



United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-261509

May 26, 1995

The Honorable William J. Perry  
The Secretary of Defense

Dear Mr. Secretary:

As a part of our on going review of the Department of Defense's (DOD) fiscal year 1996 budget request, we have been examining the Army's plan to begin Low Rate Initial Production (LRIP) of the Joint Surveillance Target and Attack Radar System's (JSTARS) Light Ground Station Module (LGSM). This correspondence is to inform you that our evaluation raises serious questions about the LGSM's maturity to enter LRIP at this time.

The Army plans to begin LGSM LRIP by awarding a fiscal year 1995 funded contract for eight LGSMs at a cost of about \$45.8 million. The contract has a fiscal year 1996 option for two additional LGSMs at a cost of about \$11.3 million. We understand that this contract will be awarded imminently, perhaps as soon as the last week in May or the first week in June.

DOD delegated the LRIP decision to the Army. However, that decision was to be based on the LGSM's having met DOD set exit criteria during Force Development Test and Evaluation (FDT&E) and Reliability Confidence Testing (RCT).

On the basis of a preliminary review of the LGSM FDT&E and RCT test results, it is clear that the LGSM has not met those exit criteria. For example, in a draft interim LGSM evaluation report dated February 21, 1995, the Army Materiel Systems Analysis Activity (AMSAA) reported that the LGSM had met only five of the 12 exit criteria. It reported insufficient data to judge three of the criteria and failure on the remaining four. Further examination of the AMSAA report and the Army's Test and Experimentation Command's (TEXCOM) FDT&E report raises serious questions about even those criteria AMSAA accepted as having been met.

### SYNTHETIC APERTURE RADAR CRITERION

The LRIP exit criteria set by DOD stated that the LGSM was to demonstrate "with .8 probability of success as estimated from observed data, receipt of all modes..." including Synthetic Aperture Radar (SAR) "...of the Joint STARS radar data and operation of radar service requests during the field portion of Government Development Test & Evaluation (GDT&E)," that is FDT&E. AMSAA reported that, based on the results of FDT&E and a follow-on demonstration at Eglin Air Force Base, the LGSM had demonstrated a SAR point estimate of 0.87 and placed a 95 percent level of confidence that the exit criterion had been demonstrated. AMSAA reported a SAR point estimate of 0.77 based only on FDT&E and a 24 percent confidence in the exit criterion having been met. The FDT&E results included nine "no-tests" that, if included, would lower the FDT&E point estimate to 0.67 and the FDT&E and Eglin results combined to just under DOD's threshold criterion.

How the Eglin demonstration resulted in such marked improvement in SAR receipt, and how, if at all, that demonstration differed from a traditional test should be considered before inclusion of data from the Eglin exercise is accepted. Additionally, whether "no-test" results should be included, as a DOT&E official indicated, or excluded, as AMSAA did, in calculating the LGSM's performance should be considered.

### RADAR SERVICE REQUESTS CRITERION

AMSAA reported that, during the Eglin demonstration, 69 of 78 Radar Service Requests (RSRs) were acknowledged by the airborne system. Based on these results, AMSAA calculated a point estimate of 0.88 on the probability of receiving an RSR and a 94 percent confidence level that the 0.8 exit criterion was met. Thus AMSAA considers this requirement to have been met. However, AMSAA did not report any RSR data from the Army's FDT&E. TEXCOM's report on FDT&E indicates that only 84 of 124 attempted RSR transmissions were successful during the Army's FDT&E, yielding a FDT&E point estimate of 0.68 on the probability of receiving an RSR, well below the 0.8 exit criterion. Based on our calculations, combining the FDT&E results with the Eglin results yields a point estimate of 0.76, still below the exit criterion. Clearly, failure to include FDT&E results on RSRs suggests that, despite AMSAA's having reported that the LGSM met this criterion, it may have in fact failed to meet this criterion.

