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MONTHLY PROGRESS REPORT

(September 1979)

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PROJECT MANAGEMENT FOR THE RELIABILITY FLEET TESTING

OF ALCOHOL/GASOLINE BLENDS

DOE/CS/50023--T1

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Office of Transportation Programs
U. S. DEPARTMENT OF ENERGY
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MONTHLY PROGRESS REPORT

(September 1979)

PROJECT MANAGEMENT FOR THE RELIABILITY FLEET TESTING OF ALCOHOL/GASOLINE BLENDS

1. INTRODUCTION

The Aerospace Corporation is providing project management support services to the DOE Alternative Fuels Branch in the Office of Transportation Programs under Contract No. DE-AC03-79CS50023. These services were initiated on April 16, 1979 and will terminate under this contract on April 16, 1981.

The estimated total cost for the contract period is \$474,476. However, the contract is being incrementally funded; \$200,000 is the amount presently obligated through April 1, 1980. All charges are being accumulated under Job Order 7825.

The following sections (1) provide a brief review of the project background, objectives, and approach, (2) present the status of progress through September 30, 1979, and (3) summarize the expenditure status. A summary of contractual task assignments is provided in Appendix A, and a history of principal reporting activities is provided in Appendix B.

2. PROJECT BACKGROUND

Ethanol and methanol are among the nonpetroleum fuel options which can be derived from resources available in abundance in the United States to replace current liquid fuels. The existing Alternative Fuels Utilization Program (AFUP) of the Office of Transportation Programs therefore includes an alcohol fuels program for highway vehicles. While the longer-term objective is the optimization of resource/engine/fuel systems based on neat alcohols, the near-term goal is to test and evaluate alcohol/gasoline blends in commercial and government fleets in order to prove the practicability and reliability of blends as a transition strategy to alcohol fuels or as a progenitor of alcohol/synfuel blends.

Assessment and evaluation studies of alcohol/gasoline blends in S.I. internal combustion engines were initiated in FY 1977 with problem solving on these fuels to be completed in FY 1979. The next sequential steps are

Controlled Fleet Tests and large-scale Reliability Fleet Tests. Inasmuch as the problems associated with the utilization of alcohol/gasoline blends, as well as their potential solutions, are not complex, it is considered feasible to conduct these latter test phases concurrently with minimum risk and thereby shorten the overall schedule. Using this approach, it is planned that reliability fleet testing will be initiated early in FY 1980.

3. OBJECTIVES

The principal goal of the reliability fleet testing program is to demonstrate the technical readiness for commercialization of 10-volume-percent alcohol/gasoline blends, including both methanol- and/or ethanol-based alcohols. Some of the expected ancillary outputs from the program include:

- A. Establishment of a performance and reliability data base for in-service operation under a wide spectrum of conditions.
- B. Accumulation of fuel supply system experience to guide subsequent design of commercial facilities.
- C. Definition of requirements and procedures for maintenance support.
- D. Development of more precise impact and market assessment data.

4. APPROACH AND PROJECT ORGANIZATION

Program emphasis will be on conventional spark-ignited internal combustion (Otto cycle) engines. The test program will include not only passenger cars but, if economically feasible, also trucks and buses normally fueled by gasoline. A wide spectrum of vehicle types, duty cycles, and especially geographical locations will be included.

The test fuels will basically consist of 10-volume-percent ethanol and/or methanol in gasoline, but the alcohol portion will not be restricted to pure products. The alcohol phase may contain higher alcohols and ethers, and, in the case of ethanol, unpotable impurities and various denaturant constituents. The gasoline component of the fuel will be an unleaded, generally conventional type for which some basic requirements

may be modified or uniquely specified. Considerable emphasis will be placed on fuels formulated in a manner consistent with likely commercial approaches.

Two operational groups are involved in the project. One, termed the Industry Group, is composed of automotive and fuel companies who have the necessary technical skills and production facilities to provide expertise on equipment, fuel, and operational requirements. Complementary field operations on the using side fall within the purview of an Operating Group, made up of various government activities and private business entities with an interest in blend use and subsequent commercialization.

