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REPORT TO THE CONGRESS

A Progress Report On United States—Soviet Union Cooperative Programs

Multiagency

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BY THE COMPTROLLER GENERAL OF THE UNITED STATES

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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

This is our report concerning the progress being made on United States-Soviet Union cooperative programs. It discusses agreements for cooperative efforts in the fields of environmental protection, space exploration, and science and technology.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of State and Interior; the Director, National Science Foundation; and the Administrators of the Environmental Protection Agency and National Aeronautics and Space Administration.

Elmer B. Staats

Comptroller General
of the United States

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ABBREVIATIONS

ASTP	Apollo and Soyuz Test Project
GAO	General Accounting Office
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

A PROGRESS REPORT ON UNITED STATES-SOVIET UNION COOPERATIVE PROGRAMS

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D I G E S T

WHY THE REVIEW WAS MADE

In the new era of United States-Soviet Union relations detente has become the byword to denote the easing of tensions and the spirit of cooperation and negotiation. The Moscow Summit Meeting in May 1972 laid the foundation for this new relationship and resulted in agreements for cooperative efforts in the fields of health, environmental protection, space exploration, and science and technology. These agreements provide for an opportunity for American and Soviet scientists and specialists to work cooperatively on problems and to promote technological and scientific progress for the benefit of both countries and all mankind.

In view of the extensive interest in the progress of detente, the General Accounting Office (GAO) made this review to appraise the implementation, management, progress, and potential benefits of cooperative programs for environmental protection, space exploration, and science and technology.

FINDINGS AND CONCLUSIONS

Previous United States-Soviet Union agreements covered a limited number of fields and principally involved exchanges and visits of scientists and specialists rather than a cooperative problem-solving approach. Under the Science and Technology Cooperative Agreement, both countries have emphasized their desire to realize tangible results promptly from the agreements. As of December 1973, nine project meetings had been held with at least five of these meetings concerning two projects. Under the agreement on cooperation in the Field of Environmental Protection, initial project plans had been finalized in nearly all areas. Activities under the science and technology and the environmental protection agreements have chiefly consisted of negotiating meetings for working out frameworks for cooperation. (See pp. 2, 8, 11, 13, and 14.)

These meetings have resulted in a number of umbrella, area, and working-group agreements directed toward topic definitization and project development. To date the exchange of information has been limited and of little technical benefit to the United States. They have established rapport and fostered public visibility, but the exchange of scientists and technicians envisioned in the agreements is just beginning to materialize. (See p. 42.)

Poor communications, differing priorities, misunderstandings, and security concerns delayed many projects during the first 18 months. These problems have plagued previous cooperative efforts and were anticipated; however, such matters as funding, language translating facilities, and travel costs of visiting scientists should have been resolved during this period but were not. In a positive sense the space project is demonstrating that these problems can be overcome. (See p. 42.)

If projects under the other agreements are to expand from the scientific and technical collaboration of the past to joint problem-solving for the future, both countries may have to make greater commitments. To attain the desired goals, the United States may be required to devote more resources, both personnel and financial, even though the exchange of know-how may favor the Soviet Union. Political considerations may justify this concession. (See pp. 42 and 43.)

Except for the multimillion dollar space project, no action has been taken to specifically identify funds for overall agreements, although the scope of the cooperative agreements is of considerable magnitude and may result in substantial outlays of resources. In this respect, GAO is concerned that the present diffused funding of the programs under these agreements makes congressional overview and control difficult and could result in significant commitments prior to congressional authorization of funds. (See p. 43.)

GAO is also concerned that the large number of projects now being considered under the science and technology and environmental protection agreements might be less conducive to effecting tangible results than would a smaller number of adequately funded projects. Although many topics should be considered in order to find specific projects of common interest for joint cooperation, the progress of the agreements would be facilitated by early selection and funding of substantive programs.

Even then, the progress of any cooperative effort will be limited if American scientists and technicians do not have the capabilities or facilities to readily translate materials and data received from the Soviet Union. (See p. 43.)

Programs evolving from the cooperative agreements are too new to produce significant scientific achievements or to predict potential benefits to either country or all mankind. For example, the Apollo and Soyuz Test Project (ASTP) will develop a universal docking system, which could assist in

the space craft of one nation rescuing the damaged craft of the other. However, such a system would be only the first step toward achieving not only an international rescue capability but the potential for joint space exploration. (See p. 43.)

Based on what is now known, the international rescue capability being developed under the current program will not be compatible with the next U.S. space venture, the Space Shuttle. As expressed by the President of the National Academy of Science, the ultimate goal of these agreements should be the normalization of scientific exchanges with Russian and American scientists free to move back and forth working in laboratories of their own choice without the need for formal mechanisms. (See p. 43.)

RECOMMENDATIONS

To facilitate the realization of meaningful results from the joint cooperative efforts, GAO recommends that the coordinators for the environmental protection and science and technology agreements (See app. X) formulate and execute improved plans which will:

--Identify topics for early development into specific cooperative programs. (See p. 44.)

--Assess the number of potential projects that can be efficiently managed. (See p. 44.)

--Insure that projects of priority interest are adequately supported and vigorously pursued by the responsible agencies or institutions. (See p. 44.)

--Emphasize the need to progress from merely exchanging visits to real cooperative efforts. (See p. 44.)

--Require participating agencies to identify all costs associated with the programs. (See p. 44.)

--Determine the long-range funding and personnel requirements of the agreements. (See p. 44.)

--Arrange the necessary Russian language training and translating facilities to meet the needs raised by the agreements. (See p. 44.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

Agencies having responsibility for implementing the cooperative agreements generally concurred with the reccomendations set forth in our report.

Participating government agencies stressed the accomplishments of negotiating meetings in working out a framework for cooperation with the Soviet Union. These agencies felt that the complexities of differing political systems, organizational approaches, and cultural outlooks created problems which restricted expeditious implementation.

All agencies believed that it

was desirable to limit the number of projects to only those which could be adequately funded. The agencies cited many instances to illustrate the close attention being given to keep the number of projects at a manageable level.

Agencies had differing views on the method for improving the funding for these agreements. Agencies having overall agreement responsibility believed that funding should be the responsibility of the project managers. On the other hand, project managers advocated a centralized funding approach because they found it difficult to secure funds from their normal sources.

The National Science Foundation (NSF) believed that adequate translation facilities existed but saw a need for implementing agencies to commit more funds for this purpose. On the other hand, the Environmental Protection Agency believed that the United States, in its dealings with other nations, generally appeared to be at a relative disadvantage in terms of scope, availability, and cost for translating services. (See p. 45)

MATTERS FOR CONSIDERATION BY THE CONGRESS

Recognizing the political aspects of the cooperative agreements with the Soviet Union and their potential significance in the new era of detente, GAO believes the Congress should consider monitoring and evaluating the Administration's actions in carrying out the resulting programs. To obtain the overall perspective of these agreements, the Congress should consider the desirability of an annual progress report on each agreement. (See p. 49.)

The reports could include, by project, the objectives and goals, participating agencies, progress to date, direct and indirect fiscal year cost, long-range funding projections, potential benefits and any other information the Congress might consider necessary to appraise the progress of the agreements. To be most beneficial, these reports should be scheduled for distribution prior to budgetary hearings. (See p. 49.)

The Congress should also consider the desirability of specifically funding the agreements. This would enhance overall cooperative efforts by providing the project coordinators with the financial means to attain project goals and objectives without having to rely primarily on those agency funds provided for other purposes as done in the past. (See p. 49.)

CHAPTER 1

INTRODUCTION

In the new era of United States-Soviet Union relations detente has become the byword to denote the easing of tensions and the spirit of cooperation and negotiation. The Moscow Summit Meeting in May 1972 laid the foundation for this new relationship between the two world powers and resulted in several agreements for mutually beneficial cooperation relating, not only to military and security areas of concern, but also in the advancement of scientific endeavors that would enhance all mankind.

In the words of President Nixon before a joint session of the Congress on June 1, 1972:

> "Recognizing the responsibility of the advanced industrial nations to set an example in combating mankind's common enemies, the United States and the Soviet Union have agreed to cooperate in efforts to reduce pollution and enhance environmental quality. We have agreed to work together in the field of medical science and public health, particularly in the conquest of cancer and heart disease.
>
> Recognizing that the quest for useful knowledge transcends differences between ideologies and social systems, we have agreed to expand United States-Soviet cooperation in many areas of science and technology.
>
> We have joined in plans for an exciting new adventure, a new adventure in the cooperative exploration of space, which will begin--subject to congressional approval of funding--with a joint orbital mission of an Apollo vehicle and a Soviet spacecraft in 1975.
>
> By forming habits of cooperation and strengthening institutional ties in areas of peaceful enterprise, these four agreements to which I have referred will create on both sides a steadily growing vested interest in the maintenance of good relations between our two countries."

Historically, American-Soviet relations in the field of science and technology were virtually nonexistent for many

years. A severe outbreak of poliomyelitis in the Soviet Union in 1956, however, prompted a Soviet delegation to visit America in early 1956. The first reciprocal exchange of medical scientists was completed when an American team of microbiologists and epidemiologists visited the Soviet Union in February 1956. This was the beginning of a limited but extremely important event in American-Soviet relations--the signing of the Bilateral Exchanges Agreement in 1958.

Under the Bilateral Exchanges Agreement and subsequent renewals, U.S. and Soviet Union scientists became acquainted through exchanges of people and information. The National Academy of Sciences served as the principal institution for furthering these scientific exchanges and individual scientists arranged to spend 1 or more months in a specified laboratory in the country which had agreed to receive them.

The Bilateral Exchanges Agreement included areas in science and technology, agriculture, public health and medical sciences, education, the performing arts, and cinematography. Most areas contained a restriction on the number and duration of the exchanges to take place while the agreement remained in force.

In 1970 and 1971, U.S. Government officials in various departments and agencies began to explore the possibility of changing the relationship between the two countries from an atmosphere of becoming acquainted to that of solving problems through joint projects. Intensive discussions and agency-to-agency agreements followed and were given new status during the May 1972 Summit Meeting when the four executive agreements providing for problem solving cooperation in science and technology, environmental protection, space exploration, and medical science and public health were signed. Since then, new cooperative agreements have also been signed in the fields of peaceful uses of atomic energy, agriculture, transportation, and world oceans.

Additional agreements were signed during the Moscow Summit meeting in 1974, including:

--An agreement on cooperation in the field of energy directed toward increasing the cooperation now existing between the two countries in energy research and development.

--An agreement on cooperation in housing and other construction.

Photo credit: Department of State

President Nixon and Premier Kosygin signing the Space Cooperation Agreement, May 24, 1972

--An agreement providing for research on heart disease and development of an effective artifical heart.

SCOPE OF REVIEW

We examined the basic government-to-government agreements and overall progress in implementing the cooperative programs provided for by the three Summit agreements concerning environmental protection, space exploration, and science and technology. Only limited attention was given to American-Soviet Union industrial activity under provisions of these agreements.

We reviewed documents including proposals for the cooperative programs and projects, minutes of meetings between U.S. and Soviet representatives, trip reports, Joint Committee reports, and various other memorandums and records. Interviews were conducted with officials of the National Science Foundation, Council on Environmental Quality, Water Resources Council, Tennessee Valley Authority, Federation of American Scientists, the Office of Science Advisor to the President1/, and 12 Government departments and agencies. In addition, inquiries were made of representatives of the Massachusetts Institute of Technology, Hampshire College, and Universities of Notre Dame, Wisconsin, Pennsylvania, and Chicago to solicit their views on the status of selected cooperative projects with the Soviet Union.

1/ The Office of Science Advisor to the President was abolished on June 30, 1973, and the Executive Secretariat for the U.S. side of the Joint Commission was established in the Department of State (Bureau of International Scientific and Technological Affairs) and reports directly to the President's Science Advisor, who is also the Director of the of the National Science Foundation.

CHAPTER 2

COOPERATION IN SCIENCE AND TECHNOLOGY

Recognizing that benefits can accrue to both countries from cooperation in the fields of science and technology, the United States and the Soviet Union signed a Scientific and Technical Cooperation Agreement on May 24, 1972, to establish closer and more regular cooperation between scientific and technical organizations to strengthen relations.

The agreement provides a broad basis for future cooperation in nonsensitive areas of common scientific or technological interest and invokes two new principles in the United States-Soviet Union scientific relationship.

First, it is directed toward combining the efforts of scientists and specialists to work on major problems whose solution will promote the progress of science and technology for the benefit of both countries and of mankind. Previous agreements covered fewer fields of research and principally involved exchanges and visits of scientists and engineers rather than a cooperative approach to problem solving.

Second, it declares that the two nations will seek to work together on the basis of mutual benefit, equality, and reciprocity in selected areas. A rigid demand for perfect reciprocity will not be required for each project, but an overall balance should be maintained.

Various forms of cooperation envisioned by the agreement include the following:

--exchanging scientists and specialists and scientific and technical information and documentation;

--developing and implementing programs and projects in the fields of basic and applied sciences;

--researching, developing and testing, and exchanging research results and experiences between scientific research institutions and organizations;

--organizing joint courses, conferences and symposiums; and

--rendering help in establishing contacts and arrangements between U.S. firms and Soviet enterprises when a mutual interest develops.

IMPLEMENTING AGREEMENT

To implement the cooperative program, the agreements established a United States-Soviet Union joint commission which is to meet at least once a year alternately in Washington and Moscow. The executive agents for the commission are the Department of State for the Unites States (see p. 4) and the State Committee of the Council of Ministers for Science and Technology for the Soviet Union.

The joint commission is to consider proposals for cooperation in specific areas; prepare suggestions and recommendations; develop and approve programs for implementation; designate organizations which will conduct the programs; and insure proper implementation. To carry out its functions the commission may create temporary or permanent joint subcommittees, councils, or working groups.

Program development

In preliminary discussions during July 1972, representatives of the United States and the Soviet Union agreed to six broad areas of common interest--energy research and development, application of computers in management, agricultural research, 1/ production of substances employing microbiological means, water resources, and research in the field of chemical catalysts. The representatives agreed to establish a working group for each area as soon as possible to develop specific proposals for cooperative programs and emphasized their desire to quickly realize results under the agreement.

Between July and October 1972 joint working groups were established and, through protocol (memorandum of understanding), identified projects to be submitted to the joint commission for approval.

For example, the joint working group on the application of computers in management held its initial meeting in Washington, D.C., from October 11 to 18, 1972, and issued its protocol on October 20, 1972. During this meeting the group, composed of four American and six Soviet members, exchanged information on the state and organization of

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1/ Agricultural research was subsequently removed from this agreement and absorbed into an overall agricultural agreement.

research and development in their fields of interest and expressed opinions about opportunities for scientific and technological cooperation. The Soviet members also visited several business and university facilities during the period, including the Courant Institute at New York University, The American Telephone and Telegraph Research Center, the Insurance Company of North America, and the Control Data Corporation service center.

As a result of the meeting, the joint working group selected the following topics for recommendation to the joint commission.

1. Theory of systems analysis applied to economics and management.

2. Computer applications and software for creating system solutions for large general-purpose problems in the field of management.

3. Development of forecasting models for analysis of various branches of the economy.

4. The use of computers for the management of large cities.

5. Theoretical foundation for the design, development, and production of software.

A preliminary work program was prepared for each topic which described the project, forms of cooperation, responsible coordinating organizations, possible participating institutions, and plans for further implementing actions.

Although protocol covering the broad areas of interest varied in detail, overall they identified 54 specific topics and defined the forms of cooperation to take place within each area.

Selecting priority projects

The initial meeting of the joint commission on Scientific and Technical Cooperation was held in Washington, D.C., from March 19 to 21, 1973, and was attended by 11 commission members, 7 American and 4 Soviet representatives. The chairmen of the 6 joint working groups from both countries also participated in the proceedings.

The commission reviewed the reports and recommendations of the joint working groups and selected 28 of the 54 proposed projects for priority implementation--9 energy research and development, 5 application of computers in management, 4 water resource, 5 chemical catalysis, and 5 production of substances employing microbiological means projects. (See app. I for a brief description of the approved projects.)

The importance of beginning projects promptly was stressed by the commission. Accordingly, both sides agreed that within one month the individual and/or organization responsible for coordinating each project would be designated. It was understood that these coordinators would contact their counterpart both by correspondence and in person to expedite the cooperation.

The commission also considered proposals for new areas of cooperation under the agreement and brief reports were made in six areas--forestry research and technology, oceanographic research, transportation, special topics in physics, electrometallurgy, and standards and standardization. The commission decided to establish joint working groups and/or groups of experts to proceed in these new areas.

The commission's second meeting was held in Moscow on November 28 and 29, 1973, when it approved 16 new priority topics in 4 new areas--4 projects in science policy, 3 in scientific and technical information, 5 in forestry research and technology, and 4 in electrometallurgy. The commission also noted reports submitted on the positive actions taken to prepare cooperative programs in two new areas, metrology and standardization, and special topics in physics.

Therefore, by the end of 1973, the commission had approved 44 projects in 9 areas. These projects will involve numerous U.S. Government departments and bureaus and will cover a wide range of scientific research. The projects were not precisely defined but were topics of common interest which had been proposed and examined by the joint working groups, and which the commission desired to be developed into joint research projects.

PROGRESS

Although most projects are not expected to attain any substantive results within the next year, progress has been achieved in some priority projects. In this regard, the Joint Commission, in its November 1973 meeting, noted that in

many fields the stage of defining work programs and determining specific organizations that would work together was then being concluded, allowing the next stage of actual implementation of concrete programs of joint work to begin.

Most projects experienced some delays and working groups have been unable to meet preliminary work schedules. In some areas, information exchanges, which were to begin in 1972, had not occurred. In others, the appointment of U.S. project chairmen had been delayed for several months. The progress made in each area is discussed below.

Water Resources Areas

On September 30, 1972, the first meeting of the joint United States-Soviet working group in the field of water resources was completed and produced a preliminary work schedule providing for the exchange of technical information to begin in 1972 on nine projects. (App. I provides details for those water resource projects which were approved by the Joint Commission). By October 1973, 13 months after the approval of the preliminary work schedule, no groups had exchanged information, no project meetings had been held, and the three chairmen GAO interviewed did not know whether American and Soviet water resource technology were compatible.

Although the United States had provided detailed technical information, information was not received from the Soviet Union until early 1974. One water resource project managed by the Bureau of Reclamation, the American lead agency for three such projects, illustrates the delays encountered in exchanging information in 1973: 1/

--May 21, Bureau sends Soviet counterpart a letter arranging for the exchange of information.

--August 21, U.S. Embassy receives Soviet response dated August 15.

--September 6, translated copy of Soviet reply is forwarded to the Department of Interior.

--September 30, Bureau receives translated Soviet reply.

1/ The team leader for this project has joined the Water Resource Council and primary responsibility has shifted to that body.

The Soviet Union wanted to send three delegations consisting of 22 people to the United States in late October at which time information on Soviet technology would be provided. Because sufficient time was no longer available to arrange for the Soviet visit due to restricting cold weather and because the Bureau believed that the information flow should precede the arrival of the Soviet delegations, the visit was postponed.

In commenting on our report, the National Science Foundation (NSF) noted that it took the Soviets three months to respond to the American letter. NSF indicated that this was not unusual. The Department of State added that arrangements for cooperation in the water resources area have been extremely slow in developing for a variety of reasons, including personnel changes at the Bureau of Reclamation, but are now beginning to proceed reasonably well in most projects.

Production of Substances by Microbiological Means Area

In October 1972, the United States-Soviet Union joint working group on cooperation in the production of substances by employing microbiological means met in Washington and approved five topics (see appendix I) to be submitted to the Joint Commission. The topics were considered a basis for developing work programs for scientific and technical cooperation. These topics were approved for research efforts by the Joint Commission in March 1973.

The second meeting of the working group was held in Moscow during June 1973, at which time discussions were held on the five approved topics and three additional topics were considered for cooperative efforts. Subsequently, the U.S. chairman, in his trip report, questioned the sincerity of the Soviets for full and open exchanges, and also the support of these programs by U.S. Government agencies. In questioning the Soviets' sincerity, the chairman noted that although the United States requested as one program a formalized information exchange including names and locations of institutes, workers, goals of work, the Soviets insisted such information was available and there was no need for a cooperative program of this nature. It was also noted that the Soviets were working on acoustically sensitive, matrix-entrapped enzymes systems, a new technique substituting medical X-rays; however, the Soviets showed no interest for exchange in this area.

