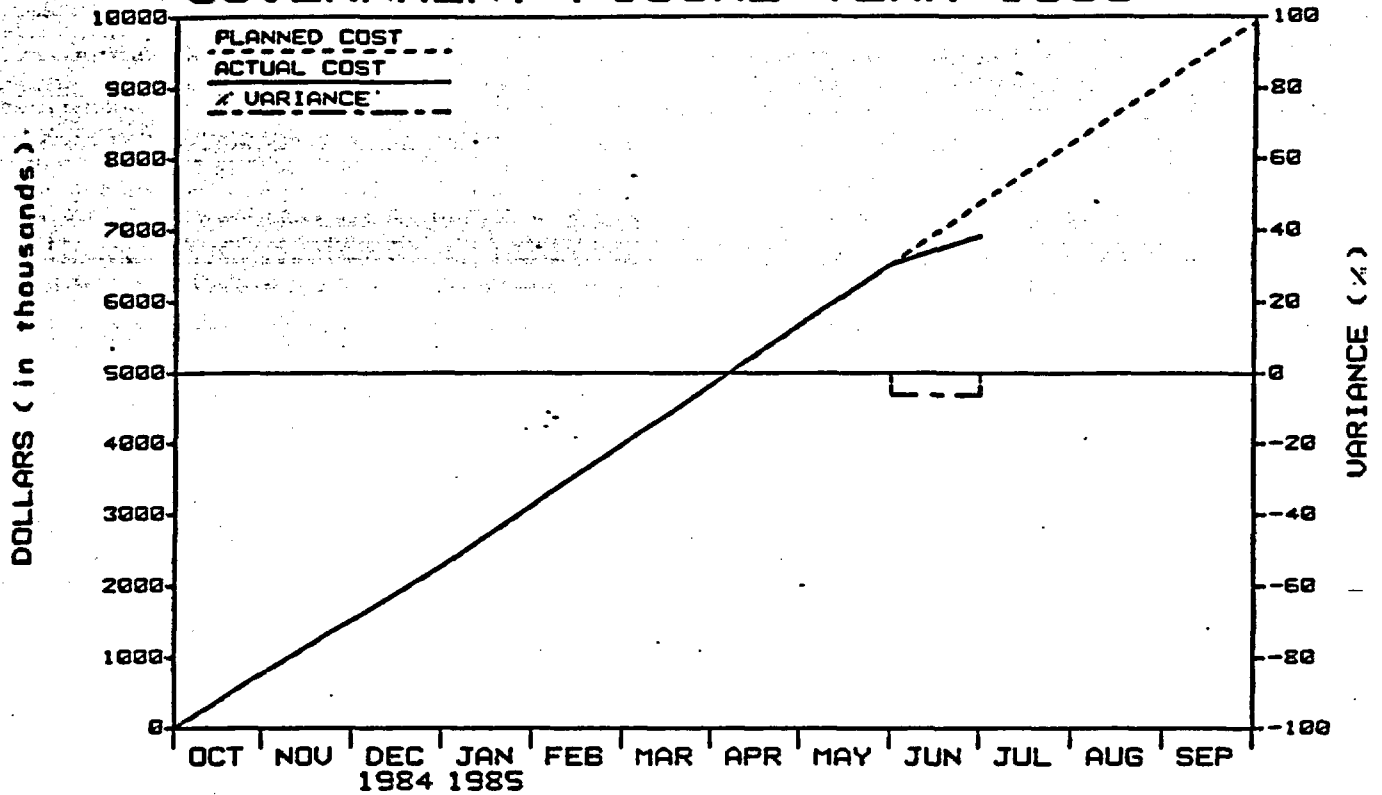
PLAN (x1000)	656	1354	2039	2892	3678	4491	5328	6187	6983	7859	8741	10130
COST (x1000)	656	1354	2039	2842	3471	4213	5060	5941	6700	0	0	0
VARIANCE (x1000)	0	0	0	50	207	278	268	246	283	0	0	0
% VARIANCE	0	0	0	-2	-6	-6	-5	-4	-4	0	0	0

FENIX & SCISSON, INC GOVERNMENT FISCAL YEAR 1985



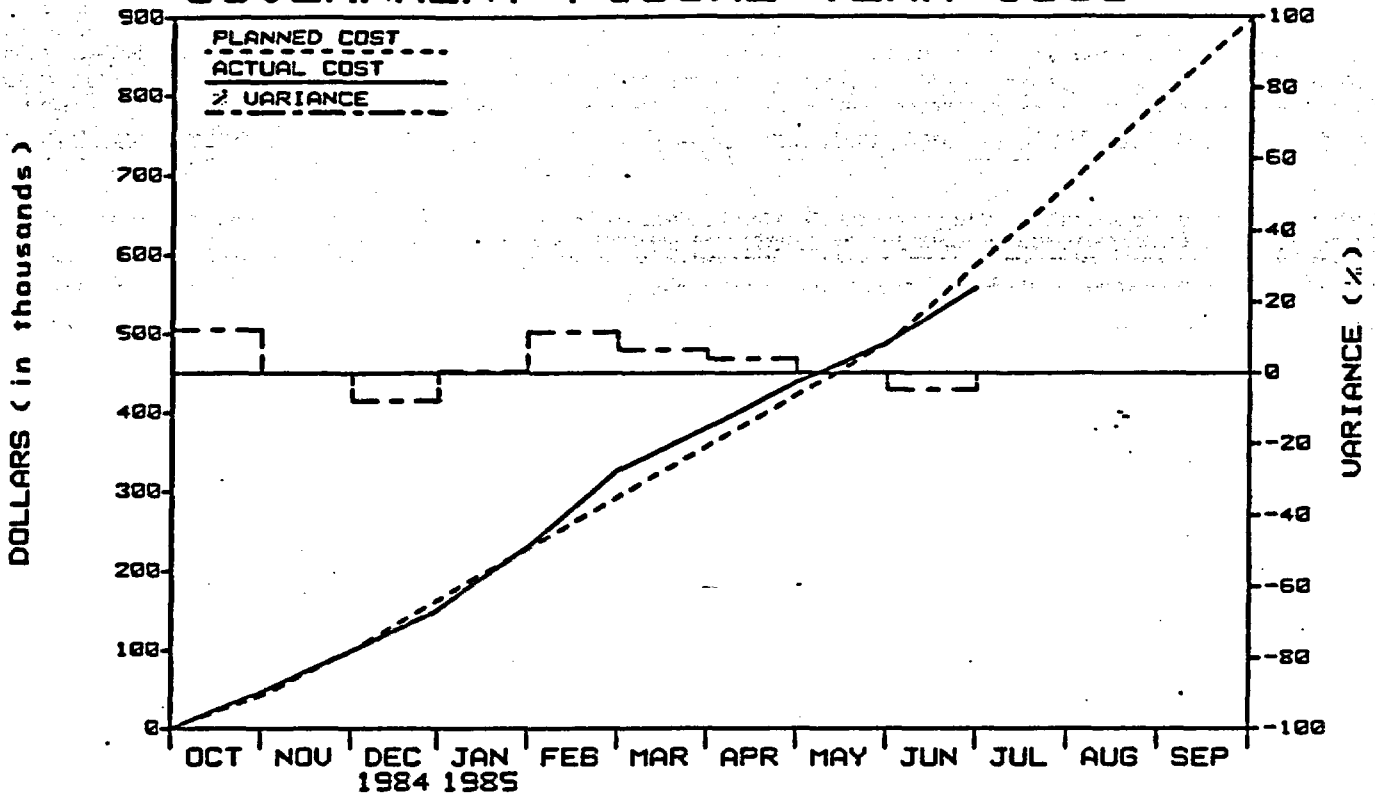
PLAN (x1000)	76	154	232	317	412	519	649	753	857	984	1083	1212
COST (x1000)	77	153	231	316	410	527	676	800	909	0	0	0
VARIANCE (x1000)	-1	1	1	1	2	-8	-27	-47	-52	0	0	0
% VARIANCE	1	-1	0	0	0	2	4	6	6	0	0	0

