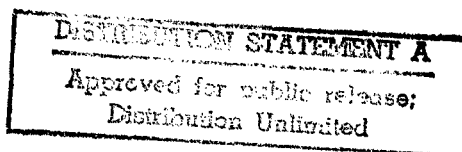


November 1986

STRATEGIC DEFENSE INITIATIVE PROGRAM

Expert's Views on DOD's Organizational Options and Plans for SDI Technical Support



19980513 010

PLEASE RETURN TO:

BMD TECHNICAL INFORMATION CENTER
BALLISTIC MISSILE DEFENSE ORGANIZATION
7100 DEFENSE PENTAGON
WASHINGTON D.C. 20301-7100

Accession Number: 0605

Publication Date: Nov 01, 1986

Title: Strategic Defense Initiative Program: Expert's Views on DOD's Organizational Options and Plans for SDI Technical Support

Corporate Author Or Publisher: U.S. General Accounting Office, GAO, Washington, DC 20548 Report Number: GAO/NSIAD-87-43

Comments on Document: TIC Core Collection - Strategic Defense Initiative

Descriptors, Keywords: SDI Organization Option Technical Support Congress Senate Military Research Analysis Development FFRDC SDII Survey

Pages: 50

Cataloged Date: Jan 28, 1987

Document Type: HC

Number of Copies In Library: 000002

Record ID: 19751

Comptroller General
of the United States

B-223094

November 19, 1986

President of the Senate and the
Speaker of the House of Representatives

Pursuant to Section 213 (c) of the National Defense Authorization Act for Fiscal Year 1987 and to a request from the Senate Committee on Armed Services dated August 4, 1986, we are reporting on the Department of Defense's (DOD's) proposal for establishing a new federally funded research and development center (FFRDC) to provide the Strategic Defense Initiative Organization (SDIO) with technical support. The new FFRDC would be called the Strategic Defense Initiative (SDI) Institute. In preparing this report, we have obtained the views of a select group of individuals on various aspects of DOD's proposal.

DOD determined that SDIO needed to quickly augment its capability to assess technical questions regarding strategic defense. In November 1985, an ad hoc SDIO Technical Support Working Group was formed in response to a request from the Director of SDIO to identify and assess possible organizational approaches to provide SDIO with technical support. The working group developed a list of characteristics considered essential for the support capability. Based on these criteria, it evaluated eight possible organizational alternatives. The group concluded that the best option was to establish a new FFRDC. The other seven options were to establish a new division in an existing FFRDC or national laboratory; contract with an existing FFRDC or national laboratory; contract with a university; contract with a non-profit laboratory or corporation; contract with a for-profit firm, such as an industrial firm or consortium of such firms; expand the present SDIO staff; and establish a new DOD field or military organization.

The Office of Federal Procurement Policy's Policy Letter 84-1 provides government-wide guidance for establishing FFRDC. FFRDC are research and development organizations that provide technical advice to their government sponsor(s). FFRDC are not to perform research or development that might be better performed by industry, universities, or government agencies. Also, FFRDC are not to compete with industry for government contracts or to perform work for industry. FFRDC are to maintain their independence, objectivity, and freedom from external influences and, thus, are to be free of conflicts of interest.

DOD currently sponsors 10 FFRDCs: 1 research and development laboratory, 6 study and analysis centers, and 3 systems engineering/systems

integration centers. Fiscal year 1985 funding for these FFRDCs totaled more than \$757 million. Other government agencies sponsor an additional 26 FFRDCs.

According to DOD, the SDI Institute would support SDIO through technical evaluation and integration of existing and potential technological advances and system concepts. The Institute's staffing level would be expected to start at about 50 professionals and increase to about 150 to 200 professionals, with a maximum of about 300 professionals. Individuals would be recruited primarily from universities, existing FFRDCs, and industry. Funding is expected to constitute less than one percent of SDIO's total budget. (See app. I.)

Objectives, Scope, and Methodology

On August 4, 1986, the Senate Committee on Armed Services asked us to (1) evaluate alternative organizational approaches for providing SDIO with technical support, (2) evaluate the extent to which DOD's plans provide for an independent and objective FFRDC in conformity with government-wide policies for FFRDCs, and (3) determine whether any precedents exist whereby DOD has created a new FFRDC to provide technical support for a major research program. Subsequent to the Committee's request, Congress passed the National Defense Authorization Act for Fiscal Year 1987 (Public Law 99-661). The act requires the Secretary of Defense to provide a report to the House and Senate Committees on Armed Services. Section 213 (c) of the act requires us to report, as appropriate, on certain matters concerning the proposed new FFRDC. This report addresses

- the ability of various organizational approaches to meet SDIO's needs for technical support;
- the comparative cost of meeting the needs through the various organizational approaches;
- the primary function of the proposed new FFRDC;
- whether the center will be required or authorized to enter into contracts with others, including other FFRDCs, for research projects;
- whether the contract to operate the new FFRDC will be awarded on a competitive basis;
- the role of DOD in selecting staff and in organizing the new FFRDC;
- whether the new FFRDC's annual budget will have funds for independent research;
- whether the proposals to operate the new FFRDC will be subjected to peer review; and

- whether DOD's plans for the new FFRDC provide for an independent and objective organization free from conflicts of interest, including prohibiting (1) any officer, employee, or member of the governing body of the new FFRDC from holding any position with SDIO or an interested private contractor and (2) more than one-half of the FFRDC's governing body from simultaneously serving on the SDI Advisory Committee or similar body.

This report satisfies both the Committee request and the legislative requirement. It does not address the Strategic Defense Initiative itself.

In order to respond to the Committee's request, as agreed with Committee representatives, we obtained the views of a select group of individuals on the Committee's areas of interest. We agreed on this approach because (1) an evaluation of alternative organizational approaches can appropriately be performed by individuals with experience and close familiarity with the organizations, (2) government guidelines concerning a FFRDC's independence and objectivity are broadly stated and do not provide specific criteria with which to measure DOD's plans, and (3) given the absence of specific criteria, the views and experiences of individuals with knowledge of FFRDCs can provide insights on the acceptability of DOD's plans. This report is a compilation of views expressed by the select group of individuals contacted during our review and other materials we have developed.

We asked 11 consultants (see app. IV) with broad governmental, military, industrial, and/or academic experience, but with no involvement with the SDI Institute proposal, to

- evaluate the eight organizational options assessed by the SDIO working group;
- rate the options in terms of DOD's criteria for providing SDIO with technical support;
- rank the options according to effectiveness and cost; and
- assess the impact on the FFRDC's independence and objectivity of DOD's plans for selecting a contractor, evaluating proposals, and participating in staff selection.

In addition, we asked the presidents or heads of nine DOD-sponsored FFRDCs to express their views on the impact on the FFRDC's independence and objectivity of DOD's plans for staff selection, work plan approval, provisions for independent research, and conflict-of-interest and post-employment restrictions. Prior to meeting with the consultants and

heads of the FFRDCs to discuss their views, we had them record their responses on data collection instruments that we designed. (See app. V.)

Ratings of Organizational Options

The consultants concluded that the SDIO needs technical support to oversee research program and systems integration efforts. They agreed with the SDIO working group's overall effectiveness rankings of the top two and bottom two organizational options for the SDI Institute. The consultants assigned their highest overall rankings to the option of creating a new FFRDC and a new division in an existing FFRDC. These organizational options tied for first in overall effectiveness. The consultants generally preferred the FFRDCs because of their proven records at (1) attracting high-quality personnel, (2) providing objective and independent assistance, and (3) safeguarding proprietary information.

The new FFRDC option scored especially well with the consultants on the criteria of independent, objective, and dedicated assistance. Six consultants rated it first and one consultant rated it second. Concerns were expressed about the new FFRDC's ability to be established quickly and relatively less costly, and to attract top quality people. A new division in an existing FFRDC was given high marks for its perceived ability to be established quickly and relatively less costly by drawing upon existing talent and infrastructure. However, several consultants expressed concerns about using an existing FFRDC: (1) the current sponsors would probably not allow their FFRDCs to assume the SDI Institute's mission, (2) the assumption of the SDI mission could severely impair the FFRDCs' current operations, and (3) present work commitments would impair the existing FFRDCs' responsiveness to SDIO. A new division in an existing FFRDC was rated first by one consultant and second by 5 consultants.

The consultants ranked expansion of SDIO and creation of a new DOD/service group seventh and eighth, respectively, for overall effectiveness. The consultants' consensus was that SDIO and a new DOD organization would not be able to attract high-quality scientific and engineering talent because of low salaries and other Civil Service restrictions and would not be able to be established and grow rapidly.

The consultants found it difficult to compare organizations on the basis of cost and selected no clear favorite as the least-cost organization. Most selected the for-profit firm as the highest cost option and scored the existing FFRDC, the expansion of SDIO's staff, a new division in a FFRDC, and a new DOD/service group as the first through fourth lowest cost

options. Cost was not a primary criterion for DOD's ranking of organizational options. (See app. II.)

Impact of DOD's Plans on the Institute's Independence and Objectivity

The Secretary of Defense stated DOD's position on establishing the Institute in an August 1986 report to the Senate Committee on Armed Services. The consultants and heads of nine DOD-sponsored FFRDCs expressed the following views on DOD's plans for the Institute. A more detailed discussion is included in appendix III.

Contractor Selection

Using the Secretary of Defense's sole-source selection authority under the Competition in Contracting Act of 1984, 10 U.S.C. 2304, DOD invited a group of individuals to submit a proposal for the establishment and operation of the Institute, rather than opting to engage in a competitive negotiation process. Any others wishing to submit proposals would be allowed to do so. Eight of the nine original contracts for the DOD-sponsored FFRDCs included in our review had been established by sole-source awards.

We asked the consultants to indicate which method—sole source or competitive selection—they believed would least compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO. No consensus appeared among consultants on this question. Three said that competition compromises independence and objectivity more than sole-source selection; four said that competition compromises less than sole-source selection; and three said that the impact of the selection methods on independence and objectivity is about the same.

