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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

The Army Should Confirm Sergeant York Air Defense Gun's Reliability And Maintainability Before Exercising Next Production Option

Prototypes delivered by the Sergeant York prime contractor have not measured up to Army performance requirements. The Army should test production units incorporating corrective modifications before contracting for next production increment.



120440

GAO/MASAD-83-8
JANUARY 27, 1983

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D C 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the need to demonstrate the Sergeant York air defense gun's reliability, availability, maintainability, and durability before the Army exercises the second-year production option.

For the past several years, we have reported annually to the Congress on the status of selected major weapon systems. This report is one in a series that is being furnished to the Congress for its use in reviewing fiscal year 1984 requests for funds.

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretary of Defense.

A handwritten signature in cursive script, reading "Charles A. Bowsher".

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

THE ARMY SHOULD CONFIRM SERGEANT
YORK AJR DEFENSE GUN'S RELIABILITY
AND MAINTAINABILITY BEFORE
EXERCISING NEXT PRODUCTION OPTION

D I G E S T

The Army's plans to test the reliability and maintainability of its new Sergeant York air defense gun had to be abandoned when the prototype the prime contractor delivered for testing in May 1982 was found to be unacceptable.

In a preliminary demonstration of the prototype, the radar fire control system failed to operate reliably, the graphic display unit failed intermittently, and the armament feed system's performance was unsatisfactory. During cold chamber testing, the system's controlling computer performed erratically in temperatures below 25 degrees Fahrenheit and the hydraulics, which would not operate properly without being preheated, developed numerous leaks. Army test and evaluation agencies subsequently concluded that the prototype was unsuitable for testing and recommended that the government tests be discontinued.

Some reliability tests are being held at the Aberdeen Proving Ground, Maryland, but, instead of Army agencies performing them, they are being done under the joint direction of the Sergeant York project manager and the prime contractor, Ford Aerospace and Communications Corporation. This is a departure from the normal weapon system acquisition procedure which is to have new weapon systems tested and evaluated by Army agencies who operate independent of the project manager and are looked to for objective assessments. The scope of the contractor tests is smaller than what Army testers had planned. (See pp. 5 and 6.)

Canceling the government's reliability, availability, maintainability, and durability (RAM-D) tests has caused some concern among officials in the Office of the Secretary of

GAO/MASAD-83-8
JANUARY 27, 1983

Defense who earlier supported Sergeant York's initial production last May (See pp 6 and 7)

The Army has no plans to have its test and evaluation agencies perform reliability and maintainability testing until after initial production units become available in March 1984. At that time, production tests will be run from which the Army plans to extract reliability and maintainability data. By that time, Sergeant York will have been in production almost 2 years. The contract with Ford has three production options. The first, for 50 systems, was exercised in May 1982. A decision on the second, for 96 systems, is due by May 1983. The third option, for 130 systems, must be exercised by May 1984. Altogether, the Army plans to procure 618 Sergeant Yorks at a program cost it now estimates to be \$4.2 billion (See p. 2.)

PROTOTYPES NOT MEASURING UP TO REQUIREMENTS

The delivery of a prototype unsuitable for RAM-D testing continues a history of difficulties the contractor has had with developing a prototype free of a number of deficiencies. The prototype the contractor is now testing, and the one delivered for government testing, are modified versions of the first prototypes delivered for competitive testing in June 1980. Ford also modified the original prototypes before a 90-day "check test" begun in November 1981. Testing and evaluating the prototypes each time they were delivered have disclosed numerous deficiencies and a need to upgrade and redesign them to achieve a satisfactory configuration for a production model. A production model will not be available until September 1983, its required delivery date. (See pp. 7 and 8)

Canceling the government's RAM-D tests is disconcerting since it indicates that at this late date the Ford Aerospace prototype still has some serious deficiencies. On the other hand, placing these tests largely under the direction and control of the contractor is consistent with the acquisition strategy which, throughout the development, has seen the government more in the role of an observer than a participant.

In GAO's view, this will permit a better assessment of the strategy to be made later on.