U. S. GEOLOGICAL SURVEY GOVERNMENT FISCAL YEAR 1985



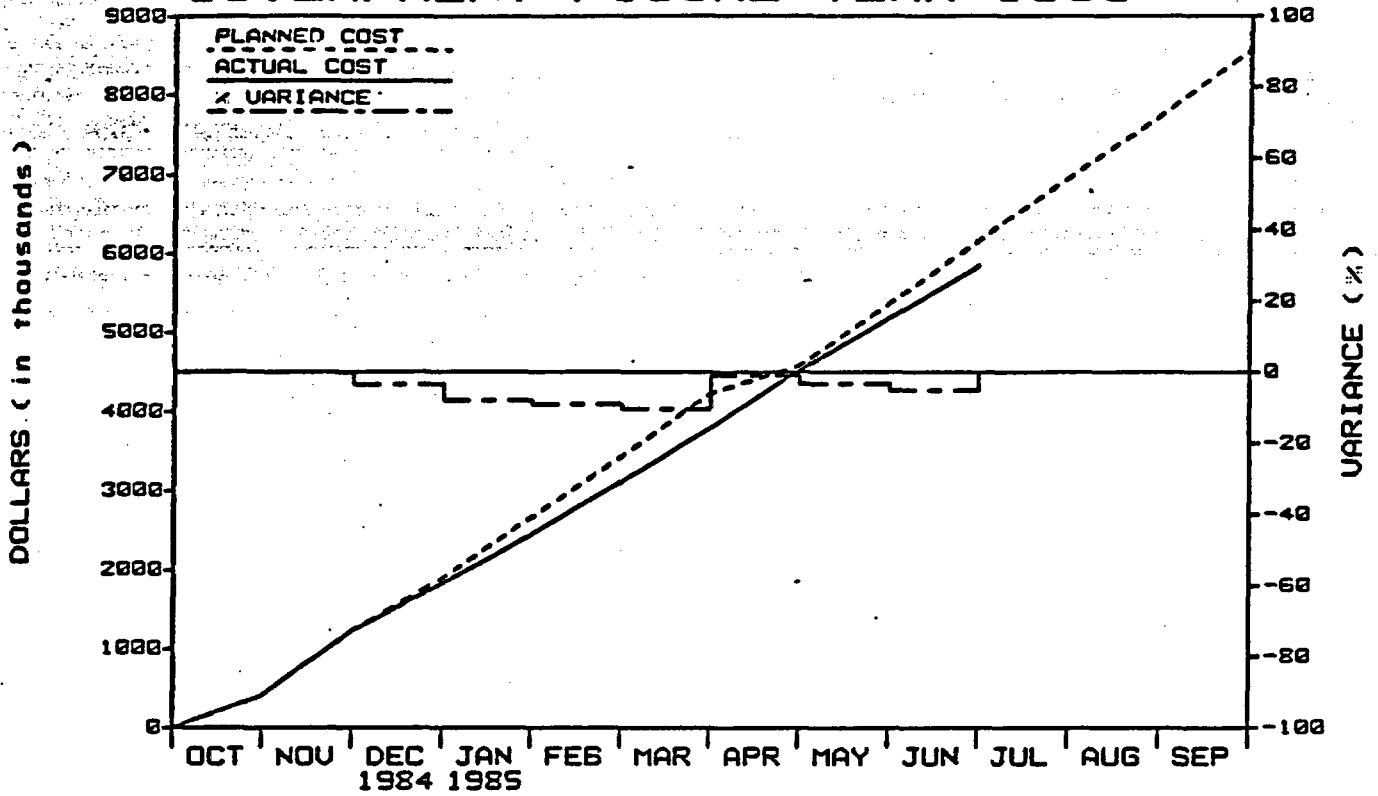
PLAN (x1000)	760	1520	2277	3125	3986	4830	5680	6525	7378	8226	9075	9922
COST (x1000)	760	1520	2277	3125	3986	4830	5680	6525	6911	0	0	0
VARIANCE (x1000)	0	0	0	0	0	0	0	0	467	0	0	0
% VARIANCE	0	0	0	0	0	0	0	0	-6	0	0	0

HOLMES & NARVER GOVERNMENT FISCAL YEAR 1985



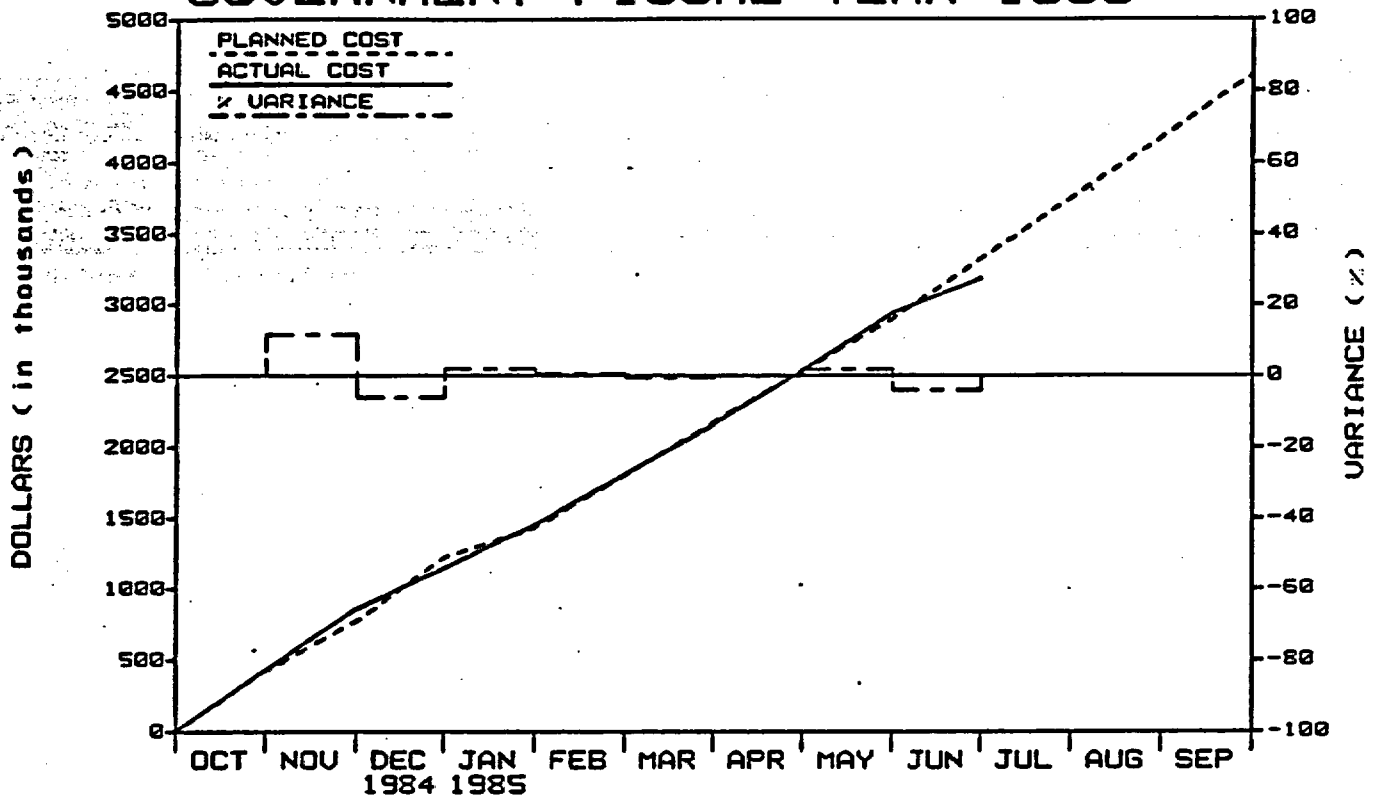
PLAN (x1000)	41	99	164	228	293	357	422	487	587	687	793	898
COST (x1000)	46	99	151	229	327	380	439	488	558	0	0	0
VARIANCE (x1000)	-5	0	13	-1	-34	-23	-17	-1	29	0	0	0
% VARIANCE	12	0	-8	0	12	6	4	0	-5	0	0	0

LAWRENCE LIVERMORE NATIONAL LABORATORY GOVERNMENT FISCAL YEAR 1985



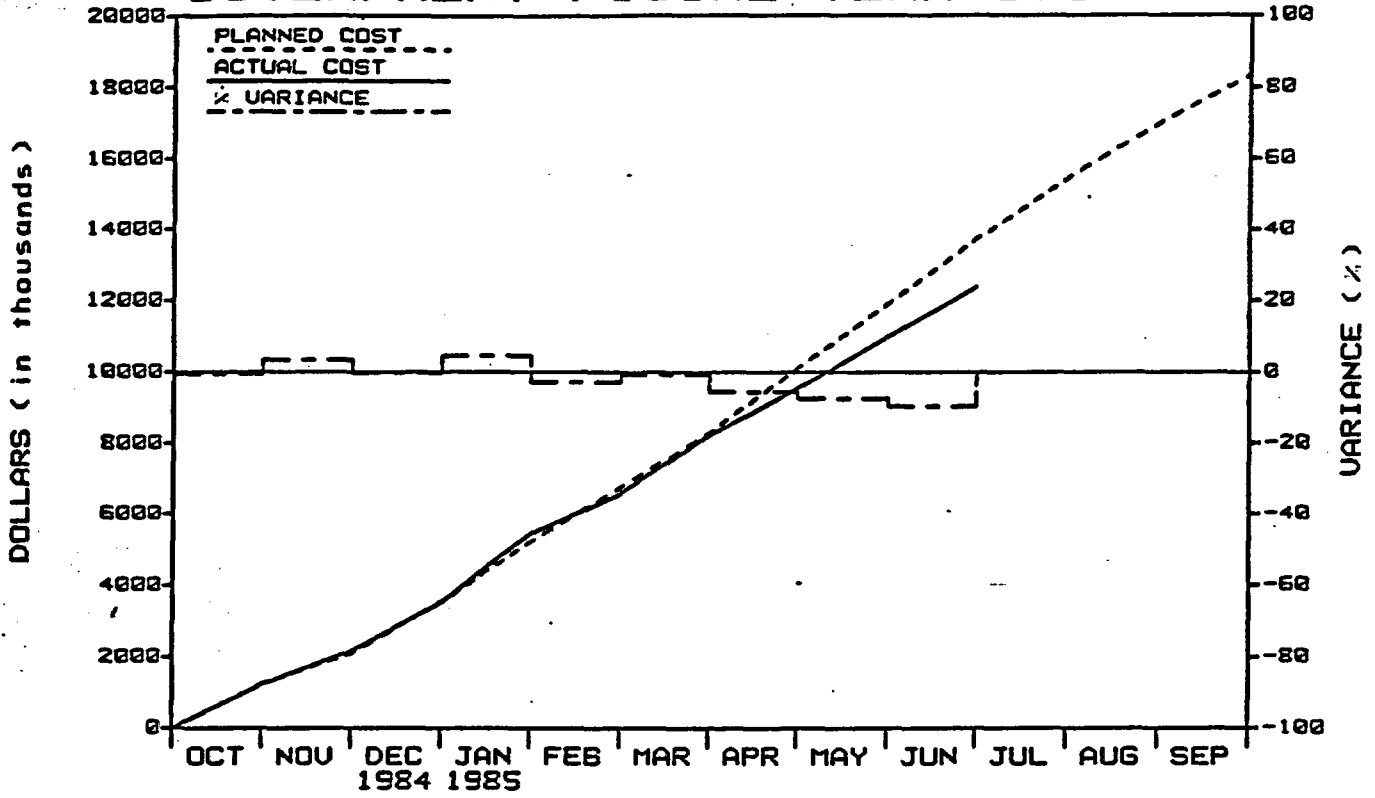
PLAN (x1000)	404	1229	1899	2655	3429	4230	4980	5372	6166	6955	7731	8565
COST (x1000)	404	1226	1829	2437	3113	3785	4526	5190	5843	0	0	0
UARIANCE (x1000)	0	3	70	218	316	445	54	182	323	0	0	0
% UARIANCE	0	0	-4	-8	-9	-11	-1	-3	-5	0	0	0

