



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

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PROCUREMENT AND SYSTEMS
ACQUISITION DIVISION

B-163058

APRIL 16, 1979

The Honorable Harold Brown
The Secretary of Defense

Attention: Assistant for Audit Reports
Room 3A336
ASD (Comptroller)

Dear Mr. Secretary:

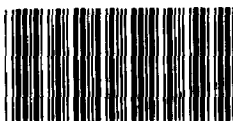
We have been reviewing the status of the Army's XM-1 tank. Although our review is not yet complete, we have several concerns we wish to make known to you at this time in view of the imminent decision on whether to begin the tank's production.

Recent operational and development testing disclosed that the XM-1 tank at this point falls short of meeting some of its critical design requirements. The principal problems are in the tank's reliability and durability. In operational testing, the XM-1 demonstrated a cumulative 104.3 mean miles between failure (MMBF) compared to the testing goal of 272 MMBF. The demonstrated performance was subsequently adjusted upward to 145 MMBF by Army officials as a result of their refining the test data. Nevertheless, the tank still falls short of achieving the test goal of 272 MMBF. The design goal is 320 MMBF. Some of the principal deficiencies contributing to the XM-1's poor reliability were:

Engine- failures resulted from excessive dirt ingestion caused by a poorly designed air filter system and leaking seals. Other failures resulted from an inadequately designed low pressure turbine wheel, an inadequate fuel drain flow system, and accessory gearbox bearing problems.

Transmission- inability to shift because of inadequate solenoids and air filter.

Fuel system- failures caused by clogged in-line fuel filters, inadequate fuel/water separator, and poorly designed fuel pumps.



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Track- broken/thrown track because of misguiding. The innovative aluminum track is not durable enough to meet XM-1 performance demands.

Operational testing also disclosed shortcomings in human factors engineering--particularly the commander's weapon station which needs to be redesigned to improve operational effectiveness.

To date over 279 modifications to the XM-1 tank have been made or planned to correct these and other known deficiencies. However, most of these changes will not be adequately tested prior to the start of production.

In spite of these problems and shortcomings, the Army is set to recommend that the tank proceed into initial production. The Army believes that modifications made so far, as well as those planned for future application, will correct the problems disclosed in testing and that the tank will achieve its design goals during the production phase. For example, the XM-1 Project Office is currently projecting that the reliability goal of 320 MMBF will be achieved in the third year of production. According to the Army's procurement plan at least 460 tanks will have rolled off the production line which would not have met this goal.

In effect, the Army is proposing to continue the concurrency which has been prevalent since the inception of the XM-1 program. The recently completed operational testing was conducted concurrently with development testing and, as now planned, development testing which is scheduled to run to November 1979, will also be conducted concurrently with initial production. This testing could result in the disclosure of additional deficiencies not known at this time. For example, the gas turbine engine which has been widely recognized as one of the high risk components selected for the XM-1 is only about half-way through its durability testing.

In addition to the hardware problems, there are a number of problems relating to the tank's support that need to be corrected. Among the concerns raised by Army logistics officials are the high fuel consumption of the XM-1 (operational testing disclosed that it uses about twice the fuel of an M60A1 tank) and the inadequacy of test sets and manuals.

In our opinion, it would be preferable to defer the initial production decision until there has been a demonstration through further testing that design changes and modifications, have indeed corrected the problems. Our view

has been, and continues to be, that total costs are minimized and system performance maximized by a step-by-step approach that recognizes and attempts to resolve high risk technical problems before going into production.

We have been told by the Army, however, that a postponement of the production decision or even a slow-down in planned monthly production rates may subject the Government to increased costs because of the loss of favorable contract options negotiated with the development contractor in 1976. For example, the Army is estimating that a reduction in tank production to 10 a month during the second year will cost \$248.6 million. In any event, it is the Army's position that the best alternative is to proceed into production as planned and avoid losing the contract options. While the Army recognizes the risk of producing tanks which will subsequently require fixes or modifications it is projecting their costs to be less than the higher prices that may have to be paid if production were delayed.

We believe, based on past experience, that this is an overly optimistic position and we are concerned that the fear of losing allegedly advantageous contractual options appears to carry more weight in deciding whether to produce this tank than those upon which a decision of this type should be based. We are also concerned that there is already deployed in Europe a number of systems whose availability for combat has been considerably reduced because of design problems. Had they been identified and corrected during system development the combat readiness of U.S. forces would be enhanced. To rush the tank into production may run the risk of adding still another critical weapon system to this list.

We recommend that, to avoid the possibility of producing a large quantity of unacceptable tanks, you defer or slow down the XM-1's production until acceptable reliability and durability levels are demonstrated.

We would appreciate receiving your comments on these matters within 30 days. Should you desire, we will be happy to discuss the details of our concerns with you or your staff. Copies of this letter are being sent to the House and Senate Committees on Armed Services.

As you know, Section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement of the actions taken on our recommendations

to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of this report and to the House and Senate Committees on Appropriations in connection with your first request for appropriations made more than 60 days after the date of this report.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "J. H. Stolarow".

J. H. Stolarow
Director