Nevertheless, an assessment of the prototype's progress is still crucial before a decision is made on whether to exercise the next production option. In the absence of the usual degree of participation by the Army test and evaluation agencies, the project manager seems to be the only one with sufficient knowledge of the program to assess Sergeant York's reliability and maintainability. With attention focused on the project manager's assessment, GAO believes the project manager will not permit any bias stemming from the role as a program advocate, to influence the report. The decision on whether to exercise the option, however, should be made at the highest Army level (See p. 11.)

ASSESSMENT OF ACQUISITION STRATEGY
IS PREMATURE

The strategy for procuring Sergeant York is unique. It leaves the contractor with full responsibility to design and produce a defense gun to meet general Army performance requirements. Throughout the development the Army has stood aside, adopting a so-called "hands-off" policy.

Since the acquisition strategy still has to run its course, an assessment of its success or failure is premature. It is apparent, however, that greater priority has been given to adhering to the schedule than to correcting some serious system performance problems at this time. Moving ahead with the program, including exercising the first production option when the prototypes continue to exhibit serious shortcomings, attests to this. In the final analysis, the strategy's success will be measured by (in addition to successful containment of cost growth) Sergeant York's performance as well as its deployment on schedule. An assessment of the strategy should await the opportunity for the Army to test and evaluate a production model. Until such assessment can be made it would appear prudent not to repeat the strategy in a future weapon system acquisition.

CONCERNS PERSIST OVER SERGEANT
YORK'S MAINTENANCE AND SUPPORTABILITY

Two general concerns have been voiced about Sergeant York's maintenance. First, Army logistics evaluators are apprehensive about the limited built-in test capability that Sergeant York has demonstrated so far. Second, officials in the Office of the Secretary of Defense have questioned the planned maintenance concept by which sophisticated and unproven field maintenance test sets are to be located in the forward, direct support area. They believe that in the stressful conditions that prevail there the test equipment may not function properly, and they have asked that other maintenance concepts be formulated to support Sergeant York in its first 2 years of deployment until the test sets are proven out

There is merit to the argument that it is risky to place unproven test equipment in the direct support area. However, advantages of doing so appear to warrant putting this equipment to the test in the forward area for an interim period so that its performance in stressful conditions can be gauged. (See pp. 9 to 11.)

RECOMMENDATIONS

GAO recommends that the Secretary of Defense

- require the Army to have the project manager prepare an assessment of Sergeant York's progress in the reliability and maintainability tests that the contractor is doing, and to have this report forwarded to the Under Secretary of the Army before the decision for exercising the second production option comes due;
- direct the Army, in whatever interim maintenance concept it elects to adopt, to provide for stationing some of the test equipment in the direct support area where it can be proven out before a final decision on its location is made; and
- refrain from again prescribing or endorsing the acquisition strategy followed in Sergeant

York until the benefits of its application to that program can be evaluated.

AGENCY COMMENTS

Comments were received from the Department of Defense. Defense officials said that the decision to terminate the government tests stemmed from several factors. These included the belated realization that certain prototype subsystems were close to wearing out after 2-1/2 years of constant testing and the prototype's lack of a number of features that will appear in the production model, making that model more representative for test purposes.

