The Mixed Waste Management Facility

Monthly Report
November 1995

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The Mixed Waste Management Facility

Monthly Report
November 1995

Ronald D. Streit

December 1995

Lawrence Livermore National Laboratory
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Project Summary

Overview

On November 15–16, 1995, the Project held its formal Preliminary Design Review (PDR). The review was the culmination of the system element preliminary design reviews conducted throughout the summer and early fall. The Project level PDR brought together all of the elements of the Project for review by the Scientific Advisory Board. The committee was chaired by Booth Myers, LLNL, and included representatives from Bechtel, IT Corp., and SAIC. In addition, DOE/OAK and DOE/HQ were represented. Due to federal budget issues and other extenuating circumstances, the Mixed Waste Focus Area (MWFA) and Department of Toxic Substance Control (DTSC) representatives were unable to attend; however, they were sent copies of the review package for their review and comment. The review went very well, with no significant action items identified. In the summary assessment, the Review Chairman indicated that it was the best Preliminary Design Review he had been to. DOE representatives also indicated that they felt the team did an excellent job.

The FY96 *Plan* was completed and issued (UCRL-ID-119105-95, L-20681-1). This plan focuses on completing the majority of Final Design activities by the end of FY96, with some elements carried into FY97, and on initiating a number of the long-lead procurement items. The planned expenditures for FY96 are \$10.7M including expected liens and carryover into FY97. Of this budget, \$9.4M is new BA and \$1.4M is carryover from FY95 (including liens and approved work scope).

The Molten Salt Oxidation (MSO) engineering development unit tests continued to resolve engineering issues for final design. The top injector system, developed on contract by ETEC, was delivered and will be installed after the current test series are completed on the side injector concepts. The telerobotic feed preparation (TRS) engineering development also continues to make significant progress. The demonstration system was set up to mock the system configuration options in the MWMF. The system has been brought on line and the robotic system is operational. A number of tours were conducted at both of these systems as part of the PDR, and subsequently as part of the DOE/HQ visit associated with the DOE/OAK end-of-year review.

Cost Status. Total FY95 carryover funds were \$1,354K (\$301K OPEX and \$1,053K CENRTC). There were no additional FY96 funds from the November Financial Plan (CENRTC). November had costs of \$483K, liens of \$491K, and preliens of \$1,141K.

While awaiting the outcome of Continuing Resolution and a final budget, costs continued to be closely monitored during November to ensure they were held as low as possible, while still accomplishing milestones.

Schedule Status. The Project PDR was held November 15–16, 1995, per the *Project Baseline 1.2* (PB 1.2) schedule. KD-2, which was due to be issued in November (Milestone D131-2), has been delayed until mid-December, 1995.

As stated previously, the approximately flat spending profile over the next three fiscal years, per DOE guidance, will result in stretch-out of the Project into FY99.

Significant Issues and Planned Corrective Actions

As stated in previous months, the uncertainty in the budget for FY96 and out years continues to be the major concern. Entering the third month of FY96, the Project does not have an approved budget or accepted scope of work. As a result, the Project is losing a number of key personnel, and we are not bringing on new team members until such issues are resolved. As this situation continues, it will become increasingly difficult to meet key Project milestones or to make up lost time. Overall, this will result in higher Project costs and delayed implementation of MWMF systems. During November the Project not only completed its PDR (Nov. 15–16, 1995), but also established the basis for the revised *Project Baseline 2.0* (PB 2.0) using DOE guidance. Based on these elements, the *FY96 Plan* was developed and issued. We will continue to proceed along this plan until further formal guidance is received from DOE. A conference call meeting with DOE/HQ, DOE/OAK, and LLNL is planned to resolve the Project status and define scope for proceeding (Dec. 14, 1995). Completion of the PB 2.0 will be delayed until such decisions are made.

For the first few months of FY96, the Project anticipates that the funding will be based on a Continuing Resolution. This should not be a problem, providing carry-over funds from FY95 are available and that the formal budget will be in place for the Project to proceed to Final Design.

Summary of Accomplishments

Detailed accomplishments and milestone status are reported in the Task Summaries that follow the Project Financial Summary. Below we highlight the major accomplishments during this reporting period:

- **Project Management.** The Project formal PDR was held November 15–16, 1995. The review went very well, with no significant items identified.
- **Technical Systems Integration.** The Facility Title I Design was completed, and Phase 1 has been initiated. We also received KD-2 for Phase 2 for the Facility design.
- **Solids Feed Preparation—Telerobotics Sorting.** A 3-D computer model of local feed control, the process room, process equipment, and demonstration equipment has been developed to allow closer examination of operator viewing access during sorting operations. The model will help determine elevations for demonstration and process equipment and is the basis for the final equipment arrangement drawings.
- **Molten Salt Oxidation.** Materials development continues with preparation of corrosion test samples for three additional classes of materials: high-Al alloys, iron aluminide weld overlays, and coatings by flame spray or CVD. The current EDU test series is investigating the effects of salt height, measuring froth height expansion, and evaluating the effect of increasing chloride content. An 8-in. sleeve has been inserted into the reactor to provide a constant diameter for the salt height experiments. The baseline configuration of the Primary Unit vessel has been finalized as a single 12-ft vessel with an 18.5-in.-ID finned lower section and a 22.5-in.-ID upper section as presented in the MWMF PDR. Proposals for the Salt Separation System were received from two vendors and evaluations were begun.

- **Water Treatment.** The HWM design team finished Title I design work for the Water Treatment system.
- **Final Forms.** Preliminary Design of Final Forms process off-gas subsystem was completed.

Project Financial Summary

Figures 1 and 2 present graphical plots of planned-versus-actual spending for OPEX and CENRTC. Table 1 presents a more detailed financial summary of the MWMF Project for November. There are no significant financial items to report beyond those discussed in the Cost Status paragraph of the Overview section above.

TABLE 1

MWMF Project - Monthly Financial Summary for FY96 November 1995

OPEX (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistb#	10/95 Plan
DOE Funds*	301	0	0											301	NA, for information only	
FY96 Plan 10/95		52	37	39	36	50	36	58	64	75	64	64	64	639		639
Actual		41	35	0	0	0	0	0	0	0	0	0	0	77		
Variance		(11)	(1)											(13)		
Actual Liens**		140	112											NA		
Mgmt Reserve		0	0											0	0	80
96/97 Liens holdback***														0	100	100
														FY96 OPEX budget =		819

OPEX (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	DOE FY96 new-BA, OPEX		
DOE Funds*	301	301	301											budget	guidance^	delta
FY96 Plan 10/95^		52	89	128	165	215	251	309	372	447	511	575	639	339		339
Actual		41	77													
Variance		(11)	(13)													

CENRTC (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistb#	10/95 Plan
DOE Funds*	1,053	1,500	0											2,553	NA, for information only	
FY96 Plan 10/95		561	1,677	621	589	745	574	586	706	580	565	648	721	8,572		8,572
Actual		440	448											888		
Variance		(121)												(121)		
Actual Liens**		434	379											NA		
Mgmt Reserve		0	0											0	0	605
96/97 Liens holdback***														0	400	400
														FY96 CENRTC budget =		9,577

CENRTC (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	DOE FY96 new-BA, CENRTC		
DOE Funds*	1,053	2,553	2,553											budget	guidance^	delta
FY96 Plan 10/95^		561	2,238	2,859	3,448	4,192	4,767	5,353	6,059	6,639	7,204	7,851	8,572	7,519		7,519
Actual		440	888													
Variance		(121)	(1,350)													

PROJECT TOTAL (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistb#	10/95 Plan
DOE Funds*	1,354	1,500	0											2,854	NA, for information only	
FY96 Plan 10/95		613	1,714	660	625	795	611	644	770	655	629	711	785	9,211		9,211
Actual		481	483											964		
Variance		(132)	(1)											(133)		
Actual Liens**		574	491											NA		
Actual Praeliens**			1,141											NA		
Mgmt Reserve		0	0											0	0	685
95/96 Liens holdback***														0	500	500
														FY96 TOTAL budget =		10,396

TOTAL PROJECT EXPENDITURES (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	DOE FY96 new-BA, TOTAL		
DOE Funds*	1,354	2,854	2,854											budget	guidance^	delta
FY96 Plan 10/95^		613	2,327	2,987	3,612	4,407	5,018	5,661	6,431	7,086	7,715	8,426	9,211	7,858	0	7,858
Actual		481	964													
Variance		(132)	(1,363)													

MANPOWER SUMMARY (total project, by month)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Labor (FTE)		41.1	31.9										
Labor (\$K)@		364	291										

* DOE funds include FY95 carryover (source: LLNL Contract Modification)

** Relevant for current month only; sum not meaningful

*** Includes budgeted amounts for management reserve, liens holdback

Undistributed remaining budget

^ No guidance has been provided

^^ Updated periodically (see note); only Subtotal Relevant

WBS Element: 1.1.1. Quality Assurance

Task Description: Quality Assurance provides quality assurance (QA) support to the MWMF Project. This effort includes development and implementation of the Project's quality assurance program and oversight for conformance to the approved plan and other quality and ES&H requirements. This WBS element covers only a proportional fraction of the OPEX quality assurance effort, with the CENRTC portion contained under WBS 1.3.2, Project Control.

