

Early Entrance Coproduction Plant

Phase II - Quarterly Report No. 16

Reporting period: July 1, 2003 – September 30, 2003

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DOE Cooperative Agreement No. DE-FC26-99FT40658

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Abstract:

The overall objective of this project is the three phase development of an Early Entrance Coproduction Plant (EECP) which uses petroleum coke to produce at least one product from at least two of the following three categories: (1) electric power (or heat), (2) fuels, and (3) chemicals. The objective is to have these products produced by technologies capable of using synthesis gas derived from coal and/or other carbonaceous feedstocks.

The objectives of Phase I were to determine the feasibility and define the concept for the EECP located at a specific site; develop a Research, Development, and Testing (RD&T) Plan for implementation in Phase II; and prepare a Preliminary Project Financing Plan.

The objective of Phase II is to implement the work as outlined in the Phase I RD&T Plan to enhance the development and commercial acceptance of coproduction technology that produces high-value products, particularly those that are critical to our domestic fuel and power requirements. The work performed under Phase II will resolve critical knowledge and technology gaps on the integration of gasification and downstream processing to coproduce some combination of power, fuels, and chemicals from coal and/or other carbonaceous feedstocks.

The objective of Phase III is to develop an engineering design package and a financing and testing plan for an EECP located at a specific site.

The project's intended result is to provide the necessary technical, economic, and environmental information needed by industry to move the EECP forward to detailed design, construction, and operation.

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The Contractor can not confirm the authenticity of the information contained herein since this report is being submitted under the U.S. Department of Energy requirement that the electronic files must be submitted without being write-protected.

Note: Unless specified otherwise, all quarters/years are calendar quarters/years.

I. List of Figures

The following figures were used in this report:

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II. List of Acronyms

ASU	Air Separation Unit
Btu	British thermal unit
CO ₂	carbon dioxide
DOE	U.S. Department of Energy
EECP	Early Entrance Coproduction Plant
F-T	Fischer-Tropsch
GE	General Electric
KBR	Kellogg Brown & Root
MDEA	methyldiethanolamine
RD&T	Research, Development, and Testing
stpd	short tons per day
TES	Texaco Energy Systems LLC

III. Executive Summary

This is the eleventh quarterly report which summarizes the progress of Phase II of the development of the Early Entrance Coproduction Plant (EECP) being performed under U.S. Department of Energy (DOE) Cooperative Agreement No. DE-FC26-99FT40658. The EECP will integrate advanced, high-efficiency, fuel-flexible electrical power generation, from coal and/or other carbonaceous materials, with a facility capable of producing clean transportation fuels and/or chemicals. An industrial consortium consisting of Texaco Energy Systems LLC (TES), Kellogg Brown & Root (KBR), General Electric (GE), Praxair, and Rentech Inc. is developing this project.

In the proposed EECP, approximately 1,235 short tons per day (stpd) petroleum coke is used to produce 55 megawatts of net electric power for export, approximately 617 barrels per day of Fischer-Tropsch (F-T) products (finished high-melt wax, finished low-melt wax, hydrotreated F-T diesel, and hydrotreated F-T naphtha), steam, and approximately 89 stpd of sulfur. Additionally, the air separation unit (ASU) will produce excess nitrogen and oxygen that will be exported.

The Phase I objective was to determine the feasibility and define the concept for the EECP located at a specific site, develop a Research, Development, and Testing (RD&T) Plan, and prepare a Preliminary Project Financing Plan. Phase I was completed in December 2000 and the final Phase I Concept Report was issued in May 2001. In Phase I, a typical refinery site, Motiva Port Arthur, was identified as the potential EECP site. As a result of the merger between Texaco and Chevron, Texaco was required to sell its interest in the Motiva Enterprises LLC joint venture to Shell Oil Company and Saudi Refining Inc. For Phase III of the EECP project, at the present time, TES has recommended to DOE that the EECP Cooperative Agreement be concluded at the end of Phase II unless another project site can be identified.

