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Quarterly Report on Program Cost and Schedule

Third Quarter FY 1989

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

MASTER

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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 cost and schedule data through June 1989.

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HIGHLIGHTS

- The following major program accomplishments were reported for the third quarter of FY 1989:
 - Phase 1A of the Prototype Drilling and Coring Program was completed on June 8, 1989. Blown core vacuum wire line coring, and conventional wire line coring systems were tested. An 8-inch diameter hole was drilled to a depth of 347 feet. A 12-inch diameter hole was drilled to a depth of 312 feet. Phase 1B was conducted in July and included modifications of the drilling, coring and sample collection equipment. Phase 1C was conducted in August with dry drilling and dry coring at a site 15 miles west of Milford, Utah.
 - The Project made presentations to the Nuclear Waste Technical Review Board (NWTRB) during the Board's June 26-28 meeting in Las Vegas, Nevada.
 - The Free Use Permit application for sand, gravel, and fill material was completed and submitted to the Bureau of Land Management. The Resource Conservation and Recovery Act (RCRA) identification number was received from the U.S. Environmental Protection Agency (EPA).
 - An air quality permit modification was requested from the Nevada Division of Environmental Protection for the prototype drilling and mapping programs.
 - The request for proposals to appraise the Yucca Mountain site for purposes of the Payments-Equal-To-Texas (PETT) program was issued.
 - The U.S. Air Force Finding of No Significant Impact (FONSI) regarding amendment of the right of way reservation to give the Yucca Mountain Project access to the Nellis Range completed a 30-day public comment period on May 18, 1989.
 - The underground injection control permit application for the C-Well Complex Tracer Test was filed with the State of Nevada. Three Air Quality Monitoring Stations in the Yucca Mountain area began operation.
 - The Nevada highway routing study was published. This report describes current Department of Transportation Regulations for the highway shipment of radioactive waste to the proposed repository site at Yucca Mountain.

HIGHLIGHTS (CONTINUED)

- FY89 actual costs through third quarter for the total Nuclear Waste Fund were \$244.9 million. The breakdown of cost by program element is as follows:
 - Total first repository costs - \$163.4 million (\$121.8 million for the Yucca Mountain project and the remainder for basalt and salt closeout, first repository technical support and repository technology program activities); second repository - \$0.1 million; transportation - \$19.2 million; MRS - \$1.3 million; systems integration - \$4.8 million; engineering development - \$3.5 million; and program management/technical support - \$52.7 million.
- The negative schedule variance for YMP (cumulative from October 1984) reported through the third quarter of FY89 remained constant from the previous quarter at -2 percent (or -\$9.6 million). The cost variance through the second quarter of FY89 increased from 6 percent (or \$23.7 million) to 7 percent (or \$33.8 million).
- The schedule variance for the transportation program through the second quarter remained constant on a percentage basis at -6 percent but changed on a dollar basis from -\$1.7 million to -\$2.2 million. The cost variance changed on a percentage basis from 5 percent (or \$1.3 million) to 2 percent (or \$0.6 million).

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 (August 1989) assumes the revenues from the 1 mill per kwh fee contained in the June 1989 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 May 1989 projection assumed the revenues from the 1 mill per kwh fee contained in the March 1989 EIA Projection. Revenues from the one-time fee and earned interest were based on the FY 1990 Congressional budget submission. FY 1988 disbursements were based on actual 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 8/89)

PROJECTED NET BALANCE

OF WASTE FUND

PROJECTED VERSUS ACTUAL FUND REVENUES

- Actual revenues from the 1 mill/kwh fee for the third quarter of FY89 were \$126.7 million. These revenues were \$3.3 million more than the projection of revenues made for this quarter on June 19, 1989. The projection of revenues for this quarter made on March 29, 1989 were \$3.3 million less than actual revenues. The June 1984 projection of revenues was \$10.1 million more 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.
- These revenue projections do not reflect the March 17, 1989 decision of the U.S. Court of Appeals concerning calculation of the revenues.