Detailed planning and close coordination of all facets is being carried out by The Aerospace Corporation, operating as a separate project management organization directly under the DOE Program Manager. This Project Manager will integrate the activities of the Industry and Operating Groups to assure compatibility and achievement of objectives within financial constraints. The Project Manager will maintain liaison with other pertinent federal organizations and institutional bodies, and assess the related needs and requirements pertinent to success. The Project Manager will also conduct related special studies and tasks as requested.

5. PROGRESS FOR THIS REPORTING PERIOD

Brief summaries of status and progress are given below for each of the tasks being performed under this contract through September 30, 1979.

5.1 Task 1 - Indoctrination of Industry and Operating Group Managers and Project Participants

The second monthly Project Review Meeting was conducted at The Aerospace Corporation in Washington, D.C., on September 6, 1979. Participation in this meeting included the DOE Program Manager, The Aerospace Corporation, Southwest Research Institute (SwRI), Mueller Associates, Incorporated, and Bartlesville Energy Technology Center. A report on the Project Review Meeting was prepared, as noted in Appendix B. The third monthly Project Review Meeting was scheduled for October 10, 1979, and preparations were initiated for this meeting.

Coordination was continued with Southwest Research Institute on completion of the Test Plan and discussions with potential fleet operators for initial fleet tests. SwRI contacted potential Federal agency fleet operators in the Washington, D.C. area, including the National Park Service and Park Police, and the U.S. Postal Service, and the U.S. Army MERADCOM, Ft. Belvoir. SwRI continued to coordinate with the Tennessee Valley Authority (TVA) on the availability of vehicles for TVA's potential participation in the Reliability Fleet Testing. These contacts with potential fleet operators are summarized below:

A. TVA - Initial discussions were held with the TVA in Chattanooga, Tennessee, in May, 1979 to develop their potential role as a fleet operator for the Reliability Fleet Testing. The Operating Group Manager recently met with the TVA in August, 1979, and has continued technical discussions since then on the potential for establishing a test fleet. TVA is currently considering two areas with a small number of vehicles in each area. The DOE Program Manager is continuing to coordinate an interagency agreement with TVA as required in order to provide funding for TVA participation. These negotiations with TVA, and their current experience with Gasohol testing, establishes TVA as a candidate for early startup of Reliability Fleet Testing. TVA indicated that testing could be started in the Cleveland, Tennessee facility with up to 16 vehicles as soon as their management arrangements are completed, and a test agreement is negotiated. TVA has now defined their organizational responsibilities for conducting their alcohol fuels testing, and they will be contacted again by SwRI to continue discussions on fleet test participation.

B. U.S. Postal Service - On September 5, 1979, the SwRI Operating Group Manager and Aerospace Project Manager met with Mr. Don Crane and Mr. Ron Bernstein of USPS to discuss potential locations suitable for supporting fleet testing with a fleet size on the order of 50 to 100 vehicles, and to discuss the necessary support and procedures for establishing a test. USPS provided a listing of facilities at various locations, for which suitable sites can be selected. The Operating Group manager will continue coordination with USPS, to determine the potential for early initiation of Gasohol testing at a USPS facility.

C. National Park Service and U.S. Park Police - The Operating Group Manager held telephone discussions with NPS regarding their interest in Reliability Fleet Testing using a fleet of service vehicles and police vehicles in the National Capital Region in Washington, D.C. The U.S. Park Police were also contacted to follow up on their expressed interest in participating in the testing. A meeting was scheduled with the NPS and Park Police for October 10, 1979, to discuss the details of a potential fleet test at this facility.

D. MERADCOM - The Operating Group Manager contacted the U.S. Army MERADCOM, Ft. Belvoir, Virginia, to follow-up on their expressed interest in interagency participation with DOE alcohol fuels testing. MERADCOM is planning to implement "gasohol" testing in vehicles at Ft. Belvoir, and may expand this testing, depending on funding availability. A representative of MERADCOM was invited to the project review meeting for Reliability Fleet Testing of Alcohol/Gasoline Blends, scheduled for October 10, 1979, to discuss areas of mutual participation.