TACTICAL FIRE DIRECTION SYSTEM  
COMMUNICATIONS CRITERION

Another example that raises questions about whether the criteria AMSAA accepted as having been met were in fact met is the Tactical Fire Direction System (TACFIRE) communications criterion. The LGSM was to demonstrate, "with .8 probability of success as estimated from observed data ...that messages appropriate to TACFIRE and All Source Analysis System can be transmitted and received via digital link..." during FDT&E.

AMSAA reported that there were 55 attempts to transmit or to receive TACFIRE messages during missions 3, 4, and 5 of the FDT&E with 37 successes, 7 failures, and 11 no-tests. On the basis of the FDT&E results, not counting no-tests, AMSAA calculated a point estimate of 0.84 as the probability a TACFIRE message was successfully transmitted or received and a 68 percent level of confidence in the exit criterion having been met. Inclusion of the no-tests reported by AMSAA results in a calculated point estimate of 0.67, well below the exit criterion.

While the exit criteria and DOD Instruction 5000.2 set no level of confidence to be achieved, an Army test official stated that an 80 percent confidence level in exit criteria is generally appropriate. On this basis alone, it would appear that the LGSM failed to meet the TACFIRE exit criterion.

In addition, AMSAA reported 55 attempts at TACFIRE transmissions. TEXCOM's report on FDT&E, however, indicates that there were 17 TACFIRE transmission attempts during mission 3, 38 during mission 4, and 42 during mission 5 for a total of 97 attempts. It appears that the AMSAA draft interim report excluded mission 5 TACFIRE results. The TEXCOM report indicates that during missions 3, 4, and 5, there were 65 successful TACFIRE transmissions, 21 failures, and 11 no-tests. This indicates a 0.76 point estimate, excluding no-tests, and a 0.67 point estimate including no-tests, both below AMSAA's calculated value and the exit criterion.

CONCLUSION AND RECOMMENDATION

These examples raise serious questions about three of the five criteria reported by AMSAA as having been met. If, as our analysis seems to suggest, three of the five criteria AMSAA reported as being met were not met, then at most only two of the 12 LRIP exit criteria were demonstrated. The results of the FDT&E and RCT raise serious questions about the maturity of the LGSM system and the appropriateness of its entering LRIP at this time. Furthermore, we recently obtained a copy of a March 27, 1995 memorandum from the DOD Director of Operational Test and Evaluation

to the Under Secretary of Defense for Acquisition and Technology that also raises this issue. In that memorandum the Director states "In my reading of the report, only the criteria for communicating with TACFIRE and ASAS were met." This reinforces our concern that the LGSM has not demonstrated its maturity to enter LRIP. Accordingly, we recommend that you instruct the Army to postpone the LGSM LRIP contract award until DOD has had an opportunity to further review the LGSM test results and has assurance that the LGSM has demonstrated the ability to meet all exit criteria established by DOD for proceeding to LRIP.

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Our review was conducted during May 1995 in accordance with generally accepted government auditing standards.

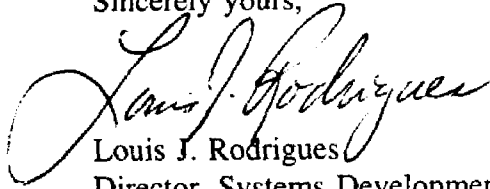
As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Reform and Oversight not later than 60 days after the date of the report. A written statement must also be submitted to the Senate and House Committees on Appropriations with an agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this letter to the Chairman of the Senate Subcommittee on Defense, Committee on Appropriations; the Chairman of the House Subcommittee on National Security, Committee on Appropriations; the Chairman of the Senate Committee on Armed Services; the Chairman of the House Committee on National Security; the Chairman of the Senate Committee on Governmental Affairs; the Chairman of the House Committee on Government Reform and Oversight; the Secretaries of the Army and the Air Force; and other interested parties. We will also make copies available to others on request.

