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Synthetic Fuels Corporation's Management Of Demonstration Projects Would Be Limited

Department of Energy management and technical direction of fossil fuel demonstration projects differ substantially from that contemplated by Synthetic Fuels Corporation officials. Under requirements of the Energy Security Act of 1980, the Synthetic Fuels Corporation cannot have any direct role in the construction or operation of a demonstration project. Although the Corporation can participate in management decisions, primary management responsibility must be given to the private sponsor of the project. While DOE would use over 100 staff members for monitoring and direction, the Corporation may only have one full-time employee devoted to the project relying more heavily on the sponsor's management and control system.



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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

B-202463

The Honorable Pete V. Domenici
Chairman, Subcommittee on Energy
Research and Development
Committee on Energy and Natural
Resources
United States Senate

Dear Mr. Chairman:

Your letter of March 6, 1981, requested that we review the current Department of Energy (DOE) management structure, process, and decisionmaking for the two Solvent Refined Coal demonstration projects--referred to as SRC-I and SRC-II--and the relevant Synthetic Fuels Corporation (SFC) management structure for projects of this type. You also asked us to comment on the effect of a potential transfer of these projects to the SFC.

In general, we found that DOE management and control of the demonstration projects differs substantially from that contemplated by SFC officials for joint venture demonstration modules or for commercial projects requiring other forms of SFC financial assistance. DOE has responsibility for the management and technical direction for both SRC projects. SFC's role in a joint venture project is restricted to that of a limited partner. While the SFC can participate in the management decisions of the joint venture, the SFC cannot have any direct role in the construction or operation of the project module. The private sponsors must have primary responsibility for the management of the joint venture.

At peak level of the SRC projects' design and construction activities, DOE had planned to use 111 staff members to monitor, analyze, and direct the cost, schedule, and technical performance of the project. In contrast, SFC officials plan to rely more heavily on the sponsors' management and control system. They state that a manager would be assigned to each SFC-financed project to review and analyze the monthly cost, schedule, and technical performance

reports and to make site visits when necessary. The SFC manager may be the only full-time SFC employee devoted to the project, although he could have a small staff, depending on project needs. The manager would obtain matrix support from other SFC groups on an as-needed basis.

The role of DOE and the SFC regarding environmental impact also varies. DOE has developed a comprehensive program to monitor emission levels and mitigate their environmental impact, including the measurement of worker exposures and research studies on potential health effects. For SFC-sponsored projects, the Energy Security Act (P.L. 96-294) requires the financial assistance contract to contain a plan developed by the sponsors for monitoring the environmental and health related emissions from the construction and operation of the project.

Administration officials, including the Secretary of Energy and the former Acting Chairman of the SFC, have stated that it is not the administration's intent to transfer the projects from DOE to the SFC. Rather, DOE funding of the projects will be withdrawn. Industry sponsors would have to apply to the SFC for financial assistance and, thus, compete with other synthetic fuels projects.

In a March 24, 1981, letter issued jointly to Congressmen Don Fuqua, Larry Winn, and Hamilton Fish (B-202463), GAO stated that legislation is required to transfer these demonstration projects from DOE to the SFC. Even though DOE can, in general, assign programs or projects to other executive agencies, the Energy Security Act of 1980, the act authorizing the establishment of the Corporation, states that the SFC shall not be deemed to be an agency of the United States or an instrumentality of the United States. Furthermore, the other agency must have authority to assume these projects, and the SFC does not have this authority. The act prohibits transfers of power, functions, or authority to the Corporation by means of either delegation by the President or any other officer of the United States, or by use of the Reorganization Act of 1977 (5 U.S.C. 901).

On June 5, 1981, the Congress enacted the Supplemental Appropriations and Rescission Act, 1981 (P.L. 97-12) which revised previously appropriated no year funds for the SRC projects. For SRC-I, the Congress specified that \$22.5 million may be used in fiscal year 1981 and deferred availability of \$135 million to fiscal year 1982. For SRC-II, the Congress deferred availability of \$100 million to fiscal year 1982.

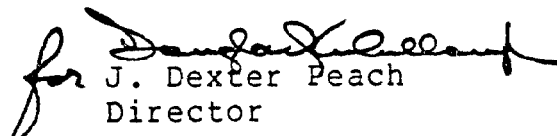
On June 23, 1981, representatives from the United States, Japan, and West Germany announced that they had agreed to terminate immediately funding for the SRC-II project. They cited rising cost estimates, schedule slippages, and the Reagan administration's shifting of responsibility for commercial synthetic fuels development from DOE to the SFC. A DOE official stated that the decision will likely result in all SRC-II related activity being concluded in 90 days. The private sponsor for SRC-II stated that it will not pursue the project.

Our review covered the period March 23, 1981, to June 12, 1981. To gather background data and information on DOE's management of the demonstration projects, we reviewed DOE planning documents and relevant contracts and agreements between DOE and industry and foreign country participants. We also reviewed DOE orders that outline procedures and responsibilities for planning, staffing, reviewing, reporting, and making decisions. We met with DOE program management officials in Germantown, Maryland, and the project management officials who are based in Oak Ridge, Tennessee.

To gather information about how the SFC might manage the demonstration projects, we reviewed the Energy Security Act which created the SFC. We met with the former Acting Chairman, a nominated member of the Board of Directors, and several other SFC officials; we reviewed 63 proposals for financial assistance that were submitted to the SFC by March 31, 1981; and we reviewed the SFC's proposed project selection guidelines. Since a chairman has only recently been confirmed by the Senate and the Board of Directors, although nominated, has not been confirmed, the discussion of SFC project management philosophy contained in the report, within the general guidelines of the Energy Security Act, is tentative.

In order to meet the request's time frame, we did not obtain agency comments. Further, as arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of its issuance. At that time, we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,


for J. Dexter Peach
Director

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ABBREVIATIONS

Btu	British thermal unit
DOE	Department of Energy
DPA	Defense Production Act
ERDA	Energy Research and Development Administration
ICRC	International Coal Refining Company
SFC	Synthetic Fuels Corporation
SRC	Solvent Refined Coal
TPD	tons per day



CHAPTER 1BACKGROUND OF SOLVENT REFINED COAL TECHNOLOGY

The Solvent Refined Coal (SRC) direct liquefaction process has two variations; one, referred to as SRC-I, produces primarily a solid product, and the other, referred to as SRC-II, produces primarily a liquid fuel.

In the SRC-I process, pulverized coal is mixed with a process-derived solvent to form a slurry. Hydrogen is then added to the slurry and submitted to high temperature (800 to 840 degrees Fahrenheit) and pressure (between 1,500 to 2,000 pounds per square inch). Undissolved solids and the coal solution in the slurry are then separated in a solid-liquid separation unit. The solids are sent to a gasifier to produce hydrogen for use in the process. Process solvent is recovered by distillation and recycled to slurry the coal feed. What remains is a product that becomes a solid at room temperature. Part of this product is then further reacted with hydrogen in the presence of a catalyst to produce various liquid products.

In SRC-II, a variation of the SRC-I process, the process solvent, which is recycled earlier in the process, contains ash which has a catalytic effect on the reaction. This increased ash concentration increases the severity of the reaction, producing only liquid boiler fuel.