COST PROFILE FOR TOTAL NUCLEAR WASTE FUND

- FY89 actual costs through the third quarter for the Nuclear Waste Fund were \$244.9 million.
- Through the third quarter of FY89, cumulative actual costs (from FY83) for the entire program totaled \$2.25 billion.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR TOTAL NUCLEAR WASTE FUND

COST PROFILE FOR FIRST REPOSITORY

- FY89 actual costs through the third quarter for the first repository were \$163.4 million. The distribution by project was \$121.8 million for the Yucca Mountain project (YMP), \$27.9 million for technical support/RTP activities, \$6.7 million for the basalt project (BWIP), and \$7.0 million for the salt project (SRP).
- Through the third quarter of FY89, cumulative actual costs (from FY83) for the first repository projects totaled \$1737 million of which 36 percent (or \$628 million) was accounted for by YMP, 30 percent (or \$515 million) by SRP, 27 percent (or \$472 million) by BWIP, and 7 percent (or \$121 million) by technical support/RTP activities.

COST PROFILE FOR TOTAL FIRST REPOSITORY

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR YMP

COST PROFILE FOR SRP

COST PROFILE FOR TECHNICAL SUPPORT/RTP

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

- The negative schedule variance through the third quarter of FY89 for the YMP remained constant at -2 percent (or -\$9.6 million).
- The cost variance through the third quarter of FY89 changed from 6 percent (or 23.7 million) to 7 percent (or \$33.8 million).

YMP (TOTAL)
FY 1989 PERFORMANCE MEASUREMENT ANALYSIS
CUMULATIVE THROUGH THIRD QUARTER 1989

BCWS

BCWP

ACWP

BCWS	360553	371700	383337	394988	409702	423913	439880	456662	475227	494705			
BCWP	350979	362125	373762	385414	400127	414339	430306	447087	465652	485131			
ACWP	329439	340586	352222	363874	378588	390168	406623	421534	436829	451300			
CV \$	21540	21540	21540	21540	21540	24170	23683	25553	28823	33831			
CV %	6	6	6	6	5	6	6	6	6	7			
SV \$	-9574	-9574	-9574	-9574	-9574	-9574	-9574	-9574	-9574	-9574			
SV %	-3	-3	-2	-2	-2	-2	-2	-2	-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 third quarter of FY89 for the second repository shutdown were \$0.1 million.

COST PROFILE FOR SECOND REPOSITORY

COST PROFILE FOR TRANSPORTATION

- The three DOE field offices (Idaho, Chicago, and Oak Ridge) which comprise the transportation subprogram, estimate a planned total cost in FY89 of \$27.2 million. Sixty-seven percent (or \$18.2 million) of the total planned cost is accounted for by the Idaho field office. Chicago represents 24 percent of the total planned cost (or \$6.5 million) while Oak Ridge accounts for the remaining 9 percent (or \$2.5 million).
- FY89 actual costs through the third quarter were \$19.2 million, or \$2.2 million below the planned cost for this period.

COST PROFILE FOR TRANSPORTATION

PERFORMANCE MEASUREMENT ANALYSIS FOR TRANSPORTATION PROGRAM

- Through the third quarter of FY89, the cost variance changed from 5 percent (or \$1.3 million) to 2 percent (or \$0.6 million).
- The schedule variance remained constant on a percentage basis at -6 percent but changed on a dollar basis from -\$1.7 million to -2.2 million.

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

BCWS	17220	19114	21302	23352	25648	27883	30288	32658	34879	37045			
BCWP	16185	17915	20030	21996	24119	26115	28560	30654	32612	34827			
ACWP	15652	17288	18958	20692	22802	24745	27223	29673	32022	34182			
CV \$	533	627	1072	1304	1317	1370	1337	982	590	645			
CV %	3	3	5	6	5	5	5	3	2	2			
SV \$	-1035	-1199	-1271	-1356	-1528	-1768	-1728	-2004	-2267	-2218			
SV %	-6	-6	-6	-6	-6	-6	-6	-6	-7	-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 third quarter were \$1.3 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR MRS

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).
- FY89 actual costs for combined systems integration activities through the third quarter were \$4.8 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR SYSTEMS INTEGRATION

COST PROFILE FOR ENGINEERING DEVELOPMENT

- FY89 actual costs through the third quarter for the engineering activities were \$3.5 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR ENGINEERING DEVELOPMENT

COST PROFILE FOR PROGRAM MANAGEMENT/TECHNICAL SUPPORT

- Activities include Program Management (salaries, benefits, and travel); contractual services (administrative support costs); and technical support (i.e., NWF audit services and fee verification, technical support activities, program integration, external relations and policy).
- FY89 actual costs through the third quarter for the program management/technical support activities were \$52.7 million.

MILLIONS OF DOLLARS (CUMULATIVE)

COST PROFILE FOR PROGRAM MANAGEMENT/TECHNICAL SUPPORT

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.