As of October 1973, the United States had not appointed chairmen for the five projects, and work schedules had not

been developed or approved. In commenting on our report, the State Department said that project coordinators had been tentatively designated in November 1973 and have since been confirmed.

Energy Area

Energy research and development projects, which are of vital concern to the United States at this particular point in time, have made some progress. These projects involved such cooperative efforts as the design and operation of large-size thermal generating units at power stations; electric power system planning and dispatching; superconducting transmission technology; design and operation of heat rejection systems to include cooling water supply for large nuclear and thermal powerplants; design and operation of air pollution reduction and waste disposal systems for thermal powerplants; ultra-high-voltage transmission technology; general solar energy technology; and, general geothermal technology.

In October 1972, the first meeting of the United States-Soviet Union joint working group was held in Moscow. They approved a list of topics and subjects together with suggested work programs for presentation to the Joint Commission. (Appendix I details the work schedule for those energy projects subsequently approved by the Joint Commission). By December 31, 1972, working subgroups for each item were to be designated to arrange working group meetings and to develop detail plans for cooperation.

As of October 1973, two of the eight project working groups had held one or more meetings and the United States had received information from the Soviet Union on three projects. Four of eight U.S. project chairmen told GAO they were aware of Soviet technology in their respective fields.

An important project in the energy area involves joint efforts in the field of magnetohydrodynamics. This type of power generation process has important potential for better use of fossil fuel resources, especially coal (which is plentiful in the United States), with greatly increased thermal efficiency and reduced environmental pollution compared to current electric power technology. (A photograph of a Soviet magnetohydrodynamic generator is shown on p. 12.)

Reportedly this project has moved ahead in accordance with the proposed schedule, but substantive results are not expected in the near future as years of effort will be required to realize the ultimate goal of designing and

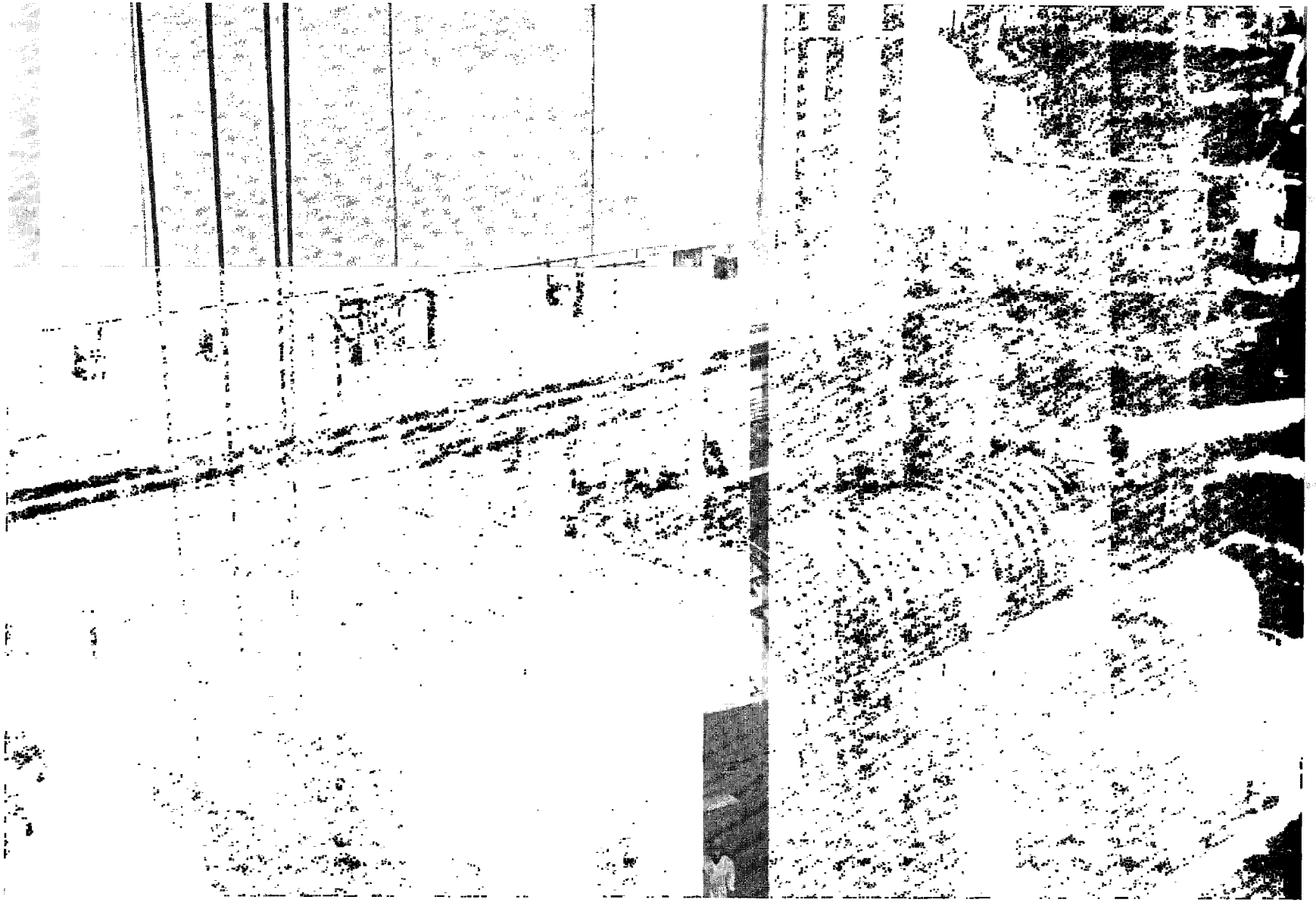


Photo credit: U.S. Department of Interior

Soviet 25-megawatt magnetohydrodynamics generator housed in the U-25 plant outside Moscow

constructing one or more commercial-scale magnetohydrodynamic powerplants in the two countries.

In commenting on our report, the Department of Interior noted some delays have occurred in this project due to instituting new contracting procedures in Interior and to the complex nature of the program which made it difficult to adhere to preliminary schedules such as those developed in July 1973. In any event, the program has moved forward to the awarding of a design contract in the amount of $171,000 for a channel to be tested in a Soviet generator.

The Department of Interior envisioned certain short-term benefits resulting from the project including the testing of American equipment in Soviet installations, obtaining information on Soviet pilot plant performance and engineering and design data from Soviet studies.

Application of computers to management area

The first meeting of the joint working group on scientific and technical cooperation in the field of application of computers to management was held in Washington, D.C., during October 1972. A list of topics and work programs was selected for presentation to the Joint Commission. Cooperative efforts for 1973 were to include project visits by American and Soviet specialists for familiarization with ongoing work and for preparation of proposals for long-term cooperative projects in early 1973, with follow-on project meetings to be held in October or November 1973.

The second meeting of the joint working group was held in Moscow during July 1973 and defined in greater detail the proposed projects set forth in the first meeting. During this second joint meeting, the working group agreed that further discussions would be necessary to complete a more precise definition of topics proposed for cooperation.

As of October 1973, the United States had not designated project chairmen for the computer projects. The Department of State subsequently informed GAO that, as of December 1973, project chairmen had been designated and three projects were underway.

The NSF advised that the pace in the computer area has been governed by the United States with a deliberate policy of keeping tight control to promote mutual benefit, equality, and reciprocity and to avoid a one-way transfer of computer technology to the Soviet Union.

Chemical catalysis area

The first meeting of the United States-Soviet Union joint working group in the field of chemical catalysis was concluded on September 1, 1972, in Washington, D.C. The working group approved a list of topics to be expanded in which cooperation would be mutually beneficial and useful. Some projects were to include exploratory and planning workshops which were to be held within 6 months.

The second meeting of the joint working group was held in Moscow during the period of September 28 to 29, 1972. The meeting was concluded with an agreement that within 2 to 8 months, project coordinators would formulate a preliminary plan for implementing the program and assign responsibilities to participating agencies. During this period the coordinators were to communicate with each other on a regular and direct basis.

As of October 1973, two of the four project managers had held meetings with their Soviet counterparts. Although the U.S. side had not received any written material from the Soviets, two of the project managers believed that they were knowledgeable of Soviet technology in their respective fields.

ACHIEVING MUTUAL BENEFITS

In June 1972 the National Academy of Science President stated before the House Subcommittee on International Cooperation in Science and Space, House Committee on Science and Astronautics, that there were major scientific areas in which current American efforts were more sophisticated and more advanced than those of their Soviet counterpart, not because of any innate superiority but because of the historical differences in the course of science in the two countries.

Soviet theory was praised by U.S. project coordinators; however, they observed that poor quality control and production standards created serious problems in applying Soviet theory. In summary, U.S. experts recognize that there are excellent individual Soviet laboratories but the quality of Soviet technology is less consistent than that in the United States.

To achieve mutual benefits, two actions are taking place: (1) Emphasis by the President's Science Advisor to project coordinators on seeking equal benefits from the cooperative exchanges, and (2) exchange of theory rather than

hardware and software on project areas where the United States is ahead of the Soviets, such as computer technology.

An overall appraisal of the tradeoffs cannot be projected at this time, because several of the project coordinators contacted did not know the state of Soviet technology in their area of interest. For those projects which were headed by coordinators who had acquired some knowledge of Soviet technology it was estimated that gains would (1) be mutual on four projects, (2) be in favor of the Soviets (with the U.S. deriving some benefits) on two projects, and (3) heavily favor the Soviets on two other projects. In the two areas with no designated project coordinators, one area chairman indicated mutual benefits would be incurred and one predicted a program heavily favoring the Soviets.

FUNDING

Total U.S. costs for implementing cooperative programs under provisions of the Scientific and Technological Agreement were not available because the numerous departments, agencies, and institutions, each with a segment of project cost, do not correlate their cost with project cost as a whole.

The project coordinators we interviewed were commonly concerned with how they were to pay for travel, per diem, interpreters, and other expenses related to the new cooperative projects without penalizing their own ongoing programs. Six of eleven project coordinators and one area chairman believed that the present funding system was inadequate to properly plan and conduct a meaningful cooperative program with the Soviets. For example, the Tennessee Valley Authority in confirming its willingness to participate in three energy projects stated that it had budgeted no funds for these undertakings and could cover only minimal costs of the program. Because the Authority receives no annual appropriation, but operates on revenues derived from charges for power used, its officials believed that funds used for Soviet cooperative expenses should be obtained from appropriations for this specific program or some other source.

The Department of State, in commenting on our report, stated that the Authority's funding problem had been resolved. However, in June 1974, the Authority advised GAO that some problems have continued and suggested centralized funding for the projects.

Grants from the National Science Foundation (NSF) to universities designated as U.S. lead institutions for chemical catalysis projects have partially solved funding problems in this area. However, two project coordinators considered the NSF grants insufficient to accomplish the objectives desired.

In one case, NSF granted $50,000 for a catalytic reactor modeling project which included the exchange of scientists between three U.S. universities and the Soviet Union. The project coordinator has found no American scientist, both technically qualified and fluent in Russian, who would participate in the project, and he estimated that an additional $50,000 would be required just for preparing scientists to participate in this program.

The second case, involving an in-depth study of selected catalytic systems, is also exchanging Russian and American scientists. Three NSF grants totaling $75,000 were considered inadequate because such limited funding would restrict the exchanges to a period too short for a visiting scientist to perform meaningful research. In both cases, almost half of each grant would be for travel, per diem, and univerisity overhead costs.

Similar funding problems were noted during our discussions with other project coordinators who stated that in most cases they found it necessary to use available program funds in order to participate in joint projects. Although at this time the costs are nominal, in certain projects they are expected to escalate as the projects develop. For example, a super conducting transmission project headed by the Atomic Energy Commission is considering purchasing $1 million of equipment to be used in the Soviet Union. In May 1974, we were advised by AEC that the Office of Management and Budget had deleted the item from AEC's budget request.

Interrelated with overall program funding is the problem that project chairmen have encountered in determining who will pay the costs of visiting delegations. The Soviets have proposed that the "receiving side" pay these expenses in-country to minimize hard currency costs to the Soviet Union. Of 14 project chairmen interviewed 5 stated that their inability to accomodate the Soviets on this issue could adversely affect their projects.

Our review of legislative authority revealed that some agencies and departments already have sufficient broad authority. Others may need to seek specific congressional authorization, a separate delegation from the President under the

Mutual Education and Cultural Exchange Act of 1961, (MECA) as amended (22 U.S.C. 2453) or to seek funding under the State Department's auspices under MECA if they desire to institute receiving side pays arrangements with foreign counterpart agencies. (See app. III for more discussion on this subject.)

Overall costs incurred to date for the various cooperative projects were not available nor were the total estimated costs for the overall program which may result from the basic agreement. However, we did obtain the following individual project costs, which are, in some instances, estimated as no cost records were available.

--Department of the Interior estimates fiscal year 1974 cost for the science and technology agreement to be $527,650 of which $500,000 is for the magnetohydrodynamics energy project. Overall cost for this project is estimated at $3 million.

--Atomic Energy Commission estimates the super conducting transmission project will cost $1 million for equipment plus the cost of several man years of effort. The Commission noted that each time a U.S. team visits the U.S.S.R. the total travel cost probably exceeds $10,000 and that foreign travel money is often difficult to obtain.

--Bureau of Reclamation estimates travel, per diem and salary expenses for 3 resources and 1 energy research project for $22,202 for fiscal year 1974 and $32,225 for 1975.

--NSF funding for chemical catalysis projects amounted to $251,600 for grants to universities, $48,899 for program development, and $7,340 for international travel during fiscal year 1973. For 1974, NSF is budgeting $400,000 for these cooperative programs.

COOPERATING WITH INDUSTRIAL SECTOR

The Scientific and Technological Agreement provides for both countries to encourage and facilitate the establishment of direct contacts and cooperation between firms. U.S. officials implemented this provision by sending about 200 letters to American companies noting that a number of U.S. companies were entering or contemplating technology exchange agreements with the Soviet State Committee for Science and

Technology. The Department further stated that it would provide additional advice if desired.

Certain immediate technological needs of the Soviet Union can be met by the American industrial sector. When the agreement was signed, however, tariff discrimination against Soviet imports and restrictions on the Export-Import Bank hindered commercial expansion with the Soviet Union. The tariff restrictions limited the Soviet's ability to obtain hard currency and made Soviet goods less competitive. The Export-Import Bank restrictions in addition limited the amount of concessional credit available to the Soviet Union.

On October 18, 1972, the President determined that it was in the national interest for the Export-Import Bank to guarantee, insure, extend credit, and participate in the extension of credit, for the purchase or lease of any product or service by, for use in, or for sale or lease to, the Soviet Union. 1/ Subsequently, the Bank participated in several financing actions with the Soviets, including a $26 million sale on submersible electric pumps, a $36 million sale of an iron ore pellet plant, and a $342 million sale of a plant to produce trucks and engines. (See app. IV for additional information on approved Export-Import Bank credits.) Other U.S. companies have announced deals with the Soviet Union which have not been approved by the Bank.

Protocol is one type of cooperative arrangement between American industrial firms and the Soviet Union. It is general in nature and calls for cooperative development in certain scientific and technological fields but not for the delivery of specific products or services. The two parties will sponsor reciprocal visits of scientists and engineers, joint symposiums, and other forms of information exchange. Over 40 U.S. companies had signed or were negotiating protocols by the end of 1973.

1/ The Comptroller General ruled in opinion B-178205.24, March 8, 1974, that the language of section 2(b)(2) of the Export-Import Bank Act of 1945, as amended, (12 U.S.C. ¶ 635 et. seq.), clearly requires a separate determination for each transaction with the Soviet Union. The Attorney General ruled that a separate determination is not required. Legislation has been introduced to clarify compliance with the Act. (H.R. 15977, 93d Cong., 2d sess. (1944)).

A second type of cooperative arrangement provides for American firms to construct industrial plants in the Soviet Union. The truck and engine plant construction and the iron ore pelleting plants to be constructed by a major U.S. corporation are receiving Export-Import Bank financing. The media has reported that a U.S. company will construct a plant to produce urethane foam for use in transportation equipment; that two other companies will each build large chemical plants for producing acetate; and that a large petroleum corporation will construct a plant for manufacturing fertilizers, including ammonia and urea.

A third type of arrangement is for American firms to provide industrial or construction equipment to the Soviet Union. About half of these contracts are for the large heavy-truck manufacturing plant equipment receiving Export-Import Bank support. Bulldozers, pipelayers, compressors, and machine tools are also being exported to the Soviet Union for other projects.

Some agency officials voiced concern that the Soviets may bypass governmental channels of the agreement in favor of industrial channels of the agreement to satisfy their technological needs. These officials recognized the Soviet's advantage in being able to pick either private or government avenues in seeking U.S. technology compared to the United States having only governmental avenues available for obtaining Russian technology. They also noted that the U.S. Government could exercise only limited control over contacts between American industrial firms and Soviet representatives.

This situation was pointedly related by a project coordinator in the water resources area, who advised us that the Soviets were able to tour the Grand Coulee Dam, the largest dam in the United States, even though the U.S. Government had rejected an official request to visit it. This rejection was based on three refusals of Soviet officials to allow U.S. representatives to visit a comparable dam in the Soviet Union. The Soviets contacted a major American industrial firm whose equipment was installed at the Grand Coulee Dam and received a 2-day tour of the facilities and certain technical information. As a result the United States lost its bargaining power for obtaining permission to visit the Soviet dam.

Grand Coulee Dam

Photo credit: Department of the Interior

CHAPTER 3

COOPERATION IN ENVIRONMENTAL PROTECTION

The Agreement on Cooperation in the Field of Environmental Protection promotes the exchange of environmental protection technology in non-proprietory fields on the basis of equality, reciprocity, and mutual benefit. Cooperative efforts are to be directed toward (1) solving the most important problems of the environment, (2) working out measures to study and prevent pollution and its effect on the environment, and (3) developing the basis for controlling the impact of human activities on nature.

The agreement identifies 11 potential areas for cooperation--air pollution, water pollution, environmental pollution associated with agricultural production, enhancement of urban environment, preservation of nature and the organization of preserves, marine pollution, biological and genetic consequences of environmental pollution, influence of environmental changes on climate, earthquake prediction, arctic and subarctic ecological systems, and legal and administrative measures for protecting environmental quality.

Cooperative activities involve exchanging scientists, experts, research scholars, information, and research findings; organizing bilateral symposiums and meetings of experts; and developing and implementing joint programs and projects. Additionally, provisions have been made for the governments to encourage and facilitate cooperation with public and private organizations.

A joint committee was established to meet once a year to approve measures and programs on cooperation and to designate the participating organizations responsible for the realization of these programs. Each country designated a program coordinator to maintain contact between sessions of the joint committee and to supervise and coordinate the activities of the participating organizations. The designated chairmen and coordinators for the agreement were the Chairman of the Council on Environmental Quality for the United States 1/ and the Chief of the Main Administration for Hydrometeorological Services for the Soviet Union.

1/ The current U.S. Chairman is Russell E. Train.

IMPLEMENTING AGREEMENT

The first meeting of the joint committee was held in Moscow in September 1972 and it approved memorandums of implementation and procedures under the agreement. The memorandum of implementation provided for joint cooperation on 30 topics within the 11 specified areas of interest. The establishment of 9 working groups and the convening of additional meetings and conferences of specialists to work out plans for continuing cooperation were also authorized at this meeting.

The second annual meeting was held in Washington, D.C., from November 13 to 16, 1973. The committee reviewed the work accomplished during the first year of cooperation and adopted a report on the progress of the program to date. This meeting was convened by the Soviet and American chairmen of the joint committee and was attended by an additional 12 Soviet and 14 American representatives. Overall, the committee noted that there had been more than 20 meetings of working groups and that some activity had taken place under each of the 11 areas of the agreement. It was agreed that a good beginning had been made in the program of environmental cooperation and that a solid basis had been laid for further progress.

PROGRESS

As of November 1, 1973, the 17 working groups had held at least 24 meetings at which a total of 109 topics of common interest were identified within ten environmental areas. (See app. II.) Subsequent meetings have been held and by June 1, 1974, there were about 40 working-group and smaller scale meetings according to the Department of State.