The SRC process has been under development since 1962. Two small pilot plants have been in operation since 1974--a 6 ton per day (TPD) SRC-I unit in Wilsonville, Alabama, and a 50-TPD unit in Ft. Lewis, Washington, which can operate in both the SRC-I and the SRC-II modes.

The Pittsburg and Midway Coal Mining Company (Pittsburg and Midway), a subsidiary of Gulf Oil Corporation, was awarded a contract in 1966 by the Department of the Interior's Office of Coal Research ^{1/} to design, construct, and operate the Ft. Lewis pilot plant. Construction of the plant did not begin until 1972 because of Federal budget limitations, and operations began in 1974. The project has been entirely funded by the Government.

Construction of the Wilsonville plant began in 1972 as a joint effort between Southern Company Services and the Edison Electric Institute. The plant became operational in January

^{1/}The Federal Government's fossil energy research, development, and demonstration program was transferred to the Energy Research and Development Administration (ERDA) on Jan. 19, 1975, and from there to DOE on Oct. 1, 1977.

1974, and the Government became a cosponsor in 1976, contributing about 65 percent to the operating cost of the project.

The Department of Energy (DOE) had planned to continue to use these pilot plants for testing and environmental and health studies in conjunction with the demonstration plants now being designed.

This design work was initially funded by contracts awarded by DOE in July 1978 to develop preliminary designs for demonstration plants of both the solid and liquid variations of the SRC process. Both the SRC-I and SRC-II demonstration plants would be full-scale modules for commercial plants and would convert about 6,000 TPD of coal into an equivalent of about 20,000 barrels per day of crude oil.

In October 1979, DOE announced that a demonstration plant for each process would be constructed, with the International Coal Refining Company (ICRC), the prime contractor for the SRC-I demonstration plant at Newman, Kentucky, and Pittsburg and Midway, the prime contractor ¹/ for the SRC-II demonstration plant at Morgantown, West Virginia. Construction of both plants had been scheduled to begin in mid-1981 with operations to begin in late 1984.

The daily product yield for the 6,000 TPD SRC-I plant is estimated to be 3,400 barrels of raw naphtha, 5,675 barrels of fuel oil, and 1,077 tons of solid fuel. Since the SRC-I process is designed to remove most of the ash and sulfur in coal, the solid material produced is a clean-burning fuel which can be burned without scrubbers under current environmental regulations and can replace coal in coal-fired boilers.

The product output for the 6,000 TPD SRC-II plant is estimated to be 2,300 barrels of liquefied petroleum gas, 2,700 barrels of naphtha, 11,500 barrels of fuel oil, 1,600 barrels of butane, and 47 million standard cubic feet of methane. SRC-II's main product is fuel oil which can replace petroleum-based fuel oil used in industrial and utility boilers.

Official DOE cost estimates for SRC-I and SRC-II, based on conceptual designs submitted in late 1979, are \$1.488

¹/This contract was later assigned to Solvent Refined Coal International, a joint venture between Pittsburg and Midway; Ruhrkohle, a West German company; and Mitsui, a Japanese company. For purposes of this report, Pittsburg and Midway will be used when referring to the SRC-II prime contractor, since they have been the focal point for the joint venture.

billion and \$1.439 billion, respectively. Revised cost estimates provided by the SRC-I prime contractor in April 1981 and the SRC-II prime contractor in February 1981 are \$1.691 billion and \$1.550 billion, respectively. The latest estimates, which are based on more detailed designs, have still not been approved by DOE. Although both construction and operating cost estimates increased dramatically for both projects, the estimated revenues from the projects derived from product sales also increased by a significant amount; thus, the net increases for the projects were more reasonable--\$103 million for SRC-I and \$111 million for SRC-II.

For the SRC-I plant, the State of Kentucky agreed to contribute \$30 million, ICRC \$90 million 1/, and DOE the remainder of the total cost including all cost overruns. The SRC-II plant cost-sharing arrangement is more complex. Two other governments, the Federal Republic of Germany and Japan, signed agreements with DOE in July 1980 to contribute 25 percent each (about \$350 million each) of the \$1.4 billion estimate. Pittsburg and Midway agreed to contribute up to \$100 million 2/, and DOE was to make up the remaining amount of the \$1.4 billion estimate. Responsibility for cost overruns for the SRC-II would ultimately be with DOE, although Japan and West Germany may also contribute. In any event, whichever country or countries provide additional funding will be reimbursed to the extent of their contribution out of any project revenues or receipts, prior to the distribution of such revenues or receipts.

As stated earlier, construction for both plants was scheduled to begin in mid-1981. However, the budget proposal announced by the current administration in March 1981 rescinded all construction funds for the projects. It is the administration's position that commercial and near-commercial (i.e., demonstration plants) development should be performed by industry. It further contends that, if industry sponsors of the demonstration projects still intend to construct the

1/ICRC will also forego management fees deemed to be \$28 million.

2/This amount includes up to \$50 million for performance-based contributions. The contract between DOE and Pittsburg and Midway states that, if mutually agreed plant modifications to improve operability or reliability are made that increase the project cost, Pittsburg and Midway will fund 50 percent of the first \$100 million in changes. Pittsburg and Midway could also use the performance-based contributions to fund one-half of the cost increase for the plant design or for a procurement procedure which it judges to be necessary, but which DOE had opposed in order to reduce costs. In addition to direct contributions, Pittsburg and Midway will forego management fees deemed to be \$30 million.

plants and seek Government financial assistance, they should apply to the Synthetic Fuels Corporation (SFC) for such assistance.

On June 5, 1981, the Congress enacted the Supplemental Appropriations and Rescission Act, 1981 (P.L. 97-12) which revised previously appropriated no year funds for the SRC projects. For SRC-I, the Congress specified that \$22.5 million may be used in fiscal year 1981 and deferred availability of \$135 million to fiscal year 1982. For SRC-II, the Congress deferred availability of \$100 million to fiscal year 1982.

On June 23, 1981, representatives from the United States, Japan, and West Germany announced that they had agreed to terminate immediately funding for the SRC-II project. They cited rising cost estimates, schedule slippages, and the Reagan administration's shifting of responsibility for commercial synthetic fuels development from DOE to the SFC. A DOE official stated that the decision will likely result in all SRC-II related activity being concluded in 90 days. The private sponsor for SRC-II stated that it will not pursue the project.

The SFC was established by the Energy Security Act (P.L. 96-294), enacted on June 30, 1980. The mission of the SFC is to foster commercial production of synthetic fuels by providing financial assistance to the private sector. By April 1, 1981, the SFC had received 63 applications for financial assistance from sponsors proposing synthetic fuels facilities. The sponsors of the SRC projects were not among the applicants.

Chapter 2 of this report will discuss the present DOE management organization, process, and decisionmaking for the SRC projects. Chapter 3 will discuss how the SFC intends to oversee the projects for which it provides financial assistance, including projects which would be similar to the SRC projects. The final chapter compares the two management techniques.

CHAPTER 2DOE MANAGEMENT OF THE SRC PROJECTS

Both SRC demonstration projects are cost sharing arrangements involving DOE and private industry. Contractual agreements, signed in July and August 1980, establish each partner's contributions and responsibilities. For both projects, the private partner has agreed to design, construct, and operate the demonstration plant. Because of the financial contributions, DOE has retained overall responsibility for the technical direction and management of both demonstration projects.