Summary of Monthly Activities:

- The *Instrumentation and Control Equipment QA Plan* was approved and issued. This plan also covers software QA requirements for the Project.
- We worked with Project personnel on QA issues and the QA filing system.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
Monthly actual	1.6	1.6										
FY96 Plan cumulative	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23.0	25.3	27.8
Actual cumulative	1.6	3.1										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.2. PSAR

Task Description: The *Preliminary Safety Analysis Report* (PSAR) provides the integration of safety input, design reviews, and safety analysis for Phases I and II of the integrated MWMF/DWTF Project. Safety analysis includes analysis, generation of documentation, and documentation review and approval. The element includes the generation of the PSAR, which must be completed prior to major procurements and follow-on analysis required for the generation of the *Final Safety Analysis Report* (FSAR). The FSAR is required after construction and prior to operation.

Summary of Monthly Activities:

No activities are planned for FY96.

FY96 Budget: Spending profile (\$K, CENTRC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0										
Current lien	64.1	64.1										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.3. NEPA/CEQA

Task Description: The NEPA portion of this WBS provides for the preparation of the *Environmental Assessment* (EA) and all required follow-up documentation required by DOE to make a determination about impacts. The effort includes preliminary evaluations, preparation of technical information, EA preparation, and comment resolution.

The CEQA and permitting portion of this WBS provide for the preparation of permit applications and associated environmental analysis to support the regulatory agency permitting and CEQA review process. The effort includes preliminary evaluations, and preparation of technical information to support the agency CEQA document and permit evaluation, and comment resolution. This element prepares and coordinates approval of State and local permits and supports public participation activities associated with the permits approvals.

Summary of Monthly Activities:

- We continued providing support to DOE regarding comments received on the EA and participated in the PDR.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	4.2	5.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Monthly actual	0.5	1.0										
FY96 Plan cumulative	4.2	9.3	13.5	17.7	21.9	26.1	30.3	34.5	38.7	42.9	47.1	51.3
Actual cumulative	0.5	1.5										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L113-2	Submit air permit to BAAQMD	Apr 96	
C113-2	Authorization to construct issued by BAAQMD	Jul 96	

WBS Element: 1.1.4. ES&H

Task Description: ES&H provides for ongoing Environment, Safety, and Health (ES&H) representation to the MWMF Project by ES&H specialists to ensure that all activities are conducted in a safe and environmentally sound manner and to ensure that ES&H standards have been properly applied.

Summary of Monthly Activities:

We provided ongoing ES&H support to the MWMF Project as described above.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.2	13.2	13.2	13.2	13.2
Monthly actual	18.3	16.6										
FY96 Plan cumulative	13.1	26.2	39.3	52.4	65.5	78.6	91.7	104.9	118.1	131.3	144.5	157.7
Actual cumulative	18.3	34.9										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.1.5. Program Support

Task Description: Program Support provides top-level planning, control, and support of MWMF Project OPEX-funded activities. Specific activities include management of Project assurances and interface with development activities. This element encompasses support for the Project Office including organization, schedule and budgeting activities, Project plans and reporting, personnel hiring and housing, Project operations control, facility technical support, and OPEX-funded technical support.

Summary of Monthly Activities:

- Due to continuing budget concerns, activities in this element were restricted to Project Manager and Scientific oversight support and clerical support as required. We continue to monitor permitting and environmental assessment comments as well as continue to work with DTSC on the classification of MSO. Additional effort was directed to support of the PDR and completion of budget estimates for the *FY96 Plan* and *Revised Baseline 2.0*.
- We continue to develop a test plan proposal for the certification of technologies in the MWMF. This will form the basis for the technology-specific test plans and run plans to be completed on each primary process submitted for demonstration.
- As a result of the PDR and EA FONSI, a number of public inquiries were made, and a number of articles written in the local press about the Project. While we believe that there is general support for the facility, the issue on the categorization of the MSO process is questioned. DTSC has this action, and we will continue to support them with technical information as required.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	31.0	15.3	15.3	15.0	26.0	15.0	20.0	15.0	26.0	15.0	15.3	15.3
Monthly actual	17.5	15.0										
FY96 Plan cumulative	31.0	46.3	61.5	76.5	102.5	117.5	137.5	152.5	178.5	193.5	208.8	224.0
Actual cumulative	17.5	32.5										
Current lien	45.4	45.4										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
D115-1	DOE issues Project Plan	Jan 95	Complete
L115-10	Submit FY96 Plan	Oct 95	
L115-11	FY98 Project Validation	Apr 96	
L115-12	Submit FY97 Plan	Oct 96	

WBS Element: 1.1.6. Public Participation

Task Description: Public Participation provides for public input to the planning and execution phases of the MWMF Project. Included are a National Review Panel (NRP), a Community Newsletter, and preparation and coordination of press releases and community tours.

Summary of Monthly Activities:

- Supported the PDR by providing a briefing on the public participation activities and providing information to the NRP on the PDR.
- Responded to a number of queries on the Project as a result of increased public attention resulting from the FONSI and PDR.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	6.0	6.0	8.5	6.0	8.5	6.0	6.0	6.0	6.5	6.0	6.0	6.0
Monthly actual	3.8	2.2										
FY96 Plan cumulative	6.0	12.0	20.5	26.5	34.0	41.0	47.0	53.0	59.5	65.5	71.5	77.5
Actual cumulative	3.8	6.0										
Current lien	28.2	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L116-3	NRP Meeting	Jan 96	
L116-3.1	MWMF Letter	Feb 96	
L116-4	NRP Meeting	Jun 96	
L116-4.1	MWMF Letter	Jul 96	

WBS Element: 1.2.1. Conceptual Design

Task Description: Conceptual Design provides the Project's technical, cost, and schedule baselines that form the basis for KD-1.

Summary of Monthly Activities:

Conceptual Design activity is complete.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0										
Current lien	2.0	2.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.2.2. Plant Start-Up Management

Task Description: Plant Start-Up Management provides (1) operations and maintenance review of system designs; (2) the development of top-level plans for staffing, training, testing, and readiness review; (3) task analysis and preparation, review, and revision of site operating plan, maintenance, instrument calibration, and emergency response procedures; (4) recruiting, hiring, clearing, and providing general employee training for the plant staff; and (5) the development of training materials, training the trainers, and special technical and on-the-job training for the plant staff.

Summary of Monthly Activities:

- Presented plan and costing logic in the *MWMF Project Preliminary Design Review*.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	16.2	27.2	27.2	27.2	27.2	27.2
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	16.2	43.4	70.6	97.8	125.0	152.2
Actual cumulative	0.0	0.0										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L122-1	Issue MWMF Start-Up and Activation Plan	Sep 96	

WBS Element: 1.2.3. Activation

Task Description: Activation provides: (1) the preparation, review, revision, and release of all Operational Test Procedures (OTPs); (2) plant systems activation, integration, and performance of OTPs in each of the technology areas including Operational Readiness Reviews (ORRs); (3) technical support for the preparation of Operational Safety Requirements (OSRs) and Facility Safety Requirements (FSRs), as well as the identification and resolution of problems during plant operational testing, start-up, and activation, including finalization of design documentation for equipment and process modifications; (4) maintenance support to perform equipment or process modifications during start-up, testing, and activation; (5) all operational spares and the initial stores inventory; and (6) all manpower and materials required to deliver support services (e.g., utilities, power, etc.) during construction, testing, and activation of the MWMF.

Summary of Monthly Activities:

- Presented plan and costing logic in the *MWMF Project Preliminary Design Review*.
- There are no activities under this WBS element during FY96.

FY96 Budget: Spending profile (\$K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.3.1. Project Management

Task Description: Project Management provides top-level Project planning, direction, and control of the MWMF Project CENRTC-funded systems. Specific activities include Project management and support of Project Office, Project assurance (including quality assurance, safeguards, environmental protection, and safety oversight), management overview of information management and technical activities, and interface with DOE.

Summary of Monthly Activities:

- Project management continued for all elements of the Title I design of CENRTC-funded activities.
- On November 15–16, 1995, the Project held its formal PDR. The review was the culmination of the system element preliminary design reviews conducted throughout the summer and early fall. The Project-level PDR brought together all of the elements of the Project for review by the Scientific Advisory Board. The committee was chaired by Booth Myers, LLNL, and included representatives from Bechtel, IT Corp., and SAIC. In addition, DOE/OAK and DOE/HQ were represented. Due to federal budget issues and other extenuating circumstances, the MWFA and DTSC representatives were unable to attend; however, they were sent copies of the review package for their review and comment. The review went very well, with no significant action items identified. In the summary assessment, the Review Chairman indicated that it was the best Preliminary Design Review he had been to. DOE representatives also indicated that they felt the team did an excellent job.
- The FY96 *Plan* was completed and issued (UCRL-ID-119105-95, L-20681-1). This plan focuses on completing the majority of Final Design activities by the end of FY96, with some elements carried into FY97, and on initiating a number of the long-lead procurement items. The planned expenditures for FY96 are \$10.7M including expected liens and carryover into FY97. Of this budget, \$9.4M is new BA and \$1.4M is carryover from FY95 (including liens and approved work scope).
- Entering the third month of FY96, the Project does not have an approved budget or accepted scope of work. As a result, the Project is losing a number of key personnel, and we are not bringing on new team members until such issues are resolved. As this situation continues, it will become increasingly difficult to meet key Project milestones or to make up lost time. Overall, this will result in higher Project costs and delayed implementation of MWMF systems. The Project PDR established the basis for the revised PB 2.0. We will continue to proceed along this plan until further formal guidance is received from DOE. A conference call meeting with DOE/HQ, DOE/OAK, and LLNL is planned to resolve the Project status and define scope for proceeding (Dec. 14, 1995). Completion of the PB 2.0 will be delayed until such decisions are made.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	64.0	88.0	72.0	61.3	64.0	61.3	61.3	61.3	64.0	61.0	61.0	88.0
Monthly actual	42.5	51.6										
FY96 Plan cumulative	64.0	152.0	224.0	285.3	349.3	410.5	471.8	533.0	597.0	658.0	719.0	807.0
Actual cumulative	42.5	94.1										
Current lien	24.5	21.6										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L131-1	Preliminary Design Review complete	Nov 95	Complete
D131-2	DOE issues KD-2	Nov 95	
L131-5	Issue Project Baseline Rev. 2.0	Jan 96	
L131-6	Final Design Review complete	Oct 96	

WBS Element: 1.3.2. Project Control

Task Description: Project Control provides for the Project integration, configuration management, cost and schedule control, quality assurance (see WBS 1.1.1), and administration of the CENRTC-funded systems. It develops and maintains the management systems used to monitor progress against the established baselines and to ensure configuration control (drawings, documents, etc.).

