U.S. DEPARTMENT OF ENERGY

OCRWM OGR

Nevada Nuclear Waste Storage Investigations PROJECT

YUCCA MOUNTAIN

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT

MONTHLY REPORT

JANUARY 1987

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PDR WASTE
WM-11 PDR

UNITED STATES DEPARTMENT OF ENERGY

NEVADA OPERATIONS OFFICE

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ABSTRACT

1.2.1 SYSTEMS

A summary of studies on coupled processes that was included in the Site Characterization Plan (SCP) was submitted to the Waste Management Project Office (WMPO) for policy review. The repository design drawings were converted to a three-dimensional representation in the Interactive Graphics Information System (IGIS). This model is now available for use in calculations and illustrations. The first-level conceptual and logical designs for the relational Scientific and Engineering Properties Data Base (SEPDB) were completed. The Sandia National Laboratories (SNL) paper entitled "A Continuum Model for Water Movement in a Fractured Rock Mass" was submitted to the Water Resources Research Journal. SNL Milestone, M870, Annual Performance Assessment Support Service (PASS) Program Interaction Memo FY 1986, was completed. SNL Milestone M761, submit Systems Engineering Management Plan (SEMP) to WMPO, was completed. SNL Milestones M104, A First Survey of Disruption Scenarios for High-Level Waste Repository at Yucca Mountain; M133, Problem Definition Memo for COVE2A Benchmarking Problem for Isothermal Flow; and M142, SNL modifications to the TRACR3D Code have been completed.

1.2.2 WASTE PACKAGE

The final version of a paper entitled "Zeolitization of Glassy Topopah Spring Tuff under Hydrothermal Conditions" was completed for inclusion in the Symposium Proceedings from the Nuclear Waste Symposium held at the 1986 Monitored Retrievable Storage (MRS) National Meeting in Boston. The Scientific Investigation Plan (SIP) for Glass Waste Form Testing was completed. The experimental activity concerned with exposure of test specimens to different environmental conditions was completed. The results from these activities will be used to evaluate present candidate container material. The Lawrence Livermore National Laboratory (LLNL) paper entitled "The Influence of Copper on Zircaloy Spent Fuel Cladding Degradation Under a Potential Tuff Repository Conditions," was submitted for NNWSI Project approval prior to presentations at Waste Management '87 in Tucson, Arizona, in early March 1987. LLNL personnel concluded negotiations with Babcock and Wilcox in Alliance, Ohio, regarding a disposal container fabrications and closure process development subcontract. A revised draft of the Waste Package Strategy Document was sent to WMPO for review.

1.2.3 SITE INVESTIGATIONS

Science Applications International Corporation (SAIC) staff members completed the Decision Document for the Sample Management Facility (SMF) and presented it to WMPO on January 22, 1987. The stop-work order issued to U.S. Geological Survey (USGS) in March 1986 remained in effect through January and almost all site characterization technical activities continued to be suspended. A draft of SIP documentation for normal faults, detachment faults, and for left-lateral strike-slip faults was completed. A draft of the fracture-mineralogy sampling procedure for the exploratory shaft mineralogy/petrology prototype test was completed and it underwent preliminary review. A computer data base for all core samples used for fracture mineralogy

studies was established. Los Alamos National Laboratory (Los Alamos) received a new mass spectrometer which will be used for alterations history and mineral stability studies. The Los Alamos report, "Chemistry of Diagenetically Altered Tuffs at a Potential Nuclear Waste Repository, Yucca Mountain, Nevada," was distributed to NNWSI Project participants and to State and Federal agencies. An additional 4 megabytes of RAM have been added to the existing C2 Ridge of the LLNL EQ3/6 group. This addition will increase the speed of code development and geochemical calculations.

1.2.4 REPOSITORY INVESTIGATIONS

The SNL report entitled "Impact on Costs and Schedules of Using a Monitored Retrievable Storage Facility in Conjunction with a Repository in Tuff at Yucca Mountain" is being prepared for publication. Post-calibration checks of instruments used in welded tuff mining evaluations were completed. A draft equipment program plan was completed. A draft study that examines the costs for different sized lateral exploration drifts in support of the Exploratory Shaft Facility (ESF) was completed and has been sent to WMPO for review. The ventilation design supporting the Site Characterization Plan/ Conceptual Design Report (SCP/CDR) was completed. The SCP/CDR review was completed. The "Report on G-Tunnel Underground Facility Summary" was completed. The "Near-Field Thermal Effects and Structural Stability Report" was completed.

1.2.5 REGULATORY AND INSTITUTIONAL

The revised SCP schedule continued to impact SAIC staff preparations for U.S. Nuclear Regulatory Commission (NRC) interactions. The NNWSI Project Administrative Procedure 2.8, Monthly Technical Data Transfer Report, was transmitted to WMPO for approval and distribution. The preliminary draft Regulatory Compliance Plan was issued for internal review. The draft SCP was transmitted to the Office of Geologic Repositories (OGR) for review. A Permanent Internal Review Committee (PIRC) 15 meeting was held to identify areas of the draft SCP that still require attention. The draft Mission Plan released by the Department of Energy/Headquarters (DOE/HQ) this month moved the start of the Environmental Impact Statement (EIS) process to 1989. Comments on the preliminary draft Environmental Regulatory Compliance Plan (ERCP) were received and a meeting was held to discuss resolution of these comments. A quarterly update of the SNL data catalog was completed.

1.2.6 EXPLORATORY SHAFT

The high priority assigned to work on the space allocation study and milestone development has delayed the study of usable liquids and restrictions on materials and methods of construction in the ESF underground. Final arrangements for EG&G to design, build, and operate the Integrated Data System (IDS) have been made. Appendix C of the Subsystems Design Requirements document was completed. Drafts of detailed prototype test plans for air coring, diffusion, and mineralogy/petrology tests were completed. A LLNL contract for services with New Mexico State University for study of thermal stability of the U.S. Bureau of Mines was prepared. Technical specifications

for the analytical stereoplotter were written. SNL Milestone R086, definition of technical procedures required to be prepared for exploratory shaft testing has been completed.

1.2.7 TEST FACILITIES

A draft list of fluids and materials to be used in the ESF was reviewed. Data acquisition for G-Tunnel was discussed.

1.2.9 PROJECT MANAGEMENT

Quality assurance records from Los Alamos Engineering Design and Quality Assurance Group have been processed and entered into the Quality Assurance Records Management System. Installation of the Automated Retrieval System applications on the SAIC/T&MSS computer system was completed. The preliminary draft of the NNWSI Project Information Management System was completed and issued for SAIC review. The USGS summary schedule was updated to show the stop-work order extending through March 1987. The ESF Quality Assurance Level Assignments for level 3 items and activities were completed. The Administrative Record for the Environmental Assessment Management Plan (EAMP) was transmitted to DOE/HQ. A total of four surveillances were conducted during January 1987. The NNWSI Project QA Plan, NVO-196-17, Revision 5, has been reviewed and approved by OGR. The final draft of the NNWSI Project Office Training Plan has been completed.

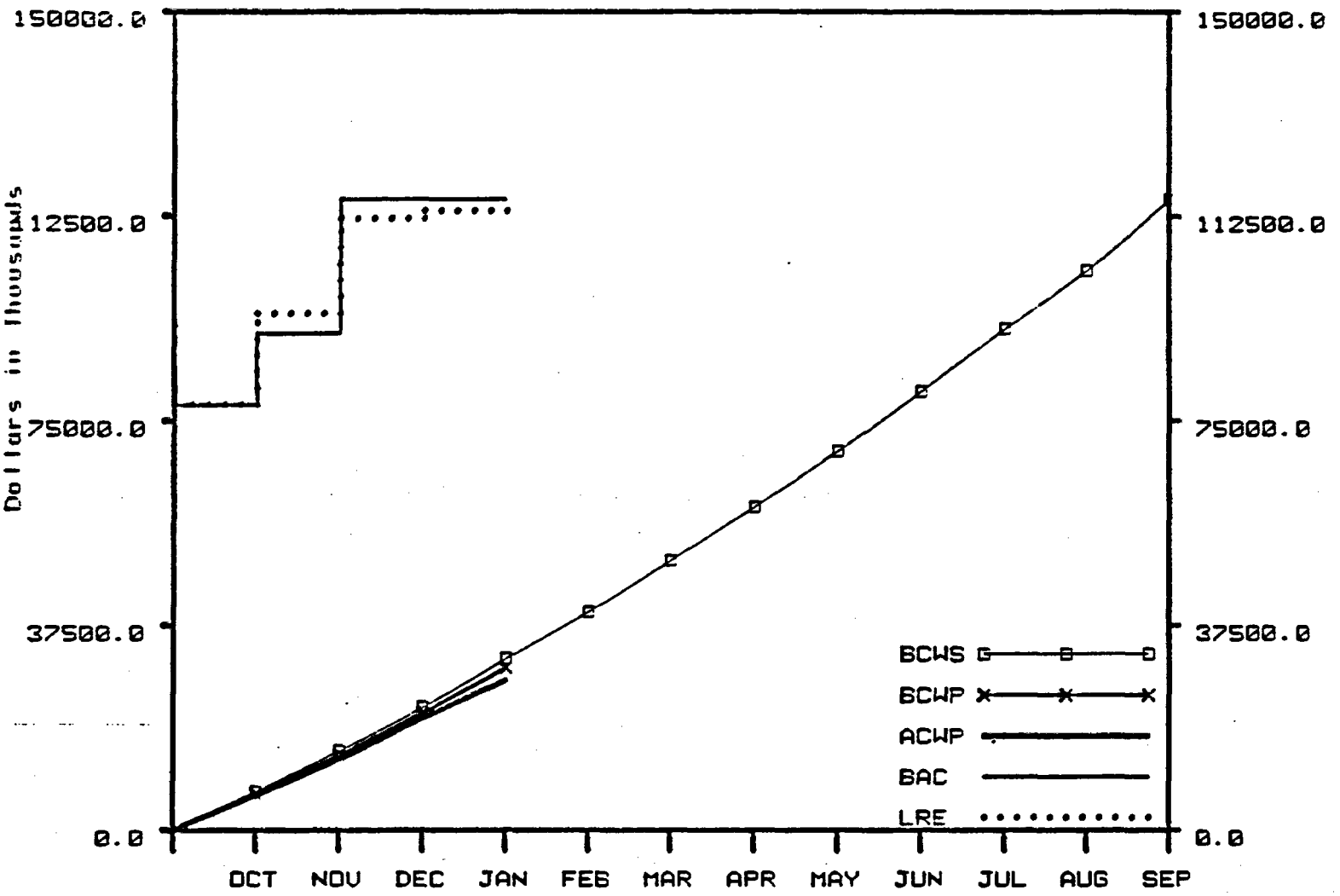
Funding Overview

The month-end estimated costs were $6,947,249 against a plan of $8,909,470 resulting in a cost underrun of $1,962,221.

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

		Plan ($000)	Cost ($000)	Variance	% Variance
WBS 1.2.1	Systems	$ 1,815	$ 1,684	$ 131	7
WBS 1.2.2	Waste Package	2,281	1,836	445	20
WBS 1.2.3	Site	8,778	7,622	1,156	13
WBS 1.2.4	Repository Investigations	2,416	2,079	337	14
WBS 1.2.5	Regulatory and Institutional Investigations	2,660	2,529	131	5
WBS 1.2.6	Exploratory Shaft Investigations	4,171	2,676	1,495	36
WBS 1.2.7	Test Facilities	124	89	35	28
WBS 1.2.8	Land Acquisition	29	31	(2)	(7)
WBS 1.2.9	Project Management	7,413	6,516	897	12
WBS 1.2.10	Financial and Technical Assistance	1,720	2,319	(599)	(35)
WBS 1.2	NNWSI Project	$ 31,407	$ 27,381	$ 4,026	13

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2



NNWSI - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	8909.5	31407.4
B. BUDGETED COST OF WORK PERFORMED (BCWP)	8210.6	29691.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	6947.2	27381.5
D. BUDGET AT COMPLETION (BAC)		115573.0
E. LATEST REVISED ESTIMATE (LRE)		113408.1

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-1716.2	-5.46
G. COST VARIANCE (B-C)	2309.8	7.78
H. AT COMPLETION VARIANCE (D-E)	2164.9	1.87

Remarks:

NNWSI PROJECT BUDGET BASELINE

JANUARY 1987

Contractors	($000) Original FY 87 Funding	($000) Current Baselined Budget	($000) Change
SNL	$ 16,148	$ 23,289	$ 7,141
LLNL	9,311	13,654	4,343
Los Alamos	10,003	13,128	3,125
USGS	13,333	20,592	7,259
SAIC	12,138	21,067	8,929
REECo	3,889	6,584	2,695
H&N	2,182	3,371	1,189
F&S	5,472	5,344	(128)
WSI	230	230	0
Pan Am	5	72	67
State Grant	3,765	5,162	1,397
DRI	100	125	25
EG&G	60	80	20
LBL	267	450	183
OSTI/TC	0	5	5
HEDL	0	117	117
CSC	0	80	80
NTS Allocation	980	2,223	1,243
Undistributed Budget	1,398	1,893	495
SUBTOTAL	$ 79,281	$ 117,466	$ 38,185
CAPITAL EQUIPMENT	$ 5,081	$ 2,727	$ (2,354)
TOTAL	$ 84,362	$ 120,193	$ 35,831

U.S. DEPARTMENT OF ENERGY

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Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

YUCCA MOUNTAIN

PROJECT STATUS

1.2.1 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

WBS 1.2.1.1 SYSTEMS MANAGEMENT AND INTEGRATION

Sandia National Laboratories (SNL) staff members prepared a summary of studies on coupled processes included in the Site Characterization Plan (SCP) and submitted it to WMPO for policy review. This fulfills Milestone M771.

WBS 1.2.1.2 SYSTEMS ENGINEERING

The System Requirements (SR) document has been revised in response to WMPO policy review comments. The SR and other prerequisites for Advanced Conceptual Design cannot be completed until the Office of Geologic Repositories (OGR) decides on an NNWSI Project proposal for the structure and content of the SR and Subsystem Designs Requirements (SDR) document. The time required to complete the SR will depend on the magnitude of revisions to the existing SR draft. Resolution of this delay is expected in February 1987.

WBS 1.2.1.2.3 Cost Schedule

A draft of the SNL cost estimate report, "A Cost Estimate of the Yucca Mountain Repository at Conceptual Design supporting Site Characterization" (SAND85-1964), has been prepared. This report is a referenced document in the SCP/CDR and should be published by April 1, 1987.

WBS 1.2.1.2.4 Systems Engineering Integration

A draft of the NNWSI Project Systems Engineering Management Plan (SEMP) was received at Lawrence Livermore National Laboratory (LLNL) and Waste Package staff completed a review, as per Action Item 87-721. Comments are being consolidated prior to the February 1987 Systems Engineering Integration Group (SEIG) meeting.

LLNL staff completed a review of the Science Applications International Corporation (SAIC) proposed plan for the "Development of Project Definitions" (SAIC: L87-LIC-CGP-001) and a letter summarizing LLNL comments has been drafted. This response was deferred, however, until comments on a second SAIC letter "Definition of Regulatory Terms" (SAIC: L87-LIC-CGP-002) could be incorporated.

Draft copies of the SEMP received from SNL on December 31, 1986, were distributed to key Project personnel at Los Alamos National Laboratories

(Los Alamos) in anticipation of a formal Waste Management Project Office (WMPO) request for review and comment.

WBS 1.2.1.2.5 Configuration Management and Change Control

The NNWSI Project Work Breakdown Structure (FY 1987) and CCB Approved Baseline document will be distributed by February 5, 1987.

The NNWSI Project Budget Baseline and Cost Plan (FY 1987) will be distributed through Document Control by February 5, 1987.

WBS 1.2.1.3 TECHNICAL DATA BASE MANAGEMENT

WBS 1.2.1.3.1 Tuff Data Base

SNL staff members are compiling data base data from Los Alamos for recertification by Los Alamos. The recertified data should be reentered into the data base under Quality Assurance Level I procedures by the end of January 1987.

WBS 1.2.1.3.2 Computer Graphics

Staff members at SNL converted the repository design drawings from Parsons Brinckerhoff, Quade and Douglas to a three-dimensional representation in the Interactive Graphics Information System (IGIS). This three-dimensional model of the underground facilities is now available for use in calculations and illustrations.

The IGIS provided design data on the Exploratory Shaft Demonstration Breakout Rooms is in response to WMPO action item #87-704.

WBS 1.2.1.3.4 Data Base Computer Support

Analysis of NNWSI Project information needs by SNL staff has resulted in a comprehensive itemization of the data requirements expressed in Chapter 8 of the SCP. This itemization will continue to be refined and correlated back to the SCP as it evolves and is revised. Further characterization of these data requirements has been carried out in an automated fashion to support Technical Data Base planning and development activities. The parameter specifications have also been used to support the activities of Permanent Internal Review Committee (PIRC) #15.

SNL staff members accomplished the first-level conceptual and logical designs for relational Scientific and Engineering Properties Data Base (SEPDB). These designs, together with the parameter characterization, are being used to support documentation of the Technical Data Base requirements-specification and planning activities currently in progress.

WBS 1.2.1.4 TOTAL SYSTEMS PERFORMANCE ASSESSMENT

WBS 1.2.1.4.1 Flow and Radionuclide Transport

Personnel from SNL submitted an abstract entitled "Preliminary Estimates of Equilibrium and Steady-State Moisture Content in the Unsaturated Zone at Yucca Mountain, Nevada" for policy review. The abstract will be presented in the AGU Spring Meeting. Also, SAND86-7018J, a contract paper entitled "Aperture Correlation of Fractal Fracture" is in policy review. This paper will be submitted to the Journal of Geophysical Research for publication.

The SNL report entitled "Effects of Drift Ventilation on Repository Hydrology and Resulting Solute Transport Implication" (SAND86-1571), has been revised for policy review.

An SNL report on modeling of saturated flow at Yucca Mountain (SAND87-0112, Milestone M180) is being revised for line review. The report describes contours of hydraulic heads and concentrations based on several interpretations of inverse calculations. Numerical experiments are intended to delineate data that would be useful in a performance assessment analysis.

An SNL report entitled "Specification of A Test Problem for HYDROCOIN Level 3 Case 2: Sensitivity Analysis for Deep Disposal in Partially Saturated, Fractured Tuff" has been submitted for line review.

WBS 1.2.1.4.2 Radionuclide Source Term

Lawrence Berkeley Laboratory (LBL) completed revising the report entitled "A Study of Thermally Induced Convection Near a High-Level Nuclear Waste Repository in Partially Saturated Fractured Tuff" based on peer and editorial reviews. The report is nov in line review.

WBS 1.2.1.4.4 Radionuclide Releases from Total System

The SNL paper entitled "A Continuum Model for Water Movement in a Fractured Rock Mass" (SAND86-0517J) has completed the review cycle and was submitted to the Water Resources Research Journal.

The SNL papers "Radionuclide Transport in an Unsaturated, Fractured Medium" and "Measuring and Modeling Water Imbibition into Tuff" (both presented at the AGU Fall Meeting "Symposium on Flow and Transport Through Unsaturated, Fractured Rock," December 8-12, 1986, in San Francisco, CA) are being prepared for publication in an AGU monograph. Both papers are awaiting WMPO review.

The SNL report entitled "Specification of a Test Problem for HYDROCOIN Level 3 Case 2: Sensitivity Analysis for Deep Disposal in Partially Saturated, Fractured Tuff" (SAND86-1264), has been submitted for management review.

PLANNED WORK

The modeling of fluid flow and radionuclide transport through the unsaturated zone of the Yucca Mountain site will continue.

PROBLEM AREAS

Requirements of the SEMP probably cannot be fully implemented in FY 1987 or FY 1988 with present budget limitations.

A problem has been identified by REECo regarding accuracy of some control points for the detailed topographic survey at Yucca Mountain. Efforts to reformat the digital data from this survey for use by the IGIS will be suspended pending resolution of the surveying problems and identification of remedial measures required to correct the problem.

MILESTONE PROGRESS

SNL Milestone M771, Submit Letter Report on Coupled-Process Studies Included in SCP, to WMPO for Policy Review, was completed on January 27, 1987.

SNL Milestone M870, Annual PASS Program Interaction Memo FY 1986 was completed.

SNL Milestone M761, submit Systems Engineering Management Plan (SEMP), to WMPO, was completed.

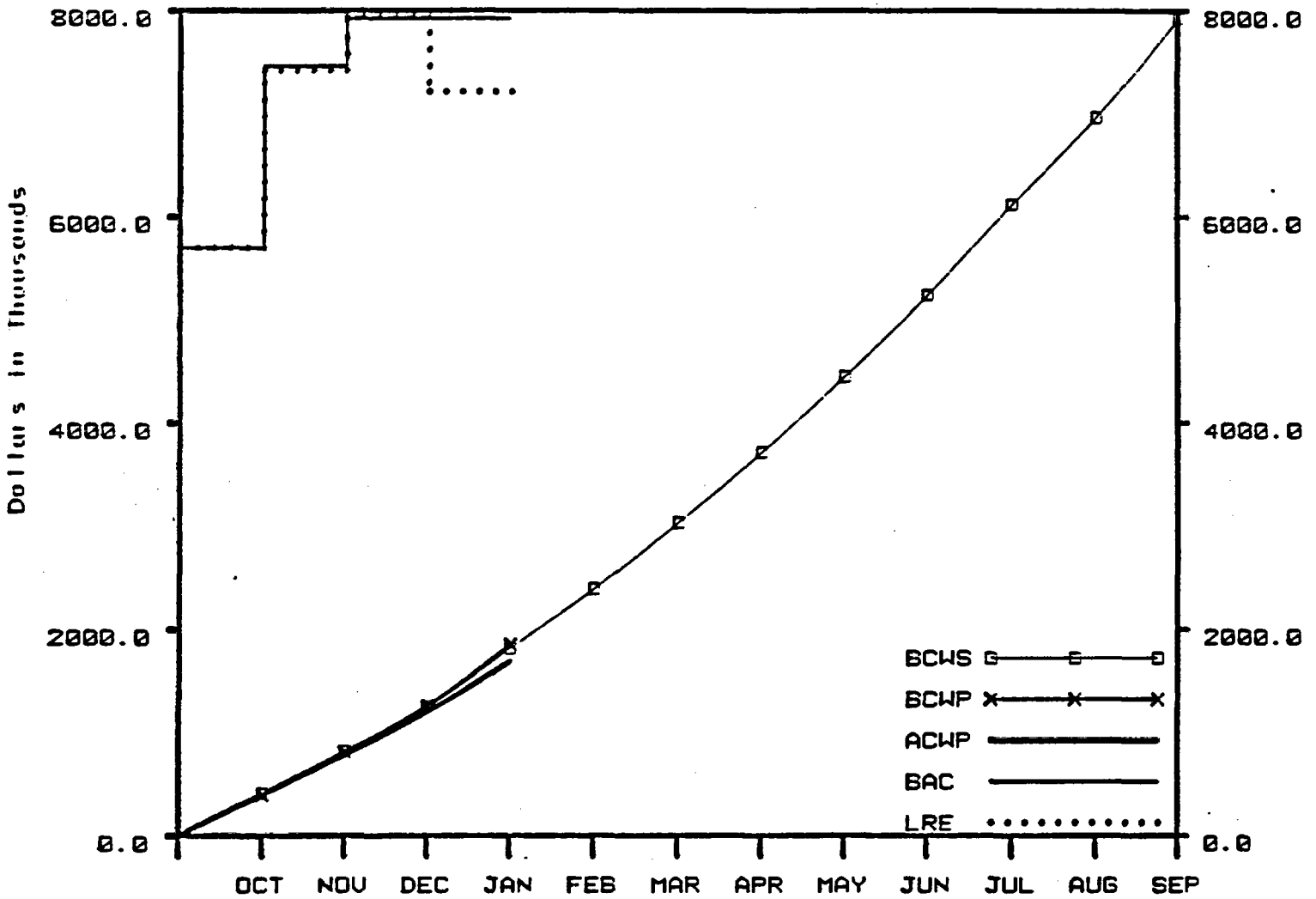
SNL Milestone R079, Technique for Subterranean Surface Modeling for the NNWSI Project Repository: Software Documentation, has been delayed.

SNL Milestone M107, NNWSI Project Position Paper Describing Engineered-Barrier System and Disturbed-Zone Boundaries, has been delayed in review.

The new completion date for SNL Milestone M102, Documentation of the Total Systems Performance-Assessment Code (TOSPAC) Volume 1: Physical and Mathematical Basis, is April 20, 1987.

SNL Milestones M104, A First Survey of Disruption Scenarios for High-Level Waste Repository at Yucca Mountain; M133, Problem Definition Memo for COVE 2A Benchmarking Problem for Isothermal Flow; and M142, SNL Modifications to the TRACR3D Code, have been completed.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.1



SYSTEMS	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	571.4	1815.4
B. BUDGETED COST OF WORK PERFORMED (BCWP)	599.7	1850.7
C. ACTUAL COST OF WORK PERFORMED (ACWP)	487.4	1684.1
D. BUDGET AT COMPLETION (BAC)		7923.0
E. LATEST REVISED ESTIMATE (LRE)		7214.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	35.3	1.95
G. COST VARIANCE (B-C)	166.7	9.00
H. AT COMPLETION VARIANCE (D-E)	708.1	8.94

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987 Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST
1211	Systems Management and Integration	100.800	100.800	39.751	.000	61.049
1212	Systems Engineering	697.600	771.710	689.316	74.110	82.394
1213	Technical Data Base Management	319.000	280.215	272.000	-38.785	8.215
1214	Total Systems Performance Assessment	698.000	697.997	683.000	-.003	14.997
121	SYSTEMS	1,815.400	1,850.722	1,684.067	35.322	166.656

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
P132	WMPO/ SNL	1.2.1.1	WMPO submits Annual PASS Program Interaction Letter Report for FY 87 to OGR												△
R108	WMPO/ SNL	1.2.1.1	WMPO submits Letter Report on Studies of Performance Allocation Included in SCP to OGR					△				◇			
R109	WMPO	1.2.1.1	WMPO submits Letter Report on Studies of Coupled Processes Included in the SCP to OGR for Information			△			◇						
M120	WMPO/ SNL	1.2.1.2	Yucca Mountain Mined Geologic Disposal System (MGDS) Requirements						△		◇				
M261	WMPO/ SNL	1.2.1.2	Draft Yucca Mountain Site-Specific Mined Geologic Disposal System (MGDS) Description									△		◇	
M108	WMPO/ SNL	1.2.1.2	System Engineering Management Plan (SEMP)					△	◇						
[illegible]	WMPO/ SNL	1.2.1.2	OGR Systems Engineering Review of the NNWSI Project						△				◇		
R092	WMPO/ SNL	1.2.1.3	WMPO Submits Hard Copy (1987 Annual) Version of the Reference Information Base to OGR								△				

△ PLANNED MILESTONE COMPLETION DATE ◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED ◆ COMPLETED AS REVISED

1.2.2 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

WBS 1.2.2.1 MANAGEMENT AND INTEGRATION

During January, the SAIC Engineering staff completed support to the Site Characterization Plan (SCP); reviewed production version of Chapters 7, 8.3.4, and 8.3.5; completed review of SCP/CDR Chapters 6 through 9; assisted WMPO in the preparation of a presentation outline to Edison Electric Institute (EEI) and attended EEI review; completed SIP 1.2.2.3.1 review and summary; and completed a report on the Mission Plan revision to WMPO.

WBS 1.2.2.2 WASTE PACKAGE ENVIRONMENT

Staff members at LLNL completed the final version of a paper written for inclusion in the Symposium Proceedings from the Nuclear Waste Symposium held at the 1986 Monitored Retrieval Storage (MRS) National Meeting in Boston. The paper is entitled "Zeolitization of Glassy Topopah Spring Tuff under Hydrothermal Conditions" by Knauss. The paper was submitted to the editor.

WBS 1.2.2.3.1.1 Waste Form Testing

Current status of all testing in this task was reviewed by LLNL during a program review at Westinghouse Hanford Co. (WHC) on January 28-29, 1987. Review included technical sessions on recent results of testing, review of WHC QA procedures and the results of an internal WHC QA audit. Planning was started for the transfer of all work now being conducted at WHC over to Pacific Northwest Laboratories (PNL) under the new organization plan for the Hanford contractors which is to be implemented this summer. Because of this change, certain alterations in the planned scope of work will be necessary.

WBS 1.2.2.3.1.2 Waste Form Testing - Glass

LLNL staff members completed the scientific investigation planning (SIP) documentation for Glass Waste Form Testing. The approved plan outlines the work in this area through licensing, and includes quality level assignments for all the work.

A draft LLNL manuscript entitled "Parametric Testing of Three ATM Glasses" is currently in review. This paper summarizes the work on actinide- and fission product-doped PNL 76-68 glasses. This is the final work on these glasses, which were extensively tested as potential civilian high-level waste forms.