Both SRC contracts contain a statement of work. The SRC-II contract includes a work breakdown structure for project design, while the SRC-I contract requires ICRC to prepare the work breakdown structure as part of its project management plan. The contracts require the private partner for each project to develop cost, schedule, and technical performance baselines. (DOE and the contractors subsequently agreed that the contractors would submit the baselines on July 1, 1981, when construction was scheduled to begin for both projects. However, because of project delays and the uncertainties of continued DOE financial support, the contractors have requested extensions.) Once these baselines are approved by DOE, they can not be changed without the mutual agreement of DOE and the contractors.

DOE MANAGEMENT STRUCTURE

DOE management and control of SRC contractor performance follows DOE orders that establish policy, general procedures, and responsibilities for projects costing more than \$50 million. Figure 1 shows the DOE organizational chart for the SRC-II project. DOE's management structure is the same for SRC-I, except it does not have the steering committee and the joint project management team. The steering committee is comprised of DOE's Assistant Secretary for Fossil Energy and director of the office of coal processing and two comparable members each from Japan and West Germany; the joint project management team is comprised of the SRC-II program manager and deputy program manager and one member representing each of the other governments.

The Secretary of Energy has delegated the principal responsibility for project management activities to the Under Secretary. Based on project reviews, the Under Secretary authorizes the start-up of long-lead procurement, plant construction, and plant operations.

The Assistant Secretary for Fossil Energy, whose budget provides the project funding, is responsible for the management and control of the SRC projects. He must approve any major changes to the pre-established cost, schedule, and technical

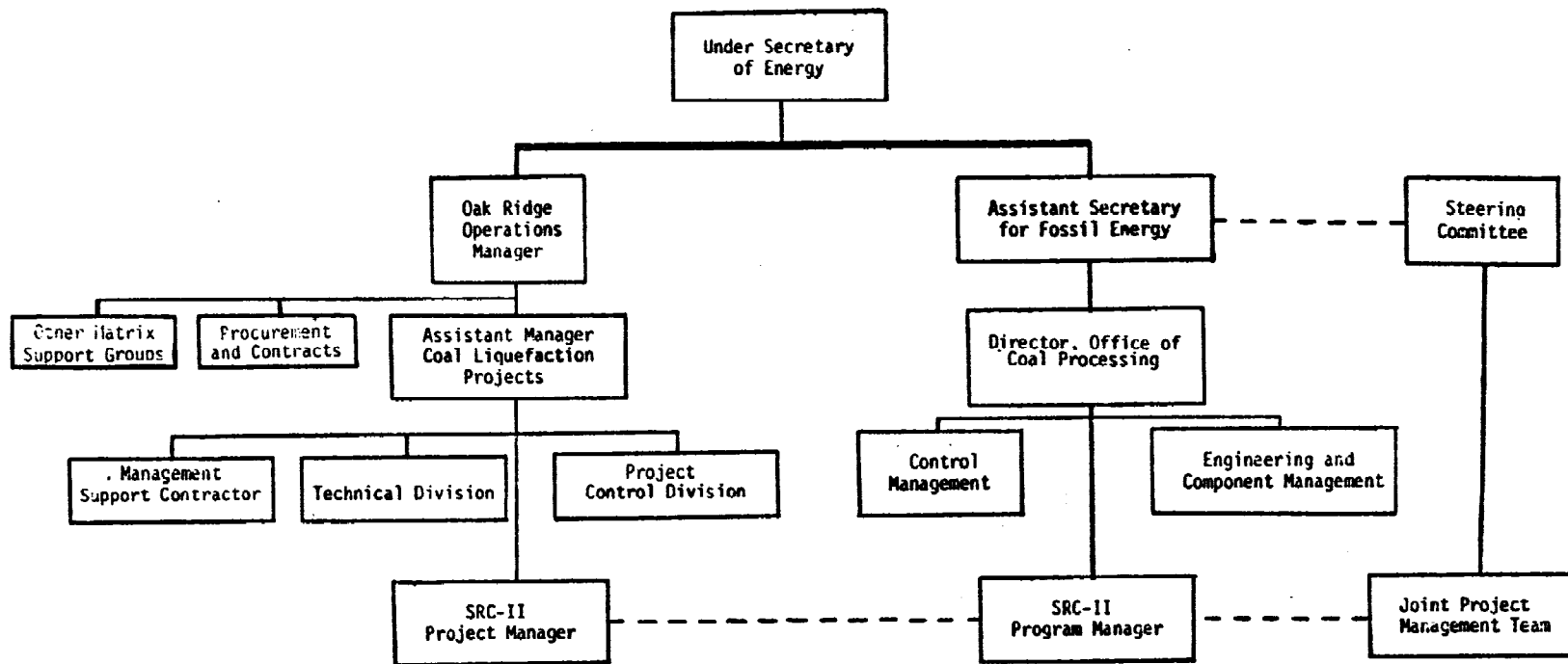


Figure 1: DOE Organizational Chart for the SRC-II Project

performance milestones. (For SRC-II, the Assistant Secretary chairs the steering committee, which must authorize project milestone changes.) The Assistant Secretary has delegated responsibility for directing and monitoring the projects, within threshold limits, to the program management office within Fossil Energy and the project management office at the Oak Ridge field office.

Originally, one program manager supervised both SRC projects. He participated in contract negotiations for each project and in drawing up the agreements with Japan and West Germany for SRC-II. In September 1980, DOE decided to use separate program managers for each project, the original program manager retaining SRC-II with a new program manager for SRC-I.

The program manager is responsible for preparing the project charter, which delineates DOE management responsibilities between the Fossil Energy and Oak Ridge groups. The program manager also establishes program objectives, scope, major milestones, and funding levels; assures that all environmental regulatory requirements are met by the project's objectives; and supervises supporting research and development and end use product testing. For SRC-II, the program manager will negotiate product purchase agreements with utility companies. 1/ In addition, the SRC-II program manager chairs the joint project management team which meets weekly to review progress and evaluate any significant changes to the project milestones.

Routine oversight and direction to the private partner for each project is provided by the project management team. The project managers for SRC-I and SRC-II were selected by the Oak Ridge operations manager with Fossil Energy approval. Each manager has primary accountability for the execution of the project. He is responsible for preparing the project management plan and establishing the control program to track actual cost, schedule, and technical performance against the pre-established milestones.

In the DOE project management structure, the program office does not have direct supervision over the project office. (See figure 1.) This enhances the independence and responsibility of the project manager; however, it reduces the authority and control of the program manager. If the program manager and the project manager disagree on an issue, the problem may not be resolved until it reaches the Office of the Under Secretary of Energy. According to program management officials, this has not been a problem in the early stages of the SRC projects

1/The SRC-I contract provides that ICRC will undertake to sell the plant product.

because the project and program managers have encouraged cooperation and communication. However, there have been personnel changes, and, as the scale and activity of the projects increase after construction begins, DOE's management structure, in our opinion, could hinder communication between the program office and the project office, potentially reducing management effectiveness.

DOE STAFFING

DOE staffing for the SRC projects is currently at minimal levels because of the proposed budget rescissions for both projects. If the projects proceed, DOE officials estimate that the program and project management teams would have to double in size to handle the peak level work load.