Summary of Monthly Activities:

- While awaiting the outcome of Continuing Resolution and a final budget, we continued to closely monitor cost during November (to ensure they were held as low as possible) while still accomplishing milestones.
- Provided budget and schedule information, as needed, to participants in the Project PDR held November 15–16, 1995.
- Other activities and accomplishments during November included the following:
 - Issued the DOE PTS monthly report.
 - Issued the *October Monthly Report*.
 - Continued investigating several liens for possible removal from Project accounts.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	38.0
Monthly actual	13.7	9.1										
FY96 Plan cumulative	40.0	80.0	120.0	160.0	200.0	240.0	280.0	320.0	360.0	400.0	440.0	478.0
Actual cumulative	13.7	22.9										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L132-8.1	Complete support of Project PDR	Nov 95	Complete
L132-10.1	Complete FY96 Budget Plan	Oct 95	Complete
L132-11.1	Complete Cost/Schedule Baseline Rev. 2.0	Jan 96	
L132-12.1	Complete support of Project Final Design Review	Sep 96	
L132-13.1	Engineering Change Control Procedure	Jan 96	
L132-13.2	Nonconformance Reporting Procedure	Apr 96	
L132-13.3	Complete QA Surveillance/Verification	Aug 96	

WBS Element: 1.3.3. Technical Systems Integration

Task Description: Technical Systems Integration provides the oversight and performance studies intended to verify or document system integration performance, system analysis, special process diagnostics, and planning and analysis of the process aspects of integrated tests. It covers technical issues that affect all primary and support processes. It also includes the responsibility for assuring that the systems interfaces are addressed in the integrated design, including interfaces with LLNL Hazardous Waste Management and facility engineering. The element coordinates the System Design Requirements, the MWMF floor plan, and the Integrated Operating Plan.

Summary of Monthly Activities:

- We transmitted responses from the lead engineers on the disposition of the review comments provided by Parsons. The Facility Title I Design was completed and Phase 1 has been initiated. We also received KD-2 for Phase 2 for the facility design.
- We completed an update of the System Design Requirements (SDR) based on the information obtained from the Project PDR.
- We have continued to answer questions and give clarification to Parsons to assist in their design effort.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	35.0	28.0	28.0	32.0	26.4	29.0	30.0	23.4	23.4	27.4	23.4	23.4
Monthly actual	20.9	14.1										
FY96 Plan cumulative	35.0	63.0	91.0	123.0	149.4	178.4	208.4	231.8	255.2	282.6	306.0	329.4
Actual cumulative	20.9	35.0										
Current lien	0.9	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L133-10.5	Facility Title I Design Review (80%)	Oct 95	Complete
L133-10.6	LLNL review of Facility Title I Design	Nov 95	Complete
L133-6	Revised SDR completed for Title II Design	Nov 95	Late
L133-7.1	Facility Title II Design Review (80%)	Feb 96	
L133-7	LLNL review of Facility Title II Design complete	Mar 96	

WBS Element: 1.4.1. Receiving and Shipping

Task Description: The principal objective of the Receiving and Shipping (RAS) system is to provide for the receiving, logging, identification and characterization of all incoming waste containers, and to determine the acceptability for processing the waste. RAS provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of RAS equipment, Title III inspection, and acceptance test procedures (ATP). RAS includes both receiving and shipping equipment and systems integration.

Summary of Monthly Activities:

- We completed the Project PDR.
- We continued design activities in preparation for the LI&C System Functional Requirements Document; a draft is completed.
- We finished the Block Flow and Process Flow Diagrams for RAS.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	1.5	1.5	1.5	1.5	2.4	4.9	2.4	4.9	2.4	2.2	2.2	2.2
Monthly actual	3.6	1.9										
FY96 Plan cumulative	1.5	3.0	4.5	6.0	8.4	13.3	15.7	20.6	22.9	25.1	27.3	29.5
Actual cumulative	3.6	5.5										
Current lien	0.0	0.0										

Significant Procurement Actions This month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L141-1.3	RAS LI&C System Functional Requirements document complete	Sep 95	Late
L141-2.1	RAS LI&C System Design Description drafted	Jun 96	
L141-2.2	RAS System Design Description drafted	Sep 96	
L141-2	RAS 90% Final Design Review complete	Oct 96	

WBS Element: 1.4.2. Solids Feed Preparation—Conventional

Task Description: The principal objective of the Conventional Feed Preparation (CFP) system is to provide for the receipt, preparation for processing, and the decontamination of homogeneous and heterogeneous solids received from storage and other processes in the facility. This includes processing the incoming combustible solids waste/surrogate stream into a form required by the treatment processes. The decontamination system provides necessary equipment to ensure materials/containers can be safely transferred out of the facility. CFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of CFP equipment, Title III inspection, and acceptance test procedures (ATP). CFP includes both solids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- We completed the Project PDR.
- We finished the Block Flow and Process Flow Diagrams for CFP.
- We continued activities in preparation for the LI&C System Functional Requirements Document, but work of higher priority preempted this work.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	17.3	20.3	31.3	30.3	33.8	31.8	32.8	31.8	31.8	30.5	30.5	31.5
Monthly actual	3.9	1.1										
FY96 Plan cumulative	17.3	37.6	68.9	99.2	133.0	164.8	197.6	229.4	261.2	291.7	322.2	353.7
Actual cumulative	3.9	5.0										
Current lien	0.0	0.0										

Significant Procurement Actions This month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L142-1.8	CFP LI&C System Functional Requirements Document complete	Oct 95	Late
L142-3.1	CFP System Design Description drafted	Sep 96	
L142-3.2	CFP LI&C System Design Description drafted	Oct 96	
L142-3	CFP 90% Final Design Review complete	Oct 96	

WBS Element: 1.4.2. Solids Feed Preparation—Telerobotics Sorting

Task Description: The principal objective of the Telerobotics Sorting (TRS) system within Solids Feed Prep is to provide remote container and waste handling equipment necessary to demonstrate remote preparation of feed for treatment processes in the MWMF and to evaluate the technology for use at sites across the DOE complex. TRS interfaces with SFP container receiving and conventional size reduction and segregation equipment and replaces manual (hands-on) sorting and container handling operations in the potentially contaminated process room. TRS primary functions include drum movement; waste characterization; segregation of the incoming waste stream into bulk streams containing predominantly organic solids, heterogeneous solids, homogeneous inorganic solids and metals, and liquids not previously identified; and repackaging of reject materials. TRS provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of Solids Feed Preparation TRS equipment, Title III inspection, and acceptance test procedures (ATP). TRS includes both solids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- A 3-D computer model of local feed control, the process room, process equipment, and demonstration equipment has been developed to allow closer examination of operator viewing access during sorting operations. The model will help determine elevations for demonstration and process equipment and is the basis for the final equipment arrangement drawings.
- The sort table, prototype console, and prototype operator control station have been fabricated and assembled. The Cybernet hand control interface has been developed and is being integrated into the ControlShell environment. Additional control components have been procured for integration into the prototype controller.
- The second-level control system functional flow diagram has been completed, and the functional requirements have been mapped onto the control system structure. This level of detail will be used to communicate MWMF requirements and design detail to ORNL as we attempt to develop a joint control system design. A design meeting at ORNL is planned for Dec. 20.
- Engineering development system operation is already yielding valuable design information on console configuration, workcell lighting, and shared control system operation.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	59.0	63.0	102.0	75.0	62.0	51.0	48.0	57.0	42.0	40.0	38.0	62.0
Monthly actual	33.0	108.6										
FY96 Plan cumulative	59.0	122.0	224.0	299.0	361.0	412.0	460.0	517.0	559.0	599.0	637.0	699.0
Actual cumulative*	33.0	141.6										
Current lien	0.0	0.0										

*Note: Accumulated costs for work performed under the SAIC Contract will be redistributed to the proper user accounts.