The objective of Phase II is to conduct the research as outlined in the Phase I RD&T Plan. Phase II was originally scheduled for two calendar years (2001 through 2002). The revised target for Phase II completion is the fourth (4th) calendar quarter of 2003.

During this reporting period, final topical reports for F-T Pilot Plant Confirmation (Task 2.1), F-T Catalyst/Wax Separation (Task 2.3), F-T Diesel Fuel/Engine Performance and Emissions (Task 2.6), Environmental (Task 2.10), and Update and Implement Essential RD&T (Task 3.0) were approved by the DOE. The F-T Product Upgrading Topical Report (Task 2.5) and the Phase II Final Report were submitted to DOE for review. Additionally, TES has requested that DOE provide a no-cost time extension for Phase II of the EECP project from November 30, 2003 to March 31, 2004. The no-cost time extension would provide the

opportunity to locate a new site and update the concept design basis prior to starting Phase III.

Phase III was envisioned to be a one-year effort scheduled to begin at the conclusion of Phase II. As discussed previously, TES has recommend to DOE that the Cooperative Agreement for the EECF Project be concluded at the end of Phase II unless another project site can be identified. An engineering design package, testing plan, and financing plan for the EECF was to be developed in Phase III. The overall project's intended result is to provide the necessary technical, economic, and environmental information needed by industry to move the EECF forward to detailed design, construction, and operation.

III. Results, Discussion, and Preliminary Conclusions

Task 1 Project Management

Task completed. The updated Project Management Plan was approved by the DOE in the second (2nd) calendar quarter of 2001.

Task 2.1 Fischer-Tropsch Pilot Plant Confirmation

Task completed. The final Task 2.1 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Task 2.2 Fischer-Tropsch Mathematical Model and Reactor Scale-Up Confirmation

Task completed. The final Task 2.2 Topical Report was approved by the DOE in the second (2nd) calendar quarter of 2003.

Task 2.3 Catalyst/Wax Separation

Task completed. The final Task 2.3 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Task 2.4 Low British Thermal Unit (Btu) Gas Combustion Test

Task completed. The final Task 2.4 Topical Report was approved by the DOE in the second (2nd) calendar quarter of 2003.

Task 2.5 F-T Product Upgrading

The Task 2.5 Topical Report was submitted to DOE for review in the third (3rd) calendar quarter of 2003.

Task 2.6 F-T Diesel Fuel/Engine Performance and Emissions

Task completed. The final Task 2.6 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Task 2.7 Petroleum Coke Analysis

Task completed. The final Task 2.7 Topical Report was approved by the DOE in the second (2nd) calendar quarter of 2003.

Task 2.8 Carbon Dioxide (CO₂) Stripping from Methyldiethanolamine (MDEA) at Medium Pressure

Task completed. The final Task 2.8 Topical Report was approved by the DOE in the fourth (4th) calendar quarter of 2002.

Task 2.9 Integration

Task completed. The final Task 2.9 Topical Report was approved by the DOE in the second (2nd) calendar quarter of 2003.

Task 2.10 Environmental

Task completed. The final Task 2.10 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Task 3.0 Update and Implement Essential RD&T

Task completed. The final Task 3.0 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Task 4.0 Update to Phase I Design Basis Topical Report

Task completed. The final Task 4.0 Topical Report was approved by the DOE in the third (3rd) calendar quarter of 2003.

Phase II Final Report

The Phase II Final Report was submitted to DOE for review in the third (3rd) calendar quarter of 2003.

