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

DEFENSE DIVISION

SEP 16 1971

B-163058

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The Honorable
The Secretary of Defense

Attention: Assistant Secretary of Defense
(Comptroller)

Dear Mr. Secretary:

The General Accounting Office has made a review of the operational test and evaluation of the Fast Automatic Shuttle Transfer (FAST) system and other systems (GAO Code 77104). The review was performed at the Navy's Operational Test and Evaluation Force (OPTEVFOR), Norfolk, Virginia.

In conjunction with this review, we noted that production commitments had been authorized by the Navy before adequate testing of about one-third of the systems assigned to OPTEVFOR as of September 30, 1970, for operational testing and evaluation. Consequently, OPTEVFOR is unable, in these cases, to perform sufficient operational evaluation of new equipment to determine its suitability for service use. As pointed out in previous reports, concurrent development and production frequently results in additional expenditures of time and money to identify and correct deficiencies and may cause delays in deployment of effective systems.

Our work indicates a need for management improvements which, we believe, would supplement the current measures being taken by the Department of Defense and the Navy to improve operational test and evaluation procedures. Although we did not assess the urgency of the procurements and other factors which the Navy decisionmakers may have considered in these cases, we are reporting our findings at OPTEVFOR and our suggestions for earlier operational evaluation to permit timely consideration of any risks related to urgent requirements.

OPTEVFOR's MISSION AND FUNCTIONS

OPTEVFOR's operational evaluation of newly developed equipment normally follows the developing command's technical evaluation and determination that the equipment meets the technical requirements. The Chief of Naval Operations (CNO) then directs OPTEVFOR to perform independent test and evaluation in an operational environment. OPTEVFOR determines whether the equipment meets the operational requirements and makes recommendations concerning its suitability for service use. This includes making a determination that the equipment can be operated, maintained, and supported logistically by service personnel.

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CNO instructions provide that new equipment will not be committed to large-scale production until its suitability for service use has been established through operational testing. When new items are submitted for testing in accordance with this policy, OPTEVFOR's test and evaluations are usually performed using prototype models of the equipment. In cases where urgency or important operational considerations indicate a need to deviate from this policy, procurement prior to completion of operational testing may be authorized. In instances where procurement is authorized before equipment has undergone operational tests and evaluations, service use and operational testing normally occur concurrently, as in the case of the FAST system. In these instances, OPTEVFOR usually utilizes equipment already delivered to the fleet to make its tests.

To meet its responsibilities, OPTEVFOR is organized into three test and evaluation squadrons located at Key West, Florida, and Point Mugu and China Lake, California, and two test and evaluation detachments located at New London, Connecticut, and Key West, Florida. It has a total military strength of about 1,400 officers and enlisted personnel and about 24 civilian personnel. OPTEVFOR has about 40 assigned military aircraft and uses other shore facilities on both the east and west coasts as well as ships of both the Atlantic and Pacific Fleets.

The results of OPTEVFOR's tests of new equipment and its recommendations are submitted directly to the CNO. Decisions as to the acceptability of new equipment for operational use are made by the CNO.

PROCUREMENT COMMITMENTS MADE BEFORE COMPLETION OF OPERATIONAL TESTING

Our review of the FAST system, which is used for underway replenishment of ammunition and stores between supply and combatant ships, identified problems that can result when new equipment is procured without completing operational testing. We found that the FAST system was installed on about 50 ships before operational testing and service use showed that the system was not reliable and could not be effectively maintained.

Procurement of the FAST system started in 1960. CNO did not assign this equipment to OPTEVFOR for operational evaluation until October 1964; operational testing started in April 1966 and was completed in April 1968. OPTEVFOR recommended that the system not be accepted for operational use until correction of a number of deficiencies. The Navy has since removed or modified most of the equipment developed for this system in order to provide a more reliable and simpler transfer system.

In view of our findings on the FAST system, we broadened our review to cover all systems assigned to OPTEVFOR for operational testing as of September 30, 1970. As of this date, the CNO had assigned to OPTEVFOR

41 items of equipment for operational testing to determine suitability for service use.