On April 4, 1986, a firm called the SDI Institute was incorporated in Washington, D.C. Section 213 (a) of the National Defense Authorization Act for Fiscal Year 1987 provides that the Secretary of Defense may not obligate or expend funds for the new FFRDC unless funds are specifically authorized to be appropriated for such purpose, other than in an appropriation act or continuing resolution.

Reviewing Proposals

DOD stated that SDIO, alone, would review any proposal received from prospective contractors interested in operating the SDI Institute. Nine of the 11 consultants said that some kind of peer review of the proposal(s) is necessary to best guarantee the independence and objectivity of the

Institute. The consultants reached no consensus on what organizations should comprise the review group, but believed that peer review would enhance the credibility of the review process, improve the quality of the proposal(s), and was necessary in the political climate of the SDI. Two consultants indicated that a review by SDIO alone was sufficient.

Staff Selection

DOD, in its August 1986 report, stated that the Institute's president and the heads of its technical directorates would have to be acceptable to the SDIO's Director. We were informed by the Secretary of Defense's Special Assistant on the Institute that the Director of SDIO would exercise veto power over the selections. Subsequent to our work, however, DOD clarified its position stating that the Director of SDIO would require concurrence in the selection of the Institute's president and coordination with the appropriate SDIO peer directors in the selection of key Institute technical personnel, but would exercise veto power only over the selection of the Institute's president.

We asked the consultants and heads of the nine FFRDCs for their views on whether SDIO's veto power over staff selections would compromise the independence and objectivity of the FFRDC. The consultants were about evenly split, with five saying that it probably would not and six saying that it would or probably would. Three considered a staff selection veto power over the FFRDC director acceptable; two would accept it to the technical director level; three said no staff selection veto power at any level would be acceptable; and one favored veto power down to an unspecified level. The other two consultants did not express strong views on the acceptability of a veto power.

All nine heads of FFRDCs said that staff selection veto power would compromise a FFRDC's independence and objectivity. Two officials considered sponsor veto power over a FFRDC's director acceptable, but none would advocate veto power over technical directors. Only one of the sponsors of the nine FFRDCs exercises veto power over staff selection: the Navy, sponsor for the Center for Naval Analyses, exercises veto power over the selection of the president and vice-president.

Work Plans

DOD proposed that SDIO would review the Institute's work plan every 6 months. We asked the FFRDCs' heads whether the necessity for a sponsor's approval of a work plan would compromise the FFRDC's independence and objectivity more than joint agreement on the plan. Two believed there is no difference between work plan approval and joint

agreement, while three thought that work plan approval compromises independence and objectivity more than joint agreement. All nine FFRDC directors agreed that work plans must be developed by mutual agreement and consultation between the sponsor and the FFRDC.

Five FFRDCs negotiate work with their sponsors; three have annual work plans approved by advisory committees after sponsor/center interaction; and one has 1- and 5-year plans approved by its sponsor.

Provisions for Independent or Self-Initiated Work

The Secretary of Defense initially expressed his opposition to committing a fixed percentage of the Institute's budget to perform independent research or self-initiated work. However, he said that DOD is not opposed to contract provisions that would permit the Institute the flexibility to initiate its own work proposals, and DOD would explore negotiating such provisions toward that purpose. Subsequently, DOD noted that SDIO would encourage the Institute to initiate related research that the Institute deems necessary and that SDIO would provide a level of funding for the Institute's independent research to be determined in future contract negotiations.

Officials of the nine FFRDCs included in our review stated that the guarantee of some level of independent research generally enhances the FFRDC's independence and objectivity. Independent research permits the FFRDCs to do forward planning, to explore long-term problems, and to examine questions that the sponsors do not think or want to ask. All nine FFRDCs have provisions for independent or self-initiated research.

Conflict-Of-Interest and Post-Employment Restrictions

DOD plans to address real or apparent conflicts of interest through SDIO's sponsoring agreement with the SDI Institute. For example, the sponsoring agreement would prohibit any SDI Institute employee, officer, or Board of Trustee member from holding any position with SDIO. The agreement would also prohibit more than one-half of the members of the SDI Institute Board of Trustees from simultaneously holding any position with the SDI Advisory Committee or any similar body which provides technical, scientific, or strategic advice to DOD on SDI. Moreover, in order to avoid any actual or apparent conflict-of-interest, DOD expects that persons who are members of both the SDI Advisory Committee and the SDI Institute Board of Trustees would abstain from participation in any evaluation or advice by the SDI Advisory Committee regarding the SDI Institute. Section 208 (a) of title 18, United States Code, would bar SDI Advisory Committee members who are also on the SDI Institute Board of

Trustees from participating in recommendations directly affecting the new FFRDC's financial interests, in the absence of a waiver under section 208 (b).

DOD intends to minimize the possibility of specific conflicts of interest between the Institute and other organizations through specific restrictions on the Institute's outside work and on Institute employees' positions with other organizations that have financial interest in SDI work and through requirements placed on Institute employees to safeguard information owned by other contractors. DOD intends no post-employment restrictions on Institute employees.

The nine FFRDC directors did not believe that the absence of post-employment restrictions would compromise the independence and objectivity of the FFRDC. All nine FFRDCs have conflict-of-interest provisions, but none have post-employment restrictions.

FFRDCs Established to Support Major Research Programs

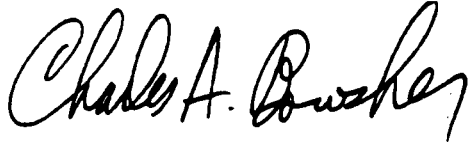
Some consultants and FFRDC officials told us that DOD's proposal to establish a new FFRDC for the SDI program is not unusual and that FFRDCs have been established to support programs, missions, or functions. For example, they noted the establishment of The Aerospace Corporation to support the military space and advanced ballistic missile programs, the Massachusetts Institute of Technology's Lincoln Laboratory to support the U.S. air defense mission, and the Logistics Management Institute to advise DOD on logistics management.

Agency Comments

In commenting on a draft of this report, DOD expressed the view that the consultants performed a credible assessment of the organizational options and that the consensus views of the consultants are reasonable. However, in relation to the issue of peer review of proposal(s) to operate the SDI Institute, DOD continues to believe that SDIO has the appropriate resources and personnel to best evaluate the proposal(s). DOD's position is that if additional outside review were needed, then it would be considered. We believe that the consultants' views in favor of peer review of the proposal(s) have merit and deserve DOD's consideration.

DOD provided several technical comments that have been incorporated into the report, as appropriate.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Defense; and the Director, Strategic Defense Initiative Organization.

A handwritten signature in black ink, reading "Charles A. Bowsher". The signature is written in a cursive style with a large, stylized "C" and "B".

Charles A. Bowsher
Comptroller General
of the United States

Contents

Letter		1
--------	--	---

Appendix I		12
FFRDCs and the SDI	Criteria for Establishing a New FFRDC	12
Institute	Categories of FFRDCs	13
	Reasons for Establishing FFRDCs	15
	SDI Institute	15

Appendix II		18
Comparative	DOD's Assessment of Alternatives	18
Effectiveness and	Consultants' Views	20
Costs of Organizational		
Approaches		

Appendix III		29
Impact of DOD's Plans	Office of Federal Procurement Policy Guidelines	29
on Independence and	DOD's Plans for Establishing the SDI Institute	30
Objectivity	Views of Consultants and Heads of DOD-Sponsored	34
	FFRDCs on DOD's Plans	

Appendix IV		42
Consultants and Heads	Consultants	42
of DOD-Sponsored	Heads of DOD-Sponsored FFRDCs	43
FFRDCs Contacted		
During Our Review		

Appendix V Data Collection Instruments Completed by Consultants and Heads of DOD- Sponsored FFRDCs	44
---	----

Tables	
Table I.1: Information on DOD-Sponsored FFRDCs	14
Table II.1: Net Scores of Organizational Options for Each Criterion	22
Table II.2: Ranking According to Comparative Effectiveness of Organizational Options	24
Table II.3: Ranking According to Comparative Costs of Organizational Options	28

Abbreviations

DOD	Department of Defense
FFRDC	federally funded research and development center
GAO	General Accounting Office
SDI	Strategic Defense Initiative
SDIO	Strategic Defense Initiative Organization

FFRDCs and the SDI Institute

The Office of Federal Procurement Policy's Policy Letter 84-1 provides government-wide policies for establishing FFRDCs. FFRDCs are research and development organizations that provide technical advice to their government sponsor(s). FFRDCs must receive at least 70 percent of their financial support from the government and, although multiple agency sponsorship of a FFRDC is possible, for administrative purposes one agency must be designated as the primary sponsor.

Under the government guidance, FFRDCs should not perform research or development that might be better performed by industry, universities, or government agencies. Moreover, FFRDCs are not permitted to compete with industry for government contracts. Neither can they perform work for the private sector. Since FFRDCs do not manufacture or sell hardware or perform any work for industry, they are to remain impartial and free from external influence in evaluating issues for their government sponsor(s). FFRDCs are to maintain special relationships with their government sponsor(s) and serve as "honest brokers" by maintaining their objectivity and independence, free from conflicts of interest found in some types of organizations. Finally, FFRDCs have provisions for conducting independent research.

Currently, 36 FFRDCs operate under the principal sponsorship of the Departments of Defense, Energy, and Health and Human Services, the National Aeronautics and Space Administration, and the National Science Foundation. Most DOD FFRDCs were established between 1942 and 1963 to augment DOD in-house research and development capabilities. During this period, DOD established 39 FFRDCs to conduct research and development in areas in which the government did not yet have expertise. As a result of congressional concern, expansion of DOD's in-house capabilities, and the fact that many FFRDCs were no longer responding to DOD's changing needs, DOD had reduced the number of its FFRDCs to six by 1976. Today, DOD sponsors 10 FFRDCs with a total fiscal year 1985 funding level of over \$757 million.