REECO GOVERNMENT FISCAL YEAR 1985



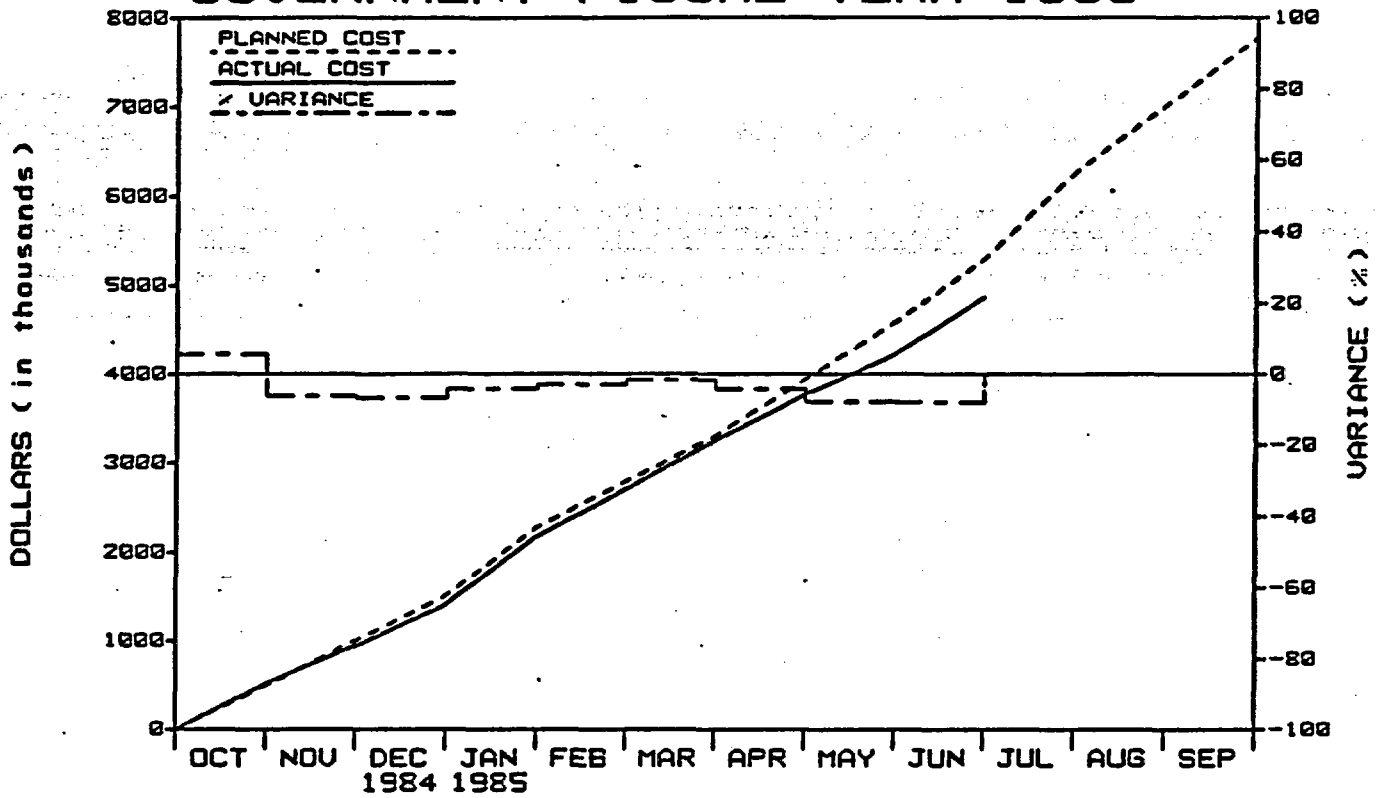
PLAN (x1000)	426	772	1222	1430	1802	2174	2538	2895	3325	3749	4172	4608
COST (x1000)	426	861	1148	1454	1812	2159	2533	2939	3184	0	0	0
VARIANCE (x1000)	0	-89	74	-24	-10	15	5	-44	141	0	0	0
% VARIANCE	0	12	-6	2	1	-1	0	2	-4	0	0	0

SANDIA NATIONAL LABORATORIES GOVERNMENT FISCAL YEAR 1985



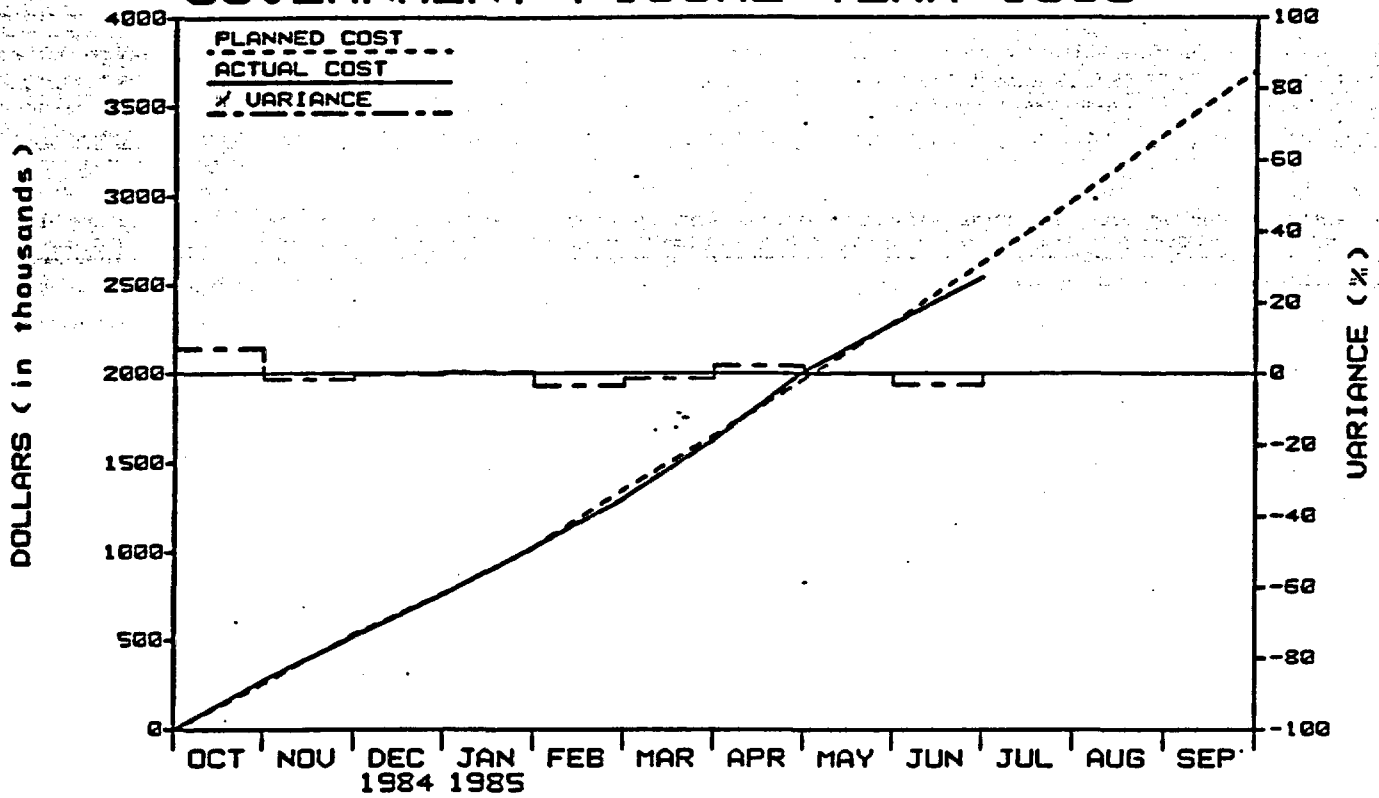
PLAN (X1000)	1240	2091	3527	5197	6736	8289	10115	11898	13722	15429	16976	18334
COST (X1000)	1230	2160	3511	5435	6546	8209	9544	10987	12380	0	0	0
VARIANCE (X1000)	10	-69	16	-238	190	80	571	911	1342	0	0	0
% VARIANCE	-1	3	0	5	-3	-1	-6	-8	-10	0	0	0