A summary paper was drafted by Aerospace to briefly describe the DOE Reliability Fleet Test Program for Alcohol/Gasoline Fuels. This draft was submitted to Mueller Associates, Inc., for use in preparing an input to the DOE Alcohol Fuels Utilization Program newsletter, as requested by the DOE Program Manager.

Preparations were continued to present the status of the Reliability Fleet Testing project at the Automotive Technology Development Contractor Coordination Meeting, to be held in Dearborn, Michigan, October 23-25, 1979. The presentation will be made jointly by Aerospace, SwRI, and the Coordinating Research Council.

5.2 Task 2 - Development of Detailed Project Activities and Schedules

The Project Plan for Reliability Fleet Testing of Alcohol/Gasoline Blends, DOE Report No. HCP/M2184-01, March, 1979, contains an overall schedule for the entire program and a detailed schedule for FY 1979

activities. An update of the overall schedule activities, consistent with actual dates of items completed to date in FY 79, was reviewed at the September project review meeting. This detailed schedule for FY 79-80 activities was distributed to the program participants, as noted in Appendix B.

The Project Plan has been given general distribution by DOE to organizations with potential interest in the fleet testing. Aerospace has assisted DOE in answering inquiries from potential fleet operators and in distributing the plan.

5.3 Task 3 - Pretest Activities

Coordination was continued with Southwest Research Institute on the task of preparing the initial Test Plan for Reliability Fleet Testing of Alcohol/Gasoline Blends. This document will support detailed discussions with potential fleet operators. The initial Test Plan was completed by SwRI in September, 1979. Final comments on this plan were discussed at the Project Review in September 1979.

Aerospace continued to follow the progress of Controlled Fleet Test planning of the Coordinating Research Council (CRC) Motor Group on Alternative Automotive Fuels. This program will provide necessary inputs on fuel blend specification and vehicle selection for the planning of the Reliability Fleet Testing of Alcohol/Gasoline Blends. The CRC Motor Group on Alternative Automotive Fuels has scheduled a meeting in Anaheim, California, on October 30 and 31, 1979, to review the details of the Systems Control, Inc. work plan for Controlled Fleet Testing.

5.4 Task 4 - Test Monitoring and Coordination

No activities have been scheduled on this task as yet.

5.5 Task 5 - Data Analysis and Evaluation

No activities have been scheduled on this task as yet.

5.6 Task 6 - Financial Management

No activities have been scheduled on this task as yet.

5.7 Task 7 - Project Documentation

Activities include preparation of the monthly progress report and reports of trips and meetings as indicated in Appendix B.

6. CURRENT STATUS OF ALL ACTIVITIES

Figure 1 depicts the overall project schedule as published in the Project Plan. Figure 2 shows FY 79-80 activities in greater detail and indicates items completed to date. Appendix B is a summary table which delineates the principal reporting activities on all task assignments from the inception of the contract through this reporting period.

7. PROBLEM AREAS

No major problems were encountered during this reporting period.

8. PLANNED ACTIVITIES FOR OCTOBER 1979

The primary activities planned for October include:

- a. Conduct the third Project Review Meeting on October 10, 1979.
- b. Update the detailed schedule of project activities.
- c. Attend the DOE Automotive Technology Development Contractor Meeting and present the status of the Reliability Fleet Test Program.
- d. Follow up, as required, on the developments of the CRC Controlled Fleet Test Program.
- e. Coordinate with SwRI and DOE to initiate Reliability Fleet Testing with potential fleet test participants.

9. EXPENDITURE STATUS

The cumulative actual total expenditure through this reporting period is \$78,200. The cumulative expenditure history is shown in Figure 3. A tabulation of expenditure by month is given in Table 1.