The information obtained in these studies is currently being applied to understanding glass reaction mechanisms, and radionuclide behavior.

WBS 1.2.2.3.2 Metal Barrier Testing

LLNL staff members completed the experimental activity concerned with exposure of test specimens to different environmental conditions; experimental results are currently being compiled and analyzed for use in evaluating the present candidate container materials. One of these candidate materials will be selected for advanced waste package designs and for additional characterization and testing.

A LLNL paper entitled "The Influence of Copper on Zircaloy Spent Fuel Cladding Degradation under a Potential Tuff Repository Condition," has been prepared and submitted for Project approval to present it at Waste Management '87 in Tucson, Arizona, in early March 1987.

WBS 1.2.2.3.4 Integrated Testing

Staff members at LLNL completed revisions to the document that describes a strategy for the NNWSI Project to show compliance with the postclosure performance objectives for the engineered barrier system. The draft was sent to WMPO on January 16, 1987.

WBS 1.2.2.4 DESIGN, FABRICATE, AND PROTOTYPE TESTING

LLNL personnel involved in the design, fabrication, and prototype testing task concluded negotiations with Babcock and Wilcox in Alliance, Ohio, in early January regarding a disposal container fabrication and closure process development subcontract. Preparation of the award package is now in progress. This initial activity was suspended last August due to FY 1987 budget uncertainties and then subsequently was delayed by the stop-work order. The results will be important to the advanced conceptual design scheduled to start in September 1987.

PLANNED WORK

LLNL staff will commence testing of the West Valley reference glass in March. The glass has been received and will be fabricated into the required forms prior to testing.

Members of the LLNL staff will continue system model design and development. Development of the QA procedure specific to performance assessment code development is planned.

PROBLEM AREAS

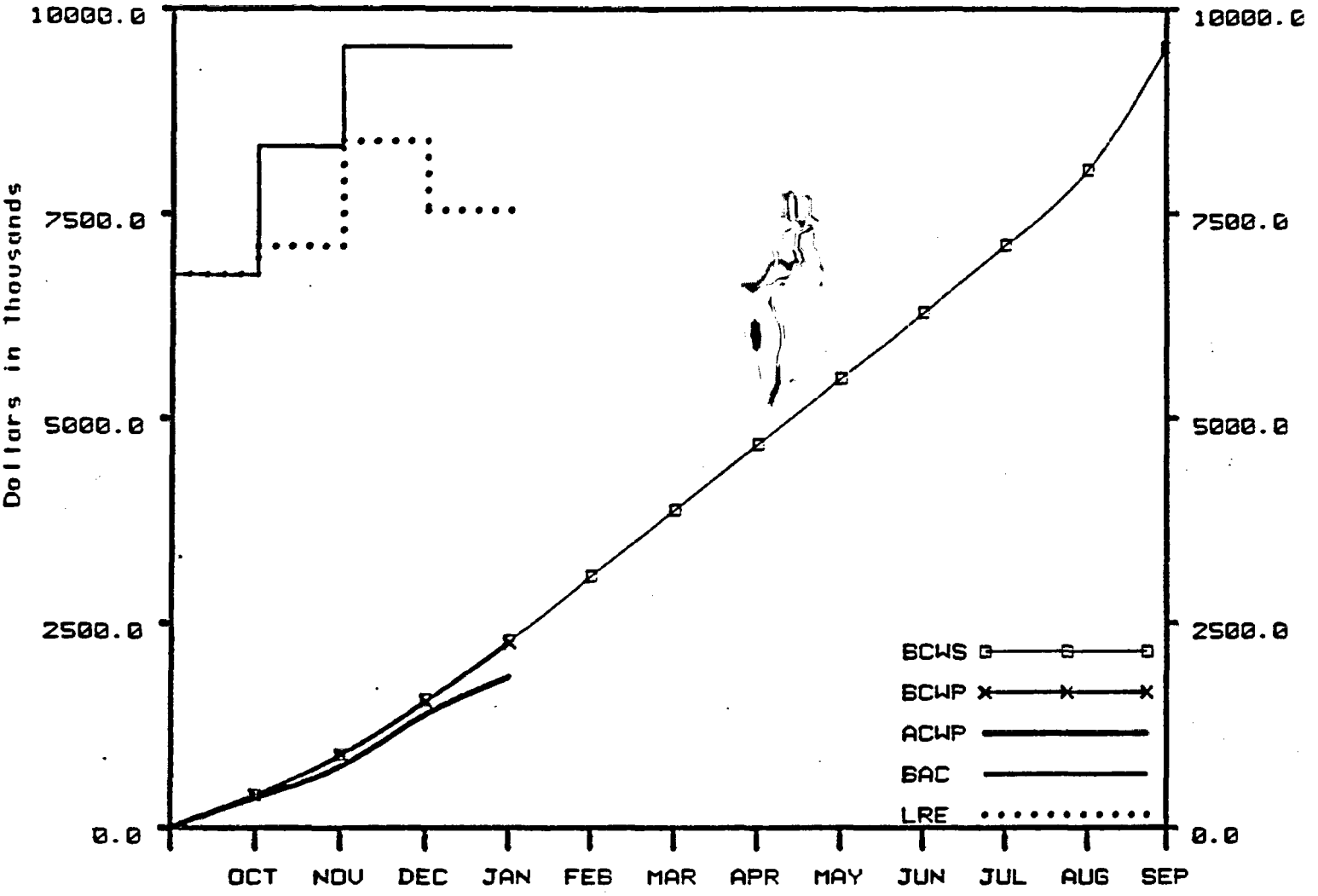
Limited final amounts of ATM-10, the West Valley reference glass are available, considerably less than LLNL staff originally anticipated, due apparently to losses caused by extensive analyses during production. Test matrixes for West Valley glass may have to be adapted to use more of the

glass produced by Catholic University for West Valley. This glass contains thorium, but no other radionuclides.

MILESTONE PROGRESS

A revised draft of LLNL milestone R003, Waste Package Strategy Document, was sent to WMPO on January 16, 1987.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.2



WASTE PACKAGE	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	721.2	2280.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	718.4	2256.2
C. ACTUAL COST OF WORK PERFORMED (ACWP)	457.9	1835.9
D. BUDGET AT COMPLETION (BAC)		9535.0
E. LATEST REVISED ESTIMATE (LRE)		7537.2

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-24.7	-1.08
G. COST VARIANCE (B-C)	420.3	18.63
H. AT COMPLETION VARIANCE (D-E)	1997.8	20.95

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST
1221	Management and Integration	230.900	210.900	160.545	-20.000	50.355
1222	Package Environment	330.000	314.100	342.100	-15.900	-28.000
1223	Waste Form & Materials Testing	1,300.000	1,333.203	1,017.600	33.203	315.603
1224	Design, Fabricate, and Prototype Testing	175.000	174.999	123.400	-.001	51.599
1225	Performance Assessment	245.000	223.000	192.300	-22.000	30.700
122	WASTE PACKAGE	2,280.900	2,256.202	1,835.945	-24.698	420.257

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
R003	WMPO/ LLNL	1.2.2.1	Waste Package Postclosure Compliance Strategy Document				△				◇				
M236	WMPO/ LLNL	1.2.2.3	Progress Report on the Results of Testing Advanced Conceptual Design Metal Barrier Materials Under Relevant Environ. Conditions for a Tuff Repository				△			◇					
M257	WMPO/ LLNL	1.2.2.3	Decision Made on Using Packing Material in the Waste Package to Assist in Controlling Radionuclides Release Rate				△					◇			
M013	WMPO/ LLNL	1.2.2.4	Revised Draft Waste Package Subsystem Conceptual Design Requirements to DOE/HQ for Review							△				◇	
M233	WMPO/ LLNL	1.2.2.4	Initiate Waste Package Advanced Conceptual Design												△
[illegible]	WMPO/ LLNL	1.2.2.5	Report on Long-Term Performance Analysis of the Conceptual Waste Package Design							△		◇			
[illegible]	WMPO/ LLNL	1.2.2.5	Report on the System Model for Waste Package Performance Analysis	△			◆								

△ PLANNED MILESTONE COMPLETION DATE . ◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED ◆ COMPLETED AS REVISED

1.2.3 SITE INVESTIGATIONS

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

WBS 1.2.3.1 MANAGEMENT AND INTEGRATION

The SAIC Site Management and Integration staff continued their involvement in the SCP at a relatively low level during January, with minor Project Overview Committee (POC) and PIRC involvement and a continued effort in writing portions of Section 8.3. Staff involvement will increase once again in February as the document goes through DOE/HQ review.

SAIC staff summarized the information on field activities in the SCP for the purpose of preparing budget estimates for drilling and construction (WBS 1.2.3.5.2). Consolidated technical information on each planned drillhole was prepared into a package that was sent to F&S, H&N, and REECo.

The information on field activities will also be used in the Field Activities Plan (FAP), scheduled for completion on March 31, 1987. Semiannual updates of the FAP will parallel the SCP Progress Reports. The FAP will contain summaries of the field activities, schedules, and technical specifications needed for budgeting purposes, as well as information on environmental and socioeconomic impacts needed for environmental permitting and for land access. The FAP will be used as a management tool for site characterization and can serve as the Project Surface-Based Test Plan.

Staff members at SAIC completed and presented the Decision Document for the Sample Management Facility (SMF) to the WMPO in a briefing on the SMF on January 22, 1987. WMPO decided at that meeting to accept the recommendations presented in the Decision Document and to have SAIC continue working with WMPO staff in developing the design, procedures, equipment, and staffing needs for the SMF. The major recommendation was that the SMF be established in Area 25 at the Test Site in Warehouses 1 and 2.

The stop-work order issued to USGS in March 1986 remained in effect through January and almost all site characterization technical activities continued

to be suspended. Most Project personnel continued to work on preparation of scientific investigation planning documents (SIPs) and their corresponding quality assurance level assignment sheets (QALAs)--a necessary step for resumption of work.

WBS 1.2.3.2 GEOLOGY

WBS 1.2.3.2.1 Geologic Investigations

WBS 1.2.3.2.1.1 Site Geology

SNL staff members made low-sun angle aerial photographs in January 1987 of the reference conceptual site for repository surface facilities. The photographs will be used to complement surface geologic mapping in support of studies on surface fault rupture.

SNL personnel submitted the Field Experiment Plan EP-0001 for final approval in early January. Completion of this plan and of technical procedures will allow negotiation of the Golder Associates contract to proceed, although work cannot commence until the study plan has been approved by NRC.

WBS 1.2.3.2.2 Geophysical Investigations

WBS 1.2.3.2.2.1 Gravity and Magnetics

USGS personnel worked on SIP documents for this task.

WBS 1.2.3.2.2.2 Seismic Investigations

The SIP documents for reflection seismology have been reviewed by the USGS QA office and by WMPO.

WBS 1.2.3.2.2.3 Rock Properties

The USGS documents for geophysical and rock properties testing, have been reviewed by SAIC and the authors have responded to the review comments. The documents are now ready for QA signoff and further processing.

WBS 1.2.3.2.3 Site Stability

WBS 1.2.3.2.3.1 Tectonics and Volcanism

The Los Alamos preclosure volcanic hazards report, "Preclosure Volcanic Effects: Evaluation for a Potential Repository at Yucca Mountain, Nevada," was submitted to the WMPO for policy review. This document fulfills the Level II milestone R202.

USGS staff members produced a first-draft of SIP documentation for normal faults, detachment faults, and for left-lateral strike-slip faults.

WBS 1.2.3.2.3.3 Seismicity and Strain

USGS personnel investigated possible strategies for increasing the limited dynamic range of the seismic record for recording seismic events in southern Nevada, and thus increasing the quality of the seismic record for larger magnitude earthquakes.

WBS 1.2.3.3 HYDROLOGY

WBS 1.2.3.3.3 Saturated Zone Hydrology

The USGS abstract "Prioritization and Field Verification of Ground-water Flow Model Variables," was sent to WMPO for review and approval for oral presentation at the American Geophysical Union, Front Range Branch "Hydrology Days," April 21-24, at Colorado State University.

WBS 1.2.3.3.4 Unsaturated Zone Hydrology

USGS personnel reviewed and revised SIP documents for both the shallow and deep unsaturated zone studies, dry coring prototype, predrill hole stemming prototype, hydrochemistry, and optimal rubble size prototype.

A representative from USGS completed an abstract "Chemical Evidence of Preferred H_2O-Flow Paths in Unsaturated Fractured Tuffs, Yucca Mountain, Nevada" for oral presentation at the American Geophysical Union spring meeting May 18-22, 1987, at Baltimore, MD.

A draft for a USGS paper, "U.S. Geological Survey, Denver, Colorado, Radiocarbon Dates," was completed for publication in Radiocarbon Journal. The paper is ready for colleague review.

A draft of the USGS report "Preliminary Estimate of Unsaturated Zone Thrust, Yucca Mountain, Nevada" was sent to WMPO for review and approval for release.

WBS 1.2.3.3.5 Future Hydrologic Conditions

The draft of a USGS abstract, "Study Design to Determine Ground-water a Recharge in a Paleoenvironment," was sent to WMPO for approval for oral presentation to the American Geophysical Union, Front Range Branch "Hydrology Days" on April 21-24 at Colorado State University.

WBS 1.2.3.4 GEOCHEMISTRY

WBS 1.2.3.4.1.2 Natural Isotope Chemistry

A draft of the Los Alamos report, "Methods for Obtaining Sorption Data from Uranium-Series Disequilibria," was sent to the WMPO for policy review. This document fulfills the Level II milestone R305.

WBS 1.2.3.4.1.5 Sorption and Precipitation

The Los Alamos FY 1986 annual report entitled "Preliminary Report on Sorption Modeling" (milestone R309) was revised and sent to the WMPO for policy review. The document will be published as a Los Alamos informal report.

WBS 1.2.3.4.1.6 Dynamic Transport Process

Los Alamos Milestone report R313 on anion exclusion in crushed rock columns was completed in draft form and is undergoing internal review and revision. Columns for further work with rocks containing elevated clay contents and for further investigation of iodine behavior are being prepared.

WBS 1.2.3.4.1.7 Retardation and Sensitivity Analysis

Los Alamos Milestone R314, "Modeling the Exploratory Shaft Diffusion Test" was sent to WMPO for policy review.

WBS 1.2.3.4.2.1 Fracture Mineralogy

Los Alamos staff members completed a draft of the fracture-mineralogy sampling procedure for the exploratory shaft mineralogy-petrology prototype test and it underwent preliminary review.

A Los Alamos procedure for the verification of probe standards was written, reviewed, and revised and is ready for external review. The procedure was originally written to describe the procedure for verifying new standards required for microprobe analysis of manganese mineral, but it is being applied to all standards used for microprobe analysis for the NNWSI Project. Two standards were examined this month with this procedure, and both were found to be homogeneous and suitable for use as microprobe standards.

Members of the Los Alamos staff established a computer data base for all core samples used for fracture mineralogy studies. The files are labeled with the core indicator .LOC and are on a central computing facility available to all mineralogy-petrology investigations. The purpose of the files is to facilitate tracking of fracture samples through various sample preparation procedures so that the exact location of any sample is easily checked at any time.

WBS 1.2.3.4.2.2 Alteration History

A new mass spectrometer was received by Los Alamos. This instrument will be used for a number of alteration history and mineral stability studies. With the addition of a gas extraction system, it will be possible to identify and measure gases released during mineral heating experiments. Another use of the apparatus will be in the bulk analysis of gaseous fluid inclusions contained in secondary minerals from Yucca Mountain. D. Bish and S. Chipera have been reconnecting the thermal analysis equipment and the fluid inclusion stage following the move to a new analytical facility.

WBS 1.2.3.4.2.3 Mineralogy of Transport Pathways

In February, Los Alamos Milestone R324, "Chemistry of Diagenetically Altered Tuffs at a Potential Nuclear Waste Repository, Yucca Mountain, Nevada" was distributed to NNWSI Project participants and to State and federal agencies. This report describes the chemical variability of zeolitic tuffs and of their constituent authigenic minerals within and marginal to the exploration block.

Los Alamos Milestone R320, "Petrographic Variations of the Topopah Spring Matrix Within and Between Cored Drill Holes," was received from the printers and has been distributed. This study extends the petrographic zonation observed in USW G-4 to four other cored holes in the Yucca Mountain area. Four petrographic zones are identified within the Topopah Spring Member. With minor exceptions, these four zones can be correlated with the four cored holes in the vicinity of the exploration block. Further sample analysis and statistical modeling should improve the ability to discriminate between zones on the basis of petrographic data.

WBS 1.2.3.5 DRILLING

WBS 1.2.3.5.2 Drilling, Construction, Engineering

USGS testhole USW U-28 remained at a temporary depth of 58 ft, as all drilling continued to be suspended under the stop-work order.

The H&N drillhole data base, revised by the Survey department to resolve differences from the F&S data base, was submitted to WMPO for review and comment.

WBS 1.2.3.6 ENVIRONMENT

WBS 1.2.3.6.1 Environmental Surveys

During January, the SAIC Environmental Monitoring Meteorological group continued to support the review of the meteorological sections in the SCP.

SAIC staff received comments from WMPO on the Population Densities along Nevada Transportation Routes draft report. These comments were prepared and presented in a briefing to State and local officials on the Socioeconomic Monitoring and Mitigation Plan (SMMP); and they completed preliminary research on taxation of actual parcels of land near the Yucca Mountain site in Nye County, Nevada. This activity is part of research as a means of implementing the "grants-equal-to-taxes" section of the NWPA, 1/6(c)(3). They also gave a briefing to WMPO representatives on the results of this preliminary research.

WBS 1.2.3.8 GEOCHEMICAL MODELING CODE EQ3/6

An additional 4 megabytes of RAM have been added to the existing 4 megabytes of the C2 Ridge of the LLNL EQ3/6 group. This will increase the speed of code development and geochemical calculations.

PLANNED WORK

The major effort by LLNL staff will be directed towards development of code release and the MCRT manual.

Los Alamos staff will continue to summarize and analyze the literature on the kinetics of silica polymorph evolution.

Los Alamos staff members will continue water diffusion experiments, rock beaker diffusion, solid rock column experiments, and single fracture rock column experiments and actinide tracer studies in crushed rock columns.

PROBLEM AREAS

The Los Alamos report on manganese minerals in fractures in USW G-4 may be delayed if samples are not available from the core library.

Minor bugs in the EQ3/6 codes are still a problem preventing the new release by LLNL.

MILESTONE PROGRESS

Los Alamos Milestone R379 will be delayed until August 31, 1987; a change control board action will be submitted for this milestone.

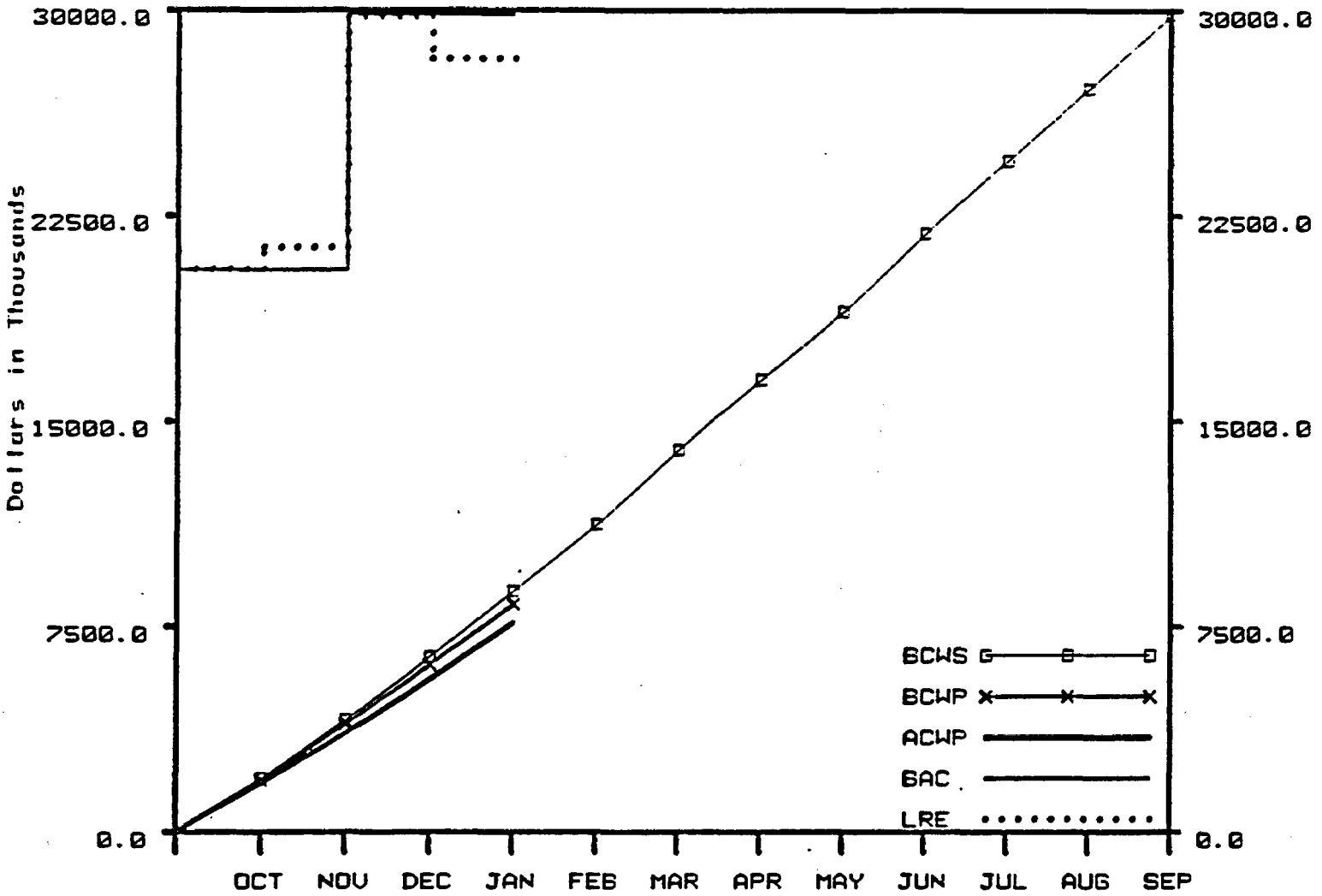
A draft of USGS Milestone P696, issue report: preliminary estimated of unsaturated zone flux at Yucca Mountain was submitted to WMPO on January 20, 1987 for review.

The new estimated date of completion for LLNL Milestone C319, interim report on modeling sorption with EQ3/6 is March 13, 1987.

Los Alamos Milestone R357 on the kinetics of silica-phase transitions is now overdue, but it should be completed in February 1987. This delay should have no significant impact on other milestones.

Los Alamos Milestone R309 was sent to WMPO for policy review on January 27, 1987.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.3



SITE INVESTIGATIONS	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	2384.0	8778.4
B. BUDGETED COST OF WORK PERFORMED (BCWP)	2193.3	8299.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	2070.2	7622.3
D. BUDGET AT COMPLETION (BAC)		29835.0
E. LATEST REVISED ESTIMATE (LRE)		28212.2

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-479.1	-5.46
G. COST VARIANCE (B-C)	677.0	8.16
H. AT COMPLETION VARIANCE (D-E)	1622.8	5.44

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
1231	Management & Integration	1,721.500	1,706.729	1,108.960	-14.871	597.769
1232	Geology	1,569.600	1,567.896	1,564.200	-1.704	3.696
1233	Hydrology	2,180.600	2,024.171	1,971.043	-155.829	53.128
1234	Geochemistry	1,724.700	1,647.399	1,663.600	-77.301	-16.201
1235	Drilling	576.750	512.709	480.110	-64.030	32.590
1236	Environment	507.000	422.225	357.436	-84.775	64.789
1237	Socioeconomic	242.800	168.692	243.252	-74.108	-74.560
1238	Geochemical Modeling Code EQ3/6	256.000	249.500	233.700	-6.500	15.800
1239	Deferred Site Close Out	.000	.000	.000	.000	.000
123	SITE INVESTIGATIONS	8,778.430	8,299.312	7,622.301	-479.118	677.010

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
R845	WMPO/ USGS	1.2.3.2	Recommendation to Proceed with Deep Regional Seismic Survey to OGR for Approval											△	
M325	WMPO/ LANL	1.2.3.4	Report on Geochemistry Simulation of Yucca Mountain Using Best Available Data on Mineralogy, Water Chemistry, Flow Rates and Crack Statistics		△			◇							
R309	WMPO/ LANL	1.2.3.4	Preliminary Report on Sorption Modeling				△	◇							
P509	WMPO/ REECo	1.2.3.5	Report: Completion of Trench Preparation at Surface Facilities Site						△						
P519	WMPO/ SAIC	1.2.3.5	Complete Drilling Shallow Unsaturated Zone										△		
M895	WMPO/ SAIC	1.2.3.1	Submit Report on Evaluation of Natural Resources at YM and Vicinity received to DOE/HQ for Information										△		
M897	WMPO/ SAIC	1.2.3.6	Final Radiological Monitoring Plan Complete					△			◇				
R327	WMPO/ SAIC	1.2.3.6	Submit Air Quality Monitoring Plan to DOE/HQ							△					
N345	WMPO/ SAIC	1.2.3.6	Begin Air Quality Monitoring												△
R945	WMPO/ SAIC	1.2.3.7	Submit Working Draft Site Characterization Socioeconomic Monitoring and Mitigation Plan (SMMP)		◆	△									
P030	WMPO/ SAIC	1.2.3.7	Submit Draft Socioeconomic Monitoring and Mitigation Plan to DOE/HQ							△		◇			

△ PLANNED MILESTONE COMPLETION DATE ◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED ◆ COMPLETED AS REVISED

1.2.4 REPOSITORY INVESTIGATIONS

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 package within the repository system.

ACTIVITIES

WBS 1.2.4.1 MANAGEMENT AND INTEGRATION

WBS 1.2.4.1.1 Management

During January, members of the SAIC Engineering staff completed reviewing a draft of SCP Section 8.4; reviewed comments on SCP/CDR with SNL; and attended the POC meeting at SAIC concerning SCP Sections 8.4 and 8.7.

WBS 1.2.4.1.2 Basis for Design

No work was performed on the SDR document pending reformatting guidance from DOE/HQ.

The SNL report entitled "Technical Plans and Parametric Study of Ground Motion and Surface Rupture Hazard Evaluations at Yucca Mountain, Nevada" (SAND86-7013) is in SNL management review.

WBS 1.2.4.1.3 Major Design Deliverables

During January 1987, representatives from the OGR of the DOE Office of Civilian Radioactive Waste Management, WMPO, Weston, Inc., SAIC, Los Alamos Technical Associates, and SNL reviewed and commented upon SCP/CDR Chapters 6 through 9. Minutes are being prepared of the review meetings. This review activity satisfied Milestone P153.

Comments on all other chapters of the SCP/CDR are being reviewed, resolved, and incorporated by SNL staff members as necessary. All comments are estimated to be reviewed and incorporated by January 30, 1987.

A design review of the SCP/CDR drawings will be held January 28-30, 1987, in San Francisco, CA.

SNL staff members devoted no effort to the Repository Design Plan during January. Effort was devoted instead to the completion of the SCP and the SCP/CDR.

WBS 1.2.4.1.4 Engineering Design Support: Special Studies

During January 1987, the SNL report entitled "Impact on Costs and Schedules of Using a Monitored Retrievable Storage Facility in Conjunction with a Repository in Tuff at Yucca Mountain" (SAND85-7112; Milestone R060) was edited in preparation for publication.

WBS 1.2.4.2 DEVELOPMENT AND TESTING

WBS 1.2.4.2.1 Rock Mechanics

WBS 1.2.4.2.1.1 Rock Mass Analysis

The revision of Chapters 6 and 8 of the SCP and of Sections 2.2 and 2.3 of the SCP/CDR continued and superseded all other work at SNL in this task. Also, time was devoted to completing reference to the SCP and SCP/CDR.

Revision of the draft of "Numerical Analyses for the G-Tunnel Small-Diameter-Heater Experiments" (SAND85-7115), by RE/SPEC, Inc., was completed. The reviewers comments were incorporated into the text, and the report was submitted for line review. This work has been delayed due to other commitments but it will have to be accelerated because it is an SCP/CDR reference and a milestone.

WBS 1.2.4.2.1.2 Field Testing

The SNL report entitled "Summary of Geomechanical Measurements Taken In and Around the G-Tunnel Underground Facility, NTS" (SAND86-1015), was sent to WMPO on January 22, 1987. This satisfies Level 2 Milestone P199.

Members of the SNL staff completed post-calibration checks of instruments used in welded tuff mining evaluations and performed pressure-deformation measurements with an instrumented flatjack to determine a field value for the modulus of deformation using the Rocha slot concept.

WBS 1.2.4.2.1.3 Laboratory Properties

SNL staff time during January 1987 was devoted to SCP related activities and to preparation of Study Plans and Experiment Procedures.

Parametric sensitivity testing at RE/SPEC, Inc., has been completed. A summary report will be submitted to SNL at the end of February.

