

GAO

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DEFENSE ACQUISITIONS

**2009 Review of Future
Combat System Is Critical
to Program's Direction**

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Highlights of [GAO-08-638T](#), a testimony before the Subcommittee on Air and Land Forces, Committee on Armed Services, House of Representatives

Why GAO Did This Study

The Future Combat System (FCS) program—which comprises 14 integrated weapon systems and an advanced information network—is the centerpiece of the Army's effort to transition to a lighter, more agile, and more capable combat force. The substantial technical challenges, the Army's acquisition strategy, and the cost of the program are among the reasons why the program is recognized as needing special oversight and review.

This testimony is based on GAO's two March 2008 reports on FCS and addresses (1) how the definition, development, and demonstration of FCS capabilities are proceeding, particularly in light of the go/no-go decision scheduled for 2009; (2) the Army's plans for making production commitments for FCS and any risks related to the completion of development; and (3) the estimated costs for developing and producing FCS.

What GAO Recommends

In its March 2008 reports, GAO made several recommendations to the Secretary of Defense that included: establishing criteria that the FCS program will have to meet in the 2009 milestone review in order to justify continuation; identifying viable alternatives to FCS; and taking other actions. DOD concurred with GAO's recommendations.

To view the full product, including the scope and methodology, click on [GAO-08-638T](#). For more information, contact Paul Francis at (202) 512-4841 or francis@gao.gov.

DEFENSE ACQUISITIONS

2009 Review of Future Combat System Is Critical to Program's Direction

What GAO Found

Today, the FCS program is about halfway through its development phase, yet it is, in many respects, a program closer to the beginning of development. This portends additional cost increases and delays as FCS begins what is traditionally the most expensive and problematic phase of development. In the key areas of defining and developing FCS capabilities, requirements definition is still fluid, critical technologies are immature, software development is in its early stages, the information network is still years from being demonstrated, and complementary programs are at risk for not meeting the FCS schedule. It is not yet clear if or when the information network that is at the heart of the FCS concept can be developed, built, and demonstrated. Yet, the time frame for completing FCS development is ambitious; even if all goes as planned, the program will not test production-representative prototypes or fully demonstrate the system of systems until after low rate production begins.

Even though the development of FCS will finish late in its schedule, commitments to production will come early. Production funding for the first spinout of FCS technologies and the early version of the FCS cannon begin in fiscal years 2008 and 2009. Production money for the core FCS systems will be requested beginning in February 2010, with the DOD fiscal year 2011 budget request—just months after the go/no-go review and before the stability of the design is determined at the critical design review. In fact, by the time of the FCS production decision in 2013, a total of about \$39 billion, which comprises research and development and production costs, will already have been appropriated for the program, with another \$8 billion requested. Also, the Army plans to contract with its lead system integrator for the initial FCS production, a change from the Army's original rationale for using an integrator. This increases the burden of oversight faced by the Army and the Office of the Secretary of Defense.

While the Army's cost estimates for the FCS program remain about the same as last year—\$160.9 billion—the content of the program has been reduced, representing a reduction in buying power for the Army. The level of knowledge for the program does not support a confident estimate, and cost estimates made by two independent organizations are significantly higher. Competing demands from within the Army and DOD limits the ability to fund higher FCS costs. Thus, the Army will likely continue to reduce FCS capabilities in order to stay within available funding limits. Accordingly, FCS's demonstrated performance, the reasonableness of its remaining work, and the resources it will need and can reasonably expect will be of paramount importance at the 2009 milestone review for the FCS program.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the Department of the Army's Future Combat System (FCS), a networked family of weapons and other integrated systems. FCS is in the forefront of efforts to help the Army transform itself into a lighter, more agile, and more capable combat force by using a new concept of operations, new technologies, and a new information network linking whole brigades together in a system of systems. In 2009, FCS faces a congressionally mandated go/no-go decision review to determine the program's future. This review is crucial, as production funding and commitments will build rapidly after that point, limiting the government's ability to alter course.

