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Statement of
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Assistant Comptroller General *100 15*
before the
Subcommittee on Domestic and International
Scientific Planning and Analysis *03502*
and the
Subcommittee on Energy Research, Development and Demonstration
Committee on Science and Technology
United States House of Representatives *03503*
on
International Cooperation in Energy Research and Development

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Mr. Chairman and members of the subcommittees:

We appreciate this opportunity to discuss with you our work relating to international cooperation in energy research and development. We cannot offer a comprehensive perspective on the subject, but some of our work does deal with aspects of the question which should be useful to the committee.

Most of our work in the area of international energy cooperation has concerned itself with nuclear matters, including, but not actually emphasizing, research and development. Our May 1976 report, entitled "Can the U.S. Breeder Reactor Development Program be Accelerated by Using Foreign Technology?" (RED-76-93, May 6, 1976), discusses some of the problems involved in international exchanges of research and development technology. Before discussing this report in some detail, however, I will briefly describe work we have done in the uranium enrichment area which also has implications for international cooperation.

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In March 1975, we issued a report to the House Committee ^{HSE 01113} on Foreign Affairs on the results of our study of the sale of U.S. uranium enrichment services to foreign countries and its effect on the Energy Research and Development Administration's ⁶⁶ (ERDA) ability to meet domestic demands. Historically, the United States had been providing access to its uranium enrichment services to foreign countries, along with U.S. customers,

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on a first-come-first-served basis. This changed in August 1974 because U.S. enrichment plants were nearing capacity. Under new procedures, all pending domestic and foreign requests for enrichment services were not awarded on a first-come-first-served basis and all requestors were not granted firm contracts.

Many foreign customers were offered contracts conditioned upon a favorable decision by the Nuclear Regulatory Commission (NRC) that plutonium produced as a byproduct in power reactors could be recycled and used to refuel reactors in an environmentally safe way. Also, further long-term Government contracting for enrichment services was terminated. These actions, together with U.S. industry's lack of a firm commitment to build additional enrichment facilities, introduced uncertainty as to future U.S. supply and may have further encouraged other nations to find new sources of enrichment services. This could cost the United States significant balance-of-payment benefits and some of the leverage that a dominant supplier position provides in influencing international nuclear policies and in achieving U.S. objectives in the international nuclear arena, including nonproliferation of weapons.

Our October 31, 1975, report entitled, "Evaluation of the Administration's Proposal for Government Assistance to Private Uranium Enrichment Groups" (RED-76-36) recognized the importance of adding to our enrichment capability both to satisfy our own future needs and to meet the needs of foreign nations. It also recognized the importance of R & D in accomplishing that objective.

If nuclear power is to continue to develop, additional enrichment capacity will be needed both here and abroad. The United States and several other countries currently use the proven gaseous diffusion process. But more advanced processes, such as gaseous centrifuge, are under development. The advanced processes offering the potential of more economical, efficient, and compact methods to enrich uranium are an area of possible international cooperation that should be carefully explored. While the implications of proliferation of nuclear technology through exchanges of this type are as serious as they are unclear, it is desirable for this country to keep abreast of foreign research and development in the enrichment area. In November 1974, the United States and 15 other major oil consuming countries formed the International Energy Agency as part of their effort to reduce their dependence on imported oil. They also agreed to study, among other things, cooperative programs in uranium enrichment.

The balance of my statement deals with our recently issued report on international cooperation in the field of breeder reactor technology. This report is directly concerned with the subject matter of these hearings.

The liquid metal fast breeder reactor is the highest priority reactor concept being developed in industrially advanced countries. The United States, Britain, France, the Federal Republic of Germany, the Soviet Union, and Japan have been conducting extensive fast breeder reactor research and development programs for years. In addition, Belgium and the Netherlands are participating with Germany in their fast breeder reactor program. Italy is participating in a combined effort with France and Germany in their programs to build large commercial-size breeder reactors.

