



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

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MISSION ANALYSIS AND  
SYSTEMS ACQUISITION DIVISION

B-206771

MARCH 26, 1982

The Honorable Caspar W. Weinberger  
The Secretary of Defense



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Attention: Director, GAO Affairs

Dear Mr. Secretary:

Subject: Reduced Performance and Increased Cost Warrant  
Reassessment of the Multiple Stores Ejector  
Rack (MASAD-82-26)

The Air Force plans to award a contract in June 1982 for the continued development of an aircraft bomb carrier known as the Multiple Stores Ejector Rack (MSER). The rack has been in development since 1976. It was intended for use by certain Navy aircraft as well as several aircraft operated by the Air Force. However, we have found that

--service interest in a common bomb rack has dwindled and both the Air Force and the Navy are pursuing separate bomb rack developments,

--some MSER development goals may not be achieved, and

--other alternatives to MSER have not been fully evaluated.

In addition,

--MSER's estimated development costs have tripled and average unit procurement costs could be 14 times greater than the cost of racks now in service;

--the development period has more than doubled; and

--because of the protracted development, additional procurement of current racks may be required to support F-16 production or reserve requirements.

SYSTEM DESCRIPTION AND STATUS

The MSER program began as a joint Air Force and Navy effort to provide a common bomb rack which would help correct deficiencies

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and limitations of existing bomb racks. Specifically, the program was to provide (1) a common bomb rack for the Air Force's F-15, F-16, and A-10 aircraft and the Navy's F-18 and AV-8B aircraft, (2) supersonic delivery capability, (3) improved bombing accuracy, (4) increased safety, and (5) reduced maintenance. The entire development effort was estimated to cost about \$12 million and take 4 years to complete.

In early 1980, however, it became apparent that the oversized initial MSER design was unacceptable. During the remainder of 1980, discussions and reviews of alternative designs were held to reduce aerodynamic drag and achieve joint program objectives. In November 1980 Air Force Headquarters directed a major modification to the MSER design as the best approach to meeting joint requirements. During 1981 discussions and reviews of alternative MSER designs continued, including additional designs proposed by several contractors for a new rack. In October 1981 Air Force Headquarters reaffirmed the modification of MSER as the best course. The Air Force plans to award a contract in June 1982 to the MSER developer, Western Gear Corporation, of Jamestown, North Dakota, for the major redesign effort. Meanwhile, the Navy has initiated a product improvement program on current bomb racks and is developing and plans to buy another rack.

#### OBJECTIVE AND SCOPE

Our objective was to examine the joint development program relative to initial goals, including how well the services had defined their requirements and assessed alternative solutions. We reviewed initial and subsequent revisions of joint service requirements, including supporting analyses as well as test plans, test results, and other documents reflecting program progress and status. Also, we interviewed officials at the Office of the Secretary of Defense, Air Force Headquarters, Air Force Systems Command's Armament and Aeronautical Systems Divisions, Tactical Air Command and its Tactical Air Warfare Center, Air Force Logistics Command's Warner Robins Air Materiel Area, and the Navy's Naval Air Systems Command.

#### JOINT SERVICE REQUIREMENTS AND CAPABILITIES NEED TO BE ADDRESSED

The need for a common bomb rack to meet service operational requirements and the ability of the MSER redesign effort to achieve program goals should be addressed before a contract is awarded for the modification of MSER. Plans by the Air Force and the Navy to procure other bomb racks increase the likelihood that they will find little, if any, common use for MSER. There is, also, little supporting data to indicate that other goals, such as reduced maintenance, improved safety, or supersonic weapon delivery capability, will be achieved. In some cases, they may not be required.

Much has changed since the services began to contemplate a common rack for several Air Force and Navy aircraft.

- The Navy has terminated funding and management support of MSER and initiated a product improvement program on current bomb racks. It has dropped its requirement for MSER for the AV-8B and F/A-18 aircraft. The Navy is also developing and plans to buy another bomb rack for the F/A-18 aircraft. We understand the Navy intends to monitor MSER development for possible future consideration.
- The Air Force's F-15 program office is developing and plans to buy a limited quantity of yet another bomb rack to support F-15s assigned to the Rapid Deployment Force. This rack will also be compatible with the F-16 and is a slight variant of a rack now in use with the F-15. F-15 program officials said they would recommend that the rack being developed for the plane's use in a Rapid Deployment Force role be used on other F-15s if the aircraft is given an expanded air-to-ground mission. At the same time, MSER continues to be developed for compatibility with the F-15.
- The Air Force deleted the requirement for MSER to be compatible with the A-10.
- The F-16 program officials are concerned because MSER was not optimized for their aircraft even though they may turn out to be the only user. These officials were continuing to monitor the development and status of other bomb racks.

If the MSER program is to continue, there are other program goals requiring further examination. They concern the need for improving the bomb rack's safety and for a supersonic delivery capability.

As for the safety goal, we found no data to show any problems with the current bomb racks that would require improvements. Engineers at Warner Robins told us that there are no significant safety problems with the current racks. Reports they received monthly from actual combat in Vietnam showed nearly 100 percent reliability.

