

GAO

Report to the Ranking Minority Member,
Subcommittee on Post Office and Civil
Service, Committee on Governmental
Affairs, U.S. Senate

April 1996

FEDERALLY FUNDED R&D CENTERS

Information on the Size and Scope of DOD-Sponsored Centers



G A O
75 years
1921 - 1996



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

National Security and
International Affairs Division

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April 24, 1996

The Honorable David Pryor
Ranking Minority Member
Subcommittee on Post Office and
Civil Service
Committee on Governmental Affairs
United States Senate

Dear Senator Pryor:

As requested, we are updating our 1988 report entitled Competition: Information on Federally Funded Research and Development Centers (GAO/NSIAD-88-116FS, May 24, 1988) for the Department of Defense's (DOD) 11 federally funded research and development centers (FFRDC). Specifically, this report describes the (1) funding and staff size of the FFRDCs; (2) extent of subcontracted FFRDC work; (3) structure of the parent organizations; (4) missions, core competencies, and capabilities of the FFRDCs; (5) sponsors' criteria for defining core work; and (6) sponsors' oversight mechanisms and responsibilities.

Background

FFRDCs were first established during World War II to meet specialized or unique research and development needs that could not be readily satisfied by government personnel, due to limits on federal salaries and hiring, or by commercial contractors.¹ Additional and expanded requirements for specialized services led to increases in the size and number of FFRDCs to a peak of 74 FFRDCs in 1969. Today, 8 agencies, including DOD, fund 39 FFRDCs that are operated by universities, nonprofit organizations, or industrial firms under long-term contracts.² Legislation and federal procurement regulations permit agencies to award these contracts noncompetitively.³ Within DOD, the Director of Defense Research and Engineering is responsible for developing overall policy for DOD's 11 FFRDCs. The Director also determines the funding level for each FFRDC based on the overall congressional ceiling on FFRDC funding and FFRDC sponsors' funding

¹FFRDCs were previously called federal contract research centers (FCRC).

²Of the total \$74.4 billion spent on federal research in fiscal year 1994, federal agencies spent about \$6.3 billion, or 8.5 percent, on FFRDCs.

³See the Competition in Contracting Act, 10 U.S.C. 2304, and the Federal Acquisition Regulation.

requirements.⁴ DOD categorizes each of its FFRDCs as a (1) systems engineering and integration center, (2) studies and analyses center, or (3) research and development laboratory. Table 1 shows DOD's 11 FFRDCs by category, parent organization, and primary sponsor.

Table 1: DOD's FFRDCs, Parent Organizations, and Primary Sponsors

FFRDC	Parent organization	Primary sponsor
Systems engineering and integration centers		
Aerospace	The Aerospace Corporation	Air Force
MITRE C ³ I	The MITRE Corporation	Assistant Secretary of Defense (C ³ I)
Studies and analyses centers		
Arroyo Center	RAND	Army
Project AIR FORCE	RAND	Air Force
National Defense Research Institute	RAND	OSD
Center for Naval Analyses	The CNA Corporation	Navy
IDA-Studies and Analyses/Operational Test and Evaluation	IDA	OSD
Logistics Management Institute	Logistics Management Institute	OSD
Research and development laboratories		
Lincoln Laboratory	Massachusetts Institute of Technology	Air Force
Software Engineering Institute	Carnegie Mellon University	Defense Advanced Research Projects Agency
IDA-Communications and Computing Center ^a	IDA	National Security Agency

Note: Command, Control, Communications, and Intelligence (C³I); Office of the Secretary of Defense (OSD); and Institute for Defense Analyses (IDA).

^aIDA-Communications and Computing Center is sometimes referred to as IDA-C³I.

The military services and defense agencies sponsor individual centers and award and administer the 5-year contracts that are typically negotiated noncompetitively after the agencies' continued need for the FFRDC is established. Unlike commercial contractors, an FFRDC accepts restrictions on its ability to manufacture products and compete for other government or commercial business. These restrictions are intended to (1) limit the potential for conflicts of interest when FFRDC staff have access to sensitive

⁴In fiscal year 1994, DOD spent about \$824.6 million, or about 2.4 percent, of its total \$34.7 billion budget for research, development, test, and evaluation on its FFRDCs. DOD's FFRDCs also receive funds from the procurement and operations and maintenance accounts.

government or contractor data and (2) allow the center to form a special or strategic relationship with its DOD sponsor.⁵

The size, scope, and oversight of DOD's FFRDCs have been recurring areas of concern to Congress, federal officials, and the private sector throughout the past three decades. Since 1991, Congress reduced the funding and approved personnel ceilings for the FFRDCs, capped executives' salaries, and prohibited the creation of new FFRDCs.

Results in Brief

Overall funding for DOD's FFRDCs, in constant 1995 dollars, increased by about 23 percent, from almost \$1.4 billion in fiscal year 1985 to a peak of approximately \$1.7 billion in fiscal year 1990, after which Congress began reducing DOD's FFRDC funding.⁶ Since fiscal year 1990, funding for DOD's FFRDCs has decreased by almost 26 percent to about \$1.3 billion in fiscal year 1995. However, over this 5-year period, funding and members of technical staff (MTS)⁷ for the three categories of FFRDCs were not reduced proportionately; smaller funding reductions were made to the studies and analyses centers (7 percent) in contrast to the systems engineering centers (24 percent) and the laboratories (36 percent). Hence, the studies and analyses centers remained closer to their 1990 levels. The majority of resources—about 57 percent of funding and 62 percent of MTS—in fiscal year 1995 were used in DOD's two systems engineering and integration centers—Aerospace and MITRE. The average cost per MTS for DOD's FFRDCs was about \$181,000 in fiscal year 1995.

Subcontracting at DOD's FFRDCs, which primarily included engineering and consulting assistance, totaled 7 percent, or about \$83 million, of FFRDC

⁵Role of Federally Funded R&D Centers in the Mission of the Department of Defense, Defense Science Board Task Force, April 25, 1995, and Report of the DOD Internal Advisory Group on Federally Funded Research and Development Centers, May 18, 1995, define the characteristics of the special or strategic relationship as unique competence and quality, close integration, objectivity and independence, and long-term continuity.

⁶The policy of the Office of the Director of Defense Research and Engineering is to report funding data using actual obligations rather than expenditures. Actual obligations represent the amount of contracts awarded, services rendered, and similar transactions during a given period that will require payment during the same or future period. Expenditures result from the issuance of checks, disbursement of cash, or electronic transfer of funds made to liquidate a federal obligation. According to DOD officials, using obligations allows you to refer to a fixed number, while expenditures are constantly changing due to economic fluctuations, among other things.

⁷MTS includes the direct professional labor of researchers, mathematicians, analysts, economists, scientists, engineers, and others who perform professional-level technical work. DOD defines an average MTS as 1,810 hours of full-time employee or professional effort; subcontracting is excluded. A DOD official told us that the FFRDCs may not use this number to calculate MTS; therefore, differences in determining MTS sometimes occur.

funding in fiscal year 1995.⁸ Lincoln Laboratory had the most subcontracts—approximately 29 percent or about \$78.4 million of its total expenditures in that year. It accounted for about 95 percent of all reported subcontracting.

Of the eight parent organizations that operate DOD's FFRDCs, six also operate organizations outside the FFRDC structure. Two of the six that operate other organizations are universities. Of the four remaining, DOD's FFRDCs constitute the majority of their total revenue. For these parent organizations, FFRDC funding ranged from about 69 percent of total funding at RAND to 94 percent at The CNA Corporation in fiscal year 1994.⁹ The MITRE Corporation and RAND also operate FFRDCs sponsored by federal agencies other than DOD.

Each of DOD's FFRDC's stated mission and core competencies are focused on supporting the requirements of the sponsor. The mission is expected to reflect the characteristics of the special or strategic relationship between the DOD sponsor and the FFRDC. The core competencies of the FFRDCs include a wide range of research and technical areas that are related to their missions. According to DOD, in pursuit of their missions, the FFRDCs maintain capabilities, including the staff, tools, facilities, and research disciplines required to effectively address diverse sponsor research needs with consistently high-quality work.

DOD defines core work as that which is consistent with an FFRDC's purpose, mission, capabilities, core competencies, and its special relationship with the sponsor. According to DOD, to be consistent with the special relationship, its FFRDCs are required to maintain certain characteristics, including freedom from real or perceived conflicts of interest, broad access to sensitive government and proprietary information, and long-term continuity of knowledge on issues and problems that are of enduring concern to the sponsors.

According to the DOD sponsoring agencies, oversight of an FFRDC is conducted at several levels, which generally include the DOD primary sponsor, an advisory group, and an executive agent as well as by other groups such as the Defense Contract Audit Agency, Defense Contract

⁸According to DOD, subcontracting includes only the subcontracts or purchase orders that the FFRDCs awarded to private companies for services directly supporting official FFRDC work. It does not include subcontracts for supplies or materials, administrative support and janitorial services, or consultants paid on a daily basis.

⁹Fiscal year 1994 funding data was not available for the Logistics Management Institute's organization, since it was created at the end of fiscal year 1994.

Management Command, DOD Inspector General's office, and OSD. For each FFRDC, the primary sponsor is responsible for providing guidance on its needs and priorities; approving and overseeing research; and continually reviewing the FFRDC's work to oversee its quality, efficiency, and appropriateness. These reviews include at least an annual review and a 5-year comprehensive review. The DOD advisory group is expected to provide information to the FFRDC on the sponsor's interests and priorities; provide guidance on the scope of work; and review, evaluate, and approve the FFRDC's research and technical program. The responsibilities of the DOD executive agent generally include administering and providing guidance to the FFRDC and serving as a liaison between the advisory group and the FFRDC.

Agency Comments

DOD generally concurred with this report. (See app. VI.) DOD provided some technical comments that have been incorporated into the report where appropriate.

We also obtained comments from the FFRDCs and have incorporated their comments where appropriate. In cases where the FFRDCs' information differed from DOD's information, we contacted both parties to attempt to resolve the discrepancies.

Scope and Methodology

We obtained the obligations and MTS data included in appendixes I and II from DOD documents, reports, and interviews with officials from the Office of the Director for Defense Research and Engineering, the sponsoring agencies, and the FFRDCs. Subcontracting data was provided by the FFRDCs. We did not independently verify the accuracy of this information. According to a DOD official, since DOD has rigidly managed its FFRDC funding within the ceilings provided by Congress, the obligations data provided by DOD is accurate. The official also said that, although the MTS data are estimates and difficult to verify, he is confident that the FFRDCs have been consistently applying the MTS definition provided by DOD to calculate their MTS. When we identified apparent discrepancies in the data, we cross-checked the information with DOD and the FFRDCs and were generally able to resolve the differences. We reported DOD data in the few cases when differences could not be resolved.