My statement today is based on the work we conducted over the past year in response to the National Defense Authorization Act for Fiscal Year 2006, which requires GAO to report annually on the FCS program.¹ Accordingly, this statement discusses (1) how the definition, development, and demonstration of FCS capabilities are proceeding, particularly in light of the go/no-go decision scheduled for 2009; (2) the Army's plans for making production commitments for FCS and any risks related to completing development; and (3) the estimated costs for developing and producing FCS and risks the Army faces in both meeting the estimate and providing commensurate funding.²

Summary

Definition, development, and demonstration of capabilities will finish late in the FCS schedule. At this point, requirements definition is still fluid, critical technologies are immature, software development is in its early stages, the information network is still years from being demonstrated, and complementary programs are at risk for not meeting the FCS schedule. Significant commitments to production will be made before FCS capabilities are demonstrated. Production money for the core FCS systems will be requested beginning in February 2010, with the DOD fiscal year 2011 budget request—just months after the go/no-go review and before the stability of the design is determined at the critical design review. By the

¹ Pub. L. No. 109-163 §211 (2006).

² GAO, *Defense Acquisitions: 2009 Is a Critical Juncture for the Army's Future Combat System*, [GAO-08-408](#) (Washington, D.C.: Mar. 7, 2008); GAO, *Defense Acquisitions: Significant Challenges Ahead in Developing and Demonstrating Future Combat System's Network and Software*, [GAO-08-409](#) (Washington, D.C.: Mar. 7, 2008).

time of the FCS production decision in 2013, about \$39 billion will already have been invested in the program. While the Army's cost estimates for the FCS program remain about the same as last year—\$160.9 billion—the content of the program has been reduced. FCS costs are likely to grow as the current level of knowledge does not support a confident estimate, and cost estimates made by two independent organizations are significantly higher. Competing demands from within the Army and DOD limit the ability to fund higher FCS costs. Thus, the Army will likely continue to reduce FCS capabilities in order to stay within available funding limits.

In our March 2008 reports, we made several recommendations to ensure that the 2009 FCS milestone review is positioned to be both well-informed and transparent. Specifically, we recommended that the Secretary of Defense, among other things, (1) establish objective and quantitative criteria that the FCS program will have to meet in order to justify its continuation and gain approval for the remainder of its acquisition strategy, (2) identify viable alternatives to FCS as currently structured that can be considered in the event that FCS does not measure up to the criteria set for the review, and (3) closely examine the oversight implications of the Army's decision to contract with the lead system integrator for early production of FCS spin outs, the non-line-of-sight cannon (NLOS-C), and low rate production for the FCS core program. In the area of FCS network and software, we recommended that the FCS program stabilize the network and software requirements of each software build to enable software developers to follow disciplined software practices and establish a clear set of criteria for acceptable network performance at each of the key program events. Finally, in setting expectations for the 2009 milestone review, we recommended that the expectations include an analysis of network technical feasibility and risks, synchronization of the network with other elements of FCS, and a reconciliation of cost estimates of network and software development scope and cost.

DOD concurred with our recommendations and stated that criteria for the 2009 FCS Defense Acquisition Board review will be established and will be reviewed and finalized at the 2008 Defense Acquisition Board review. The results of the analyses and assessments planned to support the 2009 review will inform DOD's acquisition and budget decisions for FCS. These are positive steps toward informing the 2009 Defense Acquisition Board review.

Background

The FCS concept is designed to be part of the Army's Future Force, which is intended to transform the Army into a more rapidly deployable and

responsive force that differs substantially from the large division-centric structure of the past. The Army is reorganizing its current forces into modular brigade combat teams, each of which is expected to be highly survivable and the most lethal brigade-sized unit the Army has ever fielded. The Army expects FCS-equipped brigade combat teams to provide significant warfighting capabilities to DOD's overall joint military operations. The Army has also instituted plans to spin out selected FCS technologies and systems to current Army forces throughout the program's system development and demonstration phase.

The FCS program is recognized as being high risk and needing special oversight. Accordingly, in 2006, Congress mandated that the Department of Defense (DOD) hold a milestone review following its preliminary design review.³ Congress directed that the review include an assessment of whether (1) the needs are valid and can best be met with the FCS concept, (2) the FCS program can be developed and produced within existing resources, and (3) the program should continue as currently structured, be restructured, or be terminated. Congress required the Secretary of Defense to review and report on specific aspects of the program, including the maturity of critical technologies, program risks, demonstrations of the FCS concept and software, and a cost estimate and affordability assessment.

This statement is based on work we conducted between March 2007 and March 2008 and is in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

³ John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 214 (2006).

Definition, Development, and Demonstration of Capabilities Will Finish Late in the FCS Schedule

Ideally, the Army should have entered development in 2003 with firm requirements and mature technologies. However, the FCS program will be challenged to meet these markers by the time of the preliminary design review in 2009. The Army has only recently formed an understanding of what will be expected of the FCS network. Complementary programs, necessary to the success of the FCS, are not yet fully synchronized with the FCS schedule and face funding and technical challenges. By 2009, the Army will have spent 6 years and \$18 billion on these initial efforts, with the costlier components of a development program still to come. It will be years before demonstrations validate that the FCS will provide needed capabilities.