The information exchanges primarily concerned data on organizational outlines and procedures for developing environmental controls, published technical data, and reports on the efforts of individual working group members. As of June 1974, two working groups (air pollution and modeling, and earthquake prediction) have instruments and technicians in the Soviet Union for side-by-side field comparisons of instruments and techniques. However, in most cases further details remain to be worked out before results are expected.

From the early stages of the program, officials have recognized that the United States did not expect large returns from the cooperative efforts for at least 5 years. The opinion has also been advanced that the United States

really does not expect very much in the way of hard scientific returns from most projects but is interested in establishing rapport and building up a mutually beneficial relationship.

In spite of the initial concern over the value of the program, the U.S. participants were advised by memorandum dated October 17, 1972, from the Special Assistant to the U.S. Coordinator that from the 11 areas set forth in the agreement the following had first priority:

--Air pollution modeling and instrumentation.
--Urban environment.
--Wildlife conservation.
--Influences of environmental changes on climate.

The joint working group on urban environment which is an area composed of many different but interrelated factors, illustrates many of the problems encountered in developing a framework for cooperation. The working group is one of the broadest and most diverse established under the Agreement. Its two joint meetings have enabled the U.S. group to determine the potential areas of cooperation. A work program has been agreed upon which consists of one joint project (development of criteria for the selection and location of new communities), further discussions and exchanges of visits by specialists in five topics, and exchanges of formal and informal papers on ten.

Basic information has been exchanged on comprehensive planning and development, construction technology and waste management in permafrost areas, solid waste management, noise abatement and control, urban transportation planning, historic preservation and parks and the planning and development of new communities. Exchanges also have been initiated on recreation zones on the edges of urban areas and the management and modernization of existing housing.

Soviet experts discussed these subjects with U.S. officials in Atlanta, San Francisco, Washington, D.C., Reston, Virginia; and Columbia, Maryland during the first joint working group meeting in April 1973. The U.S. team which attended the second joint meeting in the Soviet Union the following November was briefed by Soviet Officials in Moscow, Leningrad, Tashkent, Samarkand and the new Soviet town of Togliatti. (See p. 24.)

As a result of these meetings, the U.S. group believes that the United States stands to gain from a greater knowl-

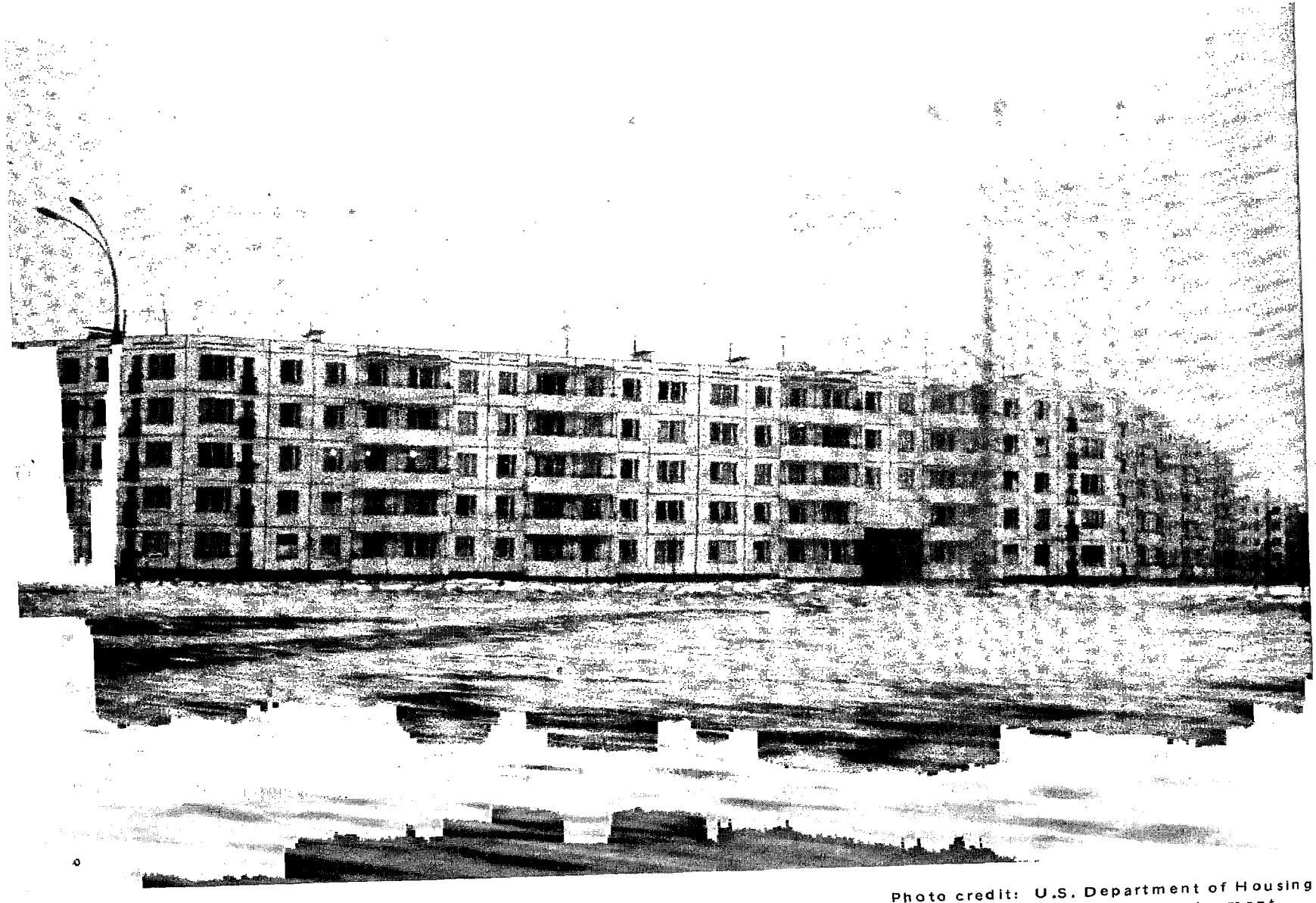


Photo credit: U.S. Department of Housing and Urban Development

Soviet apartments in the new town of Togliatti

edge of Soviet historic preservation techniques. Although differences between Soviet and U.S. political, planning and land development systems seem too great to permit much transfer of methods of urban growth, the Group believes that much can be learned from a comparison of U.S. and Soviet criteria and standards, and from the further investigation of Soviet techniques in the planning and actual development of new communities.

The Soviets, on the other hand, stand to gain from a knowledge of U.S. solid waste collection and management programs and of U.S. practices in handling tourists in historic towns, etc. The Soviet Union also wished to initiate a joint transportation project on the rational determination of intermode allocation. The United States is currently studying detailed work programs submitted by the Soviets on this subject, and on the criteria for the selection and location of new communities.

In commenting on our report, the Department of State believed that the urban environment project was not a typical example to be used in demonstrating progress under the agreement. GAO does not believe that any single project can be considered typical of all other projects under the agreement. Each has unique characteristics and each is somewhat dependent on assigned personnel, definitization, national interests, priorities, budgets and leadership. Therefore, the urban environment project was not presented as a typical project but one in which the United States indicated an early interest for development.

MUTUAL BENEFITS

Overall, the U.S. program chairmen we interviewed felt that in a strict "know how" exchange the agreement favors the Soviet Union. Six chairmen felt that in the end an exchange of technology would favor the Soviets and 5 felt that mutually beneficial programs could be worked out.

The Soviet Union has, by and large, been reluctant to provide the United States with information at any time other than during personal contacts at joint working group meetings and this lack of information is discouraging some program chairmen. Seven chairmen believed the information exchanges to date have favored the Russians and four chairmen believed the exchanges had benefited both sides. Three chairmen had reservations on whether data and information provided by the Soviet Union would be of significant value to the United States.

Many chairmen are having difficulties in assessing trade-offs in their programs. They readily admit that on a strictly technological and scientific level the United States does not really have much to gain. However, they are of the opinion that because of the global nature of environmental problems everyone benefits no matter where the environment is improved and everyone suffers when environmental problems are allowed to go unsolved.

In this respect, the Environmental Protection Agency believes that a joint earthquake prediction project may validate a technique developed by the Soviet Union for more accurate predictions which will result in significant potential savings to U.S. citizens and industry if proven reliable.

In commenting on our report, the Department of State stated that it is somewhat misleading to say that on a strict scientific and technological basis, the United States does not have much to gain. In the words of the Department, there is almost no area in which understanding of Soviet experience will not enhance our technical capacity to cope with U.S. environmental problems. GAO has no disagreement on this issue but is providing only the views of the project chairmen interviewed. Full analysis of benefits will have to be made later on a case by case basis.

The opinions of the project chairmen should, however, alert interested parties that some implementing groups are somewhat concerned that their projects could result in an imbalanced exchange of technology. However, the information and opinions accumulated during our review should be considered preliminary in nature and subject to change as more experience is gained.

PROBLEMS

Differences in organizational structures, technological levels, priorities, availability of hard currency for travel costs, and language capabilities have retarded the progress of cooperative efforts and the definitizing of specific projects.

Organizational structures

Cooperative activities require each country to designate a lead organization for each program; however, in some cases, the Americans found no Soviet counterparts because Soviet ministries had different organizational concepts.

For example, the U.S. Bureau of Sport Fisheries and Wildlife has no Soviet counterpart. This factor, together with the interdisciplinary nature of the specified areas, have complicated setting agendas and establishing firm meeting dates.

A second organizational problem was caused by the broad nature of the 11 areas. Some of these areas had to be divided. For example, the preservation of nature and the organization of preserves originally included two working groups, one concerned with wildlife conservation and preserves, the other with conservation in permafrost areas. During the 1973 joint committee meeting, the topics relating to the organization of preserves were viewed as important enough to necessitate a separate working group. As a result, a U.S. chairman has recently been selected for this new working group.

Overlapping of program interests caused problems. For example, the wildlife conservation and the permafrost groups have been unable to resolve which group should handle studies on polar bears. Both working groups are interested in the subject and it could be conducted by either group. We also noted possible overlap between the Environmental Protection Agreement and other agreements in agricultural, energy, and biological and genetic consequences areas.

In commenting on our report, the Department of State agreed that a nominal amount of overlap had occurred and certain topics had been transferred to the jurisdiction of other agreements. Reportedly, project chairmen in areas which overlap maintain contact to prevent duplication of efforts.

Technological levels

There are major differences in the technological and scientific capabilities of the two countries and in the approaches that each takes on similar problems. These factors may play a determining role in overall cooperative efforts.

As noted earlier, the information exchanges needed to familiarize each country with methodologies and research standards have been the first priority of the programs. U.S. experts have recognized the weakness of the Soviets in instrumentation and application of computers to environmental problems. American experts generally believe that the Soviets are strong in theory but weak in applying it. If these programs are to develop into joint projects which

include exchanges of equipment, the benefits of the program may become very one-sided.

Approaches

Different economic needs and scientific interest have hindered efforts to agree on topics. The urban environment working group noted one example during its discussion with the Soviets on solid waste disposal. The Soviet Union is interested in composting, since much of its waste is organic, whereas the United States has a lower proportion of organic waste and has found this method uneconomical.

Travel costs

The question of which side will cover the costs of visiting delegations and scientists is a major stumbling block. As in other agreements, the Soviets have asked for a "receiving side pays" arrangement, whereby each side would fund travel and per diem expenses of visiting delegations. The Soviets have stated that, in the absence of such an arrangement, it will be necessary to restrict the number of visits and sizes of delegations because of a Soviet shortage of hard currency. A discussion of the authority or lack of authority of U.S. agencies to enter into receiving side pays arrangement is presented in Appendix III.

Language capability

Prompt translation of Soviet data and manuals is essential for the orderly progress of cooperative efforts, yet most of the U.S. agencies involved do not have the capability to translate Soviet technical documents.

The cost of outside translation services is formidable, about $10 a page. Under the Bilateral Exchanges Agreement, for example, the National Academy of Science in 1971, in mathematics alone, had 10,000 pages translated. In one case we noted, the Soviets gave the U.S. working group on marine environmental protection certain technical information and it was not translated because of insufficient funds. The chairman of the group was unable to provide any evaluation of the data. Officials of the Department of Housing and Urban Development, lead agency for the urban environment area, also expressed concern over the lack of resources to translate Soviet technical materials.

The need for developing translation capabilities will become increasingly apparent as the various working groups

accumulate more and more materials pertinent to their joint projects. Although all documents will not require translation, it will still be necessary for U.S. scientists or technical experts, fluent in the Russian language, to evaluate the data and determine which documents require translation.

FUNDING

The Office of Management and Budget (OMB) has earmarked no funds for the agreement in agency budgets. Participating organizations have used general operating funds to cover program costs, estimated at about $500,000 through September 12, 1973.

Although funding has not been a serious problem to date it must receive increased attention in the future. In most cases, project chairmen were able to pay for the agreement costs from general operating funds without adversely affecting the domestic efforts of their agencies. As most cooperative projects are expected to take at least another year before they are definitized, these chairmen believe that short term funding requirements will not increase during the coming year and that general operating funds will continue to be the major funding source.

The second phase of the cooperative effort could include exchanges of equipment and prolonged working visits by United States and Soviet scientists, during which costs could rise substantially. Projecting these costs now is impractical because it is not known how many joint projects will be developed. The 17 working groups are discussing 109 topics which could become cooperative projects.

Although the Office of Management and Budget has expressed reservations on funding a large number of projects, it is apparent that developing substantive projects will require a significant increase in funding. The increased funding requirement should not be satisfied from general administrative funds but in a manner that requires direct congressional review and approval.

PRIVATE SECTOR PARTICIPATION

The environmental agreement calls for the parties to develop direct contacts and cooperation between public and private organizations. The Soviet Union is apparently very

interested in having U.S. business firms participate in programs established under the agreement; 7 of the 11 chairmen we interviewed have been asked by the Soviets to furnish them with a list of American companies having expertise in various areas related to problems of the environment. The firms contacted by these chairmen have been receptive to the idea of doing business with the Soviets, and a few U.S. businesses have been contacted directly by the Soviets since the agreement was signed.

EPA advised us that participation by the private sector has been solicited through representative national organizations potentially interested in the projects. There has been a positive response and representatives of trade and manufacturing organizations are members of a number of joint working groups. In addition project chairmen have used their activities as a vehicle for informing the Soviets of the capabilities and interests of U.S. industry.

The U.S. coordinator has tried to promote trade in the environmental field and, as a result of his interest, the Soviet coordinator had invited the United States to hold an exhibition of pollution control equipment and a symposium on pollution control in Moscow during 1974. Difficulties in arranging suitable exhibition space and the lead time required for marketing research and other preparations has delayed the staging of this symposium until late 1975 or early 1976.

CHAPTER 4

COOPERATION IN SPACE EXPLORATION

On October 10, 1969, the Administrator of the National Aeronautics and Space Administration (NASA) set in motion a series of events which culminated in the agreement signed by President Nixon and Chairman Kosygin at the Moscow Summit Meeting in May 1972 on cooperative efforts in the exploration and use of outer space for peaceful purposes.

This accord was preceded by an agency-to-agency agreement signed January 21, 1971, between NASA and the Soviet Academy of Sciences, which led to the creation of five working groups concerned with meteorological satellites; meteorological rocket soundings; natural environment; exploration of near earth space, moon, and planets; and space biology and medicine. Subsequently, the agency-to-agency agreement was annexed to a general agreement on exchanges and cooperation in scientific, technical, educational, cultural and other fields in 1972 and 1973 and signed by the two governments on April 11, 1972. Both governments pledged themselves to the fulfillment of these agreements in the May 24, 1972, Summit agreement on space cooperation.

Meanwhile, steps were being taken to bring about an agreement for developing a compatible rendezvous and docking system for a test docking mission between a United States and a Soviet Union spacecraft. Negotiations for this particular project began in April 1970, when the NASA Administrator suggested to his Soviet counterpart that such a project would be of mutual interest. This led to a number of agreements on means for spacecraft rendezvous and docking between NASA and the Soviet Academy of Science.

--October 26 to 28, 1970, agreement reached on procedures and schedule for efforts to design compatible rendezvous and docking arrangements. Three joint working groups were established.

--June 21, 1971, three joint working groups met in Houston and agreed to study the technical and economic implications of flight experiments testing the technical solutions for compatible systems.

--November 29, 1971, joint working groups met in Moscow and agreed on the technical feasibility of the project.

--April 6, 1972, senior NASA and Soviet Academy officials confirmed the desirability of a test mission and established understanding on the management and operation of a joint test mission.

--March through May 1972, joint working groups held technical discussions on rendezvous and docking.

Although these earlier agreements dealt with numerous technical details, there was no official agreement to conduct a joint rendezvous and docking mission. Thus, the development of a compatible rendezvous and docking system was the principal project embodied in the accord signed by the President on May 24, 1972. It also covers other aspects of space science cooperation including a mutual exchange of information and scientists.

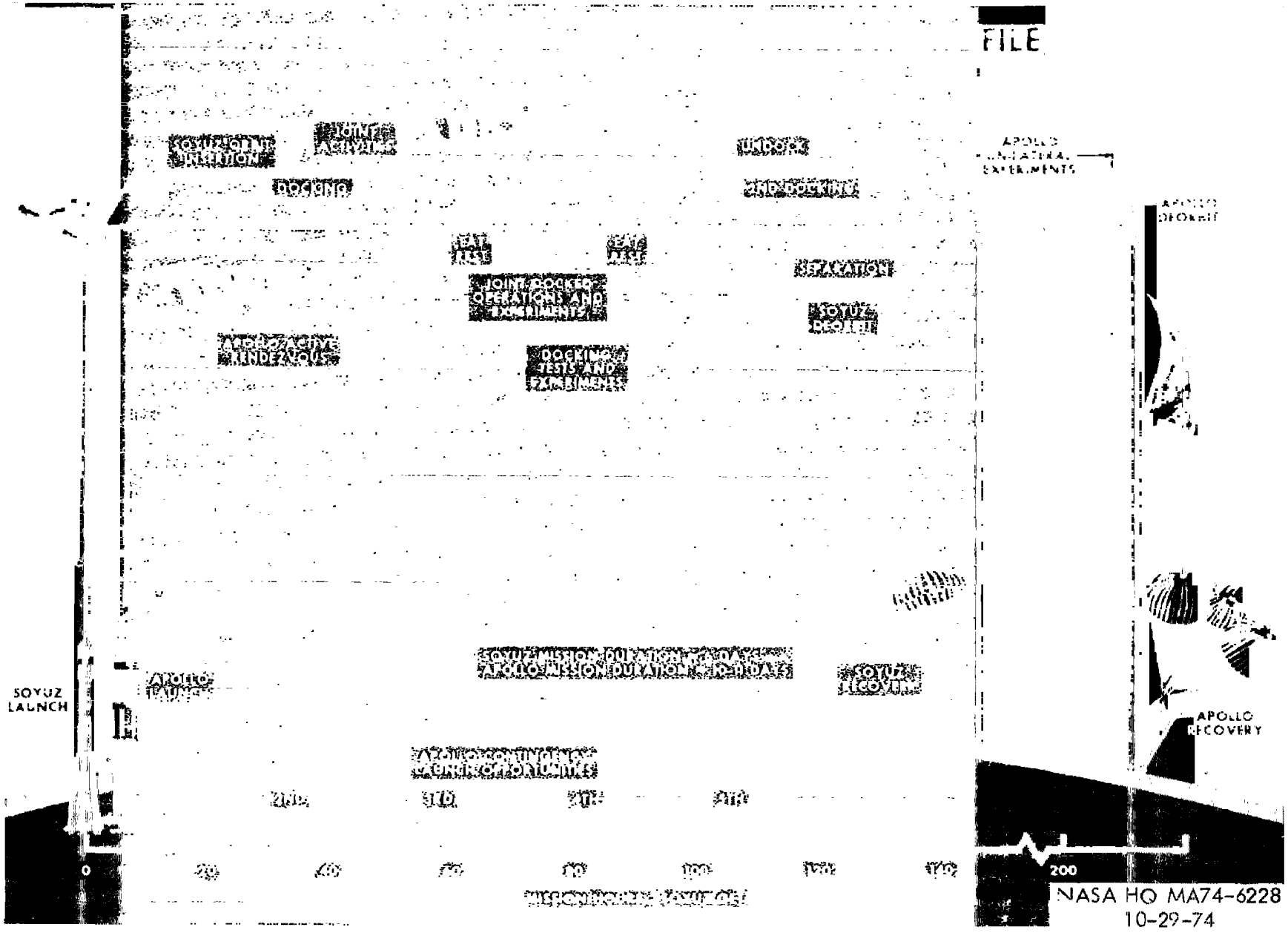
RENDEZVOUS AND DOCKING PROJECT

Specifically, the May 24, 1972, agreement provided for the two countries to carry out projects for developing compatible rendezvous and docking systems of their manned spacecraft and stations in order to enhance the safety of manned flights in space and to provide the opportunity for conducting future joint scientific experiments. The agreement further provided that the first experimental flight to test these systems be conducted in 1975 and envisioned the docking of a United States Apollo-type spacecraft and a Soviet Soyuz-type spacecraft and visits of astronauts to each other's spacecraft.

