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Fact Sheet for the Chairman,
Subcommittee on Defense,
Committee on Appropriations,
House of Representatives

September 1986

FIRE SUPPORT SYSTEM

Status of the Fire Support Systems' Development

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GAO

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National Security and
International Affairs Division

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September 15, 1986

The Honorable Bill Chappell, Jr.
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

As requested in your June 23, 1986, letter and subsequent discussions with your Office, we reviewed selected Army fire support command and control efforts. The information we obtained is summarized below and more fully described in the appendix.

-- The Advanced Field Artillery Tactical Data System's (AFATDS) contract cost has been set at $45.8 million with the government's share increased and capped at $35.6 million and the contractor responsible for the remaining $10.2 million as well as any overruns.

-- Interim milestone dates for AFATDS have slipped 3 months; however, the October 1989 initial operational capability (IOC) date has not changed.

-- The AFATDS contract scope was reduced but the Army believes that it still can satisfactorily perform the AFATDS concept evaluation. The results of the concept evaluation are scheduled to be available in fiscal year 1987.

-- The AFATDS contractor has experienced problems in integrating the communication control system's software. The increased cost and schedule delays attributed to these problems are being negotiated.

-- Light divisions need a fire support command and control system. The Light Field Artillery Data System (LFATDS) was planned to satisfy this requirement. However, because of constrained funding the Army has now decided not to procure LFATDS for the light divisions. LFATDS, which is currently being tested for a "go to war" determination, will be procured for only the 9th Infantry Division.

We held discussions with responsible agency officials to verify the information presented in the appendix. However, at your request, we did not obtain official comments.

Unless you publicly announce its contents earlier we plan no further distribution of this fact sheet until 30 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

If you have any questions please contact me at 275-4841.

Sincerely yours,

Richard Davis

Richard Davis
Associate Director

Contents

ABBREVIATIONS

AFATDS	Advanced Field Artillery Tactical Data System
CCS	Communication Control System
CEP	Concept Evaluation Phase
FAT	First Article Test
FIST/DMD	Fire Support Team Digital Message Device
IOC	initial operational capability
LFATDS	Light Field Artillery Tactical Data System
TACFIRE	Tactical Fire Direction System

AFATDS'

PROJECTED COST AND COMPLETION DATE

REQUEST

Obtain the projected cost and completion date of the AFATDS Concept Evaluation Phase (CEP) contract. The cost projection should include the contractor's and the government's share of the cost. Review the payments made to the contractor and determine whether the cost sharing provisions of the contract are being met. Ascertain whether there was a reduction in the contract scope and corresponding reduction in the contract price.

RESULTS

Estimated costs

The contract for the AFATDS CEP was awarded to Magnavox in May 1984 and scheduled to be completed in February 1987. The contract requires system design and software/brassboard hardware development, fabrication, integration, and system testing. The CEP contract was a $33.9 million cost-plus-fixed-fee arrangement whereby the government would reimburse Magnavox $23.7 million, and the contractor was to provide the remaining $10.2 million.

In May 1985, Magnavox notified the Army that the amount paid by the government, plus the contractor's share would be inadequate for performance beyond May 31, 1985. In response, the Army on May 28, 1985, issued a stop work order to Magnavox and renegotiated the contract's cost and scope.[1]

In October 1985, after negotiations with Magnavox, contract cost was set at $45.8 million with the government's share increased and capped at $35.6 million and the contractor responsible for the remaining $10.2 million. The government also agreed to reimburse the contractor $0.4 million for two items not included in the contract. In addition, there are costs associated with the May 28 stop work order which have yet to be negotiated. Magnavox estimates these costs to be about $1.5 million. Both the Army and Magnavox believe that the current projected cost of $47.7 million could be exceeded. As discussed in appendix II, the scope of the contract was reduced but there was no corresponding decrease in contract price.

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[1]See appendix II for details on contract scope.