Criteria for Establishing a New FFRDC

According to Policy Letter 84-1, agencies should only establish a FFRDC "to meet some special research or development need which, at the time, cannot be met as effectively by existing in-house or contractor resources." FFRDCs do not have a prescribed organizational structure. Some are contractor-owned/contractor-operated or government-owned/contractor-operated, while others exhibit various degrees of

contractor/government control and ownership. According to Policy Letter 84-1, a new FFRDC should:

- perform, analyze, integrate, support and/or manage research and development either upon direct request by the government or under a broad charter from the government, but in either case the results are directly monitored by the government;
- receive 70 percent or more of its funds from the government, with one government agency usually predominating in that support;
- operate as a separate unit within a parent organization or as an independent organization; and
- establish a long-term relationship (usually 5 years) with its sponsoring organization.

Categories of FFRDCs

Generally, FFRDCs are grouped into four categories based on the type of work they perform. The categories are research laboratories, research and development laboratories or "national laboratories," study and analysis centers, and systems engineering/systems integration centers.

Most FFRDCs are administered by a contractor, such as a university or consortium of universities, a non-profit organization or institute, or an industrial firm. Some are independent or self-contained within their own management organizations and are not administered by separate contractors. These FFRDCs report directly to their sponsor(s).

Since 1983, DOD has established four new FFRDCs: The Software Engineering Institute at Carnegie Mellon University in Pittsburgh, Pennsylvania; the Logistics Management Institute in Bethesda, Maryland; and the Rand Corporation's Arroyo Center and the National Defense Research Institute,¹ both in Santa Monica, California.

Currently, DOD sponsors one research and development laboratory, six study and analysis centers, and three systems engineering/systems integration centers. Table I.1 shows DOD's 10 FFRDCs by category. It also shows the principal sponsor, contractor, date established, fiscal year 1985 funding level, and the provisions for work plan approval and independent research.

¹In 1986, The Rand Corporation's FFRDC, called Rand-OSD/OJCS, which had been established in 1983 for the Office of the Secretary of Defense/Organization of the Joint Chiefs of Staff, changed its name to the National Defense Research Institute.

Appendix I
FFRDCs and the SDI Institute

Table I.1: Information on DOD-Sponsored FFRDCs

Dollars in millions

FFRDC by category	Principal sponsor	Contractor	Date established	Funding level^a	Work plan approval	Independent research
Study and Analysis Centers						
Center for Naval Analyses	Navy and Marine Corps	Hudson Institute	1942	\$25.4	Plan negotiated with sponsor	Maximum 15 percent established by contract
Institute for Defense Analyses	Ofc. Sec. of Defense, Joint Chiefs of Staff, and Defense agencies	Institute for Defense Analyses	1956	26.0	Plan negotiated with sponsor	1.5 percent of budget based on Defense Acquisition Regulations
Logistics Management Institute	Asst. Sec. of Defense/ Manpower, Installations, Acquisitions/Logistics, and Defense agencies	Logistics Management Institute	1984	11.8	Plan negotiated with sponsor	Agreement from sponsor for about 5 percent, but not to exceed 10 percent
Rand-Arroyo Center	Army	The Rand Corporation	1984	5.0 ^b	Annual plan approved by advisory committee after sponsor/ contractor interaction	Up to 25 percent permitted by Army regulation
Rand-National Defense Research Institute	Office of Secretary of Defense/Organization of Joint Chiefs of Staff	The Rand Corporation	1983	0.6	Annual plan approved by advisory committee after sponsor/ contractor interaction	Permitted by OSD/ OJCS regulation and has totalled annually about 10-12 percent
Rand-Project Air Force	Air Force	The Rand Corporation	1946	18.3	Annual plan approved by advisory committee after sponsor/ contractor interaction	Permitted by Air Force regulation and has totalled annually about 10-12 percent
Systems Engineering/ Systems Integration						
The Aerospace Corporation	Air Force Space Division	The Aerospace Corporation	1960	248.2	Plan negotiated with sponsor	Contractual fixed fee can be used for research
The MITRE Corporation/ C3I Division	Air Force	The MITRE Corporation	1958	220.6	Plan negotiated with sponsor	2.5 percent in budget and 3 percent for Mission- Oriented Investigations & Experiments
Software Engineering Institute	Air Force	Carnegie Mellon University	1984	6.1	One-and five-year work plans approved by sponsor	10 percent in negotiated contract
Research and Development Laboratory						
Lincoln Laboratory	Air Force	M.I.T.	1951	\$195.2	Annual plan approved by advisory committee after discussion with sponsor	Negotiated with contractor separately from contract

^aAccording to the National Science Foundation, these funding levels represent fiscal year 1985 federal obligations to FFRDCs for only research and development and research and development plant.

^bThe Rand Corporation's Arroyo Center funding for fiscal year 1985 consisted of only operations and maintenance funds.

DOD's research and development laboratory focuses on advanced development research. The six study and analysis centers were established to assist the Office of the Secretary of Defense and the military services in solving organizational and operational problems. No hardware-related laboratory research and development are conducted in these centers. The three systems engineering/systems integration centers provide systems engineering, research and development systems integration, and management support for development of large technical systems. DOD established them because it did not have the in-house capability to manage the development, integration, and verification of large systems. Moreover, DOD's position was that this capability was not readily available in the private sector without conflict-of-interest problems.

Reasons for Establishing FFRDCs

FFRDCs can be established to support a program, mission, or function. For example, The Aerospace Corporation was established in 1960 to support military space and advanced ballistic missile programs. The Massachusetts Institute of Technology's Lincoln Laboratory was formed in 1951 to support the U.S. air defense mission. The Logistics Management Institute was established in 1961 and designated a FFRDC in 1984 to advise DOD on logistics management.

With the exception of some of the newer FFRDCs, according to one FFRDC official, most FFRDCs were established to keep intact a unique and valuable resource: a nucleus or core of experts to meet some special research or development need that the government could not meet by existing in-house or private sector resources. Rarely has a decision been made to establish a new FFRDC and then staff it with the best-qualified people available. Rather, FFRDCs have generally been established around existing, highly capable groups of experts which, in turn, have been able to attract other highly qualified persons.

SDI Institute

According to DOD, the new FFRDC, to be known as the SDI Institute, would function primarily as a systems engineering/systems integration FFRDC for the SDIO. The Institute's mission would be to conduct studies and analyses of emerging SDI technologies and system concepts. The Institute's functions would include, but would not be limited to,

- identifying and evaluating existing and potential technological advances and system concepts;
- reducing the costs and increasing the effectiveness of both basic and applied research;

- advising SDIO on the utility and implications of integrating each aspect of the SDI program;
- assessing and developing evolving technical requirements, architectures, and test bed requirements;
- performing test and evaluation planning;
- integrating offense/defense scenarios and analyses into useful conclusions;
- framing issues for decisions by SDIO;
- developing and maintaining a data base on active SDI projects and capabilities, and continually analyzing these for overlap, duplication, and opportunities for coordination; and
- coordinating technical tasks and serving as a liaison with the military services, industry, universities, and government laboratories.

According to the Secretary of Defense's Special Assistant on the Institute, the Institute's staffing level would be expected to start at about 50 professionals, grow to about 150 to 200 professionals, and have a maximum of about 300 professionals.

The Director of SDIO has indicated that the Institute's budget would be expected to constitute less than one percent of SDIO's total budget. For fiscal year 1986, one percent of SDIO's budget would have been \$28 million. The Director has also indicated that the Institute would not be a separate line item in SDIO's budget, but would be funded by taxing each SDIO program element according to its projected use of the Institute.

DOD would require that the Institute be located in the Washington, D.C., metropolitan area. Other than some computer capability, the Institute would not have its own research facilities. Rather, the Institute would have access to research results from other organizations working on the SDI program, including the proposed National Test Bed.²

According to DOD, it is possible that the SDI Institute may subcontract in appropriate circumstances. However, DOD believes that the Institute will be successful over time in attracting the necessary personnel to avoid any great frequency of subcontracts. Further, there should be no Institute-issued research subcontracts at all, since the Institute will not be undertaking primary research on major experiments itself, with the

²The National Test Bed will be a network of facilities used to simulate battle management and command, control, and communication concepts and to evaluate system architectures and their component technologies.

possible exception of updating and refining the overall system architecture.

In commenting on the internal SDI Institute organizational structure, the Secretary of Defense stated that the Institute would be able to structure itself any way it wants.

Comparative Effectiveness and Costs of Organizational Approaches

According to Policy Letter 84-1, any government agency that considers establishing a new FFRDC should first consider existing alternatives for satisfying its requirements and then indicate its intention in The Federal Register and Commerce Business Daily. According to DOD, it evaluated alternative sources in accordance with the policy letter and determined that a new FFRDC could best satisfy SDIO's needs for technical support. From March to June 1986, DOD published notices of intent in The Federal Register and Commerce Business Daily to establish a new FFRDC to be called the SDI Institute.

We asked 11 consultants (see app. IV) to review the organizational options for satisfying SDIO's needs and express their views on the relative effectiveness and cost of each. We recorded those views on a data collection instrument (see app. V) and met individually with each consultant to further explore the bases for his/her views. The consultants ranked the creation of a new FFRDC and a new division in a FFRDC equally as the most effective options for meeting SDIO's needs. They found it difficult to compare the organizations on the basis of cost, and there was no clearly preferred approach in the least-cost category.

DOD's Assessment of Alternatives

In November 1985, an ad hoc SDIO Technical Support Working Group was established in response to a request from the Director, SDIO, to examine and assess possible institutional forms for providing SDIO with technical support. The working group consisted of personnel from SDIO and the SDI Advisory Committee, a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI program. Because of the wide scope and complex nature of the SDIO task, the working group determined it essential that SDIO quickly augment its capability to analyze and direct its research and technology programs. The working group, with input from other elements within DOD and from outside consultants, identified the following criteria for this SDIO support capability.

- It should be able to attract and retain top technical and internal management talent. This will require a combination of challenging assignments, important responsibilities, competitive salaries, and a prestigious organization having clearly perceived professional opportunities.
- It should be able to be established quickly and grow rapidly, both in terms of the number of personnel and in functional capabilities as needs unfold.