This cooperative project, which is commonly known as the Apollo-Soyuz Test Project (ASTP), is underway and reportedly on schedule to meet the planned launch date of July 15, 1975. (A profile of the ASTP mission is shown on p. 33.)

Joint working groups have been meeting on a scheduled basis to plan, review, and agree on technical and operational aspects of the project, with each country separately developing docking systems based on a mutually agreeable single set of interface design specifications. Joint testing of the docking system was successfully accomplished at the Johnson Space Center, Houston, Texas, late last fall.

Major new U.S. equipment items developed for the project are a docking module and a docking system necessary to achieve compatibility with Soviet developed hardware to be employed on the Soyuz spacecraft.



ASTP

MISSION PROFILE

The docking module (see p. 35) is cylindrical in shape and about 5 feet in diameter and 10 feet in length. It will serve as an airlock for the internal transfer of crewmen between the different atmospheres of the Apollo and Soyuz spacecraft and will be equipped with radio and TV communications, antennas, stored gases, heaters, and the displays and controls necessary for transfer operations.

The docking module is designed to handle two crewmen simultaneously. Hatches having controls on both sides will be installed at each end of the module. A universal docking system will be located at the Soyuz end of the module and will be capable of functioning with similar components on the Soyuz-type spacecraft.

The docking module and system together with an Apollo command and service module will be launched on a Saturn IB launch vehicle. The docking module and the docking system will be stowed in the spacecraft launch vehicle adapter and extracted by the command service module while in earth orbit in a manner similar to that used with the lunar module on an Apollo lunar mission. Prior to the launch of the Apollo, the Soyuz spacecraft will be launched from the Soviet Union so that it will be in orbit awaiting rendezvous with Apollo and the docking module.

FUNDING

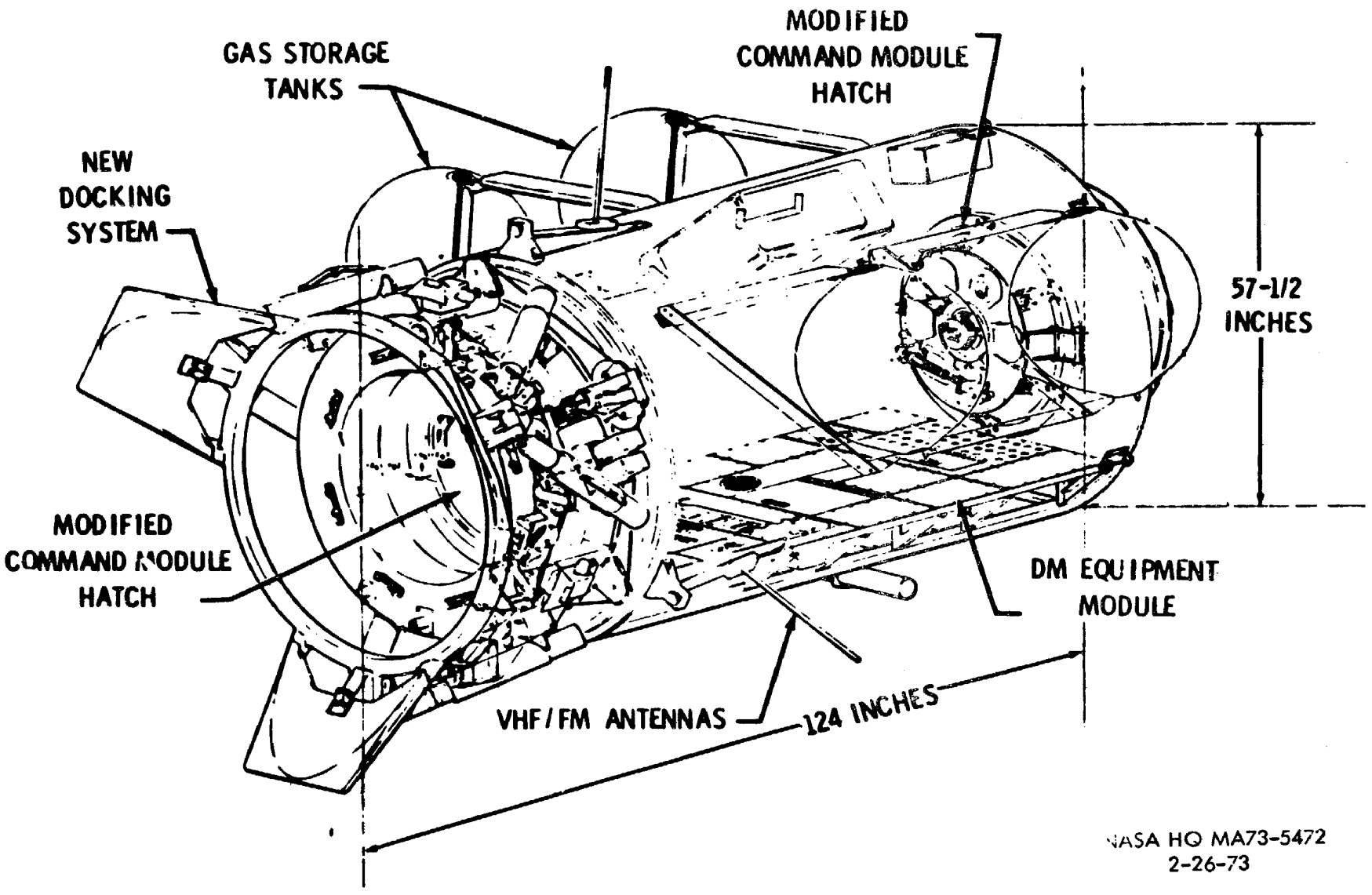
For the first 2 years the ASTP cooperative project was funded from the Skylab program rather than separately justified as a line item in the budget. This transfer of funds was approved by the appropriate Congressional committees.

On June 23, 1972, NASA notified the House Committee on Science and Astronautics and the Senate Committee on Aeronautical and Space Sciences that it would transfer $6.9 million of fiscal year 1972 funds and $30.1 million of fiscal year 1973 funds from Skylab to ASTP. The fiscal year 1973 transfer was later increased to $38.5 million. The House Committee was briefed on the project on May 31, 1972, and notified NASA of its support of the fund transfer on June 27.

The next day, the Senate Committee also expressed support of the transfer. These congressional actions satisfied requirements of Public Laws 92-68 and 92-304.

In commenting on our report, NASA highlighted several instances between March 3, 1971 and March 14, 1972, when the Administrator informed the House and Senate Space committees of discussions with the Soviets.

ASTP DOCKING MODULE



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A review of the congressional record shows that during the hearings referred to, NASA provided no indication of the amount of funds required for the ASTP project.

GAO firmly believes that any procedure that reduces or eliminates congressional debate and full House and Senate approval is undesirable. Moreover, a 2-year funding authority could easily be interpreted by the cooperating government as a full commitment to the project, under which circumstances, congressional recourse is limited because of the international relations involved.

According to NASA's budget presentations for fiscal year 1975, ASTP will cost a total of $250 million through fiscal year 1975.

Project components	Estimated cost (million)
Command and service module	$ 55.8
ASTP Docking Module system	49.9
Experiments	13.0
Launch vehicle	42.0
Launch operations	53.9
Flight support and operations	35.4
Total	$250.0

Also, certain equipment items such as an existing Apollo command service module and a Saturn rocket valued at $100 million were transferred to the project at no cost from the completed Apollo program. Modifications to the command service module of about $55 million, however, are being charged to ASTP, as shown in the above schedule.

Substantial additional support costs may be incurred by NASA for ASTP which do not show up as a direct charge to the project. The fiscal year 1975 NASA budget presentation for the overall Space Flight Operations program indicates that this support will be provided by other program elements such as development, test and mission operations, research and test operations, crew and flight operations, operations support and launch systems operations. In addition, it is presumed that certain other support costs, such as tracking and data acquisition operations will be associated with the manned space flight.

Soviet financial contributions to the joint project are not known as the Soviet Union has not publicized its ASTP

budget, and this precludes a dollar to ruble comparison of monetary support or projected costs. The United States is providing the $49.9 million docking module for the space rendezvous and the Soviets have agreed to commit two Soyuz launch systems modified to incorporate the new docking system. NASA believes the commitment of the backup Soyuz system offsets the costs of the docking module.

Short of destruction of a Soyuz during or after missile launch, the Soviet Union has not committed any resources which offset the cost of the docking module. If the Soviet Union continues the Soyuz program after the joint project with the United States the backup Soyuz launch system will be available for the next Soviet space flight thereby minimizing the Soviet financial contribution to ASTP.

In commenting on our draft report, NASA stated that even if the Soviets do not use the backup spacecraft, they will incur substantial cost with launch preparation, propellant loading, final countdown, disassembly and cleaning of the backup system. However, NASA provided no specific cost data for these procedures.

BENEFITS

The ASTP mission will test compatible orbital rendezvous and docking systems; verify techniques for transferring astronauts and cosmonauts; conduct experiments while docked and undocked; and develop experience for conducting potential joint flights, including, in case of necessity, rendering aid in emergency situations.

NASA believes that significant benefits will result from the ASTP joint mission because it will:

--Establish a basic international rescue capability for future space flights.

--Provide experience in exercising modes of international communications, coordination, and mutual understanding.

--Provide an opportunity to identify and resolve problems which flow from differences in language, equipment, and operational procedures.

--Open the way to future joint activities based on mutual confidence.

NASA also believes that ASTP provides a constructive way of continuing our national capability for manned space

flight in the period between the last Skylab mission in 1974 and the first shuttle flight in 1979. NASA noted that ASTP will help keep highly skilled government and industrial teams together by providing jobs for about 4,400 workers at the peak of the ASTP program in fiscal year 1975.

Space Rescue Benefits

ASTP is only the first step in the development of an international rescue capability because this capability will require even greater coordination and integration of United States-Soviet Union space programs than is now evident.

The ASTP flight plan calls for the Soviet Union to launch the Soyuz spacecraft first. The United States then will have only five 16-minute launch frames available during a 5-day period to launch the Apollo in order to achieve rendezvous and docking. In an emergency, even under the most favorable conditions, time opportunities available to attain the necessary orbit would be limited. This restricts the ability of one country to launch a spacecraft from earth to assist or rescue the other's craft already in outer space.

A further hinderance to future international rescue efforts is the leadtime that would be required to prepare a Soviet space vehicle for a rescue mission. The alternative--to have a vehicle on the launch pad--would entail close coordination of the U.S.-Soviet space programs and might be prohibitively expensive. Even under the best of conditions, it is estimated that it requires 10 days for the Soviets to prepare a second launch, i.e., in this case, a rescue mission.

A popular misconception is that a spacecraft in orbit, upon receiving a distress call, is able to rendezvous with a disabled spacecraft also in orbit. Lack of spacecraft power, among other obstacles, prevents such a simple approach to space rescue.

A major point to consider in assessing the role of ASTP in establishing a basic international rescue capability is that the next American manned spacecraft, the orbiter of the Space Shuttle, will generally not carry a docking module. Present plans call for a second American spacecraft to carry two docking modules into orbit and transfer one module to the disabled craft, then dock and complete the rescue.

However, the Soviets will be unable to participate in such a rescue unless they adopt the American shuttle plan or a comparable program, as the space shuttle docking module

configuration is different from that of the ASTP module, even though the docking system which latches and seals the two docking modules together will be the same.

In commenting on our report NASA agreed that rescue capability will depend on the future programs of both countries. However, NASA was unable to provide detailed information on the future compatibility of Soviet and American spacecraft.

NASA also did not discuss the potential of a Soviet rescue of an American spacecraft. NASA's comments centered on the built-in rescue capability of the space shuttle program. Two points made by NASA tend to lessen rather than stress the potential impact of the ASTP on a rescue operation. First, NASA stated that the shuttle craft in distress, not equipped with a compatible docking capability, would nontheless be able to effect a rescue if the disabled craft carried appropriate survival gear, including appropriate space suits. Under this plan, a compatible docking module is not needed because no docking takes place. Secondly, NASA stated that the shuttle system would have the capability to launch within twenty-four hours after it is mated to its booster. If this capability materializes, there seems little need for a Soviet spacecraft to ever be used in rescuing an American craft since a sister craft would always be available for a rescue mission.

Political benefits

Political benefits of ASTP cannot be overlooked, although they are difficult to measure. The perspective that other countries have of the relationship between the United States and the Soviet Union will surely be influenced by television coverage of the joint docking. The project offers visable evidence that the world's greatest ideological and military rivals can cooperate on programs of mutual interest and are following the course of detente even in outer space.

ASTP was the first Soviet space program publicly announced in advance and some political benefits such as increased openess of the Soviet space program are already being experienced. Since the agreement, additional Soyuz launches have been announced, and the Soviets have also released information on the death of three Soviet cosmonauts in a space mishap. NASA was unable to obtain details about the mishap before the joint ASTP cooperative venture.

Mutual benefits

ASTP is demonstrating that language differences, technological differences, funding and security issues can be overcome and that equipment and experiments can be jointly conceived. While other cooperative programs are encountering delays, ASTP is on schedule.

Altnough ASTP is designed to limit the amount of technology transferred between the two countries, a cooperative design of the universal docking system was successfully engineered. The Soviet spirit of cooperation is highlighted by its disclosure of previously confidential information, modifications of the Soyuz atmosphere, and the voluntary commitment of two launch venicles.

Because of the different technologies and resources involved, it would be unfair to compare the space cooperation of the two countries with other cooperative projects. Nevertheless, other project directors could use the experience gained through ASTP in developing other cooperative projects, because

--ASTP is specific as to the docking of American and Soviet spacecraft. A well-defined project will reduce the chance of misunderstandings.

--The failure to complete a task by either party will affect the completion of an intermediate goal and, eventually, the ultimate objective.

--ASTP is adequately funded, which permits planning within known budgetary limitations.

--Well defined communication procedures contribute to prompt completion of intermediate goals. In this regard, written approval of agendas and minutes is required before and after each joint meeting. Technical and administrative problems are often solved by a regular telephone call procedure.

Future benefits

The United States and the Soviet Union have not agreed upon additional joint manned space flights upon completion of ASTP. Although the United States will be concentrating on the Space Shuttle program, it is not known whether the Soviet Union has a comparable program or whether it will continue with the Soyuz type spacecraft.

NASA believes, however, that compatible rendezvous and docking capability is an important precondition for many future cooperative activities in manned space flight--for example, the assembly of complex structures in space.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Both the United States and the Soviet Union have emphasized their desire to realize results promptly from the cooperative agreements signed at the Moscow Summit Meeting in May 1972. Potential tangible results of most projects are not expected to be realized in the immediate future. One exception is the highly visible rendezvous and docking project involving ASTP planned for July 1975.

Activities under the Science and Technology Agreement and the Environmental Protection Agreement have chiefly consisted of negotiating meetings for working out frameworks for cooperation. These meetings have resulted in a series of umbrella, area, and working group agreements, directed toward topic definitization and project development. To date the exchange of information has been limited and of little technical benefit to the United States. These meetings have established rapport and fostered public visibility, but the exchange of scientists and technicians envisioned in the agreements is just beginning to materialize.

Poor communications, differing priorities, misunderstandings, and security concerns have delayed many projects during the first 18 months. These problems had plagued previous cooperative efforts and were anticipated; however, such matters as funding, language translation facilities, and travel costs of visiting scientists should have been resolved during this period.

In a positive sense, ASTP is demonstrating that these problems can be overcome. This program contains the following ingredients which, so far, are missing from most of the other projects: (1) the objectives and goals are well defined and visible; (2) the project has a built-in interdependency which demands the full cooperation of both countries; (3) the communication procedures have been well established; and (4) the project is receiving adequate financial support.

If projects under the other agreements are to expand from the scientific and technical collaboration of the past to joint problem-solving for the future, both countries may have to make greater commitments. To attain the desired goals, the United States may be required to devote more

resources, both personnel and financial, even though the exchange of know how may favor the Soviet Union. Political considerations may justify this concession.

Except for the multimillion dollar space project no action has been taken to specifically identify funds for the overall agreements, although the scope of the cooperative agreements is of considerable magnitude and may result in substantial outlays of resources. We are concerned that the present diffused funding of the programs under these agreements makes congressional overview and control difficult and could result in significant commitments prior to congressional authorization of funds.

We are also concerned that the large number of projects now being considered under the Science and Technology and Environmental Protection agreements may be less conducive to tangible results than would a smaller number of adequately funded projects. Although many topics should be considered in order to find specific projects of common interest for joint cooperation, the progress of the agreements would be facilitated by early selection and funding of substantive programs. Even then, the progress of any cooperative effort will be limited if American scientists and technicians do not have the capabilities or facilities to readily translate materials and data received from the Soviet Union.

Programs evolving from the cooperative agreements are too new to produce significant scientific achievements or to predict potential benefits to either country or all mankind. For example, ASTP will develop a universal docking system, which could assist in the spacecraft of one nation rescuing the damaged craft of the other. However, such a system would be only the first step toward achieving not only an international rescue capability but the potential for joint space exploration. As expressed by the President of the National Academy of Science, the ultimate goal of these agreements should be the normalization of scientific exchanges, with Russian and American scientists free to move back and forth, working in laboratories of their own choice without the need for formal mechanisms.

RECOMMENDATIONS

To facilitate the realization of meaningful results from the joint cooperative efforts with the Soviet Union,

GAO recommends that the coordinators for the Environmental Protection and the Science and Technology agreements (see app. X) formulate and execute a plan which will:

--Identify topics for early development into specific cooperative programs.

--Assess the number of potential projects that can be efficiently managed.

--Insure that projects of priority interest are adequately supported and vigorously pursued by the responsible agencies or institutions.

--Emphasize the need to progress from merely exchanging visits to real cooperative effort.

--Require participating agencies to identify all costs associated with the programs.

--Determine long range funding and personnel requirements of the agreement.

--Arrange the necessary Russian language training and translating facilities to meet the needs raised by the agreements.

AGENCY COMMENTS AND OUR EVALUATION

Agencies having responsibility for implementing the cooperative agreements generally concurred with the recommendations set forth in the report. The Environmental Protection Agency stated that they were proper subjects for concern and had, for the most part, already received appropriate emphasis and followup in the environmental program.

The Department of State also concurred with the desirability of the recommendations and was already pursuing most of the matters at this time. Similarly, the National Science Foundation believed that GAO recommendations and suggestions were well taken.

Agency comments on our conclusions, however, varied.

Progress

Participating Government agencies did not take exception to our conclusion that activities under the agreements have resulted in limited information of little technical benefit

to the United States. In discussing the level of activity, State, NSF and the Environmental Protection Agency each stressed the accomplishments of the negotiating meetings in working out frameworks for cooperation with the Soviet Union. These agencies felt that the complexities of differing political systems, organizational approaches, and cultural outlooks created problems which restricted expedient implementation of the agreements.

We recognize that the programs evolving from the cooperative agreements are too new to produce significant achievements or to predict potential benefits. The purpose of our report, however, is to show that slippage has occurred and to identify problems which made it difficult to adhere to preliminary schedules, such as those developed in 1972.

Need for greater translation and language capabilities

All the agencies responding to our report agreed that the language proficiency of American participants needed to be improved. For example, NSF stated that U.S. scientists and technicians do not possess sufficient Russian language capabilities to cope with the situation. The Environmental Protection Agency went further, stating that the United States, in its dealings with other countries, appears to be at a relative disadvantage in terms of scope, availablility, and cost of translating services.