V. List of Major Activities Accomplished in the Third (3rd) Calendar Quarter of 2003

The following list is provided as a quick reference for the work performed during this reporting period:

- Submitted Quarterly Report No. 15 for DOE review and approval.
- DOE approved Quarterly Report No. 15.
- Submitted final Task 2.1 Topical Report (F-T Pilot Plant Confirmation).
- DOE approved final Task 2.1 Topical Report (F-T Pilot Plant Confirmation).
- Submitted final Task 2.3 Topical Report (F-T Catalyst/Wax Separation).
- DOE approved final Task 2.3 Topical Report (F-T Catalyst/Wax Separation).
- Submitted Task 2.5 Topical Report (F-T Product Upgrading) for DOE review.
- Submitted final Task 2.6 Topical Report (F-T Diesel Fuel/Engine Performance and Emissions).
- DOE approved final Task 2.6 Topical Report (F-T Diesel Fuel/Engine Performance and Emissions).
- Submitted final Task 2.10 Topical Report (Environmental).
- DOE approved final Task 2.10 Topical Report (Environmental).
- Submitted final Task 3.0 Topical Report (Update and Implement Additional Research, Development, and Testing).
- DOE approved final Task 3.0 Topical Report (Update and Implement Additional Research, Development, and Testing).
- Submitted final Task 4.0 Topical Report (Update to Phase I Design Basis).
- DOE approved final Task 3.0 Topical Report (Update to Phase I Design Basis).
- Submitted the Phase II Final Report for DOE review.
- Requested a four (4)-month no-cost time extension for Phase II.

VI. List of Major Activities Planned for the Fourth (4th) Calendar Quarter of 2003

The following list is provided as a quick reference for the work planned for the upcoming quarter:

- Submit Quarterly Report No. 16 for DOE for review and approval.
- Submit the final Task 2.5 Topical Report (F-T Product Upgrading) to DOE for approval.
- Submit the final Phase II Final Report to DOE for approval.
- Identify potential new EECF site.