WBS 1.2.4.2.1.4 Water Migration Analysis

Work being performed by SNL staff members under the water migration analysis task has been minimal because of their involvement with the preparation of the SCP.

WBS 1.2.4.2.2 Equipment and Instrument Development

SNL staff completed a draft equipment development program plan and it is currently being reviewed.

WBS 1.2.4.2.3 Sealing

WBS 1.2.4.2.3.1 Seal Performance Requirements

The SNL report satisfying Milestone P210, "Technical Basis for Performance Goals, Design Requirements, and Material Recommendations for the NNWSI Repository Sealing Program" (SAND84-1895), has completed peer review and is now in SNL management review.

WBS 1.2.4.2.3.3 Seal Concepts Development

The SNL report entitled "Modification of Rock Mass Permeability in a Zone Surrounding a Shaft in Fractured, Welded Tuff" (SAND-7001), completed WMPO policy review with one comment to be resolved. This report satisfies Milestone R037.

WBS 1.2.4.3 FACILITIES

WBS 1.2.4.3.2 Surface Facilities

Final draft SNL reports on the site-generated waste study, the design margins philosophy study, and the repository options study, with all technical peer review comments incorporated, are currently in SNL management and policy review.

WBS 1.2.4.3.3 Shaft/Ramps

SNL staff members completed a draft study that examines the costs for different sized lateral exploration drifts in support of the Exploratory Shaft Facility. This study compares the mining costs associated with using minimum sized openings for these drifts as compared to the costs of using openings that are the same as those proposed for the repository. The study has been sent to WMPO for review.

Personnel at SNL completed the outline for a design guide for repository and exploratory shafts and the design guide is being written. It is currently scheduled for completion on April 30, 1987.

An SNL report entitled "Study of Access Alternatives and Combinations" has been revised for inclusion as an appendix of the SCP/CDR. This report documents the tradeoff studies done to support the selection of the shaft and ramps used for the conceptual design.

WBS 1.2.4.3.4 Underground Excavations

The SNL drawings to be issued with the SCP/CDR have been approved and signed in preparation for release.

The borehole length versus cost study has been approved by SNL management and forwarded to WMPO for policy review. This report examines the emplacement costs per waste container as a function of the horizontal borehole length. The report investigates horizontal emplacement holes with lengths from 100 to 700 feet. A second study relating to horizontal waste emplacement has been initiated. This study will examine emplacement costs for boreholes that are shorter than the minimum considered by the completed report; it will examine emplacement holes with lengths from 40 to 75 feet that will contain from 1 to 3 waste containers each.

WBS 1.2.4.3.5 Underground Service Systems

Members of the SNL staff have completed the ventilation design supporting the SCP/CDR. The drawings reflecting this design have been reviewed and approved.

WBS 1.2.4.4 OPERATIONS AND MAINTENANCE

Bechtel National, Inc., has submitted their portion of the operations plan to SNL for review and approval. This submittal contains conclusions and recommendations for the reconfiguration of the waste handling facilities.

WMPO has completed its policy review of and has approved publication of the report entitled "OGR Repository-Specific Rod Consolidation Study: Effect on Costs, Schedules, and Operations at the Yucca Mountain Repository" (SAND86-2357). Final editing of the report will be delayed until WMPO completes its technical review.

The report entitled "The Effect of Fuel Rod Consolidation on the Cost of Spent Fuel Disposal at the Yucca Mountain Repository" (SAND85-1694), is undergoing minor revision following SNL line review.

WBS 1.2.4.6 REPOSITORY PERFORMANCE ASSESSMENT

WBS 1.2.4.6.1 Repository Performance Code Development and Certification

The revision of sections of Chapters 6 and 8 of the SCP and of Sections 2.2 and 2.3 of the SCP/CDR continued and superseded all other work by SNL staff in this task. Also, time was devoted to completing references to the SCP and SCP/CDR.

The SNL reports entitled "NNWSI Unit Evaluation at Yucca Mountain, Nevada Test Site: Near Field Thermal and Mechanical Calculations Using the SANDIA-ADINA Code" (SAND83-0030), and "NNWSI Unit Evaluation at Yucca Mountain, Nevada Test Site: Near Field Mechanical Calculations Using a Continuum Jointed Rock Model in the JAC Code" (SAND83-0070) were sent to WMPO for policy review. These two reports are SCP references.

WBS 1.2.4.6.2 Design Analysis

During January 1987, SNL staff members completed comment responses for the design analysis sections of the SCP/CDR. The keystone memo, "Expected

Temperatures for Spent Fuel Borehole Walls and Drifts," was released for distribution as SLTR86-4005 and will be published as an appendix to the SCP/CDR.

PLANNED WORK

SNL staff commitments to modifying SCP Chapters 6 and 8 of the SCP/CDR will supersede all work planned for this task. All schedules are expected to slip accordingly.

PROBLEM AREAS

SNL staff members cannot revise the SDR until DOE provides reformatting guidance. Revision will not begin until the physical subsystem structure has been provided.

MILESTONE PROGRESS

SNL Milestone P153, SCP/CDR Review, was completed.

SNL Milestone P199, The Report on G-Tunnel Underground Facility (GTUF) Summary, has been completed.

SNL Milestone P154, incorporate WMPO and TPO comments into SAND86-1015, the report on the G-Tunnel tuff summary, has been delayed because comments have not been received yet.

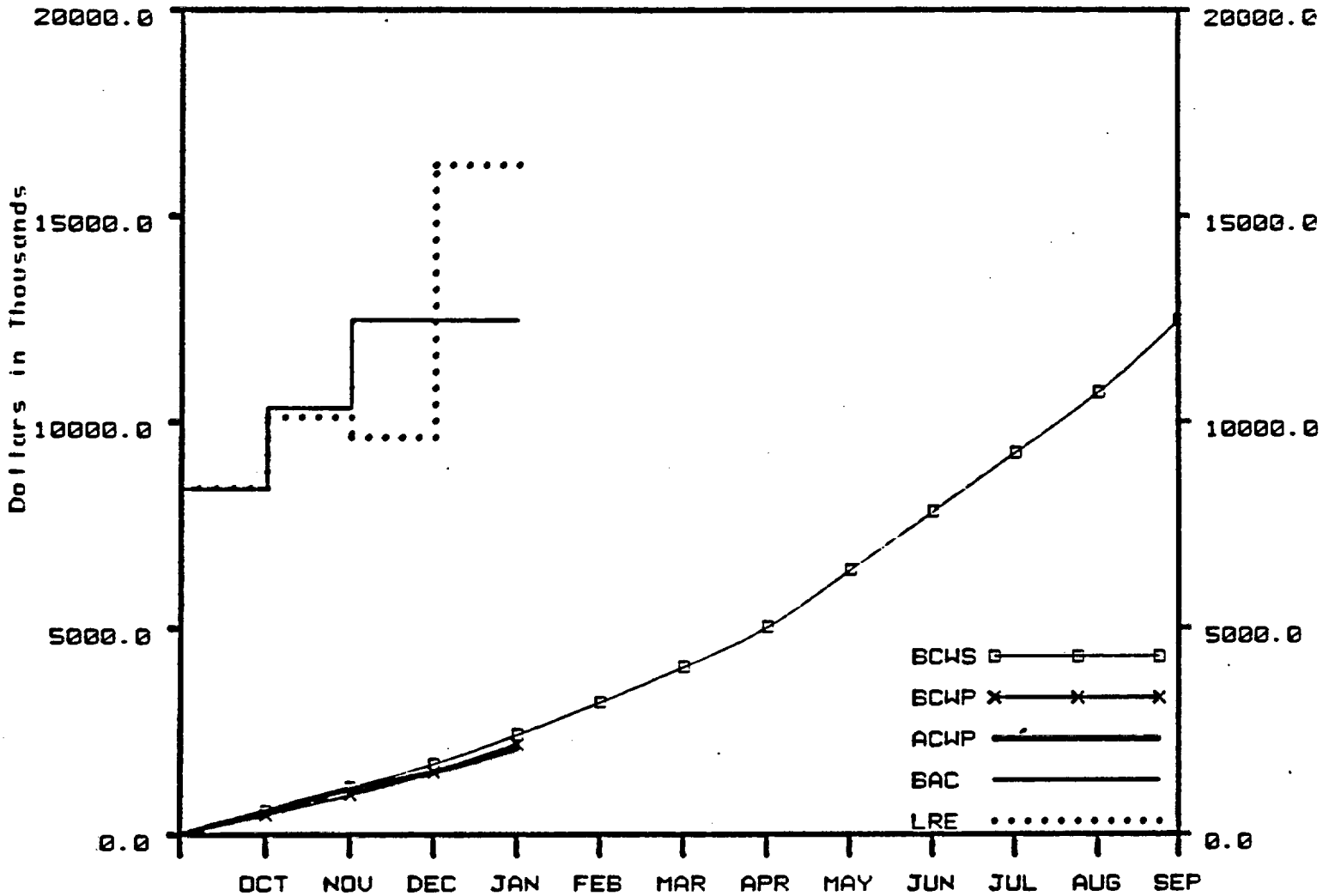
The new estimated date of completion for SNL Milestone N496, report on properties of fractures in the Topopah Spring Member, is March 16, 1987.

The new estimated date of completion for SNL Milestone P206, submit Horizontal Waste Emplacement Equipment Development Plan to WMPO is March 15, 1987.

SNL Milestone M413, near-field thermal effects and structural stability report, has been completed.

SNL Milestone P216, preliminary study of the effects of uncertain geologic data on design of the underground facility, is in line review.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.4



REPOSITORY INVESTIGATIONS	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	712.0	2415.5
B. BUDGETED COST OF WORK PERFORMED (BCWP)	675.5	2180.7
C. ACTUAL COST OF WORK PERFORMED (ACWP)	572.8	2079.2
D. BUDGET AT COMPLETION (BAC)		12472.0
E. LATEST REVISED ESTIMATE (LRE)		16224.8

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-234.8	-9.72
G. COST VARIANCE (B-C)	101.5	4.65
H. AT COMPLETION VARIANCE (D-E)	-3752.8	-30.09

Remarks:

COST PERFORMANCE REPORT
LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
1241	Management and Integration	771.500	583.620	595.226	-187.880	-11.606
1242	Development and Testing	1,115.000	1,068.062	958.000	-46.938	110.062
1243	Facilities	173.000	173.000	305.000	.000	-132.000
1244	Operations and Maintenance	106.000	105.999	68.000	-.001	37.999
1245	Decommisioning	16.000	16.000	.000	-.000	16.000
1246	Repository Performance Assessment	234.000	234.000	153.000	-.000	81.000
124	REPOSITORY INVESTIGATIONS	2,415.500	2,180.681	2,079.226	-234.819	101.455

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
N430	WMPO/ SNL	1.2.4.1	Start Repository Advanced Conceptual Design												△
N433	WMPO/ SNL	1.2.4.1	Initial Subsystem Design Requirement (SDR)							△	◇				
N432	WMPO/ SNL	1.2.4.1	Repository Conceptual Design in Support of Site Characterization					△		◇					
M455	WMPO/ SNL	1.2.4.2	Report on G-Tunnel Underground Facility (GTUF) Summary				△	◇							
M295	WMPO/ SNL	1.2.4.2	Feasibility Analysis of Horizontal Emplacement and Retrieval - Letter Report ◆ 9/86		△										
N406	WMPO/ SNL	1.2.4.2	Horizontal Waste Emplacement Equipment Development Plan					△		◇					
N603	WMPO/ SNL	1.2.4.2	Initiate Drill Tests in G-Tunnel										△		◇ 6/88
P403	WMPO/ SNL	1.2.4.2	Complete Fabrication of Development Prototype Boring Machine (DPBM) Waste Emplacement						△						◇ 5/88
P404	WMPO/ SNL	1.2.4.2	Prepare "Technical Basis for Performance Goals, Design Requirements and Material Recommendation for the NNWSI Project Repository Sealing Program Report"						△		◇				
N427	WMPO/ SNL	1.2.4.2	Initiate Procurement of Development Prototype Boring Machine		△							◇			
R036	WMPO/ SNL	1.2.4.2	Analysis to Evaluate the Effect of the Exploratory Shaft on Repository Performance at Yucca Mountain					△			◇				
[illegible]	WMPO	1.2.4.4	Submit Retrievability Compliance Strategy Plan to OGR for Review and Comment						△				◇		
R267	WMPO/ SNL	1.2.4.4	Final Report on Spent Fuel Rod Consolidation			△		◇							
N457	WMPO/ SNL	1.2.4.6	Preliminary Study of the Effects of Uncertain Geologic Data on Design of the Underground Facility					△			◇				

△ PLANNED MILESTONE COMPLETION DATE ◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED ◆ COMPLETED AS REVISED

1.2.5 REGULATORY AND INSTITUTIONAL INVESTIGATIONS

OBJECTIVE

The objective of the regulatory and institutional investigations 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

WBS 1.2.5.1 MANAGEMENT AND INTEGRATION

WBS 1.2.5.2.1 Regulatory Interaction

The revised SCP schedules continued to severely impact SAIC staff preparations for NRC interactions. Continuing slippages in prerequisite preparation, in particular the study plans, and the delay in developing definitions of regulatory terms, such as those associated with the waste package, confirm that technical meetings with the NRC will slip into mid-to-late FY 1987. All responses relating to prerequisite schedules and responsibilities, except those from SAIC, have been received.

SAIC staff members transmitted the NNWSI Project Administrative Procedure 2.8, Monthly Technical Data Transfer Report, to WMPO for approval and distribution.

The Preliminary Draft Regulatory Compliance Plan was issued for SAIC review prior to transmittal to WMPO. In addition to technical reviews, an independent internal review committee was established in accordance with AP 2.3.

WBS 1.2.5.2.2 Site Characterization Plan

SAIC production staff completed the draft SCP and it was transmitted to the OGR for review. All revisions submitted by the technical staff and the POCs by the mid-December text-freeze date were incorporated into this text version. Several sections were not available for the SCP draft and are to be submitted at a later date after POC review. These sections are as follows:

8.2	Issues
8.3.1.1	Overview of Site Program
8.3.5.6, 8.3.5.7, and 8.3.5.18	Higher-Level Findings (Information Needs only)
8.3.5.16	Performance Confirmation
8.3.5.16	NRC Siting Criteria (Information Needs only)
8.4	Plans for Site Preparation

8.5	Schedule
8.7	Decontamination and Decommissioning

PIRC 15 is working to complete these sections and is revising other sections containing problems that could not be resolved in time to be incorporated into the draft. The PIRC has been divided into several teams that will concentrate on various topics of concern. The status of activities to be performed is as follows:

Performance, design and characterization issue resolution strategies are under review and cross-checks are being made between information requested and information being provided.

The new text describing the systematic drilling plan is under review.

The text in the repository and waste package issues is being checked for consistency with the total system issue.

All sections addressing emplacement of waste access faults and sheer zones are under review to ensure consistency with pre- and postclosure seismic hazard assessment and methodologies presented in 8.3.1.

Issues 1.1 and 1.6 are under review to ensure consistency in the discussions of matrix diffusion.

The text is under review to ensure consistency in the discussions of gas-phase transport, erosion, and meteorology.

Revisions to sections of the higher-level findings issues and the NRC siting criteria are under way.

Work is continuing on future climate modeling questions, and the text is being checked for consistency in the approaches adopted by DOE/HQ and the Project.

Review of the DOE/HQ-prepared text for the issue resolution strategy (IRS) for performance confirmation is under way.

The text covering calcite-silica deposits is under review to ensure that NRC concerns are adequately covered.

Revisions to Section 8.4 are under way to make it consistent with the emerging ES design changes.

Sections discussing model validation are being reviewed for consistency.

Sections discussing flow paths, flow models, and conceptual hydrologic models are being reviewed to ensure that text is consistent and that it contains discussions of uncertainty.

The text is being reviewed for consistency in approach for containment, EBS release, total system, and ground-water travel time issues.

Review and revision of the pre- and postclosure tectonics information needs and IRSs are under way.

Sections of the text covering tectonics and faulting are under review to determine if changes to reflect NRC concerns need to be made.

Revisions are under way to the Mineral Resources section; the updated version is to be reviewed by the Project and provided to DOE/HQ reviewers before completion of the first review cycle.

Work is continuing to establish a data base that will allow a preliminary version of Section 8.5 to be provided to DOE/HQ sometime in February. Many of the milestones and activities in the current Project data base are no longer current, and it will be necessary at some point in the future to update the Project data base to reflect the site characterization activities in Section 8.3.

A letter commenting on the HQ-proposed review procedure for study plans was prepared and transmitted to DOE/HQ.

Reference verification activities for the SCP are continuing.

Reviewed the text of Key Issue 2 to establish the work necessary for better integration of the design/performance issues with the characterization issues.

At DOE/HQ direction, the Project is still working toward a March 1, 1987, freeze date for the SCP text.

WBS 1.2.5.2.2 Site Characterization Plan

The SAIC/Golden staff members continued to provide management and technical support in the development and coordination of the USGS input to the NNWSI Project SCP.

SCP activities at USGS focused on the compilation of two major integration tasks. These tasks consist of (1) assembly of the SCP site parameter list for correlation with design and performance assessment data requirements and (2) correlation of activity interfaces (technical and schedule) within the SCP for site, design, and performance assessment activities. Both the parameter compilation and activity compilation are being entered as computer files for better use in monitoring management and technical relations among the site characterization plans.

SAIC/Golden staff continued to supply input to the SCP PIRC 15 workshop on the following topics: (1) the review and integration of Chapter 8 site integration plans with design and performance assessment plans; (2) addition of text and information where necessary; (3) review of various sections of meteorology discussions to ensure consistent treatment of the topic; (4) model validation; (5) review of all sections discussing the conceptual hydrologic models; (6) review of "potential effects" information needs; and (7) review of a plan for development of a systematic drilling plan for the Project.

SAIC/Golden staff also developed and reviewed SIP documents for the unsaturated zone hydrology program.

Draft mini-networks were developed for all Information Needs (INs) for which SNL is responsible. These mini-networks are a graphic display of the logic of conducting the work described in each IN, including the interactions and dependencies with other INs. Collectively, they form the basis for the higher level (master) networks for the entire site characterization program. The development of these higher level networks will require several months, however, so the development of networks and appropriate text for SCP Section 8.5 is proceeding on the nominal basis of all level 1 SCP milestones and selected level 2 milestones. Approximately 1,000 level 2 milestones will be associated with the SCP.

Six copies of the draft SCP were received at SNL on January 20, 1987. SNL authors and technical editors are reviewing appropriate sections.

Review and revisions of all SCP sections that LLNL is responsible for were completed for the HQ draft version. Participation continued in the PIRC/POC process as well as review of HQ draft to revise text.

A PIRC 15 meeting was held January 6-7 in Las Vegas. This meeting was held to identify areas within the draft SCP that still require attention. These areas of concern were identified and teams of PIRC 15 members were formed. Work was started this month on Team 1 (data requirements), Team 26 (reference verification), Team 10 (review of the effects information needs), Team 28 (review and incorporation of the Nuclear Regulatory Commission comments on the Environmental Assessment into the SCP), and Team 24 (Schedule, 8.5).

WBS 1.2.5.3.2 Environmental Impact Statement (EIS)

The draft Mission Plan released this month by DOE/HQ revised the EIS schedule, moving the start of the EIS process, known as scoping, to 1989. The draft EIS will be completed in 1993, and the fiscal EIS in 1994. Some overall planning will continue in this WBS category.

WBS 1.2.5.3.3 Environmental Regulatory Interaction

DOE/HQ comments on the preliminary draft Environmental Regulatory Compliance Plan (ERCP) were received by SAIC on January 14, 1987. A meeting was held with DOE/HQ on January 22, 1987, to review and discuss resolution of each comment. DOE/HQ changed the date for sending the States and Tribes copies of the ERCP to March 31, 1987, and now requires that a second draft ERCP be prepared for review by February 13, 1987. Work continues on revising the ERCP.

WBS 1.2.5.4 COMMUNICATION AND LIAISON

WBS 1.2.5.4.1 Institutional Studies

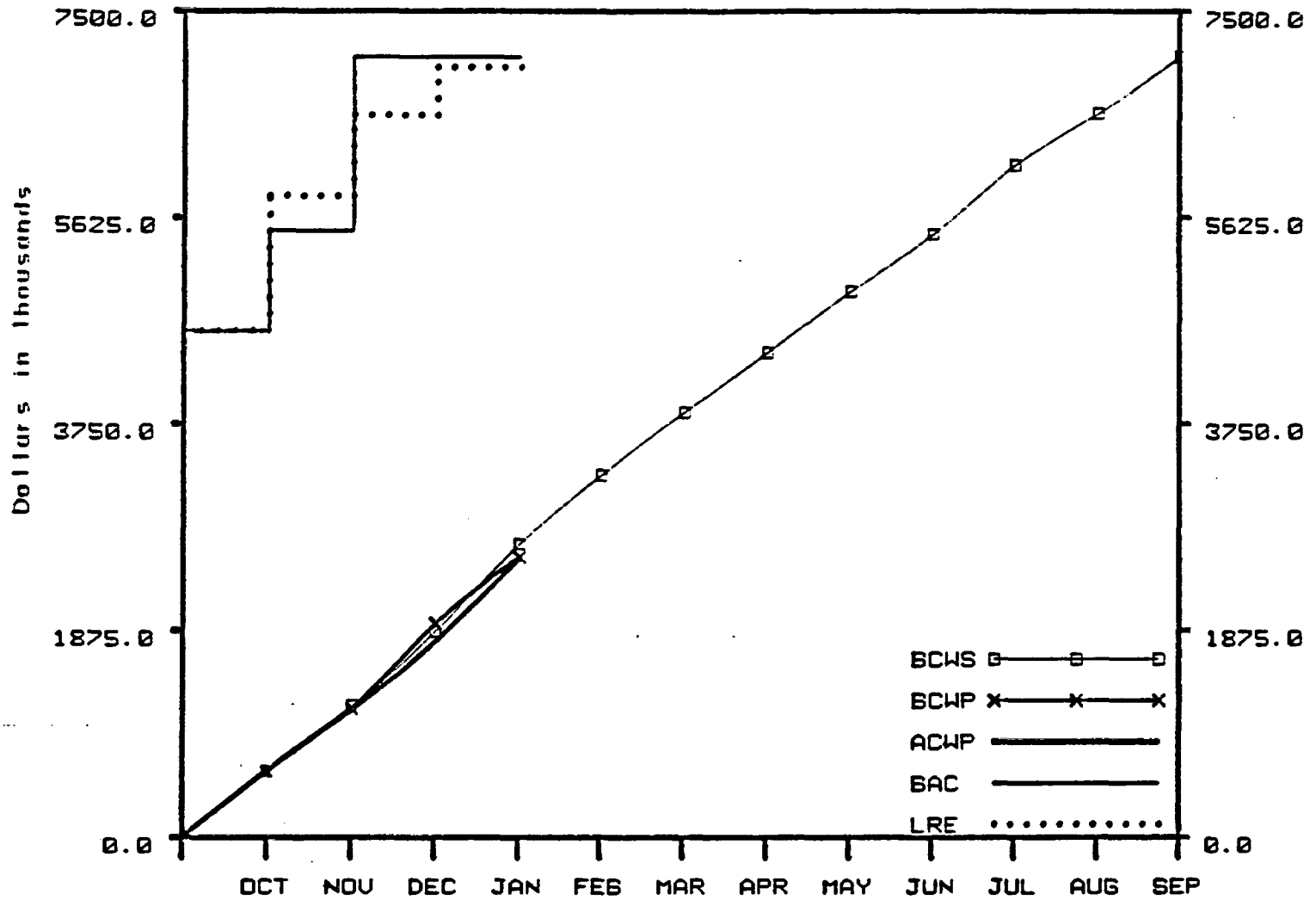
The SAIC Institutional Branch staff reviewed and compiled comments on the proposed draft amendment to the OCRWM Mission Plan; assisted WMPO with

release of the draft OCRWM Mission Plan Amendment, including mail distribution and hand delivery to Carson City; and demonstrated the NNWSI Project Newsclipping Data Base to a representative of the State of Nevada Nuclear Waste Project Office socioeconomic contractor.

MILESTONE PROGRESS

SNL Milestone R197, quarterly update of SNL data catalog, was completed.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.5



REGULATORY AND INSTITUTIONAL INVESTIGATIONS	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	796.9	2659.6
B. BUDGETED COST OF WORK PERFORMED (BCWP)	606.9	2543.6
C. ACTUAL COST OF WORK PERFORMED (ACWP)	761.9	2528.7
D. BUDGET AT COMPLETION (BAC)		7086.0
E. LATEST REVISED ESTIMATE (LRE)		6990.1

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-116.0	-4.36
G. COST VARIANCE (B-C)	14.9	0.59
H. AT COMPLETION VARIANCE (D-E)	95.9	1.35

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987 Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
1251	Management and Integration	224.300	202.340	140.744	-21.960	61.596
1252	Licensing	2,080.500	2,044.006	2,099.461	-36.494	-55.455
1253	Environmental Compliance	182,100	124.530	167.527	-57.570	-42.997
1254	Communication and Liaison	172.700	172.700	120.924	.000	51.776
1255	Technology and Financial Assistance	.000	.000	.000	.000	.000
125	REGULATORY AND INSTITUTIONAL INVESTIGATIONS	2,659.600	2,543.577	2,528.656	-116.023	14.920

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
R579	WMPO/ SAIC	1.2.5.2	Submit Draft Preliminary Plan for Scheduling, Management, and Preparation of Position Papers to WMPO/NV											△	
R583	WMPO/ SAIC	1.2.5.2	Submit Draft Seismic/Tectonic Summary Position Paper to WMPO/NV									△			
M521	WMPO/ SAIC	1.2.5.2	Draft Site Characterization Plan (SCP)				▲								
M522	WMPO/ SAIC	1.2.5.2	Site Characterization Plan (SCP)					△		◇					
R798	WMPO/ SAIC	1.2.5.3	Draft Environmental Field Study Plans Received at HQ for Review									△			
R799	WMPO/ SAIC	1.2.5.3	Environmental Field Study Plans Received at HQ for Baselining											△	
R794	WMPO/ SAIC	1.2.5.3	Submit Working Draft Environmental Regulatory Compliance Plan to DOE/HQ and State				△		◇						
R795	WMPO/ SAIC	1.2.5.3	Environmental Regulatory Compliance Plan Issued								△				
R996	WMPO/ SAIC	1.2.5.3	Submit Draft II Environmental Monitoring and Mitigation Plan (EMMP) to WMPO/NV			▲									
P034	WMPO/ SAIC	1.2.5.3	Submit Environmental Monitoring and Mitigation Plan (EMMP) to DOE/HQ							△		◇			
M795	WMPO	1.2.5.4	Complete and Sign C&C Agreement with State						△						

△ PLANNED MILESTONE COMPLETION DATE

◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◆ COMPLETED AS REVISED

1.2.6 EXPLORATORY SHAFT INVESTIGATIONS

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

WBS 1.2.6.1 MANAGEMENT AND INTEGRATION

WBS 1.2.6.1.1 Exploratory Shaft Facility Management and Integration

Work by Los Alamos staff has been temporarily suspended on the study of usable liquids and restriction on materials and methods of construction in the ESF underground. This suspension was caused by higher priority work on the space allocation study, milestone development, etc.

Los Alamos personnel made final arrangements for EG&G to design, build, and operate the IDS. A purchase request to cover the estimated work for FY 1987 is currently being written. The work will involve system design and procurement of hardware and software.

F&S staff members delivered Subsurface Excavation Study (No. 3), Compressed Air Study (No. 9), 1400' Level Development Study (No. 2), and the ESF Development Study (No. 1) to the PM for WMPO review and comment.

The ESF Development Study was scheduled for delivery by F&S to WMPO on December 31, 1986, but was delayed until January 20, 1987. The delayed delivery was due to waiting for revised 1,020 L Test Bed Layouts.

The 1,400 foot Level Development Study was scheduled for delivery to WMPO on January 5, 1987, but was delayed until January 20, 1987. The delay of this study was because assigned F&S personnel were working on the Development Study.

The Subsurface Excavation Study was scheduled for delivery to WMPO on January 16, 1987, and was delivered to the Project Manager for WMPO delivery on January 31, 1987. While analyses and narrative associated with this study were virtually complete, they and the required narrative could not be fully completed until the 1,020 L arrangement was available.

The Controlled Blasting Study was delivered on schedule to WMPO on December 8, 1986. Comments from WMPO were scheduled to be received by F&S on December 23, 1986, but as of January 31, 1987, no comments had been received.

The Compressed Air Study was scheduled for delivery to WMPO on January 29, 1987, and was delivered to the PM for WMPO delivery on January 31, 1987.