The State Department recognized that full translation was impractical except on a highly selective basis. It believed that the solution lies in a rigorous screening process to determine whether full or partial translation or abstraction is in order. State also believed that the implementing agencies themselves are probably the best judge of the value of material and that translation or abstraction could be handled in many cases by commercial contract arrangements.

The agencies did not agree on who should pay for these services. For example, State and NSF pointed out that ample facilities were available commercially and within the U.S. Government to handle translations of technical data and suggested that each agency provide the funds required for their programs. Other agencies recommended that State should provide funds for these needs.

We believe the need for translation and improved language capabilites is clear. To date, a very limited amount of Soviet technical data has been translated. Although

commercial contractors have the capability to provide translation services, the determination as to whether full or partial translations should be made rests with the project coordinator who must consider not only funds available but also in-house ability to screen the pertinent Russian-language documents.

Within this context, it seems logical that the rigorous screening referred to by the State Department will have to be done by the experts involved in specific projects. However, not all project managers have a Russian language capability. To develop these capabilities, implementing agencies seem justified in expecting additional support from State.

Funding

Comments on funding problems generally depended on whether the comments came from lead agencies or implementing agencies. Lead agencies such as State, NSF, NASA, and the Environmental Protection Agency believed that projects undertaken were tied to existing domestic responsibilities of U.S. project chairmen and should compete within budget constraints with other meritorious projects for available resources. State acknowledged that some agencies still had difficulty in securing adequate funds for international travel of U.S. participants as well as for administrative overhead. However, it did not believe that the progress of any project was seriously hampered by a lack of funds. NSF believed that little more than "seed" money would be approved by the Congress or the Office of Management and Budget prior to completion of program definition.

On the other hand, implementing agencies, such as the Department of the Interior and the Tennessee Valley Authority, advocated centralized funding for these programs, apparently believing that United States-Soviet Union projects would lose in competition with other agency priorities if only potential technical accomplishments were considered.

Interior also noted that, during the startup of the projects, the Office of Science and Technology agreed to seek necessary funding or to give U.S. agencies strong support in obtaining funds. The demise of that Office left many agencies in the position of having to meet specific technical commitments without financial support, a situation which has made it most difficult to follow through on commitments. In this respect, Interior suggested that funds be included in the budget of the Department of State for all cooperative programs.

We believe that progress under the agreements has been adversely affected by the lack of adequate funding. As NSF noted, translation facilities are available but agencies do not have funds to contract for these services which are vital to the information exchange. We also believe that such problems as differing country priorities, organizational structures, languages, and outlooks put United States-Soviet Union cooperative projects at a disadvantage when competing with domestic projects for necessary financial support. Since these agreements are an element of U.S. foreign policy it would seem that the Department of State could take a more active role to assist the cooperating agencies in obtaining adequate funding.

Travel costs of visiting delegations

A review of the policies of U.S. agencies involved in the exchange of delegations disclosed that certain agencies have declined to implement receiving side pays arrangements in the belief that legal authority for such arrangements does not exist. On the other hand some agencies have implemented receiving side pays arrangements on the basis of inappropriate legal authority. Appendix III provides an analysis of the extant legal authority for agencies to pay the travel expense of visiting foreign delegations and provides suggested remedies for agencies desiring to enter into such arrangements.

State did not believe that the issue would have any great effect on progress of the agreements until after the initial planning stage. On the other hand, the Interior Department expressed a more immediate concern, stating that the issue must be resolved because its final determination will affect the continuation of its cooperative programs with the Soviet Union. Without authority for the receiving side to pay travel costs, Interior indicated that funds must be found outside its approved budget and that this was increasingly difficult to do.

We believe that this issue has already affected progress under the agreements because (1) in the definitization phase the Soviet Union has attempted to limit the size of its delegation, which resulted in some areas of interest not receiving adequate coverage, and (2) the Soviet Union has been reluctant to proceed with some projects until the issue was resolved.

Comparison of ASTP project with other agreements

The Department of State did not agree that all the ingredients of the ASTP program noted in the report were missing from most of the other projects. It noted that some projects had been slow to develop because of efforts to define objectives and goals and to ensure that both sides shared an interest in pursuing cooperation. State characterized the built-in interdependency of ASTP as unusual, if not unique.

NSF believed the space agreement could not be compared with other United States-Soviet Union agreements, such as the Science and Technology Agreement, because (1) the space agreement is large scale ($280 million) while the Science and Technology Agreement is small scale, using a people-to-people approach, (2) space programs are national programs totally within the government control of both sides and have long been ongoing at a few selected locations while the Science and Technology Agreement involves many research institutions and universities throughout both countries, and (3) the science and technology agreement approach cuts across all limits placed by the Soviet Union on contacts between foreign and Soviet people.

We have not attempted to equate ASTP witn other agreements because we recognize the different technologies and resources involved. We believe however, that adequate funding, well-defined objectives and goals, well-established communication procedures, and built-in interdependency are desirable and obtainable in both large and small projects.

Congressional overview and control

Several agencies were in agreement that mechanisms presently existed to provide annual progress reports to the Congress. The executive branch is already being furnished annual reports for the Health and Environmental Protection agreements. Reporting requirements could be expanded for each agreement to include the necessary data for a meaningful Congressional review, an appraisal of the progress under the agreements, an evaluation of the benefits received by each country, an estimate of funding needs, and a discussion of problems encountered.

Large number of projects

State, NSF, and the Environmental Protection Agency agreed with our observation that a large number of projects may be less conducive to obtain tangible results than would a smaller number of adequately funded projects. The NSF pointed out many instances to illustrate the close attention given to keep the number of projects to manageable proportions conducive to effective results. We believe these actions will enhance the ultimate results of these programs.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Recognizing the political aspects of the cooperative agreements with the Soviet Union and their potential significance in the new era of detente, we believe that the Congress should consider monitoring and evaluating the Administration's actions in carrying out the resulting programs. To obtain an overall perspective of these agreements, the Congress should consider the desirability of an annual progress report on each cooperative agreement.

The reports could include by project, the objectives and goals, participating agencies, progress to date, direct and indirect fiscal year cost, potential benefits, long-range funding projections, and any other information the Congress might consider necessary to appraise the agreements. To be most beneficial, these reports should be scheduled for distribution prior to budgetary hearings.

The Congress should also consider the desirability of specifically funding the agreements with the Soviet Union. This would enhance overall cooperative efforts by providing the project coordinators with the financial means to attain project goals and objectives without having to rely primarily on those agency funds provided for other purposes as has been necessary in the past.

PRIORITY PROGRAMS OF JOINT SCIENTIFIC AND TECHNICAL COOPERATION

Areas of interest	U.S. lead organizations	Forms of cooperation
Energy Research and Development:		
Design and operation of large sized thermal generating units at power stations	Tennessee Valley Authority	Initial working meeting for information exchange and development of detailed program for cooperation (Soviet Union first half of 1973)
Design and operation of heat rejection systems to include cooling water supply for large-size nuclear and thermal power plants	Atomic Energy Commission	Initial working meeting for information exchange and development of detailed program for cooperation (Soviet Union, second half of 1973)
Design and operation of air pollution reduction and waste disposal systems for thermal power plants.	Tennessee Valley Authority	Initial working meeting for information exchange and development of detailed program for cooperation (United States, second half of 1973)
UHV transmission technology 750 Kv-1500 Kv a.c. ±500Kv-±1200 Kv d.c.	Bonneville Power Administration	Exchange experts in 1973 and define common research effort Symposium in Soviet Union 1974 (mechanical) Symposium in United States 1974 (electrical)
Electric power system planning and dispatching	Tennessee Valley Authority	Exchange experts and information in 1973 Symposium in Soviet Union in 1974
Superconducting transmisimision technology	Atomic Energy Commission	Exchange experts and information in 1973 Symposium in United States in 1974
Development of commercial scale open cycle power plants	Office of Coal Research	Exchange of technical information Joint theoretical and experimental research, including testing of equipment such as materials, channels, and magnets produced by one country in the facilities of the other country Cooperative design of power plants Feasibility studies for joint construction of initial commercial units.
General solar energy technology	National Science Foundation	Regular exchange of scientific information
	National Areonautics and Space Administration	Exchange of expert groups in 1973; exchange of information and experts will be carried out in all fields of solar energy use.
General geothermal technology	National Science Foundation	Exchange of expert groups in 1973 for visiting laboratories and field areas and for developing detailed programs for further cooperation.
Application of computers to management:		
Theory of systems analysis applied to economics and management	National Science Foundation	Parallel and joint implementation of individual stages of the work; exchange and dissemination of reports; actual forms of cooperation will be determined by mutual agreement between institutions
Computer applications and software for creating system solutions for large general purpose problems in the field of management	National Science Foundation	Exchange of appropriate literature and working descriptions and results Seminars on technical details of mathematical and statistical techniques of such large systems including actual case examples Exchange visits for work familiarization Development of joint work projects
Econometric modeling (Development of forecasting models for analyzing various branches of the economy)	National Science Foundation	Exchange of appropriate literature and work reports Seminars and work project reviews Exchange visits for work familiarization
Use of computers for managing of large cities.	Department of Housing and Urban Development	For managing functional activities, analyzing of decision alternatives, analyzing and planning city operations, and operational control of city services.

APPENDIX I

Areas of interest	U.S. lead organizations	Forms of cooperation
		For managing and administering the internal resources and activities of city agencies. For forecasting and guiding long-term development of urban areas.
Theoretical foundation for design, development, and production of software	National Science Foundation (Courant Institute, at New York University)	Exchange of publications and technical reports and joint seminars coordinated parallel projects for implimentation and experiment and actual forms of cooperation determined by mutual agreement between cooperating institutions
Water resources		
Planning, use and management	Bureau of Reclamation	1972 exchange of information; 1st half of 1973, development joint program 2nd half of 1973 discussion and approval of joint program
Cold weather construction techniques	Army Corps of Engineers	1972 exchange of information 1973, development of programs to test the cold-weather construction techniques and materials
Methods and means of automation and remote control in water resource systems	Bureau of Reclamation	1972 exchange of information 1st half of 1973 development of the joint research program
Plastics in construction	Bureau of Reclamation	1972 exchange of information and samples; 1973 develop of joint program for testing materials, installations and equipment, initiate research
Chemical catalysis:		
Catalysis by coordination complexes and organometallic compounds	University of Chicago	Collaborative research programs Direct exchange of information relevant to project Exchange scientific personnel at junior and senior levels. Cooperative discussion of research results
Catalytic reactor modeling	University of Notre Dame	Exchange scientific personnel Joint symposiums on specific program topics Cooperative modeling and design of catalytic reactors of mutual interest. Proposals for specific cooperative programs will be prepared by coordinators within 2 months
Indepth study of selected catalytic systems	Gulf Research Corporation	Exchange scientists periodic joint seminars
Application of catalysis to life-support systems for possible use in future space exploration	National Aeronautics and Space Administration	Direct exchange of project information Exchange of scientific personnel at junior and senior levels Design joint program to develop most promising catalytic schemes Program coordinators will be designated by working group chairmen within 2 weeks; proposals for specific cooperative programs will be prepared by coordinators within 2 months
Catalysis in environmental control	Universal Oil Products Co.	Fundamental studies of nitrous oxides decompositions catalysis
Production of substances employing microbiological means		
Development of technology for industrial production of food and feed proteins	National Science Foundation	Parallel research projects. (U.S. grants made in FY 74.) Exchange of reports and research personnel. Workshops and symposia.
Engineering research and development of instrumentation and methods for computerized simulation-design, and control of processes	National Science Foundation	Do.
Molecular biology of industrial microorganisms	National Science	Do.
Development of methods of producing and using enzymes and other biologically active substances for agricultural, industrial, and analytical purposes	National Science Foundation	Do
Microbiological control of agricultural crop pests	National Science Foundation U.S. Department of Agriculture	Grants and other activities as above to be initiated in FY 75

TOPICS BEING CONSIDERED UNDER ENVIRONMENTAL PROTECTION AGREEMENT

Area	Lead agency	Number
Air Pollution		
Modeling and instrumentation	EPA	3
Control techniques: stationary sources	EPA	11
Control techniques: mobile sources	EPA	3
Water pollution prevention	EPA	4
Agricultural pollution related to production	USDA	4
Urban environment:		
Enhancing urban environment	HUD	9
Preservation of nature and organization of preserves:		
Wildlife conservation	DOI	12
Permafrost	DOI	8
Preserves	DOI	5
Marine pollution:		
From ships	DOI	4
From non-ship sources	DOI	3
Effect on marine organisms	EPA	20
Biological and genetic consequences of environmental pollution:		
Analysis of environment	EPA	3
Biological and genetic effects	EPA & HEW	3
Influence of environmental changes on climate	NOAA	7
Earthquake prediction	DOI	4
Legal and administrative aspects of environmental protection	CEQ	6
TOTAL		109

EPA - Environmental Protective Agency
USDA - United States Department of Agriculture
HUD - Department of Housing and Urban Development
DOI - Department of the Interior
HEW - Department of Health, Education, and Welfare
NOAA - National Oceanic and Atmospheric Administration
CEQ - Council of Environmental Quality

B-179800

PAYMENT OF TRAVEL, PER DIEM, AND RELATED EXPENSES
OF INTERNATIONAL EXCHANGE VISITORS

A problem has developed in the payment of travel expenses of foreign delegations visiting the United States in connection with international cooperative agreements. The Soviet Union, with the objective of conserving available hard currency, has on a number of occasions, proposed receiving side pays arrangements to United States counterpart agencies. Under these proposals the host government would pay travel expenses of visiting foreign delegations with local currency which would not result in an outflow of foreign exchange. A survey of affected United States agencies indicates that certain of them have declined to implement receiving side pays arrangements in the belief that legal authority for such arrangements does not exist. On the other hand some agencies have implemented receiving side pays arrangements on the basis of inappropriate legal authority. Therefore the purpose of this appendix is to review the extant legal authority for agencies to pay the travel expenses of visiting foreign delegations.

The Summit Agreements of May 1972 and the agreement on exchanges and cooperation in scientific, technical, educational, cultural and other fields in 1972 and 1973 were entered into under authority given the President in the Mutual Educational and Cultural Act of 1961, as amended, hereinafter referred to as MECA (22 U.S.C. 2453(a)) governing the negotiation of cultural exchanges which provides:

"S2453. Agreements with foreign governments and international organizations.

"(a) Authorization.

"The President is authorized to enter into agreements with foreign governments and international organizations, in furtherance of the purposes of this chapter. In such agreements the President is authorized, when he deems it in the public interest, to seek the agreement of the other governments concerned to cooperate and assist, including making use of funds placed in special accounts pursuant to agreements concluded in

accordance with section 115(b) (6) of the Economic Cooperation Act of 1948, or any similar agreements, in providing for the activities authorized in section 2452 of this title, and particularly those authorized in subsection (a) (1) of said section 2452, with respect to the expenses of international transportation of their own citizens and nationals and of activities in furtherance of the purpose of this chapter carried on within the borders of such other nations."

The President has also been granted broad authority to arrange and finance cultural exchange delegations under provisions of 22 U.S.C. 2452 which provides in pertinent part as follows:

"S2452. Authorization of activities; grants or contracts for educational or cultural exchanges; participation in international fairs and expositions abroad; other exchanges.

"(a) The President is authorized, when he considers that it would strengthen international cooperative relations, to provide, by grant, contract, or otherwise, for--

* * * * *

"(2) cultural exchanges, by financing--

"(i) visits and interchanges between the United States and other countries of leaders, experts in fields of specialized knowledge or skill, and other influential or distinguished persons * * *"

This statute grants authority to the President to pay the travel, per diem, and equipment transportation expenses of visiting foreign cultural delegations traveling in the United States and would permit (though not require) "receiving side pays" arrangements, where delegations were being exchanged.

Further it would appear that the President has delegated the cultural delegation travel financing authority he has under 22 U.S.C. 2452(a)(2) and (b) to the Department of State, and to a limited extent,

to the United States Information Agency, the Department of Commerce, and the Department of Health, Education and Welfare, in Executive Order No. 11034, June 25, 1962, 27 F. R. 6071, as amended by Executive Order No. 11380, November 8, 1967, 32 F. R. 15627.

Executive agencies and departments with responsibilities under international cooperative agreements entered into on the basis of MECA, that have not been delegated authority under 22 U.S.C. 2452(a)(2)(i) to finance visits of foreign delegations may seek authority from the Department of State, to enter into receiving side pays arrangements. If the receiving side pays arrangement is authorized, funds for this purpose may be obtained from the Department of State out of appropriations controlled by that Department for Mutual Educational and Cultural Exchange Activities. This approach appears feasible where the scope of international cooperative activities carried on by the agency is limited, they require only a small amount of funds, and are the type of activities contemplated by MECA.

Agencies and departments with more extensive responsibilities under MECA international cooperative agreements may request the President to directly delegate travel financing authority under provisions of 22 U.S.C. 2452(a)(2)(i) specifically to them. This delegation could be accomplished by further amendment of Executive Order No. 11034, June 26, 1962, 27 F. R. 6071 as amended by Executive Order No. 11380, November 8, 1967, 32 F. R. 15627. Each agency receiving such delegation of authority could seek travel funds for foreign delegations in its annual appropriations and could negotiate receiving side pays agreements with counterpart agencies. It should be noted however, that pursuant to 22 U.S.C. 2454, a proposal to delegate authority under MECA must be submitted to Congress for a 60-day period before it is implemented, which would require prior planning on the part of agencies seeking such delegation to avoid delays.

In addition, the activity in question must meet the criteria set forth in MECA. In this regard, a literal reading of the law and a review of the legislative history of the MECA raises doubt as to whether Congress intended to grant authority for joint laboratory level scientific and technical research projects through the enactment of that legislation. Hence, there is a question as to whether the MECA would be the proper statutory vehicle to support travel expenses for projects of this nature. In this connection, certain executive agencies have independent statutory authority to engage in international cooperative efforts and to negotiate agreements with foreign governments without reference to MECA. For example, the National Aeronautics and

Space Administration, pursuant to 42 U.S.C. 2475 and the National Science Foundation, pursuant to 42 U.S.C. 1870 and 1872, have authority under specified conditions to enter into agreements with agencies of foreign governments. It is possible to construe the broad grants of authority as encompassing authority for receiving side pays arrangements, funded from their own appropriations.

On the other hand, agencies which have projects that do not come within the purview of MECA, and are without independent statutory authority permitting them to enter into international cooperative agreements, would be unable to enter into receiving side pays agreements with foreign agencies. The only avenue available to this class of agencies is to seek specific statutory authority that would permit receiving side pays arrangements. Unfortunately this approach may not provide a very practical solution for agencies which have responsibilities under relatively short term international agreements in view of the lead time required to obtain such legislation.

APPENDIX IV

APPROVED EXPORT-IMPORT BANK CREDITS TO THE SOVIET UNION

AS OF FEBRUARY 7, 1974

Item	Export value of sale	Exim loan	Approved	Rate	Repayment period	Repayment starting date
	(000)					
Submersible electric pumps	$ 25,937	$ 11,672	2-21-73	6%	7 years	8- 5-74
Plant to produce tableware and dishware	6,893	3,102	3- 5-73	6%	10 years	3-10-76
Kama River truck plant	342,120	153,950	3- 5-73	6% & 7%[1]	12 years	10-10-77
250 Circular knitting machines	5,620	2,529	9- 6-73	6%	7 years	2-10-75
Second tableware plant	21,833	9,825	11-26-73	6%	10 years	11-15-75
2 Assembly lines for mfg. pistons	14,358	6,461	11-26-73	6%	8 years	11- 5-75
38 Gas reinjection compressors	26,252	11,813	12-20-73	6%	7 years	11- 5-75
Iron ore pellet plant	36,000	16,200	12-20-73	6%	8 years	5-20-77
Machining friction drums	5,580	2,511	12-20-73	6%	8 years	11- 5-75
Transfer line for mfg. pistons	15,722	7,075	12-20-73	6%	8 years	5- 5-76
Total	$500,315	$255,138				

[1]86,450 @ 6%
67,500 @ 7%

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

OFFICE OF THE
DIRECTOR

Jul 16, 1974

Mr. Gregory J. Ahart
Director, Manpower and Welfare Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Ahart:

This is to furnish the comments of the National Science Foundation on the draft report entitled "A Progress Report on United States-Soviet Union Cooperative Programs."

