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February 2, 2009

Congressional Research Service

Report RS22631

*Defense Acquisition: Use of Lead System Integrators (LSIs) -
Background, Oversight Issues, and Options for Congress*

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October 22, 2008

Abstract. Some in Congress have expressed concern about the government's use of private sector lead system integrators (LSIs) for executing large, complex, defense-related acquisition programs. LSIs are large, prime contractors hired to manage such programs. Supporters of the LSI concept argue that it is needed to execute such complex acquisition efforts, and can promote better technical oversight and innovation. Two LSI managed programs - the U.S. Army's Future Combat System (FCS) and the U.S. Coast Guard's Deepwater program - have been strongly criticized by some observers because of cost and schedule overruns, and the potential for possible conflicts of interest. The Duncan Hunter National Defense Authorization Act for 2009 (P.L. 110-417) includes a provision that clarifies the status of the LSI function for the U.S. Army's FCS Program. On September 27, 2008, the House passed H.R. 6999, the Integrated Deepwater Program Reform Act of 2008, and referred the measure to the Senate. The bill would prohibit the Coast Guard from using a private sector entity as the LSI for Deepwater beginning 180 days after bill enactment.



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Congressional Research Service

7-5700

www.crs.gov

RS22631

Summary

Some in Congress have expressed concern about the government's use of private-sector lead system integrators (LSIs) for executing large, complex, defense-related acquisition programs. LSIs are large, prime contractors hired to manage such programs. Supporters of the LSI concept argue that it is needed to execute such complex acquisition efforts, and can promote better technical oversight and innovation. Two LSI-managed programs—the U.S. Army's Future Combat System (FCS) and the U.S. Coast Guard's Deepwater program—have been strongly criticized by some observers because of cost and schedule overruns, and the potential for possible conflicts of interest. The Duncan Hunter National Defense Authorization Act for 2009 (P.L. 110-417) includes a provision that clarifies the status of the LSI function for the U.S. Army's FCS Program. On September 27, 2008, the House passed H.R. 6999, the Integrated Deepwater Program Reform Act of 2008, and referred the measure to the Senate. The bill would prohibit the Coast Guard from using a private sector entity as the LSI for Deepwater beginning 180 days after bill enactment. This report will be updated.

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Background

LSI Concept

A lead systems integrator is a contractor, or team of contractors, hired by the federal government to execute a large, complex, defense-related acquisition program, particularly a so-called system-of-systems (SOS) acquisition program.¹ LSIs can have broad responsibility for executing their programs, and may perform some or all of the following functions: requirements generation; technology development; source selection; construction or modification work; procurement of systems or components from, and management of, supplier firms; testing; validation; and administration.²

Section 805 of the FY2006 National Defense Authorization Act³ defines two types of LSIs: (1) “Lead system integrators with system responsibility”—prime contractors who develop major systems⁴ that are not expected at the time of the contract award, as determined by the Secretary of Defense, to perform a substantial portion of the work on the system and major subsystems; and (2) “Lead system integrators without system responsibility”—contractors who perform acquisition functions that are closely associated with inherently governmental functions in the development of a major system. LSIs, regardless of type, are subject to the same rules as other federal contractors.⁵

¹ An SOS program is aimed at acquiring a collection of various platforms (i.e., ground vehicles, aircraft, and ships) that are to be linked together by computer networking technology so as to create a larger, integrated overall system. Refer to Lane, Joann and Boehm, Barry, *System-of-System Cost Estimation: Analysis of Lead System Integrator Engineering Activities*, Inter-Symposium 2006, the International Institute for Advanced Studies in Systems Research and Cybernetics, at http://sunset.usc.edu/publications/TECHRPTS/2006/2006_main.html.

² Generating program requirements is an important process in defining the mission, scope, and direction of a major defense acquisition program. Source selection means the solicitation, evaluation, and hiring of subcontractors to work under the supervision of the LSI. LSIs manage the procurement of all systems and components including the construction and modification of such systems; the testing of systems by validating their appropriateness and interoperability; and by performing functions usually undertaken by contracting or other acquisition officials.

³ H.R. 1815/P.L. 109-163.

⁴ Major systems are defined in the act as systems for which the total expenditures for research, development, test and evaluation (RDT&E) are estimated to be more than \$155 million, or for which the total amount projected for procurement is estimated to be more than \$710 million.

⁵ Section 805 required DOD to submit a report to Congress on the use of LSIs for the acquisition of major systems. As a result, DOD conducted a survey to determine how many contractors met the two definitions in Section 805. Of 60 contracts reviewed, DOD determined that 39 fell within the scope of some, but not all, of the requirements of the first definition, and that 21 contractors met the requirements of the second definition. (*Report to Congress, Section 805 of the National Defense Authorization Act for FY2006, Use of Lead System Integrators in the Acquisition of Major Systems*. Office of the Under Secretary of Defense for Acquisition, Technology & Logistics, September 2006, 5 p.) Also, Section 807 of the National Defense Authorization Act for 2007 (P.L. 109-364) required DOD to establish certain limitations on contractors acting as LSIs. The Director of Defense Procurement and Acquisition Policy has stated that only contractors who have no direct financial interest in the development or production of an individual system or element of an SOS will be eligible for a contract award as an LSI. (*Report to Congress, Section 805 of the National Defense Authorization Act for FY2007, Use of Lead System Integrators in the Acquisition of Major Systems*. Office of the Under Secretary of Defense for Acquisition, Technology & Logistics, April 30, 2007, 2 p.)

Examples Of LSIs

Examples of programs being executed with LSIs include the Army's Future Combat System (FCS) and the Coast Guard's Deepwater acquisition program, both of which are multibillion-dollar SOS acquisition programs.⁶ The LSI for the FCS program is a partnership between Boeing and Science Applications International Corporation (SAIC); the LSI for the Deepwater program is Integrated Coast Guard Systems (ICGS), a joint venture between Northrop Grumman and Lockheed Martin. Both of these programs have experienced problems, among them costs and schedule overruns, and have been the subject of multiple congressional oversight hearings.

Rationale For Using LSIs

In recent years, federal agencies like the Department of Defense (DOD) have turned to the LSI concept in large part because they have determined that they lack the in-house, technical, and project-management expertise needed to execute large, complex acquisition programs. It is not altogether clear what all of the reasons are for this insufficient expertise determination. Some possible reasons for the lack of in-house expertise may include the downsizing of the DOD acquisition workforce and the increase in the size and scope of DOD procurement activities. DOD states that its acquisition workforce was reduced by more than 50 percent between 1994 and 2005.⁷ The lack of sufficient in-house expertise could also result from the growing complexity of the systems being acquired.

Supporters of LSIs argue that LSI arrangements can promote better technical innovation and overall system optimization. This is largely because private-sector firms often have better knowledge and expertise, when compared to federal government agencies, of rapidly developing commercial technologies that can be used to achieve the government's program mission and objectives.

Potential Oversight Issues for Congress

The House Armed Service Committee's Subcommittee on Air and Land Forces heard recent testimony from a GAO official on the Army's decision to broaden the FCS LSI role from development to production. He stated that:

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.⁸

⁶ For more on the FCS program, see CRS Report RL32888, *The Army's Future Combat System (FCS): Background and Issues for Congress*, by Andrew Feickert. For more on the Deepwater program, see CRS Report RL33753, *Coast Guard Deepwater Acquisition Programs: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke.

⁷ Defense Acquisition Organizations: Status of Workforce Reductions. Report to the Chairman, Committee on National Security, House of Representatives. Government Accountability Office, GAO/NSIAD-98-161, June 1998, 20 pages. Also see "Report on the Federal Acquisition Workforce, FY2003-2004," Federal Acquisition Institute Report, Executive Summary, p. vii.

⁸ Defense Acquisitions: 2009 Review of Future Combat System Is Critical to Program's Direction. Statement of Paul L. Francis, Director, Acquisition and Sourcing Management before the HASC Subcommittee on Air and Land Forces. (continued...)

On April 17, 2007 the Coast Guard announced that it would gradually assume the LSI role for the Deepwater program.⁹ Media reports stated that the Department of Justice is investigating parts of the Deepwater program.¹⁰

Problems with the FCS and Deepwater programs have raised concerns regarding the use of private-sector LSIs for executing large, complex defense acquisition programs. Given the size, scope, and costs associated with the FCS program, Congress mandated that DOD hold an FCS milestone review, following the preliminary design review (scheduled for 2009). Since the inception of the FCS program, GAO has performed audits of the program's cost, schedule, and performance. One of GAO's concerns was that the actual performance of the completely integrated FCS will be demonstrated very late in the program, and could result in a significant cost increase to the government.

Congressional hearings on the Deepwater program have raised a number of oversight issues. The DOD Inspector General (IG) reported on the increased Deepwater costs due to design deficiencies and mismanagement, and raised questions about a lack of accountability and responsibility on the part of the LSI and Coast Guard management. Also, the Defense Acquisition University has questioned the overall Deepwater LSI approach and recommended fundamental changes to the program, including a revised acquisition strategy that "does not rely on a single industry entity or contract to produce or support all or the majority of U.S. Coast Guard capabilities."¹¹

Transparency

Some observers have expressed concern that LSI arrangements can result in the government having insufficient visibility into many program aspects such as program costs, optimization studies conducted by LSIs for determining the mix of systems to be acquired, LSI source-selection procedures, and overall system performance. In an LSI arrangement, the federal government has a contractual relationship with the LSI prime contractor, not with any subcontractors that report to the prime contractor. A lack of transparency in these areas can make it more difficult for the federal agency or Congress to adequately manage and conduct effective oversight of an acquisition program. Also, this lack of transparency could potentially increase the risk of cost overruns, schedule slippage, poor product quality, and inadequate system performance.

Given the three-year rotation cycle of most senior military officers, combined with DOD's decreased amount of in-house technical expertise, observers are concerned that the government's ability to make independent assessments of programs being executed by LSIs has been reduced. Any difficulty in independently assessing an LSI's performance in executing a program could

(...continued)

GAO-08-638T, April 10, 2008, p. 9.

⁹ Merle, Renae and Hsu, Spencer. Coast Guard To Take Over "Deepwater" Move Wrestles Control From Consortium of Contractors. *Washington Post*, April 17, 2007, p. D01.

¹⁰ DOJ Investigating Coast Guard's Troubled Deepwater Program. *Inside the Navy*, April 23, 2007, Vol. 20, No. 16.

¹¹ House Transportation and Infrastructure Committee Hearing on the Coast Guard Deepwater Program, April 18, 2007; Senate Committee Hearing of the Ocean, Atmospheres, and Fisheries of the Coast Guard's Subcommittee on Commerce, Science, and Transportation Committee, February 14, 2007.

also complicate the government's ability to use a contractor's past performance record in weighing a future bid from a firm that acted as an LSI.

Potential Conflicts Of Interest

Some observers have expressed concern that LSI arrangements can create conflicts of interest for an LSI in areas such as determining system requirements and soliciting, evaluating, and hiring contractors. They are concerned that an LSI might tailor system requirements to fit the LSI's own products, or that in selecting a source for a system or component the LSI might favor one of its own subsidiaries (or a favored supplier firm) over other potential suppliers. Favoring some contractors over others could increase the government's costs or reduce technical innovation, particularly if a more innovative solution offered by another firm would compete with a core business line of the LSI.

Self-certification

Some observers have expressed concern that LSI arrangements can result in LSIs certifying that their own work has met contractual requirements for the program. Such self-certification, these observers argue, can equate to no real certification. In particular, the self-certification issue has been raised in connection with the Deepwater program. Earlier this year, Philip Teel, President of Northrop Grumman Ship Systems testified that self-certification did not take place, except in some foreign contracts.¹²

Re-competing LSI Role

Acquisition programs being executed with LSIs can span over many years. Although the role of the LSI in such a program can be re-competed every few years, some observers are concerned that, in practice, it would be very difficult for an outside firm to successfully challenge an incumbent LSI that has managed a program for several years. The incumbent's greater knowledge of the program and the potential disruptions to the program that might be caused by switching to a new LSI would likely pose a barrier to another contractor's ability to take over the program. This could make it difficult for the government to terminate a program. As a result, these observers argue, the government may have little real ability or leverage to use periodic re-competition to improve the performance of the LSI in a long-term acquisition program.

Competition For Subsequent Programs

A related concern focuses on the potential for competing successor programs. Observers are concerned that if an LSI-managed SOS program is central to the future capabilities of the military service in question (as is the case for the FCS and Deepwater programs), the LSI might design the SOS architecture so as to create a built-in advantage for products made by the LSI.

¹² Walsh, Bill. "Coast Guard report angers panel; Commandant is scolded for lack of oversight of work on new flagship." *Houston Chronicle*, January 31, 2007, p. A6. Walsh, Bill. "House members react angrily to patrol boat problems." *Newhouse News Service*, January 30, 2007.

Potential Options for Congress

Potential options, in addition to maintenance of the status quo, regarding how and when LSIs might be used in acquisition programs are listed below. Some of these options could be combined.

- reduce the possible need for LSIs by pursuing separate procurement programs rather than SOS programs;
- require that certain conditions be met before a private-sector LSI can be used on an acquisition program (analogous to conditions set for use of the multi-year procurement program);
- require that LSI arrangements include features to ensure transparency, prevent conflicts of interest, prohibit self-certification, require independent assessments, and facilitate meaningful periodic competitions of the LSI role;¹³
- institute additional or stricter reporting requirements for programs being executed by LSIs;
- require DOD and other federal agencies to share lessons learned regarding programs executed with private-sector LSIs;
- prohibit the use of private-sector LSI's in future acquisition programs;
- reduce the possible need for private-sector LSIs by building back up the defense civilian and military acquisition workforces, and have DOD assume the role of the LSI, and require that DOD manage all SOS programs;¹⁴ and
- implement the recommendations of the recent Gansler Commission on improving the acquisition workforce.

Legislative Activity

P.L. 110-417, the Duncan Hunter National Defense Authorization Act for 2009, includes a provision that amends existing public law by clarifying the status of the Lead System Integrator function for the U.S. Army's FCS Program.¹⁵ Section 112 of the bill provides a provision that clarifies the length of time that the contractor can remain the LSI. The provision requires the Secretary of the Army to certify to congressional defense committees when the prime contractor is no longer serving as the lead systems integrator, and notes that any modification to the existing FCS contract, when expressly for the purpose of commencing full-rate production of any major systems or subsystems, shall be considered a new contract.¹⁶

¹³ Options for facilitating meaningful periodic competitions of the LSI role could include, among other things, requiring the system being acquired to use open architecture standards and meet the same acquisition preferences as those required for separate acquisition programs.

¹⁴ U.S. Army. Urgent Attention Required: Army Expeditionary Contracting, Report of the Commission on Army Acquisition and Program Management, November 1, 2007, p. 10, at http://www.army.mil/docs/Gansler_Commission_Report_Final_071031.pdf.

¹⁵ Section 112 amends Section 802 of the FY2008 NDAA (P.L. 110-181).

¹⁶ Section 112. Clarification of Status of Future Combat Systems Program Lead System Integrator.

On September 27, 2008, the House passed H.R. 6999, the Integrated Deepwater Program Reform Act of 2008, and referred the measure to the Senate. The bill would prohibit the Coast Guard from using a private sector entity as the LSI for Deepwater beginning 180 days after bill enactment. Other provisions include a requirement that the Coast Guard enter into full and open competition for all Deepwater contracts and subcontracts;¹⁷ establish a Chief Acquisition Officer position; and include reporting requirements on Deepwater asset costs, deliveries and contracts, as well as the implementation of changes to the Deepwater Program. The bill would provide for additional provisions, including the elimination of self-certification by the contractor or the subcontractor.

A similar bill, H.R. 2722, the “Integrated Deepwater Program Reform Act,” was passed by the House on July 31, 2007, while a companion bill by the same name (S. 924) was passed by the Senate. These two bills would have prohibited the use of a private LSI beginning two years after enactment of the legislation, require that acquisitions for Deepwater contracts are made under full and open competitions, add new requirements for technical reviews and operational assessments, and other provisions.

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¹⁷ The provision grants exceptions to the use of full and open competition, in accordance with the Competition in Contracting Act of 1984 and the Federal Acquisition Regulation.