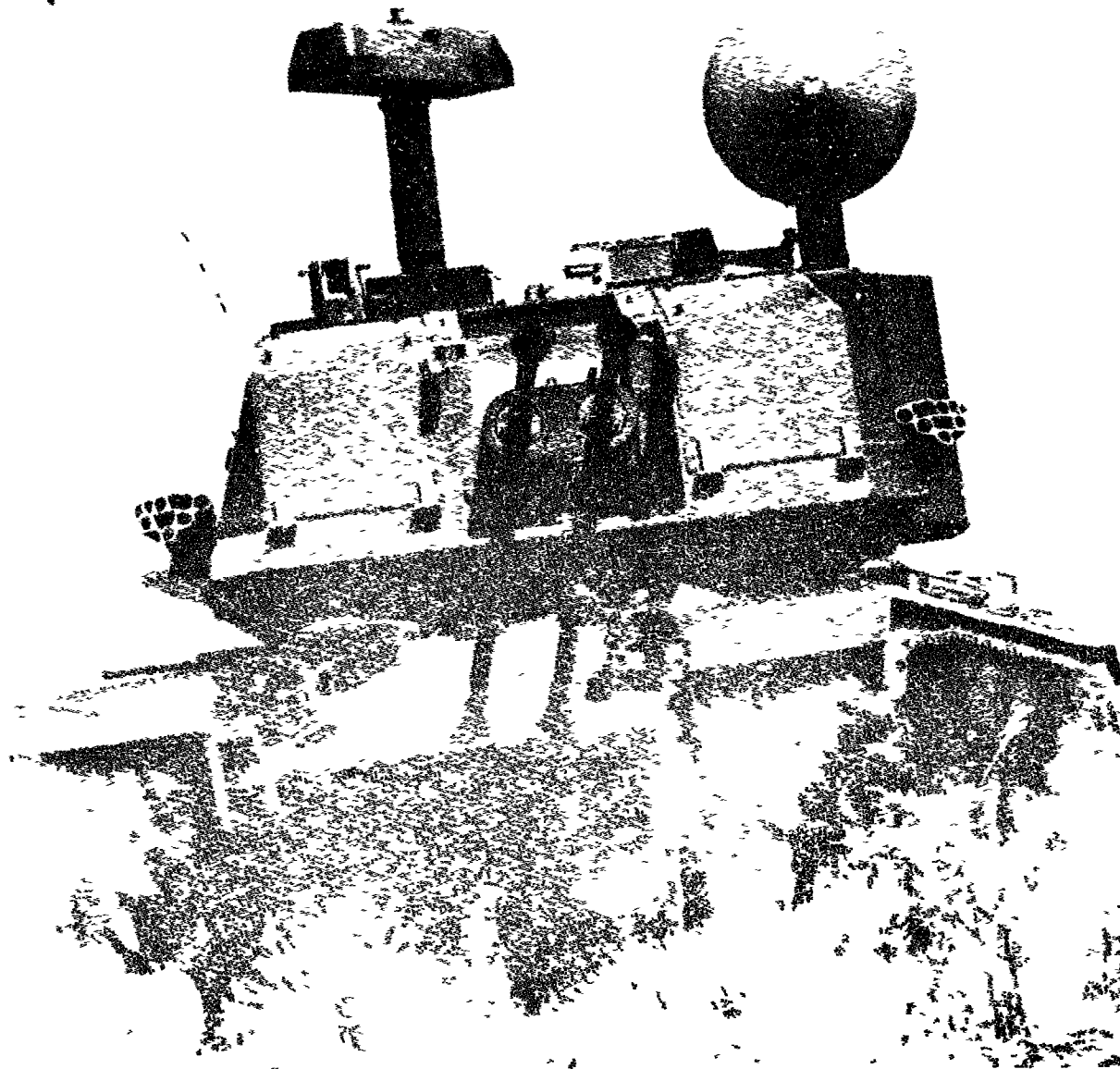
GAO's concern is that there will be little authenticated information as to whether Sergeant York measures up to the Army's reliability and maintainability requirements until 2 years after production has begun.

Defense officials do not see a need to formally require a program assessment of Sergeant York's performance by the project manager before the decision on exercising the next production option. They said Army assessments are made continuously. GAO thinks it is important to have a formalized assessment to establish accountability, particularly since Sergeant York has had less government testing and evaluation than new weapon systems usually receive.

We undertook this review because of the impending important decisions to be made both by the Secretary of Defense and the Congress on a forthcoming Army request to continue to commit large resources to the procurement of Sergeant York.