Our comments on the report are in three categories: (I) those of a general nature necessary to place the subject matter of the report in perspective; (II) comments on the specific recommendations; and (III) comments on specific sections of the draft report containing statements requiring clarification.

Sincerely yours,

H. Guyford Stever
Director

Attachment

APPENDIX V

NATIONAL SCIENCE FOUNDATION COMMENTS ON THE GAO DRAFT REPORT ENTITLED "A PROGRESS REPORT ON UNITED STATES-SOVIET UNION COOPERATIVE PROGRAMS"

I GENERAL

We view the report primarily as a historical document tracing the origins and progress of the various U.S.-U.S.S.R. cooperative science and technology agreements. In tracing the progress of the various agreements, the GAO report either specifically or by implication is critical of (A) the long time required for project definition, (B) adequacy of initial funding, and (C) lack of a Congressional capability of program oversight due to fragmentation of responsibilities among Federal agencies. While the contents of the report are applicable to all participating Federal agencies and to OMB, we have prepared comments relating to the critical nature of the report as it affects NSF, which we believe it important that the GAO consider in any revision of the draft report.

A. The Long Time Required for Project Definition.

Our comments deal primarily with parts of the GAO report which address those areas of the U.S.-U.S.S.R. Agreement on Cooperation in Science and Technology (S and T Agreement) in which NSF has the lead agency role.

Any assessment of progress under the U.S.-U.S.S.R. Agreement on Cooperation in Science and Technology must take account of the long range U.S. goal of the Agreement; namely, to promote large-scale U.S.-Soviet cooperation in science and technology. However, such an objective of enmeshing the scientific-technical communities of the two largest systems in the world has to be unavoidably pursued in the context of differing political systems, organizational approaches and cultural outlook.

In such a context, short term progress to October 1973, the time frame of the GAO report, can reasonably be measured primarily in terms of the development of a procedural and organizational framework that provides the basis for ultimate, large-scale U.S.-Soviet scientific and technological cooperation. Measured in such terms, significant progress has been made. Thus, the U.S. is:

1. Becoming more familiar with the internal operations and relationships of Soviet scientific and political organizations. This can improve our effectiveness in dealing with the Soviets and affect the pace of future progress.

2. Identifying the potential Soviet research institutes and scientists who can be involved in joint research projects.

GAO note: Page number references in this appendix may not correspond to the pages of this report.

3. Establishing personal ties that can hopefully transcend the ups and downs of political tensions and, at a minimum, promote long-term U.S.-Soviet scientific relations.

In the longer term (beyond the next few years), the above-noted short-term accomplishments will not suffice. Once the procedural-organizational framework has been established, progress will have to be measured in terms of real research results and technology made available to both sides on the basis of mutual benefit, equality and reciprocity, as provided for by the S and T Agreement.

U.S. Strategy Governing Pace of S&T Agreement Activities

Progress in the S&T Agreement to date must be measured against the foregoing background. The rationale and strategy for a careful, step-by-step approach on the U.S. side, which has been adhered to thus far, should be clearly understood. It has been the experience of those involved in international scientific cooperative projects that mutual reciprocity is best insured if each activity is planned to be carried out in stepwise phases. Each phase of the project can be evaluated for reciprocity, mutual benefit and equality before proceeding on to the next step. Such a careful step-by-step approach has required a greater time than initially expected and has contributed to the delays encountered so far. Since each technical agreement resulted from a deliberate effort to identify areas where the potential for mutual benefit and reciprocity was clearly evident, nothing in our experience to date has compromised this prior assessment of potential. However, all participants have learned to appreciate the practical problems involved in seeking this balance.

A Non-Valid Comparison

The GAO makes reference to the considerable progress made in the U.S.-U.S.S.R. Space Agreement in comparison with the other Agreements. However, the Space Agreement cannot be equated with other U.S.-Soviet agreements such as the Science and Technology Agreement. The Space Agreement involves large-scale, national U.S. and U.S.S.R. programs; these are totally within Governmental control on both sides and have been going on (by comparison with other programs) for a long time. Then, too, the joint space activities are taking place at just a few selected centers in both countries. Moreover, the U.S. has committed some $280 million to this program.

By contrast, the S&T Agreement involves a small scale, "people-to-people" approach designed to engage numerous individual scientists on both sides in the many research institutes and universities scattered throughout both countries. Such an approach cuts across all the limits that have been placed by the Soviet regime on contacts between foreign and Soviet people. It thus triggers the regime's greatest sensitivity.

Moreover, on the U.S. side, the scientific community is not under Government control and, therefore, requires the enlistment of voluntary interest in U.S.-Soviet scientific cooperation. To develop such interest takes time, as reflected in the time that it has taken to identify and compose the membership of U.S. sides of the Working Groups and to develop joint plans for cooperation.

The S&T Agreement, like the Environmental Agreement, also involves a large number of other Federal agencies. By contrast, in the Space Program, the U.S. acts through only one agency (NASA) and can designate in short order the U.S. members of the Working Group from NASA's own ranks. For these reasons, the U.S.-Soviet Space Program should not be compared with other agreements in terms of organization, funding, procedures, and short-term progress.

B. Adequacy of Initial Funding.

The matter of adequate initial funding is directly related to the time consumed by program definition. The OMB, as well as the Congress, would be reluctant to approve little more than "seed money" prior to completion of the specifics of program definition and some rather valid estimates of annual or total costs. To be specific, the report (page 3) states "**, as of October 1973, project plans had not been finalized ***". This was after the agencies had submitted their FY 1975 budget estimates to the OMB. The subsequent last-minute addition of relatively small programs during the overall Federal budget decision process is difficult and with limited prospects of success.

Another factor related to funding is that funds for cooperative science and technology projects must compete within constrained budgets with other meritorious projects and programs for adequate resources.

In recent years the NSF has had some success in obtaining additional funding for its program of International Cooperative Science Activities -- for example, a 52.4 percent increase in FY 1974 over the FY 1972 level. This increase includes an energy-related $400,000 increase obtained in the FY 1974 supplemental appropriation. Also, the NSF has recently opened a science liaison office in Bucharest to facilitate liaison and interaction between U.S. scientists and those from the U.S.S.R. and other East European countries.

C. Lack of a Congressional Capability of Program Oversight.

Throughout the report either interest or direct reference is made to a lack of a program oversight mechanism for Congress. There are basically three separate elements which any oversight function must recognize. These are:

(1) Funds used to support joint project activities.

Project support funds include contracts and grants with the performers involved in the exchange as well as the support of compensation and travel for non-government participants in the exchanges. These funds can normally be traced to the operating budget of each executive agency.

(2) Funds used to support government personnel associated with the agreement.

Government activity associated with the agreement involves the direct travel and expenses of government participants and the indirect costs associated with identifying staff requirements dedicated to the U.S.-U.S.S.R. exchanges. These expenses are difficult to identify and separate from the costs of other functions being performed at the same time.

(3) The assessment of the results of the exchanges.

The assessment of the technical progress in these exchanges is an ongoing function. In his role as Science Adviser, the Director of NSF has been working with the interested agencies in structuring a formal review of the scientific and technical progress of all the technical agreements with the Soviet Union. The results of this review, when available, will be reported to the Congress.

The technique chosen to provide oversight should recognize the three preceding elements. In addition, the oversight should reflect, as well, the development of various levels of detail within each agreement. The aging process of an agreement proceeds through various levels from the general agreement level to the definition of areas of cooperation. Within each area, projects are defined. Each project level may result in one or more specific activities. This last level is the most detailed level and consists primarily of the joint activities which lead to the mutually beneficial technical exchanges. At any specific time the entire set of agreements will exist with different levels of development between agreements. Mechanisms exist, presently, to produce information to provide the Executive Department with oversight on the entire set of technical agreements with the U.S.S.R. The same information could be provided tc the Congress so that perspective and oversight on all technical agreements can be obtained.

II COMMENTS ON SPECIFIC RECOMMENDATIONS

Pages 8 - 10. GAO's recommendations and suggestions are well taken. Specific comments follow:

Page 9. "--Emphasize the need to progress from merely exchanging visits to real cooperative efforts."

Productive, cooperative effort cannot be initiated without first achieving a "meeting of minds." (Given the difference between the U.S. and Soviet systems noted earlier, this requirement applies with particular force to U.S.-Soviet activities.) Exchange visits are designed to serve this necessary first-step purpose.

Page 10. "--Require participating agencies to identify all costs associated with the programs."

Such identification may not be entirely feasible, unless drastic changes are made in Federal accounting systems. This is true because present cooperative programs are directly linked to domestic programs and priorities. Budgets are defended primarily on the basis of such internal scientific and technical programs rather than on arguments concerning scientific and technical cooperation with the U.S.S.R.

Page 10. "--Determine the long range funding and personnel requirements of the agreements."

This is almost impossible to do meaningfully in the early stages of cooperation; after the project definition stage when costs can be reasonably estimated, such long-range planning can and should occur.

Page 10. "--Arrange the necessary Russian language training and translating facilities to meet the needs raised by the agreements."

Training would be more costly and completely outside of the time frame for implementation of projects. As for translation facilities, these already exist; only financial resources must be provided.

III COMMENTS ON SPECIFIC SECTIONS

The following specific comments are keyed to the various points made in the Digest section of the GAO draft report:

Page 3. "...Activities under the Science and Technology and the Environmental Protection Agreements have chiefly consisted of negotiating meetings for working out frameworks for cooperation."

Long and difficult negotiation toward agreement on a framework of cooperation and on program and project definition is inherent in bilateral cooperative activities in which cultural, language and political considerations impose formidable constraints. These difficulties are not normally found in similar domestic efforts. They apply with particular force to U.S.-U.S.S.R. relations. Despite this, progress in specific areas

has been made. For example, in the area of U.S.-U.S.S.R. scientific and technical information cooperation, the rate of progress in developing a cooperative program and initial exchange of information has been rapid. Within six months, through correspondence and an exchange of two symposia, agreement was reached on specific areas for cooperative development and on a general program plan.

Page 3. "...the exchange of information has been limited and of little technical benefit to the United States."

It is premature to require the demonstration of technical benefit from all agreements at the present time. Progress has been made in all agreements toward defining specific projects and activities which will benefit the technical capability of both Nations, even though the implementation of the actual detailed joint project activity has been achieved in only a few cases as yet. It is this joint project activity which will yield the expected technical benefits to the U.S. However, some significant achievements can be noted even now. For example, our experience in the scientific and technical information areas, even in the preliminary negotiating stage, has been most productive; the group of U.S. Information Specialists who visited the U.S.S.R. in June 1973 returned with information that resulted in publication of a current, informative overview of the U.S.S.R. Scientific and Technical Information System. This is something that 10 years of study of Soviet-published sources of information has not succeeded in bringing together as coherently and meaningfully.

Page 6. "...large number of projects might be less conducive to tangible results than would a smaller number of adequately funded projects."

This observation is valid, but has already been acted on in a number of instances. For example, in the area of application of computers to management the number of project areas has deliberately been limited in order to achieve tangible results and the greatest impact within the shortest possible time. In other substantive areas, the assessment of the number of potential projects that can be efficiently managed and be productive must await the results of activities under present NSF grants in the S&T Agreement. This will determine what can or cannot be done further, in terms of expansion or contraction of the number of projects, as for example in the Chemical Catalysis case.

Page 7. "...the progress of any cooperative effort will be limited if American scientists and technicians do not have the capabilities or facilities to readily translate materials and data received from the Soviet Union."

The plain fact is that U.S. scientists and technicians do not possess Russian-language capability sufficient to cope with the situation. However, there are ample facilities available commercially and within the U.S. Government (the U.S. Joint Publications Research Service) to handle their requirements. The cost involved is not more than the price that must be paid in a free-market-oriented economy on which the U.S. system is based.

A long-term, and probably more expensive, alternative solution is to fund once again language development programs as integral parts of undergraduate and graduate science curricula. (The programs under the National Defense Education Act have virtually vanished because of lack of adequate Federal funds.) Also, centralized funding and management of translations for the entire S&T Agreement may deprive participating agencies of the flexibility they need in getting their job done. Past experience does not serve as great witness to any economies gained thereby.

Other Comments

Some of GAO's comments have been overtaken by time, as will be illustrated below in the Computer Applications and the Microbiology areas. (This is understandable since GAO's report covers activities only up to October 1973, on the eve of some of the productive project planning and development.)

Thus, the comments in the second paragraph on page 27 concerning the lack of progress in the "production of substances employing microbiological means" was correct at the time the report was written. Presently, however, project coordinators have been appointed. They have contacted their counterparts, and the co-chairmen have defined the specific areas of common interest. The latter activity should result in final agreement on joint projects at the Joint Working Group meeting to be held within the next few weeks.

In the area of Computer Application to Management, the GAO report comments largely on the early work on the Joint Working Group. Specific references are made to the Working Group's report prepared during the October 1972 meetings. The GAO comments pertain primarily to the situation existing at that time. The program has evolved considerably since then. It did not seem advisable to assign coordinators while the program was still in a formative stage. In order to be more definitive in developing the cooperative program, it was decided early on that the U.S. side required direct contact with the pertinent Soviet institutions and scientists in addition to Soviet ministries. After such contacts, the topics were restructured, defined in more detail, and assigned coordinators. Since then, active work has been underway on three topics. It should be reiterated that the pace in this substantive area has been governed on the U.S. side by a deliberate policy of keeping tight control to promote mutual benefit, equality and reciprocity, and to avoid a one-way transfer of computer technology to the U.S.S.R.

The Foundation has focused on developing a strong basis for activities deemed to be of mutual benefit and, particularly, of interest to the U.S. While it may appear to some that the pace could be quickened, progress is in keeping with the phased step-by-step strategy on the U.S. side noted earlier. We believe it takes time to build up the necessary working relationships and to reflect on and react to all the many considerations involved, especially broad U.S. Government policy.

The reference to a need for more effective exchange of information made on page 27 is sound provided it is understood that to obtain timely information from the U.S.S.R. is often difficult. Thus, in the example on page 28, it should be noted that it took the Soviets three months to respond to an American letter. Our experience indicates that this is not unusual.

The "receiving side pays" principle (page 37) is in effect for all projects involving the NSF.

On page 88, appendix I, the heading is "U.S. lead agencies," but opposite "Chemical catalysis," the Universities of Chicago and Notre Dame, the Gulf Research are listed. Since these are not agencies of the U.S., this is confusing. Under "Production of substances employing microbiological means," no U.S. lead agency and no forms of cooperation are given. These are updated in the attached page.

APPENDIX V

Area of interest	U.S. lead agencies	Forms of cooperation
Production of substances employing microbiological means		
Development of technology for industrial production of food and feed proteins	NSF	Parallel research projects. (U.S. grants made in FY 74.) Exchange of reports and research personnel. Workshops and symposia.
Engineering research and development of instrumentation and methods for computerized simulation design, and control of processes	NSF	" " "
Molecular biology of industrial microorganisms	NSF	" " "
Development of methods of producing and using enzymes and other biologically active substances for agricultural, industrial, and analytical purposes	NSF	" " "
Microbiological control of agricultural crop pests	NSF (USDA)	Grants and other activities as above to be initiated in FY 75

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Jul 17, 1974

THE ADMINISTRATOR

Dear Mr. Eschwege:

This is in response to your letter of May 13 requesting comment on the GAO draft report entitled "A Progress Report on United States-Soviet Union Cooperative Programs."

I am pleased to say that we support the guidelines and suggestions outlined in the report. The Agency, in fact, is presently working through the US-USSR Program of Cooperation in the Field of Environmental Protection to promote these recommendations.

We welcome your comments on our enclosed submission.

Sincerely yours,

Russell E. Train

Mr. Henry Eschwege
Director
Resources and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Enclosure

APPENDIX VI

I. CONCLUSIONS AND RECOMMENDATIONS

We concur in the conclusions and recommendations of the draft report. They are proper subjects for concern and have, for the most part, already received appropriate emphasis and follow-up in the environmental program.

In all but a very few instances, specific topics for cooperation were identified and joint work plans were adopted at the first meeting of each joint working group. Implementation of most projects is well under way.

Determination of priorities will be based on relative potential of the various projects. The draft report correctly indicates that a large number of topics have to be pursued initially in order to identify the most productive areas of cooperation. At present we believe it would not be practical arbitrarily to assign priorities. Those projects which prove their own merit will be vigorously pursued. Those which prove unproductive will be terminated. To date, efficient management of the program has not appeared as a function of the number of projects involved.

The draft report correctly identifies the need for identification of costs and personnel associated with the program. To date, costs have been borne within existing appropriations on the premise that the work done is complimentary to the domestic responsibilities of the participants. Project chairmen are accountable for their costs, and are currently able to provide this information.

We agree that improved translation and language training capabilities are required. In addition to our concerns under the USSR Agreement, this issue might usefully receive Congressional attention as a national priority. In our dealings with other countries, the U.S. appears to be at a relative disadvantage in terms of scope, availability, and cost of translation services.

We support the recommendation calling for annual progress reports. We have, after each of the Joint Committee meetings, provided copies of our progress reports and other pertinent documents to those Congressmen who oversee environmental matters and those who have expressed interest in receiving the materials. It would not be difficult to formalize this procedure into an annual report.

Specific funding of activities under the Environmental Agreement would be welcome support for this important program.

GAO note: Page number references in this appendix may not correspond to the pages of this report.

II. LEVEL OF ACTIVITY OF THE PROGRAM

We generally agree with the comment on page seven of the draft that "programs evolving from the cooperative agreements are too new to produce significant achievements or to predict potential benefits." This does not prevent us from making preliminary assessments, and in most cases there is agreement that implementation of the project plans adopted at the first meeting of most joint working groups is proceeding satisfactorily. Naturally, there are differences in the pace of different groups, given differing degrees of complexity of subject matter, differing national problems and priorities, and sometimes the personalities of the project chairmen themselves.

While there is a political element in the Agreement's contribution to improved US-USSR relations, the primary goal is attainment of scientific returns leading to improvement of the environment.

It is true that the timing and significance of returns from the projects varies, and in some instances may take several years. In others, meaningful results will come much sooner. For instance, the earthquake prediction project appears to be validating a technique developed by the Soviets for more accurate prediction. The potential savings to U.S. citizens and industry are considerable, when one considers the injuries and damages which could be avoided through accurate prediction.

Differences in approaches are seen as enhancing the productivity of joint efforts. Through comparison of differing assumptions, methods, and technical approaches, each side can better evaluate the strengths and weaknesses of its own work.

Personnel exchanges have been emphasized as an important aspect of the cooperative program, and are now getting under way.

III. FUNDING

One of the fundamental premises of the program to date is that work undertaken is to be closely tied to the U.S. project chairman's existing domestic responsibilities. Activities have been set up out of existing funds, as being more likely to promote meaningful efforts than "add-on" funding at early stages of cooperation.

Early in the program strong emphasis was placed on the principle of "receiving side pays" requested by the Soviets as the basis for funding foreign travel. Currently, the general

Counsels of EPA, the National Oceanic and Atmospheric Administration, and the National Institute of Environmental Health Sciences are proceeding on this basis. Other agencies disagree, as their general counsels have concluded that their organizations do not have similar authority. We understand the Legal Adviser to the Department of State believes that not all participating organizations have authority to proceed on this basis. We would be pleased to receive the opinion of the General Counsel of GAO in an effort to resolve this issue.

IV. BENEFITS

As the draft report notes, it is difficult to assess accurately the potential benefits of the program at this point. While some may see a net benefit to the Soviets to date, such has been the experience under other contacts with the Soviets in the past. We believe that a certain amount of pump priming in the interest of establishing the program has been a valid approach.

As we noted above, our participation in this effort is based on the expectation of mutual benefit from foreign cooperation on topics of mutual concern. We have found Soviet project chairmen to be generally forthcoming and constructive. In most projects there is a substantive flow of useful information between the meetings of the joint working groups.

Similarly, we do not believe that use of the Urban Environment Working Group to characterize other environmental projects is apt. We attach language proposed by HUD to replace the materials at pages 50-52. We would also be pleased to assist in providing an illustration more representative of the environmental agreement.

Overlap of responsibilities between the Environmental Agreement and other agreements has not caused any substantive problems. In some cases, overlap has indeed been a benefit. For instance, the Soviet side has indicated that it is unable to include work on health effects of noise under the Environmental Agreement. Since this is a topic of concern to the U.S., we are making arrangements for the project to be carried out under the US-USSR Health Agreement.