Requirements, Technologies, and Designs Are Not Yet Mature

While the Army should have firmed requirements at the outset of its development program, it now faces a daunting task in completing this work by the preliminary design review and subsequent milestone review in 2009—6 years into a 10-year development schedule. Many of FCS's thousands of requirements are almost certain to be modified as the program approaches these reviews. The Army's decision to restructure the program in early 2007, reducing the set of systems from 18 to 14, resulted in requirements modifications, deferrals, and redistributions that affected the requirements balance among the remaining systems. As this program adjustment is implemented, further requirements changes to the systems, as well as to the network, could be required. The Army also continues to make design trade-offs to accommodate restrictions such as space, weight, and power constraints; affordability; and technical risks, such as transport requirements for manned ground vehicles. FCS software development is hampered by incomplete requirements and designs for the information network. While the Army's user community expects that FCS will deliver capabilities that are as good as or better than current forces, this position is based on the results of modeling and simulation activities—it will be several years before field demonstrations validate the user community's position.

FCS's critical technologies remain at low maturity levels. According to the Army's latest technology assessment, only two of FCS's 44 critical technologies have reached a level of maturity that, based on best practice standards, should have been demonstrated at program start. Even applying the Army's less rigorous standards, only 73 percent can be considered mature enough to begin system development today. The technological immaturity, coupled with incomplete requirements, is a mismatch that has prevented the Army from reaching the first critical knowledge point for this program—a precursor for cost growth. Many of these immature

technologies may have an adverse cumulative impact on key FCS capabilities such as survivability. In addition, the Army is struggling to synchronize the schedules and capabilities of numerous essential complementary programs with the overall FCS program. The Army has identified problems that raise concerns about the likelihood that many complementary systems will deliver the required capabilities when needed. In some cases, complementary programs have been adversely affected by FCS demands, and in others, lack of coordination between FCS and complementary program officials has stalled efforts aimed at synchronizing programs and resolving cost, schedule, and technical issues.

Significant Challenges in Developing And Demonstrating FCS Network and Software

It is not yet clear if or when the information network that is at the heart of the FCS concept can be developed, built, and demonstrated by the Army and lead system integrator (LSI). Significant management and technical challenges—owing more to the program’s complexity and immaturity than to the approach to software—have placed development of the network and software at risk. These risks include network performance and scalability, immature network architecture, and synchronization of FCS with Joint Tactical Radio System (JTRS) and Warfighter Information Network-Tactical programs that have significant technical challenges of their own. The amount of estimated software code required for the FCS network and platforms has recently increased to 95.1 million lines. This is nearly triple the size of the original estimate in 2003, and the largest software effort by far for any weapon system. Software code is difficult to estimate, and underestimation is not unique to FCS. Compounding this inherent difficulty on FCS were the program’s poorly defined requirements, indicative of its immaturity. Lines of code have grown as requirements have become better understood. The Army believes the latest increases will not substantially increase software development costs, but updated Army and independent cost estimates will not be available until next year. Previously, the independent estimates have differed sharply from the Army’s in the area of FCS software development costs.

Although several disciplined practices are being used to develop FCS’s network and software, the program’s immaturity and aggressive pace during development have delayed requirements development at the software developer level. For example, software developers for five major software packages that we reviewed report that high-level requirements provided to them were poorly defined, omitted, or late in the development process. These caused the software developers to do rework or defer functionality to future builds. In turn, these poor or late requirements had

a cascading effect that caused other software development efforts to be delayed.

It is unclear when or how it can be demonstrated that the FCS network will work as needed, especially at key program junctures. For example, in 2009, network requirements, including software, may not be well defined nor designs completed at the preliminary design review; and at the FCS milestone review later that year, network demonstration is expected to be very limited. The Army and LSI have identified and need to address numerous areas of high risk such as network performance and scalability. The first large scale FCS network demonstration—the limited user test in 2012—will take place at least a year after the critical design review and only a year before the start of FCS production. That test will seek to identify the impact of the contributions and limitations of the network on the ability to conduct missions. This test will be conducted after the designs have been set for the FCS ground vehicles, a situation that poses risks because the designs depend on the network's performance. A full demonstration of the network with all of its software components will not be demonstrated until at least 2013 when the fully automated battle command system is expected to be ready.