As of July 31, 1986, the contractor reported actual costs incurred of $38.8 million and has been reimbursed for $34.1 million which are in accordance with the provisions of the contract.

Completion milestone date

Although the October 1989 IOC date has not yet changed, various interim milestones have slipped.

Magnavox was to design and develop AFATDS' software and demonstrate the systems concepts and capabilities. The contractor experienced problems in developing and testing the software. As a result, milestones have slipped 3 months. To compensate for the slippage and keep the program on schedule, the Army compressed its CEP review efforts from 6 months to 2 months. (See table I.1.)

Table I.1: AFATDS Milestones

	Original	Revised	Change
Contract award	May 1984		
Software tests:			
Release 1	Feb. 1986		
2	Apr. 1986		
3	July 1986	Aug. 1986	1 month
4	Sept. 1986	Dec. 1986	3 months
Evaluation phase	Sept. 1986-Feb. 1987	Jan.-Feb. 1987	Schedule compressed from 6 to 2 months.
ASARC II[a]	July 1987		
JRMB II[b]	Aug. 1987		
IOC	Oct. 1989		

[a]Army Systems Acquisition Review Council.
[b]Joint Requirements and Management Board (formerly the Defense Systems Acquisition Review Council).

CONTRACT SCOPE

REQUEST

Identify the changes in contract scope and their impact on system capabilities. Determine whether the revised capabilities are such as to provide for an adequate evaluation.

RESULTS

The contract scope was reduced in October 1985. The Army believes, however, that it still can satisfactorily evaluate the adequacy and suitability of the AFATDS concept and software to assist the fire support officer to plan and conduct fire missions. In our opinion, the impact of the contract scope changes on the evaluation process can be more definitively assessed when development and testing is completed, which is scheduled for February 1987.

Some of the changes that reduced the scope of the contract were the deletion of required:

-- Brassboard hardware developments with associated risk analysis and descriptive documents. The contract now requires commercial nondevelopmental hardware.

-- Battalion and brigade software development for all functions within fire support. Software for selected basic functions is now required.

-- Functions such as technical fire direction and meteorological data processing. This data will now be processed by other existing Army systems and then transmitted to AFATDS.

-- Hardware unique training, maintenance, and diagnostic software. This requirement will be met under the next contract phase when AFATDS hardware is selected.

COMMUNICATION CONTROL SYSTEM

REQUEST

Determine if the Communication Control System (CCS) work was adequate for use by the AFATDS contractor. If not, how will this impact the AFATDS development schedule and cost? How much was spent before this effort was terminated?

RESULTS

The CCS was designed to eliminate the Tactical Fire Direction System's (TACFIRE's) communication problems and provide AFATDS with the communication interface capabilities required for an automated command and control system.

The Army awarded a $3.9 million contract to the Librascope Division of the Singer Company, in May 1982, to develop the CCS by November 1983. The government's share of contract cost was $3.3 million while Singer was to absorb the remaining $0.6 million. Singer encountered problems in meeting contract specifications which delayed the completion date almost 2 years until October 1985. As a result, contract cost increased to $15.59 million with the government's share capped at $14.64 million.

In the interim, the Army decided not to exercise the CCS full-scale development contract because the TACFIRE communication problem was improved by other means and the Army did not want an additional piece of equipment in AFATDS to perform the CCS function. Consequently, the Army decided to imbed the CCS capability in the AFATDS' lap and portable computers and awarded the task of integrating AFATDS communication modems to Magnavox under the AFATDS CEP contract. This effort was to be performed using the CCS software already developed by Singer.

Magnavox experienced problems integrating the Singer developed CCS software into AFATDS and notified the Army that additional software would have to be developed. According to Magnavox, this resulted in additional costs and a 56 working day slippage in the testing schedule. The Army believes that the cost to write this additional software falls within the provisions of the AFATDS contract. However, the Army was 8 days late in delivering the Singer software to Magnavox and indicated that it would entertain an equitable adjustment for the 8 day delay.