The United Kingdom, France, and the Soviet Union have demonstration-size breeder reactors operating with varying degrees of success. West Germany and Japan are currently constructing demonstration-size plants. The United States' demonstration plant--the Clinch River Breeder Reactor--is being designed and is also undergoing licensing review by the Nuclear Regulatory Commission. Site preparation is planned for mid-December 1976, although this date may slip because of licensing delays. Construction is scheduled to start in early 1978.

The United States has had agreements or arrangements to exchange fast breeder reactor technology with foreign countries since the mid-1950's. Active agreements or arrangements exist between the United States and the United Kingdom, Germany, Japan, and the Soviet Union. The agreement with Japan was expanded in March 1976 to include additional areas of cooperation. The agreement with Germany was just recently signed on June 8, 1976. ERDA is currently negotiating an agreement with France, and negotiating with the United Kingdom to renew and broaden the existing arrangement. ERDA also has or has had breeder reactor agreements or arrangements with the Netherlands, Switzerland, and the European Atomic Energy community.

ERDA, the Nuclear Regulatory Commission, national laboratories, U.S. industrial concerns, and foreign program managers agree that extensive information has been exchanged and that opportunities exist for more beneficial exchanges in the future. Cooperative fast breeder reactor exchange agreements can benefit the U.S. program in several ways:

- Foreign fast breeder reactor information, including information on construction and operational experience, can broaden the U.S. data base and may provide additional input to future projects or program decisions.

- Information on problems encountered in foreign programs may help the U.S. program avoid similar problems or mistakes.
- Foreign information or data which confirms findings already developed as part of the U.S. program may increase the degree of confidence placed on such data (on which future developments or decisions may be based).
- U.S. participation with other countries in experiments, use of foreign test facilities, or receipt of information concerning experiments, calculations, or construction not yet underway in the United States may enable the United States to eliminate duplicative research and development work.

However, we concluded in our study that the benefits derived from international exchanges of fast breeder technology have not been and probably will not be great enough to significantly reduce the time or money required for the United States to develop a commercial fast breeder reactor. This is because various factors hamper the effective exchange of fast breeder reactor information between the United States and foreign countries. These factors include the commerciality of the program, the Freedom of Information Act, the tighter time frames imposed in foreign programs, potential licensing problems, language and other inherent difficulties in exchanging

information, lack of travel funds, and national pride. Also, utilization of foreign technology to a degree making the U.S. dependent on that technology would obviously have severe disadvantages from a national security standpoint.

Commerciality of information

Generally, as the results of a research and development program proceed toward commercialization, it becomes more difficult to attain meaningful exchanges of information. Companies and countries are reluctant to give information to other companies and countries because the exchanges may result in the loss of competitive advantage. Foreign breeder reactor programs are now entering this phase, particularly the French program.

The French feel that the information they possess has immediate commercial value and are unwilling to release it unless royalty arrangements are negotiated. The British have the same general attitude as the French on the commercial value of some of their information and are, therefore, unwilling to release such information without receiving something of comparable value in return. The Germans are willing to provide some commercially valuable technology data to ERDA. However, they would want some of their data protected from disclosure to U.S. industry because of possible future commercial competition between U.S. and German firms for sales of breeder reactor components, subsystems, or entire reactors.

The Freedom of Information Act

The problems ERDA and also the NRC face with the Freedom of Information Act are that (1) unclassified information developed by ERDA and NRC is readily available under the Act to foreign governments upon request, thereby diminishing the need for foreign governments to enter into exchange arrangements with the United States and possibly reducing U.S. effectiveness in negotiating for similar information from foreign governments and (2) foreign governments fear that data which they have supplied in confidence to ERDA and NRC may be released to others without their approval.

Foreign concern over the Freedom of Information Act varies by country. The United Kingdom believes that information provided in confidence to ERDA and ERDA's contractors could be released to others without the approval of the United Kingdom. Such disclosures, the United Kingdom feels, could damage their position for exchanging the same information with other foreign countries as well as make available to the U.S. public and others information that is not publicly available in the United Kingdom. In the United Kingdom, information developed by government organizations is not normally made public. Also, breeder reactor technology is made available to British industry on commercial terms.

