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COMBAT RADIOS

Army's Selection of SINCGARS' Second-Source Contractor

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The Honorable John C. Stennis
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

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

This report on the Army's Single Channel Ground and Airborne Radio System (SINCGARS) program responds to the request that we address the issues raised in the conference report on the fiscal year 1988 Defense Appropriations Act and in subsequent discussions with your office. We have summarized the information we obtained on the evaluation process the Army used to select a second producer for SINCGARS and the three areas of concern expressed in the conference report—interoperability, life-cycle costs, and fielding.

On May 31, 1988, the Army announced its intent to award General Dynamics Electronics Division a contract to become a second producer of SINCGARS. The basic contract is for $22.1 million to produce 400 radios plus another 150 test units. The Army has until July 20, 1988, to sign this contract at the agreed-upon prices. The contract also provides two options that could bring the total to $80.2 million for about 13,000 radios. Assuming these options are exercised, the Army then plans to buy SINCGARS competitively, from both General Dynamics and the original producer, ITT's Aerospace and Optical Division. The total acquisition cost of SINCGARS is estimated at $5.2 billion for the Army and another $0.5 billion for the other services.

Although the second-source program involves both technical and financial risk, it also provides potential for the Army to get a better radio at a competitive price. Much of the risk is associated with the fact that neither ITT nor General Dynamics has a final production model of the radio in the final design the Army wants to buy. Recognizing this risk, the Army incorporated several protective measures into the contract. If the program is successful, the Army stands a good chance of obtaining the radio it needs while also providing the high production capacity needed for buying more than 300,000 radios at competitive prices.

Background

Under the SINCGARS program, the Army plans to buy new VHF-FM combat radios for all military services. These radios are to be smaller, lighter, and more reliable than the Vietnam-era radios they will replace. They will also be able to operate more effectively in a signal jamming environment. The requirement for the radio was approved in 1974, and a contract was awarded to ITT in 1983 to begin production.

Originally ITT was to choose a second producer for SINCGARS using ITT's design. The Army changed this plan in 1986 as a result of reliability and production problems with the original SINCGARS. Instead of having ITT select and develop a firm to build carbon copies of its radio, the Army decided to obtain a contractor through competition that would produce a new radio. Although the second-source radio had to look like and perform like the ITT version, firms could propose their own internal designs, using whatever technology and other improvements needed to meet the primary SINCGARS specifications.

Army officials believe they can get a better SINCGARS at competitive prices with their new approach to second-source production. They also want to award the contract now to help ensure that the Army will have the large production base needed to produce and deploy the radios sooner. If successful, the second-source program could provide economic benefits and technology improvements, as well as the enlarged production base the Army has sought for this program.

Table 1 provides basic cost and quantity information about the second-source contract.

Table 1: Contract Information About SINCGARS Second-Source Program

Cost in millions

Contract	No. of radios	Cost	Latest award date	Provisions
Basic	400	$22.1	July 1988	Also includes 150 test units with deliveries beginning in late 1990, and 1 year of maintenance.
Option 1	1,725	23.5	Mar. 1991	Deliveries will start in November 1991. Includes 1 year of maintenance.
Option 2	10,375	34.6	Jan. 1992	Quantity is flexible up to 10,375. Deliveries will start in October 1992. Includes 1 year of maintenance.

Note: A third option was proposed by all offerors to begin full-rate production and is contractually binding if exercised. However, the Army expects to buy these radios competitively rather than exercise option 3.

The Congress approved using up to $52 million in fiscal year 1986 procurement funds to begin the second-source program. The $22 million winning bid for the basic contract leaves about $30 million in available funds. Although the Army could use these funds to award the first option now, it has until March 1991 to decide and still obtain the firm-fixed price offered. The Army intends to use the remaining $30 million for other SINCGARS projects before obligation authority expires on September 30, 1988.

How the Offers Were Evaluated

The Army received and evaluated five second-source proposals. Negotiations were conducted with each of the offerors to attempt to obtain the best proposals. When the process was completed, the General Dynamics proposal was found to be equal to or better than the others in all areas, and at the lowest price.

The second-source solicitation began in September 1987 when the request for proposal was issued. The Army reviewed the five proposals in accordance with the source selection plan. The selection process included about 75 evaluators, a council of advisors from the Army and other Department of Defense (DOD) organizations, and a final selection official.