At present, the SRC-I and SRC-II program offices have staffs of four and seven, respectively, consisting of engineers and business and management personnel. The program offices also receive matrix support, as necessary, primarily from within the Fossil Energy Group, the Office of General Counsel, the National Environmental Policy Act Affairs Division, the Office of Health and Environmental Research, and the Directorate of Procurement and Assistance Management. At peak level each SRC program office would have about 10 full-time professionals, including 6 engineers and 4 business and management personnel.

Table 1 shows DOE's current staffing levels and draft estimates of the peak level staffing needs for the SRC-II project management team. (A similar breakout would apply for SRC-I.) The peak level staffing projections were developed under the previous administration and would be subject to review by DOE if either project is continued. According to the estimates, current staffing levels of 49 persons, including technical and management support contractor personnel, would expand to 111 at the peak level. To develop these estimates, the SRC project managers informed each Oak Ridge division and matrix support group of the project workloads and requested estimates for the number of needed staff. The project managers, the Oak Ridge operations manager, and the program manager reviewed these estimates. DOE officials state that this "bottom up" approach was used for the SRC projects because they were the first cost-shared projects of this magnitude. According to the officials, twice as many DOE and contractor staff members would be needed to manage and control a typical DOE-funded project of this magnitude. The officials believe that the private partners can be relied on to contribute to project management and control because of their direct financial contributions to the projects and because of the potential commercialization of the technologies.

Table 1

Current Staffing Levels and Estimate Peak Level Staffing Needsfor the DOE SRC-II Project Management Team (note a)

DOE	<u>Current staffing levels (note b)</u>			<u>Peak level staffing needs</u>			
	<u>Total</u>	<u>Oak Ridge</u>	<u>Denver contractor facility</u>	<u>Total</u>	<u>Oak Ridge</u>	<u>Denver contractor facility</u>	<u>Morgantown construction site</u>
Office of Assistant Manager, ORO	1	1		1.5	1.5		
Office of SRC-II Project Manager	3.5	2	1.5	17			17
Project Control Division	2	2		11	9	2	
Technical Division	2	2		11	7	4	
Procurement and Contracts	3.5	3.5		6	1	1	4
Other Matrix Support (note c)	<u>3.75</u>	<u>3.75</u>		<u>3</u>	<u>3</u>		
Total DOE Staff	15.75	14.25	1.5	49.5	21.5	7	21
<u>Management Support Contractor</u>	10	5	5	38	11	7	20
<u>Technical Support Contractor</u>	<u>23</u>	<u>23</u>		<u>23</u>	<u>23</u>		
<u>Total DOE Project Management Team</u>	<u>48.75</u>	<u>42.25</u>	<u>6.5</u>	<u>110.5</u>	<u>55.5</u>	<u>14</u>	<u>41</u>

a/The same breakout would apply to SRC-I.

b/Process design engineering is currently being done at the Denver contractor facility. No work has begun at the construction site.

c/Includes legal, finance, planning and budget, safety, personnel, energy R&D, and Office of Performance Evaluation.

The SRC-I project manager's office has three engineers, including one based in Allentown, Pennsylvania, to provide on-site supervision for the ICRC engineering design work. The SRC-II project manager's office has four engineers, including two based in Denver, Colorado, where the Pittsburg and Midway engineering design work is being performed. At peak levels, each office is projected to need 17 staff members based at each construction site.

Each SRC project also has a contracting officer who is responsible for the general administration of the contract relating to business and finance. The contracting officer enforces the Federal procurement regulations and the terms of the contract. He is authorized to approve procurement up to certain thresholds.

For SRC-II, Pittsburg and Midway is authorized to spend up to \$100,000 for cost reimbursement contracts and \$500,000 for fixed price contracts without obtaining DOE approval. Once its contracts system has been approved by DOE, Pittsburg and Midway will be able to contract for \$2 million without DOE consent. For SRC-I, ICRC has standard procurement authority of \$10,000 for a cost reimbursement contract and \$25,000 for fixed price. The ICRC contract system was recently reviewed for DOE by the Department of Defense Contracts Administrative Services to determine whether ICRC's practices were in compliance with its own policies and procedures and with generally accepted procedures. This office approved ICRC's contracts system, and, pending DOE review, the ICRC contracting threshold is likely to be raised to \$100,000/\$500,000. If construction for SRC-I is approved, ICRC's contracting system would be reviewed again, and the threshold could be raised to \$2 million. This will allow ICRC to proceed without DOE consent for larger procurement orders. The Oak Ridge operations manager is authorized to approve subcontracts up to \$25 million for both projects. This authority has been delegated to the director of the procurement and contracts division at Oak Ridge.

Both project management teams can receive matrix support from other DOE, Oak Ridge groups. The technical division acts as a quality assurance representative for the project manager, and it oversees the performance of specific technical design evaluations. The technical division currently has one mechanical and one chemical design engineer assigned to each project. At peak level staffing, there would be 11 engineers per project. The project control division assists the project manager by overseeing specific cost and schedule evaluations. At present, there are two engineers per project. At peak level there will be 11 project control, cost, and general engineers. The SRC project managers can also draw on expertise from legal, planning and budget, and other offices.

In addition to internal support groups, the SRC project management teams are using two contractors for management and technical expertise. To obtain management support, the project teams are using an existing DOE contract for assistance in the total fossil energy area with Universal Oil Products/Systems Development Corporation. Work for the SRC projects is performed under a task order arrangement. DOE, Oak Ridge officials planned to replace this interim assistance by hiring a contractor to provide management support for each of the five coal liquefaction projects, including the two SRC plants, being managed by their office. In light of the proposed budget cuts in the fossil energy area, negotiations on this contract have been suspended. The interim management support contractor is providing 10 persons, 9 engineers and a clerical worker, for each SRC project. Five are based at the project design facility. At peak level, DOE estimates that 38 persons for each SRC project will be supplied by the management support contractor. They will mainly be engineers and other technical specialists, business and management personnel, and clerical support. Both the interim and the future management support contractors will analyze the prime contractor's monthly progress reports and conduct such technical, cost, and schedule evaluations as requested by the project manager. They will also assess proposed changes to the technical design of each project.

To obtain technical support on an as-needed basis, DOE, Oak Ridge has a long-term agreement with Union Carbide which operates the Oak Ridge National Laboratory. The national laboratory will provide research and development assistance, such as the design and testing of components and processes, that is not within the scope of the management support contract. In addition, national laboratory engineers may be asked to assess proposed changes to the technical design.

DOE project management officials justify the use of contractors on the grounds that the design, construction, and operation of the SRC demonstration plants are of short-term duration, so it would be unwise for DOE to hire permanent staff. A single contractor would be used to evaluate each of the five coal liquefaction projects to foster information sharing.

DOE MANAGEMENT FUNCTIONS

Monitoring

Uncertainty can be expected on cost and schedule estimates early in the design phase for a demonstration plant. As design moves from the conceptual phase to the process phase and then to the detailed engineering phase, the uncertainty is reduced. The prime contractors will be required to submit cost, schedule, and technical performance baselines before construction start-up is approved. However, because both projects plan to overlap detailed engineering design and construction phases, the

baselines will be submitted before detailed design engineering is complete.