SCIENCE APPLICATIONS INT'L CORP. GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	492	1005	1512	2276	2786	3298	3939	4588	5293	6253	7008	7775
COST (x1000)	519	942	1408	2177	2703	3246	3768	4222	4864	0	0	0
VARIANCE (x1000)	-27	63	104	99	83	52	171	366	429	0	0	0
% VARIANCE	5	-6	-7	-4	-3	-2	-4	-8	-8	0	0	0

E-MAD GOVERNMENT FISCAL YEAR 1985



PLAN (x1000)	255	533	764	1024	1346	1649	1966	2285	2627	2975	3342	3700
COST (x1000)	273	524	761	1028	1296	1624	2009	2279	2543	0	0	0
VAR IANCE (x1000)	-18	9	3	-4	50	25	-43	6	84	0	0	0
% VAR IANCE	7	-2	0	0	-4	-2	2	0	-3	0	0	0

June 1985

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
 LEVEL 1 MILESTONES IN A TIME WINDOW OF 01 Oct 1984 TO 30 Sep 1985
 Run Date: 24 July 1985

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINED	HQ PLANNED HQ ACTUAL
System Engineering Management Plan (SEMP)	X.2.1.1.S	Witherill	1	SNL	M108	B	30 Aug 85
Performance Assessment Plan	X.2.1.1.S	Blanchard	1	SNL	N113	B	30 Sep 85
Yucca Mountain Mined Geologic Disposal System Description (System Requirements)	X.2.1.2.1.S	Witherill	1	SNL	M120	B	30 Jul 85
Establish Interim Product Specifications	X.2.2.3.1.L	Valentine	1	LLNL	M250	B	30 Aug 84 12 Apr 85
Input to DOE/HQ Report to Congress on Copper for Waste Packages	X.2.2.3.2.L	Valentine	1	LLNL	M222	B	01 Aug 85
Complete Waste Package Conceptual Design Criteria	X.2.2.4.L	Valentine	1	WMPO	M231	B	15 Jun 85
Initiate Waste Package Advanced Conceptual Design	X.2.2.4.L	Valentine	1	WMPO	M233	B	30 Jun 85
Pre-Closure Analysis of Selected Conceptual Designs	X.2.2.4.L	Valentine	1	LLNL	M251	B	28 Sep 84 20 Dec 84
Progress Report on 3-Dimensional Mineralogic Model of Yucca Mountain	X.2.3.2.A	Blanchard	1	LANL	M355	B	31 Aug 84 10 Oct 84
Weapons Test Seismic Report	X.2.3.2.2.4.S	Blanchard	1	WMPO	M357	B	15 Jan 85 14 Jun 85
Letter Report on Groundwater Chemistry Along Flow Paths	X.2.3.4.1.1.A	Blanchard	1	LANL	M354	B	30 Aug 84 14 Feb 85

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June 1985

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
 LEVEL 1 MILESTONES IN A TIME WINDOW OF 01 Oct 1984 TO 30 Sep 1985
 Run Date: 24 July 1985

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINED	HQ PLANNED HQ ACTUAL
Complete Report on Volcanic Hazards Analysis	X.2.3.6.1.A	Blanchard	1	LANL	M356	B	28 Sep 84 22 Jan 85
Implementation of Meteorological Monitoring Plan	X.2.3.6.1.T	Blanchard	1	SAIC	M364	B	01 Jun 85
Start Repository Conceptual Design	X.2.4.1.S	Skousen	1	SNL	N430	B	30 Sep 85
NNWSI Project Site Specific Repository Design Concepts Report	X.2.4.1.S	Skousen	1	SNL	N432	B	30 Sep 85
Horizontal Waste Emplacement Equipment Development Plan	X.2.4.2.2.1.S	Skousen	1	SNL	N406	B	30 Aug 85
Seal Development Plan For Repository to OCRWM for Review	X.2.4.2.3.1.S	Skousen	1	SNL	M447	B	12 Nov 84 17 Dec 84
Draft Environmental Assessment (Camera ready)	X.2.5.3.1.T	Blanchard	1	SAIC	M502	B	30 Nov 84 29 Nov 84
EA Comment/Response Document	X.2.5.3.1.T	Blanchard	1	SAIC	M503	B	30 May 85
Final Environmental Assessment	X.2.5.3.1.T	Blanchard	1	SAIC	M504	B	20 Jun 85
NNWSI Project References for EA Complete	X.2.5.3.1.T	Blanchard	1	SAIC	M523	B	01 Aug 84 06 Mar 85
Issue Exploratory Shaft Test Plan (ESTP) (NVO-244)	X.2.6.9.1.A	Witherill	1	LANL	M666	B	27 Sep 85

10-12

June 1985

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
LEVEL 1 MILESTONES IN A TIME WINDOW OF 01 Oct 1984 TO 30 Sep 1985
Run Date: 24 July 1985

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINED	HQ PLANNED HQ ACTUAL
Complete Decision Analysis on Use of Climax Facility	X.2.7.1.L	Kunich	1	LLNL	M706	B	15 Oct 84 06 Jul 84
Final Report on the SFT-C	X.2.7.2.1.L	Valentine	1	LLNL	M708	B	30 Sep 85
Draft Project Management Plan	X.2.9.1.T	Kunich	1	WMPO	M907	B	29 Mar 85
Submit FY 85 NMWSI Project Plan to DOE/HQ for Approval	X.2.9.1.1.T	Vieth	1	SAIC	M901	B	15 Mar 85 09 Jan 85
Submit NVO-196-18 (Rev. 2) NMWSI Project Quality Assurance Program Plan and Implementing Procedures to DOE/HQ for Approval	X.2.9.3.T	Blaylock	1	SAIC	M915	B	30 Nov 84 30 Nov 84

NO. MILESTONES IN THIS REPORT: 27

10-13

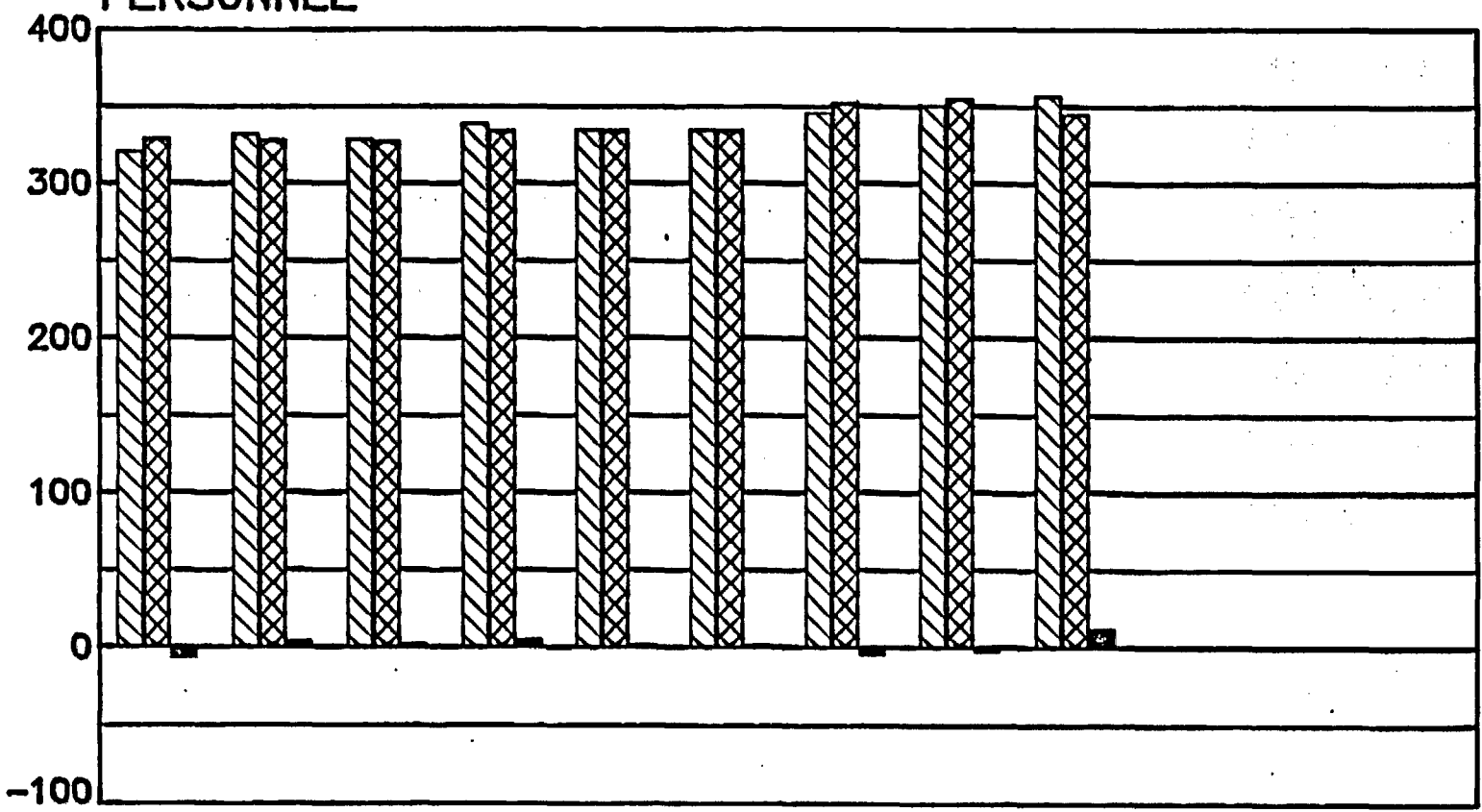
- NNWSI PROJECT STAFFING - FISCAL YEAR 1985