The five proposals were from Magnavox, General Dynamics, Cincinnati Electronics, Harris, and Raytheon. They ranged from an internal design that closely resembled ITT's SINCGARS to a design based on another radio. After the initial evaluation, the Army determined that the Magnavox and Cincinnati Electronics proposals were outside the competitive range and excluded them from further evaluation.

Evaluators scored the proposals in six major areas: reliability, price, technical performance (including interoperability), production/producibility, integrated logistics support, and management. The evaluators assigned a score of either superior, excellent, or acceptable to each area. Of the six areas, reliability and price together were considered more important than the other four combined.

When the evaluation was completed, General Dynamics had received scores that were equal to or higher than its competitors in the five technical areas. Because General Dynamics' prices were also significantly lower than the other offerors' prices, the Army advisory council considered the possibility of a "buy-in." It concluded that such was not the case for the following reasons:

- General Dynamics expects to get all or part of an incentive award fee for increased radio reliability to offset profit reductions and its own investment.
- All prices are firm-fixed prices that are contractually binding.
- The Army does not plan any significant contract modifications to allow the contractor to make up for losses.

The advisory council also looked at other factors that might explain General Dynamics' lower cost relative to the other offerors. Among them were an inherently lower cost radio design and the economies of using factories provided at nominal cost to the contractor by a local government.

As with most system procurements, a variety of risks is associated with the second-source program. Much of this risk stems from the fact that neither ITT nor the three final second-source bidders have in production the radio version the Army wants to buy. This version will have a built-in encryption device for secure communications. ITT is still working on this version while the three final offerors showed only designs for their versions of this radio. Consequently, bringing the second-source radio into production and making sure the modules are both interoperable and interchangeable with the ITT model will likely be a challenge.

To help reduce technical and financial risks in the second-source program, the Army has incorporated several provisions into the contract. Among them are product warranties, limitations on progress payments until the contractor meets agreed-upon milestones, and a reliability growth program that requires the contractor to achieve preset reliability levels as the production process moves forward. Army officials also believe that General Dynamics' has given added confidence in its ability to perform by including in its proposal—which becomes part of the contract—a provision to build 105 prototype radios for contractor testing in addition to the 150 test units they will provide to the Army.

Interoperability Requires Management Emphasis

Interoperability between ITT's SINCGARS and the second-source model is critical to the program's success. The Army has had interoperability problems with its SINCGARS and the Air Force SINCGARS (built by Cincinnati Electronics) and has taken steps to reduce the likelihood of difficulties with its second-source program. Still, the Army must manage this area intensely if it is to acquire interoperable radios with interchangeable components.

In choosing the second-source strategy, the Army recognized the need to buy radios that can talk with the original SINCGARS in the secure frequency-hopping mode. The electronic complexity of SINCGARS makes this interoperability difficult. It is made even more difficult by the fact that ITT is still working on the final radio design with the integrated communications security. This model will undergo early user testing in late 1988.

The potential problems with interoperability are highlighted by recent experience with Army and Air Force radios. Although Air Force officials said they had used Army specifications to build their version of SINCGARS, it was recently discovered that the two radios could not transfer key information between them. An engineering change, estimated to cost $2 million to $3 million, must now be made to correct the situation.

Because of this experience, Army officials incorporated several features into the second-source program to reduce interoperability risks. First, they established a joint board (to include Army, ITT, and General Dynamics) to manage radio design changes that could affect interoperability. They also required all three offerors to include in their proposal a provision for liaison with ITT and for periodic interoperability testing of their proposed radios in the production process. In final negotiations, General Dynamics also agreed to demonstrate interoperability with the ITT radio at the 2-year point as a condition for receiving additional progress payments.

While these provisions seem appropriate, they must be combined with strong program management to ensure compliance with them. Without this, there is increased risk that the radio equipment will not have the interoperability and interchangeability that are the essential elements of the second-source program.

Army Sees Improved Reliability as Key to Lower Life-Cycle Costs

Army officials said improved reliability is the main factor in reducing life-cycle costs of SINCGARS. They concluded that the increased cost of introducing a new radio into the Army is more than offset by savings from having a more reliable radio. To help achieve reliability improvements, the Army will provide up to $26 million in incentive award fees.

The Army identified three major sources of potential cost savings from the second-source radio. By far the biggest savings ($1.02 billion) came from the radio's expected greater reliability. Simply stated, a radio that breaks down less frequently will cost less to maintain in the long run.

Other areas of savings were competition ($60 million in the first 3 years) and battery life improvements ($135 million over a 20-year radio life).