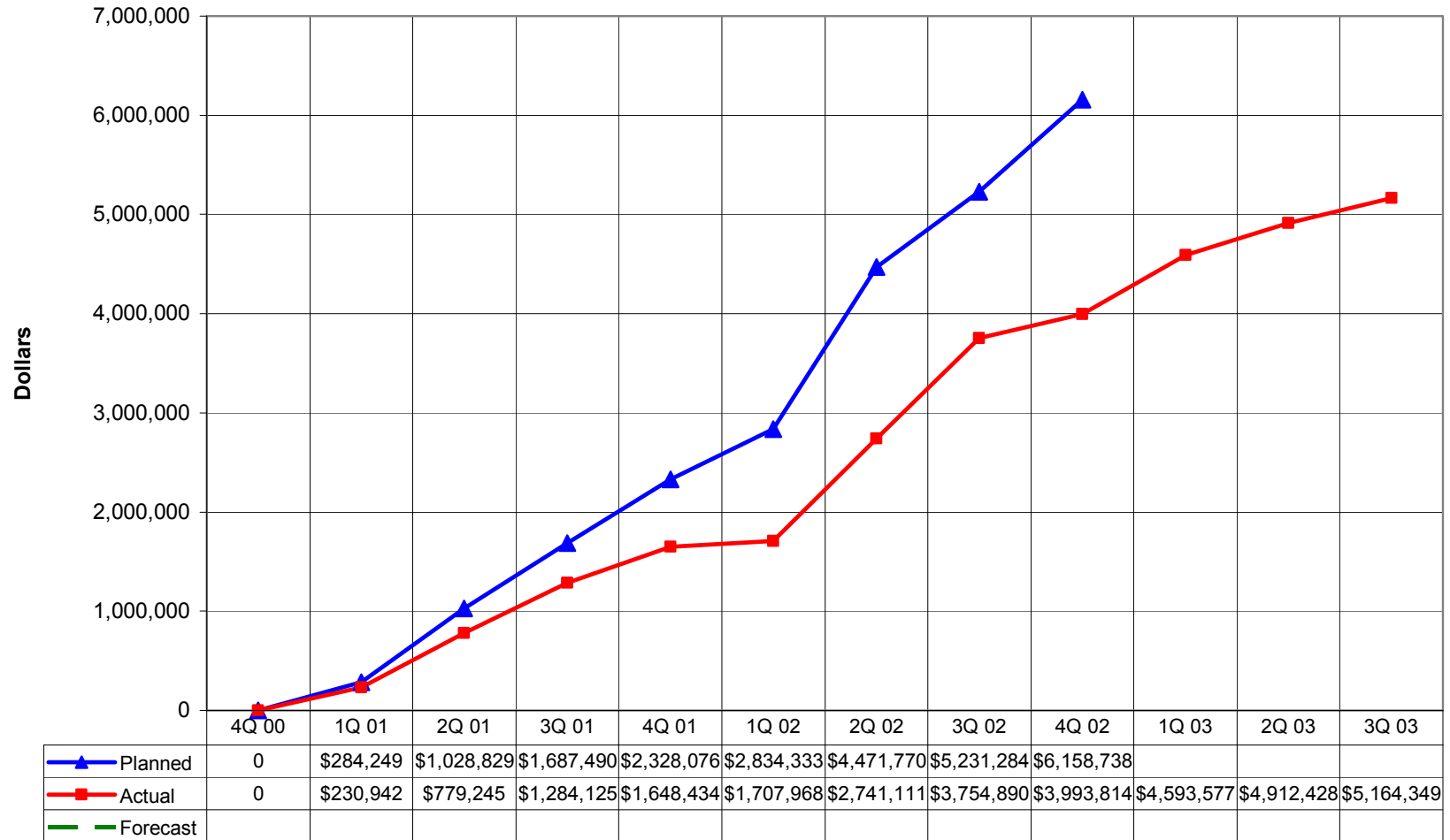
VII. Financial Status

The following three graphs depict the financial status and progress of Phase II activities. The graphs are shown