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L1422-2.1	Linear rail facility interface design complete	Dec 95	
L1422-2.2	Prototype sorting application operational	Mar 96	
L1422-2.3	Operator console prototype complete	Apr 96	
L1422-2.4	Telerobot control interface design and performance specification complete	Aug 96	
L1425-2	Crane final design (specification) complete	Aug 96	
L1422-2	Telerobotics Sorting 90% Final Design Review complete	Sep 96	

WBS Element: 1.4.3. Liquids Feed Preparation

Task Description: The principal objective of the Liquids Feed Preparation (LFP) system is to provide for the receipt, characterization, preparation for processing, and handling of homogeneous and heterogeneous liquids and solids/liquids mixtures received from storage and other processes in the facility. This includes segregating the incoming waste stream into aqueous with Trimsol, chlorinated organic liquids, oils, solvents, and scintillation cocktails. LFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of LFP equipment, Title III inspection, and acceptance test procedures (ATP). LFP includes both liquids feed preparation equipment and systems integration.

Summary of Monthly Activities:

- We completed the Project PDR.
- We continued design activities in preparation for the LI&C System Functional Requirements Document
- The Block Flow and Process Flow Diagrams for LFP were approved.
- We continued iteration on the Trade-Off study matrix.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	17.5	17.5	17.6	17.6	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8
Monthly actual	10.6	15.5										
FY96 Plan cumulative	17.5	35.0	52.6	70.2	91.0	111.8	132.6	153.4	174.2	195.0	215.8	236.6
Actual cumulative	10.6	26.1										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L143-1.6	LFP LI&C System Functional Requirements Document complete	Oct 95	Late
L143-2.1	LFP System Design Description drafted	Sep 96	
L143-2.2	LFP LI&C System Design Description drafted	Sep 96	
L143-2	LFP 90% Final Design Review complete	Oct 96	

WBS Element: 1.5.1. Mediated Electrochemical Oxidation

Task Description: The principal objective of Mediated Electrochemical Oxidation (MEO) System is to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO₂ and water, to recycle acid and silver, and to remove ash containing the radioactive constituents. The MEO element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the MEO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

- The activities are focused on completing the remaining tests and documenting the results prior to close-out of this task at the end of September.
- The steady-state run analysis is complete and the results documented.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	3.4	-0.1										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	3.4	3.3										
Current lien	0.9	0.9										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.5.2. Molten Salt Oxidation

Task Description: The principal objectives of Molten Salt Oxidation (MSO) are to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO_2 and water, to remove ash containing the radioactive constituents, and to recycle/process the spent salt. The MSO Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the MSO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

- **Materials Development**

- Current materials of interest

The failure of aluminized coatings reported last month spurred development activities for three other classes of materials:

- high-Al alloys,
 - iron aluminide weld overlays, and
 - coatings by flame spray or CVD.

Corrosion test samples of these materials are being acquired.

- High-viscosity silicate salt

During a melting experiment to help select salts for MSO corrosion testing, it was found that 20 molar% silica (SiO_2) in a carbonate-base salt formed a highly viscous, sticky, hard ash (probably sodium silicate, Na_2SiO_3) that settled to the bottom of its tube crucible. (Lesser amounts of silica, 5 and 10%, showed no such effect.) This hard ash raises three concerns for MSO operations:

- when agglomerated, it may hinder draining vessels from their bottom;
 - as free, energetic particulate, it may erode the vessel (bare or coated metal);
 - as particles stuck to the vessel surface, it may corrode the vessel locally.

- Salt for corrosion testing

Corrosion tests are being assembled to determine the *relative aggressiveness* of binary sodium carbonate—sodium chloride and more complex salts representative of the process. The most aggressive mixture will be used for future corrosion testing.

- **Engineering Demonstration Unit (EDU)**

- The current test series is investigating the effects of salt height, measuring froth height expansion, and evaluating the effect of increasing chloride content. An 8-in. sleeve has been inserted into the reactor to provide a constant diameter for the salt height experiments.

- Off-gas quality was seen to be the best when an L/D of 4 was used for both mineral oil/toluene and acetone experiments at 1.0, 1.5, and 2.0 ft/s. A detailed analysis of the data must be done to evaluate the improvement in off-gas quality relative to the height penalty incurred increasing from L/D of 3 to 4. We are ready to proceed with the addition of chloride to the melt, enabling us to

evaluate the destruction as a function of chloride in the melt and reduced reaction temperature.

- A preliminary analysis of the thermally induced loads and stresses in the EDU salt transfer tube was completed by Gary Johnson of the NTED ThermoFluids Group. His conclusion was consistent with the initial assumptions. The thermal stresses associated with a sudden temperature increase during transfer of salt are insignificant. The tube is used in an unconstrained configuration; therefore, the thermal stresses are low.

- **Primary Unit**

- The baseline configuration of the vessel has been finalized as a single 12-ft vessel with an 18.5-in.-ID finned lower section and a 22.5-in.-ID upper section as presented in the MWMF PDR. Engineering calculations, PFDs, and P&IDs are being reviewed and appropriately revised to reflect the single-vessel design. Detailed vessel design activities will proceed where the configuration is sufficiently defined.
- Several vessel drain concepts and their advantages and disadvantages were presented and discussed during one of the weekly MSO Engineering meetings. The discussion generated several action items that will aid in finalizing the vessel drain configuration.
- Gary Johnson, from the NTED ThermoFluids Group, completed a review of the reactor thermal design calculations. The approach—simplifying assumptions and results of the calculations—were deemed correct.
- Injector designs presented at the MSO PDR (Oct. 3–4) have been modified for use in the MSO single vessel now planned. Both the liquid and solid injectors required more overall length. In addition, the liquid injector required an increase in the exit nozzle area.
- A design for testing a solid feed mechanism in EDU has been completed and parts obtained. The design of the associated top solid injector is in progress.

- **Salt Recycle**

- Proposals for the Salt Separation System were received from two vendors on Nov. 22. Evaluation of the proposals began the last week in November. Preparations were made to begin negotiations with both vendors to determine which performance requirements need to be examined in light of cost and to determine the best contractual arrangement to pursue. The \$1100K planned for this procurement action will not be let until the vendor is selected and negotiations are completed to LLNL's satisfaction.

- **Salt Separation Process Modeling**

- Separation of sodium carbonate from simple salt mixtures ($\text{Na}_2\text{CO}_3\text{-NaCl-H}_2\text{O}$) was simulated in the modeling software EQ 3/6 with HMW database. The results are as follows:

	25°C		0°C	
	Freeth data*	EQ 3/6	Freeth data*	EQ 3/6
Separation efficiency	56%	49%	96%	97%

* These are based on experimental data.

The table shows that EQ 3/6 is a useful tool for predicting separation of sodium carbonate from simple mixtures. Effort is under way for modeling more complex salt mixtures. We are also starting the simulation of heavy/toxic metal removals using EQ 3/6 with COM database, which is quite useful for many species at low concentrations.

- **Salt Separation Experimental**

- Salt melting of 3 model salts were completed in November. Crucibles of model salts were melted in the test furnace and then cooled down to (1) demonstrate the separation efficiency of sodium carbonate from the frozen salts and (2) determine whether new compounds would form during the melting process.
- An analytical colorimeter and associated kits were ordered and received this month. We are using this instrument for quick analysis of certain ions in the salt brine such as sulfate, phosphate, chloride, bromide, fluoride, iron, chromium, zinc, and nickel. We are starting experiments of chromate reduction and found the colorimeter very useful.
- Removal of heavy/toxic metal ions from brine solutions is the main focus in the lab experiments. The purpose is to demonstrate effective means of removing these metal ions in the lab scale. Preliminary laboratory results indicated that chromate can be reduced to acceptable levels by adding dithionite.

- **Process Off-Gas**

- The layout of the Process Off-Gas System was changed to accommodate the new, one-vessel design. The one-vessel design increased the length of the cooling jacket by approximately 1.2 m (4 ft) and increased the pipe diameters by 25.4 mm (1 in.).
- A cost estimate for the cooling jacket has been obtained.
- More information on the catalytic converter has been obtained. The manufacturer is located in San Jose, CA.

- Extensive effort was applied to the preparation and presentation of the project PDR the third week in November.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	215.0	1315.0	215	215	215	215	215	330	227	215	215	215
Monthly actual	201.6	150										
FY96 Plan cumulative	215.0	1530.0	1745.0	1960.0	2175.0	2390.0	2605.0	2935.0	3162.0	3377.0	3592.0	3807.0
Actual cumulative	201.6	351										
Current lien	198.6	156										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L152-3.5	LI&C Functional Requirements Document complete	Oct 95	Late
L152-3.6	LI&C System Preliminary Design complete	Oct 95	Complete
L152-3	MSO System MWMMF PDR	Oct 95	Complete
L152-5.1	Select Industrial Participation method for Salt Recycle	Nov 95	Complete
L152-5.2	MSO Peer Review	Jul 96	
L152-5	MSO 90% Final Design Review complete	Sep 96	

WBS Element: 1.5.3. Wet Oxidation

Task Description: The principal objective of Wet Oxidation (WOX) is to demonstrate treatment of organic mixed wastes using a wet oxidation process to convert the organic portions to CO₂, water, and inorganic ions, leaving ash, salts, metals, and radionuclides in a residual solution/slurry. The WOX Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the WOX equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

This task has been closed out per DOE guidance. No FY96 activities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.4	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.4	0.4										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.5.4. UV Photolysis

Task Description: The principal objective of UV Photolysis (UVP) is to demonstrate ultraviolet-driven treatment of the hazardous and toxic organic constituents in the condensate from the Wet Oxidation process (WBS 1.5.3) to produce a sewerable water stream. The UVP Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the UVP equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

This task has been closed out per DOE guidance. No FY96 activities.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity	None	

WBS Element: 1.5.5. Experimental Off-Gas

Task Description: The principal objective of the Experimental Off-Gas Treatment (XOGT) is to demonstrate advanced, more effective off-gas treatment technologies that minimize secondary waste. These are improved Selective Catalytic Reduction (SCR) of NO_x to nitrogen in gaseous phase, acidic urea DeNO_x scrubbing, and advanced metal filters. The second objective is to demonstrate feasibility and effectiveness of off-gas treatment at or near the source of the gas where the treatment can be tailored to that specific source. The XOGT Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of XOGT equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities. The XOGT will be backed by the facility off-gas system.