WBS 1.2.6.1.2 Quality Assurance

During January, the SAIC engineering staff developed Project-level commitment schedule for all ESF activities and presented it to WMPO; submitted ESF Interface Design Control Procedure with comments incorporated to WMPO; completed ESF Development Study Review; completed review of the sites mineralogy data in regard to dust control and mining safety standards; completed final review and revision of SCP Chapter 2; provided comments on SCP/CDR Vol. 3 to WMPO; completed review draft of SCP Section 8.4; continued SCP technical reference verification of Chapter 6; and completed review and implementation of POC comments on SCP Section 8.3.1.1.

WBS 1.2.6.2.2 ESF Water Sewer

The Sanitary Waste Treatment analysis is nearly complete. Expected submittal to WMPO is February 17, 1987.

WBS 1.2.6.3.1 ESF BUILDINGS

Area 25 A-E Building drawings are 99 percent complete. Analysis is in outline form. Expected submittal to WMPO is February 17, 1987.

WBS 1.2.6.7.1 UNDERGROUND UTILITIES AND COMMUNICATIONS

Communications is still on hold pending WMPO review and turn-on. A stop-work letter for this study was received November 4, 1986.

WBS 1.2.6.9 TESTING

WBS 1.2.6.9.1 Exploratory Shaft Test Plan

Staff members at Los Alamos completed Appendix C of the Subsystems Design Requirements document, including input from principal investigators.

Los Alamos personnel completed drafts of detailed prototype test plans for the air coring, diffusion, and mineralogy/petrology tests.

A review draft of Section 8.4 of the SCP was prepared by Los Alamos staff.

LLNL staff members prepared a draft test plan for the first phase of prototype testing, and sent it to Los Alamos for review. Specific instrument and data collection equipment were specified and writing of technical procedures for use of these instruments was initiated.

LLNL personnel prepared a contract for services with New Mexico State University for study of thermal stability of the U.S Bureau of Mines gage.

LLNL internal review of the report titled "Preliminary Evaluation of an Electromagnetic Experiment to Map In Situ Water in Heated Welded Tuff" was completed. Revisions are in progress.

WBS 1.2.6.9.2.4 Geochemical Testing

The Los Alamos Level II report for Milestone R314 was sent to the WMPO for policy review. This report is entitled "Modeling the Exploratory Shaft Diffusion Test."

WBS 1.2.6.9.3 Exploratory Shaft Integrated Data System

EG&G was selected as the new Integrated Data Systems Contractor.

WBS 1.2.6.9.4 Prototype Testing

WBS 1.2.6.9.4.1 Prototype Geologic Testing

USGS staff members completed the writing of technical specifications for the analytical stereoplotter.

USBR staff completed the analytical plotter cost/benefit analysis. The least expensive choice is to use the photogrammetric mapping method, conventional is next, and the most expensive is the photomosaic method.

WBS 1.2.6.9.4.2 Prototype Hydrologic Testing

Work continued by U.S. Bureau of Reclamation (USBR) on preparation of prototype SIP documents: 11 of 13 have been formally submitted to USGS; one is in final preparation stage; and one is in draft preparation stage.

WBS 1.2.6.9.4.3 Prototype Geomechanical Testing

SNL staff members completed the review of the Experiment Procedure entitled "Prototype Thermal Stress Testing."

PLANNED WORK

The Los Alamos staff will perform a technical review of the ES Test Plan and prepare draft prototype test plans.

The slot strength test analysis report will undergo SNL line review. SNL staff will initiate laboratory and analysis activities for prototype thermal stress testing.

PROBLEM AREAS

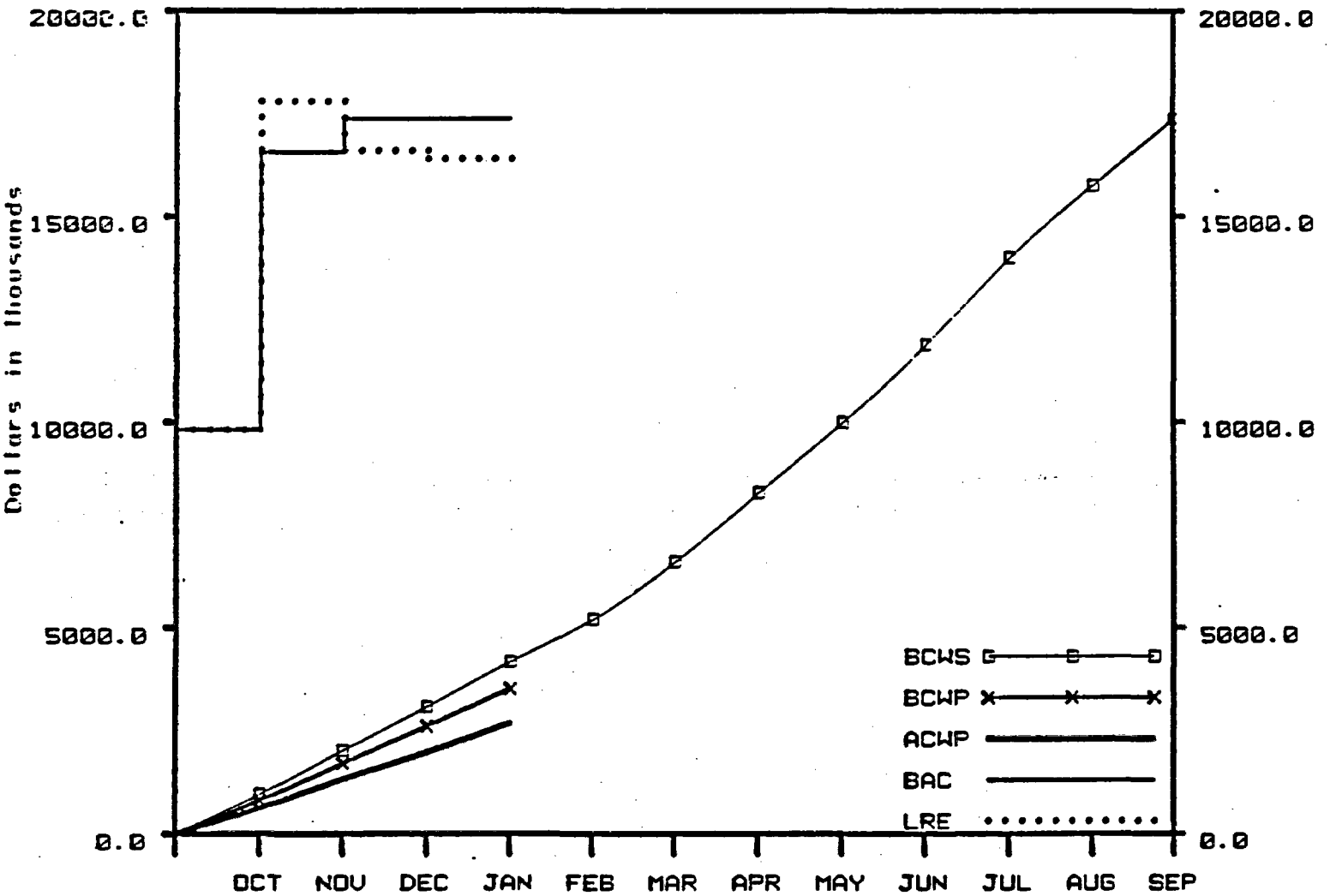
Unless prototype testing begins in G-Tunnel by May 1987, SNL may have to mothball the facility. The cost of reactivating G-Tunnel would be very high.

MILESTONE PROGRESS

SNL Milestone R086, definition of technical procedures required to be prepared for exploratory shaft testing, has been completed.

USGS Milestone P696, issue report: preliminary estimate of unsaturated zone flux at Yucca Mountain was submitted to WMPO on January 20, 1987, for review.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.6



EXPLORATORY SHAFT INVESTIGATIONS	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1096.0	4171.5
B. BUDGETED COST OF WORK PERFORMED (BCWP)	909.9	3512.5
C. ACTUAL COST OF WORK PERFORMED (ACWP)	708.5	2676.4
D. BUDGET AT COMPLETION (BAC)		17370.0
E. LATEST REVISED ESTIMATE (LRE)		16396.2

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-659.0	-15.80
G. COST VARIANCE (B-C)	836.1	23.80
H. AT COMPLETION VARIANCE (D-E)	973.8	5.61

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST
1261	Management and Integration	1,696.530	1,663.869	1,220.848	-32.661	443.021
1262	Site Preparation	46.900	17.300	18.000	-29.600	-.700
1263	Surface Facilities	28.500	20.500	10.800	-8.000	9.700
1264	First Shaft	74.000	74.000	36.638	-.000	37.362
1265	Second Shaft	8.000	8.000	.874	-.000	7.126
1266	Subsurface Excavations	121.000	121.000	159.724	.000	-38.724
1267	Underground Service Systems	147.100	109.900	42.146	-37.200	67.754
1268	Operations	15.000	15.000	7.000	.000	8.000
1269	Testing	2,034.500	1,482.932	1,180.394	-551.568	302.538
126	EXPLORATORY SHAFT INVESTIGATIONS	4,171.530	3,512.500	2,676.424	-659.030	836.076

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
M105	WMPO/ LANL	1.2.6.1	Submit Prototype Test Plans to DOE/HQ for Review and Comment					△							
M243	WMPO/ LANL	1.2.6.1	Complete Exploratory Shaft Readiness Review												△
R841	WMPO/ SAIC	1.2.6.1	DOE/HQ Receives Final FY 89 Project Validation Material						△						
M282	WMPO/ LANL	1.2.6.1	Start Field Prototype Testing in G-Tunnel						△						
R241	WMPO/ LANL	1.2.6.1	Exploratory Shaft Facility (ESF) Subsystems Design Requirements Document			△			◇						
M771	WMPO/ SAIC	1.2.6.1	Final ESF Title II Design Requirements Document Submitted To DOE/HQ								△				
P763	WMPO/ SAIC	1.2.6.1	Exploratory Shaft Title I Design Summary Submitted to WMPO								△				

△ PLANNED MILESTONE COMPLETION DATE

◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◆ COMPLETED AS REVISED

1.2.7 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.

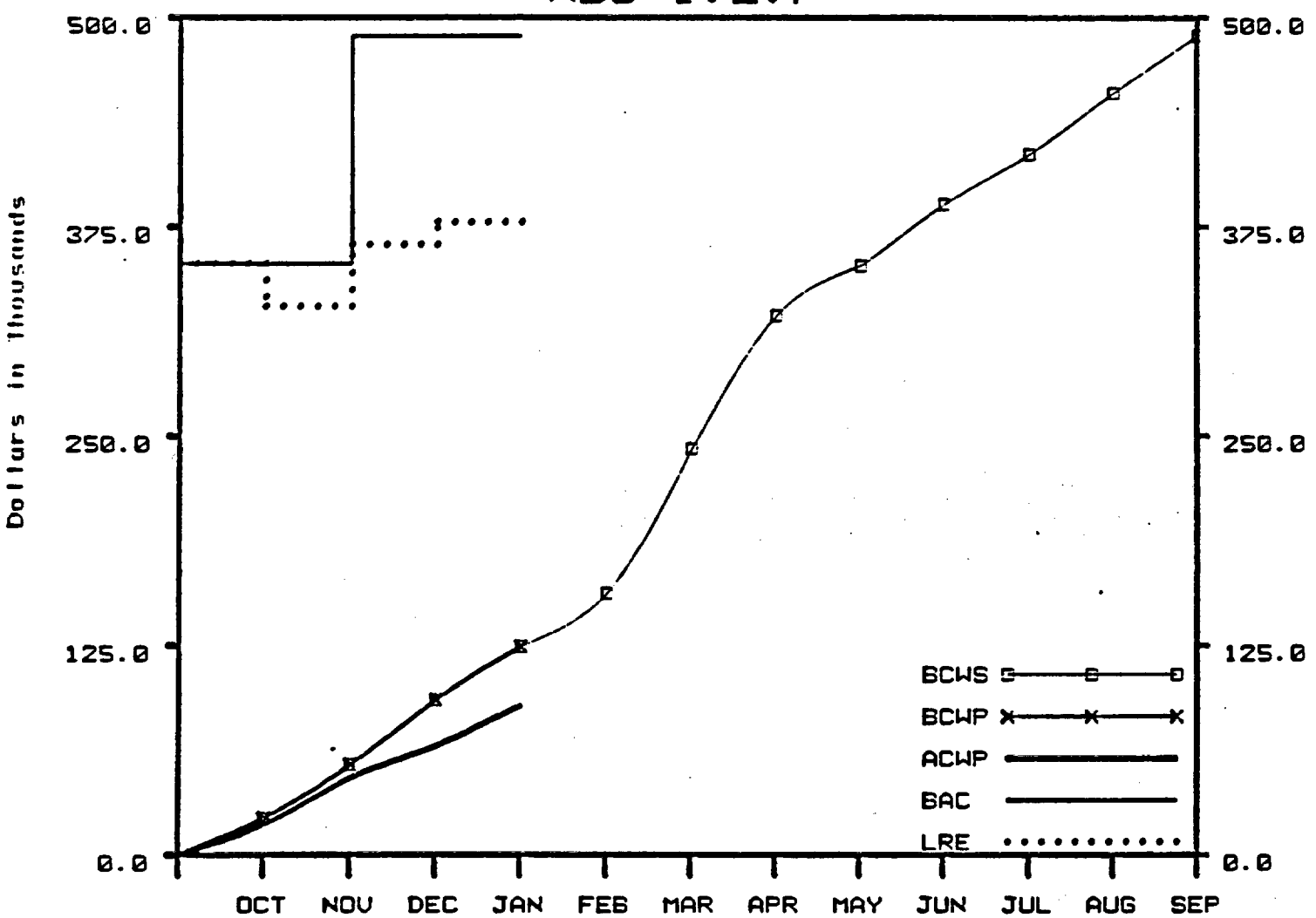
ACTIVITIES

LLNL staff members received a request from the Spanish Nuclear Energy Program for information on instrumentation at the Spent Fuel Test-Climax.

Members of LLNL staff completed a review of a Los Alamos draft list of fluids and materials to be used in the ESF.

Representatives from Los Alamos, SAIC, and SNL met at G-Tunnel on January 22, 1987, to discuss data acquisition.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.7



TEST FACILITIES	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	31.8	124.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	31.8	124.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	24.0	88.6
D. BUDGET AT COMPLETION (BAC)		489.0
E. LATEST REVISED ESTIMATE (LRE)		377.6

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	35.4	28.52
H. AT COMPLETION VARIANCE (D-E)	111.4	22.79

Remarks:

COST PERFORMANCE REPORT
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NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
1271	Management and Integration	.000	.000	.000	.000	.000
1272	Testing	123.980	123.980	88.621	.000	35.359
1273	New Facility Acquisitions	.000	.000	.000	.000	.000
127	TEST FACILITIES	123.980	123.980	88.621	.000	35.359

1.2.8 LAND ACQUISITION

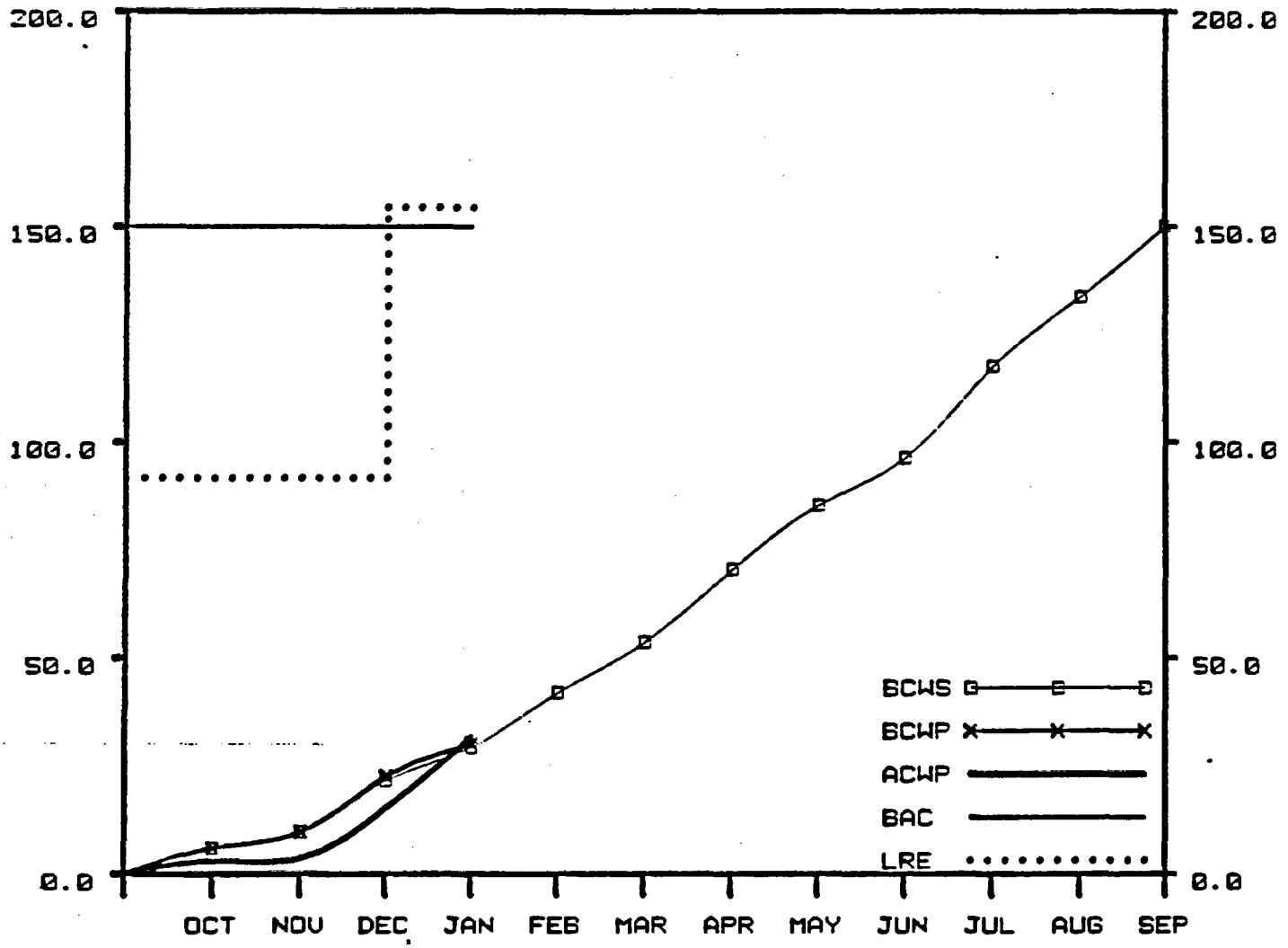
OBJECTIVE

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 to report.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.8



LAND ACQUISITION	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	7.7	29.2
B. BUDGETED COST OF WORK PERFORMED (BCWP)	7.5	30.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	16.4	31.5
D. BUDGET AT COMPLETION (BAC)		150.0
E. LATEST REVISED ESTIMATE (LRE)		154.3

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.8	2.74
G. COST VARIANCE (B-C)	-1.5	-5.09
H. AT COMPLETION VARIANCE (D-E)	-4.3	-2.89

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
1281	Land Acquisition	29.200	30.000	31.526	.800	-1.526
128	LAND ACQUISITION	29.200	30.000	31.526	.800	-1.526

1.2.9 PROJECT MANAGEMENT

OBJECTIVE

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

ACTIVITIES

WBS 1.2.9.1 MANAGEMENT AND INTEGRATION

WBS 1.2.9.1.1 Management

H&N staff members completed review of the Systems Engineering Management Plan (SEMP) and submitted comments to WMPO in response to WMPO Action Item 87-721.

In response to WMPO action item 87-682, SNL completed 36 computer code questionnaires describing the technical codes that SNL has recently used, is currently using, and plans to use in the near future for NNWSI Project-related studies.

WBS 1.2.9.1.4 Records Management

Representatives from REECo attended meetings at WMPO on the Core Storage Facility location. A decision was made to locate in Area 25 utilizing warehouses Nos. 1 and 2.

REECo personnel gave copies of the NNWSI Project participant space requirements in the Area 25 A-E Building to H&N. These requirements were in addition to Exploratory Shaft-related requirements.

Quality assurance records from the Los Alamos Engineering Design and Quality Assurance Group (MST-9) have been processed and entered into the Quality Assurance Records Management System.

Representatives from the Salt Repository Project Office (SRPO) completed installation of the Automated Retrieval System (ARS) applications on the SAIC/T&MSS computer system. Members of the Information Management Section received training in the use of the ARS. A 30-day testing period for the ARS application is in progress, after which a meeting to propose changes for a controlled version of the ARS for program use is scheduled for February 10, 1987 through February 12, 1987, in Las Vegas.

The preliminary draft of the NNWSI Project IMS Plan (Level 2 Milestone R580) was completed and released for internal SAIC review.

A draft of H&N Records Management Procedure was submitted to WMPO for review.

WBS 1.2.9.2 PROJECT CONTROL

Review by USGS staff was in progress for the SIP documents for distribution and characteristics of present-day erosion and characteristics of ambient thermal conditions at Yucca Mountain.

SIP documents for characterization of the regional surface water were revised by USGS staff members.

The USGS summary schedule was updated to show the stop-work order extending through March of 1987. Also included in this update was the revised planning, milestone modifications, and additions resulting from the development of the SCP issues schedules.

WBS 1.2.9.3 QUALITY ASSURANCE

H&N received and reviewed the draft of NV0196-17, Rev. 5. H&N staff members identified significant areas of change.

Twenty LLNL QAPP Procedures and Requirements were submitted for WMPO review and approval on January 15.

REECo QA staff performed verification review of the Operations Equipment Department in response to Audit Report AF-568-001-06.

F&S QA staff performed surveillance SR(N)-87-01 of F&S Technical Support Division/Records Management, pertaining to the NNWSI Project. No problems were noted.

The Director of QA performed a Management Surveillance Review in the F&S Tulsa Office and closed out two open items on surveillance SR (N)-86-003.

WMPO/QASC performed a QA surveillance of Sections 1 and 2 of F&S NNWSI Project QAPP, Rev. 1. Four concerns pertaining to the description of F&S organization were noted.

A Quality Assurance training session was conducted in Menlo Park on January 27 for USGS Geologic Division and Water Resources Division personnel. Similar sessions were held for Geologic Division personnel in Denver on January 9 and January 21. Training sessions should be completed by early March.

Controlled copies of the USBR QA Manual have been distributed. Most document transmittal notices have been received. One of the USBR engineers has received the QA training course. Training of the remainder of the technical personnel will be accomplished in the first half of February.

The draft of Revision 5 of NV0 196-17 was begun. It contains extensive changes from Revision 4 and will require a revision to the USBR QA manual.

An internal Los Alamos audit of the Technical Engineering Support Group (WX-4) activity was completed; it did not result in any findings, but three observations and a corrective action report were issued as a result of the

audit. Informal work was reviewed that indicates the WMPO audit of LANL's NNWSI activities will be conducted during the week of March 30. Two additional internal audits will be conducted before that date.

The Exploratory Shaft Facility (ESF) Quality Assurance Level Assignments (QALAs) for Level III items and activities were completed and incorporated in the November 13-14 WMPO comments. Following the receipt of WMPO letter JB-777, Los Alamos is submitting the QALAs to WMPO for final approval.

SAIC staff members transmitted the Administrative Record for the Environmental Assessment Management Plan (EAMP) to DOE/HQ. There are no other activities presently associated with the EAMP that are in progress.

A total of four surveillances were conducted during the month of January. A total of 10 surveillances have been conducted in FY 87 and 32 items or activities monitored. During this effort no nonconformances have been recorded.

Of the five audits conducted in FY 1986, four remain open. Of the 15 audits conducted in FY 1985, four remain open.

The SNL NNWSI Project Quality Assurance Program Plan (QAPP) was issued to appropriate parties as a controlled document.

A revision to the SNL NNWSI Project QAPP was forwarded to WMPO for review and approval. This revision reflects a change to the organization of the SNL NNWSI Projects Department.

Two SNL quality assurance implementing procedures were issued: Quality Assurance Procedure 1-3, "Procedure for Quality-Related Work Stoppage," and Department Operating Procedure 17-1, "Records Management Systems."

The NNWSI Project QA Plan, NVO-196-17, Revision 5, has been reviewed and approved by OGR. Comments from OGR and those of other reviewers are being incorporated into the document. It will be issued before March 1, 1987.

The final draft of the NNWSI Project Office Training Plan has been completed. The draft was submitted for review and comment within SAIC; resolution of comments will be completed and the final version submitted to WMPO by February 1, 1987.

QASC participated in the informal SIP review meeting with LLNL, SAIC, and WMPO personnel on January 14, 1987. Comments were resolved via a subsequent submittal and approved by WMPO on January 23, 1987. The SIP is entitled "NNWSI Glass Waste Form Testing," WBS Element 1.2.2.3.1.

PLANNED WORK

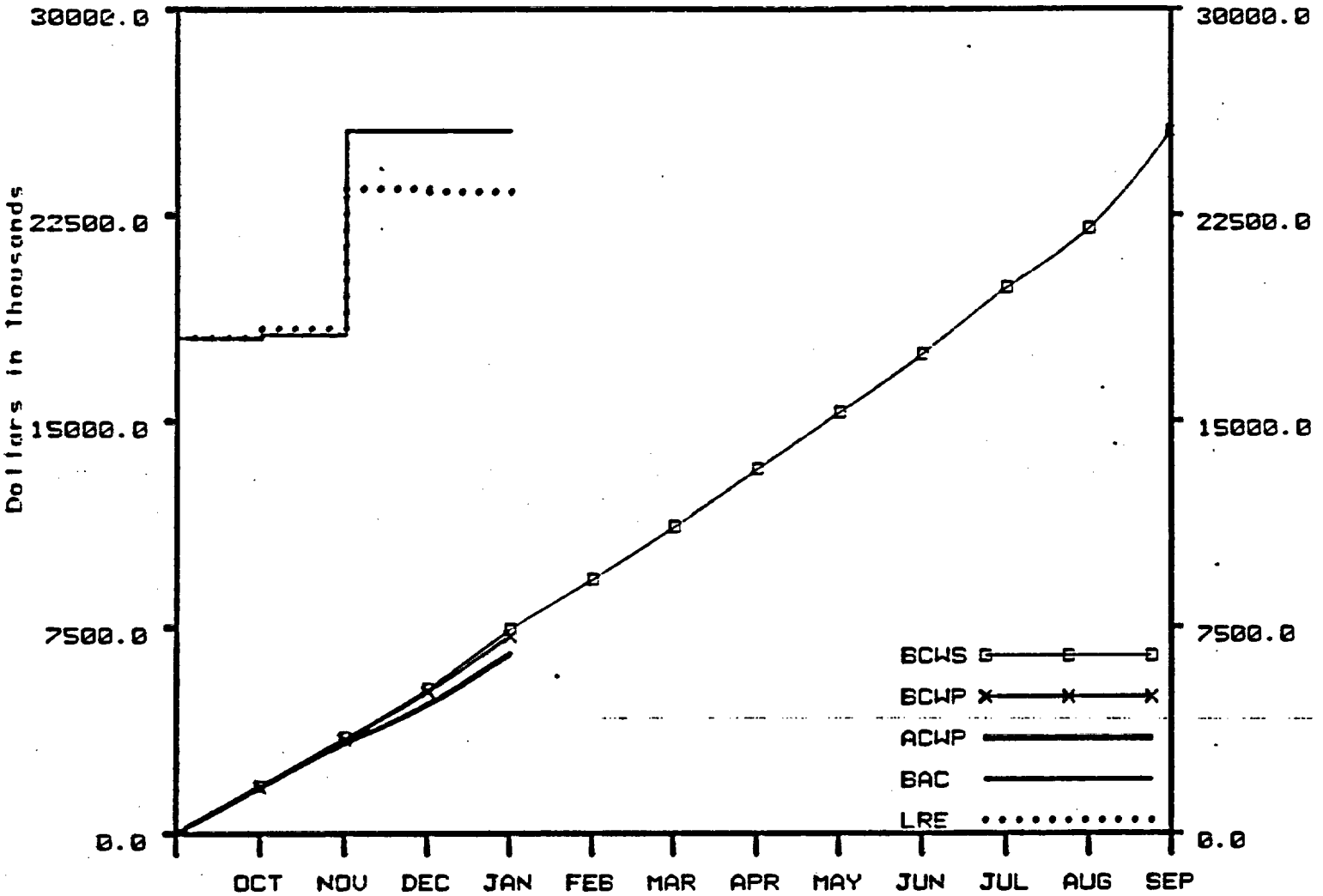
SAIC/Golden will develop a new file for QA Compliance Tracking System to track action items in a calendar format.

SAIC staff members are still working on various projects involving SCP references including acquisition, cataloging, and storage of references.