- It should be able to be flexible in terms of its ability to respond quickly to changes in priorities, budgets, evolving technologies, or other developments. Responsiveness obviously will be enhanced by close proximity and dedication to SDIO itself.
- It should be able to provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. It must operate fully in the public interest with full disclosure of its affairs to the government as may be legally required. It must not engage in any production or other service activity related to the SDI program and must not compete for any other SDIO procurement. It must be free from any apparent or actual conflicts of interest that could influence the objectivity of its work or appear to give or potentially offer its other clients, if any, an unfair competitive advantage with regard to SDI work through access to inside information.
- It should be able to possess the technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of SDIO. It must be capable of performing technical program planning and of providing general systems engineering oversight on very large systems.
- It should be able to dedicate itself to this technical support role for SDIO, and abstain from all other SDI-related work, in order to provide total objectivity and responsiveness to SDIO needs and to avoid any actual or apparent conflicts of interest with its defined role.

The working group evaluated possible alternatives to meet the long-term needs of SDIO and concluded that the best option was to establish a new FFRDC. In arriving at its decision, the group considered three basic categories of organizational forms that might meet the technical support needs of SDIO:

- government organizations, including expansion of the present SDIO staff or establishment of a new DOD field agency or a military organization;
- for-profit firms, including large industrial firms, small-to-mid-sized systems engineering and technical assistance contractors, or a new consortium of such firms or contractors, either U.S. or foreign; and
- non-profit firms, including existing FFRDCs, a new division within an existing FFRDC, a new FFRDC, universities, and private not-for-profit laboratories/corporations, new or existing.

The working group's assessment of each category was as follows:

- The use of a government organization to provide the special technical support needs of SDIO was found to be undesirable for two main reasons:

it would be difficult to attract, retain, and manage the required number of highly qualified scientific and engineering personnel; and the needed personnel buildup could not occur sufficiently rapidly, or respond quickly enough to changing requirements.

- The use of for-profit firms was found to be undesirable because of the conflicts of interest inherent in the for-profit organizational approach, the probable inability to ensure total objectivity and independence of thought, and the negative business impact on such a firm through its necessary dedication to SDIO technical support alone.
- Of the various not-for-profit alternatives examined, a new FFRDC ranked highest. The FFRDC mechanism was considered to offer quick, responsible handling of SDIO needs, while allowing considerable freedom in establishing salary structures and a working environment conducive to attracting top scientific and engineering talent. While reliance on an existing FFRDC or other non-profit organization potentially would provide more readily or more quickly available capability and staff, none was found to have the breadth of specialized expertise to undertake major SDI technology program review and oversight. Any existing organization, including a FFRDC or national laboratory, necessarily will have ongoing work and a deeper background in one technology or another. Neither would any organization already in existence be in a position to offer the desired degree of dedication to and exclusive focus on the SDI program. It was found that the establishment of a new FFRDC, specifically oriented to SDIO technical support needs, likely would result in materially greater responsiveness and support than would the reorientation of an existing FFRDC.

Consultants' Views

We asked 11 consultants with broad experience in and out of government to evaluate the same organizational options evaluated by the working group. We asked them to rank the options based on their overall judgments about the organizations' relative effectiveness in providing technical support to SDIO. We further asked the consultants to rank the options based on their relative costs, considering both start-up and yearly operating costs. The individual rankings were combined to create a single overall value for each organizational approach, based on the total number of points assigned.

**Effectiveness of
Organizational Options**

We asked the consultants to apply the criteria identified by the working group, an additional criterion,¹ and any additional major criteria that they wished to consider. We had the consultants rate each organizational option on each criterion based on their judgment of whether the organization would strengthen or limit the achievement of the criterion. We used a scale of +2 (greatly strengthen), +1 (strengthen), 0 (strengths/limitations balance out), -1 (limit) and -2 (greatly limit). Table II.1 presents the net scores for the organizational options for each criterion.

¹Provide an adequate competitive environment, which encourages technical quality and cost containment.

Appendix II
Comparative Effectiveness and Costs of
Organizational Approaches

Table II.1: Net Scores of Organizational Options for Each Criterion

Criteria to be satisfied	Organizational approaches							
	SDIO	New DOD/ service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/ national lab.	New FFRDC/ national lab.	Other non-profit group ^a
Criterion #1 Attract and retain top technical and internal management talent. Consider relative prestige and appeal in offering professional opportunities, including competitive salaries and benefits.	-11	-14	+12	0	+11	+16	+10	+4
Criterion #2 Be able to be established quickly and grow rapidly, both in terms of number of personnel and in functional capabilities as needs unfold. Consider relative freedom from institutional constraints in justifying, negotiating, and executing personnel staff requirements.	-10	-17	+13	-3	+11	+15.5	+9	+2
Criterion #3 Capability to respond sufficiently quickly to changing requirements such as priorities, budgets, and evolving technologies. Consider also proximity and dedication of resources to SDIO requirements.	+1	-3	+9	-3	+8	+11.5	+14	+6
Criterion #4 Provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. Consider relative freedom from other institutional loyalties (service/corporate affiliations), relative freedom from real or apparent conflicts of interest in handling industry proprietary data and ability to safeguard national security information, full disclosure of affairs as may be legally required, intellectual independence in recommending controversial actions and strategies to SDIO.	-5	-3	-4	+11	+9	+13.5	+12	+8
Criterion #5 Possess technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of the SDIO. Must maintain close, continuous interactions with SDIO in performing technical program planning and in providing general systems engineering oversight on very large systems.	+5	+6	+8	+2	+9.5	+15	+14	+6
Criterion #6 Dedicate itself to this technical support role for the SDIO in order to avoid any actual or apparent conflicts of interest with its defined role.	+16	+8	-5	+7	+7.5	+10	+20	+7
Criterion #7 Provide an adequate competitive environment which encourages technical quality and cost containment.	-6	-9	+9	+1	+10.5	+13	+11	+6

Appendix II
Comparative Effectiveness and Costs of
Organizational Approaches

Criteria to be satisfied	Organizational approaches							
	SDIO	New DOD/ service group	For-profit firm	Univer- sity	Existing FFRDC/ national lab.	New division in existing FFRDC/ national lab.	New FFRDC/ national lab.	Other non-profit group ^a
Criterion #8								
Other criteria mentioned.								
Provide a professional climate and management flexibility to meet unique organizational requirements.	-1	-1	+1	+1	+1	+2	+2	+1
Provide objective peer evaluation of quality and activity.	-4	-4	-3	+3	+1	+1	+1	N/A
Provide the ability to "get around" government acquisition requirements.	N/A	N/A	-2	+2	+2	+2	+2	+2
Provide the ability to most effectively react to technical competition.	N/A	N/A	+2	0	0	0	0	0

^aThree consultants did not rank this approach for any criteria.

We then asked the consultants to rank the organizational options from 1 to 8 on their relative effectiveness in providing technical support to SDIO. "One" was to be considered the most effective and "eight" the least effective option. Table II.2 (1) presents an overall ranking of organizational options on effectiveness, based on the consultants' individual rankings, (2) shows the number of consultants who ranked the options as either their first/second or seventh/eighth choices, and (3) provides the SDIO working group's ranking of options.

Appendix II
Comparative Effectiveness and Costs of
Organizational Approaches

Table II.2: Ranking According to Comparative Effectiveness of Organizational Options

Ranking ^a	Organization	Total of individual rankings	Number of consultants who ranked organization ^b		Ranking by DOD
			1 or 2	7 or 8	
1	New FFRDC/national laboratory	26	7	0	1
1	New division in existing FFRDC/national laboratory	26	7	0	2
3	Existing FFRDC/national laboratory	38	3	0	3
4	Other non-profit group	37 ^c	3	0	5
5	For-profit firm	52	2	3	6
6	University	62	0	3	4
7	SDIO	71	0	7	7
8	New DOD/service group	74	0	7	8

^a1 is most effective; 8 is least effective.

^bTwo consultants gave the same rank to several organizations.

^cOne consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 38, and its maximum score would have been 45.

FFRDC/National Laboratory Option

The consultants preferred two of the FFRDC/national laboratory approaches (new FFRDC/national laboratory and new division in existing FFRDC/national laboratory) both in terms of achieving overall effectiveness and in satisfying individual criteria.

These organizational approaches tied for first in overall effectiveness. Within these options, the FFRDC was the preferred choice over the national laboratory because the laboratories have traditionally been involved in research and development, and the new Institute's mission would be to perform research, studies, and analyses—a mission more like that performed by existing DOD FFRDCs.

The consultants generally ranked the FFRDCs favorably because of their proven records at (1) attracting high-quality personnel, (2) providing objective and independent assistance, and (3) safeguarding proprietary data. One consultant also noted that FFRDCs have shown that they can hire personnel who can work with high levels of security data. Conversely, about half of the consultants indicated that the FFRDCs and national laboratories have demonstrated the negative characteristic of perpetuating themselves by going beyond their original missions to focus on their own agendas.

A new FFRDC was rated first in effectiveness by six consultants and second by another consultant. The new FFRDC option scored especially well with the consultants on the issues of providing independent, objective, and dedicated assistance. One consultant's view was that a new FFRDC will have only one master; hence, it will be independent from other organizational biases.

The consultant who rated the new FFRDC option second in effectiveness said that it would have been ranked first if it were not for uncertainties about its ability to get established quickly. Others expressed the same concern about the new FFRDC's ability to attract quality staff quickly. One consultant said that it will be difficult to get people to join the new FFRDC because of the uncertainty of its existence and the problem in recruiting high-quality people for an organization with no track record. Excellent people are simply not willing to move. According to this consultant, "If the first 10 to 20 individuals to join the new FFRDC are the right people, the FFRDC will have little difficulty attracting the remainder." Another consultant, however, said that the new FFRDC scored well on its ability to attract quality staff because it is easier to get people enthusiastic about doing something new.

Two consultants expressed the view that a new FFRDC would be too costly an undertaking for a program with an uncertain future. The same two individuals believed that a new FFRDC specifically created to support SDIO would tie the organization too closely to SDIO and, thus, give the appearance that it lacks independence and objectivity.