Summary of Monthly Activities:

No activity to report.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monthly actual	0.0	0.0										
FY96 Plan cumulative	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actual cumulative	0.0	0.0										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element: 1.6.1. Process Transport and Storage

Task Description: The principal objective of the Process Transport and Storage (PTS) system is to collect, transfer, deposit, store and handle containers, discrete items, dry and wet bulk materials, slurries, and liquids. PTS provides management, system analysis and support, design (Title I, II, and III) engineering, procurement, installation of Process Support Systems equipment, Title III inspection, and acceptance test procedures (ATP). PTS includes both process transport and storage equipment and systems integration.

Summary of Monthly Activities:

- Several options were investigated for interfacing transport containers to the MSO feed system. A vendor visited and demonstrated operation of an innovative "zero-leak" disconnect. Unfortunately, its cost, combined with the need for an alternative system for solids transfer, makes it questionable as a final design option.
- Staffing changes have resulted in splitting design team support between the transport delivery system and the MSO feed systems. The result will be a very well integrated delivery and feed system, and possibly reduced design cost. The impact of the change on the PTS Title II schedule has not been assessed. However, the primary design dependency for PTS is the MSO feed system, so no serious schedule issues are expected.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	0.5	0.5	5.5	9.5	11.1	14.1	12.1	9.1	3.1	2.1	2.1	2.1
Monthly actual	1.4	1.2										
FY96 Plan cumulative	0.5	1.0	6.5	16.0	27.1	41.2	53.3	62.4	65.5	67.6	69.7	71.8
Actual cumulative	1.4	2.6										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L161-2.1	Final Design of transport interface complete	Feb 96	
L161-2.2	Final Design of batch makeup station complete	May 96	
L1615-2.3	LI&C prototype user interface approved	May 96	
L1615-2.4	LI&C System Design description complete	Jul 96	
L161-2	PTS 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.2. Process Diagnostic Services

Task Description: The principal objective of the Analytical Services is to provide chemical analysis support for process control and characterization, material control, and regulatory requirements. Analytical Services provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of Analytical Services equipment, Title III inspection, and acceptance test procedures (ATP). Analytical Services includes Analytical Services Equipment, Local Process I&C, and Process Off-Gas.

Summary of Monthly Activities:

- Due to budgetary uncertainties, activities within PDS were kept to a minimum during the month of November.
- Presented system PDR on November 15-16, 1995. No action items were identified as a result of the PDR.
- Completed action items resulting from 90% system PDR held on October 12, 1995.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	9.0	15.0	24.0	25.0	29.0	29.0	30.1	37.0	35.0	40.0	125.0	145.0
Monthly actual	6.2	4.1										
FY96 Plan cumulative	9.0	24.0	48.0	73.0	102.0	131.0	161.1	198.1	233.1	273.1	398.1	543.1
Actual cumulative	6.2	10.3										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L162-7	90% Preliminary Design Review	Oct 95	Complete
L162-8.1	Define MSO on- and at-line measurement methods	Mar 96	
L162-8.2	Define off-gas analysis requirements	May 96	
L162-8.3	Select vendor for off-gas system procurement	July 96	
L162-8.4	Select vendors for tritium and gas proportional counter procurements	Aug 96	
L162-8.5	Complete custom test and sample tracking database design	Sep 96	
L162-8	LAB 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.3. Water Treatment

Task Description: Water Treatment is an integral part of treatment train demonstrations, continuing treatment of aqueous by-products as part of demonstration tests to produce solid residuals suitable for Final Forms and fully treated water that meets treatment standards and sewer limits. The Water Treatment element provides the management, system analysis and support, design and engineering (Title I, II, III), procurement, and installation of the Water Treatment equipment necessary to demonstrate treatment trains, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities:

- The HWM design team finished Title I design work on Water Treatment.
- Work to support PB 2.0 was completed in November.
- The Project PDR was held in November.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	9.7	9.6	8.3	8.3	8.3	8.3	15.3	15.3	15.3	10.7	11.1	13.2
Monthly actual	12.7	9.8										
FY96 Plan cumulative	9.7	19.3	27.6	35.9	44.2	52.5	67.8	83.0	98.3	109.0	120.1	133.3
Actual cumulative	12.7	22.5										
Current lien	0.0	0.0										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L163-3.1	LI&C Functional Requirements Document complete	Oct 95	Complete
L163-3.2	LI&C System Preliminary Design Review	Oct 95	Complete
L163-3	WT System Preliminary Design Review	Oct 95	Complete
L163-4	Begin Final Design	Nov 95	Late
L163-5.1	WTR Unit Operation Subsystems Final Design complete	Aug 96	
L163-5	WTR 90% Final Design Review complete	Sep 96	

WBS Element: 1.6.4. Final Forms

Task Description: The Final Forms (FFM) task is to immobilize the solid residues from the treatment of the mixed waste input streams by the primary processes, and wastes resulting from secondary support processes that are integral to the primary treatment processes. The waste form types under investigation in FY96 are (1) ceramics for mineral residues, (2) polymer microencapsulation for salt, and (3) sulfur-polymer microencapsulation for volatile inorganic solids.

Summary of Monthly Activities:

- The FFM portion of the MWMF PDR was completed. The review did not uncover any serious problems.
- As noted in October's report, polymer microencapsulation of salt residues has, under the proposed PB 2.0, been deleted from FFM's scope. Milestone 164-3 is to be rescheduled, but this still has not been done pending further discussions on the extent of close-out work.
- Preliminary Design of FFM's process off-gas subsystem was completed.
- Marker 164-4.1 was completed. Marker 164-4.2 has been rescheduled owing to other priorities.
- The FFM LI&C Functional Requirements document was completed.
- Most action items identified at the FFM Peer Reviews and PDR have been completed. The principal open action items are completion of FFM's P&IDs and completion of the ceramic final form recipe-writer block flow logic diagram. Some documentation also remains.
- Work on ceramic final forms continues on a broad front, including comparisons between the California WET and Federal TCLP methods and characterization and reduction of residual glass in the ceramic.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	54.0	35.0	36.0	35.0	198.0	34.0	35.0	34.0	34.0	34.0	34.0	35.0
Monthly actual	50.7	38.0										
FY96 Plan cumulative	54.0	89.0	125.0	160.0	358.0	392.0	427.0	461.0	495.0	529.0	563.0	598.0
Actual cumulative	50.7	88.7										
Current lien	0.2	0.2										

Significant Procurement Actions This Month:

None

Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L164-3	Report: Design of polymer microencapsulation system	Oct 95	Late
L164-4.1	Report: Volatile residue components and the design of ceramic waste form system	Oct 95	Complete
L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters	Jan 96	
L164-5.1	Rotary calciner design procurement complete	Jun 96	
L164-5	Rotary calciner operational	Sep 96	
L164-6.1	Final Design of sulfur-polymer cement system complete	Aug 96	
L164-6.2	Final Design of ceramic recipe-writer complete	Sep 96	
L164-6.3	Final Design of local process off-gas system complete	Jun 96	
L164-6	FFM 90% Final Design Review complete	Jan 97	

WBS Element: 1.6.5. Supervisory Instrumentation and Control (SI&C)

Task Description: Supervisory Instrumentation and Control (I&C) systems will be provided and integrated to demonstrate, test, and evaluate mixed-waste destruction technologies in a safe, environmentally acceptable, reliable, and cost-effective manner. I&C systems provide the management, system analysis and support, design (Title I, II, III) engineering, procurement, equipment installation, Title III inspection, and acceptance test procedures (ATP) covering equipment and system integration activities for: facility database management, safety control, process I&C standards, supervisory control, and ancillary systems and equipment including the instrumentation and equipment database, intercom communication, process and surveillance CCTV, cable and power distribution and grounding, and control room facilities.

Summary of Monthly Activities

- Presented the I&C section of the *MWMF Project Preliminary Design Review*.
- Issued the *MWMF Instrumentation and Control Equipment Quality Assurance Plan*.
- Generated a draft *Memorandum of Understanding for MWMF Container Tracking and Material Accounting Requirements*. This document provides the baseline requirements for marker L165-2.3. Two related issues have been identified. The first relates to waste certification; the second to the availability of RTR data for incoming solids containers. Review of the MOU is scheduled for December 7.
- Resumed DBMS testing (Engr. Dev. Phase 5) activities. We tested the MinnovEX driver, which moves data from the Oracle RDBMS to ProcessVision. We will upgrade the database interface to Windows NT to enhance performance and reliability. Further testing is stalled until a network bridge failure is repaired; parts are on order. As a result, marker L165-1.13—*Engineering Development tasks complete and documented*—was not completed.
- Continued an investigation into implementing multiheaded workcell control stations. We demonstrated Human Design Systems (HDS) hardware and software, which operates two monitors that function as a single workspace. We are now in the process of obtaining HDS Share software that will operate two or more X-terminals as a single workstation. If successful, adoption of the HDS Share configuration could lead to significant cost savings to the Project.
- Updated the SDR per current knowledge.
- Revised MWMF—*Guideline for the Preparation of I&C Functional Requirements Documents*.