MILESTONE PROGRESS

The new estimated date of completion for SNL Milestone R890, develop and issue a schedule for internal and external SNL NNWSI quality assurance audits during FY 1987, is February 13, 1987.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.9



PROJECT MANAGEMENT	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	2158.5	7412.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	2037.6	7174.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1848.2	6516.0
D. BUDGET AT COMPLETION (BAC)		25551.0
E. LATEST REVISED ESTIMATE (LRE)		23342.1

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-238.6	-3.22
G. COST VARIANCE (B-C)	658.3	9.18
H. AT COMPLETION VARIANCE (D-E)	2208.9	8.65

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987 Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST
1291	Management and Integration	3,922.670	3,693.120	3,353.646	-229.550	339.474
1292	Project Control	1,227.120	1,227.081	1,141.193	-.039	85.888
1293	Quality Assurance	1,947.100	1,938.100	1,705.198	-9.000	232.902
1299	NTS Allocation	316.000	316.004	316.000	.004	.004
129	PROJECT MANAGEMENT	7,412.890	7,174.305	6,516.037	-238.585	658.268

MILE-STONE	RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
R448	WMPO/ SAIC	1.2.9.1	Final NNWSI Project Management Plan to WMPO/NV and DOE/HQ			△				◇					
R849	WMPO/ SAIC	1.2.9.1	Submit FY 87 Baseline Budget Information and Cost Plans to OGR for Information			▲									
R850	WMPO/ SAIC	1.2.9.1	Approved Revised Project Charter				△		◇						
M712	WMPO SAIC	1.2.9.1	Submit FY 89 Budget to DOE/HQ						△						
R647	WMPO/ SAIC	1.2.9.1	Licensing Support System Document Collection Procedure to Headquarters for Approval							△					
M725	WMPO/ SAIC	1.2.9.2	Implement Phase II of Earned Value System		△				◇						
[illegible]	WMPO SAIC	1.2.9.1	Submit NNWSI Project Plan to WMPO/NV and DOE/HQ												△
R842	WMPO/ SAIC	1.2.9.1	Implement Document Collection for the Licensing Support System										△		

△ PLANNED MILESTONE COMPLETION DATE ◇ REVISED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED ◆ COMPLETED AS REVISED

1.2.10 FINANCIAL AND TECHNICAL ISSUES

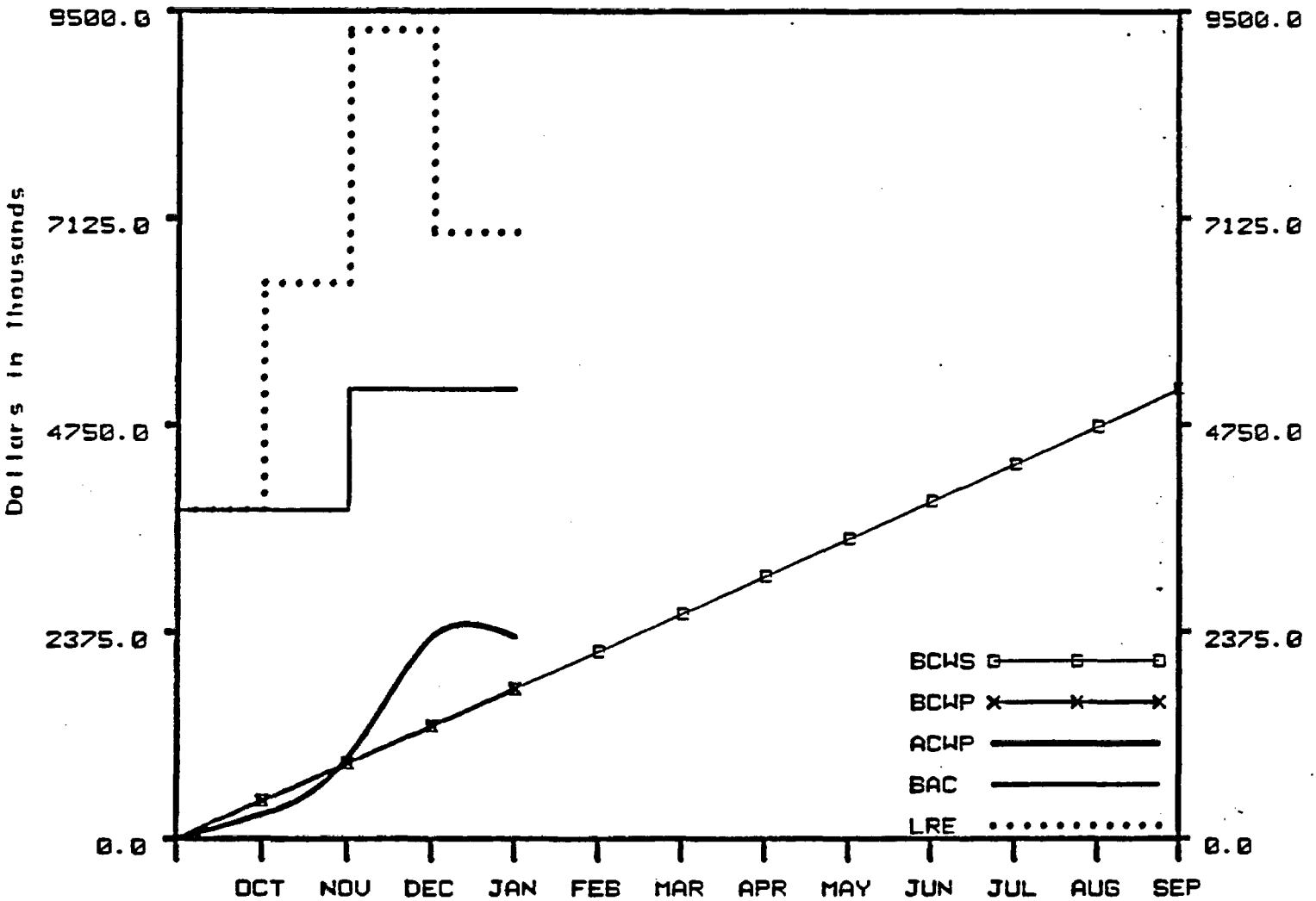
OBJECTIVES

This WBS element includes grant assistance to the State of Nevada.

ACTIVITIES

None to Report.

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.10



FINANCIAL & TECHNICAL ASSISTANCE	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	430.0	1720.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	430.0	1720.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.0	2318.7
D. BUDGET AT COMPLETION (BAC)		5162.0
E. LATEST REVISED ESTIMATE (LRE)		6958.7

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	-598.7	-34.81
H. AT COMPLETION VARIANCE (D-E)	-1796.7	-34.81

Remarks:

COST PERFORMANCE REPORT
WBS LEVEL 4
U.S. DEPARTMENT OF ENERGY
NNWSI PROJECT

For: JAN 1987

Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		YEAR TO DATE				
		BUD. COST OF WORK SCHEDULED	BUD. COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES	
					SCHEDULE	COST
12101	Financial & Technical Assistance	1,720.000	1,719.999	2,318.664	-.001	-598.665
1210	FINANCIAL & TECHNICAL ASSISTANCE	1,720.000	1,719.999	2,318.664	-.001	-598.665

U.S. DEPARTMENT OF ENERGY

OCRWM OGR

Nevada Nuclear Waste Storage Investigations PROJECT

YUCCA MOUNTAIN

PARTICIPANT

BUDGET vs COST

COST PERFORMANCE REPORT - LEVEL 3
WORK BREAKDOWN STRUCTURE (FORMAT 1)
U.S. DEPARTMENT OF ENERGY

CONTRACTOR	CONTRACT TYPE NO.	PROJECT NAME/NUMBER.	REPORT FISCAL MONTH AND YEAR	SIGNATURE
NNWSI Project		NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS	JAN 1987	
LOCATION P O Box 14100 Las Vegas, NV 89114				TITLE. PROJECT MANAGER Date.February 20, 1987

		CURRENT PERIOD					YEAR TO DATE					FISCAL YEAR (CUMULATIVE)		
WBS NUMBER AND DESCRIPTION		BUD COST OF WORK SCHEDULED	BUD COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST	BUD COST OF WORK SCHEDULED	BUD COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST	BASELINED BUDGET	LATEST REVISED ESTIMATE	VARIANCE
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
121	SYSTEMS	571 400	599 655	487 377	28 255	112 278	1,815 400	1,850 722	1,684 067	35 322	166 656	7,923 000	7,214 947	708 053
122	WASTE PACKAGE	721 200	718.401	457 930	-2 799	260 471	2,280 900	2,256 202	1,835 945	-24 698	420 257	9,535 000	7,537 204	1,997 796
123	SITE INVESTIGATIONS	2,384 800	2,193.296	2,070 179	-190 704	123 117	8,778 430	8,299 312	7,822 301	-479 118	677 010	29,835 000	28,212 172	1,622 828
124	REPOSITORY INVESTIGATIONS	712 000	675.480	572 753	-36 520	102 726	2,415 500	2,180 681	2,079 226	-234 819	101 455	12,472 000	16,224 796	-3,752 796
125	REGULATORY AND INSTITUTIONAL INVESTIGATIONS	796 900	606.901	761 933	-189 999	-155 032	2,850 600	2,543 577	2,528 656	-116 023	14 920	7,806 000	8,998 147	95 853
126	EXPLORATORY SHAFT INVESTIGATIONS	1,096 800	909.939	708 543	-186 861	201 397	4,171 530	3,512 500	2,676 424	-659 030	836 076	17,370 000	16,396 196	973 804
127	TEST FACILITIES	31 770	31.770	24 000	.000	7.770	123 980	123 980	88 621	000	35 359	489 000	377 569	111 431
128	LAND ACQUISITION	7 700	7.500	16 304	-.200	-8 804	29.200	30 000	31 526	800	-1 526	150 000	154 341	-4 341
129	PROJECT MANAGEMENT	2,158 900	2,037 814	1,848 150	-120 886	189 464	7,412.890	7,174 305	6,516 037	-238 585	658 268	25,551 000	23,342 066	2,208 934
1210	FINANCIAL & TECHNICAL ASSISTANCE	430 000	430 000	800	- 000	430.000	1,720 000	1,719 999	2,318 664	- 001	-598 665	5,182 000	6,958 694	-1,796 694
12	NNWSI - SUBTOTAL	8,909 470	8,210.556	6,947 249	-698 914	1,263 307	31,497 430	29,691 278	27,381 468	-1,716 152	2,309 810	115,573 000	113,408 134	2,164 866
	UNDISTRIBUTED BUDGET											1,893.000	1,893.000	.000
	NNWSI - TOTAL											117,466.000	115,301.134	2,164.866

COST PERFORMANCE REPORT - LEVEL 3
WORK BREAKDOWN STRUCTURE (FORMAT 1)
U.S. DEPARTMENT OF ENERGY

CONTRACTOR	CONTRACT TYPE NO	PROJECT NAME/NUMBER	REPORT FISCAL MONTH AND YEAR	SIGNATURE
NNWSI Project		NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS	JAN 1987	
LOCATION P.O. Box 14100 Las Vegas, NV 89114				TITLE: PROJECT MANAGER Date February 24, 1987

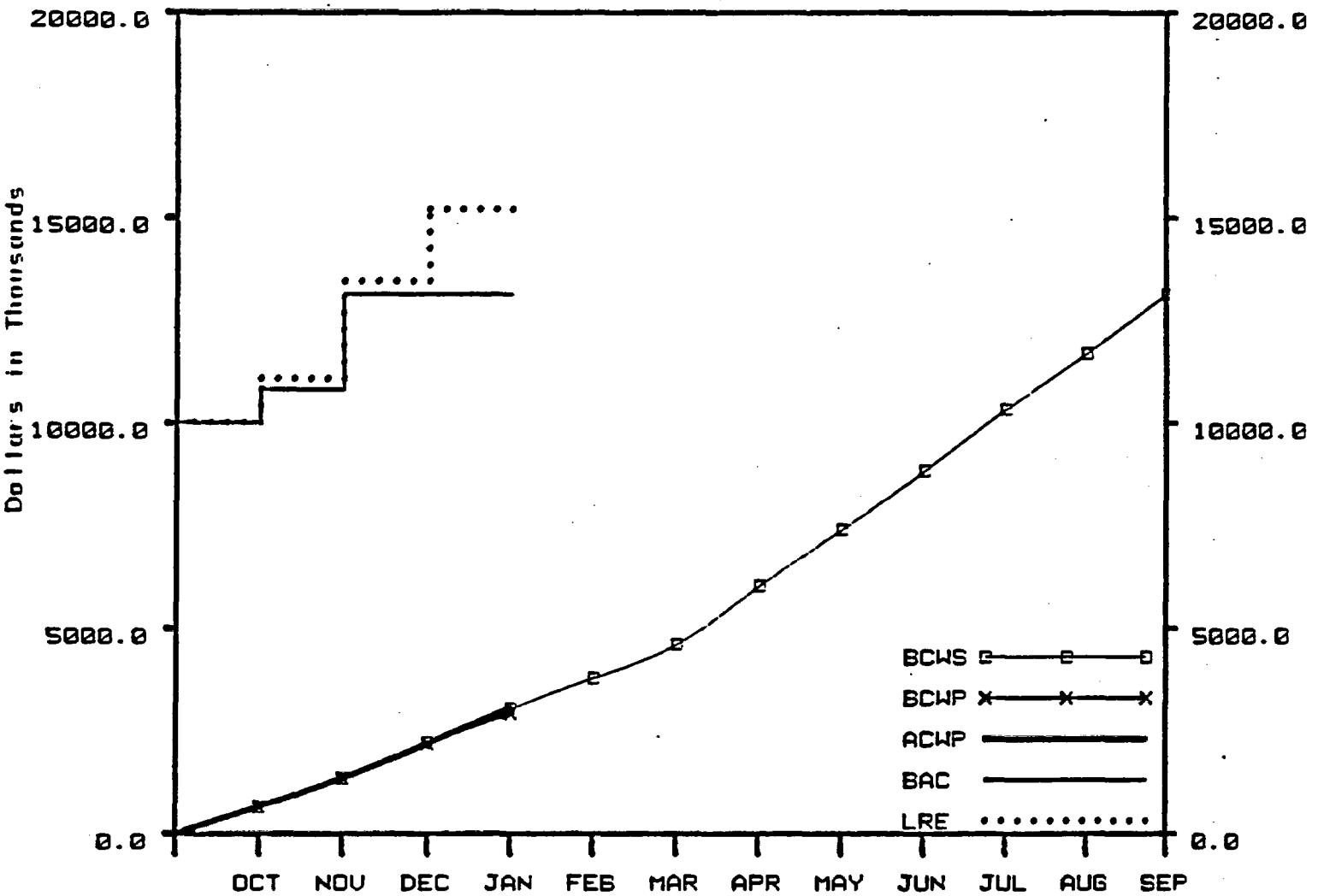
WBS NUMBER AND DESCRIPTION	CURRENT PERIOD: BUD COST OF WORK SCHEDULED	CURRENT PERIOD: BUD COST OF WORK PERFORMED	CURRENT PERIOD: ACTUAL COST OF WORK PERFORMED	CURRENT PERIOD: VARIANCES SCHEDULE	CURRENT PERIOD: VARIANCES COST	YEAR TO DATE: BUD COST OF WORK SCHEDULED	YEAR TO DATE: BUD COST OF WORK PERFORMED	YEAR TO DATE: ACTUAL COST OF WORK PERFORMED	YEAR TO DATE: VARIANCES SCHEDULE	YEAR TO DATE: VARIANCES COST	FISCAL YEAR COMPLETION: BASELINED BUDGET	FISCAL YEAR COMPLETION: LATEST REVISED ESTIMATE	FISCAL YEAR COMPLETION: VARIANCE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
127 TEST FACILITIES	31 770	31 770	24 000	000	7 770	123.900	123.900	88 621	.000	35.350	489 000	377.569	111 431
1281 Land Acquisition	7 700	7.500	16 384	- 200	-8 884	29 200	30 000	31 526	800	-1 526	150 000	154 341	-4 341
128 LAND ACQUISITION	7 700	7 500	16 384	- 200	-8 884	29.200	30 000	31 526	800	-1.526	150.000	154 341	-4 341
1291 Management and Integration	1,110 860	998 872	944 730	-111 880	54 241	3,922 670	3,093 120	3,353 646	-229 550	339 474	12,315 000	11,256 124	1,058 876
1292 Project Control	370 460	370 461	340 653	001	29 808	1,227 120	1,227 001	1,141 193	- 039	85 808	3,990 000	3,719 157	279 843
1293 Quality Assurance	598 180	589 180	483 767	-9 000	105 414	1,947 100	1,938 100	1,705 198	-9 000	232 902	7,023 000	6,143 836	879 164
1299 NTS Allocation	79 000	79 001	79 000	001	.001	316 000	316 004	316 000	004	.004	2,223 000	2,222 949	.051
129 PROJECT MANAGEMENT	2,158 500	2,037 614	1,848 150	-120 886	189 464	7,412 890	7,174 305	6,516 037	-238 585	658 268	25,551 000	23,342 066	2,208 934
12101 Financial & Technical Assistance	430 000	430 000	000	- 000	430 000	1,720 000	1,719 999	2,318 064	- 001	-598 065	5,102 000	6,958 694	-1,796 694
1210 FINANCIAL & TECHNICAL ASSISTANCE	430 000	430 000	000	- 000	430 000	1,720 000	1,719 999	2,318.064	-.001	-598 065	5,102.000	6,958 694	-1,796 694
12 NNWSI - SUBTOTAL	8,909 470	8,210 556	6,947 249	-698 914	1,263 307	31,407 430	29,691 278	27,381 468	-1,716 152	2,309 810	115,573 000	113,408 134	2,164 866
UNDISTRIBUTED BUDGET											1,893.000	1,893.000	.000
NNWSI - TOTAL											117,466.000	115,301.134	2,164.866

COST PERFORMANCE REPORT - LEVEL 4
WORK BREAKDOWN STRUCTURE (FORMAT 1)
U.S. DEPARTMENT OF ENERGY

CONTRACTOR	CONTRACT TYPE NO	PROJECT NAME/NUMBER	REPORT FISCAL MONTH AND YEAR	SIGNATURE
SAIC Project		NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS	JAN 1987	TITLE: PROJECT MANAGER
LOCATION: P O Box 14100, Las Vegas, NV 89114				Date: February 24, 1987

WBS NUMBER AND DESCRIPTION		CURRENT PERIOD					YEAR TO DATE					FISCAL YEAR COMPLETION		
		BUD COST OF WORK SCHEDULED	BUD COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST	BUD COST OF WORK SCHEDULED	BUD COST OF WORK PERFORMED	ACTUAL COST OF WORK PERFORMED	VARIANCES SCHEDULE	VARIANCES COST	BASELINED BUDGET	LATEST REVISED ESTIMATE	VARIANCE
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1211	Systems Management and Integration	35 100	35 100	20 751	000	14 349	100 000	100 000	39 751	000	61 049	478 000	258 115	219 885
1212	Systems Engineering	229 300	284 705	224 826	55 405	59 879	897 000	771 710	889 316	74 110	82 394	2,740 000	2,110 964	629 036
1213	Technical Data Base Management	99 000	71 850	44 000	-27 150	27 850	319 000	200 215	272 000	-38 785	8 215	1,437 000	1,861 721	-424 721
1214	Total Systems Performance Assessment	208 000	208 000	198 000	- 000	10 000	898 000	697 997	883 000	- 003	14 997	3,268 000	2,984 147	283 853
121	SYSTEMS	571 400	599 655	487 377	28 255	112 278	1,815 400	1,050 727	1,084 067	35 322	166 656	7,923 000	7,214 947	708 053
1221	Management and Integration	66 200	56 200	53 030	-10 000	3 170	230 000	210 000	180 545	-20 000	50 355	725 000	595 782	129 218
1222	Package Environment	85 000	85 000	87 300	000	-2 300	330 000	314 100	342 100	-15 900	-28 000	990 000	1,110 817	-120 817
1223	Waste Form & Materials Testing	445 000	478 201	247 700	33 200	230 500	1,300 000	1,333 203	1,017 000	33 203	315 003	5,025 000	4,066 960	1,558 040
1224	Design, Fabricate, and Prototype Testing	45 000	45 000	23 100	- 000	21 900	175 000	174 999	123 400	- 001	51 599	1,260 000	874 391	385 609
1225	Performance Assessment	80 000	54 000	46 000	-26 000	7 200	245 000	223 000	192 300	-22 000	30 700	955 000	889 257	65 743
122	WASTE PACKAGE	721 200	718 401	457 930	-2 799	260 471	2,280 000	2,256 207	1,895 945	-24 698	420 257	9,535 000	7,537 296	1,997 704
1231	Management & Integration	483 500	474 307	285 610	-9 193	188 697	1,721 000	1,706 729	1,188 000	-14 871	597 709	8,521 000	4,276 714	2,244 286
1232	Geology	391 400	390 599	390 500	- 801	-3 901	1,560 000	1,567 096	1,564 200	-1 704	3 096	5,131 000	5,089 488	41 512
1233	Hydrology	545 000	505 683	494 578	-39 317	11 105	2,100 000	2,029 171	1,971 043	-155 829	53 128	8,552 000	8,583 955	-31 955
1234	Geochemistry	504 300	454 400	462 600	-49 900	-8 200	1,724 700	1,647 399	1,663 000	-77 301	-16 201	5,800 000	6,070 617	-270 617
1235	Drilling	186 400	131 400	130 143	-55 000	1 257	578 730	512 700	400 110	-66 030	32 590	3,024 000	2,866 442	157 558
1236	Environment	137 000	136 190	138 807	-1 610	-2 617	547 000	422 225	357 436	-84 775	84 789	1,215 000	1,209 323	5 677
1237	Socioeconomics	91 500	36 218	104 641	-55 302	-68 423	242 000	188 892	243 252	-74 108	-74 500	810 000	1,377 730	-559 730
1238	Geochemical Modeling Code 03/8	64 000	64 500	59 500	500	5 000	256 000	249 500	233 700	-6 500	15 800	774 000	738 304	35 696
1239	Deferred Site Close Out	000	000	000	000	000	000	000	000	000	000	000	000	000
123	SITE INVESTIGATIONS	2,306 000	2,193 296	1,870 179	-190 704	123 117	8,778 430	8,299 312	7,622 301	-670 118	677 010	29,035 000	28,417 672	1,622 328
1241	Management and Integration	214 000	156 709	104 753	-57 220	52 027	771 500	583 820	595 226	-187 880	-11 606	2,806 000	4,860 745	-1,874 745
1242	Development and Testing	256 000	276 700	145 000	20 700	131 700	1,115 000	1,068 062	958 000	-46 938	110 062	5,534 000	7,605 035	-2,071 035
1243	Facilities	101 000	101 000	206 000	000	-105 000	173 000	173 000	305 000	000	-132 000	1,448 000	2,405 321	-957 321
1244	Operations and Maintenance	34 000	34 000	22 000	- 000	12 000	106 000	105 999	68 000	- 001	37 999	811 000	715 043	95 957
1245	Decommissioning	10 000	10 000	000	- 000	10 000	10 000	10 000	000	- 000	10 000	99 000	000	99 000
1246	Repository Performance Assessment	97 000	97 000	35 000	- 000	62 000	234 000	234 000	153 000	- 000	81 000	1,564 000	808 652	755 348
124	REPOSITORY INVESTIGATIONS	712 000	675 409	572 753	-36 520	102 720	2,415 500	2,180 881	2,079 226	-234 819	101 655	12,472 000	18,224 796	-5,752 796
1251	Management and Integration	75 400	87 710	58 895	-7 890	16 825	224 300	202 340	140 744	-21 960	61 596	881 000	520 553	160 449
1252	Licensing	881 700	438 921	828 156	-102 779	-109 235	2,000 500	2,044 096	2,099 461	-56 404	-55 455	5,377 000	5,364 252	12 748
1253	Environmental Compliance	63 400	63 870	65 527	-19 530	-1 657	182 100	124 530	167 527	-57 570	-42 997	550 000	770 648	-220 648
1254	Communication and Liaison	56 400	56 400	37 365	000	19 035	172 700	172 700	120 924	000	51 778	478 000	334 894	143 106
1255	Technology and Financial Assistance	000	000	000	000	000	000	000	000	000	000	000	000	000
125	REGULATORY AND INSTITUTIONAL INVESTIGATIONS	796 900	686 981	781 933	-189 999	-155 852	2,850 000	2,543 577	2,528 656	-116 823	14 920	7,086 000	6,990 147	95 853
1261	Management and Integration	439 300	407 599	314 795	-31 701	92 804	1,696 530	1,663 000	1,270 848	-33 661	443 021	4,871 000	3,572 749	1,298 251
1262	Site Characterization	0 500	0 000	11 000	-0 500	-2 900	46 000	17 300	18 000	-29 000	- 700	324 000	553 652	-229 652
1263	Surface Facilities	10 000	17 200	5 100	7 200	12 100	20 500	20 500	10 000	-0 000	9 700	181 000	124 258	56 742
1264	Exploratory Shafts	23 000	23 000	10 967	- 000	12 033	74 000	74 000	36 638	000	37 362	252 000	125 703	126 297
1265	Seismic Activity	2 000	2 000	719	000	1 281	8 000	8 000	874	000	7 126	190 000	170 387	27 613
1266	Underground Facility Systems	24 000	24 000	26 822	- 000	-2 822	121 000	121 000	150 724	000	30 724	358 000	472 571	-114 571
1267	Underground Facility Systems	54 500	41 000	27 533	-13 500	13 467	147 100	100 900	42 146	57 200	67 754	981 000	870 496	110 504
1268	Operations	000	000	200	000	- 200	15 000	15 000	7 000	000	8 000	20 000	8 333	10 667
1269	Testing	530 700	306 149	315 797	-152 560	70 344	2,034 500	1,402 932	1,100 394	-551 568	307 538	10,295 000	10,006 966	-291 966
126	EXPLORATORY SHAFT INVESTIGATIONS	1,096 000	999 939	798 543	-106 061	201 397	4,171 530	3,512 500	2,676 624	-659 030	836 876	17,370 000	16,396 198	973 804
1271	Management and Integration	000	000	000	000	000	000	000	000	000	000	000	000	000
1272	Testing	31 770	31 770	24 000	000	7 770	123 000	123 000	88 621	000	35 359	409 000	377 569	111 431
1273	New Facility Acquisitions	000	000	000	000	000	000	000	000	000	000	000	000	000

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.A

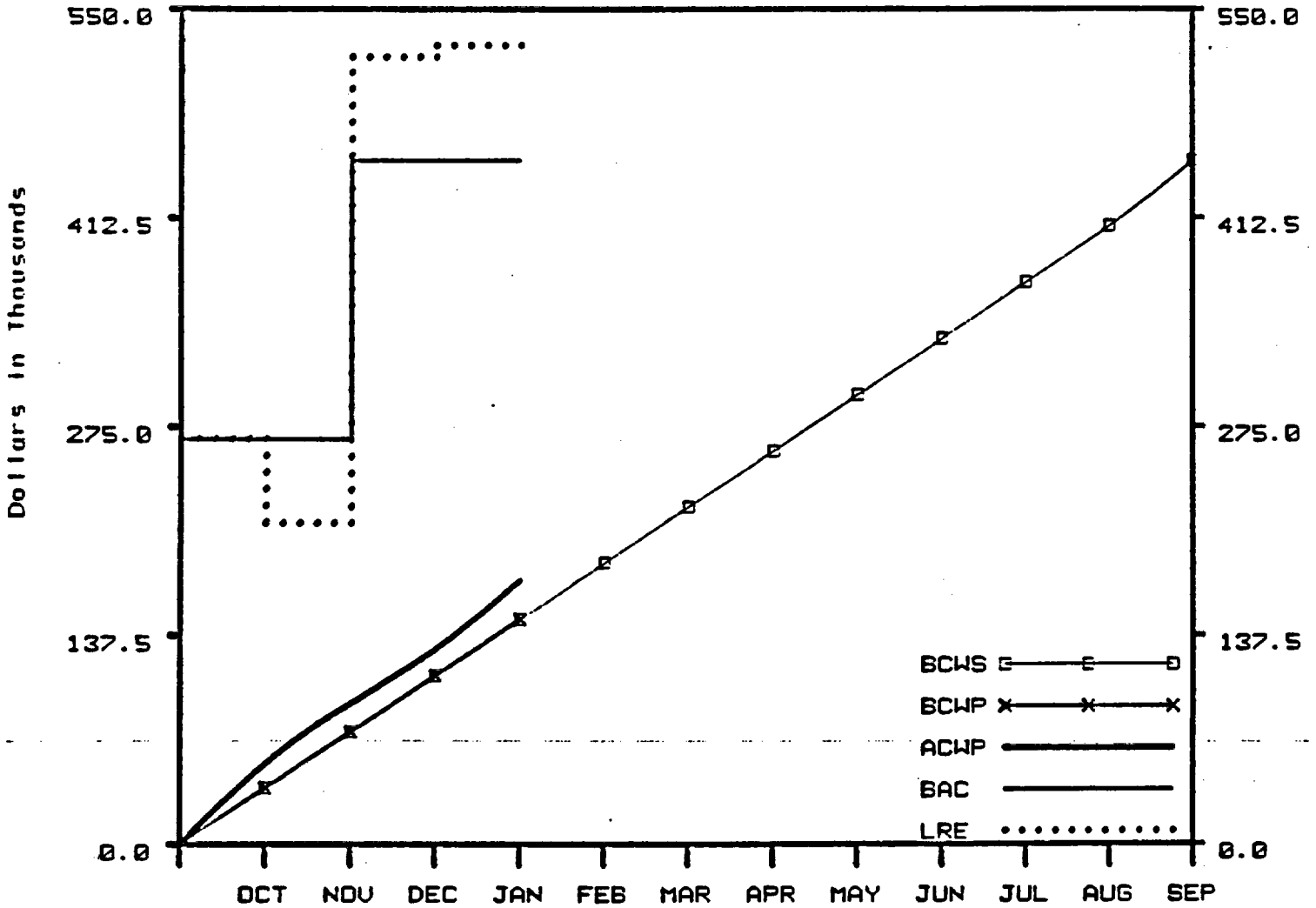


LOS ALAMOS - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	828.1	3028.3
B. BUDGETED COST OF WORK PERFORMED (BCWP)	736.3	2908.2
C. ACTUAL COST OF WORK PERFORMED (ACWP)	870.5	3050.3
D. BUDGET AT COMPLETION (BAC)		13128.0
E. LATEST REVISED ESTIMATE (LRE)		15194.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-120.1	-3.97
G. COST VARIANCE (B-C)	-142.1	-4.89
H. AT COMPLETION VARIANCE (D-E)	-2066.9	-15.74