BUDGET


ACTUAL


VARIANCE


PERSONNEL

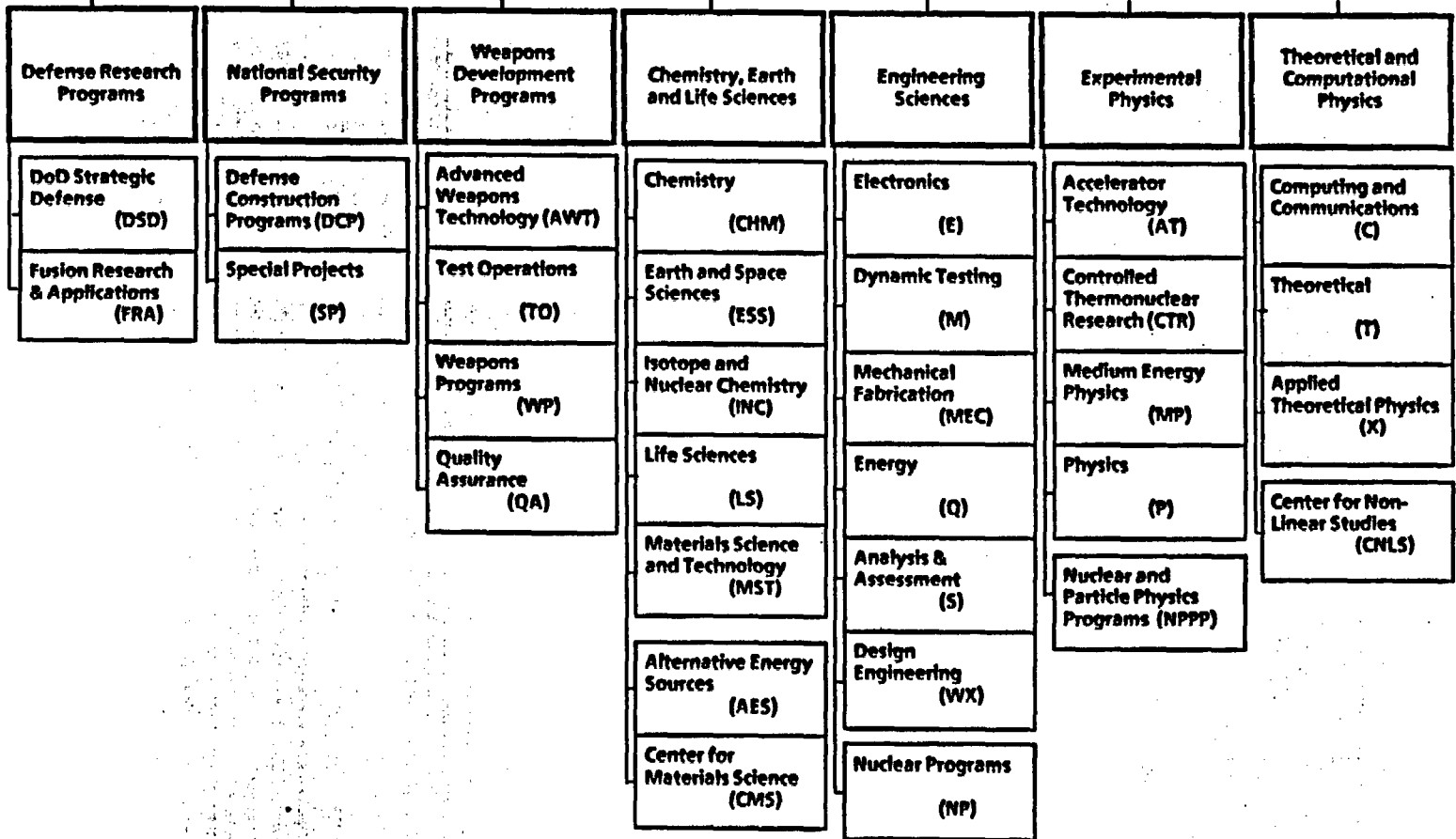


	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
B	321	332	329	339	335	335	346	351	357			
A	329	328	327	334	334	334	352	355	345			
V	-8	4	2	5	1	1	-6	-4	12			

10-10

DIRECTOR
DEPUTY DIRECTOR
EXEC. ASST. DIRECTOR

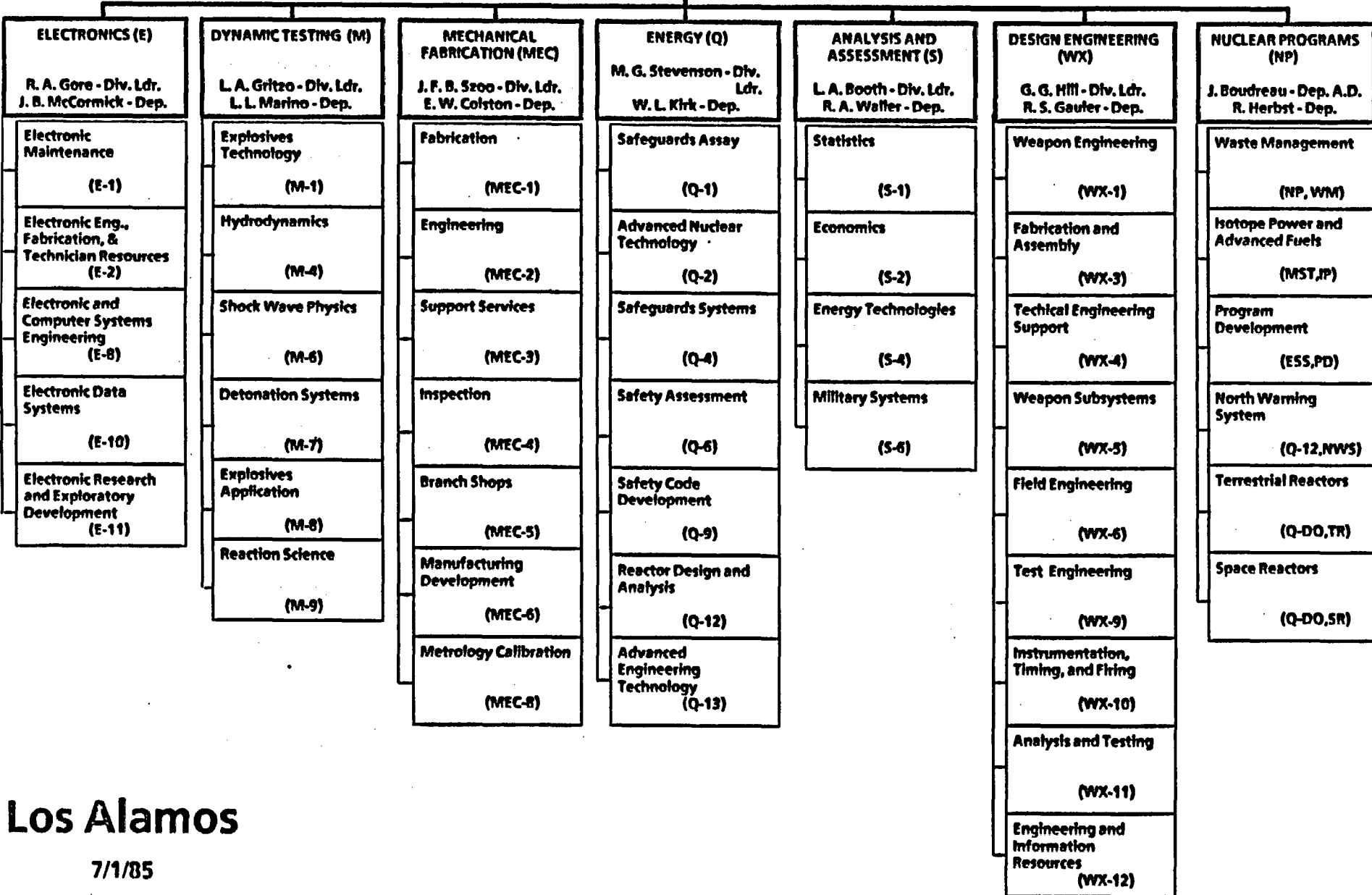
Equal Employment Officer **Industrial and International Initiatives** **Laboratory Counsel** **Planning and Analysis** **Community & Public Affairs Office** **Special Programs** **Institute Geophysics Planetary**