The objective of DOE's cost and schedule control program is to measure work progress; to analyze cost and schedule variances and trends; and to relate cost, schedule, and technical accomplishments and problems to contractor forecasts. DOE officials state that DOE monitoring will consist of on-site supervision and the review of monthly status reports. As shown in table 1, at peak level more than 60 percent of the DOE project management and the management support contractor staffs will work on-site at the engineering design facility and the construction site.

The prime contractor submits to the project manager monthly status reports which review cost, schedule, and technical performance data. These reports will be evaluated, with the assistance of the management support contractor, to identify any problem areas and recommend corrective action to the project manager. DOE officials state that the project manager will use the support contractor only in an advisory capacity. The project manager will use the information from the reports and from on-site monitoring to develop monthly and quarterly status reports that are submitted to the program manager.

Approval of changes

The contracts for both SRC projects provide that DOE has overall responsibility for the technical direction and management of the projects. If there are significant changes in the project, either in the technical design or in costs or schedules, the changes must be approved by DOE. The project manager is authorized to approve and implement changes that are within control thresholds and his delegated authorities. Changes that exceed these thresholds must be approved by the Assistant Secretary for Fossil Energy for SRC-I or the steering committee for SRC-II. 1/

The international agreements for SRC-II define significant changes to the project baseline that must be approved by the steering committee

--cost changes above .10 percent to any single line item of the cost breakdown;

--schedule changes that affect the mechanical completion (completion of construction) by over 6 months during

1/If the steering committee rejects a design change or a cost increase for SRC-II, DOE could act unilaterally to provide funding. DOE would be reimbursed from project net revenues.

the design phase, over 3 months during construction, or over 3 months during the initial operation period;

--any changes in the principal liquid product of more than 25 percent; and

--changes in the prime contractor's organization.

Changes in the baseline for SRC-I that must be approved by the Assistant Secretary for Fossil Energy will be contained in the final project charter that is being developed by the SRC-I program manager.

Because work for both SRC projects is currently in the process design phase, the main changes that have been reviewed by the DOE project manager involve technical design and performance. Once construction begins, the cost and schedule milestones become more critical.

An example of a decision made by a project manager involved the number of fire heaters for the SRC-I plant. DOE engineers had conducted a cost-benefit analysis that favored two heaters. However, ICRC concluded that six heaters should be used to allow for redundancy so that the possibility of down-time during plant operation would be reduced. As a result, DOE instructed ICRC to submit a process design package that reflected the change. The project manager set up an eight-man technical team to evaluate the design change. The team consisted of two Oak Ridge technical division personnel, two program office personnel, three management support contractor personnel, and one technical support contractor engineer. The review took about 4 days, and the team supported using six fire heaters. The project manager gave approval to the design change. The program manager was aware of the decision, but did not directly participate in it.

A second example of a design change authorized by a project manager involved a proposal by Pittsburg and Midway to rearrange the SRC-II on-site 30-day coal supply so that it could be enclosed at a later date if necessary. Pittsburg and Midway was concerned that a heavy rain would leach minerals from the exposed coal and the runoff would exceed standards set by the Environmental Protection Agency. Five project management personnel reviewed the proposal, including the project manager, a contracting officer, and three technical division engineers. They raised the issue of potential safety and fire hazards resulting from coal dust collection in an enclosed area and proposed the use of a series of collection ponds. The decision was deferred so that Pittsburg and Midway could address the safety issue. Pittsburg and Midway's response pointed out that the potential hazards have been resolved satisfactorily in other covered coal storage facilities and discussed how it

could do the same. The project manager's office agreed with the logic of the contractor and concurred with its proposal.

For issues that involve changes that exceed the baseline thresholds, the project management team will make assessments and recommend a course of action to the program manager. For SRC-I, the program manager will review the issue and the project manager's recommendations and communicate this position to the director of the office of coal processing. Based on the advice of the program and project management team, the Assistant Secretary for Fossil Energy makes the final decision. For SRC-II, the program manager and the joint project management team review the project manager's position and make recommendations to the steering committee.

An example of a decision to be made by the SRC-II steering committee involved a proposal in November 1980 by a Pittsburgh and Midway subcontractor to delete the syngas purification unit from the plant design. Because of plant design changes, the \$4 million unit was no longer considered necessary. Pittsburgh and Midway concurred and forwarded the proposal to the project manager's office in March 1981. The engineering staff reviewed the proposal and agreed that the unit was not needed. Because the deletion constituted a significant change, the proposal was forwarded to the program manager. The steering committee would have been asked to make the final decision at its next meeting. However, no meeting occurred prior to the governmental agreement to terminate SRC-II funding.

ENVIRONMENTAL AND SOCIOECONOMIC IMPACTS

In January 1981, DOE issued a final environmental impact statement (EIS) for SRC-II and a draft EIS for SRC-I. A DOE official stated that the final EIS for SRC-I will be issued later this summer and, based on comments on the draft, will contain minimal changes. These documents discuss DOE's planned program for environmental monitoring and environmental and socioeconomic mitigation.

Both the EIS for SRC-II and the draft EIS for SRC-I state that an extensive environmental monitoring program will take place during construction and operation of the proposed demonstration plants. A substantial portion of the monitoring program is designed, as it would be for any large energy demonstration facility, to demonstrate that the plants can be constructed and operated in compliance with existing environmental requirements. These requirements for construction and operation include consideration of occupational safety and health, air quality, water quality, solid waste disposal, spill prevention and cleanup, noise, endangered species, proper management of floodplains and wetlands, and

preservation of national historic landmarks. A portion of the monitoring program will focus on early detection of pollutants or contaminants in ambient and work place environments so that adverse effects can be avoided or mitigated. The remainder of the monitoring program will be used to acquire an understanding of environmental and health effects caused by the presence or release of chemical substances from SRC technology for which no legislated standards exist. Obtaining these data is one of the fundamental purposes of the demonstration projects.

To mitigate the impact on the environment, the EIS's state that a number of systems will be incorporated into each plant design.

- A wastewater treatment system will collect and treat all process wastewater and all runoff from all product storage and shipping areas.
- All wastewater handling areas will be lined to minimize direct infiltration of wastewater.
- Coal storage areas will have compacted clay liners with close supervision of foundation preparation being carried out to ensure that the proposed liner is adequate.
- All air emissions from sources that have significant concentrations of heavy organic compounds will be vented through a controlled combustion device.
- Fugitive hydrocarbon releases will be minimized through the use of a direct maintenance program (e.g., vapor recovery on liquid storage tanks, high integrity seals and packings, and enclosures around processing equipment).

In regard to socioeconomic impact, the EIS for SRC-II estimates a population increase of between 2,400 and 3,100 people, including dependents, may occur during the construction phase and direct employment of 460 people during the operation phase, with an additional 465 people indirectly employed. It states that DOE plans to work with the Department of Housing and Urban Development and State and local planning agencies to identify means to mitigate housing, sewer, and water shortages. Also, the Energy Impacted Area Development Assistance Program, administered by the Department of Agriculture's Farmer's Home Administration, has allocated \$3.5 million for mitigating the effects to the surrounding area of the SRC-II project.

The draft EIS for SRC-I states that the socioeconomic impacts of the proposed facility will not exceed the capacity of the local infrastructure. Although a population

increase of about 1,600 people, including dependents and secondary employment, will result, the area appears to have adequate housing and public services to accommodate the population increase.