The Germans believe that the Freedom of Information Act could impede the transfer of important information that would otherwise be exchanged on a government-to-government basis.

We do not feel that the Freedom of Information Act is a major problem with the French. France appears unwilling to exchange what it considers commercially valuable fast breeder reactor technology, even if such data were specifically exempted from the Act, unless they are suitably compensated.

Because of this foreign concern over the Freedom of Information Act, we recommended that ERDA seek legislation specifically exempting data acquired through international technology agreements from the disclosure provisions of the act. ERDA officials agreed with this recommendation, and we understand that ERDA is planning to develop a legislative proposal along these lines.

Tighter time frame in foreign programs

The United Kingdom, France, the Federal Republic of Germany, and Japan have tighter time frames for developing commercial fast breeder reactors than does the United States because they do not have the fossil fuel or uranium resources that the United States possesses. Foreign officials describe their programs as being more urgent, taking higher risks, and progressing faster than the U.S. program. Foreign program managers expressed concern that future exchanges of information with the United States may not provide data which can be readily used in their more advanced programs.

Undesirable results from relying on foreign breeder reactor programs

If the United States relies too heavily on foreign development of commercial breeder reactors, several long-term problems will almost certainly result. The immediate result may be the lack of a domestically controlled breeder reactor industry. The United States would then be forced to purchase foreign-designed reactors which would have an unfavorable effect on the U.S. balance of payments. This could also place the United States in the position of relying on foreign sources for an important energy system.

Potential licensing problems in the United States

NRC officials view the licensing of foreign design breeder reactors as introducing additional complications and problems of undefined magnitude. To license a nuclear reactor in the United States, NRC requires detailed technical data and development information including design information, experiment and testing results, research information, and safety data. Communicating this information across language and other barriers will present obvious problems, starting with the willingness of the foreign country to supply the data.

Inherent difficulties in international exchange

Attempts to exchange breeder reactor information have met with difficulties which are probably encountered in all international technology exchanges. There is a general tendency for countries possessing information to think of their data as having more value than it is thought to have by other countries. Also, negotiations for exchanges are often time consuming.

Lack of travel funds and other considerations

The most effective information transfer in many areas is achieved through personal contact and by temporary assignments to other programs. Restrictions on the amount of international travel funds have prevented ERDA and its contractors from fully benefiting from developments in foreign breeder reactor programs.

Impediments, other than cost, to exchanges of personnel are (1) the reluctance of management to allow their most qualified people to be assigned overseas, thereby losing their direct services for the duration of the assignment, (2) willingness of people to relocate, and (3) language problems. Other problems arise concerning the stationing of U.S. representatives. For instance, the United Kingdom will not permit a U.S. representative to be assigned to its breeder reactor facility because of the potential opportunity to learn information of commercial value.

National pride

National pride impedes effective international information exchanges because the various parties involved may be unwilling to accept "foreign" technology as being more advanced or useful than domestic.

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We concluded that because of the various impediments to exchanges, it is unrealistic to expect that the U.S. breeder reactor development program could be greatly accelerated or that large amounts of money could be saved through quid pro quo exchanges with other countries. We feel that the impediments to cooperative exchanges of fast breeder reactor technology with other industrially developed countries become increasingly difficult to overcome as their programs approach commercial status. However, we believe that ERDA's efforts to develop areas of exchange are worthwhile and should be continued. The areas offering the most potential for cooperative exchange agreements include:

- equal exchanges of basic research and technology development data and safety-related data,
- agreements permitting component testing in reactors and test facilities of other countries,
- participation in joint component development programs, and

--purchase of technical information, reactor
components, or entire reactors.

That concludes my statement. We will be glad to attempt
to answer any questions you may have.