FY96 Budget: Spending profile (\$K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FY96 Plan (10/95)	33.8	38.8	35.8	34.1	29.8	31.1	39.0	37.2	37.2	37.2	40.2	40.2
Monthly actual	34.8	31.5										
FY96 Plan cumulative	33.8	72.6	108.4	142.5	172.2	203.3	242.3	279.5	316.7	353.9	394.1	434.3
Actual cumulative	34.8	66.2										
Current lien	21.2	21.2										

Significant Procurement Actions This Month:

None

Key Milestones and Markers:

*See "Milestone/Marker Log" for original dates and reconciliation.

ID No.	Milestone/Marker	Scheduled Date*	Status
L165-1.12	SI&C Functional Requirements Document complete	Oct 95	Complete
L165-1.13	Engineering Development tasks complete and documented	Oct 95	Late
L165-2.3	Container Tracking and Material Accounting requirements document approved	Nov 95	Late
L165-2.4	Facility Monitoring and Safety Control System task analysis complete/documented	Feb 96	
L165-2.5	Instrumentation and Equipment Database complete	Mar 96	
L165-2.6	Final Design Process I&C Standards complete	Apr 96	
L165-2.7	Control Room and Equipment Room design complete	May 96	
L165-2.8	Supervisory Control System SDD drafted	Jun 96	
L165-2	SI&C 90% Final Design Review complete	Oct 96	

Appendix A

Milestone/Marker Log

MWMF Milestone/Marker Log

For Nov 95 Monthly Report - Sorted by Number

Number	Item	PTS	Orig. Date	Date	Status	Comments
	Rev. Date: 12/18/95; Doc. Resp. Person: M. Hussey					
X	= changes in this revision					
C113-1	RD&D permit issued by DTSC	X		Apr-96		date required by DWTF schedule. Better est. after DTSC review applic.
C113-2	Authorization to construct issued by BAAQMD	X	Oct-94	Jul-96		Schedule change as a result of permitting strategy change.
D112-1	PSAR Approved by DOE	X	Jun-94	Nov-94	deleted	facility categorized Low Hazard; DOE approval not req'd
D113-1	EA determination by DOE	X	Aug-94	Sep-95	complete	EA draft submitted for comments. Final determination and issue of FONSI by DOE Compliance Office now expected in September.
D115-1	DOE issues Project Plan	X		Jan-95		
D121-1	Preliminary approval and funding for Preliminary Design	X	Apr-94	Jun-94	complete	delayed decision by DOE
D121-2	KD 1/2 Approval by DOE	X		Jun-94	complete	received KD-1 only
X D131-2	DOE issues KD-2	X	Jun-94	Nov-95	late	Delayed due to reduced DOE funding. Decision expected in Dec-95.
L111-1	Develop and issue Quality Assurance Plan			Oct-93	complete	
L111-2	Develop and issue Document Control Plan			Jan-94	complete	
L111-3	Issue Design Review Procedure			Sep-94	complete	
L112-1	PSAR to DOE for Review	X	Mar-94	Dec-94	complete	delayed to include CDR information and due to DOE decision to merge MWMF & DWTF
L112-1.1	Issue PSAR Contract			Oct-93	complete	
L112-1.2	Preliminary PSAR Review			Feb-94	complete	
L113-1	Environmental Assessment (EA) submitted to DOE	X	Mar-94	Jun-94	complete	delayed to include CDR information, draft submitted
L113-2	Submit air permit to BAAQMD	X	May-94	Apr-96		Schedule change as a result of permitting strategy change.
L113-3	Submit RD&D permit application to DTSC	X	Jul-94	Feb-95	on hold	Draft application complete. Permit application may not be submitted if revised strategy is approved.
L113-4	Submit revised EA to DOE (for MWMF/DWTF merge)	X	Dec-94	Feb-95	complete	Delayed to allow coordination with permitting efforts (L113-3).
L114-1.1	ES&H review of 30% CDR			Dec-93	complete	
L114-1.2	ES&H review of 90% CDR			Mar-94	complete	
L114-1.3	ES&H review of 90% PDR		Sep-94	Jan-95	deleted	changed to reflect level of effort work
L114-2	Complete review of PSAR			Aug-94	complete	
L115-1	Submit Project Management Plan (Final)	X	Jan-95	May-95	complete	Delayed due to unavailability of DOE Project Plan.
L115-1.1	Project Management Plan (Draft)			Oct-93	complete	
L115-2	Select Project Engineers and Project Control Manager			Dec-93	complete	
L115-3	Submit FY94 Plan	X		Jan-94	complete	
L115-4	Initiate PTS and Monthly reporting			Jan-94	complete	
L115-5	Technology Selection and Implementation Plan	X		Feb-94	complete	
L115-6	Develop Design Basis Operations Plan			Mar-94	complete	
L115-7	Submit FY95 Plan	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
L115-8	Technology Selection and Implementation Plan, Part II		Mar-95	Apr-95	complete	Document in TID for publication. Release expected in Apr-95.
L115-9	FY97 Project Validation			Apr-95	complete	
L115-10	Submit FY96 Plan	X		Oct-95	complete	
L115-11	FY98 Project Validation			Apr-96		
L115-12	Submit FY97 Plan	X		Oct-96		
L116-1	First meeting of NRP	X	Feb-95	Jun-95	complete	Delayed while key regulatory issues were resolved and the detail strategy for NEPA and CEQA finalized. Now scheduled for 6/20/95.
L116-1.1	National Review Panel (NRP) formed		Dec-94	Apr-95	complete	Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.

	L116-2	Second meeting of NRP		Aug-95	Aug-95	complete	Date affected by review of EA by DOE and State(Ca.).
	L116-2.1	Issue first public newsletter		Mar-95	Sep-95	complete	Date affected by review of EA by DOE and State(Ca.).
	L116-2.2	Receive comments from NRP			Apr-95	Deleted	Comments and action items will be received as part of NRP meeting minutes.
	L116-3	NRP Meeting			Jan-96		
	L116-3.1	MWMF Letter			Feb-96		
	L116-4	NRP Meeting			Jun-96		
	L116-4.1	MWMF Letter			Jul-96		
	L121-1	30% CDR Review			Dec-93	complete	
	L121-1.1	Initiate Point Design Reviews			Oct-93	complete	
	L121-1.2	Complete Point Design Reviews			Nov-93	complete	
	L121-2	90% CDR Review			Mar-94	complete	
	L121-3	CD Report issued	X		Apr-94	complete	
	L122-1	Issue MWMF Start-Up and Activation Plan		Sep-95	Feb-96		Delayed due to 4/95 budget cut.
X	L131-1	Preliminary Design Review Completed	X	Sep-94	Nov-95	complete	Delayed due to reduced DOE funding.
	L131-2	Input to FY95 Plan (see 115-7)	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
	L131-3	Submit MWMF Rebaseline (KD-1)	X		Sep-94	complete	
	L131-4	Submit MWMF Rebaseline (MWMF/DWTF Merge)	X	Mar-95	May-95	complete	Delayed due to FY97 field submittals and other higher priority work.
	L131-5	Issue Project Baseline Rev. 2.0		Sep-95	Jan-96		Delayed due to reduced DOE funding.
	L131-6	Final Design Review Complete	X		Oct-96		
	L132-1	Implement Cost planning/tracking systems (document)		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
	L132-2	Implement Technical baseline control system		May-94	Nov-94	complete	see 132-7
	L132-3	Implement Schedule control/tracking system			Aug-94	complete	see 132-7
	L132-4	Input to FY95 Plan (see L115-7)		Nov-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
	L132-5	Issue Configuration Control System Document		Jan-95	Mar-95	complete	Delayed to allow discussion and review and due to higher priorities.
	L132-6.1	Input to MWMF Project Management Plan (see L115-1)		Feb-95	Apr-95	complete	Delayed due to higher priority work.
	L132-7	Performance Management System documented		Apr-95	Aug-95	complete	Delayed due to requests for unplanned work from DOE.
X	L132-8.1	Complete support of Project PDR		Jun-95	Nov-95	complete	Delayed due to reduced DOE funding.
	L132-9	Complete QA Self Assessment			Aug-95	complete	
	L132-9.1	Records Control Procedure issued			Apr-95	complete	
	L132-9.2	Assessment/Surveillance Procedure issued			Jul-95	complete	
	L132-10.1	Complete FY96 Budget Plan			Oct-95	complete	
	L132-11.1	Complete Cost/Schedule Baseline Rev. 2.0			Jan-96		
	L132-12.1	Complete support of Project Final Design Review			Sep-96		
	L132-13.1	Engineering Change Control Procedure			Jan-96		
	L132-13.2	Non-conformance Reporting Procedure			Apr-96		
	L132-13.3	Complete QA Surveillance/Verification			Aug-96		
	L133-1.1	Draft System Engineering Management Plan			Sep-94	deleted	information in other documents
	L133-1.2	Issue MWMF development plan			Jul-94	complete	
	L133-1.3	Complete MWMF floor plan			Jul-94	complete	
	L133-1.4	Input to FY95 Plan (see 115-7)			Nov-94	complete	
	L133-2	Issue Integrated Operations Plan			Jan-95	complete	
	L133-3	Issue Title I System Design Requirements		Feb-95	Aug-95	complete	Delayed due to reduced DOE funding.
	L133-4	Issue Metrication Plan			Feb-95	complete	
	L133-5	Input to FY96 Plan (see 115-10)			Oct-95	complete	
X	L133-6	Revised SDR completed for Title II Design	X		Nov-95	late	Completion expected in Dec-95.
X	L133-7	LLNL Review of Facility Title II Design Complete	X	Apr-96	Mar-96		To meet bldg. occupancy date Facility Title II Design must be shortened.
X	L133-7.1	Facility Title II Design Review (80%)		Jan-96	Feb-96		To meet bldg. occupancy date Facility Title II Design must be shortened.
	L133-10.1	Identify emissions for air permit			Jun-95	complete	New marker
	L133-10.2	Review floorplan layout and personnel egress			Jul-95	complete	New marker
	L133-10.3	Review facility Process Flow Diagrams		Aug-95	Sep-95	complete	Delayed due to higher priority activities.

	L133-10.4	Facility preliminary design (20%)		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
	L133-10.5	Facility Title I Design Review (80%)		Sep-95	Oct-95	complete	Review of drawings in progress. Completion expected in October.
X	L133-10.6	LLNL Review of Facility Title I Design			Nov-95	complete	
	L141-1	RAS System Preliminary Design Review		Sep-94	Sep-95	complete	Delayed due to reduced DOE funding.
	L141-1.1	Complete pilot characterization studies		Jun-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
	L141-1.2	Identify equipment and define floor plan		Sep-94	Mar-95	complete	activity stretched-out due to reduced funding guidance
	L141-1.3	RAS LI&C System Functional Requirements Document complete		Jun-95	Sep-95	late	Delayed due to higher priority activities.
	L141-1.4	RAS LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L141-2	RAS 90% Final Design Review complete			Oct-96		
	L141-2.1	RAS LI&C System Design Description drafted			Jun-96		
	L141-2.2	RAS System Design Description drafted	X		Sep-96		
	L142-1	SFP System Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L142-1.1	SFP surrogate feeds defined			May-94	complete	
	L142-1.2	Identify initial suite of characterization equipment		Jun-94	Jan-95	complete	Delayed due to later than scheduled completion of pilot characterization studies and reduced manpower and funding guidance received after original schedule was established.
	L142-1.3	Complete validation of characterization, isolation, and segregation methods		Sep-94	Apr-95	complete	Delayed by late completion of pilot characterization studies, reduced manpower/funding guidance, rebaselining activities, and project delay of procurements of engineering development equipment.
	L142-1.4	Complete preliminary operator control station design		Mar-95	Apr-95	complete	Delayed due to project rebaseline activities.
	L142-1.5	Process Vision/Robline bilateral communication link demonstrated			Feb-95	complete	
	L142-1.6	Process Vision/Robline bilateral message handling demonstrated			Mar-95	complete	
	L142-1.7	SFP workcell control architecture designed			May-95	complete	
	L142-1.8	SFP LI&C System Functional Requirements Document complete		Jun-95	Oct-95	late	Delayed due to higher priority activities.
	L142-1.9	LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L142-1.10	Locate user interface stations and required functionality		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
	L142-1.11	Draft FP control console layout		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
	L142-2	Telerobotics Preliminary Design Review			Sep-95	complete	New milestone.
	L142-3	SFP 90% Final Design Review complete			Oct-96		
	L142-3.1	SFP System Design Description drafted	X		Sep-96		
	L142-3.2	SFP LI&C System Design Description drafted			Oct-96		
	L1422-2	Telerobotics Sorting 90% Final Design Review complete	X		Sep-96		
	L1422-2.1	Linear rail facility interface design complete			Dec-95		
	L1422-2.2	Prototype sorting application operational			Mar-96		
	L1422-2.3	Operator console prototype complete			Apr-96		
	L1422-2.4	Telerobot control interface design and performance specification complete			Aug-96		
	L1425-2	Crane final design (specification) complete			Aug-96		
	L143-1	LFP System Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L143-1.1	Define surrogate feeds		May-94	Nov-94	complete	date changed to agree with extended project schedule
	L143-1.2	LFP general arrangement plan finalized		Jul-94	Dec-94	deleted	
	L143-1.3	Complete validation of characterization and segregation methods		Sep-94	Apr-95	complete	Delayed by technical difficulties which have since been resolved.
	L143-1.4	LI&C Functional Requirements Document complete		Jun-95	Sep-95	deleted	Transferred to L143-1.6 (Were redundant)
	L143-1.5	LI&C Preliminary Design Review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
	L143-1.6	LFP LI&C System Functional Requirements Document complete			Oct-95	late	Delayed due to higher priority activities.
	L143-2	LFP 90% Final Design Review complete			Oct-96		
	L143-2.1	LFP System Design Description drafted	X		Sep-96		
	L143-2.2	LFP LI&C System Design Description drafted			Sep-96		
	L151-1.1	Complete tests on turbo-aerator for nitrous acid conversion (document issued)		Mar-94	Jan-95	complete	Release of report delayed due to slower than expected review cycle.
	L151-1.2	Initiate steady-state flow and chemistry balance tests			Apr-94	complete	

L151-1.3	Initiate instrumentation and control system tests for MEO			Aug-94	complete	
L151-1.4	Summarize silver recovery chemistry results to date (document)		Sep-94	Apr-95	complete	Release of report delayed because PI was involved with higher priority tasks. Task has been assigned to another engineer.
L151-1.5	Fabricate and set-up cellulose Feeder		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
L151-1.6	Report on NaOH-AgCl recovery (document)		Feb-95	Apr-95	complete	Delayed to allow patent disclosure to be filed. Document is in review cycle with release expected in Apr-95.
L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)		Feb-95	Mar-95	complete	Delayed due to higher priority tasks.
L151-1.8	Final Report on steady-state flow and chemistry balance tests (document issued)		Apr-95	Sep-95	complete	Document delayed while waiting for chemical analysis results.
L151-1.9	Demonstrate prototype cellulose feeder (document)			Jun-95	deleted	Deleted per Rebaseline 1.2 as cost savings measure.
L151-1.10	P&ID drawings (document)			Sep-95	complete	Incorporated into L151-3.
L151-1.11	Layout drawings of major equipment items (document)			Sep-95	complete	Incorporated into L151-3.
L151-1.12	LI&C Functional Requirements Document complete		Aug-95	Sep-95	complete	Delayed due to higher priority activities.
L151-1.13	LI&C Preliminary Design Review			Sep-95	deleted	Replaced by L151-3.
L151-2	MEO System Preliminary Design Review			Sep-95	deleted	Replaced by L151-3.
L151-2.1	Preliminary Process Flow Diagram for MEO			Jun-94	complete	
L151-2.2	Preliminary equipment layout for MEO			Sep-94	complete	
L151-3	MEO System Design Description (document)			Jul-95	complete	New milestone. Replaces L151-1.13 and L151-2.
L152-1	Complete MSO bench scale rubber destruction tests			Dec-93	complete	
L152-2	Select Industrial Participation method for Primary Unit			Jun-95	complete	
L152-2.1	MSO advertise in the CBD		Apr-94	Jun-94	complete	delayed due to funding limitations per DOE guidance
L152-2.2	Complete Design Specification		May-94	Jan-95	complete	delayed for incorporation of reviewer's comments
L152-2.3	Conduct Industrial Partner meeting		Jul-94	Jan-95	complete	Delayed due to funding limitations per DOE guidance and unavailability of participants due to holidays. Scheduled for January 5th.
L152-3	MSO System MWMF PDR	X	Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L152-3.1	Preliminary Process Flow Diagram complete for MSO		Jun-94	Sep-94	complete	
L152-3.2	Initiate MSO Preliminary Design			Jul-94	complete	
L152-3.3	Initiate vessel material study			Oct-94	complete	
L152-3.4	Install development unit			Jun-95	complete	
L152-3.5	LI&C Functional Requirements Document complete		May-95	Oct-95	late	Delayed due to reduced DOE funding.
L152-3.6	LI&C Preliminary Design Review complete		Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L152-4	Start Development Activities			Aug-94	complete	
L152-5	MSO 90% Final Design Review complete	X		Sep-96		
X L152-5.1	Select Industrial Participation method for Salt Recycle			Nov-95	complete	
L152-5.2	MSO Peer Review			Jul-96		
L153-1	Award WOX contract			Sep-94	deleted	WBS element deleted per DOE guidance
L153-1.1	Complete and document work to date			Jul-94	complete	
L153-1.2	Issue RFQ for WOX treatment unit w/ completed specification			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2	30% Preliminary Design Review for WOX			Sep-94	deleted	WBS element deleted per DOE guidance
L153-2.1	WOX dispersion system test and design recommendation complete			May-94	deleted	WBS element deleted per DOE guidance
L153-2.2	Preliminary WOX treatability tests complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.3	Preliminary WOX Process Flow Diagram complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.4	Preliminary P&ID for WOX Support System complete			Jul-94	deleted	WBS element deleted per DOE guidance
L154-1	Complete and document UVP work to date			Jul-94	complete	
L154-2	UVP System Preliminary Design Review			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.1	UVP Process Flow Diagram			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	P&ID for UVP Support System			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	EOG preliminary Equipment Layout			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.3	UVP Equipment Layout			Aug-94	deleted	WBS element deleted per DOE guidance
L155-1	Summarize Gas Liquid Contactor Tests (document)		Jun-95	Aug-95	complete	Delayed due to testing difficulties. Corrections have been made.

L155-1.1	Fab prototype gas-liquid contactor for acidic urea NOx destruction		Jun-94	Jun-95	complete	Delayed due to DOE stretchout & peer review action item(s). Design/fabrication package currently out for bid.
L155-1.2	Complete XOG tests on urea and SCR DeNOx			Jul-94	deleted	break up into other markers
L155-2	Urea DeNOx: peer review			Aug-94	complete	
L155-2.1	Initiate instrumentation and control system test		Aug-94	Feb-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3	XOG System Preliminary Design Review		Sep-94	Jun-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.1	Summarize NOx-urea chemistry to date (document)		Sep-95	Sep-95	late	Delayed awaiting completion of Milestone L155-1. Work in progress.
L155-3.2	Initiate systematic catalysts testing			Jan-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.3	LI&C Functional Requirements Document complete			May-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.4	LI&C Preliminary Design Review			Jun-95	deleted	Deleted from scope due to budget reductions. (1/95) Title correction.
L161-1	Process Transport & Storage System Preliminary Design Review		Sep-94	Sep-95	complete	Delayed due to reduced DOE funding.
L161-1.1	Select standard transport container designs		Jun-94	Jul-95		Delayed due to reduced DOE funding.
L161-1.2	Floor plan layout complete		Jul-94	Aug-95	complete	Delayed due to reduced DOE funding.
L161-1.3	LI&C Functional Requirements Document complete		Jun-95	Sep-95	late	Delayed due to higher priority activities.
L161-1.4	PTS LI&C System Preliminary Design review		Jul-95	Sep-95	complete	Delayed due to reduced DOE funding.
L161-2	PTS 90% Final Design Review complete	X		Sep-96		
L161-2.1	Final Design of transport interface complete			Feb-96		
L161-2.2	Final Design of batch make-up station complete			May-96		
L1615-2.3	LI&C prototype user interface approved			May-96		
L1615-2.4	LI&C System Design description complete			Jul-96		
L162-1	Complete preliminary floor plan layout			Jun-94	complete	
L162-1.1	Select ATS standard transport container designs			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.2	Finalize ATS transport handling capacity			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.3	Finalize ATS transport equipment selection			Aug-94	deleted	WBS content revised to "Analytical Lab"
L162-2	Define analysis tests based on process acceptance criteria		Sep-94	Oct-95	partial	Delayed due to reduced DOE funding. First issue expected in October.
L162-3	Define facility off-gas monitoring requirements		Sep-94	Feb-95	complete	Completed for preliminary design.
L162-4	Define MEO on-line analysis requirements		Dec-94	Feb-95	complete	Completed for preliminary design.
L162-5	Define MSO on-line analysis requirements		Jan-95	Mar-95	complete	Waiting for salt analysis to be defined. Completion expected in Mar-95.
L162-6	Define DWTF analysis requirements			Feb-95	complete	Completed for preliminary design.
L162-7	Analytical Lab System Preliminary Design review		Aug-95	Sep-95	complete	Rescheduled to Oct. 12, 1995, due to programmatic conflicts.
L162-7.1	LI&C Functional Requirements Document complete		Jul-95	Aug-95	complete	Delayed while document is in review cycle.
L162-7.2	LI&C Preliminary Design Review		Aug-95	Sep-95	complete	Rescheduled to Oct. 12, 1995, due to programmatic conflicts.
L162-8	LAB 90% Final Design Review complete	X		Sep-96		
L162-8.1	Define MSO on- and at-line measurement methods			Mar-96		
L162-8.2	Define offgas analysis requirements			May-96		
L162-8.3	Select vendor for offgas system procurement			Jul-96		
L162-8.4	Select vendors for tritium and gas proportional counter procurements			Aug-96		
L162-8.5	Complete custom test and sample tracking database design			Sep-96		
L163-1	Water Treatment trade-off study		Jun-94	Sep-94	complete	
L163-1.1	Water Treatment trade-off study revision		Dec-94	Feb-95	complete	Delayed due to previously unplanned decision to have TID edit document. Presently out for signatures. Release expected in Feb 95.
L163-2	Memorandum of Understanding with HWM			Jan-95	complete	
L163-3	WTR System Preliminary Design Review		Jul-95	Oct-95	complete	Delayed due to reduced DOE funding.
L163-3.1	LI&C Functional Requirements Document complete		Jun-95	Oct-95	complete	Delayed due to reduced DOE funding.
L163-3.2	LI&C Preliminary Design Review		Jul-95	Oct-95	complete	Delayed due to reduced DOE funding.
X L163-4	Begin Final Design		Jul-95	Nov-95	late	Delayed due to reduced DOE funding. KD-2 delayed until Dec-95.
L163-5	WTR 90% Final Design Review complete	X		Sep-96		
L163-5.1	WTR Unit Operation Subsystems Final Design complete			Aug-96		
L164-1	Evaluations of immobilization technologies complete		May-95	Jun-95	complete	Delayed pending decision on most cost effective technology for the project.

L164-1.1	Preliminary process flow diagram complete for FF			Jul-94	complete	
L164-1.2	Preliminary equipment layout complete for FF			Aug-94	complete	
L164-1.3	Report status of immobilization evaluations		Sep-94	May-95	complete	Delayed until after peer review of polymer microencapsulation. Peer Review activities finalized on 4/24/95. Report expected in May 95.
L164-2	Final Forms System Preliminary Design Review		Jun-95	Aug-95	complete	Delayed due to reduced DOE funding.
L164-2.1	Final Forms subsystem design status peer review		Feb-95	May-95	complete	Peer Review activities finalized on 4/24/95. Report to be completed in May 95.
L164-2.2	LI&C Functional Requirements Document complete		May-95	Sep-95	complete	Document in review cycle.
L164-2.3	LI&C Preliminary Design Review		Jun-95	Aug-95	complete	Delayed due to reduced DOE funding.
L164-3	Report: Design of polymer microencapsulation system		Jun-95	Oct-95	late	Delayed due to reduced DOE funding. To be rescheduled.
L164-4.1	Report: Volatile residue components and the design of ceramic waste form system		Jul-95	Oct-95	complete	Delayed due to higher priority activities.
L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters		Aug-95	Jan-96	late	Delayed due to higher priority activities.
L164-5	Rotary calciner operational	X		Sep-96		
L164-5.1	Rotary calciner design procurement complete			Jun-96		
L164-6	FFM 90% Final Design Review complete			Jan-97		
L164-6.1	Final Design of sulfur-polymer cement system complete			Aug-96		
L164-6.2	Final Design of ceramic recipe-writer complete			Sep-96		
L164-6.3	Final Design of local process off-gas system complete			Jun-96		
L165-1	SI&C System Preliminary Design Review		May-95	Jun-95	complete	Delayed due to scheduling conflicts.
L165-1.1	I/C general arrangement plan complete			Mar-94	complete	
L165-1.2	Process Control System FEP hardware/software selected			Apr-94	complete	
L165-1.3	Supervisory Control System hardware/software selected			Apr-94	complete	
L165-1.4	Handling Systems open architecture controller selected			Jul-94	deleted	to WBS 1.4.2
L165-1.5	Analytical laboratory LIMS selected			Jul-94	deleted	LIMS may not be used in system design
L165-1.6	Telerobotics platform selected			Aug-94	deleted	to WBS 1.4.2
L165-1.7	Teleoperator controller selected			Sep-94	deleted	to WBS 1.4.2
L165-1.8	Database Management System hardware/software selected			Jul-94	complete	
L165-1.9	Engineering Development System operational		Dec-94	Jan-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver.
L165-1.10	Rapid prototype Engineering Development testing complete and report written		Jan-95	Feb-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver. See Jan 95 WMMF Monthly Report.
L165-1.11	Integrated control system design peer review		Feb-95	Mar-95	complete	Completion expected in early Mar 95. Key participants are unavailable in February.
L165-1.12	SI&C Functional Requirements Document complete		Apr-95	Oct-95	complete	Delayed due to higher priority work on Local I&C.
L165-1.13	Engineering Development tasks complete and documented		Jun-95	Oct-95	late	Delayed due to higher priority work on Local I&C.
L165-1.14	Preliminary Design activities complete, documented		Jun-95	Sep-95	complete	Delayed due to reduced DOE funding.
L165-2	SI&C 90% Final Design Review complete			Oct-96		
L165-2.1	Instrumentation and Equipment Database operational		Mar-95	Apr-95	complete	Delayed pending I&C design team review scheduled for 4/7/95.
L165-2.2	Process I&C Standards established			Sep-95	complete	
X L165-2.3	Container Tracking and Material Accounting requirements document approved	X		Nov-95	late	Completion expected in Dec-95.
L165-2.4	Facility Monitoring and Safety Control System task analysis complete / documented			Feb-96		
L165-2.5	Instrumentation and Equipment Database complete			Mar-96		
L165-2.6	Final Design Process I&C Standards complete	X		Apr-96		
L165-2.7	Control Room and Equipment Room design complete			May-96		
L165-2.8	Supervisory Control System SDD drafted	X		Jun-96		
end						