Los Alamos

7/1/85

**ASSOCIATE DIRECTOR
ENGINEERING SCIENCES**
J. F. JACKSON - A. D.
R. B. PERKINS - Dep.



**ASSOCIATE DIRECTOR
CHEMISTRY, EARTH AND
LIFE SCIENCES**

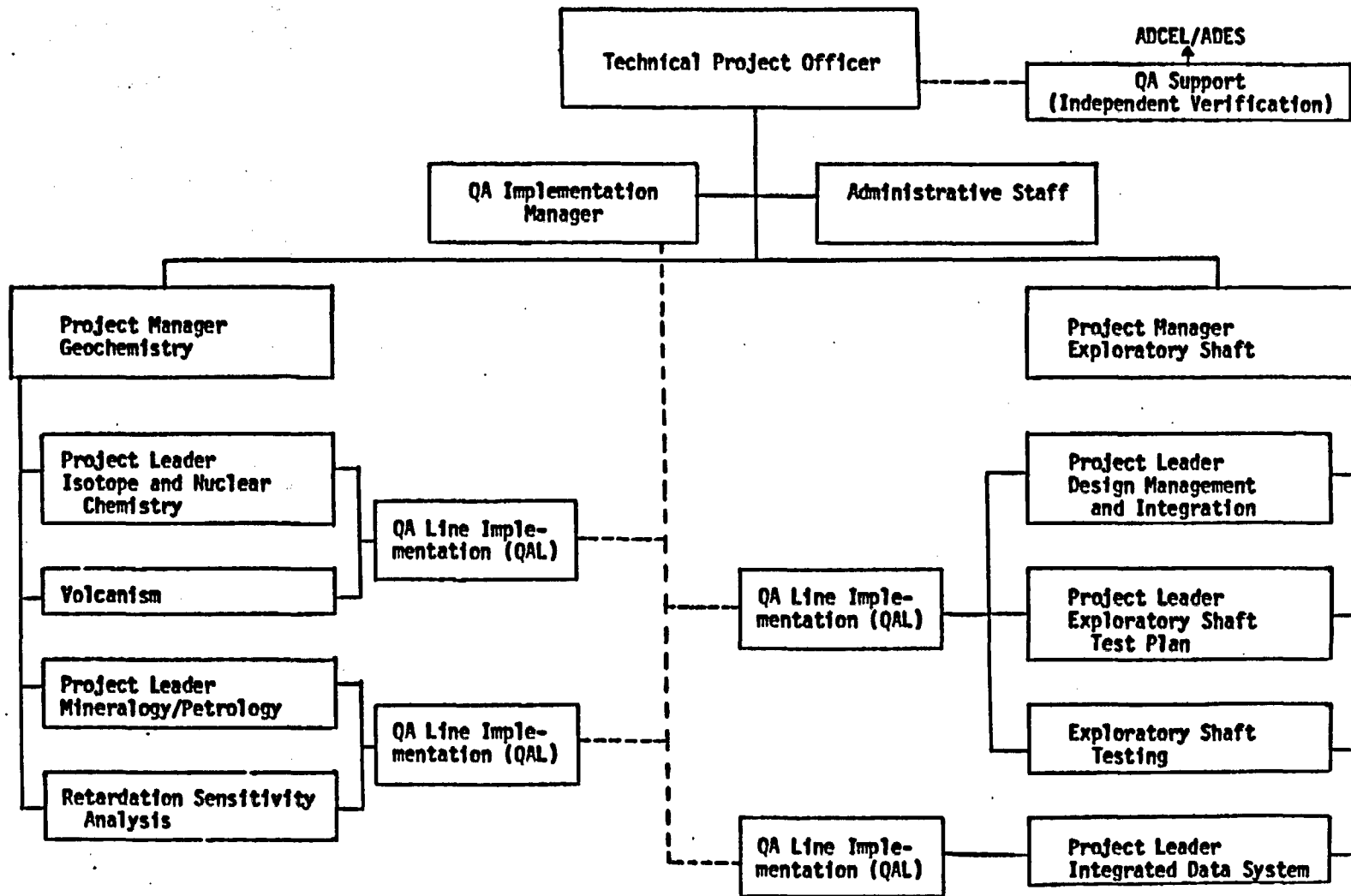
**J. H. BIRELY - A.D.
G. H. KWEI - Dep.**

Chemistry (CHM) A. Hartford, Jr. - Div. Ldr. D.H. Gill - Dep.	Earth and Space Sciences (ESS) J.T. Whetten - Div. Ldr. W.D. Evans - Dep.	Isotope and Nuclear Chemistry (INC) D.W. Barr - Div. Ldr. J. E. Sattizahn - Dep.	Life Sciences (LS) M. W. Bitensky - Div. Ldr.	Materials Science and Technology (MST) E. M. Wewerka - Div. Ldr.	Alternative Energy Sources (AES) M. E. Berger - Dep. A. D.	Center for Materials Science (CMS) S. S. Hecker - Chairman
Analytical Chemistry (CHM-1)	Geology and Geochemistry (ESS-1)	Isotope and Structural Chemistry (INC-4)	Toxicology (LS-1)	Materials Chemistry (MST-3)	Fossil Energy and Materials	
Physical Chemistry (CHM-2)	Geophysics (ESS-3)	Research Reactor (INC-5)	Genetics (LS-3)	Physical Metallurgy (MST-5)	Energy Security	
Chemical Process Development (CHM-3)	Geological Engineering (ESS-4)	Isotope Geochemistry (INC-7)	Pathology (LS-4)	Materials Technology: Metallurgy and Ceramics (MST-6)	Hot Dry Rock	
Photochemistry (CHM-4)	Geoanalysis (ESS-5)	Nuclear and Radiochemistry (INC-11)	Biophysics/ Neurobiology (LS-7)	Materials Technology: Polymers and Coating (MST-7)	National Aeronautics and Space Administration	
Discharge Lasers and Applications (CHM-5)	Earth Science Instrumentation (ESS-6)			Engineering Design & Quality Assurance (MST-9)		
Tunable Lasers and Applications (CHM-6)	Atmospheric Sciences (ESS-7)			Nuclear Materials Management (MST-10)		
	Space Plasma Physics (ESS-8)			Nuclear Fuel Development and Facilities Operation (MST-11)		
	Space Astronomy and Astrophysics (ESS-9)			Nuclear Materials Process Technology (MST-12)		
	Data Analysis (ESS-10)			Plutonium Metal Technology (MST-13)		
	Space Instrumentation (ESS-11)			Irradiated Materials Examination (MST-14)		

Los Alamos

7/1/85

NNWSI ORGANIZATION





Department of Energy

Nevada Operations Office

P. O. Box 14100

Las Vegas, NV 89114-4100

AUG 16 1985

W. J. Purcell, Director, Office of Geologic Repositories, DOE/HQ (RW-20),
FORSTL

NNWSI PROJECT WEEKLY HIGHLIGHTS FOR WEEK ENDING AUGUST 15, 1985

I. Issues Requiring Involvement of HQ or Other Projects

A. New Issues:

None to report.

B. Previously Reported Issues:

<u>Issue</u>	<u>Status</u>	<u>First Report Date</u>
1. Regarding controlled copy of NNWSI Project Administrative Procedures Manual; Purcell needs to sign and return document transmittal form to sender.	Require transmittal form by no later than September 3.	7/24/85
2. Scope and schedule for EA Issues Resolution Meetings with State and NRC.	Letter sent to Purcell on 7/24/85.	7/24/85
3. Letter to Rusche dated March 4 requesting consideration for the continued use of E-MAD on a cost-sharing basis.	Open	8/7/85
4. Letter to Rusche dated April 16 requesting program office approval for reprinting three "Fact Sheets."	Open	8/7/85

II. Major Internal Concerns

None to report.

AUG 16 1985

III. Significant Accomplishments (SA)/Information Items (II)

SA

The NNWSI Project Exploratory Shaft Test Plan, Revision 1, was submitted to DOE/NV for review on August 8.

The NNWSI Project Draft Comment Response Appendix was submitted on schedule to DOE/HQ on August 8.

Oral arguments in the NWSA grant litigation, Nevada v. Herrington, took place on Monday, August 12 before a three-judge panel at the Ninth Circuit Court of Appeals in San Francisco. A decision in the case is not expected for at least six weeks.

II

A dry run was conducted in Las Vegas on August 12 and 13 to prepare for the Exploratory Shaft Facility Design meeting to be held with NRC on August 27-28 in Washington, D.C.

Tom Clark, Don Vieth, and Vern Witherill conducted a tour of the NTS for a group of officials from the State of Tennessee on August 14. Roger Hilley (DOE/HQ), Peter Gross (DOE/Oak Ridge), and a reporter from the Nashville Tennessean newspaper also participated in the tour. The group is interested in the waste management facilities because the Clinch River Breeder Reactor Site in Tennessee may be selected as a Monitored Retrievable Storage facility.

IV. Upcoming Events

1. Coordination Group Meetings

None to report.

2. HQ Meetings

- o Wednesday-Friday, August 14-16: HQ ESF Design Review, Las Vegas.
- o Tuesday-Friday, August 20-23: EA Chapter 6 Findings Meeting, HQ.