We requested the Navy to complete a questionnaire on each of these projects to facilitate our evaluation of whether OPTEVFOR was being utilized in accordance with its assigned mission. The Navy returned questionnaires for 39 of the 41 projects. While the questionnaires contained certain inconsistencies, we determined the following:

	No. of projects
Contracts for production of items for service use entered into:	
Before or about the date operational testing was requested	5
After operational testing was requested but before tests were started	4
After operational tests were requested but before the tests were completed	4
	13

Thus, production commitments had been authorized before the completion of operational test and evaluations for about one-third of these systems. In these cases, OPTEVFOR was determining suitability for service use after procurement commitments had been made. Pertinent data regarding each of the 13 cases summarized above is included in the appendix to this report.

These 13 cases involve conditions similar to those discussed in our report to the Congress entitled "Adverse Effects of Large-Scale Production of Major Weapons Before Completion of Development and Testing" (B-163058 dated November 19, 1970). In that report, we pointed out that most of the Navy's major weapons systems were approved for large-scale production before development and testing were completed. The report also commented that (1) when concurrent development and production occurred, weapons frequently did not perform as intended resulting in expenditures of large sums of money and time to identify and correct deficiencies and (2) the deployment of effective weapons may not have been accelerated and, in fact, may have been delayed.

We made a limited examination into the 13 cases where production commitments were authorized prior to completion of operational evaluations and found adverse effects similar to those described in the above report.

In one case, we found that contracts for production of 829 gun pods costing $18.6 million were awarded in December 1964 and June 1965. After units of this equipment were placed in service, various Navy operational commands reported that the equipment was not satisfactory. During OPTEVFOR's evaluation--requested by CNO in August 1965 and completed in March 1968--it was also determined that the gun pods were unsatisfactory. In October 1966 CNO directed that no additional units be procured because this equipment could not be considered reliable.

With respect to timely utilization of OPTEVFOR we found that delays have occurred in the assignment of projects to OPTEVFOR. In addition, we found that delays have occurred in the commencement of tests by OPTEVFOR after projects have been assigned by the CNO. We noted, for example, that OPTEVFOR (1) was not requested by the CNO to perform operational tests on one item until about two years after the date of initial procurement action, and (2) did not start actual testing on another item until over four years had elapsed from the date testing was requested. The appendix to this report illustrates similar delays for other items.

AGENCY ACTIONS

In March 1970, in commenting on the draft of our earlier report (B-163058), the Navy stated it would revise its instructions regarding concurrent development and testing of weapons systems. Subsequently, in an attachment to a memorandum dated December 21, 1970, to the Secretary of Defense, the Secretary of the Navy cited certain weaknesses in the conduct of operational tests and evaluations. To improve the effectiveness of operational tests and evaluations, the Secretary stated that he planned to (1) centralize the test and evaluation forces to achieve a greater depth and variety of analytical capability, data processing facilities, and instrumentation; (2) give OPTEVFOR a role earlier in the development process; and (3) strengthen the present system of monitoring the correction of deficiencies revealed during operational evaluations.

In February 1971 the Office of the Secretary of Defense established a position of Deputy Director for Test and Evaluation with across-the-board responsibilities for the Office of the Secretary of Defense in test and evaluation matters. Also, in March 1971, the Navy established a Director, Research, Development, Test and Evaluation (RDT&E) within CNO. In May 1971, the Navy established an Assistant Director for OT&E and a Test and Evaluation Division within the Navy's Office of the Director, RDT&E.

We were informed by an OPTEVFOR official in June 1971 that no specific changes had occurred in the conduct of OT&E at the operating level. At a meeting with officials of the Navy's Office of the Director for RDT&E in August 1971, we were informed that certain guidance concerning the conduct of operational test and evaluation had recently been

received from the Secretary of Defense, but in view of the newness of their organization, actions had not yet been taken at the Service headquarters level to implement these instructions.

CONCLUSIONS AND RECOMMENDATIONS

The delays in requesting OPTEVFOR to perform operational tests and in the start of testing indicate a need in cases of urgency (1) to assign higher priorities to operational test and evaluation effort and (2) to emphasize earlier operational evaluation by the independent test agency to permit consideration by the decisionmaker of any risks related to large-scale production of urgent requirements before completion of operational testing. We believe that a decision to commence production before completion of testing because of urgent need should be accompanied by an equally urgent effort to complete the required operational evaluations.