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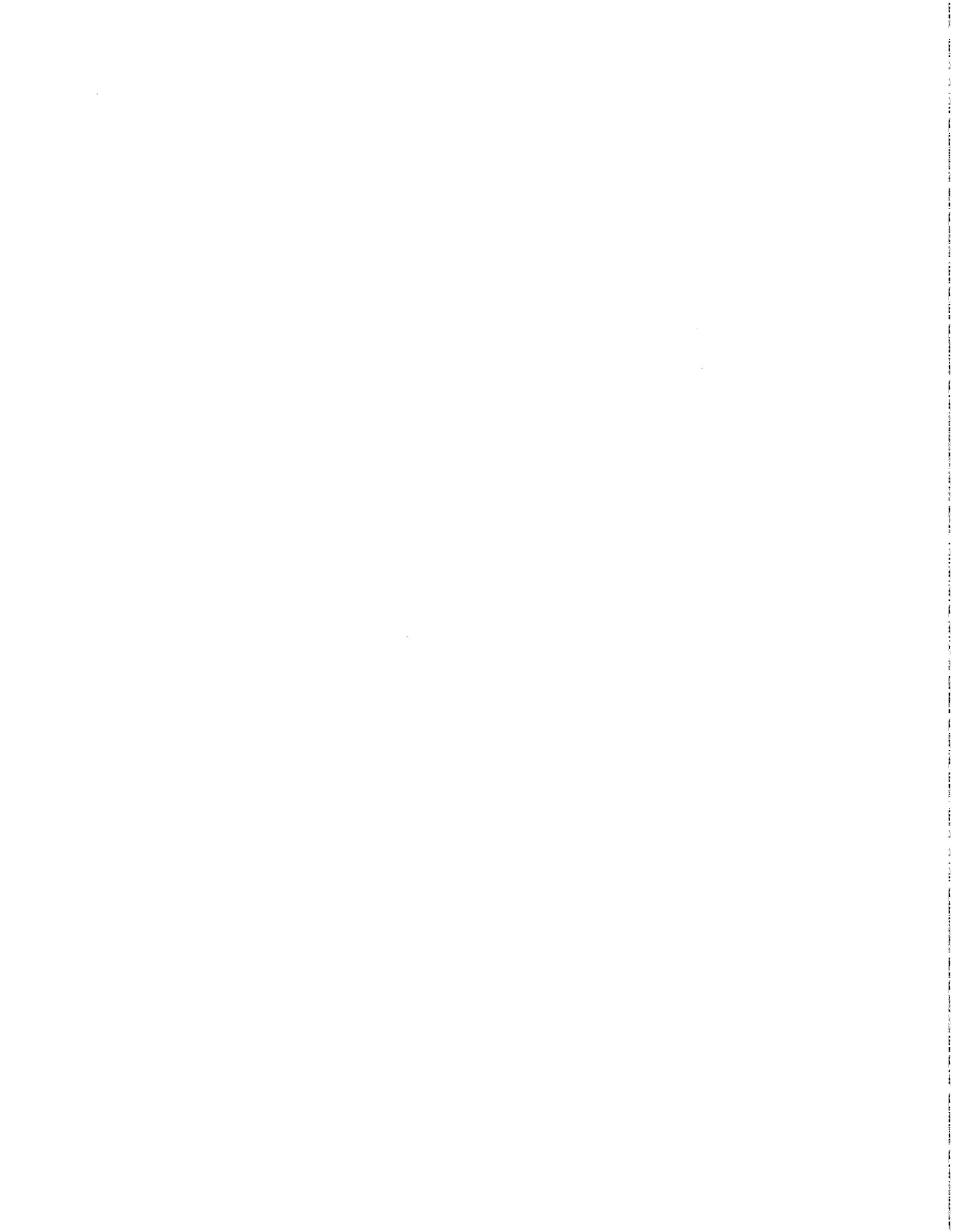
Please contact me at (202) 512-4341 if you or your staff have any questions concerning this letter. Major contributors to this report were William L. Wright Jr., Assistant Director, and Bruce H. Thomas, Evaluator-in-Charge.

Sincerely yours,

A handwritten signature in cursive script that reads "Louis J. Rodrigues". The signature is written in black ink and is positioned to the left of the printed name.

Louis J. Rodrigues  
Director, Systems Development  
and Production Issues

(707118)



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