on the following three pages:

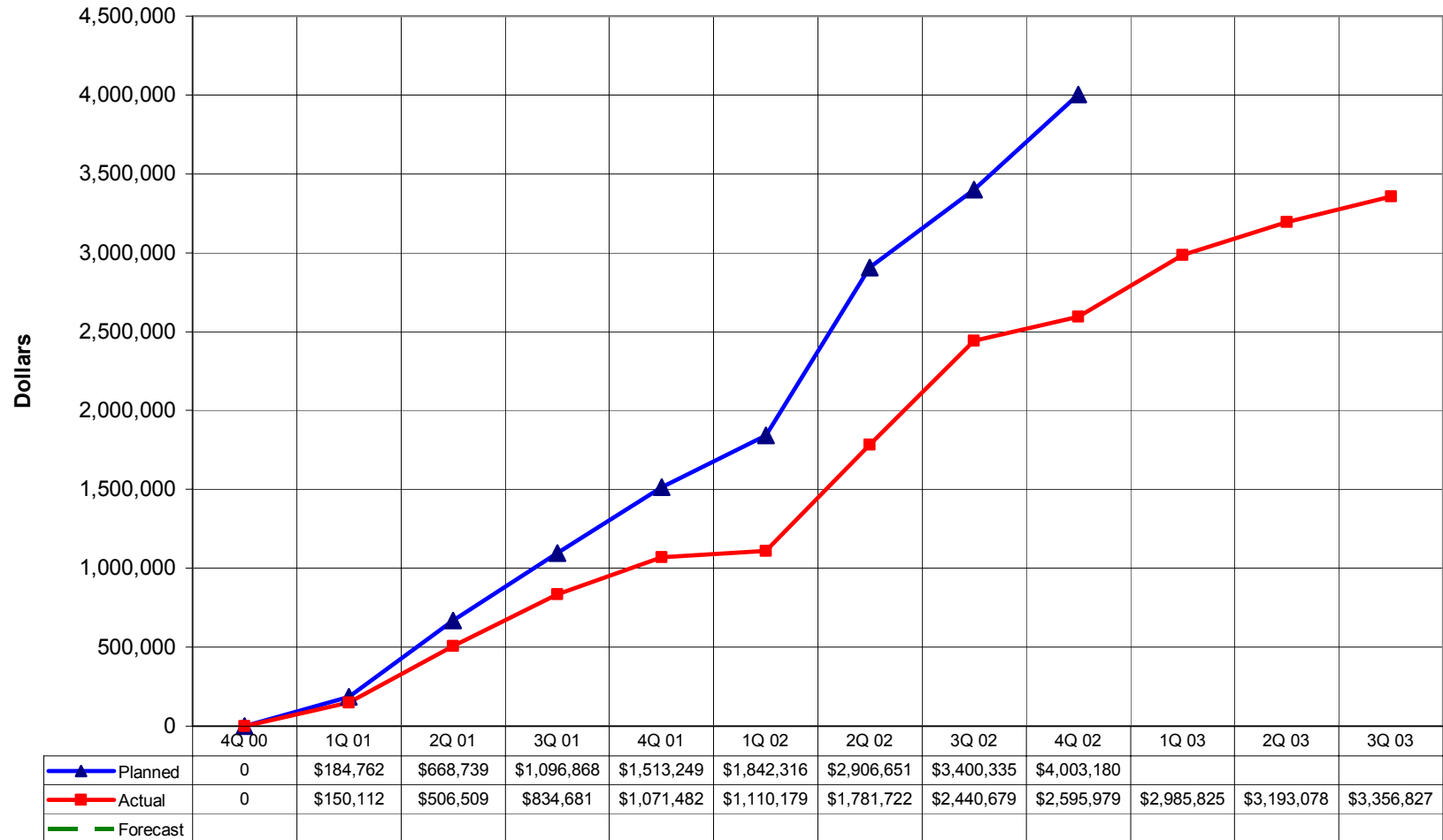
Phase II Total Expenditures	14
Phase II DOE Expenditures	15
Phase II Total Percent Complete.....	16