C o n t e n t s

	<u>Page</u>
DIGEST	1
CHAPTER	
1	1
INTRODUCTION	1
System description	1
Program history	2
Important coming events	2
Our previous reports	2
Objective, scope, and methodology	3
2	5
GOVERNMENT TESTS TO VERIFY SERGEANT YORK'S RELIABILITY AND MAINTAINABILITY ARE NOT PLANNED BEFORE PRODUCTION BEGINS	5
Prototype found unacceptable for testing	5
Contractor conducting reliability testing	5
Discontinuing government tests is causing some concern among Defense organizations who previously supported entry into production	6
Prototypes not measuring up to requirements	7
3	9
CONCERNS PERSIST OVER SERGEANT YORK'S MAINTENANCE AND SUPPORTABILITY	9
Army logistics community questions supportability of Sergeant York when fielded	9
Inherent risk in Sergeant York's maintenance concept	10
4	11
CONCLUSIONS, RECOMMENDATIONS, AND AGENCY COMMENTS	11
Conclusions	11
Recommendations	12
Agency comments	12
 <u>ABBREVIATION</u> 	
RAM-D	reliability, availability, maintainability and durability



Sergeant York Air Defense Gun

CHAPTER 1

INTRODUCTION

The Army is developing the Sergeant York air defense gun, formerly known as the Division Air Defense gun, to fill a perceived air defense void in the forward battle area. Sergeant York will engage armed helicopters and fixed-wing aircraft used in the close-air-support role. In a secondary surface-to-surface role, it will engage lightly armored vehicles, trucks, and personnel. Thirty-six Sergeant York systems will replace the 24 self-propelled Vulcan air defense guns currently deployed in each of the 14 armored, infantry, and mechanized divisions. Initial operational capability is planned for April 1985. The Army plans to procure 618 Sergeant York systems through 1989, of which 504 will be deployed, with 114 being used for training purposes.

Sergeant York's estimated unit program cost is \$6.8 million. The total estimated program cost is \$4.2 billion for 618 systems plus 4 prototypes. A funding profile follows.

<u>Category</u>	<u>Total</u> (millions)
Development	\$ 226.6
Fire unit	2,991.8
Spares	379.3
Ammunition	584.1
Ammunition production facilities	<u>47.5</u>
Total	<u>\$4,229.3</u>

SYSTEM DESCRIPTION

Sergeant York's turret and other components such as the prime power unit are mounted on an M48A5 tank chassis. Overall, Sergeant York closely resembles a tank. However, when its prominent radar antennae are extended, the system's height is 15 feet compared, for example, to the M1 tank's 8 feet. Sergeant York's major subsystems are the tank chassis, the turret which contains most of the system's electronic equipment, and the radar which is derived from the F-16 aircraft's radar. Its primary armament are twin 40mm BOFORS L70 guns. The system is operated by a three-member crew.

Sergeant York's guns can be fired in the automatic or semi-automatic modes, either singly or in pairs. The 40mm ammunition for the system consists of proximity-fuzed, point-detonating, and target practice rounds. The system also has a 7.62mm machine gun mounted on a pedestal next to the squad leader's hatch.

PROGRAM HISTORY

Engineering development contracts totaling about \$86 million were awarded to Ford Aerospace and Communications Corporation and to General Dynamics Corporation on January 13, 1978. Each competing contractor delivered two prototype systems to Fort Bliss, Texas, in May and June 1980, respectively, for combined development and operational testing. Testing was completed in November 1980. On May 7, 1981, Ford was awarded a fixed-price incentive contract with a ceiling price of \$1.725 billion. The contract required Ford to complete engineering development and included three production options to be exercised annually beginning in May 1982, for 50, 96, and 130 systems and associated items. The first option for 50 units was exercised on schedule. Final delivery of the total of 276 systems included in the options is scheduled for September 1986.

IMPORTANT COMING EVENTS

In May 1983 the Army must decide whether to exercise the second option to buy 96 more Sergeant York systems. In September 1983 the contractor is expected to deliver the first of the 50 production units now under contract. The 50 units are to be used primarily for testing and training. Initial operational capability is scheduled for April 1985. The Army plans a significant amount of testing with the production models.