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W. J. Purcell

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3. Internal Project and DOE/NV Meetings

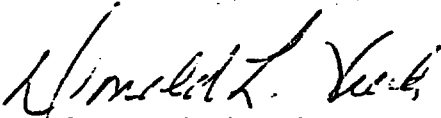
- o Thursday, August 15: SAIC Network Planning Review, Las Vegas.
- o Tuesday, August 20: WMPO Management Review, Las Vegas.
- o Monday, August 26: PM-TPO Meeting, Las Vegas.
- o Monday, August 26: SCP Management Group, Las Vegas.
- o Thursday-Friday, August 29-30: ESTP Committee Meeting, Las Vegas.
- o Tuesday, September 3: ESF Status meeting, NTS (tentative); SOC Meeting, NTS.

4. State and Public Interaction

- o Tuesday, August 20: Nuclear Waste Oversight Committee Hearing, Don Vieth and Ben Rusche.
- o Thursday, August 22: U.S. Senator Chic Hecht tour of NTS.
- o Friday, August 23: Materials Science Symposium talk by Don Vieth, Reno.
- o Monday-Friday, September 2-6: Don Vieth - USNCTT Meeting, Prague.

5. NRC Interaction

- o Tuesday-Wednesday, August 20-21: Seismic/Tectonics NRC Meeting.
- o Tuesday-Wednesday, August 27-28: ESF Design NRC Meeting.
- o Monday-Tuesday, September 16-17: ESTP NRC Meeting.
- o Monday-Thursday, September 23-26: Hydrology/Geochemistry NRC Meeting.
- o Tuesday-Friday, October 1-4: Performance Assessment Plan NRC Meeting.


Donald L. Vieth, Director
Waste Management Project Office

WMPO:DLV-1499



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JUL 30 1985

W. J. Purcell, Director, Office of Geologic Repositories, DOE/HQ (RW-20),
FORSTL

NNWSI PROJECT WEEKLY HIGHLIGHTS FOR WEEK ENDING JULY 25, 1985

I. Issues Requiring Involvement of HQ or Other Projects

A. New Issues:

None to report.

B. Previously Reported Issues:

<u>Issue</u>	<u>Status</u>	<u>First Report Date</u>
1. Regarding March 19 letter to E. S. Burton - EA Briefings and Hearings - requested copy of documents generated as a result of "Roles and Responsibilities at Briefings" memo.	Open - Per ISGG Meeting 5/9-10, should be available 6/15. Received Volume 1 of a seven-volume set on 6/28/85.	5/14/85
2. Regarding controlled copy of NNWSI Project Administrative Procedures Manual; Purcell needs to sign and return document transmittal form to sender.		7/24/85
3. Scope and schedule for EA Issues Resolution Meetings with State and NRC.	Letter sent to Purcell on 7/24/85.	7/24/85

II. Major Internal Concerns

None to report.

III. Significant Accomplishments (SA)/Information Items (II)

SA

None to report.

II

Frank McLean of the Bureau of Reclamation called on Tuesday to arrange a visit to WMPO/NV. He, along with two or three staff members, will visit WMPO on Monday, July 29 to better understand our structure and operations.

Jim Devine of the USGS will be in Las Vegas on Tuesday and Wednesday, July 30 and 31, to discuss the rule and operational requirements of WMPO in support of the NNWSI Project.

The Nevada Legislative Council Bureau has announced the membership of the Nuclear Waste Oversight Committee. The members are: (1) Senator Thomas Hickey (D-North Las Vegas) Chairman, (2) Assemblywoman Galen Spiggs (R-Hawthorn) Vice Chairman, (3) Senator Jim Gibson (D-Las Vegas), (4) Senator Kenneth Redelsperger (R-Pahrump), (5) Assemblyman Jim Schofield (D-Las Vegas), (6) Assemblywoman Jane Ham (R-Las Vegas), and (7) Jack Jeffries (D-Henderson). The fulltime staff member for the committee is Don Bayer. It is the Project's understanding that the committee will hold its first hearing on August 20. They have asked Don Vieth to testify before the committee and he has agreed.

Senator Tom Hickey called to say that he had not received his copy of the Mission Plan. A WMPO staff member delivered a copy to him on July 23.

Don Vieth has been contacted by U.S. Congressman Wyden's office in Portland, Oregon to be luncheon speaker at a meeting he the Congressman is sponsoring to help businessmen understand that a repository is not a major danger. The motivation is the recent cancelling of relocation efforts to the Portland area by corporations when they found out about the prospect of a repository at Hanford. Don Vieth has been asked to discuss the approach to answering questions about the intangible aspects of a repository such as the impact on tourism or the "more fuzzy" aspect of the program. The luncheon is scheduled for August 5.

The Ninth Circuit Court of Appeals has scheduled the oral arguments on August 12 for the State of Nevada litigation filed against DOE.

IV. Upcoming Events

1. Coordination Group Meetings

- o Tuesday-Wednesday, July 30-31: QACG Meeting.

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2. HQ Meetings

- o Tuesday, August 6: Program Manager's Meeting, Denver.
- o Tuesday-Friday, August 20-23: EA Chapter 6 Findings Meeting, HQ.

3. Internal Project and DOE/NV Meetings

- o Friday, July 26: SAIC Monthly Status Review, Las Vegas.
- o Monday, July 29: Computer QA SOP meeting, Las Vegas.
- o Tuesday, August 6: ESF Status meeting, NTS; SOC Meeting, NTS.
- o Thursday, August 15: SAIC Network Planning Review, Las Vegas.
- o Tuesday, August 20: WMP0 Management Review, Las Vegas.

4. State and Public Interaction

- o Wednesday, July 25: Association of General Contractors' tour of NTS.
- o Monday, July 29: Texas Low-level Waste Disposal Authority, tour of NTS (Kunich).
- o Monday, August 5: Don Vieth to address Government and Business leaders of Portland, Oregon.
- o Tuesday, August 6: Don Vieth to brief Tonopah City officials, Tonopah.
- o Wednesday-Thursday, August 7-8: First Repository States Meeting, Denver.
- o Monday-Friday, August 12-16: Don Vieth - USNCTT Meeting.
- o Tuesday, August 20: Nuclear Waste Oversight Committee Hearing, Don Vieth.

5. NRC Interaction

- o Wednesday, July 31: Retrievability Position NRC Meeting - Generic (Tentative).
- o Tuesday-Wednesday, August 20-21: Seismic/Tectonics NRC Meeting.
- o Tuesday-Wednesday, August 27-28: ESF Design NRC Meeting.

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W. J. Purcell

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- o Tuesday-Wednesday, September 17-18: ESTP NRC Meeting.
- o Monday-Thursday, September 23-26: Hydrology/Geochemistry NRC Meeting.
- o Tuesday-Friday, October 1-4: Performance Assessment Plan NRC Meeting.



Donald L. Vieth, Director
Waste Management Project Office

WMPO:DLV-1366

cc:

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M. W. Frei, DOE/HQ (RW-23), FORSTL
V. J. Cassella, DOE/HQ (RW-22), FORSTL
Ralph Stein, DOE/HQ (RW-23), FORSTL
E. S. Burton, DOE/HQ (RW-25), FORSTL
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O. L. Olson, DOE/RL, Richland, WA
R. W. Taft, AMES, DOE/NV
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W. W. Dudley, Jr., USGS, Denver, CO
L. D. Ramspott, LLNL, Livermore, CA
D. T. Oakley, LANL, Los Alamos, NM
J. B. Wright, W/WTSD, Mercury, NTS
M. E. Spaeth, SAIC, Las Vegas, NV
J. R. LaRiviere, SAIC, Las Vegas, NV
W. S. Twenhofel, SAIC, Lakewood, CO
J. H. Fiore, SAIC, Las Vegas, NV
R. R. Loux, NWPO, Carson City, NV
C. H. Johnson, NWPO, Carson City, NV
P. T. Prestholt, NRC/Las Vegas, NV
David Siefken, Weston, Rockville, MD
Robert Jackson, Weston, Rockville, MD
William McClain, Weston, Rockville, MD
Terrence Bates, Weston, Rockville, MD
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Donald Schweitzer, BNL, Upton, NY



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W. J. Purcell, Director, Office of Geologic Repositories, DOE/HQ (RW-20),
FORSTL

NNWSI PROJECT WEEKLY HIGHLIGHTS FOR WEEK ENDING JULY 31, 1985

I. Issues Requiring Involvement of HQ or Other Projects

A. New Issues:

None to report.

B. Previously Reported Issues:

<u>Issue</u>	<u>Status</u>	<u>First Report Date</u>
1. Regarding March 19 letter to E. S. Burton - EA Briefings and Hearings - requested copy of documents generated as a result of "Roles and Responsibilities at Briefings" memo.	Open - Per ISGG Meeting 5/9-10, should be available 6/15. Received Volume 1 of a seven-volume set on 6/28/85.	5/14/85
2. Regarding controlled copy of NNWSI Project Administrative Procedures Manual; Purcell needs to sign and return document transmittal form to sender.		7/24/85
3. Scope and schedule for EA Issues Resolution Meetings with State and NRC.	Letter sent to Purcell on 7/24/85.	7/24/85

II. Major Internal Concerns

None to report.

III. Significant Accomplishments (SA)/Information Items (II)

SA

None to report.

II

A meeting was held at Lawrence Livermore National Laboratory to review the status of the study under way regarding the use of copper as a potential waste package material. A detailed report is due August 30, 1985 and will be referenced in OCRWMs status report due to Congress on the same date. All activities to support this are on schedule.

A meeting was held July 23-24, 1985 with the NRC and their consultants to review the status of the NNWSI Project waste package development program. Several significant observations were made by the NRC which could have serious impact to the NNWSI Project waste package development program.