V. INVOLVEMENT OF THE PRIVATE SECTOR

The draft report depicts the emphasis which has been placed on involvement of the private sector in the Agreement. This section might be enhanced by mention that this participation has been solicited through representative national organizations potentially interested in the projects. One means of solicitation has been through the Department of Commerce. There has been a positive response, and representatives of trade and manufacturing organizations are members of a number of joint working groups. In addition, the project chairmen have used their projects as a vehicle for informing potential Soviet customers of the capabilities and interests of U.S. industry.

The date indicated for the pollution control exhibition and symposium on page 75 is no longer current. Marketing research and preparation lead times have required postponement, as has difficulty in arranging suitable exhibition space. The current target date is late 1975 or early 1976.

VI. CORRECTIONS

There are a few instances where factual statements in the draft should be modified to reflect the current situation:

Page 3: As of October 1973, initial project plans had been finalized in nearly every area.

Page 45: The Environmental Agreement is not limited to exchange of technology, but involves techniques, information, data, and practices as well.

Page 46: The President has designated Russell E. Train personally as Chairman of the U.S. side of the Joint Committee.

Page 47: At the conclusion of the first meeting a single Memorandum was agreed on specifying topics to be covered and identifying lead agencies.

Page 48: Two working groups (air pollution and modeling and earthquake prediction) currently have instruments and technicians in the Soviet Union for side-by-side field comparisons of instruments and techniques. Several exchanges of scientists for extended periods are now under way.

Page 49: There has been no designation of priorities as indicated.

APPENDIX VI

Suggested Revision of Pages 50 and the First Two Paragraphs of Page 52

The urban environment is composed of many different but interrelated factors. The joint working group which deals with this subject is one of the broadest and most diverse of the groups established under the Agreement. Nevertheless, its two joint meetings have enabled the US Group to determine the potentially most fruitful areas of cooperation. A work program has been agreed upon which consists of one joint project (development of criteria for the selection and location of new communities), further discussions and exchanges of visits by specialists in five topics, and exchanges of formal and informal papers on ten.

Basic information has been exchanged on comprehensive planning and development, construction technology and waste management in permafrost areas, solid waste management, noise abatement and control, urban transportation planning, historic preservation and parks and the planning and development of new communities. Exchanges also have been initiated on recreation zones on the edges of urban areas and the management and modernization of existing housing.

Soviet experts discussed these subjects with US officials in Atlanta; San Francisco; Washington, D. C.; Reston, Virginia; and Columbia, Maryland during the first joint working group meeting in April 1973. The US team which attended the second joint meeting in the USSR, the following November, was briefed by Soviet officials in Moscow, Leningrad, Tashkent, Samarkand and the Soviet new town of Togliatti.

As a result of these meetings, the US Group believes that the US stands to gain from a greater knowledge of Soviet historic preservation techniques. Although differences between Soviet and US political, planning and land development systems seem too great to permit much transfer of methods of urban growth, the Group believes that much can be learned from a comparison of US and Soviet criteria and standards, and from the further investigation of Soviet techniques in the planning and actual development of new communities.

The Soviets, on the other hand, stand to gain from a knowledge of US solid waste collection and management programs and of US practices in handling tourists in historic towns, etc. The USSR also wished to initiate a joint transportation project on the rational determination of inter-model allocation. The US is currently studying detailed work programs submitted by the Soviets on this subject, and on the criteria for the selection and location of new communities.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

REPLY TO
ATTN OF: D

Jun 20, 1974

Mr. R. W. Gutmann, Director
Procurement and Systems Acquisition Division
United States General Accounting Office
Washington, DC 20548

Dear Mr. Gutmann:

Thank you for giving us the opportunity to comment on the GAO draft report entitled "A Progress Report on United States-Soviet Union Cooperative Programs."

We are pleased to have an independent objective assessment of the Apollo-Soyuz Test Project as a means of overcoming some of the difficulties in cooperating with the Soviet Union in the area of science and technology.

Enclosed is a NASA position paper which contains some detailed comments on the report. This enclosure suggests that the report also address the NASA/Soviet Academy agreement of January 1971 on cooperation in space science and applications. We believe that agreement has resulted in perhaps less spectacular but nonetheless significant cooperation. The enclosure also identifies several impressions conveyed by the report which may be quite misleading and sets out relevant facts which apparently did not come to the attention of the auditors during the course of their field work. In addition, the memorandum contains comment on two of the conclusions and some suggestions for specific editorial changes.

We request an opportunity to see the revised draft of those parts of the report which relate to US/USSR space cooperation after your staff has had an opportunity to consider our comments. Please let us know whenever we can be of further assistance.

Sincerely,

Bernard Moritz
Associate Administrator for
Organization and Management

APPENDIX VII

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

REPLY TO
ATTN OF: I

Jun 13, 1974

MEMORANDUM

TO: D/Associate Administrator for
Organization and Management

FROM: I/Assistant Administrator for
International Affairs

SUBJECT: Comments on GAO Draft Report, "A Progress Report on United States-Soviet Union Cooperative Programs"

The GAO draft "Progress Report on United States-Soviet Union Cooperative Programs" concludes that the Apollo-Soyuz Test Project demonstrates that problems which may have impeded progress under other summit agreements in the area of science and technology may be overcome. Thus we have an independent and positive assessment of the project approach which has been from the first an essential part of the NASA approach to international cooperation.

The following detailed comments are grouped for clarity under four headings: (1) Progress under NASA/Soviet Academy Agreement of January 21, 1971, (2) Possibly Misleading Impressions, (3) Conclusions and Recommendations, and (4) Suggestions for Specific Textual Changes.

Progress under NASA/Soviet Academy Agreement of January 21, 1971

We fully agree that the Apollo-Soyuz Test Project is an excellent example of how cooperation with the Soviet Union can be effectively pursued. However, enthusiasm for ASTP should not obscure the fact that there has been very gratifying progress under the NASA Soviet Academy Agreement of January 21, 1971 for cooperation in space science and applications (cited on p. 62). The following are among the results of Joint Working Group activity under this agreement: a scientifically productive exchange of lunar samples acquired in the Apollo and Luna programs; an

GAO note: Page number references in this appendix may not correspond to the pages of this report.

exchange of data which should assist both sides in their future missions to Mars and Venus and which includes a special briefing on June 5-6 for Viking Project scientists and engineers on the results of the recent Soviet Mars missions; a successful joint ship-aircraft experiment in coordinated microwave measurements in the Bering Sea area; and a continuing and detailed exchange of physiological data from Soviet and US manned space flight and ground-based programs. The GAO report should include some appropriate reference to these achievements.

Possibly Misleading Impressions

Although it cites ASTP as a model for other agencies engaged in cooperation with the Soviet Union, the GAO report in its present form conveys a number of possibly misleading impressions which should be corrected. The impressions are listed below along with statements of the factual situation:

(1) Impression: ASTP represents a serious commitment prior to Congressional authorization (see pp. 6, 82) and for two years received "back door funding" (p. 69).

Relevant Facts:

-- The leadership and staffs of the House and Senate space committees were informed of discussions with the Soviets as they occurred, although the final confirmation of readiness to proceed had to be communicated after the Summit Agreement in order to protect that agreement.

-- On March 3, 1971, during Hearings on the 1972 NASA Authorization, Dr. Low reported to the House Committee on Science and Astronautics on the NASA/Soviet Academy Agreement of October 1970 to explore requirements for compatible rendezvous and docking.

-- On March 17, 1971, Dr. Low reported on the same agreement to the Senate Committee on Aeronautical and Space Sciences during a Hearing on Space Cooperation between the United States and the Soviet Union.

-- On March 2, 1972, Dr. Kraft described for the House Subcommittee on Manned Space Flight the status of our discussions with the Soviets, including the December 1971 Working Group conclusion that a test mission was feasible.

-- On March 14, 1972, during Hearings on the 1973 NASA Authorization, Dr. Low told the Senate Committee on Aeronautical and Space Sciences that we had "discussed with the Soviets the possibility of conducting a joint experiment using existing spacecraft, Apollo and Salyut, in the 1975 time period." In response to a question the same day, Dr. Fletcher provided the following statement for the record: "Continuing technical discussions are under way with the Soviets on the possibility of an experimental docking mission in which a Command and Service Module left over from the Apollo Program would dock with a Soviet Salyut spacecraft. No decisions have been made.* We are doing studies within the Office of Manned Space Flight and are using Apollo 1972 funds to make sure that the hardware could be made available if it is decided to undertake a mission of this type.* If further work is required in fiscal year 1973 to keep the option open we will seek to accomplish such work within the funds requested for Skylab. Although no funds are specifically identified for such a mission, the budget does not preclude that possibility."

-- On June 1, 1972, the President, in a special report to a Joint Session of Congress, specifically stated that the joint mission was subject to Congressional approval of funds: "We have joined in plans for an exciting new adventure --- a new adventure in the cooperative exploration of space which will begin, subject to congressional approval of funds, with the joint orbital mission of an Apollo vehicle and a Soviet spacecraft in 1975."

(2) Impression: The Soviets will not have committed any resources to offset the cost to the US of the Docking Module if it proves unnecessary to use the back-up spacecraft and launch vehicle they have committed to the project (pp. 8, 71-2).

Relevant Facts:

-- Even if the Soviets do not use the back-up spacecraft and launch vehicle they have committed to ASTP, they will incur the substantial costs associated with launch preparation, propellant loading, final countdown, and post countdown disassembly and cleaning.

*Underscoring added.

-- The Soviets have had to modify two Soyuz spacecraft to incorporate the new docking system. In our view, it would have been more costly for us to modify the basic Apollo hardware to accommodate the new compatible system than it is to build the Docking Module. We estimate, therefore, that the Soviet commitment in terms of basic spacecraft modifications probably offsets the costs to us of the Docking Module.

-- The Soviets have flown two Soyuz missions and have indicated that they will fly others to test modifications to the Soyuz spacecraft before they use it in ASTP. We are flying no missions in preparation for ASTP.

(3) Impression: The funds we have committed to ASTP are not buying anything tangible that we can use (pp. 73-6).

Relevant Facts:

-- The purpose of the Apollo-Soyuz Test Project is to develop, test, verify, and acquire operational experience with a universal system for rendezvous and docking of future manned spacecraft and space stations.

-- Compatible rendezvous and docking capability should not be considered in terms of space rescue alone. Such compatibility is an important precondition for many future cooperative activities in manned space flight -- for example, the assembly of complex structures in space.

-- Actual rescue capability in the future will depend on the programs of both countries. On the US side, the Space Shuttle will be available. On the USSR side, our discussions with Soviet officials indicate that they too plan on having a compatible rendezvous and docking capability available for their future spacecraft.

-- The Space Shuttle Orbiter, the next US manned spacecraft, will have the capability of carrying a docking module in its cargo bay. Since the Orbiter is the heart of a flexible system designed to accommodate a wide variety of mission modes, the use of a compatible docking system has been planned on a flexible basis with provision for its use where appropriate and feasible in specific missions and with alternate payloads and provision for rescue where its use is not planned. If a spacecraft in distress should

not be equipped with a compatible docking capability, the Shuttle Orbiter would nonetheless be able to effect a rescue if the crew in the disabled craft carried appropriate survival gear, including EVA suits.

-- The discussion of rescue capability in the report is based on the limitations, especially the time required for preparation, of current launch vehicles. A much more rapid response to an emergency situation will be possible when the Space Shuttle System is fully operational. The Shuttle System will have the capability to launch within twenty-four hours after the Orbiter is mated to its booster. We expect Shuttle flights to be sufficiently frequent that we will be able to respond to an emergency situation in a very few days. The Orbiter will be capable of supporting the survival of a four-man crew for ninety-six hours after an in-orbit emergency.

Conclusions and Recommendations

We have the following comments on the "Conclusions and Recommendations" section of the report.

-- We take exception to the characterization of ASTP as an example of "significant commitments prior to Congressional authorization" (p. 82). As detailed above, NASA did inform the appropriate Congressional committees as the technical discussions with the Soviets progressed over nearly two years and before any decisions had been made. When the May 24, 1972 Agreement was announced, the funding transfers proposed by NASA to support ASTP were supported separately by the House and Senate authorization committees. These Congressional actions satisfied the requirements of Public Laws 92-68 and 92-304 (as noted on page 69 of the GAO draft report).

-- We do not believe that it would be desirable in every case to provide for specific Congressional funding of US/USSR cooperation under the Summit agreements (pp.12, 82). Such approval is unquestionably necessary and desirable for a project of the magnitude of ASTP. On the other hand, there are other projects that may properly fall within the scope of more general appropriations for national programs. To enhance a domestic program by implementing it cooperatively may bring both international political and program advantages and at reduced cost.

We would not like to see the ability of US cooperating agencies to take advantage of such opportunities impaired by an inflexible requirement for specific funding.

-- We question the conclusion (p. 83) that the "United States and the Soviet Union will have to open their space programs to each other if the technology achievements of ASTP are to provide future benefits." To realize future benefits, we need only projects which are carefully structured to assure access to information and facilities relevant to the immediate project purpose. Significant cooperation does not depend on either party having extensive access to the space program of the other.

Suggestion for Specific Textual Changes

-- p. 62. At the end of the paragraph on the January 1971 NASA/Soviet Academy agreement, add the following: "Both governments pledged themselves to its fulfillment in the May 24, 1972 Summit Agreement on Space Cooperation."

-- p. 64. To complete the listing of agreements looking toward ASTP, add the following: "April 6, 1972, senior NASA and Soviet Academy officials confirmed the desirability of a test mission and established understanding on the management and operation of a joint test mission."

-- p. 70. Change lines 1 and 2 of paragraph 2 so that they refer to "an existing Apollo command and service module and an existing Saturn rocket . . ."

-- p. 73. Add the words underlined to the first sentence of the paragraph beginning at the middle of the page: "NASA also believes that ASTP provides a constructive way of continuing our national capability for manned space flight in the period between the last Skylab mission and the first Shuttle flights (1974 to 1979)."

-- p. 78. Change the last sentence to read as follows: "Technical and administrative problems are often solved by a regular telephone call procedure."

Arnold W. Frutkin

DEPARTMENT OF STATE

Washington, D.C. · 20520

Mr. J. K. Fasick
Director
International Division
U. S. General Accounting Office
Washington, D. C. 20548

June 28, 1974

Dear Mr. Fasick:

I am replying to your letter of May 13, which forwarded copies of the draft report: "A Progress Report on United States-Soviet Union Cooperative Programs" and requested the Department's comments. I regret the delay in responding to your request, but as you will note the enclosed comments are comprehensive and required inputs from and coordination with several offices.

The Department welcomes this review as being most timely and has no doubt that the synthesis of the past two years' experience since the signing of the US-USSR Agreement will prove valuable. However, there are some areas of disagreement with the report to be resolved and in some cases progress since the cut-off date of the report may lead to different judgements.

I shall be happy to arrange such meetings as you may desire with appropriate Department personnel to discuss further the enclosed comments.

Sincerely yours,

Richard W. Murray

Richard W. Murray
Deputy Assistant Secretary
for Budget and Finance

Enclosure

DEPARTMENT OF STATE COMMENTS ON GAO DRAFT REPORT: "A Progress Report on United States - Soviet Union Cooperative Programs"

We welcome the opportunity to comment on the GAO Draft Report, which reviews the programs being carried out under the US-USSR Agreements of May 1972 on cooperation in the fields of science and technology, environmental protection, and space exploration. A review of experience in the two years since these landmark agreements were signed is most timely. However, we are puzzled about the omission of the agreement on cooperation in medical science and public health which was signed at the same time, was cast in the same mold, is no less important, and is being implemented successfully. Its inclusion would provide a more complete picture.

Since the cut-off date for the report was evidently about October or November 1973, we believe it useful to note, in the comments that follow, the progress since then that bears on judgments based on earlier information.

Comments Concerning the Conclusions and Recommendations

1. (p. 80). The importance, complexities, and accomplishments of the "negotiating meetings for working out frameworks for cooperation" seem to us to deserve greater stress. The process of developing such a framework involves familiarization, definition, a matching of interest and capability, a consideration of budgets, priorities, and principal participants. Particularly in the light of the need to break new ground in US-Soviet scientific and technical cooperation and the often imperfect knowledge of each other's work in any given field, the process in our view fully deserves the care being given to it, should not be rushed, and has accomplished a great deal more than seems to be implied in this paragraph.

2. (p. 80, bottom). The statement that "the exchange of scientists and technicians envisioned in the agreements has not materialized" requires qualification. Unlike the previous exchanges agreements, the purpose of these exchanges is to carry forward work on specific projects. Such exchanges necessarily follow only after negotiation and definition of projects--that is, after the framework for specific projects has been established. In fact, exchanges of this nature have already begun. Thus, under the S&T Agreement, there are now 5 American research fellows working in Soviet

GAO note: GAO selected the three cooperative agreements at random and believes that a review of these would provide sufficient basis for reporting.

laboratories on Chemical Catalysis projects for periods of at least 3 months, there have been a number of reciprocal visits by senior researchers in Chemical Catalysis for periods of several weeks, and on the MHD project technical teams have already held several detailed discussions in depth. Under the Environment Agreement's wildlife project, US and Soviet scientists have for several months been making reciprocal visits to exchange data on birds migrating between the two countries and are actively collaborating in research on marine mammals, with similar work on swans and musk oxen to begin shortly. In a more general sense, each participant in a working group or project meeting is also participating in an "exchange visit"; thus the "negotiating meetings" generally involve visits to technical facilities and discussions with the working scientists. Overall, the number of scientific visits has increased dramatically in recent years. For example, the total of Soviet scientific visits to the US (under all programs but not including travel to international scientific conferences) increased from 113 in 1970 to 246 in 1972 and to 463 last year. US scientific visitors to the Soviet Union showed an even steeper increase, from 98 in 1971, to 262 in 1972, and to 531 in 1973. We have already passed considerably beyond any "scientific and technical tourism", and indeed consider that the use of this disparaging term (p. 81) even for the past is unjustified. The scientific and technical exchanges had serious purposes, seriously pursued.

3. (p. 81, top). Considerable progress has been made toward resolving a number of the problems. To our knowledge, no project is being seriously hampered at this time by lack of funds, although some agencies continue to experience difficulties in securing adequate funds for international and domestic travel of US participants as well as for administrative overhead such as interpreters and secretarial/clerical help. No agency has funds for representational needs. The question of travel costs of visiting scientists, which does not arise until the initial planning stage for a project is passed, has been settled in the majority of cases where the projects have advanced sufficiently and is being examined urgently in the remainder.

The translation problems fall into three separate categories, and are generally of a nature that does not permit rapid and easy resolution:

a) language services (involving interpreting, translating, and typing of Russian) in connection with joint meetings in the United States, and for translation of key correspondence. The Department of State's Language Services Division has thus far been able to meet the increasingly

heavy demand for such services (and to maintain consistently high standards) but its resources are of course limited and priorities have to be established when a number of visits occur at the same time or a large number of documents must be dealt with. Plans to expand the available interpreting and translating resources are being examined.

b) translation into English of technical materials. Full translation is impractical except on a highly selective basis. We believe the solution lies in a rigorous screening process to determine whether full or partial translation, or abstraction is in order. The implementing agencies are probably themselves the best judge of the value of the material. Translation or abstracting in many cases could probably be handled by commercial contract arrangements.

c) training of scientists to be able to communicate, at least to some degree, on their own. This seems to us practical only on a selective, "as needed", basis. Language training has already been arranged in a few cases--for example, for some in the chemical catalysis area of the S&T Agreement.

The problem of communications is not so much in the procedures of transmission as in delays in responses; this has been a subject of periodic consultation between the US and USSR Secretariats, and we anticipate that communication on any given project will generally improve as implementation develops. We are not aware that security concerns on the US side have been a cause for serious delay of any project, despite the continued close attention paid to such matters.

4. (p. 81, middle). We do not agree that all the ingredients listed "are missing from most of the other projects". We have commented above concerning communications and financial support. The reason that some projects have been slow to develop is the effort being devoted to trying to define objectives and goals and to ensure that both sides share an interest in pursuing cooperation. The "built-in interdependency" that characterizes ASTP is unusual, if not unique.

5. (p. 81, bottom). We believe it more accurate to say that both countries may have to make greater commitments. The reason that more projects have not reached a "joint problem-solving" stage does not, as here implied, derive

from US failure to devote sufficient financial and personnel resources, but rather from the need for extensive groundwork-laying as described above.

6. (p. 82). Close attention continues to be paid to the question of keeping the number of projects to manageable proportions conducive to effective results. The process of exploration and definition of projects is still going on, we are prepared to discard any that turn out not to be promising, and we do not anticipate that any additional projects will be agreed to (except in compelling circumstances) under either the S&T or Environmental Agreements until the existing list is well digested. As noted above, while there are various problems associated with funding, no major project is presently being held up because of inadequate funding.

7. (p. 83). We agree that "openness...is an essential ingredient to the success of the goals of cooperative efforts", but question the implication that such openness is lacking on the US side. Under the Environmental Agreement, for example, the US has been willing to share, on a reciprocal basis, all non-proprietary information at its command in order to foster profitable cooperation and expects, in time, that the USSR will be equally forthcoming. We also wish to note that since March 1962 the United States has unilaterally exempted Soviet exchange visitors from closed area restrictions in the US which are applicable to other Soviet citizens. The Soviet Union has not reciprocated but we continue to urge them to do so.

8. (p. 84-85). We concur with the desirability of the recommendations listed, and in fact almost all of these matters are already being pursued so far as feasible at this time. The need to progress to specific cooperative work aimed at early results has been emphasized consistently. So too has the fact that we are not engaged in "merely exchanging visits". At both the joint commission and working group levels, there has been a consistent striving to select only those projects that appear to offer the best possibilities for success. It seems premature to try to determine long-range funding and personnel requirements of the overall program in specific terms because a number of projects are still in an essentially exploratory phase. Participating agencies are being requested to identify all costs associated with the program.

9. (p. 85). Annual progress reports are already produced under the Environmental and Health Agreements, and of course the record of each annual joint committee meeting under each of the specialized agreements provides an overview of progress

and plans. On the question of whether the agreements should be specifically funded by line items in each agency's budget, we concur in the value of providing project coordinators with an assured source of funds, and assume that it is intended that each agency would continue to justify its expenditures for the cooperative activities primarily in terms of the pursuit of its own program objectives. We believe it should be noted, however, that a line item is unlikely to be warranted for any project until the exploratory phase is completed and it is reasonably clear that a program of appropriate magnitude is contemplated.

Comments on Chapter 2, Cooperation in Science and Technology:

1. (p. 21, middle). The Executive Secretariat for the US side of the Joint Commission is established in the Department of State (Bureau of International Scientific and Technological Affairs) and reports directly to the President's Science Adviser, who is the US Chairman.

2. (pp. 22, 24, 27, 40). The term "protocol" as used in a number of places in this chapter is confusing. The Soviets use this term, in its Russian meaning, to denote what in English we would call variously a record of a discussion or meeting or a memorandum of understanding. "Protocol" is not a type of cooperative arrangement, although of course such an arrangement can be provided for within a "protocol".

3. (p. 26, bottom). The topics selected were far from "merely topics of interest". Each was examined in some detail by the Joint Working Groups, as set forth in their reports making recommendations to the Joint Commission. Each therefore was "definitized" sufficiently to permit the Joint Commission to determine whether it offered promise enough to be pursued in depth.

4. (p. 27, middle). We do not understand the assertion that "personal contacts had been made on only four projects". If it is intended to convey the number of project meetings, it may be stated that as of December 1973, a total of 9 project meetings had been held, with a number of others scheduled over the next few months.

5. (p. 27, same para.). In November 1973 US project coordinators for the computer applications area had been designated, after considerable work in reorganizing and further defining the topics. For microbiology, US project coordinators were designated tentatively in November 1973, and have since been confirmed.

6. (p. 28, top). The assertion that there has been little progress in accomplishing exchanges of information seems misleading. It may be true in the narrow sense of written materials. In the larger sense, however, the many visits to facilities and the discussions that take place in the course of working group and project meetings and in visits by principal investigators represent an important and indeed essential part of the familiarization process. We believe that, desirable as it is to reach the final problem-solving stage as rapidly as possible, we should not rush through the familiarization and definition process. We also believe that there are real benefits to be derived from the familiarization, short of "problem-solving".

7. (p. 28-29). Arrangements for cooperation in the water resources area have been extremely slow in developing, for a variety of reasons including personnel changes at the Bureau of Reclamation, but are now beginning to proceed reasonably well in most projects. A US project team visited the Soviet Union in May 1974, and joint meetings of two other project groups are scheduled this summer.

The example selected to illustrate delays in information exchange seems to us a poor choice, based on apparent misunderstanding. What was involved essentially was an effort to arrive at a mutually agreed definition of the scope and content of the program. As of the time described, to our knowledge the US side had not provided "detailed technical information"; thus, the May 21 letter from the Bureau of Reclamation stated: "Following agreement on the content of the project, we will initiate the collection and exchange of representative technical literature covering each area of interest." Concerning the sequence of letters cited on p. 28, the Soviet reply was dated August 15, transmitted by our Embassy in Moscow on August 21, and therefore not actually received in the Department of State until late in August; and a translation was sent to the Department of the Interior by memo dated September 6. Considering that a Labor Day weekend intervened, we do not believe this delay in translation to be excessive. Moreover, according to a report at the time by the Bureau of Reclamation, the Soviet visit proposed for October or November was postponed not because of the reasons given on p. 29, but "due to the restrictive factor of cold weather and the limited opportunity to observe field work and practices".

8. (p. 30). The assertion that the MHD project "had not been definitized as of October 1973" is unclear. Detailed planning had begun in July 1973, and further meetings to work out details in progressively greater depth were held in October and December 1973 and January, February and May 1974. For a project of this magnitude and complexity, such careful efforts to define and develop the specifics of cooperation seem to us not surprising and indeed commendatory.

9. (p. 35). The problem of funding support for the TVA participation has since been resolved.

10. (p. 36, bottom). We do not believe it has been established to be necessarily bad for program funds to be used in order to participate in joint projects, since those projects should contribute to the advancement of the US programs involved. Concerning the example cited on p. 37 top, this funding problem has since been resolved.

11. (p. 37, middle). As noted previously, the question of "receiving side pays" has been resolved in the majority of cases where the projects have advanced sufficiently, and is under urgent examination in the others.

12. (pp. 39-43). In the section headed "Cooperating with Industrial Sector", there is need to distinguish carefully between activities in implementation of Article 4 of the S&T Agreement on the one hand and regular commercial arrangements on the other. The latter are not carried out at all under the S&T Agreement, as this section seems to imply, and therefore much of the discussion needs to be refocussed. The agreements or "protocols" signed between US private firms and Soviet institutions which cite Article 4 of the S&T Agreement are essentially documents of intent providing for scientific and technical cooperation to be implemented by specific agreements, and are not what is usually considered commercial contracts.

13. (p. 39, top). The letters to US companies did not raise the question whether "they would be interested in participating with the Russians", but rather noted that a number of US companies were entering into or contemplating technology exchange agreements with the USSR State Committee for Science and Technology, that cited Article 4. The letter said that additional information would be welcomed and offered to provide advice if desired.

14. (p. 42). The sentence concerning the possibility that the Soviets may "bypass" governmental channels in favor of industrial channels is unclear. There is no requirement that the Soviets must depend on "governmental channels"; they are free to work out arrangements with US firms in accordance with established commercial practices, which of course continue to be subject to the established conditions, including controls under the export administration and munitions control acts.

The US secretariat for the S&T Agreement, in cooperation with the Department of Commerce, does maintain contact with US firms that have signed or contemplate signing technical cooperation agreements under Article 4 of the Agreement, in order to fulfill our obligations to facilitate contacts with the Soviets, to insure that the US Government does not unwittingly duplicate efforts by our private sector, and to advise US firms where desired.

15. (p. 41). The list of US firms is considered to include sensitive and proprietary information. We request that it be treated as such, and deleted from the unclassified body of the report.

Comments on Chapter 3, Cooperation in Environmental Protection

1. (p. 45). The statement that the Environment Agreement "promotes the exchange of environmental protection technology" needs clarification. Direct intergovernmental cooperation under the agreement is in non-proprietary fields only. Article 4 of the agreement does, however, stipulate that the Parties will encourage and facilitate contacts and cooperation between private, non-governmental bodies. In practice, this means contacts between US private companies dealing in environmental technology and Soviet Government agencies.

2. (p. 46). The US chairman is Russell E. Train, Administrator of the Environmental Protection Agency (formerly Chairman of the Council on Environmental Quality).

3. (p. 48, para. 1). The figures on the number of meetings and topics of common interest are more than seven months out of date. As of June 1, 1974 at least forty working group meetings and smaller scale meetings of experts have taken place.

4. (p. 48, para. 2). In several instances, e.g. wildlife conservation, marine pollution, biological and genetic effects--US and Soviet scientists have already engaged in joint short-term field work, and considerably

more is planned by other groups in the near future.

5. (p. 49, top). While the US does not expect very much in the way of hard scientific returns from the exchange in the short run, we are interested in establishing rapport and building up a mutually beneficial relationship which should pay off in concrete terms in the long run.

Moreover, advances in scientific knowledge are not the only gains anticipated from this agreement. Because the United States is generally more advanced in environmental protection than the USSR and is devoting more resources to this purpose, it is to our advantage to encourage the Soviets to adopt high environmental standards and to develop the technical means to implement them to preclude distortions in international trade. This accords with our efforts in the OECD to avoid such distortions. Potential cooperation on harmonization of environmental standards under the Legal and Administrative Project (Area XI) should further promote this end. Development of a Soviet market for US pollution control technology is another not unlikely result, as noted on p. 60 of this report.

6. (p. 49, para. 1). This is incorrect. The United States has not specified priorities from among the eleven areas set forth in the agreement. Even if we had, those cited would not necessarily be the priority areas. While it is probably true that certain areas of cooperation will turn out to be more profitable than others, it would be improper at this early stage for us to single out certain areas until all had been given a chance to prove their potential value.

7. (pp. 50-52). The Urban Environment project is not a typical example to use in demonstrating the progress of the agreement. That project has suffered from extensive personnel changes within the US lead agency, HUD, and has been particularly slow in getting underway. More representative has been the experience of the water pollution project under which meaningful plans have been laid for cooperation in comparative river basin modelling, control of industrial waste discharges, and water quality in lakes in estuaries, including exchange of water samples from Lake Baikal and Lake Superior. The US chairman of this project, which is less affected by governmental, economic and philosophical differences of the two societies than the urban project, is quite sanguine about the prospects for meaningful cooperation.

8. (p. 53, para. 2). While cooperation is not proceeding on a strictly quid pro quo basis, it is somewhat misleading to say that on a strictly scientific and technological basis the United States does not really have much to gain. Although our hardware is generally more sophisticated, there is almost no area in which understanding of the Soviet experience will not enhance our technical capacity to cope with US environmental problems. The last statement of the paragraph is most significant and we heartily concur.

9. (p.55). There is a nominal amount of overlap between the environment agreement and other agreements, but in areas of overlap project chairmen from the various agreements have stayed in close touch with each other to prevent duplication. In some instances, certain topics have been transferred to the jurisdiction of other agreements, e.g. wind erosion to the agriculture agreement.

10. (p. 57-58). The serious problem of translation, in our opinion, can best be resolved by having included in each lead agency's appropriations, adequate funds to cover the cost of translation of relevant Soviet documents.

Comments on Appendix III

Appendix III discusses the Mutual Educational and Cultural Act, responsibility for which has been delegated primarily to the Department of State. As set forth in detail in the attached memorandum, the Legal Adviser's Office does not agree with the conclusion reached that the needed legislative authority for "receiving side pays" arrangements already exists for all participating US departments and agencies.

John V. N. Granger
Acting Director
Bureau of International Scientific
and Technological Affairs

Attachment:

L/OES Memorandum

GAO notes: 1. The attachment deleted from this letter concerns matters not included in the report.

2. Page number references in this appendix may not correspond to the pages of this report.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

June 28, 1974

Dear Mr. Conahan:

In order to provide a comprehensive and realistic appraisal of the GAO draft report, we have circulated it to relevant offices and bureaus within the Department for comment. Some of these comments are explained in this letter because of their importance; others have been noted directly on the enclosed copy of your report.

First and foremost, our Solicitor does not agree with the conclusion drawn by your General Counsel regarding the authority for Interior to enter into receiving-side payment of travel, per diem and related expenses of international exchange visitors as set forth in Appendix III. Our point of view is based on the fact that, although the President has the authority alluded to on pages 90 and 91 of Appendix III, he has not delegated authority to carry out any functions of the Mutual Educational and Cultural Exchange Act of 1961 to the Secretary of the Interior except as set forth in Executive Order 11770 which deals only with Interior's funding of the World Energy Conference.

Enclosed is a copy of a memorandum from our Associate Solicitor describing more fully this opinion. This is a question which must be resolved because its final determination will affect the continuation of Interior's cooperative programs with the USSR. Without the authority to enter into receiving-side-pays arrangements, funds must be found outside of Interior's approved budget, which is increasingly difficult to do.

In addition, we believe that parts of the draft report require further clarification to reflect the following points:

--Page 4. During the startup of the US-USSR program, the Office of Science and Technology (OST) agreed to seek necessary funding or to lend U. S. agencies strong support in getting funding. The demise of OST left many agencies in the position of having to meet specific technical commitments without this financial support from OST, a situation which has made it more difficult or impossible to follow through on commitments.

--Page 4. The statement that, "ASTP is demonstrating that these problems can be overcome" leaves an inaccurate implication that other agencies have not been putting forth their best efforts. Budgeting procedures, lack of legislative authorities for international activities, and certain Congressional directives regarding expenditure of appropriated funds are limiting factors which impede the progress that other agencies without such restrictions can demonstrate. We recommend, therefore, that these limiting factors be recognized.

--Page 5. Action has been taken to identify funds. The Office of Coal Research has awarded design contracts in the amount of $171,000 for a channel to be tested in a Soviet MHD generator. Estimates of Interior's US-USSR program costs have been made (please see enclosed table). We also note that other cost estimates are provided on page 38 of the draft report. This information should be recognized and the paragraph should be changed to reflect it.

--Page 12. In followup to the point made in the first complete paragraph, we would recommend that some U. S. organization should monitor the program to assure the attainment of overall mutual benefit, equality, and reciprocity in selected areas.

--Page 30. It should be noted that there are short-range benefits that can be expected from the MHD cooperative program which include:

a. Testing of U. S. equipment, especially an MHD generator channel, in Soviet installations.

b. Information on Soviet pilot plant performance.

c. Engineering and design data from Soviet studies.

--Page 30. It should also be noted that some delays have occurred in the MHD project due to the institution of new contracting procedures in Interior and to the complex nature of the program which makes it difficult to adhere to preliminary schedules such as those developed in July 1973. These reasons for delay, which have been recognized by both sides and which explain why more rapid progress has not been possible, should be acknowledged in this report.

--Page 34. If Interior has been able to estimate its costs (please see table enclosed), it would appear that total U. S. cost estimates could also be obtained.

--Pages 48, 49. Interior specialists involved with the US-USSR wildlife conservation cooperative effort object to the statement that not "very much in the way of hard scientific returns from the exchange" is expected. They believe that the United States will gain considerably from the cooperation.

--Page 57. Departmental comments regarding the authority to enter into "receiving-side-pays" arrangements are noted in the first part of this letter.

--Page 82. Comments concerning identification of funds would be similar to our comments directed to page 5 of the report.

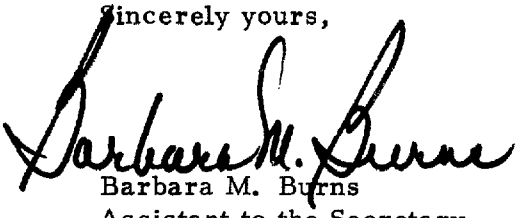
--Page 84. The word "supported" in item three should be more clearly defined. Does it refer to funding, manpower back-up or policy support? The meanings of "specific cooperative programs" and "real cooperative effort" also should be clarified.

--Page 84. A seventh recommendation should be listed as follows: "Request funds in the budget of the Department of State for all these programs."

--Page 92. Reference should be made to the source of funds.

If you would like any explanation of these suggestions or if we can assist you in any other way in this valuable evaluation, please let me know.

Sincerely yours,



Barbara M. Burns
Assistant to the Secretary
for International Activities

Mr. Frank C. Conahan
Associate Director
International Division
Government Accounting Office
Room 4116, 441 G Street, N. W.
Washington, D. C. 20548

Enclosures

GAO notes: 1. The enclosures deleted from this letter concern matters not included in the report.

2. Page number references in this appendix may not correspond to the pages of this report.

6/24/74

US - USSR EXCHANGES SUMMARY FY 74

	BSFW	USGS	MINES/ MESA	BPA	BLM	OCR	TOTALS
1. S&T, Ed., & Cultural Agreement							
1. Scope:							
(a) Number missions to USSR FY 74			1	1		2	4
(b) Number people on missions			6	20		21	47
(c) Number of those from USDI			2	14		3	19
(d) Number of missions from USSR			1	1		N/A	2
2. Cost:							
(a) Domestic support			$9,000	$9,000		$483,000	$501,000
(b) Foreign travel			3,150	6,500		17,000	26,650
(c) Sub total			$12,150	$15,500		$500,000*	$527,650
Environmental Protection Agreement							
1. Scope:							
(a) Number missions to USSR FY 74	1	2			0		3
(b) Number people on missions	1	18			0		19
(c) Number of those from USDI	1	8			0		9
(d) Number of missions from USSR	1	2			1		4
2. Cost:							
(a) Domestic support	$1,100	$ 9,200			$2,600		$12,900
(b) Foreign Travel	1,100	15,800					16,900
(c) Sub total	$2,200	$25,000			$2,600		$29,800
OTAL COST:							$557,450

* The US-USSR co-op program on MHD is a line item funded at $500,000 for FY 74 salary, travel, and R&D.

6/24/74

US - USSR EXCHANGES SUMMARY FY 74

	BSFW	USGS	MINES/ MESA	BPA	BLM	OCR	TOTALS
A. S&T, Ed., & Cultural Agreement							
1. Scope:							
(a) Number missions to USSR FY 74			1	1		2	4
(b) Number people on missions			6	20		21	47
(c) Number of those from USDI			2	14		3	19
(d) Number of missions from USSR			1	1		N/A	2
2. Cost:							
(a) Domestic support			$9,000	$9,000		$483,000	$501,000
(b) Foreign travel			3,150	6,500		17,000	26,650
(c) Sub total			$12,150	$15,500		$500,000 *	$527,650
B. Environmental Protection Agreement							
1. Scope:							
(a) Number missions to USSR FY 74	1	2			0		3
(b) Number people on missions	1	18			0		19
(c) Number of those from USDI	1	8			0		9
(d) Number of missions from USSR	1	2			1		4
2. Cost:							
(a) Domestic support	$1,100	$ 9,200			$2,600		$12,900
(b) Foreign Travel	1,100	15,800					16,900
(c) Sub total	$2,200	$25,000			$2,600		$29,800
TOTAL COST:							$557,450

* The US-USSR co-op program on MHD is a line item funded at $500,000 for FY 74 salary, travel, and R&D.

APPENDIX X

PRINCIPAL OFFICIALS HAVING MANAGEMENT RESPONSIBILITY FOR MATTERS DISCUSSED IN THIS REPORT

	Tenure of Office	
	From	To
DEPARTMENT OF STATE		
SECRETARY:		
Henry A. Kissinger	Sept. 1973	Present
William P. Rogers	Jan. 1969	Sept. 1973
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION		
ADMINISTRATOR:		
James C. Fletcher	Apr. 1971	Present
EXECUTIVE OFFICE OF THE PRESIDENT		
SCIENCE ADVISOR TO THE PRESIDENT:		
H. Guyford Stever	July 1973	Present
Edward E. David, Jr.	Sept. 1970	June 1973
COUNCIL OF ENVIRONMENTAL QUALITY		
CHAIRMAN:		
John A. Busterud (Acting)	Sept. 1973	Present
Russell E. Train	Mar. 1970	Sept. 1973
ENVIRONMENTAL PROTECTION AGENCY		
ADMINISTRATOR:		
Russell E. Train	Sept. 1973	Present
Robert W. Fri (Acting)	Apr. 1973	Sept. 1973
William D. Ruckelshaus	Dec. 1970	April 1973

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