OUR PREVIOUS REPORTS

We have issued two previous reports on Sergeant York 1/. The theme in both reports was that production not proceed until sufficient testing had been done to indicate the system's reliability and supportability. The Department of Defense response was that Sergeant York had met most of its performance specifications and was ready for production. Defense acknowledged shortcomings with respect to the system's supportability and that risks existed in proceeding into production, but said these were outweighed by evidence that necessary remedial actions had been identified, the urgency to field a new air defense gun, and cost savings achievable by not delaying production.

1/"Inherent Risk in the Army's Acquisition Strategy Demands Particular Caution in Evaluating the Division Air Defense Gun System's Production Readiness," dated 1/31/80 (C-PSAD-80-9)

"Tests and Evaluations Still in Progress Should Indicate Division Air Defense Gun's Potential Effectiveness," dated 2/26/82 (C-MASAD-82-7)

OBJECTIVE, SCOPE, AND METHODOLOGY

We undertook this review because of the impending important decisions to be made both by the Secretary of Defense and the Congress on a forthcoming Army request to continue to commit large resources to the procurement of Sergeant York

The objective of this review was to evaluate the Army's management of the Sergeant York program and to assess the weapon system's program in development during the past year

In reviewing the system's progress, we examined reports by Army test and evaluation agencies and discussed their significance with the principal parties concerned, including the prime contractor and officials of the project manager's office.

We also discussed with the prime contractor and with individuals of the Army logistics agencies, their assessment of the maintenance concept planned for Sergeant York.

We did not review the enemy threat which this system is to counter. However, the project manager's office stated that there are no indications the threat has changed to any significant degree since our last report of February 1982. We visited the following organizations for the purposes of discussions and obtaining documentation.

- Army Armament Research and Development Command's Sergeant York Project Office, Dover, New Jersey
- Army Human Engineering Laboratory Detachment, Dover, New Jersey
- Office of the Secretary of Defense, Washington, D C.
- Headquarters, Department of the Army, Washington, D.C
- Ford Aerospace and Communications Corporation, Newport Beach, California
- Test and Evaluation Command, Aberdeen, Maryland
- Army Materiel Systems Analysis Activity, Aberdeen, Maryland
- Materiel Testing Directorate, Aberdeen, Maryland
- Operational Test and Evaluation Agency, Falls Church, Virginia
- Logistics Evaluation Agency, Mechanicsburg, Pennsylvania.

--Product Engineering Services Office, Alexandria, Virginia

Our review was made in accordance with generally accepted auditing standards.

CHAPTER 2

GOVERNMENT TESTS TO VERIFY

SERGEANT YORK'S RELIABILITY

AND MAINTAINABILITY ARE NOT PLANNED

BEFORE PRODUCTION BEGINS

The contractor's progress in developing the Sergeant York has not kept pace with the Army's plans for testing its reliability, availability, maintainability, and durability (RAM-D). The Army had scheduled a 7-month RAM-D test beginning in February 1982, which was to be done by its Test and Evaluation Command at the Aberdeen Proving Ground, Maryland. This critical testing was intended to evaluate the system's performance for the first time under the stressful conditions to be expected when it is engaged in combat. The Army agreed to delay the test's start from February to May 1982 to give the contractor more time to modify and upgrade the prototype it was to deliver for the tests.

PROTOTYPE FOUND UNACCEPTABLE FOR TESTING

The additional time provided was apparently not enough. After three attempts to demonstrate the prototype's readiness for RAM-D testing, the Test and Evaluation Command and the Army Materiel Systems Analysis Activity which was to evaluate the RAM-D results, concluded that the prototype's deficiencies rendered it unsuitable for testing. Both organizations recommended to the project manager that the planned government tests be discontinued. They further recommended that the upcoming second option for the procurement of 96 systems not be exercised until Sergeant York successfully completes government RAM-D testing.

The Army Materiel Systems Analysis Activity and the Test and Evaluation Command became concerned after the prototype that the contractor delivered for the RAM-D testing exhibited numerous deficiencies in a demonstration before testing was to begin. For example, during the last of three demonstration attempts, which included a 50-mile road test, the radar fire control system failed to operate reliably, the graphic display unit failed intermittently, and the armament feed system could not be satisfactorily operated. Further, during cold chamber testing the system's controlling computer performed erratically in temperatures below 25 degrees Fahrenheit and the hydraulics, which would not operate properly without being preheated, developed numerous leaks.

