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CRS Report for Congress

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

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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. 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. Supporters of the LSI concept argue that it is needed to execute certain large, complex acquisition efforts, and can promote better technical oversight and innovation. They assert that the use of LSIs result in an overall benefit for the government. Congress has several potential options regarding how and when LSIs might be used in the future. Section 115 of P.L. 109-364 requires the Comptroller General to report to Congress on the FCS lead system integrator. The 110th Congress has also introduced legislation (S. 680) to require the federal government to study the use of LSIs, and legislation which would prohibit the use of LSIs for remaining contracts under the Deepwater Program (S. 889). This report will be updated as events warrant.

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

[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. For more on SOS acquisition programs, see System-of-System Cost Estimation: Analysis of Lead System Integrator Engineering Activities, by Lane, Joann and Boehm, Barry. Inter-Symposium 2006, the International Institute for Advanced Studies in Systems Research and Cybernetics. Accessed online, February 21, 2007, at

(continued...)

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 Act[3] defines two types of LSIs: (1) prime contractors who develop major systems,[4] that are expected at the time of the contract award to perform a substantial portion of the work on the system and major subsystems; and (2) 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]

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.

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[1] (...continued)
[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. Decisions made here can help mitigate the government's potential risk. Source selection means the solicitation, evaluation, and hiring of sub-contractors 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. LSIs manage the testing of systems, validate that systems are appropriate and interoperable, and administer all aspects of this process. LSIs perform functions that are usually performed by the contracting officer, and other officials on the government's acquisition team.

[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, Required by 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.)

[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 Program: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke.

Other examples of LSI-managed programs include the National Missile Defense Program (the LSI is Boeing), and the Air Force's Transformational Communication System (the LSI is Booz-Allen-Hamilton).

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 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 scope of DOD procurement activity. 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, consequently, overall system optimization. This is largely because private-sector firms often have better knowledge and expertise, 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

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, the Government Accountability Office (GAO) has performed audits of the program's cost, schedule, and performance. One of GAO's concerns is that under the current FCS program schedule, 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. Section 115 of P.L. 109-364 requires the Comptroller General to report to Congress on GAO's assessment of a myriad of factors associated with the FCS program, including the Boeing-SAIC LSI arrangement.[8]

Recent congressional hearings on the Deepwater program have raised a number of oversight issues. The DOD Inspector General (IG) reported on the increased Deepwater

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[7] Defense Acquisition Organizations: Status of Workforce Reductions. Report to the Chairman, Committee on National Security, House of Representatives. General Accounting Office, GAO/NSIAD-98-161,June 1998. 20 pages. For another source of data on the federal acquisition workforce, see Report on the Federal Acquisition Workforce, FY2003-2004, Federal Acquisition Institute Report, Executive Summary, p. vii.

[8] For further discussion on the FCS program, refer to the following: Key decisions to be made on the Future Combat System. Statement of Paul L. Francis, Director, Acquisition and Sourcing Management. Government Accountability Office, GAO-07-376, Mar. 15, 2007, 29 p. For further information about the FCS program, see Government Accountability Office, *Future Combat Systems Challenges and Prospects for Success*, GAO-05-442T, Mar. 16, 2005, p. 2.

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. Another assessment, from the Defense Acquisition University, 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."[9]

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 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 a system's 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. The self-certification issue has been raised in particular in connection with the Deepwater program. In a recent hearing, Philip Teel, President of Northrup Grumman Ship Systems, has denied that self-certification took place, except in some foreign contracts. [10]

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[9] Senate Committee Hearing of the Ocean, Atmospheres, and Fisheries of the Coast Guard's Subcommittee on Commerce, Science, and Transportation Committee, February 14, 2007.

[10] 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.

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. This decision could impact follow-on competitions the military service might later conduct for other acquisition programs.

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;
- 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.
- 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;[11]
- institute additional or stricter reporting requirements for programs being executed by LSIs;

[11] 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.

- 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.

Legislative Activity

In the first session of the 110th Congress, the Accountability in Government Contracting Act of 2007 (S. 680) was introduced in the Senate (February 17, 2007) and referred to the Committee on Homeland Security and Governmental Affairs. The purpose of the bill is to ensure proper oversight and accountability in federal contracting. Section 125 of the bill would direct the head of the Office of Federal Procurement Policy to recommend regulations to control the use of lead system integrators, as described here.

> Section 125. Lead System Integrators.
> (a) Study- Not later than 180 days after the date of the enactment of this Act, the Administrator for Federal Procurement Policy shall develop a government-wide definition of lead systems integrators and complete a study of the use of such integrators by executive agencies.
>
> (b) Recommendations- Not later than 180 days after the study under subsection (a) is completed, the Administrator for Federal Procurement Policy shall submit to Congress recommendations for regulations to control the use of lead systems integrators to ensure that they are used in the best interests of the Federal Government.

On March 15, 2007, S. 889 was introduced and referred to the Senate Commerce, Science, and Transportation Committee. The bill is in the first step of the legislative process and the text of the legislation is not yet available. Media sources report that the bill would require the Coast Guard to terminate its Deepwater LSI contract.[12]

In the second session of the 109th Congress, a provision enacted in P.L. 109-364 prohibits contractors who serve as LSIs from having any direct financial interest in the development or construction of any individual platform, system, or element of any SOS, with certain exceptions.[13]

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[12] Lipowicz, Alice. Kerry bill would torpedo Deepwater program. *Washington Technology*, March 19, 2007.

[13] Section 807 of H.R. 5122, the FY2007 John Warner National Defense Authorization Act.