FCS Capabilities Will Be Demonstrated after Key Decision Points

When FCS reaches its planned preliminary design review in 2009, the Army will have expended over 60 percent of its development funds and schedule. However, much will still need to be done in terms of technology maturation, system integration and demonstration, and preparing for production—all three knowledge points fundamental to a successful acquisition. Large scale demonstrations of the network will not occur until after manned ground vehicles, which depend on the performance of the network, are already designed and prototyped. The Army does not plan to demonstrate that the FCS system of systems performs as required until after the production decision for the core program in 2013. That would preclude opportunities to change course if warranted by test results and increasing the likelihood of costly discoveries in late development or during production. The cost of correcting problems in those stages is high because program expenditures and schedules are less forgiving than in the early stages of a program. Conversely, the test standards we apply reflect the best practice of having production-representative prototypes tested prior to a low rate production decision. This approach demonstrates the prototypes' performance and reliability as well as manufacturing processes—in short, that the program is ready to be manufactured within cost, schedule, and quality goals.

Significant Commitments to Production Will Be Made Before FCS Capabilities Are Demonstrated

While the FCS production decision for the core FCS program is to be held in fiscal year 2013, production commitments will begin in fiscal years 2008 and 2009 with production for the first of a series of three planned spin out efforts and the early versions of the NLOS-C vehicle. When considering these activities, along with long-lead and facilitization investments associated with the production of FCS core systems, a total of \$11.9 billion in production money will have been appropriated and another \$6.9 billion requested by the time of the production decision for the FCS core systems in 2013. When development funds are included, \$39 billion will have been appropriated and another \$8 billion requested. As noted previously, key demonstrations will not yet have taken place by this time. Also, in April 2007, the Army announced its intention to contract with the LSI for the production for the first three brigade combat teams of FCS systems, the production of the FCS spin out items, and the early production of NLOS-C vehicles. This decision makes an already unusually close relationship between the Army and the LSI even closer, and heightens the oversight challenges FCS presents.

Spin Out Procurement to Begin before Testing Completed

In 2004, the Army revised its acquisition strategy to bring selected technologies and systems to current forces via spin outs while development of the core FCS program is underway. The first of these spin out systems will be tested and evaluated in the coming year, and a production decision is planned in 2009. However, the testing up to that point will feature some surrogate subsystems rather than the fully developed subsystems that would ultimately be deployed to the current forces. For example, none of the tests will include fully functional JTRS radios or associated software. The Army believes this strategy is adequate; however, testing of surrogates may not provide quality measurements to gauge system performance, and the Army may have to redesign if JTRS radios have different form, fit, and function than expected. Taken together, these spin out 1 capabilities serve as a starting point for FCS but represent only a fraction of the total capability that the Army plans for FCS to provide. The Army has general plans for a second and third set of spin out items but, according to the Army, these have not yet been funded.

NLOS-C Production to Begin Soon at Congress' Direction

Responding to congressional direction, the Army will begin procuring long lead production items for the NLOS-C vehicle in 2008.⁴ The Army will deliver six units per year in fiscal years 2010 through 2012; however, these early NLOS-C vehicles will not meet threshold FCS requirements and will not be operationally deployable without significant modifications. Rather, they will be used as training assets for the Army Evaluation Task Force.

To meet the early fielding dates, the Army will begin early production of the NLOS-C vehicles with immature technologies and designs. Several key technologies will not be mature for several years, and much requirements and design work remains on the manned ground vehicles, including the NLOS-C. Significant challenges involving integrating the technologies, software, and design will follow. To the extent these aspects of the manned ground vehicles depart from the early production cannons, costly rework of the cannons may be necessary.

The Army is planning a seamless transition between NLOS-C production and core FCS production. However, beginning the production of NLOS-C vehicles 5 years before the start of FCS core production could create additional pressure to proceed with FCS core production. Moreover, to the extent that beginning NLOS-C production in 2008 starts up the manned ground vehicle industrial base, it could create a future need to sustain the base. If decision makers were to consider delaying FCS core production because it was not ready, a gap could develop when early NLOS-C production ends. Sustaining the industrial base could then become an argument against an otherwise justified delay. The Under Secretary of Defense for Acquisition, Technology, and Logistics recently took steps to keep the decisions on the NLOS-C early production separate from FCS core production. In approving procurement of long lead items for the NLOS-C vehicles in 2008, the Under Secretary designated the 18 early prototypes as a separate, special interest program for which he will retain authority for making milestone decisions. The Under Secretary will make a second decision in 2009 whether to approve NLOS-C production and has put a cost limit of \$505.2 million (fiscal year 2003 dollars) on production of these vehicles. He also added that specific requirements be met at that time, such as a capability production document, technology readiness assessment, test plan, independent estimate of costs, and an approved acquisition program baseline. This is a positive step in ensuring that the

⁴ Department of Defense Appropriations Act, 2003, Pub. L. No. 107-248 § 8121 (2002), and similar provisions in subsequent defense appropriations acts.