A new division in an existing FFRDC was rated first by one consultant and second by five consultants. A key factor in its ranking was its ability to draw upon existing talent and infrastructure to get underway quickly. However, about half of the consultants raised concerns, including (1) current sponsors would probably not allow their FFRDCs to assume the Institute's mission, (2) the assumption of that mission could severely impair the FFRDCs' operations and (3) present work commitments would impair the FFRDCs' responsiveness to SDIO.

Other Non-Profit Group

About half of the consultants had difficulty envisioning the type of organization that would fit into this category. For example, two who rated this option as their second choice for effectiveness could not identify an existing organization that they would strongly endorse.

For-Profit Firm

For-profit firms were rated first for effectiveness by two of our consultants. One indicated that a private company could best perform the tasks of systems integration and program management. The other indicated that a for-profit firm is under the right kind of competitive arrangement and is best because of its ability to hire and fire people easily. Moreover, it is more qualified than any other type of entity. For-profit firms scored especially high on their ability to attract and retain top talent (criterion 1) and to be established quickly and grow rapidly (criterion 2). They scored very low on criterion 6, which includes the avoidance of conflict of interest and on criterion 4, which includes the handling of industry proprietary data.

The consultants focused on one primary reason why for-profit firms did not fare well: for-profit firms would be reluctant to exclude themselves from hardware contracts where most of the SDI funding is directed and, without such exclusion, would have conflict-of-interest problems. One consultant added that other firms would be reluctant to share proprietary data with the for-profit firm.

University

Universities were not rated first or second by any of our consultants. They received one seventh and two eighth place votes and generally were rated low on most criteria. Their highest score was received on criterion 4, which includes independent and objective advice, freedom from conflicts of interest in handling industry proprietary data, and intellectual independence. The consensus among the consultants was that most universities would not agree to operate an organization as politically controversial as the SDI Institute. Other limiting factors mentioned included low salaries, slow responsiveness, and inexperience in recruiting.

SDIO and New DOD/Service Group

SDIO and a new DOD/service group ranked seventh and eighth, respectively. They scored low on most criteria. Their lowest scores came on their ability to attract and retain top talent (criterion 1) and to be established quickly and grow rapidly (criterion 2). Their best scores came on their dedication to SDIO's technical support (criterion 6). SDIO scored especially well on criterion 6.

The consensus among the consultants was that neither SDIO nor a DOD organization would be able to attract quality scientific and engineering talent because of low salaries and other Civil Service restrictions. SDIO was rated poorly on independence by several consultants because of its

close ties to the SDI program. One consultant said that SDIO would have a tendency to tell the boss what he wants to hear.

Cost of Organizational Options

We asked the consultants to rank the organizational options from 1 to 8 on their relative cost in providing technical support to SDIO. "One" was to be considered the least costly, and "eight" the most costly option. Table II.3 (1) presents an overall ranking of organizational options on cost based on the consultants' individual rankings, and (2) shows the number of consultants who ranked the options as either their first/second or seventh/eighth choices.

Our consultants found it difficult to rank the organizations on the basis of comparative cost. One individual considered all organizations the same. Another individual indicated a preference for rating the organizations on efficiency. A third individual said that there is no way to directly compare and rank industry and government costs on the same scale.

Unlike our effectiveness ranking, there was no clearly preferred organizational approach in the least-cost category, as indicated by the large number of organizations that received first or second place rankings. The for-profit firm was clearly considered highest in cost, although it was ranked as the least costly option by one consultant.

Appendix II
Comparative Effectiveness and Costs of
Organizational Approaches

**Table II.3: Ranking According to
Comparative Costs of Organizational
Options**

Ranking ^a	Organization	Total of individual rankings	Number of consultants who ranked organization ^b	
			1 or 2	7 or 8
1	Existing FFRDC/national laboratory	29	4	0
2	SDIO	33	4	2
3	New division in existing FFRDC/national laboratory	37	3	0
4	New DOD/service group	38	4	1
5	University	41	2	1
6	New FFRDC/national laboratory	50	1	3
7	Other non-profit group	51 ^c	0	3
8	For-profit firm	67	1	7

^a1 is least costly; 8 is most costly.

^bSome consultants did not rank the organizations while others gave the same rank to more than one organization.

^cOne consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 52, and its maximum score would have been 59.

An existing FFRDC/national laboratory and a new division in an existing FFRDC/national laboratory scored well on the cost ranking. Lower startup costs were mentioned by some consultants because of the existing infrastructure and the ability to use existing facilities and equipment. Since a new FFRDC/national laboratory would not have such advantages, that option was ranked much lower.

Some consultants said that SDIO and the DOD/service group scored well because of low salaries. One consultant indicated that SDIO was rated first in cost containment for the same reasons that it rated poorly in effectiveness: it offered lower salaries, no large new management structure, and no new facilities.

Several reasons were given for the for-profit firms' poor rating on cost, including (1) their tendency to do whatever is necessary to get the job done, such as hiring the best people and obtaining the best equipment, and (2) their higher salaries, overhead, and fees.

Impact of DOD's Plans on Independence and Objectivity

According to the Secretary of Defense, DOD intends the SDI Institute to function in an independent and objective manner. Although there would be a close liaison between SDIO and the Institute, the Secretary indicated that there is no reason to believe that such a working relationship would lead reputable scientists to compromise their objectivity or independence.

DOD's plans for the Institute have been outlined in a number of documents, principally in the SDIO Director's comments on a May 30, 1986, Congressional Research Service report¹, in an August 1986 report by the Secretary of Defense to the Senate Committee on Armed Services, and in discussions with us. SDIO's plans for the Institute raised concerns within the Congress as to whether the proposed FFRDC would be independent and objective in accordance with the provisions of Policy Letter 84-1. The areas of concern involved

- contractor selection,
- review of proposal(s),
- staff selection,
- work plan approval,
- provisions for independent or self-initiated work, and
- conflict-of-interest and post-employment restrictions.

Eleven consultants and the directors of nine DOD-sponsored FFRDCs with whom we met (see app. IV) provided their opinions on the impact of DOD's plans on the Institute's independence and objectivity. Although viewpoints varied with the experience and backgrounds of the respondents, some patterns emerged in the answers to our data collection instrument and explanations of the responses. In addition, individual responses sometimes presented insights into the FFRDC/sponsor relationship.

Office of Federal Procurement Policy Guidelines

Policy Letter 84-1 outlines several policies relating to maintaining the independence and objectivity of FFRDCs:

- Government monitoring is not to create a personal services relationship or to cause disruptions that are detrimental to the productivity and/or quality of the FFRDC's work.

¹The Strategic Defense Initiative Institute: An Assessment of DOD's Current Proposal, Congressional Research Service, Library of Congress, May 30, 1986, updated August 11, 1986.

- The activity is to be operated as an autonomous organization or as an identifiable, separate operating unit of a parent organization.
- The activity is to be required to conduct its business in a responsible manner befitting its special relationship with the government, to operate in the public interest free from organizational conflict-of-interest, and to disclose its affairs as a FFRDC to the primary sponsor.
- The sponsoring agency, in establishing a FFRDC, shall ensure that the purpose, mission, and general scope of effort of the FFRDC are stated clearly enough to enable differentiation between work that should be performed by the FFRDC and work that should be performed by a non-FFRDC.
- The government-FFRDC relationship should be of a type to encourage the FFRDC to maintain currency in its field(s) of expertise, maintain its objectivity and independence, preserve its familiarity with the needs of its sponsor(s), and provide a quick response capability.

DOD's Plans for Establishing the SDI Institute

The SDI Institute, according to DOD, is being established to meet the technical support needs of SDIO in objectively evaluating and integrating SDI research. SDIO proposes to establish the Institute and to set policies concerning its operations and relationship with its sponsor agency. The Secretary of Defense stated DOD's position on establishing the Institute in an August 1986 report to the Senate Committee on Armed Services.

Contractor Selection

As stated in the August 1986 report, the Secretary of Defense, pursuant to his authority under the Competition in Contracting Act of 1984 (10 U.S.C. 2304 (c)(3)(B)), determined that the immediate technical support needs of SDIO would not be met by a full, formal procurement, which in the case of the most recently established DOD-sponsored FFRDC—the Software Engineering Institute—took about ten months. Accordingly, the Secretary invited a number of prominent scientific and technical individuals to submit a proposal to operate the Institute. The Secretary, noting that many of these persons are also members of the SDI Advisory Committee, a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI program, determined them to be probably the most qualified people to set up the Institute.

The Secretary noted that no commitment had been or would be made until the invited proposal was received, reviewed, and evaluated. He also indicated that companies that had contacted DOD in response to the announcements of DOD's intent to establish the Institute were advised

that DOD would consider fully and fairly any proposals that were received.

Review of Proposal(s)

SDIO plans to be the sole body to review proposals to operate the new FFRDC. SDIO currently has no plans to enlist peer review by persons outside the government in this review process. According to the Secretary of Defense, SDIO has the appropriate resources and personnel to best evaluate proposals to operate the Institute. The SDIO Deputy Director for Programs and Systems will chair an evaluation board consisting of SDIO Technology Office Directors. The Secretary's report to the Senate Committee on Armed Services noted that, if additional outside review were needed, it would be considered at that time.

Staff Selection

SDIO originally planned to prepare a sponsoring agreement between itself and the new FFRDC that would require the Institute's president and the heads of its technical directorates to be acceptable to the SDIO's Director. The Secretary noted that such approval of key FFRDC personnel is neither new nor unusual and cited the agreement between the Center for Naval Analyses and the U.S. Navy as a precedent.

The Secretary stated that such a role would not adversely affect either the objectivity or the independence of the Institute. He added that to carry out its technical support mission properly, the Institute's personnel must possess the highest professional qualifications and that effective communication and liaison between top management of the two organizations must exist. The approval provisions are meant to ensure this purpose, according to the Secretary.