SCP Chapter 3, Geohydrology, is undergoing internal committee review with Project staff and representatives from OCRWM, Weston, and Pacific National Laboratory.

SCP Chapter 5, Climatology and Meteorology, will undergo internal committee review on August 1-2 with Project staff and representatives from OCRWM, Weston, and Kent State University.

A findings analysis is being prepared for a visit on August 5-8 from OCRWM and Weston.

The NRC Retrievability Position NRC meeting was attended by J. Szymanski and L. Skousen.

Frank McLean of the Bureau of Reclamation visited WMPO/NV on Monday, July 29 for detailed discussions regarding involvement in the NNWSI Project.

Jim Devine, Assistant Director, Engineering Geology, of the USGS visited WMPO/NV on Tuesday and Wednesday, July 30 and 31, to discuss the activities to be conducted by the USGS in support of this Project, and the role and operational requirements of WMPO in support of the NNWSI Project.

IV. Upcoming Events

1. Coordination Group Meetings

o None to report.

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2. HQ Meetings

- o Tuesday, August 6: Program Manager's Meeting, Denver.
- o Tuesday-Friday, August 20-23: EA Chapter 6 Findings Meeting, HQ.

3. Internal Project and DOE/NV Meetings

- o Tuesday, August 6: ESF Status meeting, NTS; SOC Meeting, NTS.
- o Thursday, August 15: SAIC Network Planning Review, Las Vegas.
- o Tuesday, August 20: WMPO Management Review, Las Vegas.
- o Tuesday, September 3: ESF Status meeting, NTS (tentative); SOC Meeting, NTS.

4. State and Public Interaction

- o Thursday, August 1: Don Vieth to address the Community Radiation Site Managers Training session.
- o Sunday, August 4: Don Vieth interview with Chris Sivula, Washington (State) Tri-City Herald.
- o Monday, August 5: Don Vieth to address Government and Business leaders of Portland, Oregon.
- o Tuesday, August 6: Don Vieth to brief Tonopah City officials, Tonopah.
- o Wednesday-Thursday, August 7-8: First Repository States Meeting, Denver.
- o Monday-Friday, August 12-16: Don Vieth - USNCTT Meeting.
- o Tuesday, August 20: Nuclear Waste Oversight Committee Hearing, Don Vieth.
- o Monday-Friday, September 2-6: Don Vieth - USNCTT Meeting.

5. NRC Interaction

- o Tuesday-Wednesday, August 20-21: Seismic/Tectonics NRC Meeting.
- o Tuesday-Wednesday, August 27-28: ESF Design NRC Meeting.

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W. J. Purcell

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- o Tuesday-Wednesday, September 17-18: ESTP NRC Meeting.
- o Monday-Thursday, September 23-26: Hydrology/Geochemistry NRC Meeting.
- o Tuesday-Friday, October 1-4: Performance Assessment Plan NRC Meeting.



Donald L. Vieth, Director
Waste Management Project Office

WMPO:DLV-1416

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M. W. Frei, DOE/HQ (RW-23), FORSTL
V. J. Cassella, DOE/HQ (RW-22), FORSTL
Ralph Stein, DOE/HQ (RW-23), FORSTL
E. S. Burton, DOE/HQ (RW-25), FORSTL
J. O. Neff, DOE/SRPO, Columbus, OH
S. A. Mann, DOE/CRPO, Argonne, IL
O. L. Olson, DOE/RL, Richland, WA
R. W. Taft, AMES, DOE/NV
T. O. Hunter, SNL, 6310, Albuquerque, NM
R. W. Lynch, SNL, 6300, Albuquerque, NM
W. W. Dudley, Jr., USGS, Denver, CO
L. D. Ramspott, LLNL, Livermore, CA
D. T. Oakley, Los Alamos, NM
J. B. Wright, W/WTSD, Mercury, NTS
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J. R. LaRiviere, SAIC, Las Vegas, NV
W. S. Twenhofel, SAIC, Lakewood, CO
J. H. Fiore, SAIC, Las Vegas, NV
R. R. Loux, NWPO, Carson City, NV
C. H. Johnson, NWPO, Carson City, NV
P. T. Prestholt, NRC/Las Vegas, NV ←
David Siefken, Weston, Rockville, MD
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AUG 09 1985

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FORSTL

NNWSI PROJECT WEEKLY HIGHLIGHTS FOR WEEK ENDING AUGUST 7, 1985

I. Issues Requiring Involvement of HQ or Other Projects

A. New Issues:

None to report.

B. Previously Reported Issues:

<u>Issue</u>	<u>Status</u>	<u>First Report Date</u>
1. Regarding March 19 letter to E. S. Burton - EA Briefings and Hearings - requested copy of documents generated as a result of "Roles and Responsibilities at Briefings" memo.	Open - Per ISGG Meeting 5/9-10, should be available 6/15. Received Volume 1 of a seven-volume set on 6/28/85. Due date changed to 6/30/86. Item to be dropped.	5/14/85
2. Regarding controlled copy of NNWSI Project Administrative Procedures Manual; Purcell needs to sign and return document transmittal form to sender.	Require transmittal form by no later than September 3.	7/24/85
3. Scope and schedule for EA Issues Resolution Meetings with State and NRC.	Letter sent to Purcell on 7/24/85.	7/24/85
4. Letter to Rusche dated March 4 requesting consideration for the continued use of E-MAD on a cost-sharing basis.	Open	8/7/85
5. Letter to Rusche dated April 16 requesting program office approval for reprinting three "Fact Sheets."	Open	8/7/85

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6. Letter to Stein dated July 11 requesting review and comment on NNWSI Project SOP-03-02, Software Quality Assurance. Open 8/7/85

II. Major Internal Concerns

None to report.

III. Significant Accomplishments (SA)/Information Items (II)

SA

None to report.

II

On August 4, Don Vieth was interviewed by a reporter from the Tri-City Herald Newspaper, which is distributed in the State of Washington.

Don Vieth spoke to a symposium for the Portland, Oregon business community on August 5. The talk, entitled "Nuclear Waste Fears and Perceptions: Truth or Imagination," was well-received by attendees.

On August 6, 7, and 8, Dr. Jelacic and a group of geoscientists from his staff and Weston were taken on an extended tour of the Yucca Mountain site and Nevada Test Site waste management facilities. The purpose of the week-long visit was to gain a more complete understanding of the Project. On Monday, August 5, a meeting was held prior to the tour to discuss the unsaturated zone conceptual model and the challenged EA findings for geohydrology and tectonics.

An NNWSI Project representative from the Waste Management Project Office (Larry Skousen) is attending the MRS Workshops that started on July 29 and will continue until August 16.

On Tuesday, August 6, Don Vieth briefed the Nye County Commissioners in Tonopah on Project progress.

IV. Upcoming Events

1. Coordination Group Meetings

- o Tuesday-Thursday, August 13-15: Waste Package Coordination Group, Kansas City.

2. HQ Meetings

- o Wednesday-Friday, August 14-16: HQ ESF Design Review, Las Vegas.
- o Tuesday-Friday, August 20-23: EA Chapter 6 Findings Meeting, HQ.

3. Internal Project and DOE/NV Meetings

- o Monday-Tuesday, August 12-13: ESF design review dry run, Las Vegas.
- o Tuesday, August 13: Records Management Meeting, Las Vegas.
- o Thursday, August 15: SAIC Network Planning Review, Las Vegas.
- o Tuesday, August 20: WMPO Management Review, Las Vegas.
- o Monday, August 26: PM-TPO Meeting, Las Vegas.
- o Thursday-Friday, August 29-30: ESTP Committee Meeting, Las Vegas.
- o Tuesday, September 3: ESF Status meeting, NTS (tentative); SOC Meeting, NTS.

4. State and Public Interaction

- o Wednesday-Thursday, August 14-15: Don Vieth and Mitch Kunich to tour the WIPP site, Carlsbad, NM.
- o Tuesday, August 20: Nuclear Waste Oversight Committee Hearing, Don Vieth and Ben Rusche.
- o Friday, August 23: Materials Science Symposium talk by Don Vieth, Reno.
- o Monday-Friday, September 2-6: Don Vieth - USNCTT Meeting, Prague.

5. NRC Interaction

- o Tuesday-Wednesday, August 20-21: Seismic/Tectonics NRC Meeting.
- o Tuesday-Wednesday, August 27-28: ESF Design NRC Meeting.
- o Monday-Tuesday, September 16-17: ESTP NRC Meeting.

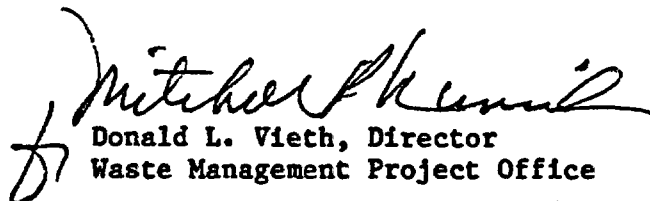
W. J. Purcell

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- o Monday-Thursday, September 23-26: Hydrology/Geochemistry NRC Meeting.
- o Tuesday-Friday, October 1-4: Performance Assessment Plan NRC Meeting.

WMPO:DLV-1454


Donald L. Vieth, Director
Waste Management Project Office

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