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Quarterly Report On Program Cost and Schedule

First Quarter FY 1989

*U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Washington, DC 20585*

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PREFACE

This report is intended to provide a summary of the cost and schedule performance for the Civilian Radioactive Waste Management Program. Performance data are presented for each of the major program elements. Also included in this report is the status of the Nuclear Waste Fund revenues and disbursements. This report includes performance data through December 1988.

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HIGHLIGHTS

- The following major program milestones were completed in the first quarter of FY 1989:
 - Completed final draft and issued NWPA Section 175 Impact report to Congress.
 - Issued Site Characterization Plan.
 - Issued Draft Environmental Program Overview.
 - Issued Revision 1 Environmental Regulatory Compliance Plan.
 - Issued Revision 2 Environmental Monitoring and Mitigation Plan.
 - Issued Federal Register Notice for FY88 Federal Interim Storage Fees.
 - Submitted Annual Update to Congress on Federal Interim Storage Deployment.
 - Submitted FY90 Congressional Budget.
 - Filed land withdrawal application.
 - Completed site reclamations in Mississippi and Louisiana.
- Major accomplishments for the first repository Yucca Mountain Project during the first quarter of FY 1989 were:
 - The NRC issued the Safety Evaluation Report showing acceptance of the Yucca Mountain Quality Assurance Plan, 88-9 Rev. 1 with 6 issues to be resolved. The project responded to these issues and a meeting was scheduled for November to obtain final concurrence.
 - The 100 percent ESF Title I Technical Assessment was completed by the issuance of the Record Memorandum.
 - The acceptance review of the Waste Package Design Requirements document was completed.
 - The Floodplain Assessment necessary to satisfy Executive Order 11988 was completed and sent to HQ for review. The underground injection control permit application was reviewed and sent to HQ for review in December.
 - The following draft Environmental Field Activity Plans (EFAPs) were completed and submitted to the State of Nevada: 1) Air Quality, 2) Terrestrial Ecosystems, 3) Cultural Resources: Native American Component, 4) Cultural Resources: Archaeological Component, and 5) Radiological Studies. The Reclamation Feasibility Plan and the EFAP's for water resources and soils have been provided to DOE/HQ in draft form for review.

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HIGHLIGHTS (Continued)

- The Surface-Based Investigations Plan was released late December in conjunction with the release of the Site Characterization Plan. This document details the technical plans for the field activities planned for site characterization including present design information, schedule/duration, land access considerations and expected environmental impact of planned activities. This document covers planned activities and is planned to be updated approximately once every 6 months.
- The final draft of the Nevada Highway Routing Study was completed for submittal to DOE/HQ for publications approval. This report describes DOT routing regulations and their implications to the State of Nevada. Publication of the report will clarify the Project Office position on highway routes.
- FY89 actual costs through the first quarter for the total first repository were \$48.8 million. The Yucca Mountain project accounted for 71 percent (or \$34.4 million); technical support activities accounted for 16 percent (or \$7.9 million); and the basalt and salt projects accounted for 10 percent (or \$5.0 million) and 3 percent (or \$1.5 million), respectively, for reclamation activities.
- Only actual costs were reported for the Yucca Mountain project. Therefore, the negative schedule variance (cumulative from October 1984) through the first quarter of FY89 remained constant from the previous quarter at -3 percent (or -\$9.6 million). The cost variance through the fourth quarter of FY89 also remained constant from the previous quarter at 6 percent (or \$21.5 million).
- Actual costs through the first quarter of FY89 were \$6.1 million for the repository technology program.
- Through the first quarter of FY89, actual costs of \$5.1 million for the transportation program were \$2.6 million less than planned costs.
- The schedule variance for the transportation program through the first quarter remained constant on a percentage basis at -6 percent but changed on a dollar basis from -\$1.0 million to -\$1.4 million. The cost variance changed from 3 percent (or \$0.5 million) to 6 percent (or \$1.3 million).
- Since June 1986, the MRS project has been reporting level-of-effort for the work performed. Variance analysis reporting will be resumed for the MRS report when future project plans are established. Actual costs through the first quarter of FY89 were \$0.1 million.
- Through the first quarter of FY89, the actual costs for systems integration activities were \$1.1 million.

PROGRAM MILESTONE REVIEW

- The Program Milestone Review (PMR) is a monthly report which monitors the status of significant program milestones. Baseline, actual, and rescheduled dates are reported each month for selected activities. The PMR used for this report is the schedule as of January 1, 1989.
- Program milestones completed during the first quarter of FY89 were:
 - Completed final draft and issued NWPA Section 175 Impact report to Congress.
 - Issued Site Characterization Plan.
 - Issued Draft Environmental Program Overview.
 - Issued Revision 1 Environmental Regulatory Compliance Plan.
 - Issued Revision 2 Environmental Monitoring and Mitigation Plan.
 - Issued Federal Register Notice for FY88 Federal Interim Storage Fees.
 - Submitted Annual Update to Congress on Federal Interim Storage Deployment.
 - Submitted FY90 Congressional Budget.
 - Filed land withdrawal application.
 - Completed site reclamations in Mississippi and Louisiana.
- Schedule changes were not reported due to PMR baselines being established in the final month of this quarter.