While ITT can also make reliability improvements to its radio, the Army believes more improvements are possible on the second-source radio because of differences in the radio's design and technology. In reviewing the offerors' reliability growth programs, Army evaluators concluded that General Dynamics offered the most aggressive proposal. It offered to build significantly more prototype radios and to subject them to more testing than did the other offerors. General Dynamics predicted its production radio will achieve reliability of 4,438 hours mean-time between failure versus the required 1,250 hours.

Introducing a new radio design into the logistics system would cost more than having one radio, but the Army said these costs would be much less than the savings gained from a more reliable radio. Specifically, an Army study concluded that the cost difference between having one radio design and two different internal radio designs in the logistics system is negligible. This is mainly because the Army expects to buy large quantities of radios and second-source components that are interchangeable with ITT components.

To encourage reliability improvements, the contract provides award fees of up to $26 million. These fees will be awarded periodically, beginning about 3 years after contract award, to General Dynamics for high quantity production of radios that surpass the required 1,250 hours mean-time between failure. The Army expects the $26 million will be sufficient to cover the basic production contract and the first two options.

Battery consumption is another element of life-cycle cost on which the Army expects to see savings. Battery costs make up a large portion—over 50 percent—of the radio's operation and support cost, and General Dynamics proposal to reduce battery consumption by 33 percent was rated the best.

Operation and support cost was not a separate issue in the evaluation, but the proposed prices for the basic contract and each production option included 1-year options for contractor maintenance. The Army expects to have its own maintenance capability 2 years after the first second-source radios are deployed.

Too Early to Tell the Second-Source Program's Effect on Fielding

The Army expects to deploy second-source radios earlier under the current strategy than it originally planned. However, the program is too new to predict whether the schedule will be met. If experience with the original SINCGARS is an indicator, delays in fielding can be expected.

By deciding to buy a new radio rather than a carbon copy of ITT's SINCGARS, the Army said it can deploy second-source radios much sooner. Under the old second-source strategy, the service said it would have had to wait until 1991 to get another producer because ITT would not have its final production design until then. By allowing another company to produce its own versions of SINCGARS now, the Army expects to attain high production rates much sooner.

If everything goes according to plan, General Dynamics will deliver radios for first article test in late 1990. After first article and operational tests, the Army could begin deploying the radios in August 1991.

Based on the Army's previous SINCGARS experience, this schedule is ambitious. Production of the original SINCGARS began in 1983, and the program schedule has changed several times since then. Due to production and reliability problems, the Army now plans to begin full-scale deployment of ITT's SINCGARS in the summer of 1988.

Although the second-source program contains more provisions to protect the Army than the original SINCGARS program, schedule risk still exists. Because the contractor must do many things before the radios can be deployed, it is too early to predict with any certainty whether the current second-source program will provide radios on time.

Conclusions and Matter for Congressional Consideration

The SINCGARS second-source program provides both opportunity and risk. The opportunity is that the Army could get a better radio at competitive prices while enlarging the production base in a relatively short time. The risk stems from the amount of work that both ITT and the second producer need to do before they produce the required radios.

The degree of risk is indicated by the reliability problems with ITT's SINCGARS, the interoperability difficulties with Air Force SINCGARS, and the fact that the second-source contractor does not have a production model of its radio. The Army considers the risk acceptable in view of its need to produce and deploy a large number of radios as soon as possible.

We agree with the current Army plan to defer awarding the first and second options until the contractor has proven its ability to produce and deliver the radios for first article test.

The cost of the basic contract leaves $30 million remaining from the fiscal year 1986 appropriation, and the Subcommittees may want to consider rescinding these funds. However, Army officials told us they plan to use the funds for other SINCGARS program projects. These projects include buying installation kits for deployment of radios to Korea, buying new radio batteries, and making changes to the antenna.

Objectives, Scope, and Methodology

In reviewing the second-source program, we examined reports prepared by the proposal evaluators, interviewed Army evaluation officials, and visited facilities of the three final offerors. We also visited ITT's production facilities for SINCGARS and discussed the program with DOD and Army officials. Our review was performed from February to June 1988 in accordance with generally accepted government auditing standards.

Because of time constraints we did not obtain official agency comments on this report. However, we discussed a draft of the report with DOD and Army officials and included their comments where appropriate. Unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from its issue date. At that time we will send copies to interested parties and make copies available to others on request.

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