CONTRACTOR CONDUCTING RELIABILITY TESTING

The Army has no plans to have its test and evaluation agencies perform reliability and maintainability testing until after

initial production units become available in March 1984. Production tests will then be run from which the Army plans to extract reliability and maintainability data. By that time, Sergeant York will have been in production almost 2 years.

Following the discontinuance of the government's 7-month RAM-D test in September 1982, a similar test was started at Aberdeen, instead of the canceled test, which is being done under the joint direction of the prime contractor and the project manager. This is a departure from the normal weapon system acquisition procedure which is to have new weapon systems tested and evaluated by Army agencies that operate independent of the project manager and are looked to for objective assessments. The scope of the contractor tests is less than the one which the Army test and evaluation agencies had planned to do. The system will accumulate less mileage and fire less rounds, and the fire control system will be operated for a lesser number of hours.

Both the project manager and the contractor believe that the contractor's tests are progressing well, the only difference from the original plan being that this testing is not managed or evaluated by the Army's development testers and evaluators. The project manager has assembled a team to collect and analyze data on the system's performance in the contractor tests, analyze test failures, and assess any required corrective actions together with the contractor.

DISCONTINUING GOVERNMENT TESTS IS CAUSING
SOME CONCERN AMONG DEFENSE ORGANIZATIONS
WHO PREVIOUSLY SUPPORTED ENTRY INTO PRODUCTION

Canceling the government's RAM-D tests has caused the Test and Evaluation Office and the Production Engineering Services Office, both within the Office of the Secretary of Defense, to reflect on their support for Sergeant York's entry into production.

An official in the Test and Evaluation Directorate has said that support given by that office for Sergeant York to begin production was based on the assumption that the RAM-D testing would be successfully done by the Army. When told that the Army test had been canceled, the official commented that this could erode the Directorate's confidence in the procurement of more systems at this time.

The Product Engineering Services Office supported the initial production decision but not without reservations. The office was concerned that testing of a completely integrated weapon system would not be done until after the scheduled exercise of the second production option in May 1983. Other specific concerns related to the design of electronic components, software development, the ammunition feed system's redesign, the prime power unit air filter

system's redesign, and the development of spare parts requirements. It was anticipated that the RAM-D tests would answer some of these concerns

At a minimum, the Product Engineering Services Office believes that program progress should be closely monitored and evaluated during initial production testing and that a program review by the Office of the Secretary of Defense should reassess schedule and technical risks before the Army exercises the second production option

PROTOTYPES NOT MEASURING UP TO REQUIREMENTS

The delivery of a prototype unsuitable for RAM-D testing continues a history of difficulties the contractor has had with developing a prototype free of numerous deficiencies

The strategy for procuring Sergeant York is a unique one. It leaves the contractor with full responsibility to design and produce a defense gun to meet general Army performance requirements. Throughout the development the Army has stood aside, adopting a so-called "hands-off" policy. It is the Army's expectation that this will result in a system that can be fielded in quick time and with less cost growth than is found in the acquisition of weapon systems along more traditional lines. Sergeant York was considered particularly suitable for this type of strategy because it incorporated so many key off-the-shelf subsystems

The acquisition strategy provided for two phases--a competition phase involving two contractors for a 29-month period charged with developing two prototype systems each and a subsequent concurrent development and initial production phase. The engineering development contracts for the first phase were a firm fixed-price type issued on January 13, 1978. They specified the government would be minimally involved. The Army provided the competing contractors a flexible requirements document to permit cost and performance trade-offs. There was, however, no flexibility in the June 1980 date when the first prototypes were to be delivered to Fort Bliss, Texas, for a competitive combined development and operational shoot-off

The strategy contemplated the availability of prototype systems that would be continuously modified for test and evaluation purposes

Ford's prototypes, at the time it won the competition, nevertheless were found to have numerous deficiencies which the contractor was required to correct before a 90-day "check test" begun in November 1981. The check test did not demonstrate that all deficiencies and shortcomings were overcome. However, the project

manager and the Under Secretary of Defense, Research and Engineering among others, supported exercising the first production option because it appeared that the contractor had met most performance requirements and that sufficient development progress had been made.