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▼ BASELINE MILESTONE DATE
 ◆ ACTUAL COMPLETION DATE
 ◇ FORECAST MILESTONE DATE
 TBD TO BE DETERMINED

PROGRAM MILESTONE REVIEW (CHART II)
 (COMPLETIONS AS OF JANUARY 1, 1989)
 (FORECASTS AS OF DECEMBER 1, 1988)

NUCLEAR WASTE FUND PROJECTIONS

- For FY 1983 through FY 1988, receipts were actual amounts collected from utilities while disbursements included both actual disbursements and interest paid on the appropriated debt.
- The current projection (February 1989) assumes the revenues from the 1 mill per kwh fee contained in the December 1988 EIA projection. Revenues from the one-time fee and earned interest are based on the FY 1990 Congressional budget submission. Disbursements for FY 1989 through FY 1992 assume the budget outlay estimates contained in the FY 1990 budget submittal.
- The November 1988 projection assumed the revenues from the 1 mill per kwh fee contained in the September 1988 EIA Projection. Revenues from the one-time fee and earned interest were based on the FY 1990 OMB budget submission. FY 1988 disbursements were based on estimates of planned costs. Disbursements for FY 1989 through FY 1990 assumed the budget outlay estimates contained in the FY 1990 budget submittal.
- The February 1986 projection assumed the cost estimates, revenue (both from the 1 mill per kwh and the one-time fee), and earned interest contained in the FY 1987 budget submittal.
- Projection of net balance made in January 1985 was based on revenue and cost projections (escalated to current dollars by an average annual growth rate of 5 percent per year) in the FY 1986 budget submitted to Congress in January 1985. This projection assumed that \$770 million would be received in June 1985 for the one-time payment for fuel generated before 1983 (compared to the \$1.4 billion that was actually collected). The projection of net balance assumed that a positive yearly balance earns interest at a rate of 7 percent per year.

PROJECTED NUCLEAR WASTE FUND

RECEIPTS & DISBURSEMENTS (AS OF 11/88)

PROJECTED NET BALANCE

OF WASTE FUND

PROJECTED VERSUS ACTUAL FUND REVENUES

- Actual revenues from the 1 mill/kwh fee for the first quarter of FY89 were \$144.9 million. These revenues were \$2.0 million more than the projection of revenues made for this quarter on December 12, 1988. The projection of revenues for this quarter made on September 21, 1988 were \$6.1 million less than actual revenues. The June 1984 projection of revenues was \$0.4 million less than actuals.
- Comparison of June 1984 projection of revenues from the 1 mill/kwh fee with actual collections on a quarterly basis indicates that the projections have fallen within -\$6 million to +\$45 million of actual amounts. The +\$45 million difference in the June 1984 projection versus the actual amount collected in the 4th quarter of FY86 was due to credits given to the utilities for previous overpayment as a result of the change in the fee basis from gross to net generation.

Waste fund revenues from 1 mill/kwh fee: actual vs projected.

COST PROFILE FOR FIRST REPOSITORY

- FY89 actual costs through the first quarter for the first repository were \$48.8 million. The distribution by project was \$34.4 million for Yucca Mountain project (NNWSI), \$7.9 million for technical support activities, \$5.0 million for basalt project (BWIP), and \$1.5 million for salt project (SRP).
- Through the first quarter of FY89, cumulative actual costs (from FY83) for the first repository projects totaled \$1578 million of which 34 percent (or \$541 million) was accounted for by NNWSI, 32 percent (or \$510 million) by SRP, 30 percent (or \$471 million) by BWIP, and 4 percent (or \$56 million) by technical support activities.

COST PROFILE FOR TOTAL NUCLEAR WASTE FUND

COST PROFILE FOR FIRST REPOSITORY

- FY89 actual costs through the first quarter for the first repository were \$48.8 million. The distribution by project was \$34.4 million for Yucca Mountain project (NNWSI), \$7.9 million for technical support activities, \$5.0 million for basalt project (BWIP), and \$1.5 million for salt project (SRP).
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COST PROFILE FOR TOTAL FIRST REPOSITORY

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR BWIP

COST PROFILE FOR NNWSI

COST PROFILE FOR SRP

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR TECHNICAL SUPPORT

PERFORMANCE MEASUREMENT ANALYSIS

- There are three parameters which provide the basis for variance analysis of project performance, according to the Cost and Schedule Control Systems Criteria (CSCSC). These are:
 - The budgeted cost for work scheduled (BCWS)
 - The budgeted cost for work performed (BCWP)
 - The actual cost of work performed (ACWP)
- The measures of cost and schedule variance presented in this report use these parameters as defined below:

$$\text{Schedule Variance (\%)} = \frac{\text{BCWP} - \text{BCWS}}{\text{BCWS}}$$

$$\text{Cost Variance (\%)} = \frac{\text{BCWP} - \text{ACWP}}{\text{BCWP}}$$

- A positive variance is a favorable indicator, while a negative variance is an unfavorable indicator.
- In response to the December 1987 legislation, the variance analysis data presented in this report for all program elements except the Yucca Mountain repository project begin with FY 1988. Until the tuff project is rebaselined, the cumulative variance analysis from the beginning of FY 1986 will continue to be presented.