We ascertained the official purpose and mission of each FFRDC from its sponsoring agreement or contract. The core competencies, capabilities, criteria for assigning work, and oversight and responsibilities were

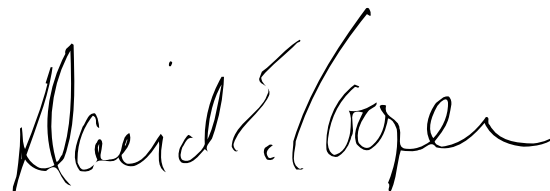
obtained from DOD documents, reports, and interviews with officials from the Office of the Director for Defense Research and Engineering, the sponsors, and the FFRDCs. We also reviewed prior reports by the Defense Science Board, DOD's Inspector General's office, Congressional Research Service, Office of Technology Assessment, and our office. We conducted our review between April and November 1995.

Appendix I provides information on the funding, staff size, and extent of subcontracting at DOD's FFRDCs, and appendix II includes information on the parent organizations of the FFRDCs. Appendixes III through V include general information on each of the FFRDCs by category, and appendix VI contains comments from DOD. A list of related FFRDC reports is provided at the end of this report.

Unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days after its issue date. At that time, we will send copies of this report to the Chairmen and Ranking Minority Members, Senate and House Committees on Appropriations, Senate Committee on Governmental Affairs, and House Committee on Government Reform and Oversight; the Secretary of Defense; and the Administrator of the Office of Federal Procurement Policy. Copies will also be available to others on request.

Please contact me at (202) 512-4587 if you or your staff have any questions concerning this report. Major contributors to this report were Maria Boyreau, Erin Slonaker Noel, and Charles W. Thompson.

Sincerely yours,

A handwritten signature in black ink that reads "David E. Cooper". The signature is written in a cursive style with a large, prominent "D" and "C".

David E. Cooper
Associate Director
Defense Acquisitions Issues

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Abbreviations

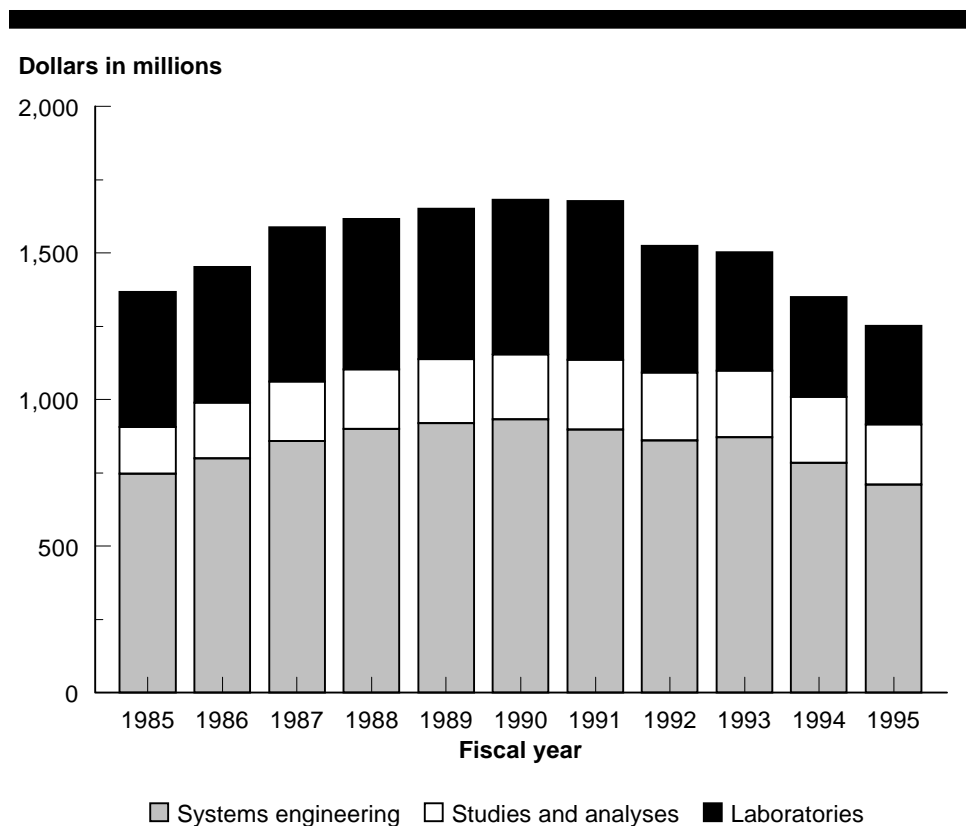
C ³ I	command, control, communications, and intelligence
C ⁴ I	command, control, communications, computers, and intelligence
CNA	Center for Naval Analyses
DOD	Department of Defense
FFRDC	federally funded research and development center
IDA	Institute for Defense Analyses
LMI	Logistics Management Institute
MTS	members of technical staff
NDRI	National Defense Research Institute
OSD	Office of the Secretary of Defense
SEI	Software Engineering Institute

Information on the Funding, Staff Size, and Extent of Subcontracting at DOD's FFRDCs

Funding and Staff Size

From fiscal year 1985 to 1991, overall funding, in constant 1995 dollars, for the Department of Defense's (DOD) federally funded research and development centers (FFRDC) increased by about 23 percent. After this growth period, Congress began to legislate reductions. From a peak of almost \$1.7 billion in fiscal year 1990, funding decreased approximately 26 percent to about \$1.3 billion in fiscal year 1995. Figure I.1 shows the obligations of DOD's FFRDCs from fiscal year 1985 to 1995.

Figure I.1: Obligations for DOD's FFRDCs in Constant 1995 Dollars (fiscal years 1985-95)



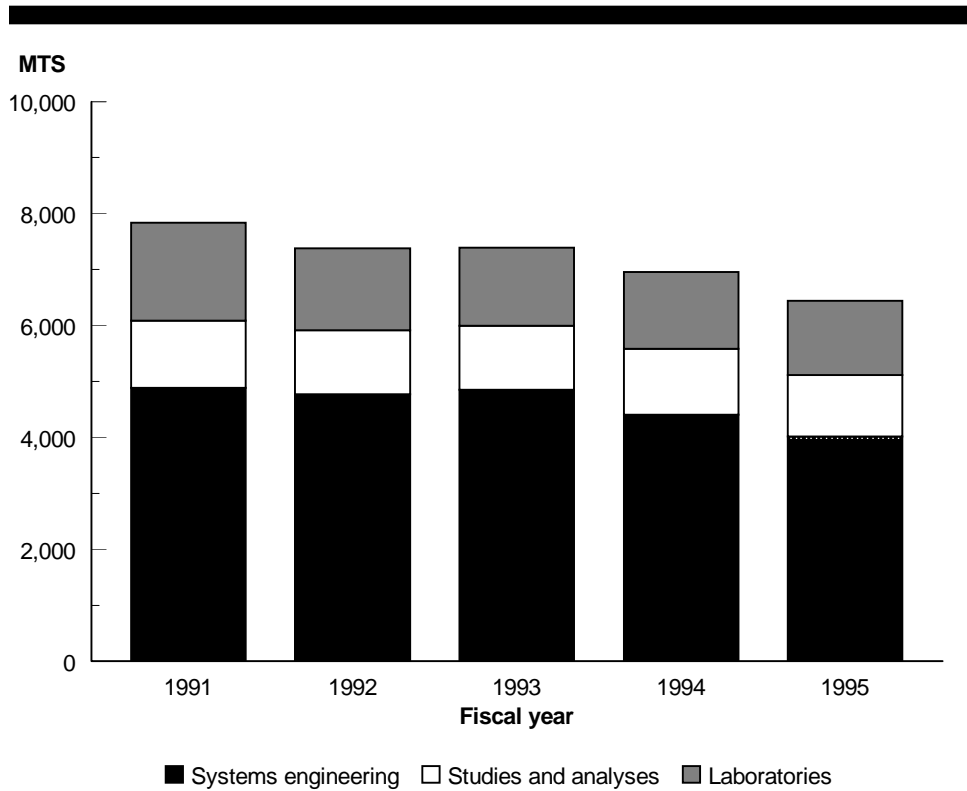
Source: DOD.

From the mid-1980s to the early 1990s, DOD's FFRDCs experienced a growth in members of technical staff (MTS). In conjunction with congressional

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reductions in DOD's FFRDC funding, in fiscal years 1991-95, total MTS were reduced by about 18 percent from 7,833 to 6,446 (see fig. I.2).

**Figure I.2: MTS for DOD's FFRDCs
(fiscal years 1991-95)**



Note: MTS data was available for fiscal years 1985-95; however, due to a change in the definition for MTS in fiscal year 1991, data for fiscal years 1985-90 is not comparable to more recent data and is not presented.

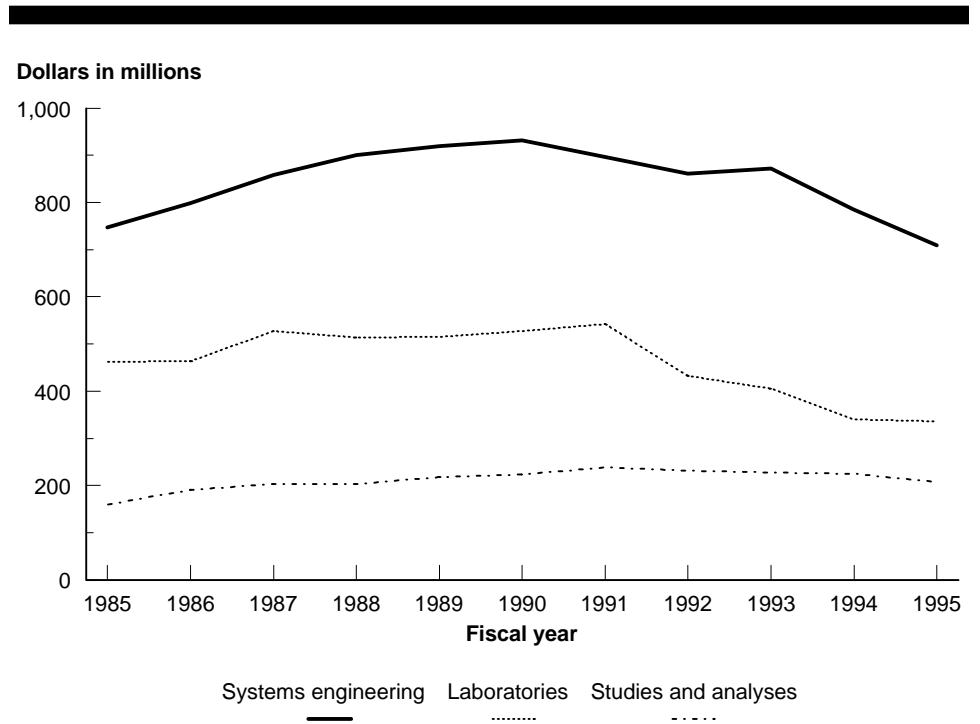
Source: DOD.

In fiscal year 1991, Congress began to reduce funding for DOD's FFRDCs. During fiscal years 1990-95, funding for DOD's studies and analyses centers was reduced 7 percent versus a reduction of 24 percent and 36 percent for

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systems engineering and laboratory centers, respectively. Figure I.3 shows obligations by FFRDC categories for fiscal year 1985 through 1995.