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.B



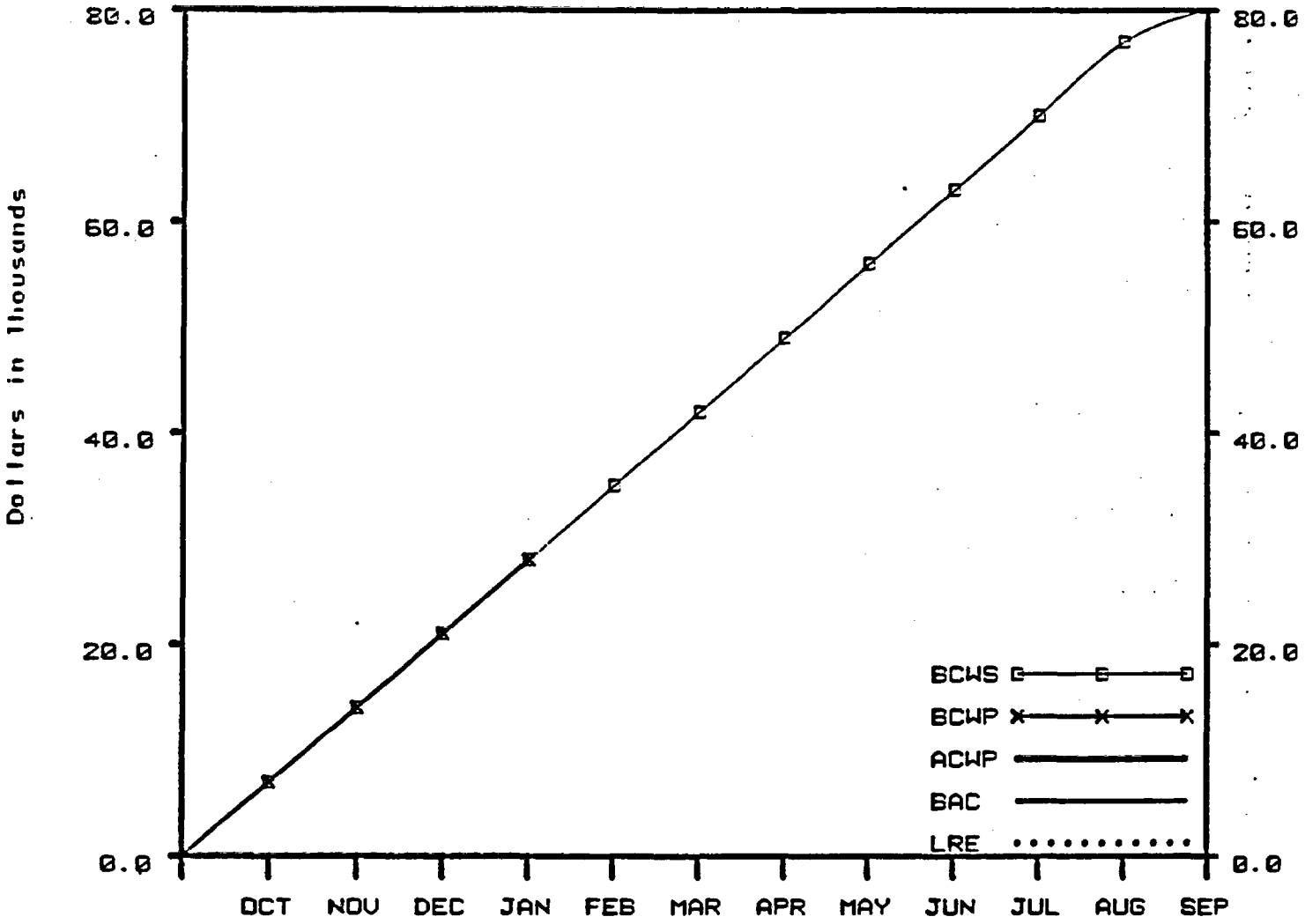
LBL - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	37.0	148.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	37.0	148.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	45.1	173.2
D. BUDGET AT COMPLETION (BAC)		450.0
E. LATEST REVISED ESTIMATE (LRE)		526.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	-25.2	-17.00
H. AT COMPLETION VARIANCE (D-E)	-76.0	-16.88

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.C

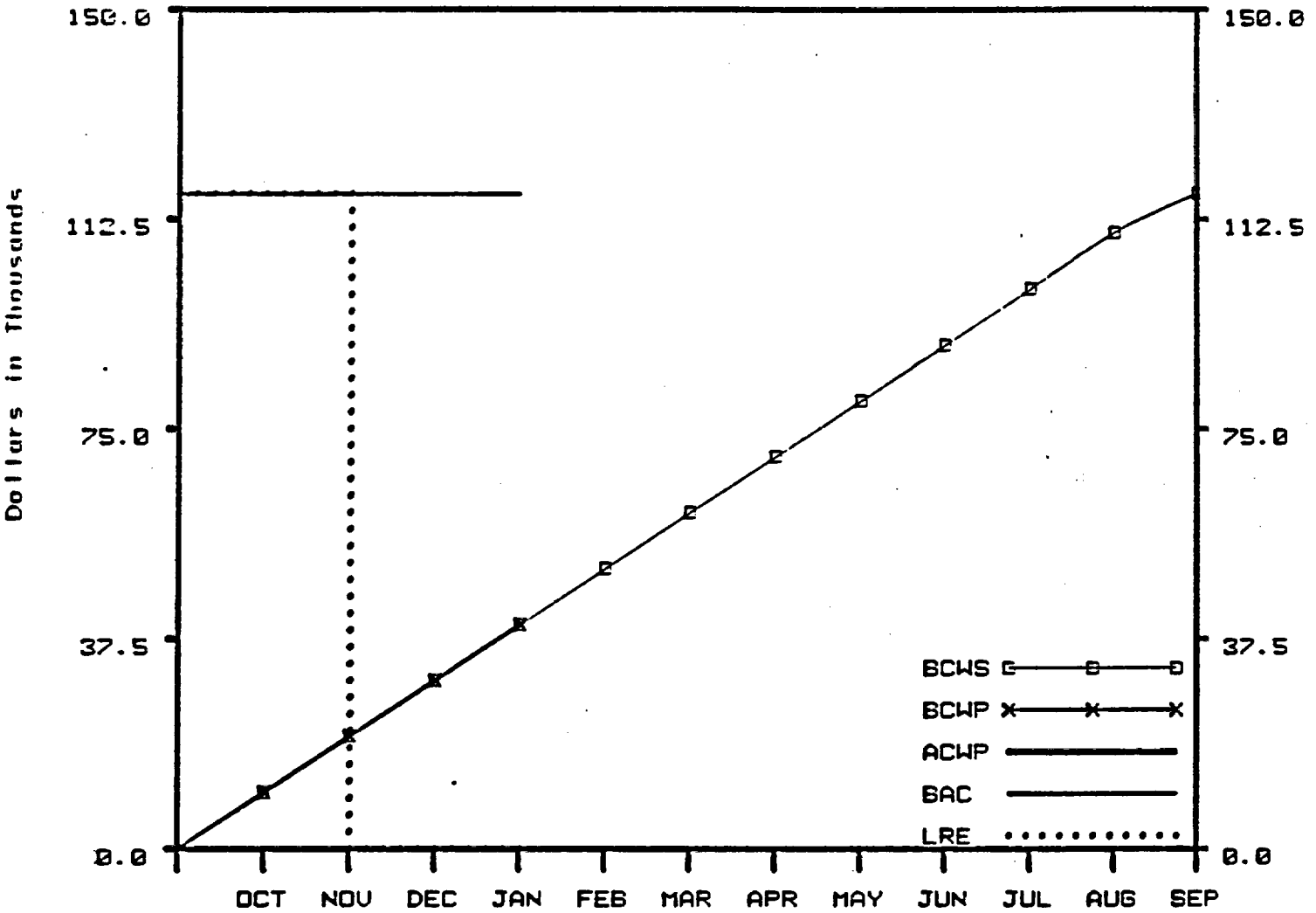


CSC-TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	7.0	28.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	7.0	28.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.0	0.0
D. BUDGET AT COMPLETION (BAC)		80.0
E. LATEST REVISED ESTIMATE (LRE)		0.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	28.0	100.00
H. AT COMPLETION VARIANCE (D-E)	80.0	100.00

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.D



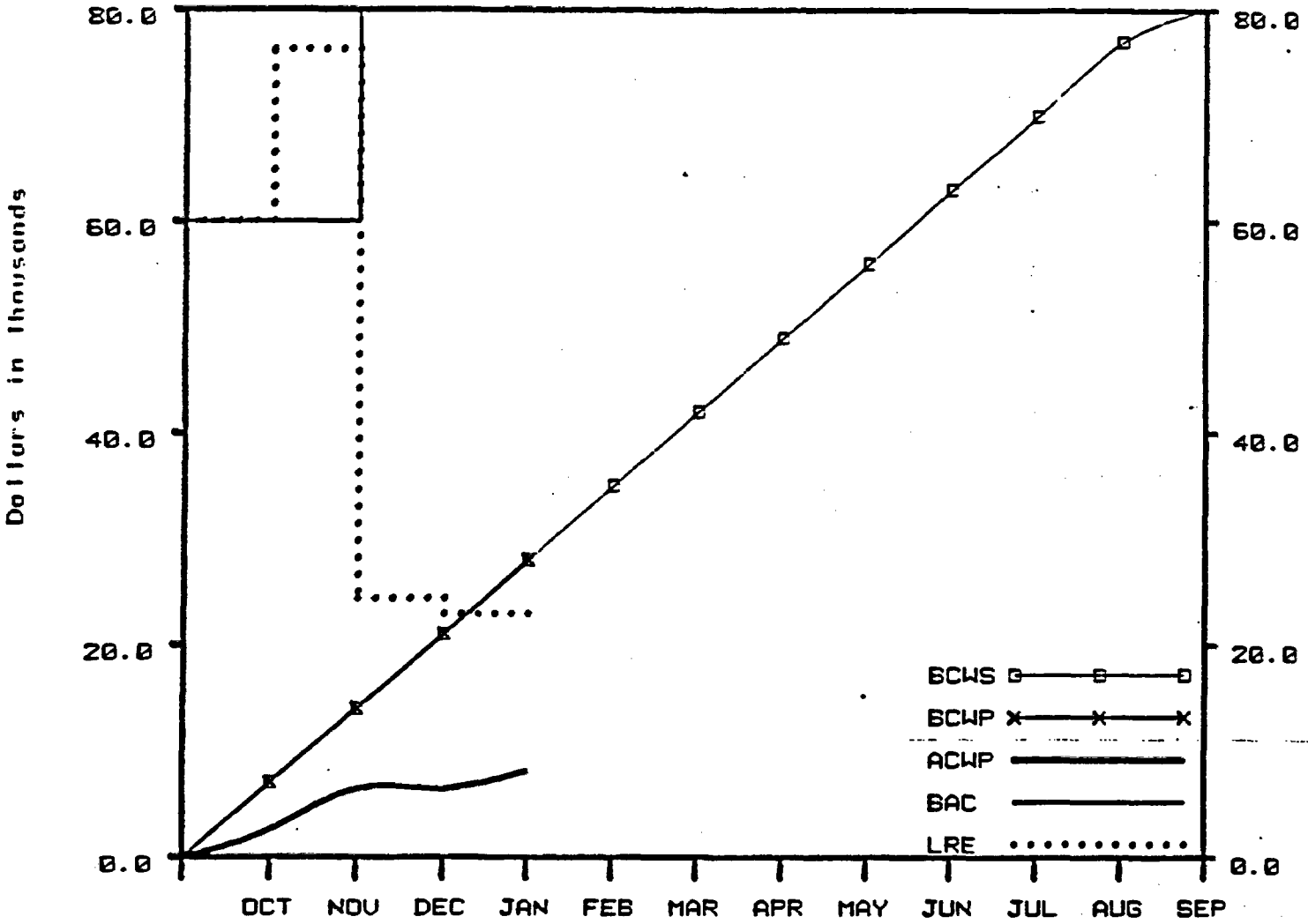
HEDL-TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	10.0	40.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	10.0	40.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.0	0.0
D. BUDGET AT COMPLETION (BAC)		117.0
E. LATEST REVISED ESTIMATE (LRE)		0.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	40.0	100.00
H. AT COMPLETION VARIANCE (D-E)	117.0	100.00

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.E

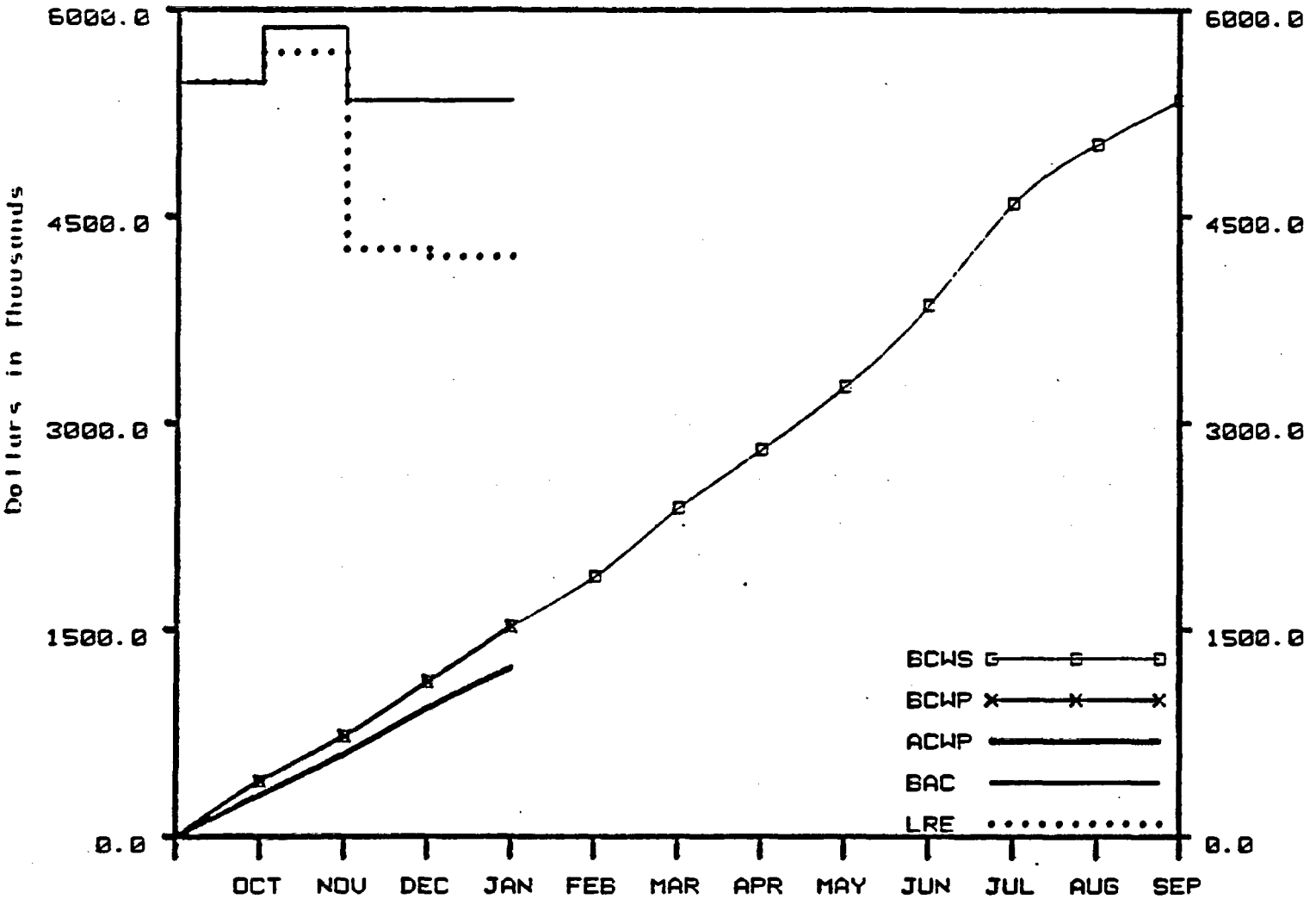


EG&G - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	7.0	28.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	7.0	28.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1.6	8.0
D. BUDGET AT COMPLETION (BAC)		80.0
E. LATEST REVISED ESTIMATE (LRE)		22.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	20.0	71.38
H. AT COMPLETION VARIANCE (D-E)	57.1	71.38

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.F

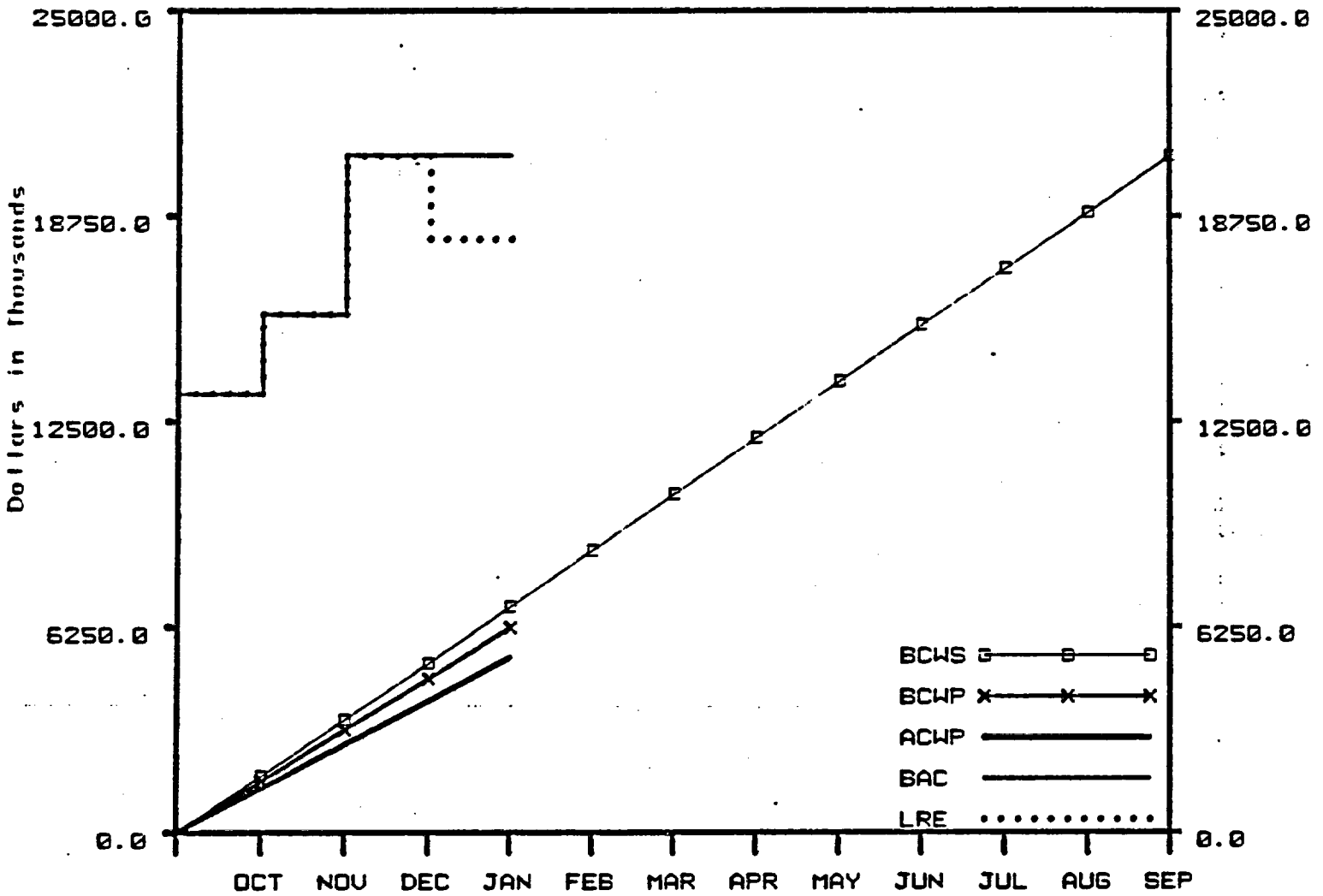


F&S - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	401.0	1522.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	401.0	1522.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	293.5	1218.8
D. BUDGET AT COMPLETION (BAC)		5344.0
E. LATEST REVISED ESTIMATE (LRE)		4203.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	303.2	19.92
H. AT COMPLETION VARIANCE (D-E)	1141.0	21.35

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.6

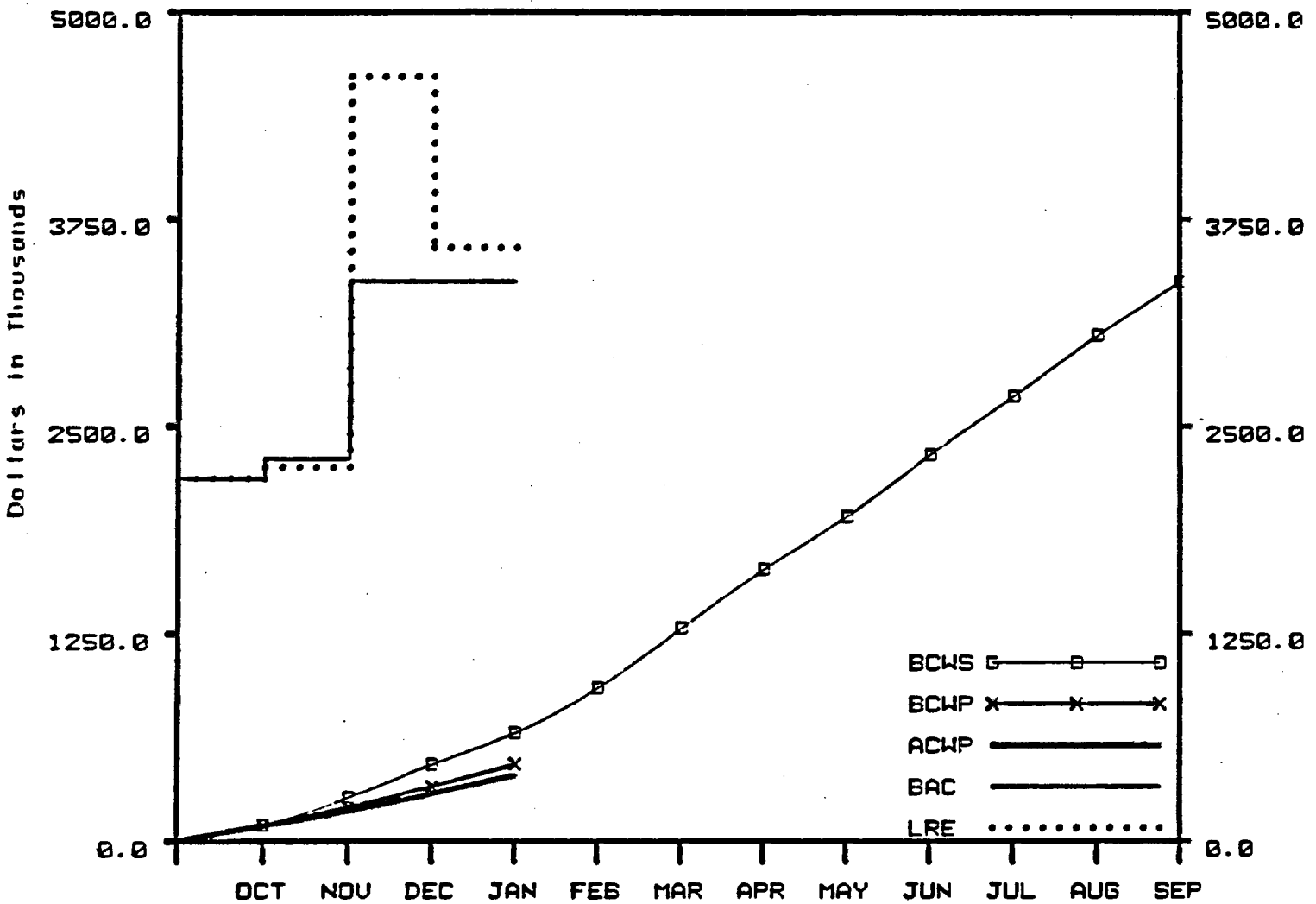


USGS - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1715.0	6860.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1553.6	6219.9
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1327.4	5309.6
D. BUDGET AT COMPLETION (BAC)		20592.0
E. LATEST REVISED ESTIMATE (LRE)		18036.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-640.1	-9.33
G. COST VARIANCE (B-C)	910.3	14.63
H. AT COMPLETION VARIANCE (D-E)	2555.1	12.41

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.H



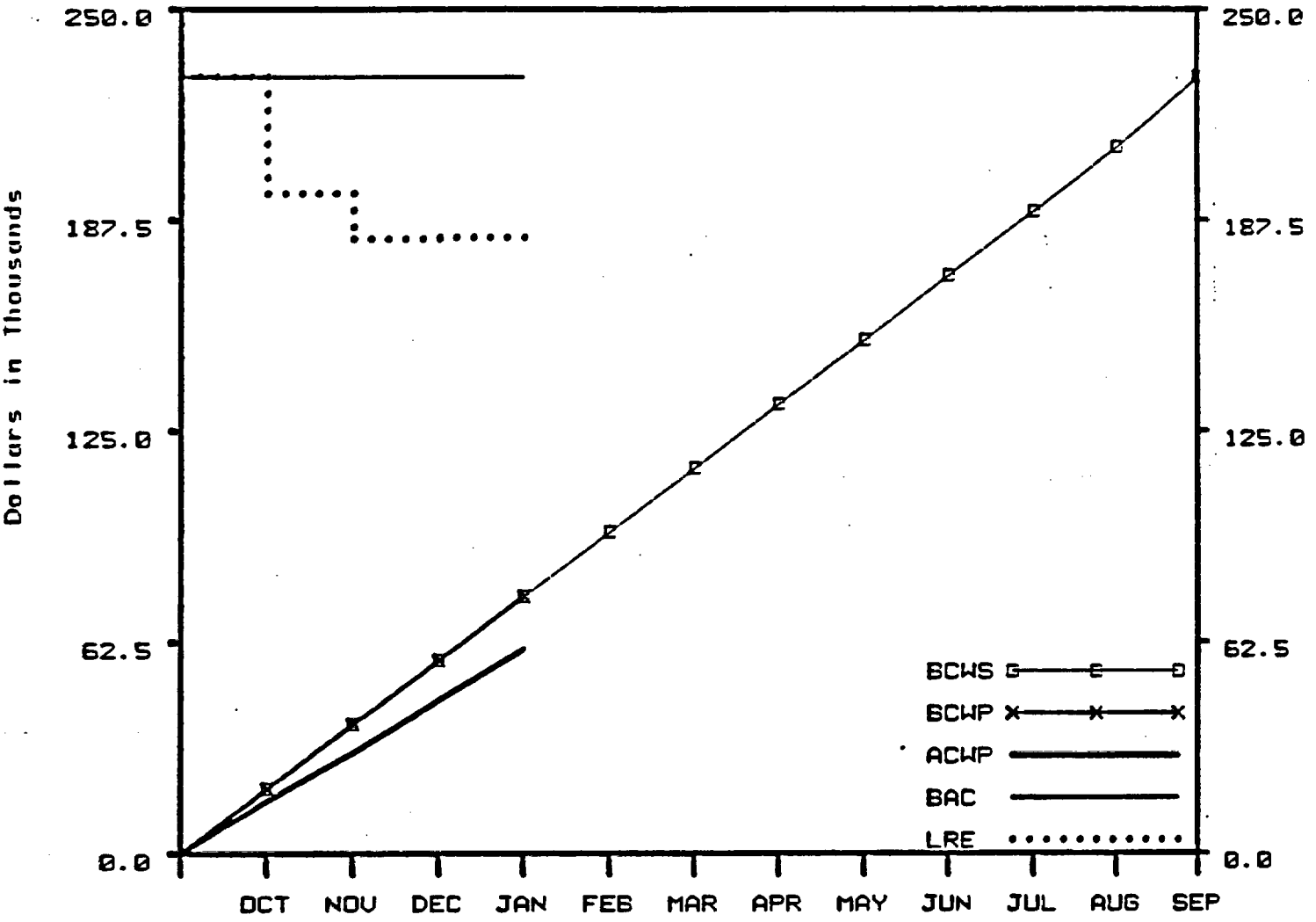
H&N - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	189.3	649.7
B. BUDGETED COST OF WORK PERFORMED (BCWP)	134.4	460.8
C. ACTUAL COST OF WORK PERFORMED (ACWP)	107.6	393.3
D. BUDGET AT COMPLETION (BAC)		3371.0
E. LATEST REVISED ESTIMATE (LRE)		3575.1

