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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20540

RESOURCES AND ECONOMIC
DEVELOPMENT DIVISION

B-164105

JUN 29 1973

The Honorable Dixy Lee Ray
Chairman, Atomic Energy Commission

Dear Dr. Ray:

We have reviewed the policies and procedures of the Atomic Energy Commission (AEC) for keeping AEC management and the Congress advised of changes in cost and schedule estimates for the construction of the Fast Flux Test Facility (FFTF). We made this review because FFTF is the highest priority project under the Liquid Metal Fast Breeder Reactor (LMFBR) program and because FFTF has experienced significant cost and schedule changes since fiscal year 1968 when the Congress authorized its construction.

FFTF will test fuels and materials for fast breeder reactors. According to AEC, FFTF is the focal point and lead plant in the LMFBR program and provides the needed pace and relevance to the development of LMFBR technology and engineering.

AEC's Division of Reactor Research and Development and Richland, Washington, Operations Office are responsible for constructing FFTF. The Division of Construction (CONS) is responsible for independently reviewing, and informing AEC management of, the progress of all AEC construction projects, including FFTF.

In July 1967 AEC estimated that FFTF would cost \$87.5 million and would be completed by April 1973. In June 1970 AEC increased the total estimated cost to \$102.8 million and extended the scheduled completion date to June 1974. In December 1972 AEC increased the total estimated cost to \$187.8 million and extended the scheduled completion date to June 1975.

In March 1973 the Director, Division of Reactor Research and Development, testified before the Joint Committee on Atomic Energy that (1) the most recent estimates had been based on an analysis of cost estimates ranging from \$185 million to \$220 million and on completion dates ranging from June 1975 to May 1976 and (2) all project participants would have to continue to improve their performance to realize these estimates.

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We believe that CONS should develop better internal reporting requirements for complex construction projects, to carry out its responsibilities for independently monitoring and assessing the progress of construction projects for AEC management. We believe also that AEC could improve its reporting to the Congress on the status of complex projects, such as FFTF.

NEED FOR BETTER
INTERNAL REPORTING REQUIREMENTS
ON COMPLEX CONSTRUCTION PROJECTS

CONS is responsible for (1) monitoring all AEC construction projects, (2) informing the various levels of AEC management of the status of construction projects, and (3) promptly reporting to AEC management potential problem areas or matters which may affect schedules and cost estimates.

CONS, as part of its responsibilities, administers a construction status and progress reporting system which requires AEC field offices or contractors to submit a monthly progress report for construction jobs for all projects estimated to cost over \$100,000. CONS evaluates these reports and uses them as a basis for informing AEC management of the progress being made and the problems being experienced.

If a project estimated to cost \$500,000 or more is 5 percent or more behind schedule, CONS requires that the monthly progress report include the reasons for the lag; the estimated lag, in weeks; and the estimated date that the project will be back on schedule. The April through August 1972 reports by the Richland Operations Office for FFTF showed lags of 5 percent or more between actual and planned progress; however, they did not estimate the time lag in weeks or the date when the project would be back on schedule.

CONS requires also that the monthly progress reports show the status of fabrication and expected delivery dates for major critical items (e.g., reactor vessels and heat exchangers) that will have a serious impact on construction progress. Since construction started, the Richland Operations Office has not shown these items on FFTF progress reports.

The Manager of the Richland Operations Office told us that monthly progress reports did not always include information on time lags and expected delivery dates for major critical items, because it was impracticable for complex projects, such as FFTF, which have many inter-related items. He stated that this type of information was included in

detailed reports to the Division of Reactor Research and Development and to contractors which had to correct such lags,

CONS also requires that the "present working estimate" in the monthly progress reports give the latest estimated cost of each line item listed for each project. The estimates are to be the latest engineering evaluations of project costs and not necessarily the official cost estimates. The monthly progress reports the Richland Operations Office submitted for March through July 1972 generally showed no changes in the present working estimate of FFTF project line items, even though cost changes related to those items had been approved during that period.

The Manager of the Richland Operations Office told us that the approved cost changes had been omitted from the monthly progress report through oversight, and after we brought this matter to the Richland officials' attention, they included the approved cost changes in the August 1972 report.

The Director, CONS, told us in September 1972 that the information required in the monthly progress reports was too structured and standardized to provide an adequate basis for assessing complex projects, such as FFTF. He told us that his division was in the process of revising the construction reporting system, particularly the requirements for the monthly progress report, and was discussing various reporting alternatives with AEC field offices and with other AEC Headquarters divisions and offices. The Director also said that, although the system for reporting on complex projects needed improvement, AEC management had been involved in solving many of the problems related to FFTF and had been kept informed of its status through other means.

CONS is also responsible for investigating potential problem areas which may contribute to construction delays and cost overruns. We therefore believe that CONS needs complete and timely cost and schedule information to effectively carry out its responsibilities for independently monitoring and assessing the progress of construction projects for AEC management.