In the area of supersonic delivery, questions have been raised by program officials regarding both the need for this capability and the ability of MSER to achieve this goal. Development specifications included a high ejection velocity, 20 feet per second, to achieve weapon separation at supersonic speeds. However, reaction forces attendant with this velocity stress the F-16 wings beyond structural limits. Flight tests remain to be done to evaluate the effects of supersonic delivery by the F-16 aircraft. Aside from the questionable capabilities of the delivery aircraft to fly low-level supersonic missions, F-15 and F-16 program office officials questioned the combat use of supersonic delivery because

of associated penalties, such as reduced combat radius and increased infrared signature.

While these and other questions have been raised, the Air Force and the Navy have not jointly evaluated either the continued validity of their goals or the feasibility of achieving the goals.

There have been many discussions and studies of alternative MSER designs to reduce drag, cost, and weight, and more recently, consideration was given to other rack designs provided by other contractors. However, in our opinion none of these assessments have been adequate. In 1980 the Air Force and the Navy reviewed only MSER redesign options before the Air Force selected the modification of MSER as the preferred candidate. When the Navy terminated active participation in the MSER program, and the F-15 program office was directed to make a limited buy of another rack to satisfy Rapid Deployment Force requirements, another review was made to satisfy only unique F-16 requirements. The most recent Air Force Headquarters study, completed in October 1981, only considered Air Force requirements and did not include Navy participation. Program direction from that review deleted the Navy's unique hardware and testing requirements but required continued accommodation of Navy requirements, if practical, for a future joint service expanded program.

The former MSER Navy Deputy Program Manager told us attempts to review joint requirements and supporting data led only to additional doubts regarding MSER's goals such as improved safety and supersonic delivery capability. Because of these questions, the program manager did a separate review of bomb rack deficiencies and limitations which were used to structure the current Navy product improvement program.

#### SIGNIFICANT COST INCREASES AND SCHEDULE DELAYS

MSER development costs have tripled and unit procurement cost could exceed 14 times the cost of bomb racks now in service. Further, the MSER development period has more than doubled, requiring the Air Force to decide whether it should, in the interim, buy additional racks now in service to meet F-16 production or reduce reserve requirements.

After spending approximately \$21 million for development, the Air Force is about to contract for the redesign effort estimated to cost an additional \$18 million. The total development effort could cost approximately \$39 million, or more than three times the initial \$12 million estimate.

MSER unit procurement costs are high compared to racks now in service. According to Air Force data, the average unit procurement cost for a modified MSER in 1981 dollars exceeds \$65,000. This amounts to over 14 times the current estimated unit cost of

\$4,500 for each rack used on the F-16. Total program costs to meet the F-16's MSER requirements are estimated at \$653 million.

MSER's development period has more than doubled. Initially, the total development effort was to take 4 years to complete; however, now after approximately 6 years, the Air Force is planning to continue development for another 3 years for a total of 9 years until completed in 1985. Because of the MSER schedule delay, the Air Force has to draw from its inventory reserve to support F-16 production aircraft. To preclude further inventory reductions, the Air Force may be required to procure additional inventory racks. One of the reasons the Navy terminated its participation in the program was because MSER was unavailable to support F/A-18 production schedules.

#### CONCLUSIONS AND RECOMMENDATIONS

Much has changed since MSER was justified and initiated in 1976 as a joint Air Force and Navy program. The program sought to develop a common bomb rack and prevent the proliferation of such racks, but this has not occurred. After nearly 6 years in development and the expenditure of \$21 million, a common bomb rack has not been developed and the proliferation of racks continues.

The Air Force has basically reduced its MSER requirements to one aircraft, the F-16, and the Navy has all but pulled out of the program. Meanwhile, the Air Force's F-15 is being fitted with a different newly developed bomb rack as is the Navy's F/A-18, and each service, to some extent, is involved in separate product improvement programs. What the program sought to avoid has continued to occur. Despite this situation, the Air Force is planning on a major redesign of MSER at the estimated additional cost of \$18 million. A decision is needed on whether it is desirable from the standpoints of efficiency and economy to permit the varied bomb rack developments to proceed at the same time that MSER's development continues.

Before authorizing further expenditure of funds for MSER, we recommend that you require the Secretaries of the Air Force and the Navy to determine whether a common bomb rack is still needed, whether MSER will meet Air Force and Navy requirements, and whether it is cost effective.

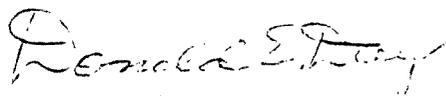
In addition, we recommend that you tell the Secretary of the Air Force to delay the planned modification of MSER, pending results of the above. If MSER is determined to be the preferred bomb rack, we recommend that you require the Secretaries to justify continuation of other bomb rack programs before further funding is permitted.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on 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 the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Since we did not request formal comments, and in view of the pending procurement, we would appreciate receiving a copy of your response when it is provided to the congressional committees.

We are sending copies of this letter to the Director, Office of Management and Budget; the chairmen of the House and Senate Committees on Armed Services and Appropriations, House Committee on Government Operations, and Senate Committee on Governmental Affairs; and the Secretaries of the Air Force and the Navy.

Sincerely yours,

*for*   
W. H. Sheley, Jr.  
Director