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-188.9	-29.08
G. COST VARIANCE (B-C)	67.5	14.65
H. AT COMPLETION VARIANCE (D-E)	-204.1	-6.05

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.1

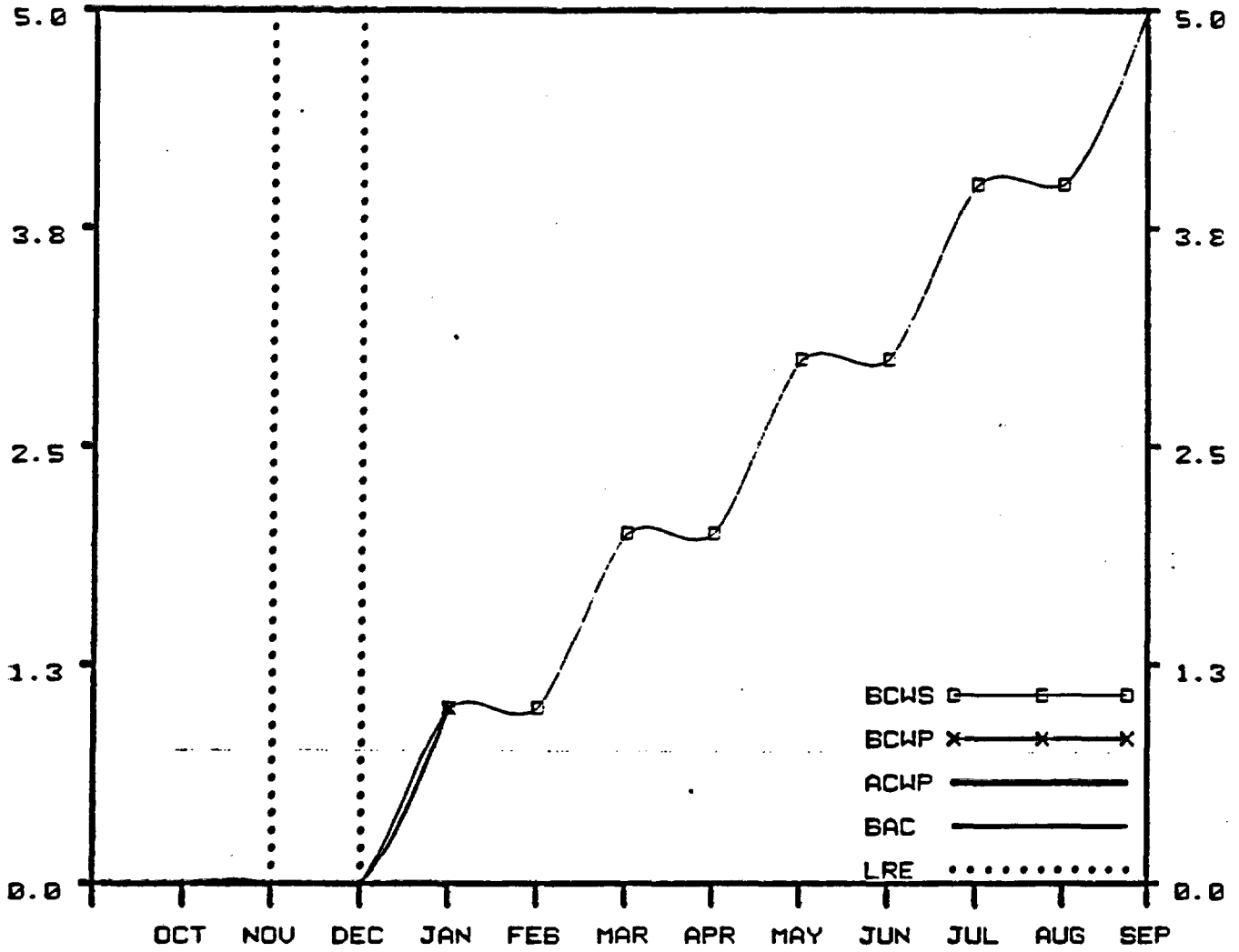


WSI - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	19.0	76.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	19.0	76.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	15.2	60.2
D. BUDGET AT COMPLETION (BAC)		230.0
E. LATEST REVISED ESTIMATE (LRE)		182.3

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	15.8	20.75
H. AT COMPLETION VARIANCE (D-E)	47.7	20.75

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.J

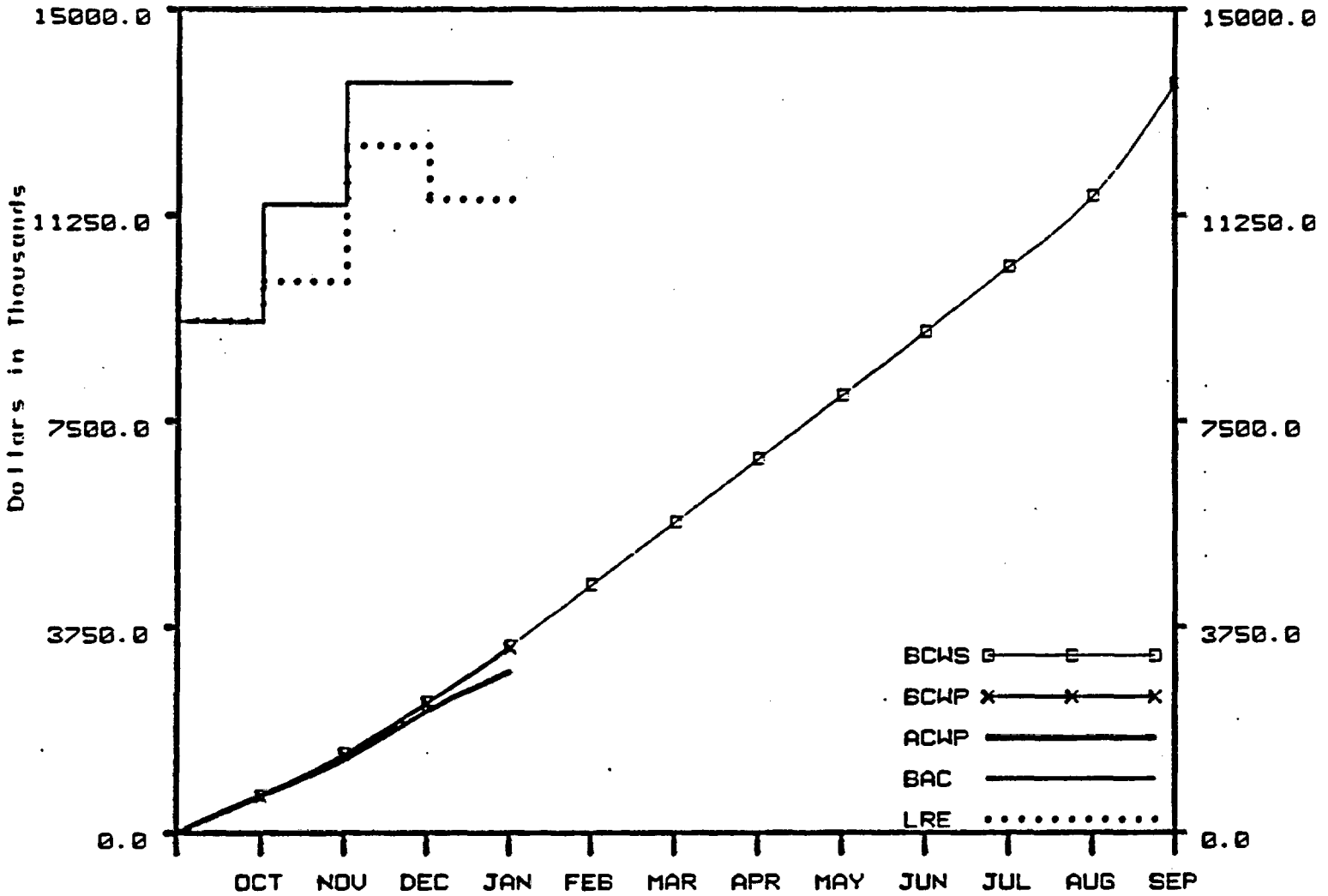


OSTI/TC-TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1.0	1.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1.0	1.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.0	0.0
D. BUDGET AT COMPLETION (BAC)		5.0
E. LATEST REVISED ESTIMATE (LRE)		0.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	1.0	100.00
H. AT COMPLETION VARIANCE (D-E)	5.0	100.00

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.L

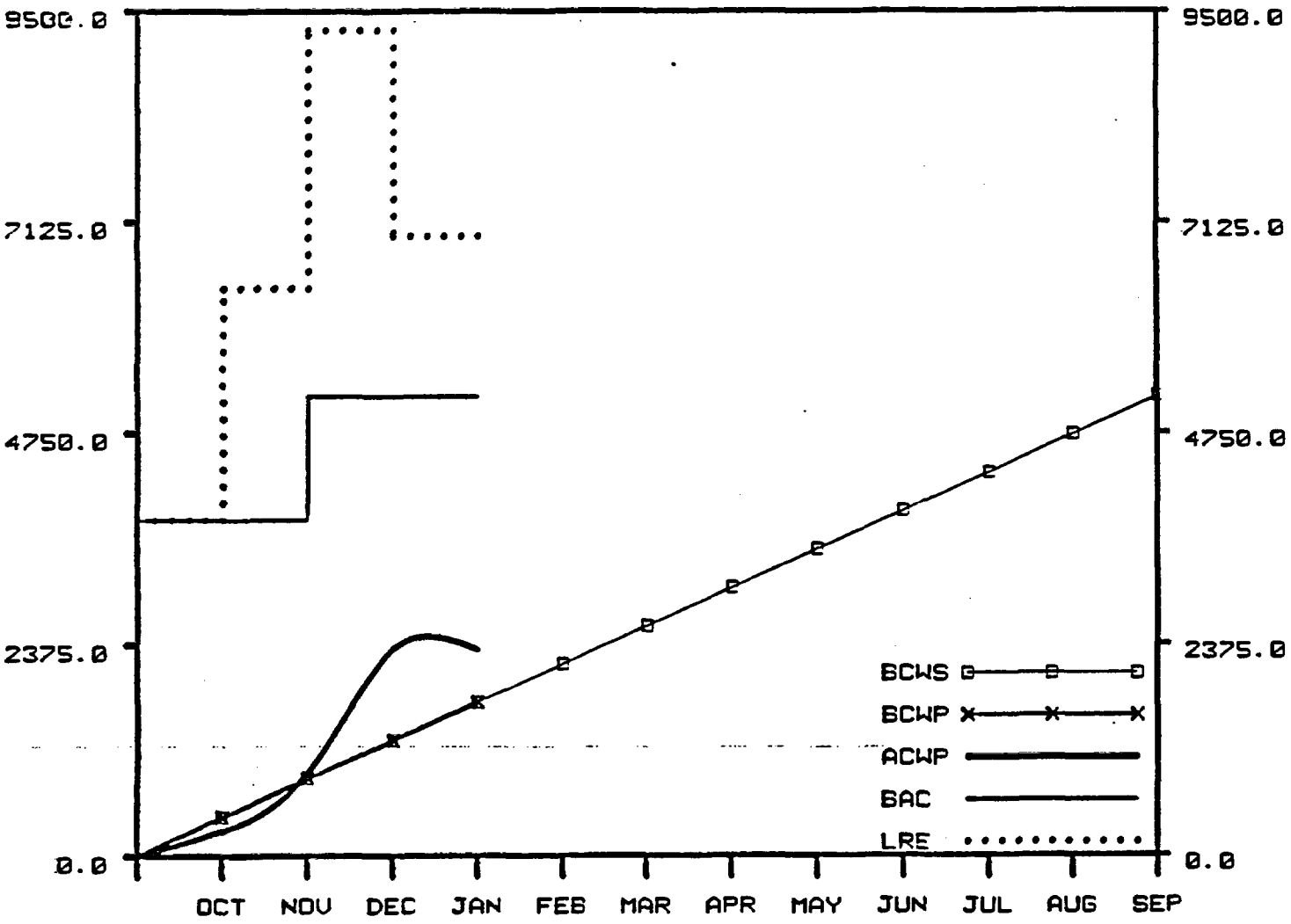


LLNL - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1014.0	3402.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1002.7	3364.8
C. ACTUAL COST OF WORK PERFORMED (ACWP)	718.0	2932.0
D. BUDGET AT COMPLETION (BAC)		13654.0
E. LATEST REVISED ESTIMATE (LRE)		11531.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-37.2	-1.09
G. COST VARIANCE (B-C)	432.8	12.86
H. AT COMPLETION VARIANCE (D-E)	2122.1	15.54

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.N

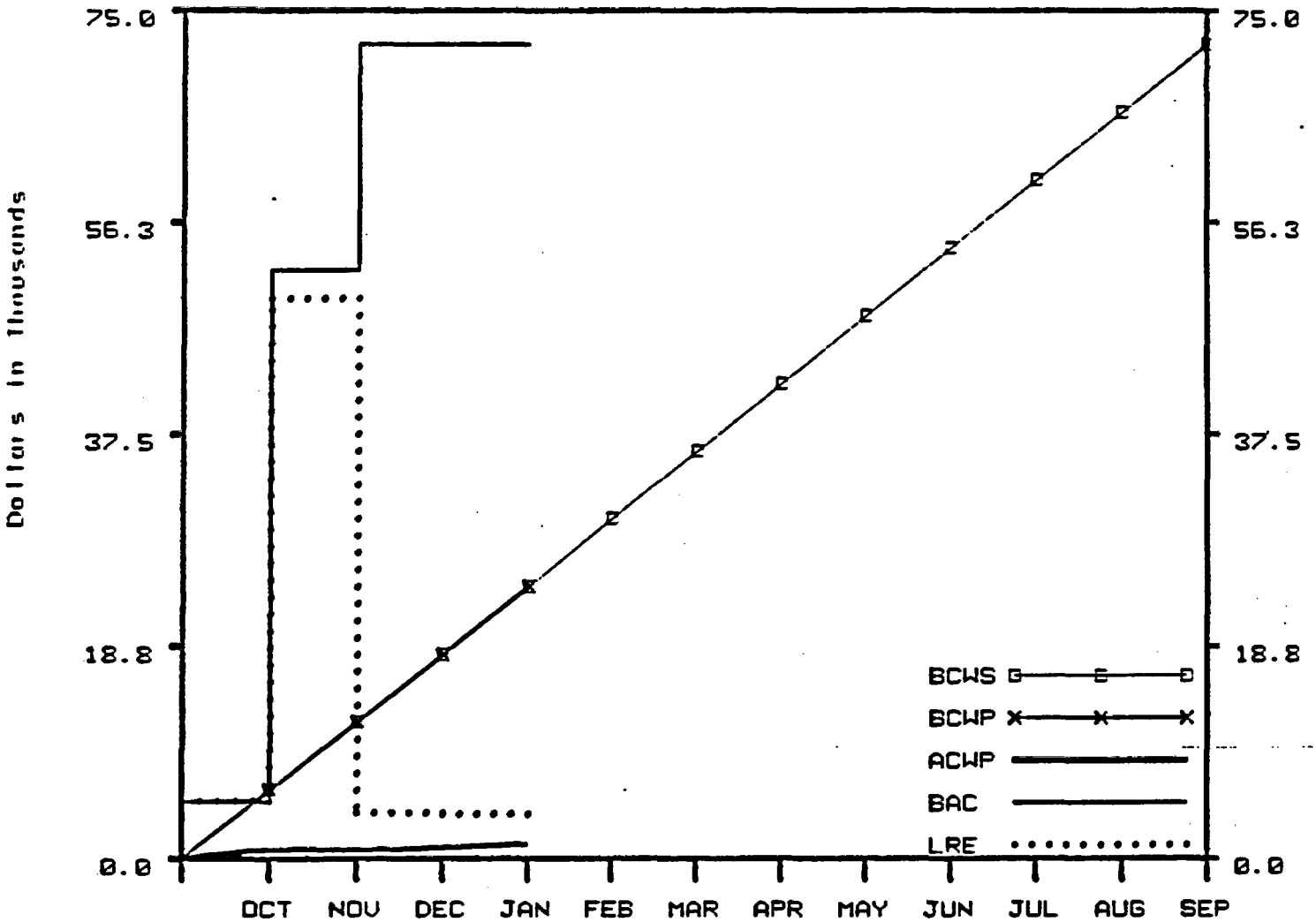


STATE - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	430.0	1720.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	430.0	1720.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.0	2318.7
D. BUDGET AT COMPLETION (BAC)		5162.0
E. LATEST REVISED ESTIMATE (LRE)		6958.7

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	-598.7	-34.81
H. AT COMPLETION VARIANCE (D-E)	-1796.7	-34.81

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.P

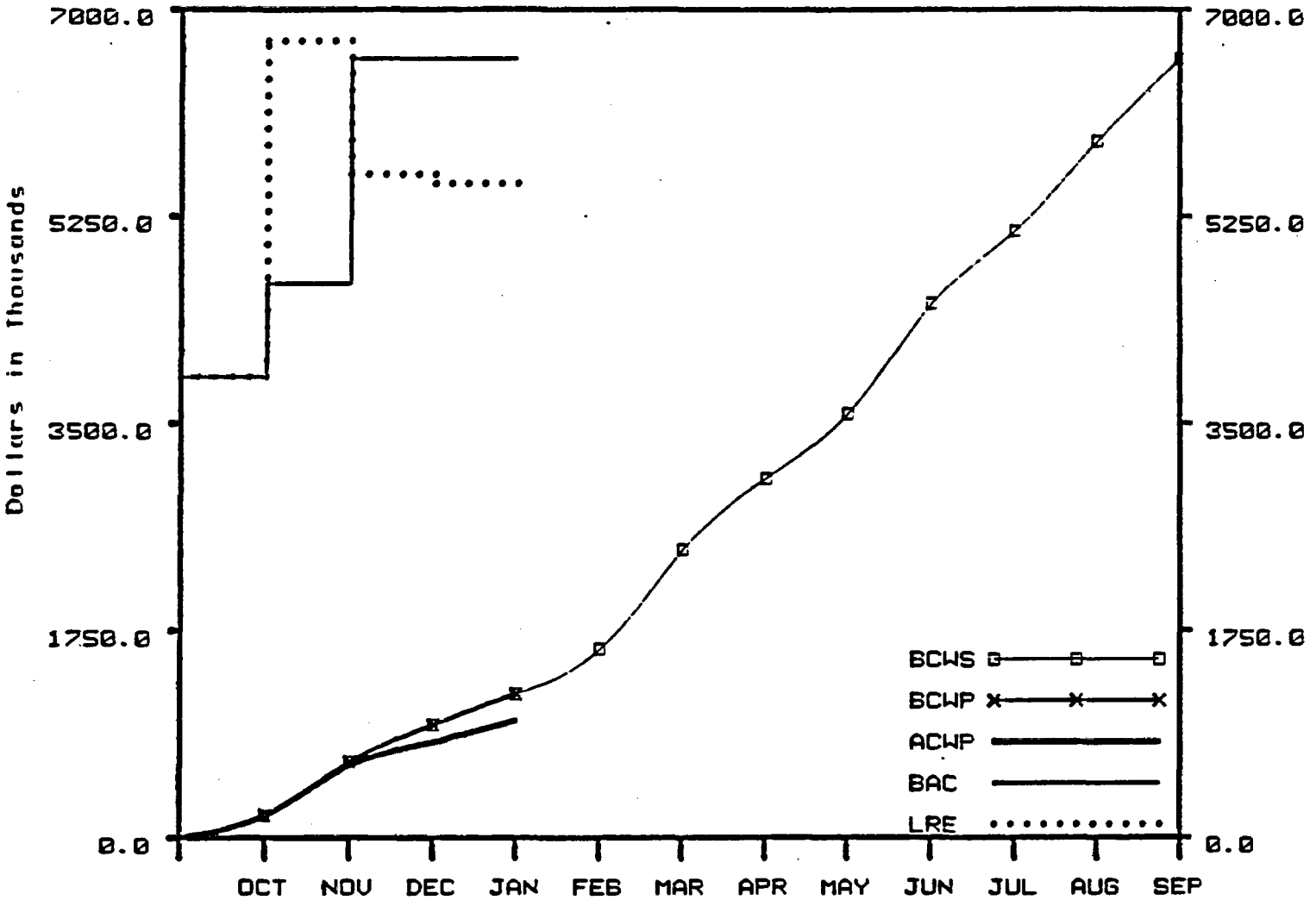


PAN AM - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	6.0	24.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	6.0	24.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	0.3	1.2
D. BUDGET AT COMPLETION (BAC)		72.0
E. LATEST REVISED ESTIMATE (LRE)		3.8

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	22.8	94.83
H. AT COMPLETION VARIANCE (D-E)	68.2	94.66

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.R

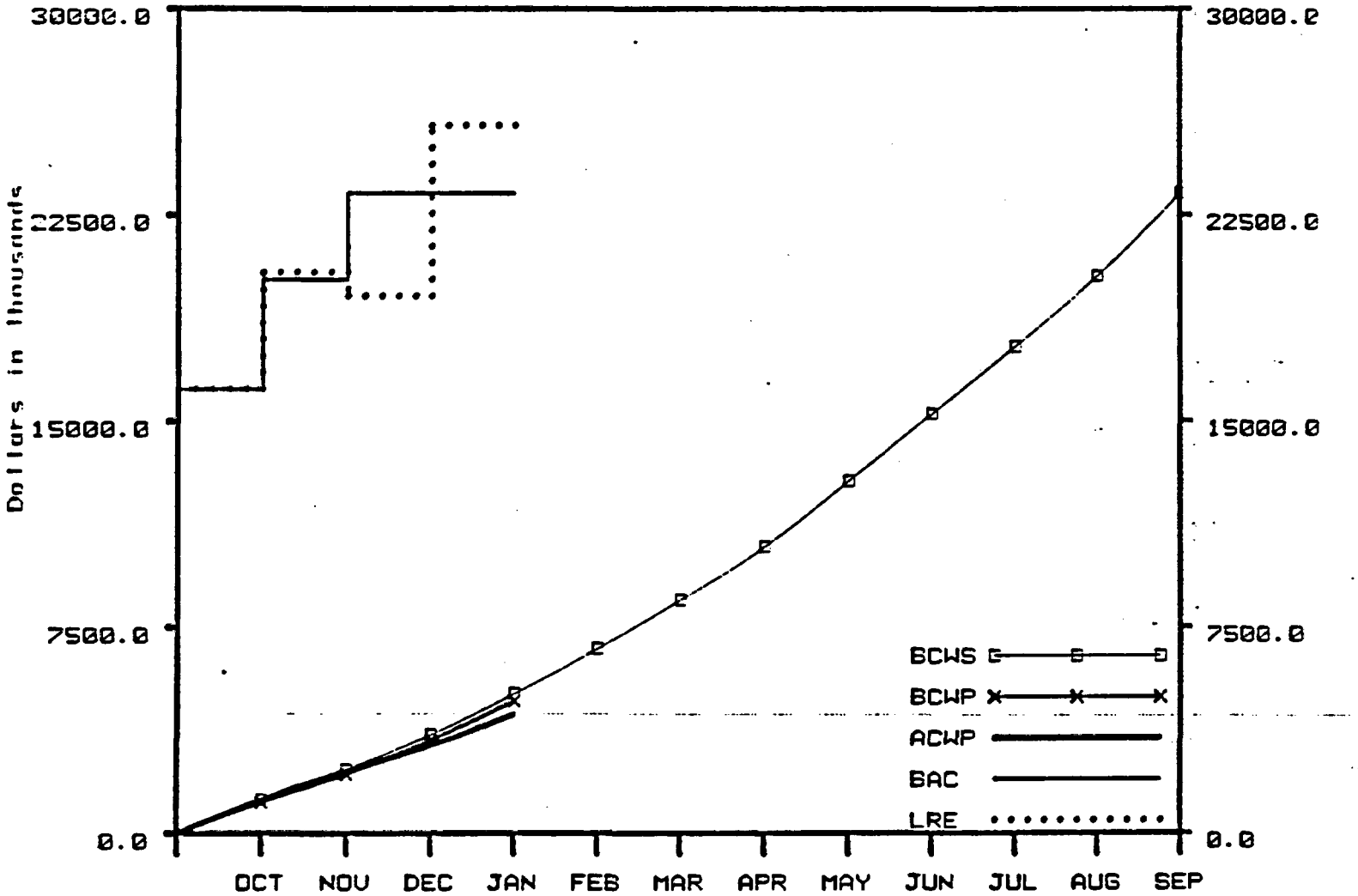


REECO - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	264.6	1211.9
B. BUDGETED COST OF WORK PERFORMED (BCWP)	264.6	1211.9
C. ACTUAL COST OF WORK PERFORMED (ACWP)	184.0	982.8
D. BUDGET AT COMPLETION (BAC)		6584.0
E. LATEST REVISED ESTIMATE (LRE)		5527.0

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	229.1	18.90
H. AT COMPLETION VARIANCE (D-E)	1057.0	16.05

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.S



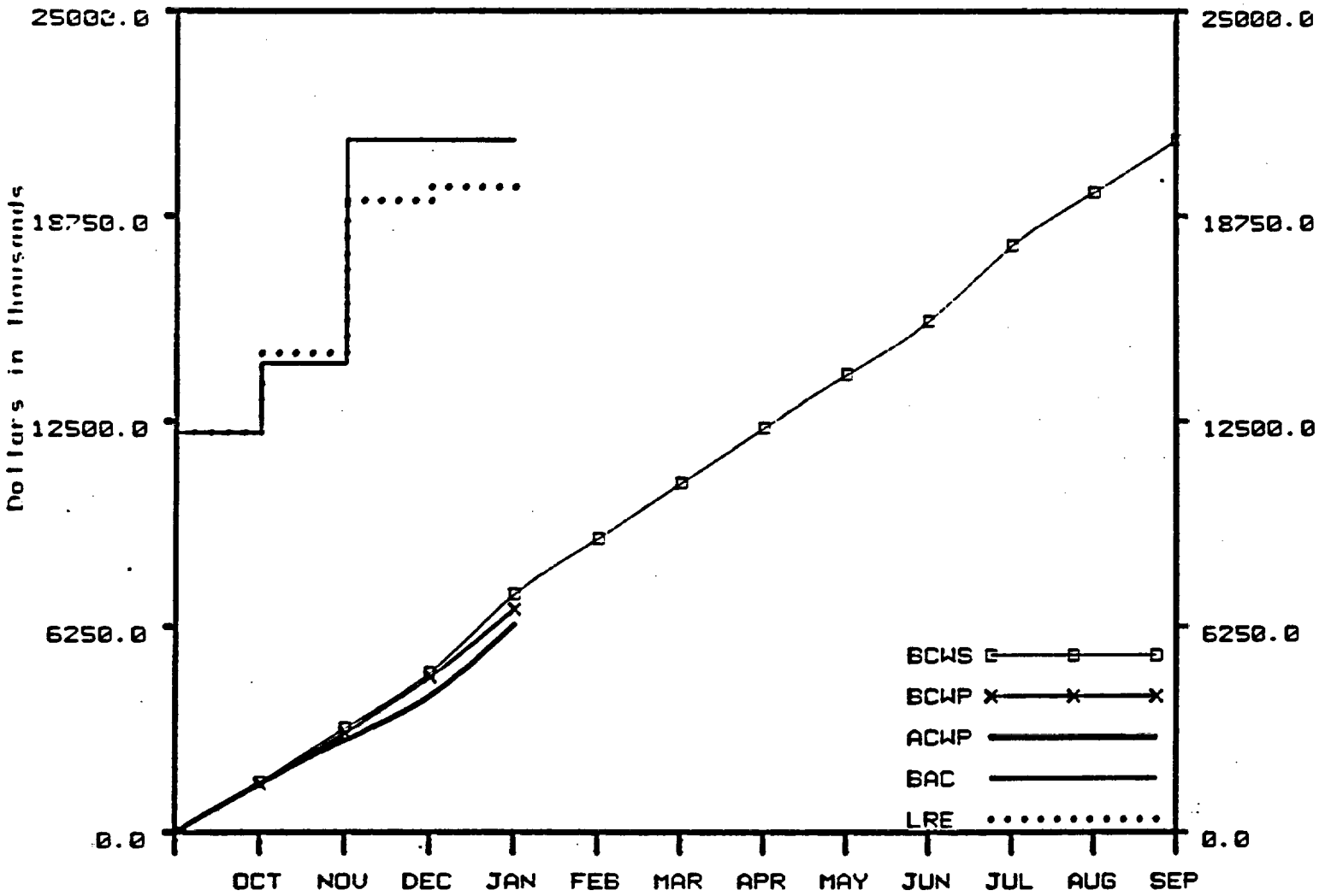
SNL - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	1496.0	5078.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	1432.3	4804.4
C. ACTUAL COST OF WORK PERFORMED (ACWP)	1126.0	4311.0
D. BUDGET AT COMPLETION (BAC)		23289.0
E. LATEST REVISED ESTIMATE (LRE)		25751.1