CHAPTER 3THE SYNTHETIC FUELS CORPORATION

On June 30, 1980, the Congress enacted the Energy Security Act, which authorizes the creation of the SFC. The purpose of the act is to reduce the threat of economic disruption from oil supply interruptions, increase the Nation's security by reducing its dependence upon imported oil, and improve the Nation's balance of payments. The SFC's mission is to foster the commercial production of synthetic fuels by providing financial assistance to the private sector. To do this, the SFC is expected by the Congress to function much like a private bank.

The act establishes overall national synthetic fuel production capability goals for SFC-financed projects of at least 500,000 barrels per day of oil equivalent by 1987 and at least 2,000,000 barrels per day by 1992. The Congress has appropriated \$17.2 billion which can be obligated for commercial synthetic fuels projects. Of these funds, \$6 billion is currently available to the SFC and an additional \$6.212 billion will become available after June 30, 1982. The remaining \$5 billion was appropriated to DOE under the Nonnuclear Energy Research and Development Act (Nonnuclear Act) and the Defense Production Act (DPA) to finance alternative fuels projects. (DOE is currently negotiating agreements to finance three synthetic fuels projects.) ^{1/} All unobligated DOE funds, and any of the three projects which DOE agrees to finance and which the SFC Board of Directors approves, will be transferred to the SFC once the Corporation is declared operational by the President.

In December 1980, the SFC published in the Federal Register a solicitation of proposals for synthetic fuel projects. The closing date for applications was March 31, 1981, and the SFC received 63 proposals, plus three status reports from sponsors who may apply for financial assistance later. The proposals requested financial assistance for coal gasification, coal liquefaction, oil shale, tar sands, heavy oil, and hydrogen from water projects. Almost all of the sponsors requested price guarantees, purchase agreements, and/or loan guarantees. No sponsor requested a direct loan, and only two proposed joint venture projects.

^{1/}These projects include the Great Plains high-Btu (British thermal unit) coal gasification project to be financed under authority of the Nonnuclear Act and the Colony and Union Parachute Creek oil shale projects to be financed under authority of the DPA.

Of the five demonstration projects that are being rescinded by DOE, only one, the City of Memphis Light, Gas and Water Division, applied. Memphis requested a loan guarantee for a commercial-scale project which would produce medium-Btu industrial gas. Sponsors of the H-Coal direct coal liquefaction pilot plant, that has been funded by DOE, applied for a loan guarantee to construct a commercial facility.

The 63 proposals are currently being reviewed by the SFC staff. Sponsors of those projects considered to be mature and having a reasonable prospect of receiving financial assistance will then be asked to submit more detailed proposals. A SFC project team consisting of about five engineering and financial professionals will then be formed to conduct an indepth review. For those determined by the team to be satisfactory, a recommendation to the Board of Directors would be made that a financial assistance package be negotiated.

Currently, the SFC does not have a Board of Directors. In September 1980, President Carter nominated a chairman and six members for the SFC Board of Directors and gave them interim appointments when it became evident that the Congress would not act on the nominations. Shortly after President Reagan assumed office, the appointed Board members resigned. President Reagan has announced new nominees for the chairman and for four members of the Board of Directors. Thus far, only the chairman has been confirmed by the Senate.

On April 9, 1981, the SFC staff released initial project selection guidelines for public comment. The guidelines review Energy Security Act requirements and identify broad issues that the SFC will evaluate in each project.

STATUTORY REQUIREMENTS FOR FINANCIAL ASSISTANCE

The Energy Security Act directs the SFC to submit to the Congress by June 30, 1984, a comprehensive strategy to achieve the production goals. Prior to congressional approval of the comprehensive strategy, the SFC is required to balance production with technical diversity in awarding financial assistance. For each domestic resource that offers significant potential for use as a synthetic fuel feedstock, the SFC is directed to encourage a technological diversity of processes, methods, and techniques. Based on comprehensive reports for each assisted project, the SFC is required to recommend the specific mix of technologies and resource types that it proposes to support after the Congress approves the comprehensive strategy. (The Energy Security Act establishes upper limits for congressional authorizations for the implementation of the comprehensive strategy at \$68 billion.)

In meeting the production and technological diversity goals, the SFC is directed to select for financial assistance those proposals which, in the judgment of the Board of Directors, are most advantageous. Preference must be given to the proposals which represent the least commitment of financial assistance by the Corporation and the lowest unit production cost within a given technological process, taking into account the amount and value of the anticipated synthetic fuel products.

The act establishes the following order of priority for financial commitments: (1) price guarantees, purchase agreements, or loan guarantees; (2) loans; and (3) joint ventures. All financial assistance contracts must state in dollars the maximum amount of SFC liability. 1/

Price guarantees and purchase agreement contracts provide a floor price for a project's synthetic fuel production. In each case the price that is established must reflect projected prices of competing fuels and the requirements for economic and financial viability of the synthetic fuel project. In addition, a purchase agreement contract is required to provide for quality assurance and timely deliveries. If market prices for competing fuels are higher than the contract's floor price, then the SFC's obligation would not be executed under a price guarantee contract. The act requires the SFC to review any price guarantee or purchase agreement contract 10 years after production begins to determine the need for continued financial assistance.

The SFC can provide loan guarantees up to 75 percent of a project's initial total estimated cost. In the event of cost overruns, the SFC can guarantee at most 50 percent of the overruns, provided that the revised total estimated cost does not exceed 200 percent of the initial total estimated costs. The SFC can guarantee at most 40 percent for cost overruns between 200 and 250 percent. For revised estimated costs exceeding 250 percent of the initial total estimated cost, the SFC is required to transmit to the Congress a justification for additional loan guarantees. If the Congress does not disapprove, the SFC may award the guarantees. Stipulations for SFC loans are the same, except that any loan must be limited to at most 49 percent of the initial total estimated cost unless the SFC Board of Directors determines that the borrower has demonstrated that additional loans are necessary for the financial viability of the project.

1/For any project or sponsor, the SFC is prohibited from committing more than \$3 billion.

Under the Energy Security Act, the SFC's ability to enter into a joint venture agreement is limited. The joint venture can only be for a synthetic fuel project module that, in the judgment of the Board of Directors: (1) will demonstrate the commercial feasibility of a technology for the production of synthetic fuel from a significant domestic resource which offers potential for achievement of the national synthetic fuel production goal and (2) can, at the same site, be expanded into a synthetic fuel project. The act also stipulates that the SFC cannot finance more than 60 percent of the project module cost as estimated by the SFC as of the date of execution of the joint venture agreement. Cost overruns are to be paid by the private sponsors.

Congressional intent for establishing joint venture financing is given in the Joint Explanatory Statement of the Committee of the Conference for the Energy Security Act (House Report No. 96-1104, June 19, 1980):

"In order to assure the demonstration of the maximum number of potentially viable synthetic fuel technologies from the widest variety of domestically available feedstocks, it is important that the Corporation's incentives be as flexible as possible. The Conferees intend that the Corporation attempt to limit its financial participation in synthetic fuel projects to price guarantees, purchase agreements, loan guarantees, and loans, but recognize that these incentives may be insufficient to induce private sector participation in demonstrating all of the synthetic fuel technologies which must be demonstrated if the program goals are to be realized."