We also believe that, in cases where urgency may be a factor, there is a need for earlier coordination of the technical and operational evaluations. In this way, optimum information--concerning system operational effectiveness and the associated risks--may be made available to the decisionmaker earlier in the acquisition cycle.

Our major concern in such instances is whether the decisionmaker has sufficient data available to assure and to document that the risks connected with the decision to proceed to full-scale production because of urgent requirements are reduced to acceptable levels so that, in his opinion, the decision will not jeopardize effective operational use of the equipment. In instances where the absence of military urgency permits the use of initial or pilot production units to complete realistic operational evaluations, we are also concerned that the initial procurement is approved only for the limited quantities needed for a determination of operational suitability. From our experience, it appears that when the approval for large-scale production of an item is made before completion of operational evaluation testing, harmful cost and performance consequences usually occur.

Reassignments of responsibility and organizational changes made or now under consideration at the close of our review may result in strengthening controls over the matters noted during our review. However, as of June 1971, some 15 months after the date of the Navy's reply to our earlier draft report (B-163058), we noted no significant changes at the Navy's test and evaluation operating levels.

Accordingly, we are recommending that, together with the organizational changes, specific steps be taken to assure that (1) initial contracts for production units are awarded only for the minimum quantities needed for operational testing and for any urgent requirements which must be met while operational suitability is being established;

(2) in cases of essential urgent need, the decisionmaker has sufficient operational test data to reasonably establish and document that risks resulting from the urgent requirements are acceptable; and (3) OPTEVFOR be directed to proceed with the required tests on a priority basis. In this regard, we further recommend that OPTEVFOR be required to monitor the development of systems and components requiring operational evaluations in order to better plan OPTEVFOR's future workload and to arrange for testing at the earliest possible date, particularly when urgency is a compelling factor.

We would appreciate your comments and advice of any specific actions planned or being taken to improve the utilization of operational test and evaluations within the Navy. If you or your representatives wish to discuss these matters or require additional information, please contact Mr. Harold H. Rubin, Associate Director, code 129, extension 4515.

Since this report contains recommendations for your consideration, copies are being sent to the Appropriations and Government Operations Committees of both Houses of the Congress under the provisions of Section 236 of the Legislative Reorganization Act of 1970. We will appreciate receiving copies of the statements you furnish the specified Committees in accordance with these provisions.

Copies of this letter are also being sent to the Director of Defense Research and Engineering and the Secretary of the Navy for their information.

Sincerely yours,

E. H. Bailey

Director

APPENDIX I

DEPARTMENT OF THE NAVY
OPERATIONAL TEST AND EVALUATION FORCE

Schedule of Pertinent Data for Projects Showing
Procurements Before Completion of
Operational Test and Evaluation
as of March 31, 1971

Case number	Date of developing agency's request for evaluation	Date assigned to OPTEVFOR by CNO	Testing by OPTEVFOR		Date procured for service use
			Date started	Date completed	
1	6/28/65	8/26/65	9/10/65	3/12/68[a]	12/1/64[d]
2	10/30/66	11/23/66	3/29/71	-	FY 67[d,e]
3	3/14/67	5/12/67	10/67	-	4/12/68[d]
4	11/13/67	3/20/68	3/12/69	-	3/2/70[d]
5	12/7/67	2/19/68	5/68	-[b]	7/25/68
6	7/15/68	3/14/69	2/70	3/70[c]	9/13/68
7	8/5/68	1/8/69	8/69	7/70	9/27/69[d]
8	5/22/69	7/28/69	8/31/70	11/70	FY 67[d]
9	6/24/69	10/30/69	5/70	2/71	11/19/68[d]
10	1/15/70	4/10/70	-	-	10/7/70
11	2/5/70	5/25/70	-	-	9/29/70
12	3/10/70	4/22/70	2/71	-	FY 71[e]
13	6/12/70	9/16/70	3/5/71	-	8/22/69

[a]Open end project to provide for testing of additional components as needed.

[b]Additional component of system to be tested.

[c]Items to be tested on supplemental delivery vehicles.

[d]Multiple procurement contracts awarded commencing with the initial procurement date shown.

[e]Exact dates not shown in questionnaires completed by the Navy.