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-273.6	-5.39
G. COST VARIANCE (B-C)	493.4	10.27
H. AT COMPLETION VARIANCE (D-E)	-2462.1	-10.57

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.T



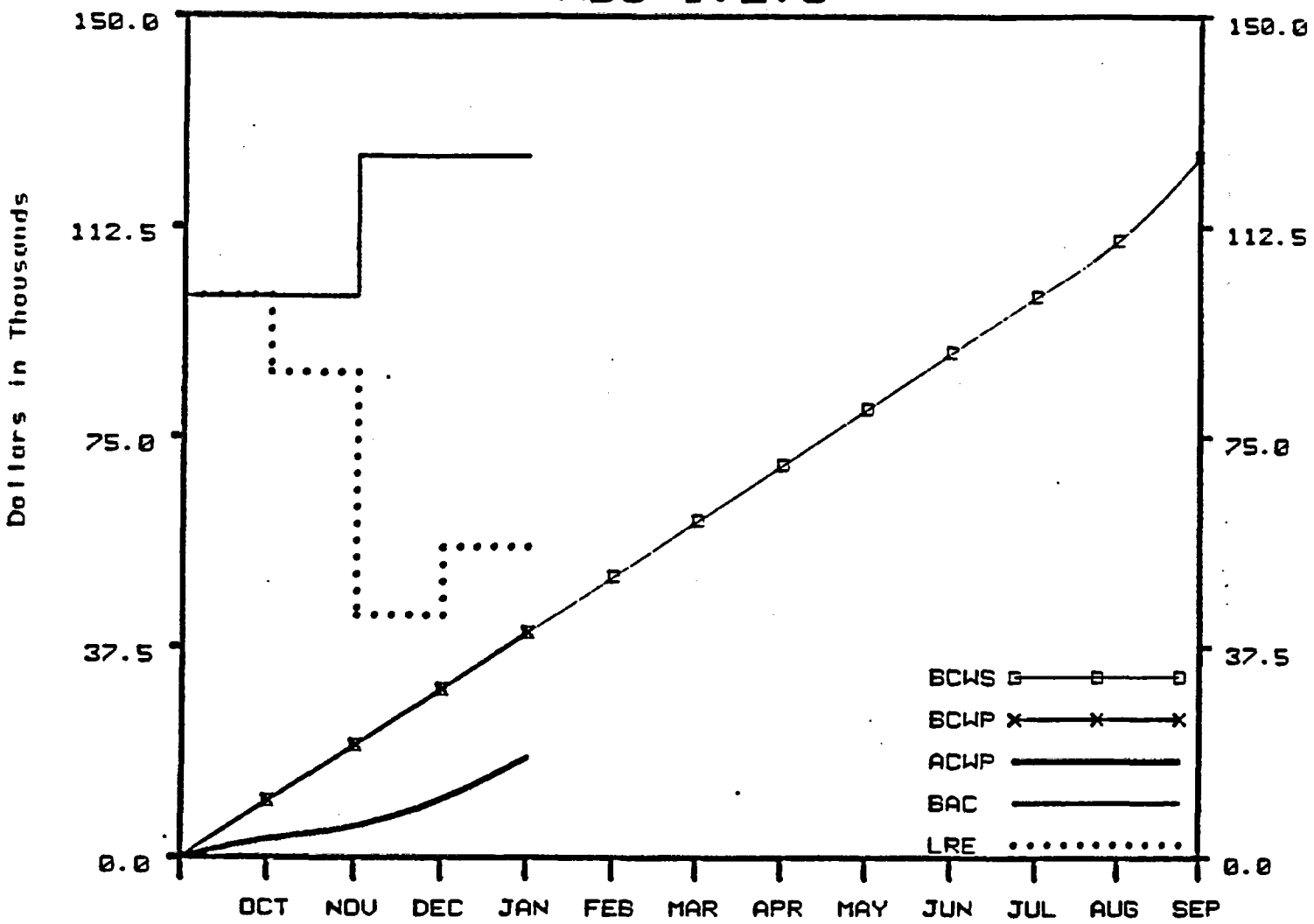
SAIC - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	2395.5	7234.5
B. BUDGETED COST OF WORK PERFORMED (BCWP)	2079.6	6778.3
C. ACTUAL COST OF WORK PERFORMED (ACWP)	2171.7	6288.7
D. BUDGET AT COMPLETION (BAC)		21067.0
E. LATEST REVISED ESTIMATE (LRE)		19616.4

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	-456.2	-6.31
G. COST VARIANCE (B-C)	489.6	7.22
H. AT COMPLETION VARIANCE (D-E)	1450.6	6.89

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.U



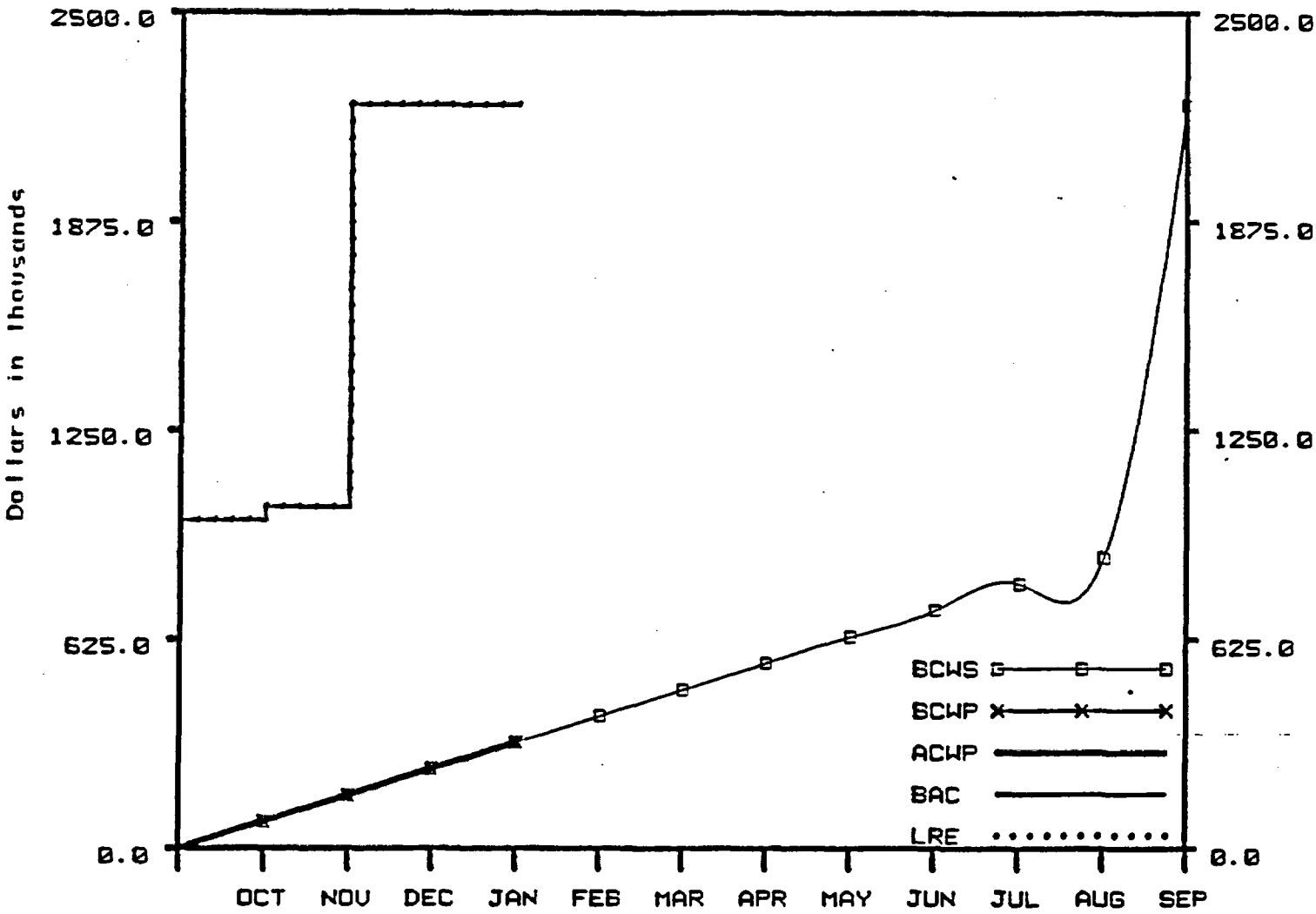
DRI - TOTAL

	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	10.0	40.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	10.0	40.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	7.3	17.7
D. BUDGET AT COMPLETION (BAC)		125.0
E. LATEST REVISED ESTIMATE (LRE)		55.2

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	22.3	55.84
H. AT COMPLETION VARIANCE (D-E)	69.8	55.84

Remarks:

NNWSI PROJECT
COST PERFORMANCE GRAPH FOR JAN 1987
WBS: 1.2.X



NTS - TOTAL	Current Period	Year To Date
A. BUDGETED COST OF WORK SCHEDULED (BCWS)	79.0	316.0
B. BUDGETED COST OF WORK PERFORMED (BCWP)	79.0	316.0
C. ACTUAL COST OF WORK PERFORMED (ACWP)	79.0	316.0
D. BUDGET AT COMPLETION (BAC)		2223.0
E. LATEST REVISED ESTIMATE (LRE)		2222.9

VARIANCES (Year To Date)	Dollars	Percent
F. SCHEDULE VARIANCE (B-A)	0.0	0.00
G. COST VARIANCE (B-C)	0.0	0.00
H. AT COMPLETION VARIANCE (D-E)	0.1	0.00

Remarks:

Run Date: 02 Feb 1987

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
MAJOR SYSTEMS ACQUISITION (MSA) MILESTONES
01 Oct 1986 to 30 Sep 1987

(B)=Baselined
(P)=Planned

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINE DATE	FORECAST (F) or ACTUAL (A)
WMPO submits letter report on Studies of Coupled Processes Included in the SCP to OGR for information	1.2.1.1	Robson	1	WMPO	R109 (P)	26 Nov 86	31 Mar 87 (F)
WMPO submits letter report on Studies of Performance Allocation Included in SCP to OGR	1.2.1.1	Robson	1	WMPO/SNL	R108 (B)	16 Feb 87	02 Jul 87 (F)
WMPO submits Annual PASS Program Interaction Letter Report for FY87 to OGR	1.2.1.1	Robson	1	WMPO/SNL	P132 (B)	30 Sep 87	
Yucca Mountain Mined Geologic Disposal System (MGDS) Requirements	1.2.1.2.1	Robson	1	WMPO/SNL	M120 (B)	31 Mar 87	30 May 87 (F)
Draft Yucca Mountain Site-Specific Mined Geologic Disposal System (MGDS) Description	1.2.1.2.1	Robson	1	WMPO/SNL	M261 (B)	30 Jun 87	15 Aug 87 (F)
System Engineering Management Plan (SEMP)	1.2.1.2.4	Robson	1	WMPO/SNL	M105 (B)	16 Feb 87	09 Mar 87 (F)
OGR Systems Engineering Review of the NNWSI Project	1.2.1.2.4	Robson	1	WMPO/SNL	R074 (B)	15 Mar 87	06 Jul 87 (F)
WMPO submits hard copy (1987 Annual) version of the Reference Information Base to OGR	1.2.1.3.3	Livingston	1	WMPO/SNL	R092 (B)	29 May 87	
Waste Package Postclosure Compliance Strategy Document	1.2.2.1	Valentine	1	WMPO/LLNL	R003 (B)	30 Jan 87	30 May 87 (F)
Progress Report on the Results of Testing Advanced Conceptual Design Metal Barrier Materials Under Relevant Environmental Conditions for a Tuff Repository	1.2.2.3.2	Valentine	1	WMPO/LLNL	M236 (B)	30 Jan 87	30 Apr 87 (F)
Decision Made on Using Packing Material in the Waste Package to Assist in Controlling Radionuclides Release Rate	1.2.2.3.3	Valentine	1	WMPO/LLNL	M257 (B)	30 Jan 87	30 Jun 87 (F)
Revised Draft Waste Package Subsystem Conceptual Design Requirements to DOE/HQ for Review	1.2.2.4	Valentine	1	WMPO/LLNL	M013 (B)	30 Apr 87	14 Aug 87 (F)
Initiate Waste Package Advanced Conceptual Design	1.2.2.4	Valentine	1	WMPO/LLNL	M233 (B)	30 Sep 87	
Report on the System Model for Waste Package Performance Analysis	1.2.2.5	Valentine	1	WMPO/LLNL	M276 (B)	31 Oct 86	12 Jan 87 (A)
Report on Long Term Performance Anaylsis of the Conceptual Waste Package Design	1.2.2.5	Valentine.	1	WMPO/LLNL	M260 (B)	30 Apr 87	30 Jul 87 (F)
Submit Report on Evaluation of Natural Resources at Yucca Mountain and Vicinity received to DOE/ HQ for Information	1.2.3.1	Livingston	1	WMPO/SAIC	M895 (B)	31 Jul 87	
Recommendation to Proceed With Deep Regional Seismic Survey to OGR for Approval	1.2.3.2.2	Rotert	1	WMPO/USGS	R845 (B)	31 Aug 87	

Run Date: 02 Feb 1987

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
MAJOR SYSTEMS ACQUISITION (MSA) MILESTONES
01 Oct 1986 to 30 Sep 1987

(B)=Baselined
(P)=Planned

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINE DATE	FORECAST (F) or ACTUAL (A)
Report on Geochemistry Simulation of Yucca Mountain Using Best Available Data on Mineralogy, Water Chemistry, Flow Rates and Crack Statistics	1.2.3.4.1	Livingston	1	WMPO/LANL	M325 (B)	26 Nov 86	27 Feb 87 (F)
Preliminary Report on Sorption Modeling	1.2.3.4.1	Livingston	1	WMPO/LANL	R309 (B)	30 Jan 87	27 Feb 87 (F)
Report: Completion of Trench Preparation at Surface Facilities Site	1.2.3.5.2	Rotert	1	WMPO/REECo	P509 (P)	31 Mar 87	TBD
Complete Drilling Shallow Unsaturated Zone	1.2.3.5.2	Rotert	1	WMPO/SAIC	P519 (P)	31 Jul 87	TBD
Final Radiological Monitoring Plan Complete	1.2.3.6.1	Jankus	1	WMPO/SAIC	M897 (B)	27 Feb 87	01 May 87 (F)
Submit Air Quality Monitoring Plan to DOE/HQ	1.2.3.6.1	Jankus	1	WMPO/SAIC	R327 (B)	30 Apr 87	
Begin Air Quality Monitoring	1.2.3.6.1	Blanchard	1	WMPO/SAIC	N345 (B)	30 Sep 87	
Submit Working Draft Site Characterization Socioeconomic Monitoring and Mitigation Plan (SMMP)	1.2.3.7	Dixon	1	WMPO/SAIC	R945 (B)	01 Dec 86	21 Nov 86 (A)
Submit Draft Socioeconomic Monitoring and Mitigation Plan to DOE/HQ	1.2.3.7	Dixon	1	WMPO/SAIC	P030 (B)	02 Apr 87	22 Jun 87 (F)
Start Repository Advanced Conceptual Design	1.2.4.1.1	Zvada	1	WMPO/SNL	N430 (B)	30 Sep 87	
Initial Subsystem Design Requirement (SDR)	1.2.4.1.2	Skousen	1	WMPO/SNL	N433 (B)	30 Apr 87	30 May 87 (F)
Repository Conceptual Design in Support of Site Characterization	1.2.4.1.3	Skousen	1	WMPO/SNL	N432 (B)	27 Feb 87	01 Apr 87 (F)
Report on G-Tunnel Underground Facility (GTUF) Summary	1.2.4.2.1	Skousen	1	WMPO/SNL	M455 (B)	30 Jan 87	27 Feb 87 (F)
Feasibility Analysis of Horizontal Emplacement and Retrieval - Letter Report	1.2.4.2.2	Skousen	1	WMPO/SNL	M295 (B)	30 Nov 86	05 Sep 86 (A)
Initiate Procurement of Development Prototype Boring Machine	1.2.4.2.2	Skousen	1	WMPO/SNL	N427 (B)	30 Nov 86	30 Jun 87 (F)
Horizontal Waste Emplacement Equipment Development Plan	1.2.4.2.2	Skousen	1	WMPO/SNL	N406 (B)	27 Feb 87	30 Apr 87 (F)
Complete Fabrication of Development Prototype Boring Machine (DPBM) Waste Emplacement	1.2.4.2.2	Skousen	1	WMPO/SNL	P403 (P)	29 May 87	16 May 88 (F)
Initiate Drill Tests in G-Tunnel	1.2.4.2.2	Skousen	1	WMPO/SNL	N603 (P)	31 Jul 87	15 Aug 88 (F)
Analysis to Evaluate the Effect of the Exploratory Shaft on Repository Performance at Yucca Mountain	1.2.4.2.3	Skousen	1	WMPO/SNL	R036 (B)	27 Feb 87	30 May 87 (F)

Run Date: 02 Feb 1987

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
MAJOR SYSTEMS ACQUISITION (MSA) MILESTONES
01 Oct 1986 to 30 Sep 1987

(B)=Baselined
(P)=Planned

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINE DATE	FORECAST (F) or ACTUAL (A)
Prepare "Technical Basis for Performance Goals, Design Requirements and Material Recommendation for the NNWSI Project Repository Sealing Program Report"	1.2.4.2.3	Skousen	1	WMPO/SNL	P404 (B)	31 Mar 87	30 May 87 (F)
Final Report on Spent Fuel Rod Consolidation	1.2.4.4	Skousen	1	WMPO/SNL	R267 (B)	31 Dec 86	27 Feb 87 (F)
Submit Retrievability Compliance Strategy Plan to OGR for Review and Comment	1.2.4.4	Skousen	1	WMPO	R848 (P)	31 Mar 87	15 Jul 87 (F)
Preliminary Study of the Effects of Uncertain Geologic Data on Design of the Underground Facility	1.2.4.6.2	Skousen	1	WMPO/SNL	N457 (B)	27 Feb 87	30 May 87 (F)
Submit Draft Seismic/ Tectonic Summary Position Paper to WMPO/NV	1.2.5.2.1	Szymanski	1	WMPO/SAIC	R583 (B)	15 Jun 87	
Submit Draft Preliminary Plan for Scheduling, Management, and Preparation of Positon Papers to WMPO/NV	1.2.5.2.1	Szymanski	1	WMPO/SAIC	R579 (B)	31 Aug 87	
Draft Site Characterization Plan (SCP)	1.2.5.2.2	Clanton	1	WMPO/SAIC	M521 (B)	16 Jan 87	14 Jan 87 (A)
Site Characterization Plan (SCP)	1.2.5.2.2	Clanton	1	WMPO/SAIC	M522 (B)	27 Feb 87	31 Mar 87 (F)
Draft Environmental Field Study Plans Received at HQ for review.	1.2.5.3	Jankus	1	WMPO/SAIC	R798 (B)	30 Jun 87	
Environmental Field Study Plans Received at HQ For Baselining	1.2.5.3	Jankus	1	WMPO/SAIC	R799 (B)	31 Aug 87	
Submit Working Draft Environmental Regulatory Compliance Plan to DOE/HQ & State.	1.2.5.3.3	Jankus	1	WMPO/SAIC	R794 (B)	30 Jan 87	27 Mar 87 (F)
Environmental Regulatory Compliance Plan Issued	1.2.5.3.3	Jankus	1	WMPO/SAIC	R795 (B)	31 May 87	
Submit Draft II Environmental Monitoring and Mitigation Plan (EMMP) to WMPO/NV	1.2.5.3.4	Jankus	1	WMPO/SAIC	R996 (B)	01 Dec 86	01 Dec 86 (A)
Submit Environmental Monitoring and Mitigation Plan (EMMP) to DOE/HQ	1.2.5.3.4	Jankus	1	WMPO/SAIC	P034 (B)	30 Apr 87	22 Jun 87 (F)
Complete and Sign C&C Agreement with State	1.2.5.4.1	Dixon	1	WMPO	M795 (P)	31 Mar 87	
Exploratory Shaft Facility (ESF) Subsystems Design Requirements Document	1.2.6.1.1	Irby	1	WMPO/LANL	R241 (B)	30 Dec 86	27 Feb 87 (F)
Submit Prototype Test Plans to DOE/HQ for review and comment	1.2.6.1.1	Irby	1	WMPO/LANL	M105 (B)	27 Feb 87	
DOE/HQ receives Final FY89 Project Validation Material	1.2.6.1.1	Irby	1	WMPO/SAIC	R841 (B)	13 Mar 87	

Run Date: 02 Feb 1987

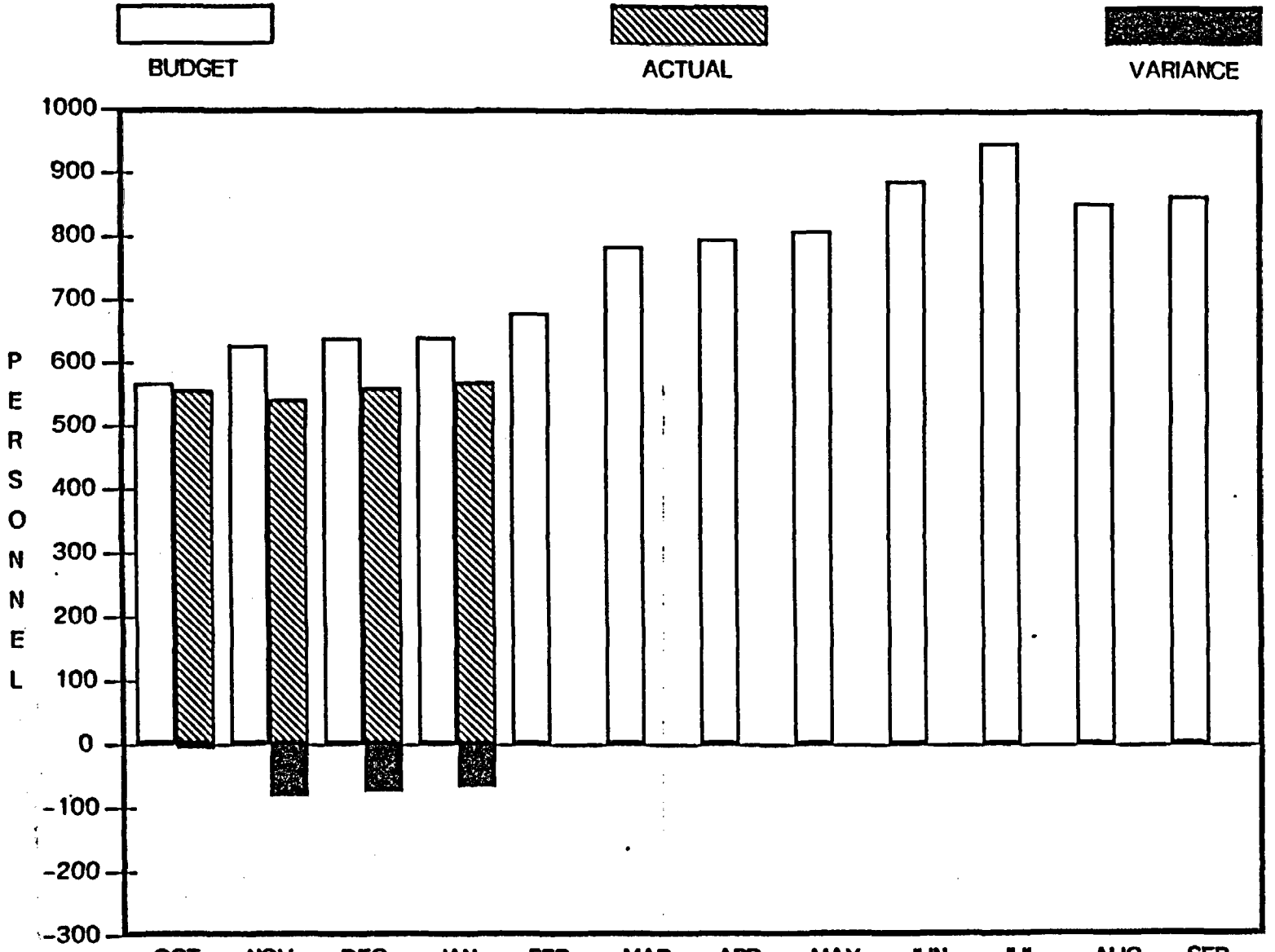
NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS
MAJOR SYSTEMS ACQUISITION (MSA) MILESTONES
01 Oct 1986 to 30 Sep 1987

(B)=Baselined
(P)=Planned

MILESTONE DESCRIPTION	WBS NO.	WMPO RESP	LEVEL	RESP ORG	MILESTONE	BASELINE DATE	FORECAST (F) or ACTUAL (A)
Start Field Prototype Testing in G-Tunnel	1.2.6.1.1	Irby	1	WMPO/LANL	M282 (B)	30 Mar 87	
Final ESF Title II Design Requirements Document submitted to DOE/HQ	1.2.6.1.1	Irby	1	WMPO/SAIC	M773 (B)	29 May 87	
Exploratory Shaft Title I Design Summary Submitted to WMPO	1.2.6.1.1	Irby	1	WMPO/SAIC	P763 (B)	29 May 87	
Complete Exploratory Shaft Readiness Review	1.2.6.1.1	Irby	1	WMPO/LANL	M243 (B)	30 Sep 87	
Submit FY 87 Baseline Budget Information and Cost Plans to OGR for Information	1.2.9.1.1	Kunich	1	WMPO/SAIC	R849 (B)	30 Dec 86	22 Dec 86 (A)
Final NNWSI Project Management Plan to WMPO/NV and DOE/HQ	1.2.9.1.1	Dixon	1	WMPO/SAIC	R448 (B)	30 Dec 86	01 Apr 87 (F)
Approved Revised Project Charter	1.2.9.1.1	Vieth	1	WMPO/SAIC	R850 (B)	30 Jan 87	31 Mar 87 (F)
Submit NNWSI Project Plan to WMPO/NV and DOE/HQ	1.2.9.1.1	Dixon	1	WMPO/SAIC	R810 (B)	30 Sep 87	
Submit FY 89 Budget to DOE/HQ	1.2.9.1.2	Dixon	1	WMPO/SAIC	M712 (B)	13 Mar 87	
Licensing Support System Document Collection Procedure to Headquarters for Approval	1.2.9.1.4	Hatch	1	WMPO/SAIC	R647 (B)	30 Apr 87	TBD
Implement Document Collection for the Licensing Support System	1.2.9.1.4	Hatch	1	WMPO/SAIC	R842 (P)	31 Jul 87	TBD
Implement Phase II of Earned Value System	1.2.9.2	Dixon	1	WMPO/SAIC	M725 (B)	30 Nov 86	31 Mar 87 (F)

NNWSI PROJECT STAFFING*

FISCAL YEAR 1987



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
B	566	627	638	640	678	783	796	810	888	948	853	865
A	556	541	560	569								
V	-10	-86	-78	-71								

*FTE's shown reflect input from all NNWSI Project participants except the State of Nevada.

PLANNED NNWSI PROJECT FIELD ACTIVITIES

FOR MARCH

Participant	Activity	Location	Planned Day	Planned Time
LLNL	No scheduled activities			
Los Alamos	No report received			
SAIC	Meteorological monitoring	Yucca Mountain	Field site technicians will maintain stations weekly, 3 days per week.	
USGS	Seismic network monitoring	NTS and Vicinity	Continuous throughout month.	
	Collect precipitation and runoff data	NTS	Following storm events.	
	Water-level monitoring	Wells at Yucca Mountain and Vicinity	March 2-3, 16-17, and 30-31	8-4
	Monitoring of test well USW UZ-1	Test well USW UZ-1	March 2, 11, 20, and 30	8-11 2:30-3:30
	Monitoring of neutron test holes	Yucca Mountain and vicinity	Continuous throughout month	8-4
	Gas sampling	Test hole USW UZ-1	March 23-April 2	Daylite hours
	Prototype testing	Test hole USW UZ-13	March 16-20	Continuous