Although the software integration was completed in August 1986, the cost of this effort is still being negotiated.

FIRE SUPPORT TEAM DIGITAL MESSAGE DEVICE

REQUEST

Determine the current status of the Fire Support Team Digital Message Device (FIST/DMD) and the propriety of the Army committing it to full production before adequate testing of the hardware and software. Describe the major problems being encountered and determine whether Army's procurement plans are justified.

RESULTS

The FIST/DMD is a small 20-pound data entry terminal designed for field artillery units. Connected to Army radios or telephone wire, it provides a four channel communications capability mainly at the company and battalion levels, where target information and fire orders are exchanged. In the newly formed light divisions, it is also to be used at the brigade and division levels. The Army plans to replace the device when AFATDS is available.

In August 1984, the Army contracted with Magnavox Electronics Systems Company, Fort Wayne, Indiana, for production of 905 FIST/DMDs. The initial buy was for 127 units, followed by three options for 72, 279, and 427 devices. The Army requested $17 million for fiscal year 1987 to purchase an additional 307 FIST/DMDs.

The program is presently 2-years behind schedule. The IOC was originally planned for July 1985 but is now scheduled for July 1987. Delays are mainly due to problems with the software and insufficient memory capacity. As a result, the Army has reduced progress payments from 75 to 50 percent of the contractor's billings and has decided to reduce the fiscal year 1986 option from 427 to 349 devices a reduction of 78 devices, or about $2.8 million.

Development problems have delayed First Article Tests (FAT). The contractor has delivered 14 FIST/DMD units for FAT. The Army is currently testing these units without supporting software because it does not want further delays in the hardware tests. The software FAT has slipped and is not expected to be completed until March 1987.

Due to these delays, production of the fiscal years 1984, 1985, and 1986 funded buys of FIST/DMDs will not begin until about April 1987. Awarding the August 1984 production contract and subsequent options appear to have been premature based on these delays. Also, because of these delays a program official acknowledged that the planned fiscal year 1987 competitive buy probably will be deferred until fiscal year 1988.

The Army plans to replace the FIST/DMD with AFATDS' fire support terminal--starting perhaps as early as fiscal year 1990. The Army desires the features of AFATDS such as common software language for all components and more capable computers.

Although FIST/DMD production delays have narrowed the fielding period before it could be replaced by AFATDS, the Army plans to continue with FIST/DMD production. Also, because FIST/DMD has limited capabilities the Army plans to improve it following production. The Army has not examined the need or feasibility of reducing or terminating the FIST/DMD production and improvement.

LFATDS

REQUEST

Provide a preliminary assessment of the LFATDS testing and software status. In addition, inquire if LFATDS meets light division needs, requirements and the urgency of those needs.

RESULTS

TACFIRE's size and weight makes its use impractical for light divisions. As a result, light divisions do not have an automated fire support command and control capability above battery level fire direction.

For several years, the Army's Forces Requirements documents, Operational and Organizational Plans as well as light division commanders have documented an urgent need for a near-term capability to effectively control and coordinate light division's fire support resources. This need was originally planned to be satisfied with LFATDS. However, in June 1985, the Army decided not to procure LFATDS for light divisions. Since, Army officials concluded that constrained funding will not support more than one new fire support command and control system so they are concentrating efforts on the AFATDS program.

The proposed LFATDS is now a one-time buy of a battalion/brigade light division system for the 9th Infantry Division. The system's development and procurement cost for a division's complement of equipment is sunk in a $6.8 million firm fixed-price contract. The system was field tested in May 1986 to determine whether it is a useful "go to war" system. The Army reviewed the LFATDS test results and decided to further defer a final "go to war" decision pending additional testing. This testing is scheduled for September 3 through September 20, 1986. The contractor believes that the latest software submitted for testing will meet final contractual obligations by correcting all priority software and hardware problems.

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