Because of the limited government participation in the development of Sergeant York, this program's progress can best be evaluated in the context of Sergeant York's availability for testing and evaluating purposes. The system the contractor is now testing at Aberdeen is an extensively modified version of the prototype used for the competitive test in June 1980. Testing and evaluating the prototypes each time they were delivered has disclosed a need to upgrade them and to redesign them to achieve a satisfactory configuration for a production model. A final production model configuration will not be available until its required delivery date in September 1983.

CHAPTER 3

CONCERNS PERSIST OVER

SERGEANT YORK'S MAINTENANCE AND SUPPORTABILITY

Two general concerns have been voiced about Sergeant York's maintenance and supportability. Army logistics evaluators are apprehensive about the limited built-in test capability that Sergeant York has demonstrated so far. Second, officials in the Office of the Secretary of Defense have questioned the planned maintenance concept by which sophisticated and unproven field maintenance test sets are to be located in the forward, direct support area. They believe that in the stressful conditions that prevail there the test equipment may not function properly.

ARMY LOGISTICS COMMUNITY QUESTIONS SUPPORTABILITY OF SERGEANT YORK WHEN FIELDDED

The Army's Logistics Evaluation Agency assessed the development of a maintenance concept for Sergeant York in time for its fielding to be high risk. It was concerned over the limited built-in test capability that Sergeant York has shown. The agency has been concerned about the lack of emphasis on integrated logistics support efforts since this program's inception, especially the deferral of deliverable support items until after the production phase began. The agency believes the lack of progress in developing an automatic built-in test capability, and lack of information on the field maintenance test set that the contractor is not required to deliver until November 1983, could exacerbate an already high risk approach to system supportability.

The Logistics Evaluation Agency's concerns, and those within the Office of the Deputy Chief of Staff for Logistics, have prompted the Deputy Chief's office to plan a special integrated logistics support review. The date for this review has not been set.

Ford Aerospace officials believe that during development and operational testing in 1980, and the check test in 1981-82, the absence of criteria for detecting legitimate faults caused reported faults to be misconstrued and improperly considered. They have said that demonstrating this capability requires physically inserting a fault in the system, establishing criteria for successful detection, and then correcting that fault before other testing can be continued. They said that when their approach was used during a demonstration test in May 1982, 53 of 57 faults inserted into the system were accurately identified. They plan to do similar demonstrations through December 1983.

INHERENT RISK IN SERGEANT
YORK'S MAINTENANCE CONCEPT

The Sergeant York maintenance concept includes locating field maintenance test sets, housed in 35-foot vans and in associated repair vans, in the direct support area. Two similar vans are to be located in the general support area located further to the rear. The test set and repair vans for each area are oriented toward different levels of testing and repair.

The maintenance concept proposed by the contractor and accepted by the Army begins with the fault detection system notifying the operator on a graphic display screen of a fault and identifying the component responsible. Maintenance personnel at the battery level confirm the fault message, and then remove and replace the defective unit. The replaced unit is tested for sub-component failures in the direct support area and is repaired by replacing the subcomponent. Finally, the subcomponent removed is shipped to the general support level, repaired, and returned to stock. The objective is to keep the Sergeant York in a high state of readiness without an enormous investment in maintenance personnel and with a reduced quantity of spare units.

In approving Sergeant York's entry into production the Deputy Secretary of Defense, in a decision memorandum, required the Army to develop an interim maintenance concept to support the fielded units of Sergeant York for the first 2 years. This was to counteract the perceived inherent risk in placing sophisticated and unproven test equipment in the direct support area. Placing the same equipment in the general support area was considered acceptable because the environment there is less stressful and the probability is greater that the test set will be continuously operational.

The Army's concept of placing some test vans in the forward area offers the advantage of maintaining more sustained operational capability, avoids waiting for repaired parts to be returned from the general support area, and reduces the investment in a spare parts inventory.

As of October 1982, no action had been taken on adopting an interim maintenance concept. The contractor has studied several options. The study was predicated on supporting 144 fire units for the first 2 years after fielding, using four direct and two general support units. The results indicate the options will increase spares cost from \$10 million to \$50 million over the concept that the Army has proposed and reduce the number of test sets available in the field. Colocating the direct support test set with the general support test set in the general support area seems feasible to the contractor on a short-term basis. However, the contractor believes the long-term investment cost for spare units would be substantial if all test sets were to be kept in the general support area beyond the short term.

CHAPTER 4

CONCLUSIONS, RECOMMENDATIONS, AND AGENCY COMMENTS

CONCLUSIONS

Canceling the government's RAM-D tests is disconcerting since it indicates that at this late date the Ford Aerospace prototype still has some serious deficiencies. On the other hand, placing these tests largely under the direction and control of the contractor is consistent with the acquisition strategy which, throughout the development, has seen the government more in the role of an observer than a participant. In our view, this will permit a better assessment of the strategy to be made later on.

Nevertheless, an assessment of the prototype's progress is still crucial before a decision is made on whether to exercise the second production option. It would have been preferable if this assessment could have been made by the Army test and evaluation agencies. In the absence of their usual degree of participation in a weapon system development, the project manager seems to be the only one with sufficient knowledge of the program to make this assessment. With attention focused on the project manager's assessment, we believe the project manager will not permit any bias, stemming from the role as a program advocate, to influence the report. The decision on exercising the option, however, should be made at the highest Army level.

Since the acquisition strategy still has to run its course, an assessment of its success or failure is premature. It is apparent, however, that greater priority has been given to adhering to the schedule than to correcting some serious system performance problems at this time. Moving ahead with the program, including exercising the first production option when the prototypes have continued to exhibit serious shortcomings, attests to this. In the final analysis, the strategy's success will be measured by (in addition to successful containment of cost growth) Sergeant York's performance as well as its deployment on schedule. An assessment of the strategy should await the opportunity for the Army to test and evaluate a production model. Until such assessment can be made it would appear prudent not to repeat the strategy in a future weapon system acquisition.

With regard to the appropriate maintenance concept for Sergeant York, there is merit to the argument that it is risky to place unproven test equipment in the direct support area. However, advantages of doing so appear to warrant putting this equipment to the test in the forward area for an interim period so that its performance in stressful conditions can be gauged.

RECOMMENDATIONS

We recommend that the Secretary of Defense

- require the Army to have the project manager prepare an assessment of Sergeant York's progress in the RAM-D tests that the contractor is doing, and to have this report forwarded to the Under Secretary of the Army before the date for exercising the second production option comes due;
- direct the Army, in whatever interim maintenance concept it elects to adopt, to provide for stationing some of the test equipment in the direct support area where it can be proven out before a final decision on its location is made; and
- refrain from again prescribing or endorsing the acquisition strategy followed in Sergeant York until the benefits of its application to that program can be evaluated.

AGENCY COMMENTS

Comments were received from the Department of Defense. Defense officials said that the decision to terminate the government tests stemmed from several factors. These included a realization that certain prototype subsystems were close to wearing out after 2-1/2 years of constant testing and the prototype's lack of a number of features that will appear in the production model, making that model more representative for test purposes. The Army expects to obtain reliability and maintainability information when a production model is delivered for testing.

Our concern is that there will be little authenticated information as to whether Sergeant York measures up to the Army's reliability and maintainability requirements until 2 years after production has begun.

Defense officials do not see a need to formally require a program assessment of Sergeant York's performance by the project manager before the decision on exercising the next production option. They said Army assessments are made continuously. We think it is important to have a formalized assessment to establish accountability, particularly since Sergeant York has had less government testing and evaluation than new weapon systems usually receive

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