Figure 1. Reliability Test Project Schedule for Alcohol Fuel Blends

Figure 2. Summary of Detailed Activities Schedule for Reliability Fleet Testing (FY 79-80)

Figure 3. Cumulative Expenditure History

Table 1. Monthly Expenditure History

<u>Month</u>	<u>Year</u>	<u>Monthly Expenditure</u>	<u>Cumulative Expenditure</u>
April	1979	\$ 2,500	\$ 2,500
May		15,500	18,000
June		20,700	38,700
July		13,000	51,700
August		14,500	66,200
September		12,200	78,200
October			
November			
December			
January	1980		
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
January	1981		
February			
March			

APPENDIX A

SUMMARY OF TASK ASSIGNMENTS

1. Specific Work Requirements

The work to be performed by The Aerospace Corporation for the DOE/TP is confined to the following basic task areas.

1.1 Task 1 - Indoctrination of Industry and Operating Group Managers and Project Participants

The contractor shall prepare presentations and documents and acquaint project participants and interested parties in project plans and status, avenues of communication, operating interfaces, and other pertinent project details.

1.2 Task 2 - Development of Detailed Project Activities and Schedules

The contractor shall assess project plans such as the size, cost, and schedule for the project; the fuels to be included and the supply concepts; fleet locations, selection criteria, and vehicle requirements; and details of initial test activities.

The contractor shall coordinate, assemble, write, and publish the project details based on major contributions to be prepared by the group managers and their supporting organizations, as directed by the DOE Program Manager. The contractor shall also assure that the plan is reviewed by industry experts, that suggested changes are incorporated, and that the final document is distributed to all interested parties. The plan shall be revised and reissued by the contractor at intervals deemed appropriate by the Program Manager.

In the event that a public review cycle may be associated with either the preparation of the plan or its publication, the contractor shall provide presentation and other materials required by the Program Manager.

1.3 Task 3 - Pretest Activities

The contractor shall coordinate, as appropriate to meeting project requirements, studies, surveys, contacts, and visits necessary to provide a realistic basis for the program planning and test preparation functions. In particular, this shall involve identification of potential fleet operators and fuel suppliers, determination of vehicle modifications, defining legal and institutional requirements, and assembling cost/schedule data.

Much of this effort will be accomplished by the Industry and Operating Groups, under the coordination of the contractor. The contractor's activities shall include a compilation of needed information and due dates; definition of legal/institutional requirements and procedures to be satisfied; liaison with other state/federal organizations as designated by the Program Manager; planning of data handling and reporting techniques; and management control procedures to ensure cooperative, integrated activities, and information flow.

1.4 Task 4 - Test Monitoring and Coordination

The contractor shall monitor actual fleet test operations, assess actions necessary to the DOE Program Manager's avoiding fuel supply/demand dislocations, assess unforeseen problem situations, maintain financial controls and adjust financial allocations, assure compatible data acquisition, and otherwise interface between groups and with local or federal government agencies having an interest in the test program. The contractor shall provide surveillance of the project through regular periodic meetings with the group managers to review and assess progress and problem areas.

1.5 Task 5 - Data Analysis and Evaluation

The contractor shall maximize the quality of the output data by placing emphasis on both the data-gathering phase and the data analysis/interpretation procedures applied to the field information. The contractor shall plan the data-handling system so that the maximum amount of knowledge can be extracted from the raw inputs in a timely fashion. Financial data for the project shall be integrated with the purely technical programs to the extent determined desirable and reasonable.

The bulk of the data reduction and assessment will be accomplished by, or under the aegis of, the managers of the Operating and Industry Groups. The contractor shall be responsible for compiling and integrating the total data output into periodic progress reports for both technical and cost data. The contractor shall also ensure compatibility of data forms, procedures, and reporting techniques between the two groups and the DOE Program Manager's requirements.

1.6 Task 6 - Financial Management

The contractor shall establish uniform and comprehensive fiscal planning and management, in accordance with the directions of the DOE Program Manager. This shall include defining the level of breakdown, assumptions, and ground rules for the financial analysis.