The Secretary of Defense's Special Assistant for the Institute subsequently clarified DOD's position by noting that the Director of SDIO would require SDIO's concurrence on the selection of the Institute's top level executive—the president—and coordination with the appropriate SDIO peer directors in the selection of key Institute technical personnel. SDIO would exercise veto power over only the Institute's selection of the president. SDIO intends to seek only review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Work Plan Approval

SDIO proposes that the Institute submit its work plans every 6 months for SDIO's approval. The Secretary noted that this requirement is reasonable in that it ensures that the FFRDC fulfills its stated purpose, meets the

SDIO's technical needs, and maintains a proper focus on its specific functions without encroachment on the private sector or other organizations.

**Provision for Independent
or Self-Initiated Work**

The Secretary's report to the Senate Committee on Armed Services noted DOD's opposition to committing a fixed percentage of the Institute's budget to the performance of self-initiated work and cited the history of severe cutbacks in requested SDI funding as the basis for his objection. According to the report, DOD is not averse to contract provisions that permit the Institute the flexibility to initiate its own work proposals. The Secretary agreed that the ability to initiate related research and studies is valuable and that DOD would explore the possibility of negotiating contract provisions toward that purpose.

In subsequent remarks, the Secretary's Special Assistant noted that SDIO would support and encourage the Institute to initiate related research and studies that the Institute deems necessary to provide SDIO with objective technical and feasibility data. SDIO would provide funding for the Institute's independent research, but the level of funding would not be determined until future contract negotiations are conducted.

**Conflict-Of-Interest and
Post-Employment
Restrictions**

DOD plans to address real or apparent conflicts of interest through SDIO's sponsoring agreement with the SDI Institute. For example, the sponsoring agreement would prohibit any SDI Institute employee, officer, or Board of Trustee member from holding any position with SDIO. The agreement would also prohibit more than one-half of the members of the SDI Institute Board of Trustees from simultaneously holding any position with the SDI Advisory Committee or any similar body which provides technical, scientific, or strategic advice to DOD on SDI. Moreover, in order to avoid any actual or apparent conflict-of-interest, DOD expects that persons who are members of both the SDI Advisory Committee and the SDI Institute Board of Trustees would abstain from participation in any evaluation or advice by the SDI Advisory Committee regarding the SDI Institute. Section 208 (a) of Title 18, United States Code, would bar SDI Advisory Committee members who are also on the SDI Institute Board of Trustees from participating in recommendations directly affecting the new FFRDC's financial interests, in the absence of a waiver under section 208 (b).

The Secretary noted DOD's intent to minimize possible conflicts of interest between the Institute and other organizations. Toward this end, the Institute would not be permitted to have any SDI-related work

beyond its specific technical functions, or to serve other clients who have SDI-related work. This restriction is considered necessary because DOD expects that the Institute would provide advice, recommendations, and evaluations to the SDIO that could affect decisions to award federal research and development contracts to other entities. Also, the Institute may undertake research audits of other entities, including other FFRDCs and national laboratories, that are performing research for the SDI program.

DOD intends to require that Institute personnel not hold any positions with other organizations that have financial interest in SDI work. DOD also plans to incorporate appropriate provisions in the sponsoring agreement under which Institute employees would safeguard information owned by other contractors.

According to DOD, it is possible that, in isolated instances and as a temporary measure, individual technical personnel from SDIO may be stationed at the SDI Institute to fill an immediate need, but there is no plan to do so as a regular course. The DOD believes that there would be no apparent conflict-of-interest between the SDIO and SDI Institute as the purpose of one is to meet the technical support needs of the other.

The Institute would not be legally subject to the post-employment restrictions that apply to federal employees. According to the advice of DOD counsel, the Secretary reported that it would not be appropriate to attempt to impose "revolving door" provisions on FFRDC employees because

- DOD could not include "revolving door" provisions that included financial penalties and imprisonment under federal statutes in a contract;
- the type of employment limitations that the FFRDC contractor would need to negotiate with its employees has been found to be of questionable enforceability under general principles of contract law, as well as specific state statutes; and
- provisions limiting future employment are likely to inhibit recruitment of personnel possessing the highest level of relevant experience.

The Institute's involvement would be primarily oriented to evaluating research results, rather than research proposals. Moreover, DOD plans to require the Institute to follow the general practices of submitting financial disclosure statements and agreeing to safeguard proprietary information in any activities that call for reviewing research proposals.

Views of Consultants and Heads of DOD- Sponsored FFRDCs on DOD's Plans

The consultants responded to questions concerning contractor selection, review of proposal(s), and staff selection, while the heads of FFRDCs answered questions about staff selection, work plan approval, provisions for independent or self-initiated work, and conflict-of-interest/post-employment restrictions.

Contractor Selection

Eight of the nine original contracts for the DOD-sponsored FFRDCs were established by sole-source awards. The contract for the Software Engineering Institute, established in 1984, was a competitive award, as was the renegotiated contract in 1983 for the Center for Naval Analyses.

No consensus appeared among consultants on the question of what selection method would least compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO. Three said that competition compromises independence and objectivity more than sole-source selection; four said that competition compromises them much less than the alternative method; and three said that the two selection methods' impacts are the same. The following reasons were provided in support of these responses.

One consultant who said that competition compromises independence more than sole-source selection noted that (1) the best proposal is not always written by the best source and (2) the competitive process would not always ensure the best possible source. Another consultant indicated that sole-source selection will be interpreted by the public as a "put up" job: SDIO did not want any embarrassing questions asked so it selected its people for the FFRDC proposal. Conversely, the consultant believed that DOD did the right thing by not going public for proposals at this point. He indicated that the Institute will have to contract out since it will not have all the needed expertise in-house. The consultant added that SDIO would contract out for the assistance it needs but that SDIO lacks objectivity and is not trusted. SDIO wants the new Institute to project the objectivity it lacks.

Three consultants said that it is unrealistic to expect for-profit firms to submit proposals in anticipation that SDIO might reject the proposal of the group it had invited to set up the Institute.

In contrast, three consultants said that a form of competition already had occurred within SDIO and DOD for the people selected to submit the proposal.

Reviewing Proposals

Nine consultants said that some type of peer review of the proposal(s) is necessary to best guarantee independence and objectivity, while two indicated that a review by SDIO was sufficient. All agreed that SDIO needs to be involved in the review because it is responsible for the SDI program. Beyond this agreement, no consensus emerged among those who voiced a need for a peer review on the organization(s) that should comprise the review group. However, peer review was thought to enhance the credibility of the review process, improve the quality of the proposal(s), and be required because of the political climate over SDI.

The military services and other DOD agencies should be included in the review process because they are heavily involved in SDI, according to three consultants. One consultant stated that participation by organizations heavily involved in the SDI program would help them feel more comfortable about the Institute. Another consultant said that DOD agencies that are involved with FFRDCs, unlike SDIO, have experience with FFRDCs that could benefit SDIO.

Three consultants agreed that non-DOD government agencies could lend insights and credibility to the review process. The consultants suggested such organizations as the Department of Energy, National Bureau of Standards, National Science Foundation, Space Science Board, National Academy of Engineering, Defense Science Board, and National Research Council. One consultant envisions a cross-service, multiagency board under the Secretary of Defense to review the proposal and thinks that non-DOD government agencies should be involved, but not non-governmental bodies. The consultant said that it is always wise to have some redundancy in the process.

One consultant believes that a combination of SDIO, other DOD, and non-DOD agency peer review and non-government institutions or persons would best serve to evaluate the Institute proposal(s). Individuals outside the government—"the best minds in the country"—should be brought in to provide their expert advice.

In contrast, another consultant said that he would not submit the proposal(s) to review by non-government organizations because of the misinformation and deep feelings about the SDI program that exist outside of government. Neither would he submit the proposal(s) for peer review to those DOD organizations involved in the SDI program because of their biases.

Two consultants said that only SDIO should review the proposal(s) for the FFRDC because SDIO is the customer. One does not think that SDIO's review would have any affect on the FFRDC's independence and objectivity. The second consultant stated that SDIO has responsibility and authority for its decisions. According to this consultant, the right group of people on the Board of Trustees is more important to guarantee independence and objectivity than the group that reviews the original proposal.

Staff Selection

Only one of the sponsors of the nine FFRDCs we questioned exercises veto power over staff selection. The Navy, sponsor for the Center for Naval Analyses, exercises veto power over the selection of the president and vice-president.

The 11 consultants were almost evenly split on the question of whether SDIO's veto power over staff selection would compromise the FFRDC's independence and objectivity. Three said that they would find acceptable a staff selection veto power over the FFRDC director; two would accept it to the technical director level; three said that no staff selection veto power at any level would be acceptable; and one favored veto power to some unspecified level. The other two consultants did not express strong views on the acceptability of a veto power.

All nine FFRDC officials said that SDIO's proposed veto power over staff selections would compromise the FFRDC's independence and objectivity. Nevertheless, while no FFRDC official would accept sponsor veto power to the technical directors' level, two would accept it at the director's level.

Consultants and FFRDC officials suggested several reasons for their observations.

Four FFRDC officials and three consultants suggested that consultation was the proper mechanism for selecting top level staff. Because FFRDCs have many motivations against acquiring a person who would be unacceptable to the sponsor, they would not force an unacceptable person on their sponsors. The consultants said that consultation on selection is important and usually occurs.

One consultant believed that the question of veto power over staff selection is "a red herring" because staff selection will be done in consultation with the customer. Thus, to describe the veto power of a FFRDC

sponsor as being similar to that of the President of the United States is nonsense. With respect to veto over technical directors, the Board of Trustees will select staff according to qualifications.

A FFRDC official and a consultant said that an informal veto power already exists in the sponsor's control of the salaries of top personnel and input to funding for the FFRDC. This type of intervention is another motivation against selecting a person who would be unacceptable.

Seven heads of FFRDCs said there should be no sponsor veto power over the selection of staff at any level, while two FFRDC officials and three consultants approved of a veto power at the president or director level, but not at the technical director level. In contrast, two consultants believed that a staff selection veto power even at lower levels is necessary to ensure that people compatible with SDIO are selected. Officials of six of these seven FFRDCs said that the choice should be left to the Board of Trustees, which would be aware of the sponsor's views.