The Committee of the Conference also stipulates that the SFC can participate in a joint venture if it is "the only feasible means of attracting private sector participation on a scale necessary to 'prove' a given technology, utilizing a given feedstock."

SFC participation in a joint venture is restricted to limited partnership status. While the SFC can participate in the management decisions of the joint venture, the SFC can not have any direct role in the construction or operation of the project module. The private sponsors must have primary responsibility for the management of the joint venture.

In recent years, several major first-of-a-kind projects have experienced substantial cost and schedule overruns. These projects include the SASOL II coal liquefaction plant in the Republic of South Africa, the H-Coal pilot plant funded by DOE, military weapons systems, the space shuttle, and the trans-Alaskan oil pipeline. While the Energy Security Act provides the SFC with flexibility for funding a diversity of synthetic fuel projects, there are also several requirements that limit the SFC's financial exposure.

As previously mentioned, the act prescribes maximum limits for the purchase price under price guarantees and purchase agreements, for the amount of loan guarantees and loans, and for the extent of SFC participation in a joint venture. No more than \$3 billion can be devoted to one project, or to one corporation which may be sponsoring several projects. The SFC is required to impose such terms and conditions on any financial assistance as may be necessary to assure that the project's sponsors bear a substantial risk of after-tax loss in the event of any default or other cancellation of the project. In addition, the SFC may require such security and collateral as it deems appropriate for the repayment of any fixed or contingent obligations, and the SFC may prescribe record keeping methods and require such examinations, reports, and records as it deems appropriate.

SFC MANAGEMENT AND CONTROL

SFC officials state that SFC management and control will vary among projects mainly according to the type of financial assistance that is awarded. More stringent control is needed for loan guarantees during project construction than for price guarantees or purchase agreements. SFC loan guarantee funds are at risk during construction because the guaranteed loans are drawn down as construction milestones are met. For price guarantees and purchase agreements, the sponsors assume the technical and financial risks of getting the project built and operating.

SFC officials state that management and controls would be even more important for a joint venture, both because the SFC has direct equity participation and because of the technological and cost uncertainties involved in demonstrating new technologies. They would expect full access to technical and economic information so they could assess the viability of the technology. SFC officials state that the sponsor's project management team is a particularly important variable for controlling costs.

Under the requirements of the Energy Security Act, SFC management and control of a joint venture would be less stringent than DOE's for the SRC demonstration projects. The contracts for both SRC projects stipulate that "the performance of work under [the] Contract shall be subject to the technical direction and management of the DOE * * * Project Manager." The Energy Security Act states that while the SFC can participate in management decisions, it cannot deny project sponsors the primary responsibility for management of the joint venture. SFC project office personnel state that they would participate in any major decision that affected the terms of the contract, such as changes in the product slate or plant capacity, but would only have a monitoring role in the day-to-day technical direction or management of the project.

A main reason for the difference in management and control is the difference in financial participation. While the maximum SFC participation in a joint venture would be 60 percent of the original cost estimate and no cost overruns, DOE is contributing over 90 percent of the currently estimated costs and all of the cost overruns for SRC-I. DOE, Japan, and West Germany are sharing over 90 percent of the currently estimated costs and all of the cost overruns for SRC-II.

The SFC plans to use the project sponsors' management and control system to monitor construction. In contrast to the DOE organizational structure consisting of a management team in the field working with a program management team at headquarters, the SFC would have a fulltime manager--an engineer who has major project management experience in the private sector. The manager could have a small staff, depending on project needs, and would obtain additional matrix support on an as needed basis. The SFC would not use the equivalent of the DOE, Oak Ridge project management team.

SFC project office personnel anticipate that the SFC manager will track the project from the review of the detailed proposal through contract negotiations and project construction. Before a financial assistance contract is signed, the SFC may fund a separate assessment of the project costs by an independent architectural/engineering firm. The SFC manager will review the sponsor's regular construction status and expenditure reports and make periodic site visits. Actual progress will be compared to contractual milestones. For major milestones, the SFC would require certification by the architect and the construction manager that the segment of work had been completed.

SFC officials intend to employ three principles to better assure a project's success. First, the SFC plans to select "mature" projects, i.e., ones that are highly defined and ready for construction. The sponsors will be expected to have detailed engineering designs, including fabrication drawings. (Cost estimates based on detailed design are considered to be substantially more reliable than estimates based on conceptual or process designs.) Also, project sponsors will be expected to have addressed environmental, health, and safety issues, to be able to meet all regulatory guidelines and permitting requirements in a timely manner, and to have prepared plans for monitoring emissions and mitigating socioeconomic impacts.

Second, the SFC plans to maximize the equity participation of the project sponsors. This principle follows the requirements of the act that the SFC select projects that represent the least financial commitment for the SFC and that the sponsor bear substantial risk of after-tax loss if the project defaults. With large amounts of equity at risk, the sponsors presumably will be motivated to ensure that the

project is carefully managed with minimal waste. However, we note that other energy projects with heavy national interests (e.g., the trans-Alaskan pipeline) received substantial or total private financing, but still experienced management inadequacies and major cost overruns.

Third, the SFC plans to select projects that have capable management teams. Capability will be judged by the experience and quality of the sponsor, key individuals in the project management, principal contractors, and appropriate specialist groups. In addition, the SFC will review the management plan for the provisions made for cost, progress, and procurement monitoring and control during construction.

SFC officials state that, once the contract is signed, the SFC's principal means to enforce the terms of a loan guarantee, loan, or joint venture contract is through incremental financing or suspension of the guarantees. All SFC financial incentives will not become immediately available to the sponsor when the contract is signed. Rather, they will be allotted in increments. As certain milestones of the project construction are completed, progress and costs are reviewed and the next increment of SFC financial incentives would be released. If the SFC is not satisfied with cost and schedule information, or if other changes were made that the SFC disapproved, then funds would be withheld. ^{1/} SFC officials also plan to ensure that sponsors, especially equity partners in a joint venture, contribute substantial amounts of their financial incentives each time an increment is made by the SFC.

The SFC is likely to negotiate a back out clause into all contracts so that, as the work progressed, the SFC could withdraw from the project if costs or schedule delays escalate too rapidly or because of a lack performance by the sponsor. For loan guarantees, loans, and joint ventures, the main purpose of the back out clause would be to minimize SFC financial exposure. For price guarantees and purchase agreements, the purpose would be to enable SFC to re-designate the funds to assist a more viable project.

ENVIRONMENTAL AND SOCIOECONOMIC ISSUES

The Energy Security Act requires SFC to review environmental and health issues. The SFC is directed to give priority to a project located in any State which indicates an intention to expedite all regulatory, licensing, and related government agency activities related to such project. The act requires the

^{1/}Incremental financing is not used by DOE for the SRC projects. DOE simply reimburses the private partners as they submit their expenses.

financial assistance contract to contain a plan developed by the sponsors for monitoring the environmental and health related emissions from the construction and operation of the project. The sponsor must consult with the Administrator of the Environmental Protection Agency, the Secretary of Energy, and appropriate State agencies. For joint ventures, the SFC is required to consult with the Governor of the State in which the project module would be built regarding how the project would be developed and the regulatory, licensing, and related governmental activities pertaining to the project. The States are given the opportunity by the act to provide written response to the SFC on all aspects of the development, licensing, and operation of a joint venture project.