PERFORMANCE MEASUREMENT ANALYSIS FOR THE FIRST REPOSITORY

- For the first quarter, only actual costs (ACWP) were reported by the field project office; thus the BCWS and BCWP was assumed to equal ACWP.
- The negative schedule variance through the first quarter of FY89 for NNWSI changed on a percentage basis from -3 percent to -2 percent but remained constant on a dollar basis at -\$9.6 million.
- The cost variance through the first quarter of FY89 remained constant at 6 percent (or \$21.5 million).

NNWSI (TOTAL)
FY 1989 PERFORMANCE MEASUREMENT ANALYSIS
CUMULATIVE THROUGH FIRST QUARTER

BCWS	360553	371700	383337	394988										
BCWP	350979	362125	373762	385414										
ACWP	329439	340586	352222	363874										
CV \$	21540	21540	21540	21540										
CV %	6	6	6	6										
SV \$	-9574	-9574	-9574	-9574										
SV %	-3	-3	-2	-2										

85-88 OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP

COST PROFILE FOR SECOND REPOSITORY

- Actual costs through the first quarter of FY89 for the second repository shutdown were \$0.3 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR SECOND REPOSITORY

COST PROFILE FOR REPOSITORY TECHNOLOGY PROGRAM

- Actual costs through the first quarter of FY89 for the Repository Technology Program were \$6.1 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR REPOSITORY TECHNOLOGY PROGRAM

COST PROFILE FOR TRANSPORTATION

- The three DOE field offices (Idaho, Chicago, and Oak Ridge) which comprise the transportation subprogram, estimated a planned total cost in FY89 of \$28.5 million. Seventy-one percent (or \$20.2 million) of the total planned cost is accounted for by the Idaho field office. Chicago represents 21 percent of the total planned cost (or \$5.9 million) while Oak Ridge accounts for the remaining 8 percent (or \$2.4 million).
- FY89 actual costs through the first quarter were \$5.1 million, or \$2.6 million below the plan.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR TRANSPORTATION

PERFORMANCE MEASUREMENT ANALYSIS FOR TRANSPORTATION PROGRAM

- Through the first quarter of FY89, the cost variance changed from 3 percent (or \$0.5 million) to 6 percent (or \$1.3 million).
- The schedule variance remained constant on a percentage basis at -6 percent but changed on a dollar basis from -\$1.0 million to -\$1.4 million.

TRANSPORTATION (TOTAL)
FY 1989 PERFORMANCE MEASUREMENT ANALYSIS
CUMULATIVE THROUGH FIRST QUARTER

	BCWS				BCWP				ACWP				
(\$000)	BCWS	17220	19114	21302	23352								
	BCWP	16185	17915	20030	21996								
	ACWP	15652	17288	18958	20692								
	CV \$	533	627	1072	1304								
	CV %	3	3	5	6								
	SV \$	-1035	-1199	-1271	-1356								
	SV %	-6	-6	-6	-6								
	FY88 CUM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

COST PROFILE FOR MONITORED RETRIEVABLE STORAGE

- The MRS project covers the work administered through the Richland and Oak Ridge field offices. Since work is being performed on a level-of-effort basis, no cost plan is yet available.
- FY89 actual costs for the MRS project through the first quarter were \$0.1 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR MRS

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PERFORMANCE MEASUREMENT ANALYSIS FOR MRS PROJECT

- Starting in June 1986, budgeted cost is assumed to equal actual cost due to the level-of-effort nature of the work currently being performed. Variance analysis reporting will be resumed when future project plans are established.

COST PROFILE FOR SYSTEMS INTEGRATION

- Systems integration activities are composed of work performed by Pacific Northwest Laboratory (PNL) and Oak Ridge National Laboratory (ORNL). Cost plans for FY1989 have not yet been prepared for these activities.
- FY89 actual costs for combined systems integration activities through the first quarter were \$1.1 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR SYSTEMS INTEGRATION

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GLOSSARY

PERFORMANCE MEASUREMENT TERMS:

ACWP - Actual Cost of Work Performed

The cost actually incurred in accomplishing the work performed (BCWP).

BCWP - Budgeted Cost of Work Performed

The earned value of work performed in terms of the original budget. It is a sum of the budgets for completed work packages and the completed portion of in-process work packages during a given period.

BCWS - Budget Cost of Work Scheduled

The sum of budgets for the work packages scheduled to have been accomplished during an incremental period of time or cumulative-to-date.

Cost Variance - (BCWP minus ACWP)

The cost variance indicates whether more or less money was spent for work performed than was planned for that amount of work.

Cost Variance (%) - (Cost Variance over BCWP)

The cost variance measured against the work performed.

Schedule Variance - (BCWP minus BCWS)

The schedule variance is a quantification of the schedule deviation in terms of dollars. A positive variance indicates an ahead-of-schedule condition.

Schedule Variance (%) - (Schedule Variance over BCWS)

The schedule variance measured against the work planned.