Figure I.3: Obligations by FFRDC Category in Constant 1995 Dollars (fiscal years 1985-95)

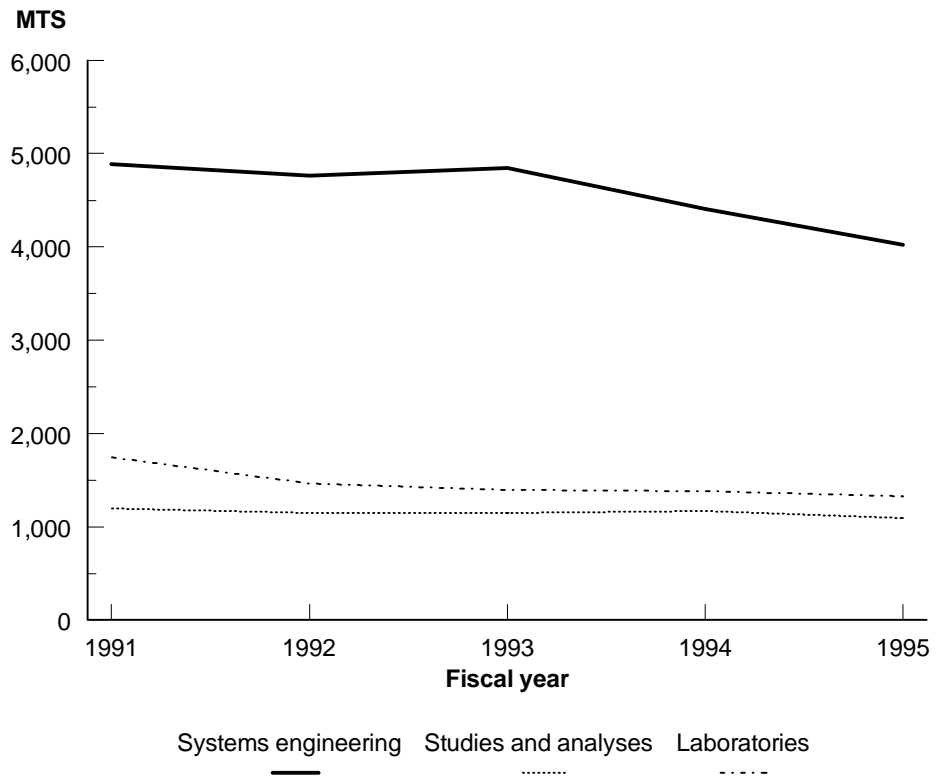


Source: DOD.

Similar to funding trends for the different types of DOD FFRDCs, reductions in MTS levels for fiscal years 1991-95 were greater for the laboratories and systems engineering FFRDCs. The cumulative MTS reduction for studies and analyses FFRDCs was approximately 9 percent, as compared to 24 percent and 18 percent for laboratories and systems engineering FFRDCs, respectively. Figure I.4 shows MTS by FFRDC categories for fiscal years 1991-95.

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Figure I.4: MTS by FFRDC Category
(fiscal years 1991-95)

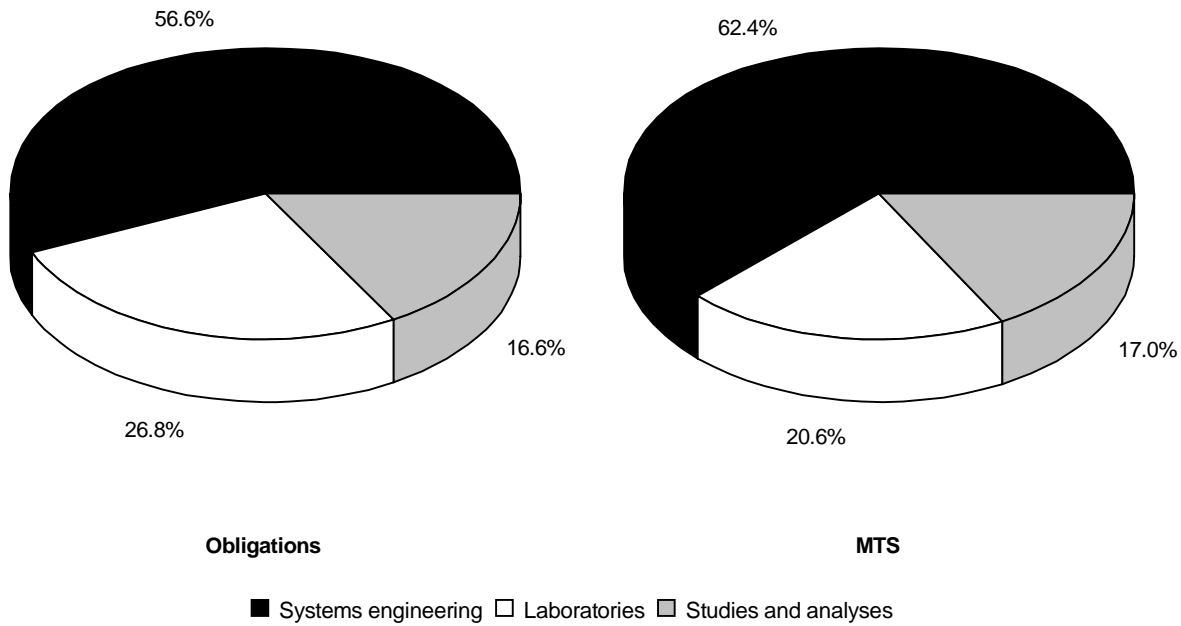


Source: DOD.

In fiscal year 1995, DOD spent about \$1.25 billion for its FFRDCs and used 6,446 MTS. The majority of funds (57 percent) and staff (62 percent) were used in DOD's two systems engineering and integration FFRDCs—MITRE command, control, communications, and intelligence (C³I) and Aerospace (see fig. I.5).

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Figure I.5: Percentage of Obligations and MTS for Each FFRDC Category (fiscal year 1995)

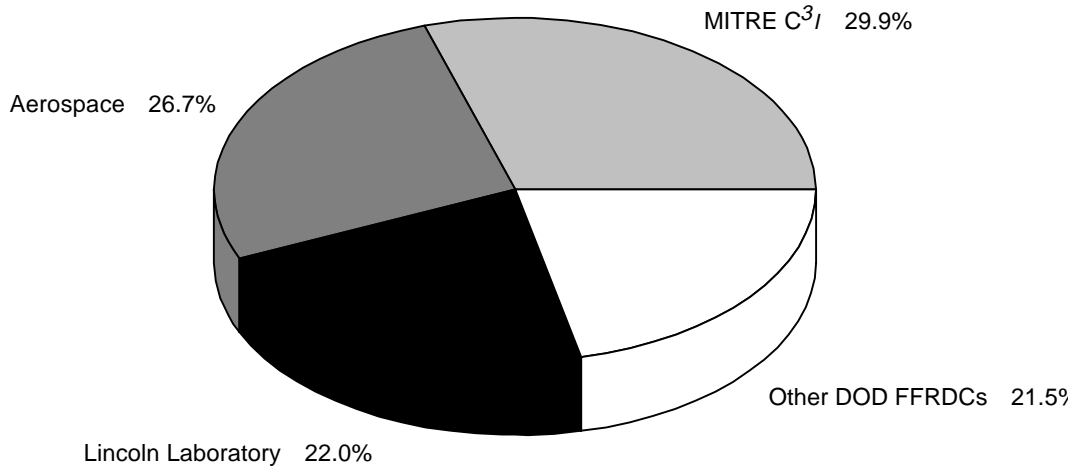


Source: DOD.

The three largest FFRDCs—including the two systems engineering and integration FFRDCs and Lincoln Laboratory—used about 79 percent of the funds and 78 percent of MTS in fiscal year 1995. Figures I.6 and I.7 show the percentage of obligations and MTS allocated to MITRE ^CI, Aerospace, Lincoln Laboratory, and the remaining FFRDCs, respectively.

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Figure I.6: Percentage of Obligations for DOD's FFRDCs (fiscal year 1995)

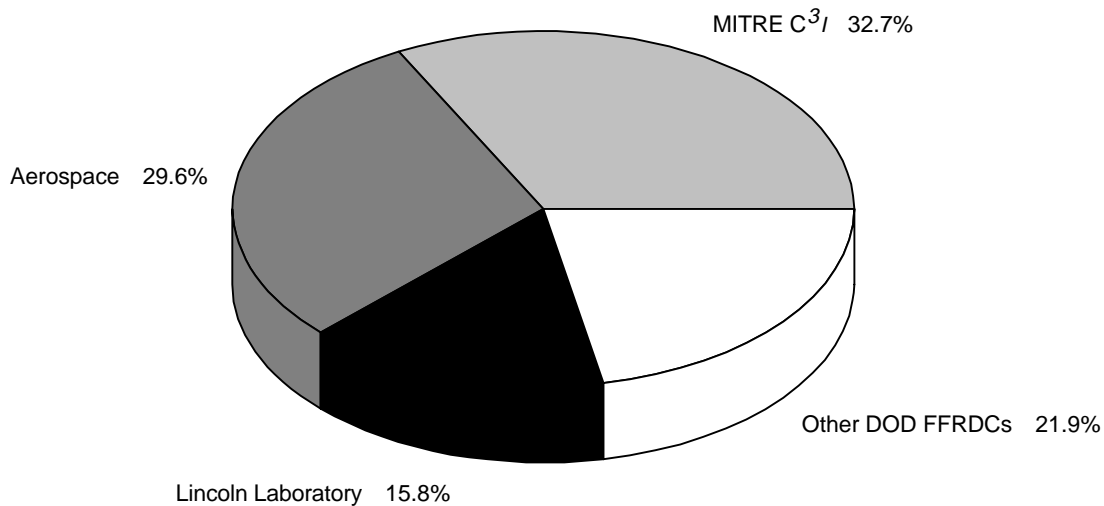


Note: Other DOD FFRDCs include Arroyo Center, 1.6 percent; Project AIR FORCE, 1.9 percent; National Defense Research Institute (NDRI), 1.5 percent; Center for Naval Analyses (CNA), 3.7 percent; Institute for Defense Analyses-Studies and Analyses/Operational Test and Evaluation (IDA), 5.5 percent; Logistics Management Institute (LMI), 2.3 percent; Software Engineering Institute (SEI), 2.3 percent; and IDA-Communications and Computing Center, 2.6 percent.

Source: DOD.

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Figure I.7: Percentage of MTS for DOD's FFRDCs (fiscal year 1995)



Note: Other DOD FFRDCs include Arroyo Center (1.5 percent), Project AIR FORCE (1.7 percent), NDRI (1.6 percent), CNA (3.7 percent), IDA-Studies and Analyses/Operational Test and Evaluation (5.9 percent), LMI (2.6 percent), SEI (2.6 percent), and IDA-Communications and Computing Center (2.2 percent).

Source: DOD.

The average cost per MTS for DOD's FFRDCs is about \$181,000.¹ This cost is somewhat higher for the research and development laboratories—about \$194,000.² The averages of the cost per MTS for the systems engineering

¹The cost per MTS is calculated by dividing the total obligations for the FFRDC, minus subcontracts, by the total MTS. The cost per MTS includes direct and indirect costs. According to a DOD official, the comparability of the cost per MTS is affected by several factors, such as the type and amount of materials and equipment procured by the FFRDC.

²According to DOD, the cost per MTS for DOD FFRDC laboratories may be higher due to the nature of work that FFRDC laboratories are tasked to complete. For example, DOD FFRDC laboratories are required to design prototypes that necessitate purchasing a great deal of hardware. Hence, some laboratories, as compared to studies and analyses centers, use a greater proportion of their DOD FFRDC ceiling allocation to procure materials and equipment.

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and integration centers and the studies and analyses centers are approximately \$176,000 and \$186,000 respectively. Table I.1 provides DOD's fiscal year 1995 FFRDC obligations less subcontracts, MTS, and cost per MTS.

Table I.1: Obligations, MTS, and Cost Per MTS for DOD's FFRDCs (fiscal year 1995)

Dollars in thousands			
FFRDC	Obligations less subcontracting	MTS	Cost per MTS (obligations/MTS)
Aerospace	\$334,700	1,910	\$175
MITRE C ³ I	373,200	2,109	177
Arroyo Center	20,100	99	203
Project AIR FORCE	24,000	112	214
NDRI	19,100	105	182
CNA	46,200	238	194
IDA-Studies and Analyses/ Operational Test and Evaluation	67,100	377	178
LMI	27,700	166	167
Lincoln Laboratory	196,500	1,018	193
SEI	28,700	170	169
IDA-Communications and Computing Center	32,600	142	229
Total	\$1,169,900	6,446	\$181

Source: DOD.

Extent of Subcontracting

Data provided by the FFRDCs showed that the extent of subcontracting by DOD's FFRDCs in fiscal year 1995 totaled about \$83 million, or about 7 percent of total fiscal year 1995 obligations. Table I.2 shows the extent of subcontracting reported by each FFRDC.

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Table I.2: DOD FFRDCs' Obligations and Extent of Subcontracting (fiscal year 1995)

Dollars in thousands			
FFRDC	Obligations	Total subcontracts	Subcontracts as a percentage of obligations
Aerospace	\$335,000	\$288	0.09
MITRE C ³ I	373,984	777	0.21
Arroyo Center	20,100	0	0
Project AIR FORCE	24,000	33	0.14
NDRI	19,355	221	1.14
CNA	46,642	443	0.95
IDA-Studies and Analyses/ Operational Test and Evaluation	68,380	1,279	1.87
LMI	28,972	1,295	4.47
Lincoln Laboratory	274,900	78,408	28.52
SEI	28,700	0 ^a	0
IDA-Communications and Computing Center	32,593	6	0.02
Total	\$1,252,626	\$82,750	6.61

^aSEI subcontracts fall within the categories of supplies and consultants paid on a daily basis and therefore are not required to be reported.

Source: DOD provided the data on obligations, and the FFRDCs provided the data on subcontracts.

FFRDCs' Parent Organizations

Eight parent organizations currently operate DOD's 11 FFRDCs. Six of these parents—MITRE, RAND, and CNA Corporations; Logistics Management Institute; the Massachusetts Institute of Technology; and Carnegie Mellon University—also operate one or more organizations that are outside of the FFRDC structure. In addition, the MITRE Corporation and RAND operate FFRDCs that are sponsored by the Federal Aviation Administration and the Office of Science and Technology Policy, respectively. This appendix provides information on each parent organization, including the DOD and non-DOD obligations and MTS for each FFRDC it operates and the obligations and MTS for each of its affiliated organizations.

The Aerospace Corporation

The Aerospace Corporation is a private, nonprofit corporation chartered in 1960 that has entered into a sponsoring agreement with the Air Force for the operation of the Aerospace FFRDC. The Board of Trustees oversees all functions of The Aerospace Corporation—DOD FFRDC activities account for about 95 percent of the corporation's work. The remainder of its work deals with space or space-related technical matters for non-DOD agencies, such as the National Aeronautics and Space Administration. The total funding for Aerospace's FFRDC was \$381 million and MTS was 2,186 for fiscal year 1994. This total funding includes \$365.5 million of DOD obligations and 2,090 MTS.

The MITRE Corporation

The MITRE Corporation was incorporated in 1958 as a private, nonprofit, public service organization. Prior to 1996, the corporation operated a DOD-sponsored FFRDC—MITRE C³I—and an FFRDC sponsored by the Federal Aviation Administration—the Center for Advanced Aviation System Development.¹ The MITRE Corporation also operated two organizations that were outside of the FFRDC structure, the Center for Environment Resources and Space and the Center for Information Systems. These non-FFRDC organizations received most of their funding from federal agencies, including DOD, the National Aeronautics and Space Administration, the Department of Justice, and the General Services Administration. Table II.1 provides fiscal year 1994 funding and MTS information for the FFRDCs and non-FFRDCs operated by the MITRE Corporation.

¹In early 1996, the MITRE Corporation spun off a nonprofit company—Mitretek Systems—to perform all of its non-FFRDC work.

Appendix II
FFRDCs' Parent Organizations

Table II.1: Funding and MTS for the MITRE Corporation's FFRDCs and Non-FFRDC Organizations (fiscal year 1994)

Dollars in millions				
Organization	Funding	Percentage of total funding	MTS	Percentage of total MTS ^a
MITRE C ³ I	\$437 ^b	74	2,569 ^b	75
Center for Advanced Aviation System Development	90	15	502	15
Center for Information Systems and Center for Environment Resources and Space	63	11	374	11
Total	\$590	100	3,445	100

^aPercentages do not add due to rounding.

^bThis figure includes \$402.9 million of DOD obligations and 2,319 MTS.

Source: DOD.

RAND

RAND is a private, nonprofit corporation headquartered in California that was created in 1948 to promote scientific, educational, and charitable activities for the public welfare and security. RAND has contracts to operate four FFRDCs, three of which are studies and analyses centers sponsored by DOD—the Arroyo Center, Project AIR FORCE, and NDRI. RAND's fourth FFRDC, the Critical Technologies Institute, is administered by the National Science Foundation on behalf of the Office of Science and Technology Policy. RAND also operates five organizations outside of the FFRDC structure: the National Security Research Division, Domestic Research Division, Planning and Special Programs, Center for Russian and Eurasian Studies, and RAND Graduate School. These non-FFRDC organizations receive funding from the federal and state governments, private foundations, and the United Nations, among others. Table II.2 provides funding and MTS information for RAND's FFRDCs and organizations operated outside the FFRDC structure.

Appendix II
FFRDCs' Parent Organizations

Table II.2: Funding and MTS for RAND's FFRDCs and Non-FFRDC Organizations (fiscal year 1994)

Dollars in millions				
Organization	Funding	Percentage of total funding	MTS	Percentage of total MTS ^a
Arroyo Center	\$20 ^b	20	99 ^b	19
Project AIR FORCE	24 ^b	24	117 ^b	22
NDRI	25 ^b	25	122 ^b	23
Critical Technologies Institute	3	3	25	5
National Security Research Division, Domestic Research Division, and others	28	28	168	32
Total	\$100	100	531	100

^aPercentages do not add due to rounding.

^bThis figure includes only DOD obligations; the FFRDC did not receive any non-DOD obligations during fiscal year 1994.

Source: DOD.

The CNA Corporation

The CNA FFRDC was created in 1961 when several elements of the Navy's civilian analytical support community were brought together under the management of the Franklin Institute. Between 1961 and 1990, the FFRDC operated under the umbrella of university and nonprofit institutions, including the University of Rochester and the Hudson Institute. In 1990, The CNA Corporation became an independent organization and entered into a contractual agreement to operate an FFRDC with the Navy. The CNA Corporation operates one FFRDC that is sponsored by the Navy as well as an organization outside the FFRDC structure—the Institute for Public Research. The Institute conducts work for federal, state, and local governments as well as nonprofit corporations, foundations, and educational institutions. Table II.3 provides funding and MTS information for The CNA Corporation's FFRDC and organization operated outside the FFRDC structure.

Appendix II
FFRDCs' Parent Organizations

Table II.3: Funding and MTS for The CNA Corporation's FFRDC and Non-FFRDC Organization (fiscal year 1994)

Dollars in millions				
Organization	Funding	Percentage of total funding	MTS	Percentage of total MTS
CNA	\$49 ^a	94	249 ^a	97
Institute for Public Research	3	6	7	3
Total	\$52	100	256	100

^aThis figure includes only DOD obligations; the FFRDC did not receive any non-DOD obligations during fiscal year 1994.

Source: DOD.

Institute for Defense Analyses

At the request of the Secretary of Defense, IDA was created as an independent, nonprofit corporation in 1956. IDA has contracts to operate two DOD-sponsored FFRDCs, the Studies and Analyses/Operational Test and Evaluation Center and the Communications and Computing Center, a research and development laboratory. Table II.4 provides funding and MTS information for IDA's FFRDCs.

Table II.4: Funding and MTS for IDA's FFRDCs (fiscal year 1994)

Dollars in millions				
Organization	Funding	Percentage of total funding	MTS	Percentage of total MTS
IDA-Studies and Analyses/Operational Test and Evaluation	\$73 ^a	68	414 ^a	74
IDA-Communications and Computing Center	34 ^b	32	149 ^b	26
Total	\$107	100	563	100

^aThis figure includes \$72 million in DOD obligations and 405 MTS.

^bThis figure includes only DOD obligations; the FFRDC did not receive any non-DOD obligations during fiscal year 1994.

Source: DOD.

Logistics Management Institute

LMI was created in 1961 as a private, nonprofit corporation whose purpose is to promote national security and the public interest. LMI has operated a DOD-sponsored FFRDC since 1985. The total funding for LMI's FFRDC was \$36.3 million and MTS was 207 for fiscal year 1994. This total funding includes \$29.7 million of DOD obligations and 171 MTS. At the end of fiscal year 1994, LMI created an organization outside of the FFRDC structure, the Center for Public Administration. LMI reported no funding for the Center in fiscal year 1994.

Massachusetts Institute of Technology

The Massachusetts Institute of Technology has operated a DOD-sponsored FFRDC—Lincoln Laboratory—since 1951. Lincoln Laboratory is only one of the Institute's operations, and the Laboratory's funding does not constitute the majority of the Institute's total funding.² The total funding for Lincoln Laboratory was \$316.5 million and MTS was 1,243 for fiscal year 1994. This total funding includes \$268.1 million of DOD obligations and 1,052 MTS.

Carnegie Mellon University

Carnegie Mellon University operates a DOD-sponsored FFRDC—SEI—which is a research and development laboratory that was created in 1984. SEI is only one of the university's operations, and SEI's funding does not represent the majority of the university's total funding. The total funding for SEI was \$32.7 million and MTS was 193 for fiscal year 1994. This total funding includes \$30.5 million of DOD obligations and 182 MTS.

²Total funding is not provided for the universities, because the FFRDCs are separate arms of the universities and, as opposed to corporate-sponsored FFRDCs, have a different structural relationship with the FFRDCs.

Systems Engineering and Integration Centers

DOD has two FFRDCs that are classified as systems engineering and integration centers—Aerospace and MITRE Corp. These centers were created to provide long-term technical and engineering support that cannot be met by existing in-house or contractor resources to ensure that systems will meet operational requirements. The centers are expected to assist with the creation and choice of system concepts and architectures, specification of technical system and subsystem requirements and interfaces, development and acquisition of system hardware and software, tests and verification of performance, and integration of new capabilities and continuous improvement of system operation and logistics. The centers are also expected to assist their sponsors in technically formulating, initiating, and evaluating programs and activities undertaken by for-profit firms.

Aerospace

The Aerospace FFRDC was created to provide scientific and engineering support involving launch, space, and related ground support systems; support scientific activities and projects; provide space system architecture and planning functions; perform research, development, and advisory services; and provide general systems engineering, engineering support, and systems integration support to the U.S. government. The Assistant Secretary of the Air Force (Acquisition) is the primary sponsor for the Aerospace FFRDC. Day-to-day management responsibilities are delegated to the Air Force Materiel Command’s Space and Missile Systems Center, which is the executive agent and primary user of the Aerospace FFRDC. Table III.1 provides general information regarding Aerospace.

Table III.1: General Information on Aerospace

Mission	Assist the Air Force in applying the resources of modern science and technology to achieve continuing advances in military space and space-related systems that are basic to national security.
	Provide the Air Force’s space efforts with an organization that is objective, technically competent, and characterized by long-term continuity.
	Provide a link between the U.S. government and U.S. scientific and industrial organizations with a capability and interest in the space field.
	Help to ensure that the technical resources of the nation are properly applied and that the potential advances in the space field are realized in the shortest time possible.
	Support the U.S. government through technical review, monitoring, and steering of industry efforts.
	Ensure that technical deficiencies and weaknesses are isolated and that the impact of new data and developments is properly assessed.
Core competencies	Launch certification.
	Systems of systems engineering.

(continued)

**Appendix III
Systems Engineering and Integration
Centers**

	Systems development and acquisition.
	Process implementation.
	Technology application.
Capabilities	<p>Assist with the creation of and choice of space system concepts and architectures; specification of technical space systems and subsystem requirements and interfaces; development and acquisition of space systems hardware and software; testing and verification of performance; integration of new capabilities and continuous improvement of system operations and logistics; and the technical formulation, initiation, and evaluation of space programs and activities of commercial firms supporting the Air Force and national security space community.</p> <p>Provide technical review, monitoring, and steering of industry efforts after a development program is initiated.</p> <p>Ensure that technical deficiencies and weaknesses are isolated and that the impact of new data and developments are properly assessed and appropriate changes are made.</p> <p>Maintain a workforce with the highest technical capability in disciplines relevant to national security space systems.</p> <p>Provide two levels of systems engineering for space systems, including the integration of subsystems and system segments into complete systems and the integration of each system into the overall national security space system.</p>
Criteria for defining core work	<p>Consistent with Aerospace's mission.</p> <p>Consistent with core capabilities and competencies.</p> <p>Consistent with special relationship:</p> <ul style="list-style-type: none"> •Objective and high-quality work on subjects integral to the Air Force's mission. •Freedom from real or perceived conflicts of interest. •Broad access to DOD planning information, intelligence, and industry proprietary information. •Comprehensive knowledge of Air Force needs and problems. •Long-term continuity of knowledge of Air Force issues. •Technical link between the Air Force space program and scientific and industrial organizations worldwide.
Oversight and responsibilities	<p>Primary sponsor</p> <p>Sets broad program direction.</p> <p>Oversees ongoing development programs.</p> <p>Reviews annual work plans and manpower allocations.</p> <p>Periodically assesses efficiency and effectiveness.</p> <p>Evaluates the work.</p> <p>Resolves intraprogram conflicts.</p> <p>Validates the appropriateness of assigning work to the FFRDC.</p> <p>Executive agent</p> <p>Manages daily activities.</p> <p>Chief Engineer's Office</p> <p>Reviews, critiques, and summarizes the assessments of Aerospace's efficiency and effectiveness and formally presents this information to the commander.</p>

(continued)

**Appendix III
Systems Engineering and Integration
Centers**

Users

Assess the efficiency and effectiveness of Aerospace, including the FFRDC's ability to maintain its objectivity, independence, quick response capability, and currency in its field of expertise.

Contracting officers

Reviews the appropriateness of work on their contracts and compliance with applicable regulations and funding limits.

Board of Trustees

Oversees all functions of the corporation and its FFRDC activities.

Considers corporation's business base, corporate structure, and executive leadership.

Reviews Aerospace performance, including technical, financial, personnel, and security issues.

MITRE C³I

MITRE C³I was created to serve as a link between the government and the science and engineering communities and provide a sound technical basis for the conception, analysis, selection, design, and evaluation of command, control, communications, computers, and intelligence (C⁴I) systems. The Assistant Secretary of Defense (C³I) is the primary sponsor of MITRE C³I. The secondary sponsors are the Air Force Electronic Systems Center and the Army Communications-Electronics Command. Table III.2 provides general information regarding MITRE C³I.

Table III.2: General Information on MITRE C³I

Mission	<p>Provide C⁴I general systems engineering, engineering support, and systems integration support to the DOD users.</p> <p>Assist sponsors in applying science and technology to the continuing advancement of military electronic systems.</p> <p>Use all pertinent resources to ensure the accomplishment of known military requirements.</p> <p>Provide technical assessment on the requirements as improved capabilities are projected.</p> <p>Perform work objectively with state-of-the-art technical knowledge and extensive familiarity with military requirements.</p> <p>Provide continuity of experience in developing successive systems.</p>
Core competencies	<p>Systems of systems engineering.</p> <p>Systems development and acquisition.</p> <p>Process implementation.</p> <p>Technology application.</p> <p>Architectures and interoperability.</p>
Capabilities	<p>Assist with the creation and choice of C⁴I systems concepts and architectures, specification of technical systems and subsystem requirements and interfaces; development and acquisition of system hardware and software; testing and verification of system performance; integration of new capabilities; continuous improvement of systems operations and logistics; and technical formulation, initiation, and evaluation of programs and activities of commercial firms supporting DOD.</p>

(continued)

**Appendix III
Systems Engineering and Integration
Centers**

Provide technical review, monitoring, and steering of industry efforts after a system development program is initiated.

Maintain a workforce with the highest technical capability and integrity.

Maintain a thorough understanding of the operational role played by the overall C⁴I systems in wartime and peacetime.

Provide on-site support to operational commanders worldwide and during actual demonstrations, tests, and exercises.

Provide a quick, in-depth response.

Provide unique, high-quality, technical, international perspectives in the mission area.

Criteria for defining core work

Consistent with MITRE C³I's purpose, mission, and capabilities.

Consistent with core competencies.

Consistent with special relationship:

- High-quality, state-of-the-art work.
- Freedom from bias and real or perceived conflicts of interest.
- Broad access to sensitive government information to ensure interoperability, detailed government budget plans, and proprietary information to support future full and open competition with industry.
- Comprehensive knowledge.
- Long-term continuity of effort ensuring technical consistency of design and a stable development strategy for the C³I systems being developed within DOD.

Oversight and responsibilities

Primary sponsor

Implements and monitors provisions in applicable regulations and legislation for using FFRDCs.

Provides management oversight and direction, technical review, and policy guidance.

Defines its mission, overall priorities, and core work.

Allocates dollar ceilings to all users.

Serves as the focal point for DOD regarding funding and dollar ceiling issues.

Provides guidance to the secondary users on the use of the FFRDC and other policy matters.

Assesses and reviews the appropriateness of each project.

Aligns overall work program based on assessments of DOD-wide priorities.

Oversees the spring reviews, comprehensive reviews, and corporate activities that affect the FFRDC.

Secondary sponsor

Negotiates and administers contracts and manages contracting relationship with MITRE C³I.

Oversees respective work programs.

Performs annual spring reviews.

Serves as focal point to prioritize the users' needs.

Reviews requests for support to determine continuing need for the FFRDC.

Ensures conformance with regulations.

Analyzes customer satisfaction and provides assessment to primary and other secondary sponsors, as well as MITRE management.

(continued)

**Appendix III
Systems Engineering and Integration
Centers**

Joint Users Committee^a

Reviews MITRE C³I work, the allocation of dollar ceilings, the quality of work, major accomplishments of the FFRDC during the previous year, and problems identified by the sponsors and/or major users.

Contracting officers

Review the appropriateness of work on their contracts, compliance with applicable regulations, and efficiency and cost-effectiveness of work programs.

Project officers

Determine the need for MITRE C³I support.

Define objectives of individual projects.

Provide evaluations of project performance to MITRE project leaders and management and sponsor managers.

Receive monthly progress reports, conduct ad hoc project reviews, and submit an annual standardized report evaluating the FFRDC's quality and efficiency.

Major users

Conduct periodic management reviews.^b

Provide a sole-source certification for each project that is signed by a general officer or senior executive official.

Focal points of major users

Oversee the appropriateness of MITRE's support.

Prioritize dollar ceiling allocations.

^aThe Joint Users Committee includes senior officials of the primary and secondary sponsors, services, defense agencies, and Joint Staff that receive technical support from the FFRDC.

^bManagement reviews are conducted by panels of general officers and/or senior executive officials.

Studies and Analyses Centers

DOD has six FFRDCs that are classified as studies and analyses centers—the Arroyo Center, Project AIR FORCE, NDRI, CNA, IDA-Studies and Analyses/Operational Test and Evaluation, and LMI. These centers were created to provide objective analyses and advise on core areas important to their sponsors in support of policy development, decision-making, alternative approaches, and new ideas on major defense issues.

Arroyo Center

At the request of the Chief of Staff of the Army, the Arroyo Center, an existing FFRDC, was moved to RAND in 1985. The center was created to provide the Army with objective and independent analyses of major policies, with an emphasis on mid- to long-term issues. The Arroyo Center’s stated purpose is to maintain expertise and institutional memory about Army operations and policy; provide a balanced, arms-length perspective on controversial issues; and provide short-term assistance on urgent issues relevant to senior Army officials. The Department of the Army is the primary sponsor of the center. Table IV.1 provides general information regarding the Arroyo Center.

Table IV.1: General Information on the Arroyo Center

Mission	Provide expert and interdisciplinary analytical research capabilities covering a broad range of relevant specialties.
	Provide objective, independent analyses emphasizing mid- and long-term issues.
	Provide advice to the Army on alternative programs and courses of action without real or perceived conflicts of interest.
	Provide a quick response capability in area of expertise.
Core competencies	Force development and technology.
	Manpower and training.
	Military logistics.
	Strategy and doctrine.
Capabilities	Provide in-depth knowledge of Army and DOD systems, technologies, operations, strategies, and resources.
	Cover a broad spectrum of issues, including alternative strategies and structures for a post-Cold War army.
	Maintain a high-quality, interdisciplinary research staff that combines long-standing experience with current knowledge.
	Draw on a broad range of facilities and current analytic tools, such as models, simulations, and databases, that are provided by RAND.
	Provide independent analyses that are free from conflicts of interest.
	Enforce a rigorous review of project results to ensure that the analyses and conclusions are thorough and sound.

(continued)

**Appendix IV
Studies and Analyses Centers**

Criteria for defining core work

- Consistent with Arroyo's purpose, mission, and capabilities.
- Consistent with core competencies.
- Consistent with special relationship:
 - Effective performance of objective, high-quality work on subjects integral to the mission and operations of the sponsors.
 - Freedom from real or perceived conflicts of interest caused by service, commercial, or other involvement.
 - Broad access to proprietary, competition-sensitive, or no-contract data.
 - Comprehensive knowledge of sponsors' needs, problems, and issues.
 - Long-term continuity of effort on issues and problems of enduring concern, including both maintaining corporate memory for sponsors when appropriate and providing a quick response as needed in areas of established expertise.
- Responsiveness to emerging and evolving needs of sponsors.

Oversight and responsibilities

- Primary sponsor**
 - Exercises broad oversight over the center and conducts a comprehensive review to determine the continuing need for the FFRDC.
- Arroyo Center Policy Committee^a**
 - Provides policy guidance to the Arroyo Center's management and meets semiannually to review, evaluate, and approve the annual research program.
- Executive agent^b**
 - Chairs pre-committee meetings semiannually and provides an annual update to the center's management.
 - Offers guidance and emphasis on development of the research agenda.
 - Maintains personal interaction with committee members.
 - Facilitates the center's contacts with senior Army leaders.
 - Develops, coordinates, and justifies the center's annual budget.
 - Conducts the annual survey, which includes a review of the center's efforts regarding quality, utility, value, cost, and timeliness.
- Project sponsors^c**
 - Oversee individual research projects.
- Board of Trustees**
 - Oversees operation of the center as specified in RAND's charter.

^aThe Arroyo Center Policy Committee is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Research, Development, and Acquisition).

^bThe Director for Program Analysis and Evaluation serves as the executive agent for the Arroyo Center.

^cA project sponsor must be a general officer or official in the Senior Executive Service.

Project AIR FORCE

Project AIR FORCE was established by the Air Force (then the Army Air Forces) at Douglas Aircraft in 1946.¹ It was transferred to RAND in 1948. The purpose of the FFRDC is to provide studies, analyses, and research on the broad subject of aerospace power, with the objective of recommending to the Air Force preferred methods, techniques, and instrumentalities for the development and deployment of aerospace power. To carry out its mission, Project AIR FORCE must have an Air Force-wide perspective and ability to deal with cross-cutting, multidisciplinary problems; a responsibility to follow problems across organizational boundaries; a focus on future Air Force needs and effectiveness; access to senior Air Force leadership and planning; and an institutional memory. The Assistant Secretary of the Air Force (Acquisition) is the primary sponsor of the center. Table IV.2 provides general information on Project AIR FORCE.

Table IV.2: General Information on Project AIR FORCE

Mission	Conduct a continuous interrelated program of objective analyses on major cross-cutting policy and management issues of enduring concern to the Air Force.
	Maintain expertise on, and an institutional memory about, Air Force operations and policy.
	Provide timely, short-term assistance on urgent problems consistent with the project's demonstrated expertise.
	Explore long-term issues and questions that will become vital concerns in the future.
Core competencies	Strategy and doctrine.
	Force development and application.
	Resource management.
Capabilities	Based on its institutional memory, provide a broad understanding of the major issues facing the Air Force, including the most pressing concerns identified by Air Force leaders.
	Provide an integrated, interdisciplinary research style and approach policy issues from multiple perspectives, which results in an understanding of the shifting boundaries and connections among policy areas.
	Draw on a broad range of research disciplines, facilities, and current analytic tools, such as models, simulations, and databases, that are provided by RAND.
	Provide trusted advice in response to urgent policy questions.
Criteria for defining core work	Consistent with Project AIR FORCE's mission, purpose, and capabilities.
	Consistent with core competencies.
	Consistent with special relationship:
	•Objective, high-quality research on subjects integral to the mission of the Air Force.
	•Freedom from real or perceived conflicts of interest.

(continued)

¹Project AIR FORCE was originally known as Project RAND. The FFRDC was renamed in 1976.

Appendix IV
Studies and Analyses Centers

Oversight and responsibilities

- Comprehensive knowledge of sponsors' needs and operations.
- Long-term continuity of effort on Air Force and aerospace power issues.

Air Force Advisory Group^a

Administers Project AIR FORCE.

Establishes overall objectives for the project.

Provides information on Air Force needs, interests, and priorities to permit the project to formulate the annual research program.

Provides broad supervisory and policy guidance to enable RAND and the project's management to conduct the research program.

Reviews and approves the annual research program.

Empowers the project sponsors to approve and oversee the individual project research.

Periodically evaluates, with RAND management, the total current and planned research program.

Establishes the policy for conducting direct research assistance and concept formulation.

Serves as the final corporate-level mechanism for providing monitoring and oversight.

Executive agent^b

Administers Project AIR FORCE, as approved by the advisory group.

Ensures FFRDC compliance with DOD and federal FFRDC policy.

Evaluates and presents to the advisory group an annual assessment of individual research projects and the overall program.

Establishes and executes policies for processing new research proposals and distributing the project's publications.

Consolidates and provides to the advisory group proposed guidance for the future direction of the project's research program.

Acts as the Air Force focal point for contact with the project.

Recommends and assists in developing the project's budgets, work statements, and procurement actions.

Furnishes information on Project AIR FORCE research to the Air Force, DOD, and other government agencies.

Monitors direct assistance requests.

Project sponsors^c

Furnish guidance on Air Force needs and priorities.

Approve research objectives.

Oversee the research.

Ensure access to information necessary to conduct the research.

Periodically review the status of the research under their cognizance.

Make recommendations on the future direction of the research.

Inform the advisory group of progress and results.

Appoint a project focal point and action officers to facilitate the administration of the project.

Board of Trustees

Oversees the operation of the FFRDC as specified in RAND's charter.

(Table notes on next page)

**Appendix IV
Studies and Analyses Centers**

^aThe Air Force Advisory Group is chaired by the Air Force Vice Chief of Staff and includes senior representatives from the Air Force Secretariat and Air Staff.

^bThe Director of Plans is the executive agent of the advisory group.

^cAn Air Force sponsor is a general officer or senior executive equivalent from Air Force headquarters or a major command. Each sponsor formulates and supports a particular research project.

**National Defense
Research Institute**

NDRI was established in 1984 to consolidate into a single FFRDC RAND's research efforts in support of the Office of the Secretary of Defense (OSD), the Joint Staff, and the defense agencies. NDRI's purpose is to help meet the long-term analytical needs of its sponsors. The Office of the Under Secretary of Defense (Acquisition and Technology) is the primary sponsor of NDRI. Table IV.3 provides general information regarding NDRI.

Table IV.3: General Information on NDRI

Mission	Broadly support the analytical requirements of the sponsor.
	Provide independent, objective findings and policy advice based on research and analyses of national security problems.
	Conduct a continuous, integrated research program focused on the high-priority, mid- to long-term policy research and analysis needs of the sponsor, including enduring issues that cut across organizational boundaries.
	Maintain expertise on important issues of interest to the sponsor and a thorough understanding of the sponsor's needs.
	Further develop and institutionalize capabilities for analysis and integration of defense issues.
	Perform both in-depth and quick response policy analyses.
Core competencies	International policy and defense strategy.
	Forces and resources policy.
	Technology and acquisition policy.
	Research integration.
Capabilities	Addresses diverse sponsor needs with consistently high quality.
	Maintains a high-quality, multidisciplined staff with in-depth, long-standing experience in all areas of defense policy as well as many areas of nondefense policy.
	Draws on a broad range of facilities and current analytic tools, such as models, simulations, and databases, that permit efficient and reliable analyses of complex policy questions.
	Provides a proven internal review process.
Criteria for defining core work	Consistent with NDRI's mission and purpose.
	Require RAND's research capability and consistent with NDRI's core competencies.
	Consistent with special relationship:

(continued)

**Appendix IV
Studies and Analyses Centers**

- Independence and objectivity.
- Absence of conflicts of interest to allow access to sensitive government or proprietary information.
- Familiarity with sponsor mission, responsibilities, and policy-analytical needs and close working relationship.
- Long-term continuity of the research program.
- Adaptability to rapidly changing research needs.
- Flexibility and quick response capability.
- Dedication to the public interest.

**Oversight and
responsibilities**

Primary sponsor

Ensures continuity in level of support to FFRDC, consistent with the agency's need for the FFRDC and the sponsoring agreement regulations and contingent on available funding.

Ensures that NDRI is consistent with its mission.

Ensures that individual sponsors use NDRI work appropriately.

Determines that costs of services offered by NDRI are reasonable and that work produced is of high quality.

Reviews final outcome of comprehensive review.

Designates an executive agent to administer NDRI.

NDRI Advisory Board^a

Establishes multiyear objectives and guidelines on overall level of effort and recommends a ceiling when required.

Provides information on DOD needs, interests, and priorities, especially on cross-cutting issues.

Reviews, revises, and approves NDRI's long-term research plan and annual research plan, ensuring they are consistent with the mission, scope, and objectives of the FFRDC.

Reviews the annual research program proposed jointly by the sponsor community and RAND; makes adjustments when required by ceiling constraints or in the interest of balance.

Identifies funding from the OSD studies budget and other sources.

Semiannually evaluates with RAND management the current research effort and suggests correction as necessary.

Reviews the annual assessments of individual research projects and the overall NDRI program and coordinates with RAND to resolve problems.

Executive agent and project sponsor

Exercise joint responsibility for determining that a proposed research project is consistent with NDRI's mission, is within the general scope of work, and meets the criteria for being assigned to an FFRDC.

Provide day-to-day management and oversight through the FFRDC program management office and contracting officer's representative.

Designate membership and chair the NDRI Advisory Board.

Contracting officer's representative

Administers NDRI for the government consistent with primary sponsor initiatives.

Ensures compliance with DOD and FFRDC policy.

Administers procurement actions for NDRI research efforts.

Acts as the DOD focal point for contact with NDRI.

(continued)

**Appendix IV
Studies and Analyses Centers**

Board of Trustees

Oversees the operation of the FFRDC as specified in RAND's charter.

^aThe NDRI Advisory Board is chaired by the Director, Acquisition Program Integration, Office of the Under Secretary of Defense (Acquisition and Technology), and includes representatives from OSD, Joint Staff, and Defense Advanced Research Projects Agency.

The Center for Naval Analyses

The CNA FFRDC was created in 1961 to provide a unique ability to combine technical analytical capability with current operational experience to address the Navy requirements for the analyses of major issues. Table IV.4 provides general information on the CNA FFRDC.

Table IV.4: General Information on CNA

Mission	Provide the Navy with an independent, authoritative source of applied research and analyses that is focused on the major present and future needs and issues of the Navy and Marine Corps. Offer analytical support in evaluation of operational capabilities, optimum use of resources, analyses of fleet or field exercises, and development and evaluation of tactics.
Core competencies	Operations analyses. System requirements and acquisition. Resource analyses. Program planning. Policy, strategy, and doctrine.
Capabilities	Combines technical analytical capability with current operational experience to address Navy requirements for analyses of major issues. Maintains a well-educated, multidisciplinary staff with experience in Navy issues, operational experience gained through hands-on exposure to Navy fleets, and a perspective on the policy-making environment. Produces high-quality, analytically rigorous, and comprehensive analyses free from bias or partisanship. Provides a quick response to meet urgent or immediate requirements. Assists the Navy in bringing definition to unstructured problems and issues and identifies the best method and analytical approach for assessing these problems. Provides on-site, timely, and objective analyses to operational commanders worldwide.
Criteria for defining core work	Consistent with CNA's mission, purpose, and capabilities. Consistent with core competencies. Consistent with special relationship: <ul style="list-style-type: none"> •Independent and objective. •Access to sensitive government and proprietary information. • Long-term relationship. •Broad corporate knowledge.

(continued)

**Appendix IV
Studies and Analyses Centers**

Could not be performed as effectively by another contractor.

**Oversight and
responsibilities**

CNA Policy Council

Annually reviews the quality of CNA's performance, budget, and operating procedures, proposed studies, and relationship with the Navy.

Provides policy guidance to CNA.

Considers other matters proposed by any member.

Product area managers

Review, approve, and coordinate CNA work that falls within their responsibilities.

Scientific officer^a

Monitors all CNA work done for the Department of the Navy and non-Navy sponsors.

Contracting officer

Reviews proposed CNA research projects for appropriateness.

Contracting officer's technical representative^b

Provides final determination of whether a proposed research project is appropriate for CNA.

^aThe scientific officer is the Deputy Chief of Naval Operations (Resources, Warfare Requirements, and Assessments).

^bThe contracting officer's technical representative is the Director of the Assessment Division.

**IDA-Studies and
Analyses/Operational
Test and Evaluation**

As part of IDA, the Studies and Analyses/Operational Test and Evaluation FFRDC was created to promote the national security, public welfare, and advancement of scientific learning by performing analyses, evaluations, and reports on matters of interest to the U.S. government. OSD is the primary sponsor; secondary sponsors include the Joint Staff, Unified and Specified Commands, and defense agencies. Table IV.5 provides general information on IDA-Studies and Analyses/Operational Test and Evaluation.

**Appendix IV
Studies and Analyses Centers**

Table IV.5: General Information on IDA-Studies and Analyses/Operational Test and Evaluation

Mission	<p>Provide studies, analyses, computer software prototypes, simulations, analytical models, and other technical and analytical support useful for policy, program planning, and management by its sponsors.</p> <p>Maintain high-quality staff and technical capabilities across a broad range of issues of concern to its sponsors, consistent with its charter.</p> <p>Maintain access to sensitive government and proprietary data and facilities.</p>
Core competencies	<p>Systems evaluations.</p> <p>Technology assessments.</p> <p>Force and strategy assessments.</p> <p>Resource and support analyses.</p>
Capabilities	<p>Provides high-quality, timely analyses that are produced in an environment that encourages independent thinking and objective results.</p> <p>Maintains a high-quality, interdisciplinary research staff that combines long-standing experience with current knowledge.</p> <p>Draws on a broad range of current analytic tools, such as models, simulations, and databases.</p> <p>Enforces a rigorous review of project results to ensure that the analyses and conclusions are thorough and sound.</p> <p>Maintains technical direction, oversight, and responsibility for its work.</p>
Criteria for defining core work	<p>Consistent with IDA's mission, purpose, and capabilities.</p> <p>Consistent with core competencies.</p> <p>Consistent with special relationship:</p> <ul style="list-style-type: none"> •Objective, high-quality work on subjects integral to the mission and operations of sponsors. •Freedom from real or perceived conflicts of interest caused by service, commercial, or other involvement. •Broad access to sensitive government and proprietary information. •Comprehensive knowledge of sponsor needs, problems, and issues. •Long-term continuity of knowledge on issues and problems of enduring concern, including maintaining corporate memory for sponsors and providing a quick response when appropriate in areas of established expertise. •Responsive to emerging and evolving needs of sponsors.
Oversight and responsibilities	<p>Primary sponsor</p> <p>Ensures that the IDA program deals with and adheres to issues that the sponsors collectively believe are important and in the national interest to resolve.</p> <p>Ensures that the work is within the scope of IDA's charter.</p> <p>IDA Advisory Group^a</p> <p>Periodically evaluates IDA's overall research effort.</p> <p>Provides information on the general interest and priorities of sponsors.</p> <p>Offers guidance on the general scope of IDA's work.</p>

(continued)

Appendix IV
Studies and Analyses Centers

Executive agent

Administers IDA work for OSD and the Joint Staff and their components.

Administers IDA work done for defense agencies at the agencies' request.

Contracting officer

Reviews contract tasks for appropriateness and funding limits.

Contracting officer's representative

Reviews all task orders for appropriateness and compliance with the DOD Management Plan.

Administrative contracting officer

Coordinates the oversight of all of the FFRDC's business operations.

Reviews and approves all major subcontracting transactions.

Board of Trustees

Oversees IDA's operation as specified in the certificate of incorporation with the State of Delaware.

Exercises quality control.

IDA management

Review and direct all of the FFRDC's operations.

Ensure compliance with all aspects of the FFRDC's charter and sponsoring agreement.

Exercise day-to-day control of staff activities.

^aIDA's Advisory Group is chaired by the Under Secretary of Defense for Acquisition and Technology or his designee, and the members of the group include the heads of the principal offices that sponsor work at IDA.

Logistics Management Institute

LMI's FFRDC was created in 1984 to help meet the short- and long-term analytical needs of its sponsors. The primary sponsor is OSD; secondary sponsors include the military services, Joint Staff, Unified and Specified Commands, and defense agencies. Table IV.6 provides general information on LMI's FFRDC.

Table IV.6: General Information on LMI

Mission	Provide independent, objective, and high-quality research, studies, and analyses across the spectrum of logistics and acquisition issues. Maintain access to sensitive government or proprietary information.
Core competencies	Materiel management. Acquisition. Operational logistics. Facilities and environment. Force management.
Capabilities	Provides high-quality, timely policy and management analyses that are produced in an environment that encourages independent thinking and objective results. Maintains a high-quality, interdisciplinary research staff that combines long-standing experience with current knowledge. Draws on a variety of current analytic tools, such as models, technologies, and databases. Enforces a rigorous review of project results to ensure that the analyses and conclusions are thorough and sound. Maintains technical direction, oversight, and responsibility for its work. Provides an understanding of the logistics and acquisition issues across DOD, especially the complex interrelationships of responsibilities, and identifies opportunities to improve efficiency and effectiveness. Focuses on the high-priority needs of the sponsors, especially enduring cross-cutting issues.
Criteria for defining core work	Consistent with LMI's mission, purpose, and capabilities. Consistent with core competencies. Consistent with special relationship: <ul style="list-style-type: none"> •Objective, high-quality work on subjects integral to the mission and sponsor's operations. •Freedom from real or perceived conflicts of interest caused by service, commercial, or other involvement. •Broad access to sensitive government or proprietary information. •Comprehensive knowledge of sponsor needs, issues, and problems. •Long-term continuity of knowledge on issues and problems of enduring concern, including maintaining corporate memory for sponsors and providing a quick response when appropriate in areas of established expertise. Responsive to emerging and evolving needs of sponsors.

(continued)

**Appendix IV
Studies and Analyses Centers**

**Oversight and
responsibilities**

LMI Advisory Board^a

- Provides and exchanges information on issues of general interest.
- Reviews, determines, and establishes the long-term research agenda.
- Prioritizes specific studies and research projects.
- Identifies sources and levels of funding for sponsor studies.
- Reviews and establishes the level of support required of the FFRDC.
- Evaluates the quality, efficiency, and substance of the LMI support.

Executive agent and task sponsors

- Determine that a proposed project is appropriate and within LMI's charter and that LMI is the most effective source.
- Incur sole responsibility for the conduct and oversight of the annual and comprehensive reviews.

Contracting officer's representative

- Analyzes task orders for compliance with the DOD Management Plan, the FFRDC contract, and the appropriateness of work assigned to LMI.
- Reviews all documents for each task order requested by the sponsor to verify appropriateness of work.

Board of Trustees

- Develops the strategic plan and has final authority over the Institute's business and assets.

LMI's president and vice presidents

- Oversee task orders for conformance with the DOD Management Plan, the FFRDC contract, and the appropriateness of work assigned to LMI.

^aThe LMI Advisory Board includes senior members of sponsor activities; Assistant and Deputy Under Secretaries of Defense; Secretaries of the Departments of the Army, Navy, and Air Force; Marine Corps; Coast Guard; and defense agencies.

Research and Development Laboratories

DOD has three FFRDCs that are classified as research and development laboratories—Lincoln Laboratory, SEI, and IDA-Communications and Computing Center. These laboratories were created to fill voids in which in-house and private sector research and development centers were unable to meet DOD's needs and engage in projects that emphasize the evolution and demonstration of advanced concepts and technology and the transfer or transition of technology. Specific objectives for these FFRDCs are to (1) maintain long-term competence in areas where no government in-house or private sector resources exist and (2) develop and transfer important new technology to the private sector so the government can benefit from a broader base of expertise.

Lincoln Laboratory

Lincoln Laboratory was established as an FFRDC in 1951 under the sponsorship of the Air Force, Army, and Navy.¹ The Air Force is currently the primary sponsor. Lincoln Laboratory was created to perform research and development that is pertinent to the national defense, with particular emphasis on advanced electronics. Table V.1 provides general information regarding Lincoln Laboratory.

¹The Defense Advanced Research Projects Agency became a sponsor in 1958.