Total planned expenditures for Phase II were expected to be \$6,158,738 (DOE share is \$4,003,180). Based on the work completed, the final Phase II expenditures are expected to be less than the planned amount. Final Phase II DOE expenditures are expected to be approximately \$600,000 below the budget amount.

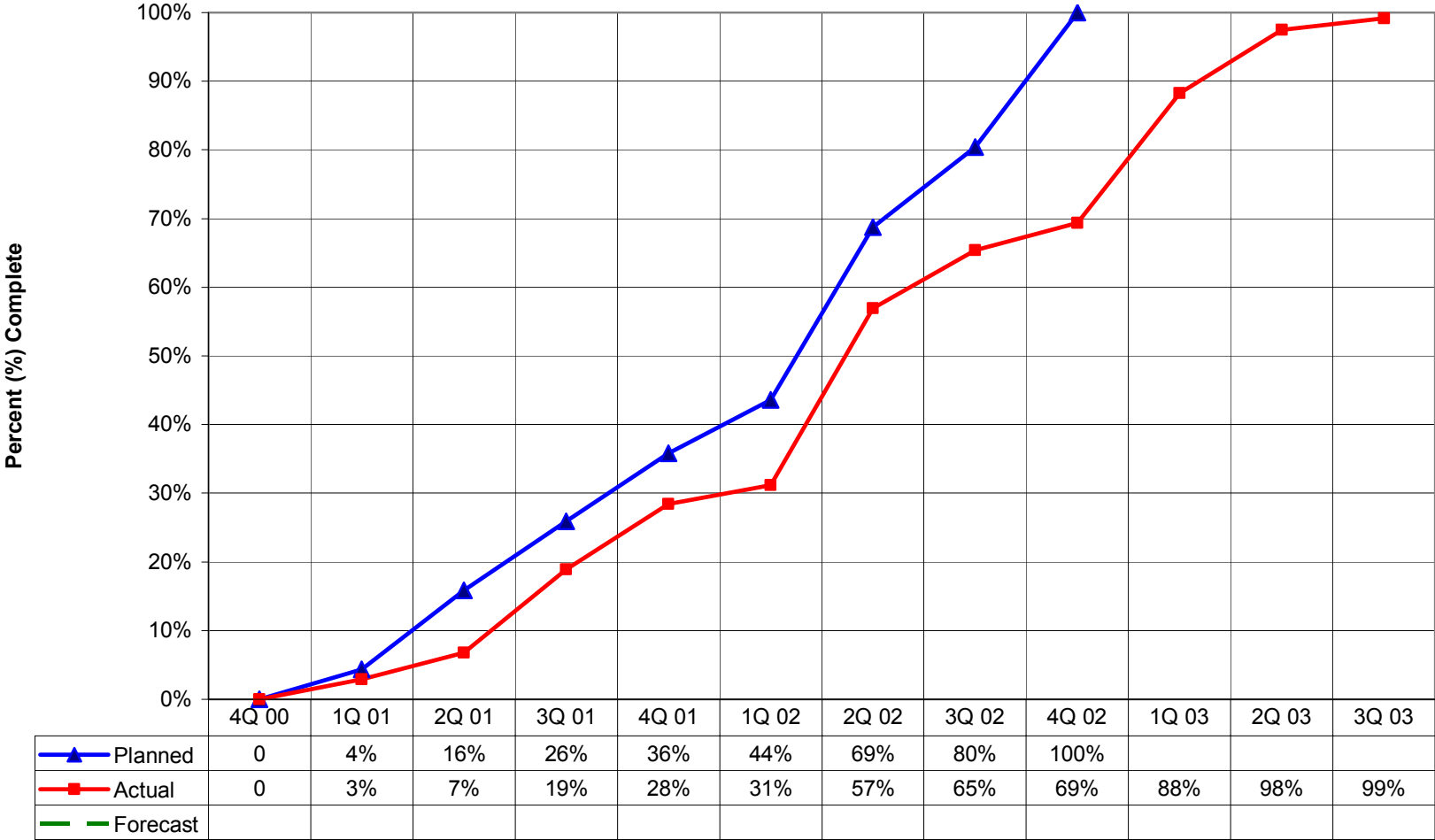
Early Entrance Coproduction Plant Phase II - Total Expenditures