Army's efforts to meet Congressional direction do not result in unfavorable consequences.

Army Commitment to LSI for Production Heightens Oversight Challenges

The Army's April 2007 decision to contract with the LSI for FCS production makes an already close relationship closer, represents a change from the Army's original rationale for using an LSI, and may further complicate oversight. The specific role the LSI will play in production of spin outs, NLOS-C, and FCS core production are unclear at this point. According to program officials, the statements of work for the long lead items contracts for spin outs and NLOS-C have not yet been worked out. The statements of work for the production contract will also be negotiated later. The work the LSI does in actual production of FCS is likely to be small compared to the other hardware suppliers and assemblers. Thus, the production role of the LSI is likely to be largely in oversight of the first tier subcontractors.

From the outset of the program, the LSI was to focus its attention on development activities that the Army judged to be beyond what it could directly handle. Army leadership believed that by using an LSI that would not necessarily have to be retained for production, the Army could get the best effort from the contractor during the development phase while at the same time making the effort profitable for the contractor. Nonetheless, the LSI's involvement in the production phase has been growing over time. The current LSI development contract for the core FCS systems extends almost 2 years beyond the 2013 production decision. The Army does not expect the initial brigades outfitted by FCS will meet the upper range of its requirements and has made the LSI responsible for planning future FCS enhancements during the production phase. Combined with a likely role in sustainment, the LSI will remain indefinitely involved in the FCS program. By committing to the LSI for early production, the Army effectively ceded a key point of leverage it had held—source selection—and is perhaps the final departure from the Army's initial efforts to keep the LSI's focus solely on development. This decision also creates a heightened burden of oversight in that there is now additional need to guard against the natural incentive of production from creating more pressure to proceed through development checkpoints prematurely. As we have previously reported, this is a burden that will need to be increasingly borne by the Office of the Secretary of Defense.

FCS Costs Likely to Grow beyond Army Estimates

The Army's \$160.9 billion cost estimate for the FCS program is largely unchanged from last year's estimate despite a program adjustment that reduced the number of systems from 18 to 14. This may mean a reduction in capabilities of the FCS program and thus represents a reduction in the Army's buying power on FCS. Further, two independent cost estimates—from DOD's Cost Analysis Improvement Group (CAIG) and the other from the Institute for Defense Analyses (IDA), a federally funded research and development center—are significantly higher than the Army's estimate. Both assessments estimate higher costs for software development, to which a recent increase in lines of code adds credence. The Army has not accepted either of the independent estimates on the grounds that they each include additional work scope, particularly in the later years of the development phase. Also, the CAIG and IDA both use historical growth factors in their estimates, based on the results of previous programs. It is reasonable to include such growth factors, based on our own analysis of weapon systems and the low level of knowledge attained on the FCS program at this time.

Given the program's relative immaturity in terms of technology and requirements definition and demonstrations of capabilities to date, there is not a firm foundation for a confident cost estimate. The Army has not calculated confidence levels on its estimates, though this is a best practice and could reduce the probability of unbudgeted cost growth. Under its current structure, the Army will make substantial investments in the FCS program before key knowledge is gained on requirements, technologies, system designs, and system performance, leaving less than half its development budget to complete significantly expensive work, such as building and testing prototypes, after its preliminary design review. The Army maintains that if it becomes necessary, FCS content will be further reduced, by trading away requirements or changing the concept of operations, to keep development costs within available funding levels. As the Army begins a steep ramp-up of FCS production, FCS costs will compete with other Army funding priorities, such as the transition to modular organizations and recapitalizing the weapons and other assets that return from current operations. Together, the program's uncertain cost estimate and competing Army priorities make additional reductions in FCS scope and increases in cost likely.

Conclusion

The deficiencies we cite in areas such as requirements and technology are not criticisms of progress in the sense that things should have gone smoother or faster. At issue, rather, is the misalignment of the program's normal progress with the events used to manage and make decisions on

such acquisitions—key decisions are made well before sufficient knowledge is available. The decision in 2009 will provide an opportunity to realign the progress of knowledge in FCS with events such as the critical design review and tests of prototypes before the production decision. The 2009 decision may also be the government’s last realistic opportunity to safeguard its ability to change course on FCS, should that be warranted. The first decision, as we see it, will have to determine whether FCS capabilities have been demonstrated to be both technically feasible and militarily worthwhile. If they have not, then DOD and the Army will need to have viable alternatives to fielding the FCS capability as currently envisioned. Depending on the results of the first decision, the second decision is to determine how to structure the remainder of the FCS program so that it attains high levels of knowledge before key commitments.

Other aspects of the FCS program warrant attention that should not wait until the 2009 decision. Primary among these is the Army’s decision to extend the role of the LSI into FCS production. This is a decision that will necessarily heighten the role the Office of the Secretary of Defense will have to play in overseeing the program and departs from the Army’s philosophy of having the LSI focus on development without the competing demands and interests that production poses. A second aspect of the program warranting attention is the Army’s approach to spin outs. It will be important for the Army to clearly demonstrate the military utility of the spin outs to current Army forces, based on testing high-fidelity, production-representative prototypes, before a commitment is made to their low rate production. This is not the current plan, as the Army plans to use some surrogate equipment in the testing that will support the production decision for spin out 1. Finally, it is important that the production investments in the spin outs and NLOS-C do not create undue momentum for production of the FCS core systems. As noted above, commitment to production of the FCS core systems must be predicated on attaining high levels of knowledge, consistent with DOD policy.

Actions Recommended in Our Recent Reports

In our March 2008 reports, we made several recommendations to ensure that the 2009 FCS milestone review is positioned to be both well-informed and transparent. Specifically, we recommended that the Secretary of Defense establish objective and quantitative criteria that the FCS program will have to meet in order to justify its continuation and gain approval for the remainder of its acquisition strategy. The criteria should be set by at least July 30, 2008, in order to be prescriptive, and should be consistent with DOD acquisition policy and best practices. At a minimum, the criteria

should include, among other things, the completion of the definition of all FCS requirements including those for the information network and the synchronization of FCS with all essential complementary programs. We also recommended that the Secretary of Defense, in advance of the 2009 milestone review, identify viable alternatives to FCS as currently structured that can be considered in the event that FCS does not measure up to the criteria set for the review. As we have previously reported, an alternative need not be a rival to the FCS, but rather the next best solution that can be adopted if FCS is unable to deliver the needed capabilities. For example, an alternative need not represent a choice between FCS and the current force, but could include fielding a subset of FCS, such as a class of vehicles, if they perform as needed and provide a militarily worthwhile capability. We further recommended that the Secretary of Defense (1) closely examine the oversight implications of the Army's decision to contract with the LSI for early production of FCS spin outs, NLOS-C, and low rate production for the core FCS program; (2) take steps to mitigate the risks of the Army's decisions, including the consideration of the full range of alternatives for contracting for production; and (3) evaluate alternatives to the LSI for long-term sustainment support of the FCS system of systems.

Finally, regarding the FCS network and software development and demonstration efforts, we recommended that the Secretary of Defense (1) direct the FCS program to stabilize network and software requirements on each software build to enable software developers to follow disciplined software practices; (2) establish a clear set of criteria for acceptable network performance at each of the key program events; and (3) in setting expectations for the 2009 milestone review, include a thorough analysis of network technical feasibility and risks, synchronization of network development and demonstration with that of other FCS elements, and a reconciliation of the differences between independent and Army estimates of network and software development scope and cost.

DOD concurred with our recommendations and stated that criteria for the 2009 FCS Defense Acquisition Board review will be established and will be reviewed and finalized at the 2008 Defense Acquisition Board review. The results of the analyses and assessments planned to support the 2009 review will inform DOD's acquisition and budget decisions for FCS. These are positive steps toward informing the 2009 Defense Acquisition Board review.

Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions you or members of the subcommittee may have.

Contacts and Staff Acknowledgements

For future questions about this statement, please contact me on (202) 512-4841 or francisp@gao.gov. Individuals making key contributions to this statement include William R. Graveline, Assistant Director; Martin G. Campbell; Ronald N. Dains; Tana M. Davis; Marcus C. Ferguson; John A. Krump, John M. Ortiz; and Carrie R. Wilson.

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