**Appendix V
Research and Development Laboratories**

Table V.1: General Information on Lincoln Laboratory

Mission	<p>Demonstrate the feasibility of and conduct research and development on advanced systems concepts and technology with an emphasis on advanced electronics, and build the necessary prototype/demonstration components for the sponsors.</p> <p>Conduct research and development in other relevant technical areas.</p> <p>Produce models of laboratory-developed equipment suitable for field demonstration and test by appropriate military services or agencies.</p> <p>Furnish necessary procurement information concerning such equipment.</p> <p>Provide technical advice on military technology areas.</p>
Core competencies	<p>Ballistic missile defense.</p> <p>Communications.</p> <p>Space surveillance.</p> <p>Air defense.</p> <p>Surface surveillance.</p> <p>Advanced electronics technology.</p>
Capabilities	<p>Provides independent advice on military technology issues.</p> <p>Maintains high-quality, experienced, and interdisciplinary research staff who are productive, have published extensively, and are recognized regularly by their technical peers.</p> <p>Draws on the resources of and interacts with the Massachusetts Institute of Technology, one of the world's leading technical universities, to produce technical advances.</p>
Criteria for defining core work	<p>Consistent with Lincoln Laboratory's mission, purpose, and capabilities.</p> <p>Consistent with core competencies.</p> <p>Consistent with special relationship:</p> <ul style="list-style-type: none"> •Objective, high-quality work on subjects integral to the mission of the sponsor. •Freedom from real or perceived conflicts of interest. •Broad access to sensitive government or proprietary information. •Comprehensive knowledge of sponsor needs and problems. •Long-term continuity of knowledge of sponsor issues.
Oversight and responsibilities	<p>Joint Advisory Committee^a</p> <p>Annually reviews and approves the research and development program.</p> <p>Executive agent</p> <p>Reviews policy and administers the contract.</p> <p>Contracting officer</p> <p>Performs continuing reviews of Lincoln Laboratory's management.</p>

^aThe Joint Advisory Committee is chaired by the Director of Defense Research and Engineering and made up of secretariat-level representatives from the services, Defense Advanced Research Projects Agency, and Ballistic Missile Defense Organization.

Software Engineering Institute

SEI was created as an FFRDC in 1984 by Congress to address the transition of software engineering technology. Its purpose is to provide leadership in advancing state-of-the-art software engineering and improving the quality of systems that depend on software. The Defense Advanced Research Projects Agency is the primary sponsor. Table V.2 provides general information regarding SEI.

Table V.2: General Information on SEI

Mission	Improve the quality of operational software in software-intensive systems.
	Accelerate the reduction to practice of modern software engineering technology.
	Institute the use of modern software engineering techniques and methods throughout the defense systems community.
	Establish standards of excellence for software engineering.
Core competencies	Software engineering and supporting software technology.
	Technology transition.
Capabilities	Establishes state-of-the-art and state-of-the-practice in software engineering technology and maintains appropriate metrics.
	Identifies and assesses needs and opportunities for software technology transition.
	Engineers technology for use, as required.
	Demonstrates, disseminates, and encourages the use of such technology products throughout the software community.
	Conducts research and development in support of technology areas judged to be the most essential and to have the highest potential payoff.
	Evaluates, develops, and conducts courses and seminars that support technology transitioning and influences software engineering curricula throughout the educational community, industry, and government.
Criteria for defining core work	Consistent with SEI's mission, purpose, and capabilities.
	Consistent with core competencies.
	Consistent with special relationship:
	•High-quality work.
	•Freedom from real or perceived biases or conflicts of interest.
	•Ability to protect sensitive government or proprietary information.
	•Comprehensive knowledge of sponsor programs, operations, needs, and problems and the technical opportunities that will address these problems.
	•Relationship with and ability to influence the software engineering infrastructure.
Must be sponsored by an appropriate organization.	
Oversight and responsibilities	Primary sponsor
	Provides overall strategic policy and program guidance to the FFRDC, administrative agent, and Air Force Electronics Systems Center for the management of the FFRDC.

(continued)

Appendix V
Research and Development Laboratories

Sets general guidance for work that is appropriate.

Conducts in-depth program reviews two to three times per year.

Joint Advisory Committee^a

Provides overall policy and program guidance to the FFRDC.

Reviews the FFRDC's work plan.

Provides recommendations on priorities.

Provides advice to the primary sponsor on strategy and current and proposed programs.

Advises and assists the FFRDC in implementing policies affecting its status as an FFRDC, relations with federal agencies, and general operations.

Administrative agent

Implements strategic guidance and oversees the day-to-day activities for the primary sponsor.

Administers the FFRDC, including providing guidance to the FFRDC.

Determines through technical and contractual reviews that all work is consistent with the Institute's program plan and mission and federal regulations.

Conducts three to four financial/program management reviews each year.

Joint Program Office Site Director

Reviews and approves all work performed by the FFRDC.

Senior technical review group

Provides technical advice to the advisory committee and primary sponsor to determine the relevance of technical objectives and priorities.

Reviews program plans and progress to date.

Program technical advisory panels^b

Provide customer guidance on current activities and future plans.

Perform technical reviews of projects.

Board of Visitors

Reviews the plans and accomplishments of the FFRDC.

^aThe Joint Advisory Committee is composed of senior executives from the Army, Navy, Air Force, and Defense Information Systems Agency.

^bProgram technical advisory panels have included the Software Process Program Advisory Board, Software Acquisition Metrics Working Group, and Risk Taxonomy Users Group.

IDA-Communications and Computing Center

As part of IDA, the Communications and Computing Center's purpose is to promote national security, public welfare, and the advancement of science by performing analyses, evaluations, and reports on matters of interest to the U.S. government. The primary sponsor of the center is the National Security Agency. Table V.3 provides general information regarding IDA-Communications and Computing Center.

**Appendix V
Research and Development Laboratories**

Table V.3: General Information on IDA-Communications and Computing Center

Mission	<p>Perform applied research and development in the specialized fields of cryptomathematics and cryptocomputing and in related fields, such as speech research and special signals processing techniques.</p> <p>Maintain a staff with expertise and currency in the relevant disciplines, familiarity with National Security Agency needs, and access to experts in industry and academia.</p>
Core competencies	<p>Cryptologic mathematics.</p> <p>Computing sciences.</p> <p>Basic communications theory.</p>
Capabilities	<p>Not available.</p>
Criteria for defining core work	<p>Consistent with IDA-Communications and Computing's mission, purpose, and capabilities.</p> <p>Consistent with core competencies.</p> <p>Consistent with special relationship:</p> <ul style="list-style-type: none"> •High-quality work. •Freedom from real or perceived biases or conflicts of interest. •Ability to protect sensitive government or proprietary information. •Comprehensive knowledge of sponsor programs, operations, needs, and problems and the technical opportunities that will address these problems. •Relationship with and ability to influence the software engineering infrastructure.
Oversight and responsibilities	<p>Primary sponsor</p> <p>Ensures that the IDA program deals with and adheres to issues that the sponsors collectively believe are important and in the national interest to resolve.</p> <p>Ensures that the work is within the scope of IDA's charter.</p> <p>IDA Advisory Group^a</p> <p>Periodically evaluates IDA's overall research effort.</p> <p>Provides information on the general interest and priorities of sponsors.</p> <p>Offers guidance on the general scope of IDA's work.</p> <p>Executive agent</p> <p>Administers IDA work for OSD and the Joint Staff and their components.</p> <p>Administers IDA work done for defense agencies at the agencies' request.</p> <p>Contracting officer</p> <p>Reviews contract tasks for appropriateness and funding limits.</p> <p>Contracting officer's representative</p> <p>Reviews all task orders for appropriateness and compliance with the DOD Management Plan.</p> <p>Administrative contracting officer</p> <p>Coordinates the oversight of all of the business operations of the FFRDC.</p> <p>Reviews and approves all major subcontracting transactions.</p>

(continued)

Appendix V
Research and Development Laboratories

Board of Trustees

Oversees the operation of IDA as specified in the certificate of incorporation with the State of Delaware.

Exercises quality control.

IDA management

Review and direct all of the operations of the FFRDC.

Ensure compliance with all aspects of the FFRDC charter and sponsoring agreements.

Exercise day-to-day control of staff activities.

^aIDA's Advisory Group is chaired by the Under Secretary of Defense for Acquisition and Technology or his designee, and the members of the group include the heads of the principal offices that sponsor work at IDA.

Comments From the Department of Defense



DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
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WASHINGTON, D.C. 20301-3030



FORM 1000

Mr. David E. Cooper
Associate Director,
Defense Acquisition Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington D.C. 20548

Dear Mr. Cooper:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "FEDERALLY FUNDED R&D CENTERS: Information on the Size and Scope of DoD-Sponsored Centers," dated December 8, 1995 (GAO Code 705106/OSD Case 1032).

The DoD concurs with the draft report. The information presented in the report will be very helpful to the ongoing DoD effort to strengthen its procedures for the management and oversight of the DoD sponsored Federally Funded Research and Development Centers (FFRDCs).

Several suggested technical changes were provided separately to the GAO staff. The DoD appreciates the opportunity to respond to the draft report.

Sincerely,

Anita K. Jones



Appendix VI
Comments From the Department of Defense

Related FFRDC Products

Federally Funded R&D Centers: Observations on DOD Actions to Improve Management (GAO/T-NSIAD-96-117, Mar. 5, 1996).

Defense Research and Development: Fiscal Year 1993 Trustee and Advisor Costs at Federally Funded Centers (GAO/NSIAD-96-27, Dec. 26, 1995).

Federal Research: Information on Fees for Selected Federally Funded Research and Development Centers (GAO/RCED-96-31FS, Dec. 8, 1995).

Federally Funded R&D Centers: Use of Fee by the MITRE Corporation (GAO/NSIAD-96-26, Nov. 27, 1995).

Federally Funded R&D Centers: Use of Contract Fee by The Aerospace Corporation (GAO/NSIAD-95-174, Sept. 28, 1995).

Defense Research and Development: Affiliations of Fiscal Year 1993 Trustees for Federally Funded Centers (GAO/NSIAD-95-135, July 26, 1995).

A History of the Department of Defense Federally Funded Research and Development Centers, Office of Technology Assessment (OTA-BP-ISS-157, June 1995).

Compensation to Presidents, Senior Executives, and Technical Staff at Federally Funded Research and Development Centers, DOD Office of the Inspector General (95-182, May 1, 1995).

Comprehensive Review of the Department of Defense's Fee-Granting Process for Federally Funded Research and Development Centers, Director of Defense Research and Engineering, May 1, 1995.

The Role of Federally Funded Research and Development Centers in the Mission of the Department of Defense, Defense Science Board Task Force, April 25, 1995.

Addendum to Final Audit Report on Contracting Practices for the Use and Operations of DOD-Sponsored Federally Funded Research and Development Centers, DOD Office of the Inspector General (95-048A, Apr. 19, 1995).

DOD's Federally Funded Research and Development Centers, Congressional Research Service (95-489 SPR, Apr. 13, 1995).

Report on Department of Defense Federally Funded Research and Development Centers and Affiliated Organizations, Director of Defense Research and Engineering, April 3, 1995.

Federally Funded R&D Centers: Executive Compensation at The Aerospace Corporation (GAO/NSIAD-95-75, Feb. 7, 1995).

Contracting Practices for the Use and Operations of DOD-Sponsored Federally Funded Research and Development Centers, DOD Office of the Inspector General (95-048, Dec. 2, 1994).

Sole Source Justifications for DOD-Sponsored Federally Funded Research and Development Centers, DOD Office of the Inspector General (94-012, Nov. 4, 1993).

DOD's Federally Funded Research and Development Centers, Congressional Research Service (93-549 SPR, June 3, 1993).

Inadequate Federal Oversight of Federally Funded Research and Development Centers, Subcommittee on Oversight of Government Management, Senate Governmental Affairs Committee (102-98, July 1992).

DOD's Federally Funded Research and Development Centers, Congressional Research Service (91-378 SPR, Apr. 29, 1991).

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