Cost estimates shall be broken down into categories and be developed on a chronological basis so that funding requirements can be forecast for budgetary planning.

Estimates of potential industry cost-sharing for the program shall also be developed.

1.7 Task 7 - Project Documentation

The contractor shall provide two major types of reports: annual reports, subsequent to completion of the first year of the program and each year thereafter, and a final summary report of all significant findings. The contractor shall integrate the drafts of the Operating and Industry Groups into a single document, adding any additional items arising from the contractor's overview/management activities; e.g., total program costs for the year.

The final report shall be comprehensive, including not only statistical data supporting the program conclusions, but also such items as fuel specifications, program plan, vehicle materials and modification history, results of any special tests and studies, institutional problems, and a summary of any public hearings.

The contractor shall also submit monthly letter reports covering progress of each group and overall program status. In addition, the contractor shall conduct monthly project review meetings with the group managers and the DOE Program Manager. The contractor shall prepare and present progress and overview reports to outside organizations as requested by the DOE Program Manager.

APPENDIX B

Summary Table of Principal Reporting Activities of
The Aerospace Corporation under Contract No. DE-AC03-79CS50023
(includes formal reports, drafts, and memorandums or other
working papers transmitted to DOE/TP personnel to document
progress on assigned task activities)

Period Through September, 1979

Description	Type of Report
1. DOE Reliability Fleet Test Program for Alcohol/Gasoline Fuels	Briefing to Highway Vehicle Systems Contractors' Coordination Meeting, 26 April 1979 (11 pages)
2. Trip Report to TVA	Memorandum Report 7825-HMW-79-01, 18 May 1979
3. Alcohol/Gasoline Reliability Fleet Tests: A U. S. Federal Project	Briefing to Third International Symposium on Alcohol Fuels Technology, 30 May 1979
4. Trip Report to Southwest Research Institute, San Antonio, Texas	Memorandum 7825-HMW-79-02, 8 June 1979 Trip report of Technical discussions on test planning.
5. (Draft) Test Plan for Reliability Fleet Testing of Alcohol/Gasoline Blends.	Preliminary draft of Test Plan, June 12, 1979
6. Coordinating Research Council (CRC) Meeting of Motor Group on Alternative Automotive Fuels	Memorandum 7825.79.RDR-003, 20 June 1979, Trip report on controlled Fleet Test proposals
7. Report on Meeting of CRC Motor Group on Alternative Automotive Fuels, and Visit to ADM Facilities	Memorandum 7825.79.RDR-004, 2 July 1979 Trip report on Controlled Fleet Test Proposals and visit to ethanol production facility

APPENDIX B (Continued)

Description	Type of Report
8. Review of Comments on Project Plan for Reliability Fleet Testing of Alcohol/Gasoline Blends, received from Mathtech Division of Mathematica, Inc.	Letter to Mathtech in response to comments received by DOE, July 6, 1979, 7825.79.RDR-005
9. Comments on draft by DOE of Guidelines for Fleet Operation Using "Gasohol".	Letter to DOE submitting revised draft with comments, July 10, 1979, 7825.79.RDR-006
10. Progress Report for June, 1979	Monthly letter report on project status, July 10, 1979, 7825.79.RDR-007
11. Report on Project Review Meeting for Reliability Fleet Testing of Alcohol/Gasoline Blends, August 1, 1979.	Meeting report, August 1, 1979, 7825.79.RDR-008
12. Schedule for Reliability Fleet Testing of Alcohol/Gasoline Blends	Revised detailed schedule for FY 79-80, August 1979. Transmittal letter 7825.79.RDR-014, August 22, 1979
13. Progress Report for July, 1979	Monthly letter report on project status, August 10, 1979, 7825.79.RDR-012
14. Report of Project Review Meeting for Reliability Fleet Testing of Alcohol/Gasoline Blends, September 6, 1979.	Meeting Report, September 6, 1979, 7825.79.RDR-021
15. Progress Report for August, 1979.	Monthly letter report on project status, September 10, 1979, 7825.79.RDR-020.