Such information should provide CONS with a sufficient basis for (1) effectively analyzing and evaluating the actions being taken by program divisions and field offices to meet cost and schedule objectives, (2) analyzing the potential for any changes in those objectives, and (3) promptly advising the AEC Assistant General Managers of potential problem areas.

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As of May 1973 CONS was still reviewing the construction reporting system but had not revised the reporting requirements for complex projects.

Recommendation

We recommend that you require CONS to develop more specific reporting requirements for complex construction projects. Such requirements should insure that CONS has sufficient information to adequately assess the progress of such projects.

REPORTING TO THE CONGRESS ON THE STATUS OF
CONSTRUCTION PROJECTS COULD BE IMPROVED

Under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2252), AEC is responsible for keeping the Joint Committee on Atomic Energy fully and currently informed of AEC activities. In January 1969 the Joint Committee requested that AEC provide it with a semiannual report on the status of active authorized construction projects. The semiannual report for the period ended December 31 of each year is published in the Joint Committee's annual authorization hearings on AEC's budget request, and a copy is sent to the House and Senate Appropriations Committees.

The Joint Committee requested that the semiannual report provide current authorization and appropriation background information on active construction projects.

For each active construction project, the semiannual report shows the funds authorized, the current estimated cost, the initial and current estimated completion dates, and the percentage of completion for both design and construction. In addition, it includes a remarks section for additional information on the status of each project, such as a summary of the project's authorization and appropriation history. We noted that information on cost and schedule changes and problems on construction projects was given in several places in the report.

The semiannual report for the period ended June 30, 1972, showed a total cost estimate of \$102.8 million and a completion date of June 1974 for the FFTF project. In addition, it showed that design work on FFTF was about 44 percent complete and that construction was about 7 percent complete. The remarks section of the report and the letter transmitting the report stated that AEC was reviewing the schedule and the total estimated costs for FFTF.

Although not included in the semiannual report, information the Richland Operations Office sent to CONS prior to June 30, 1972, indicated that the FFTF project was behind schedule. For example, the June 1972 monthly construction summary report that CONS submitted to AEC management showed that the FFTF design was 44 percent, rather than the scheduled 56 percent, complete and that construction was 7 percent, rather than 16 percent, complete. In addition, the report summarized actual costs and discussed management actions being taken to recover schedule slippages.

Our discussions with AEC officials indicated that the total cost estimate of FFTF included in the semiannual report for the period ended June 30, 1972, was not firm at that time. These officials stated that, although the inadequacy of the cost and schedule estimates for FFTF was recognized, specific cost figures and dates were not available for reporting to the Joint Committee as of June 30, 1972, because AEC and the other project participants had not agreed on a revised project cost estimate and scheduled completion date.

AEC officials stated that the basic purpose of the semiannual report was to advise the Joint Committee of the status of the funding history of construction projects and that it was not intended to be an operational report highlighting costs and schedule changes or problems related to construction projects. They stated, therefore, that it would be inappropriate to include the same detailed information that is provided to AEC management.

AEC officials also stated that over the past several years they had provided the Joint Committee with extensive information on the FFTF project. By letter dated May 17, 1973, AEC provided a summary of such information to the Joint Committee regarding FFTF cost increases and schedule delays. AEC's letter responded to the Joint Committee's letter dated April 4, 1973, in which the Committee's Executive Director stated that

"Because the FFTF is vital to the success of the LMFBF base and demonstration programs, it is important that strict financial control and up-to-date reporting of costs be rigidly enforced. From the record, however, it does not appear that the Commission has fully and promptly advised the Committee of the changing cost estimates, schedule delays, and other factors affecting the FFTF project."

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We believe that AEC should routinely provide the Joint Committee with pertinent information on major construction projects experiencing major variances between actual performance and planned cost and schedule estimates.

Recommendation

We recommend that you direct that a system be developed to semi-annually provide the Joint Committee on Atomic Energy with information on the status of major construction projects experiencing significant variances between actual performance and the planned cost and schedule estimates last reported to the Congress. Such information should (1) compare performance with planned cost and schedule estimates last reported to the Congress and explain any major variances, including management actions being taken and planned to resolve any major problems affecting cost and schedule objectives and (2) advise the Joint Committee of any expected major cost and schedule changes or major problems.

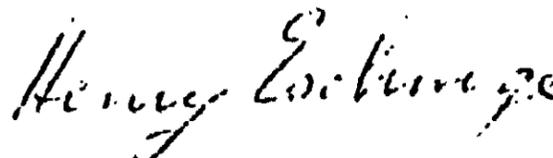
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AEC officials agreed to develop some means of providing the Joint Committee with the type of information referred to in our recommendation.

We appreciate the courtesies and cooperation extended to our representatives during the review. Please advise us of any actions planned or taken on the matters discussed in this report.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairman, Joint Committee on Atomic Energy; and the Chairmen of the House and Senate Appropriations and Government Operations Committees.

Sincerely yours,



Director, Resources and
Economic Development Division