In its initial project selection guidelines, the SFC states that it will consider the extent to which the proposed site will meet environmental regulations and the sponsor's plan to abate environmental and health related emissions from the construction and operation of the project. SFC officials consider these plans to be critical because of the potential delays that could arise in resolving environmental and health concerns.

The SFC plans to review proposed projects both for the adequacy of their water supply and their impact on water quality. According to the proposed guidelines, sponsors must demonstrate that the project has secured rights to the water supplies required for construction, operation, and any planned future scale-up of sufficient priority to avoid most "calls" on the water supply. These water rights must receive high enough priority to guarantee water in a drought year. In addition, sponsors must demonstrate that provision has been made to avoid or mitigate effects on surface and ground water quality and that potential conflicts with other local users have been considered.

The SFC expects project sponsors to submit a socioeconomic mitigation plan. According to the initial project selection guidelines, the SFC will consider the extent to which the sponsor identifies community and regional infrastructure and service needs and provides evidence that acceptable financial arrangements will be in place or available when needed. The SFC expects sponsors to consult with officials of the affected States and local communities.

SFC officials state that socioeconomic issues are important both for maintaining local good will and for minimizing worker turnover. Sponsors of two oil shale projects, who are currently negotiating contracts with DOE under DPA, have agreed to provide funds for the construction of schools in nearby communities. Sponsors could alternatively assist impacted regions by prepaying taxes and royalties or by providing financial or legal expertise for floating bond issues. SFC officials emphasize, however, that assistance to mitigate the

socioeconomic impact of a project is restricted to arrangements made by the sponsors and local and State officials. The SFC cannot use the financial assistance terms in the contract to channel money to local communities for socioeconomic impact assistance.

CHAPTER 4OBSERVATIONS

The financial arrangements between DOE and the private sponsors of the SRC demonstration projects are very different from those that the Energy Security Act permits the SFC to award. For example, ICRC's participation in SRC-I is limited to \$90 million and Pittsburg and Midway's in SRC-II is limited to \$100 million. These amounts are less than 10 percent of the cost estimates developed during conceptual design. DOE is ultimately responsible for cost overruns for the SRC projects. The Energy Security Act directs the SFC to impose such terms and conditions on any financial assistance as may be necessary to assure that the project's sponsors bear a substantial risk of after-tax loss in the event of any default or other cancellation. The act also prescribes maximum limits for financial assistance. For joint ventures, which would be the type of financial arrangement demonstration project sponsors would apply for, SFC can finance at most 60 percent of the demonstration module cost as estimated by the SFC as of the date of execution of the joint venture agreement.

As a result of these differences in the financial arrangements, DOE management and control of the demonstration projects differs substantially from that contemplated by SFC officials for joint venture demonstration modules, or for commercial projects which require even less SFC financial commitment. DOE has ultimate responsibility for the management and technical direction for both SRC projects. The SFC's role in a joint venture is restricted to that of a limited partner. While the SFC can participate in the management decisions of the joint venture, the SFC can not have any direct role in the construction or operation of the project module. The private sponsors must have primary responsibility for the management of the joint venture.

At peak level of the SRC projects' design and construction activities, DOE plans to use 111 staff members ^{1/} for each project management team and 10 for each program management team to monitor, analyze, and direct the cost, schedule, and technical performance of the project. About 60 percent of the project management team would work at the construction site or at the sponsor's technical design facility. In contrast, SFC officials plan to rely heavily on the sponsors' management and control system. They state that a manager would be assigned to each SFC-financed project to review and analyze the monthly cost, schedule, and technical performance reports and to make site visits when necessary. The SFC manager may be the only full-time

^{1/}These include 38 management support contractor personnel and 23 technical support contractor personnel. (See p. 9.)

SFC employee devoted to the project, although he could have a small staff, depending on project needs. The manager would obtain matrix support from other SFC groups on an as-needed basis. The SFC would not use the equivalent of the DOE, Oak Ridge project management team.

The role of DOE and the SFC regarding environmental and socioeconomic impact also varies. DOE is required to prepare an EIS which identifies the environmental and socioeconomic impacts and the measures to mitigate them. In the SRC-II final EIS and the SRC-I draft EIS (the final EIS is due later this summer), DOE has proposed to implement a comprehensive program to monitor emission levels and mitigate their environmental impact. Neither SRC project is expected to have a major socioeconomic impact, assuming that the proposed mitigation measures are implemented. The Energy Security Act requires the SFC to ensure that a number of environmental, water supply, and socioeconomic issues are addressed. However, the SFC is not required to prepare an EIS. A plan for monitoring the environmental and health related emissions from the construction and operation of the project is to be developed by the private sponsors with SFC approval. Thus, the private sponsors have the lead responsibility for the development and implementation of the program to monitor and mitigate plant emissions.

While there are definite advantages to the Government of having the private sponsors bear a large portion of the risks of cost overruns and/or technical failure, there is no guarantee that greater sponsor participation in project financing will prevent major cost overruns, inefficiencies and failures. Some previous energy projects with heavy national interest (e.g., the trans-Alaskan pipeline) experienced management inadequacies and major cost overruns, even with substantial or total private financing.

By reducing the number of Federal employees involved in a project, private sponsors' ability to implement decisions in a timely manner could be improved since less layers of review would be required at the Federal level. However, there are risks as to whether certain project-related areas such as environmental monitoring would receive the degree of attention they deserve, since technical success and margin of profit are a private sponsor's primary motivations.

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United States Senate

COMMITTEE ON
 ENERGY AND NATURAL RESOURCES
 WASHINGTON, D.C. 20510

March 6, 1981

The Honorable Milton J. Socolar
 Acting Comptroller General
 of the United States
 U.S. General Accounting Office
 Washington D.C. 20548

Dear Mr. Socolar:

As you know, the administration's budget proposals on energy imply a reorientation of the Federal Government's role in energy policy and programs. For example, the Department of Energy (DOE) efforts to demonstrate synthetic fuels technologies would be curtailed and the Synthetic Fuels Corporation would have to decide whether or not to support these efforts.

Much interest and scrutiny has recently been centered on DOE's management of its coal liquefaction program which includes two Solvent Refined Coal demonstration projects (SRC-I and SRC-II). While it has been reported by the General Accounting Office (GAO) that DOE's management of the program can be improved, I am also concerned with the implications of a possible transfer of the SRC projects to the Synthetic Fuels Corporation. Therefore, I would like GAO to review the current DOE management structure, process, and decisionmaking for the SRC-I and SRC-II demonstration plants and the relevant Synthetic Fuels Corporation management structure and provide the Subcommittee a report commenting on the effect of a potential transfer of these projects to the Corporation.

In order to meet the Subcommittee's needs for information during the DOE authorization and appropriation process, I would like a briefing on your potential findings in late April and a written report before the end of July 1981. I understand that GAO is performing similar work for the House Subcommittee on Oversight and Investigations, Committee on Energy and Power. In order to facilitate your reporting, we have no objection to receiving a joint report to both Subcommittees.

Sincerely,


 Pete V. Domenici

Chairman, Subcommittee on
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