One FFRDC director said that any sponsor involvement at all becomes the equivalent of making a choice. If the sponsor suggests a name to the FFRDC, the contractor really has no choice and has given up its power to appoint people. Staff selection veto power, according to another FFRDC official, undercuts all the other reasons for SDIO to establish a FFRDC.

Two consultants, one who supported a veto power and one who said it denigrates an organization, agreed that a good Board of Trustees is more important.

According to a consultant who indicated that veto power for only the top two or three individuals is acceptable, the Department of Energy has the right to exercise a veto over the selections of the top individuals for its laboratories.

One consultant said that the FFRDC's sponsor should have a top man at the FFRDC in whom it has confidence, but the sponsor should not reach down into the senior analyst/engineer level, where the organization's technical talents are.

Of the two consultants who believed that veto power over staff selection is necessary, one said that veto power compromises independence and objectivity, but is essential because the Institute needs to have a management with which SDIO can work. This consultant said that SDIO should have veto power over the top 10 to 15 management people, but should

not have input in selecting individuals below that level. The other consultant believed that, based on his experience, SDIO's veto power over staff selection would probably not compromise the FFRDC's independence and objectivity.

The big danger, according to the head of one FFRDC, would be in setting up a FFRDC whose president supported the administration's position, right or wrong, when an independent body is needed. This official's FFRDC has had people from government on its staff, but has never given its sponsor a say in who runs the organization. The trustees, however, deliberate over who can work with the sponsor.

Among the FFRDC officials who indicated that veto power over staff selection would definitely compromise the FFRDC's independence and objectivity, three said that their strength is the diversity of their staffs' viewpoints and that the Institute will need to work harder at maintaining this because its client base will be less diverse.

Work Plan Approval

Five FFRDCs negotiate work plans with their sponsors; three have annual work plans approved by advisory committees after sponsor/FFRDC interaction; and one has 1- and 5-year plans approved by its sponsor.

No consensus emerged among the heads of FFRDCs regarding whether required SDIO approval of the Institute's work plan compromises independence and objectivity more, less, or the same as joint agreement. Two officials indicated that there is no difference between work plan approval and joint agreement, and three indicated that work plan approval compromises independence and objectivity more than joint agreement. Four officials responded that the question did not define "work plans," that use of such terms as "joint agreement" and "approval" did not accurately describe the research plan formulation process, or that they were unable to answer the question.

All FFRDC officials indicated that work plans must be developed by mutual agreement and consultation between the sponsor and FFRDC because the FFRDC must be responsive to the sponsor's needs.

Six officials noted that projects can be initiated by either party. Work plan development is always an interactive process.

Seven officials distinguished between overall work plans and task orders for particular research projects. One FFRDC president noted that

the assignment of a research project is not a work plan. This president's FFRDC receives funding and a contract, which has a general scope of work. The FFRDC cannot spend money until it has task orders which tell it what to do, but not how to do it. Six officials noted that sponsors can determine projects to do, but not methodologies or staff assignments.

One FFRDC president noted that what amounts to a veto power over FFRDC work plans is "the greatest danger" to control. If the FFRDC and sponsor work things out together, it is in both parties' interests.

Another FFRDC director said that a work plan is a form of contract; a good contract is based on mutual agreement and trust. This approach maintains independence in the same way that contracts maintain the independent roles of the parties. However, the process must be mutual: it makes no sense to propose something to be done if the FFRDC has no resources to do it or for the FFRDC to propose a project that would use resources if the customer has no need for the product.

The government always has the right to decide not to use a FFRDC when there are disagreements over a work plan, according to one FFRDC head. The FFRDC's funding is generally agreed to at the highest level with respect to overall size, but actual funds are set aside program by program. (This FFRDC has no charter, tenure, or guarantee of a specific level of funding.) If a program office is dissatisfied, it need not set aside funds for work at the FFRDC. Thus, the power to go elsewhere is a form of control, but operationally it is not a direct line of control.

Two officials said that a 6-month review is too frequent, while another said that SDIO might need to review the Institute program monthly because SDI is moving so quickly. Another FFRDC director said that the constantly changing environment of SDI would make such a 6-month review process difficult and that it is better to work together to develop and write mutually agreeable work plans and mutually bring them up the management chain.

Provisions for Independent or Self-Initiated Work

All nine FFRDCs have provisions for independent research² under the pertinent procurement regulations, specific agreements in their contracts, and/or negotiated agreements with their sponsors.

²Some FFRDCs prefer to call independent research "self-initiated work" because, by definition, independent research is charged to an organization's overhead account.

Eight of the nine FFRDC officials said that the guarantee of some level of independent research enhances the FFRDCs' independence and objectivity; however, there was no agreement on the level. The other official stated that the independent research provision probably enhances the FFRDC's independence and objectivity.

According to the officials, independent research allows them to do forward planning, to examine longer-term problems, and to explore questions that the sponsors do not think to or do not want to ask.

According to representatives of one FFRDC, a FFRDC always has ideas or proposals to bring to the sponsor that it is not directing the FFRDC to examine. Some provision should be made for initial exploration in those areas or for carrying some other work further than the definitions of the assigned projects. They also said that the need for a "guarantee" depends on the sponsor, as some seek more control than others. Moreover, the term "guarantee" is a strong statement. This FFRDC, for example, operated many years without such an arrangement, but the sponsor gave the organization flexibility. Some small flexibility is required to preserve an organization's independence and objectivity.

These FFRDC officials said that there is no such thing as a "guaranteed" independent research program. The sponsor could reject self-initiated research in a given year and could emphasize this rejection by not providing funds for such work. They added that a formal provision, instead of a guarantee, would enhance the FFRDC's independence.

Another FFRDC representative stated that the amount allocated for independent research should be enough to achieve meaningful results. A small percentage of a few million dollars in a program the size of the Institute might fund only a few staffers and might not be significant. When resources are so small, what occurs is not research, but rather people currently without projects to work on simply charging their time to the "independent research" category.

Conflict-Of-Interest and Post-Employment Restrictions

All nine FFRDCs have conflict-of-interest provisions, but none has post-employment restrictions. All nine of the FFRDC presidents or heads indicated that not having post-employment provisions would compromise the independence and objectivity of a FFRDC serving SDIO to little or no extent. FFRDC directors noted several points.

Four said that "revolving door" provisions are not necessary since FFRDCs have strict conflict-of-interest provisions or policies, such as prohibiting employees from having any relationship with designated companies, restricting staffs from running businesses that the FFRDCs would then have to evaluate, and approving outside work.

Post-employment restrictions, according to officials of three FFRDCs, are not enforceable and/or inhibit FFRDCs from attracting high-quality people. One FFRDC's president had not seen abuse in either direction (from government to FFRDCs or vice versa). In this president's experience, as a matter of human nature, people moving from one office or agency to another adopt the new organization's perspective, as do people leaving government or the military to go to FFRDCs.

Officials of two FFRDCs said that their organizations do not hire government or military people from offices with which the FFRDC works. One official's organization keeps the total number of retired government/military people on its rolls below 20 percent.

Two officials of FFRDCs stated that they do not subcontract work and thus see no potential for conflict. Because these FFRDCs do not contract, there is little chance for individual employees to set up entities that they could operate for their own benefit upon leaving the FFRDC. Contracts are all controlled by the government. Furthermore, as a corporation, the FFRDC does not evaluate proposals to the government. Although government agencies can ask consultants, including the FFRDC, to assist it in the technical evaluation of proposals from any source, the government is completely in charge. One official recommended that the Institute stay out of the bid selection process for SDI contracts.

Consultants and Heads of DOD-Sponsored FFRDCs Contacted During Our Review

Consultants

Dr. D. Allan Bromley — Director, Wright Nuclear Structure Laboratory, Yale University. Consultant to several corporations and national laboratories. Member, White House Science Council, Federal Laboratory Review Panel.

Dr. Ruth M. Davis — President, Pymatuning Group, Incorporated. Served as Deputy Under Secretary of Defense for Research and Engineering. Served as Assistant Secretary for Resource Applications, Department of Energy.

Mr. Richard DeLauer — President, The Orion Group, Ltd. and member of the Board of Directors, TRE Corporation. Served as Under Secretary of Defense for Research and Engineering. Served as Executive Vice-President and a member of the Board of Directors, TRW, Incorporated.

Dr. John M. Deutch — Provost, Massachusetts Institute of Technology. Served as a member of the Defense Science Board and on the Army Science Advisory Panel. Served as Under Secretary, Office of Energy Research, Department of Energy.

Dr. Alexander H. Flax — Home Secretary, National Academy of Engineering. Served as a member of the Defense Science Board. Served as Chief Scientist and Assistant Secretary for Research and Development, Department of the Air Force. Served as Vice-President and Technical Director, Cornell Aeronautics Laboratory. Served as President, Institute for Defense Analyses.

Dr. Ivan A. Getting — Consultant. Served as President and Trustee, The Aerospace Corporation. Served as the Vice-President for Engineering and Research, Raytheon Corporation.

Dr. Marvin L. Goldberger — President, California Institute of Technology. Served as a member of the President's Science Advisory Committee. Served as Chairman, Federation of American Scientists.

Dr. Arthur K. Kerman — Director, Laboratory for Nuclear Science, Massachusetts Institute of Technology. Consultant to several national laboratories. Served as a member of the President's Science and Academic Advisory Committee for Livermore and Los Alamos National Laboratories. Member, White House Science Council, Federal Laboratory Review Panel.

General Brent Scowcroft — Consultant with International Six, Incorporated. Retired Air Force General. Served as Special Assistant to Director, Joint Staff, Joint Chiefs of Staff. Served as Assistant to President, National Security Affairs.

Mr. Barry Shillito — Consultant. Served as Chairman, Trade Management International, Ltd. Served as Assistant Secretary of Defense for Installations and Logistics.

Major General Robert Trimble — Vice President with Martin Marietta Corporation. Retired Air Force General. Served as Assistant Deputy Under Secretary of Defense for Research and Engineering (Acquisition) and Acting Deputy Under Secretary of Defense for Acquisition Management.