Early Entrance Coproduction Plant Phase II - DOE Expenditures



**Early Entrance Coproduction Plant
Phase II - Total Percent Complete**

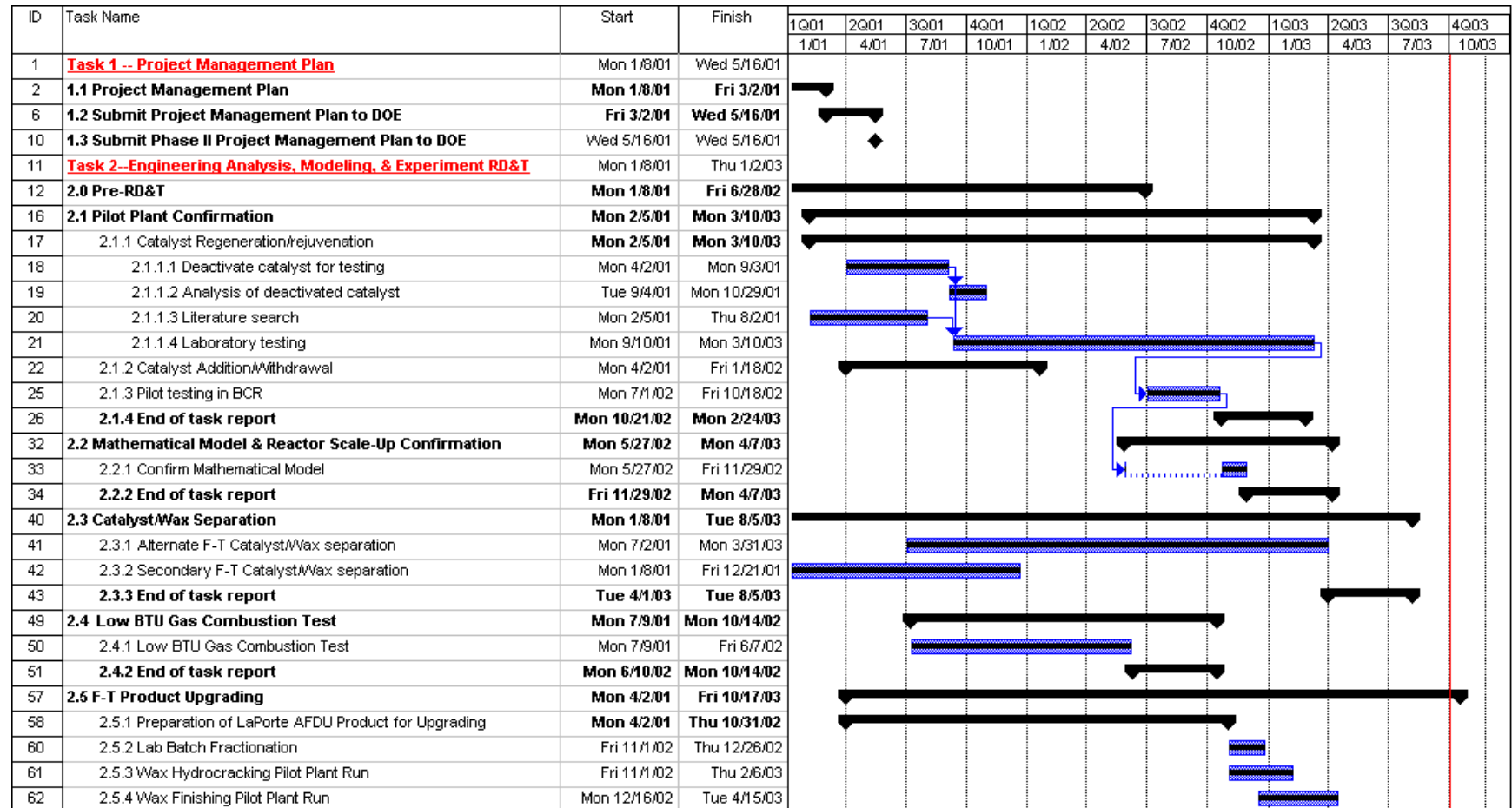


VIII. Schedule

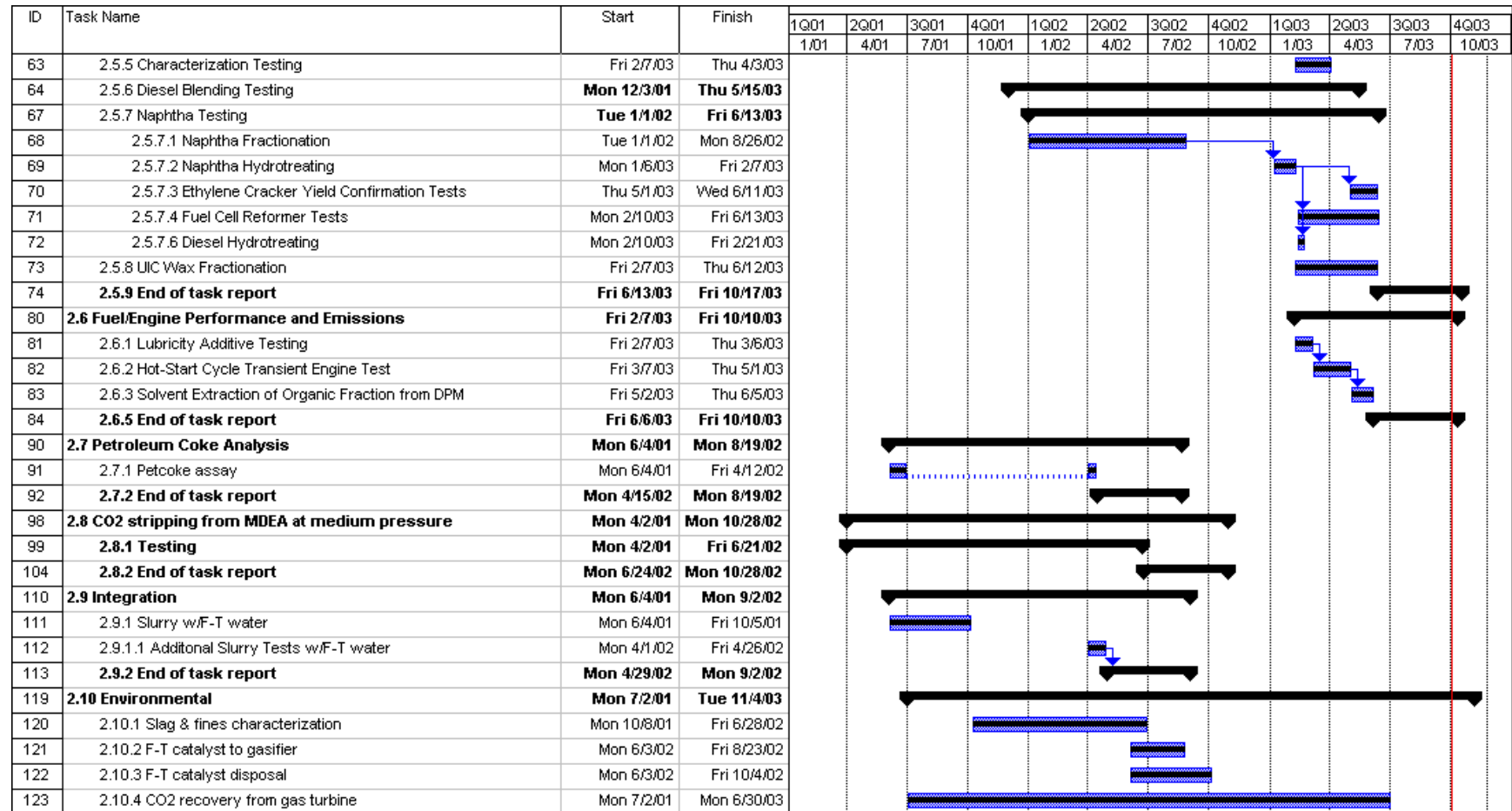
The following schedule depicts the updated Phase II project schedule and shows percent complete by task as of September 30, 2003. For a description of the work involved in each task, refer to the Cooperative Agreement and the RD&T Plan. This schedule was prepared using Microsoft Project 2000 software. Reporting is expected to be complete by December 31, 2003.

TES has requested DOE provide a no-cost time extension for Phase II of the EECF project from November 30, 2003 to March 31, 2004. The no-cost time extension would provide the opportunity to locate a new site and update the concept design basis prior to starting Phase III.

Early Entrance Coproduction Plant (EECP) – Phase II Schedule



Early Entrance Coproduction Plant (EECP) – Phase II Schedule



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ID	Task Name	Start	Finish	1Q01	2Q01	3Q01	4Q01	1Q02	2Q02	3Q02	4Q02	1Q03	2Q03	3Q03	4Q03
				1/01	4/01	7/01	10/01	1/02	4/02	7/02	10/02	1/03	4/03	7/03	10/03
124	2.10.5 End of task report	Tue 7/1/03	Tue 11/4/03												
130	2.11 End of Task 2 Summary Report	Tue 9/2/03	Tue 12/16/03												
136	Task 3--Updating & Implementing Essential RD&T	Mon 10/8/01	Tue 12/10/02												
137	3.0 Critical & Essential RD&T Plan	Mon 10/8/01	Mon 2/4/02												
144	3.1 Critical & Essential RD&T	Tue 2/5/02	Mon 11/11/02												
145	3.2 Preliminary Report	Tue 11/12/02	Thu 1/9/03												
152	3.3 Final Report	Fri 1/10/03	Tue 2/11/03												
155	Task 4--Update Concept Basis of Design	Mon 5/27/02	Wed 1/1/03												
156	4.1 Update the Concept Basis of Design	Mon 5/27/02	Wed 10/30/02												
162	4.2 Submit the Concept Basis of Design to DOE	Wed 10/30/02	Wed 1/1/03												
166	4.3 Submit the Updated Concept Basis of Design to DOE	Wed 1/1/03	Wed 1/1/03												
167	Administration	Mon 1/8/01	Wed 12/31/03												