Heads of DOD-Sponsored FFRDCs

Dr. Eberhardt Rechtin, President, The Aerospace Corporation

Dr. Phillip DePoy, President, Center for Naval Analyses

General William Y. Smith, President, Institute for Defense Analyses

Mr. Perkins C. Pedrick, President, Logistics Management Institute

Dr. Stephen Drezner, Vice-President, Rand-Arroyo Center

Mr. Michael Rich, Vice-President, Rand-National Defense Research Institute

Dr. James A. Thomson, Vice-President, Rand-Project Air Force

Dr. Angel Jordan, Acting Director, Software Engineering Institute and Provost, Carnegie Mellon University

Mr. Charles A. Zraket, President, The MITRE Corporation¹

¹We also met with Dr. Norman Waks, Chief Management Scientist, The MITRE Corporation.

Data Collection Instruments Completed by Consultants and Heads of DOD-Sponsored FFRDCs

DATA COLLECTION INSTRUMENTS

ASSESSMENT OF TECHNICAL SUPPORT ORGANIZATION FOR THE STRATEGIC DEFENSE INITIATIVE ORGANIZATION

Assessment of Alternative Means

Eight organizational approaches were evaluated by DOD as alternative means of technical support for the Strategic Defense Initiative Organization (SDIO). In your judgment, would each of these organizational approaches (listed below) strengthen or limit the achievement of the following criteria or would the strengths and limitations balance out? Rate each type of organizational approach for each criterion by entering one of the following numbers:

- +2 = greatly strengthen
- +1 = strengthen
- 0 = strengths/limitations balance out
- 1 = limit
- 2 = greatly limit

Enter N/A if you believe a criterion doesn't apply to an organizational approach, or if you have no basis for judgment.

Organizational Approaches

Criteria to be satisfied	SDIO	New DOD/ Service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/national lab.	New FFRDC/ national lab.	Other non- profit group
1. Attract and retain top technical and internal management talent. Consider relative prestige and appeal in offering professional opportunities including competitive salaries and benefits.								
2. Be able to be established quickly and grow rapidly, both in terms of number of personnel and in functional capabilities as needs unfold. Consider relative freedom from institutional constraints in justifying, negotiating and executing personnel staff requirements.								
3. Capability to respond sufficiently quickly to changing requirements such as priorities, budgets, and evolving technologies. Consider also proximity and dedication of resources to SDIO requirements.								

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

Assessment of Alternative Means, page 2

Organizational Approaches

Criteria to be satisfied	SDIO	New DOD/ Service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/nation- al lab.	New FFRDC/ national lab.	Other non- profit group
4. Provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. Consider relative freedom from other institutional loyalties (Service/corporate affiliations); relative freedom from real or apparent conflicts of interest in handling industry proprietary data and ability to safeguard national security information; full disclosure of affairs as may be legally required; intellectual independence in recommending controversial actions and strategies to SDIO.								
5. Possess technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of the SDIO. Must maintain close, continuous interactions with SDIO in performing technical program planning and in providing general systems engineering oversight on very large systems.								
6. Dedicate itself to this technical support role for the SDIO in order to avoid any actual or apparent conflicts of interest with its defined role.								

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

Assessment of Alternative Means, page 3

Criteria to be satisfied	Organizational Approaches							
	SDIO	New DOD/ Service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/nation- al lab.	New FFRDC/ national lab.	Other non- profit group
7. Provide an adequate competitive environment which encourages technical quality and cost containment								
8. Please describe and rate any additional major criteria not included above								

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

Assessment of Alternative Means, page 4

Comparative Effectiveness of Organizational Approaches

Please review the previous judgments you gave for each of the eight organizational approaches. We are interested in your overall judgments about the relative effectiveness of these approaches in providing technical support to the SDIO. Please rank order these approaches (listed below) from 1 to 8 in the right hand column. "One" is the most effective and "eight" is the least effective approach. Check to be sure you have ranked each item, and that no two items have the same rank.

Effectiveness Ranking

SDIO	—
New DOD/Service group	—
For-profit firm	—
University	—
Existing FFRDC/ national lab.	—
New division in existing FFRDC/national lab.	—
New FFRDC/national lab.	—
Other non-profit group	—

Comparative Costs of Organizational Approaches

We are interested in your judgments about the comparative costs of the eight organizational approaches. Please rank order the organizational approaches by their relative costs from 1 to 8 in the right hand column. Consider both start-up and yearly operating costs. "One" is the least costly and "eight" is the most costly approach. Check to be sure you have ranked each item, and that no two items have the same rank. In making your judgments, consider cost-related factors only and exclude other organizational advantages and disadvantages.

Cost Ranking

SDIO	—
New DOD/Service group	—
For-profit firm	—
University	—
Existing FFRDC/ national lab.	—
New division in existing FFRDC/national lab.	—
New FFRDC/national lab.	—
Other non-profit group	—

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

Page 5

Independence and Objectivity of FFRDCs

PLEASE NOTE: The next few questions discuss the independence and objectivity of a FFRDC that would provide technical support to the SDIO. By independence and objectivity we mean the ability of the FFRDC to provide conflict-free support, recommendations, and evaluations to the SDIO. It does not mean that the FFRDC would make its own agenda and policy role.

Reviewing Proposals

To best guarantee independence and objectivity, which of the following organizations or persons should evaluate the proposal(s) to operate a FFRDC to provide technical support to the SDIO? (Check one)

1. ☐ Only SDIO
2. ☐ SDIO and peer review by other DOD agency(cies)
3. ☐ SDIO and peer review by non-governmental institutions or persons
4. ☐ SDIO and peer review by other DOD agency(cies) and non-governmental institutions or persons
5. ☐ A combination of SDIO, other DOD and non-DOD agency peer review and by non-governmental institutions or persons
6. ☐ Peer review by non-DOD government agency(cies)
(Please specify) _____
7. ☐ Other (Please specify) _____

Contractor Selection

What selection method (sole source or competitive) would least compromise the independence and objectivity of the contractor chosen to provide technical support to the SDIO? Indicate your opinion by checking one of the alternatives listed below.

1. ☐ Competition compromises the independence and objectivity of the contractor much more than sole source selection
2. ☐ Competition compromises the independence and objectivity of the contractor more than sole source selection
3. ☐ There is no difference between sole source and competitive selection methods
4. ☐ Competition compromises the independence and objectivity of the contractor less than sole source selection
5. ☐ Competition compromises the independence and objectivity of the contractor much less than sole source selection

Staff Selection

In order to ensure for the selection of qualified personnel and effective communication between SDIO and the FFRDC, some believe that the SDIO should have some control over staff selection. Specifically, the president and technical directors should be acceptable to SDIO and SDIO should have veto power over selections. Others believe that such control creates a potential for bias and control over research results thereby compromising the independence and objectivity of the technical support organization. The question is, would SDIO's veto power over staff selections compromise the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

COMPLETED BY HEADS OF DOD-SPONSORED FFRDCs

Independence and Objectivity of FFRDCs

PLEASE NOTE: The following questions discuss the independence and objectivity of a FFRDC that would provide technical support to the SDIO. By independence and objectivity we mean the ability of the FFRDC to provide conflict-free support, recommendations, and evaluations to the SDIO. It does not mean that the FFRDC would make its own agenda and policy role.

Conflict-of-Interest and
Post-Employment Restrictions

To minimize the possibility of conflicts-of-interest certain restrictions may be placed on both a new FFRDC and on its employees. For example, the organization may not be permitted to engage in any other SDI-related work beyond its specific technical functions nor to serve other clients who themselves have SDI or SDI-related work. Personnel with a new FFRDC may not be permitted during their tenure with the organization to hold any position with any other organization that has financial interest in SDI work and the sponsoring agreement would require employees to safeguard information owned by other contractors. Also, if any directors of a new FFRDC providing technical support to the SDIO are members of the SDI Advisory Council (SDIAC), they must recuse themselves from participation in any evaluation or advice by the SDIAC regarding the new FFRDC. If it arises that personnel must review proposals submitted by private concerns, the reviewing personnel would be required to submit financial disclosure statements and agreement to safeguard proprietary information.

In some situations, post-employment restrictions may also be required, that is, employees are subject to "revolving door" provisions intended to protect the government from conflict of interest. To what extent, if at all, would the lack of post-employment provisions compromise the independence and objectivity of an FFRDC serving the SDIO? (Check one)

1. ☐ Compromises the FFRDC to little or no extent
2. ☐ Compromises the FFRDC to some extent
3. ☐ Compromises the FFRDC to a moderate extent
4. ☐ Compromises the FFRDC to a great extent
5. ☐ Compromises the FFRDC to a very great extent

Work Plans

Some feel that SDIO's technical needs would be best served if SDIO had the authority to approve the work plans of the proposed FFRDC every six months. Others disagree on the grounds that this procedure might compromise the independence and objectivity of the FFRDC. They believe that jointly agreed upon work plans would best ensure responsiveness to SDIO and preserve the independence and objectivity of the FFRDC. Indicate your opinion by checking one of the alternatives listed below.

1. ☐ Work plan approval compromises independence and objectivity much less than joint agreement
2. ☐ Work plan approval compromises independence and objectivity less than joint agreement
3. ☐ There is no difference between work plan approval and joint agreement with regard to independence and objectivity
4. ☐ Work plan approval compromises independence and objectivity more than joint agreement
5. ☐ Work plan approval compromises independence and objectivity much more than joint agreement

Appendix V
Data Collection Instruments Completed by
Consultants and Heads of DOD-
Sponsored FFRDCs

Staff Selection

In order to ensure for the selection of qualified personnel and effective communication between SDIO and the FFRDC, some believe that the SDIO should have some control over staff selection. Specifically, the president and technical directors should be acceptable to SDIO and SDIO should have veto power over selections. Others believe that such control creates a potential for bias and control over research results thereby compromising the independence and objectivity of the technical support organization. The question is, would SDIO's veto power over staff selections compromise the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes

Provisions for Independent Research

All FFRDCs have some money for independent research. The purpose of this money is to encourage innovation and provide a means to resolve conflicts over conclusions. For some FFRDCs this money is guaranteed and for some it is not. The question is, does the guarantee of some level of independent research money enhance the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes