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BY THE COMPTROLLER GENERAL

Report To Senator Alan Cranston

OF THE UNITED STATES

[illegible] to be released outside the General Accounting Office except on the basis of specific approval by the Office of Congressional Relations.

Circumstances Surrounding The Government's Approval Of Nuclear-Related Exports To Iran

RELEASED

In June 1978 the Department of Energy concluded that a proposed equipment export to Iran did not present a nuclear weapons proliferation risk. GAO believes the Department of Energy's review of that export was not as comprehensive as it should have been. The absence of sufficient information on the exact nature of the export prevented GAO from reaching an independent conclusion about its proliferation significance.

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The Honorable Alan Cranston
United States Senate

Dear Senator Cranston:

On August 30, 1979, you asked the General Accounting Office to review the circumstances and the nuclear weapons proliferation implications of a 1978 export of four lasers and related equipment to Iran. We found that the Department of Commerce followed appropriate procedures by referring the export license application to the Department of Energy for further review. DOE concluded that the export could not help Iran develop a uranium enrichment capability and that it did not present a nuclear weapons proliferation risk. We found that DOE's review was not as comprehensive as it should have been. Additionally, we were unable to independently determine the proliferation significance of the export.

Since the time of the reported export, changes have been made in Iran's Government, including announcements that the country is abandoning its nuclear power program. Although the abandonment could reduce the potential proliferation significance of this export, such a reduction is uncertain. In any event, an examination of the circumstances surrounding the export's approval is useful from the standpoint of identifying those export review steps that, if not properly executed, could result in the U.S. Government approving proliferation-sensitive equipment for export in the future.

Certain laser equipment and technology have the potential to enrich uranium. Slightly enriched uranium is used for nuclear reactor fuel. However, when highly enriched, this same uranium takes on qualities that make it suitable for use as a nuclear explosive. DOE has identified commercial advantages to slightly enriching uranium with lasers and is currently spending about $30 million per year on laser enrichment research. Both the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978

address the dangers associated with the proliferation of nuclear explosive devices and the capability to manufacture or acquire them. The acts provide for strict controls to be placed over the export of any equipment or technology useful in either the development of a uranium enrichment capability or the actual enrichment of uranium.

EXPORT LICENSING PROCEDURES

The Department of Commerce has regulations governing most exports. An exporter is responsible for complying with the regulations and, where appropriate, obtaining a Commerce export license. Prior to issuing licenses for nuclear related exports, Commerce refers the export applications to DOE for a review of their proliferation potential. Referral is made when

--the stated end use is related to nuclear activities;

--the end user is a known nuclear establishment; or

--the items to be exported are contained on a special referral list of items that, if misused, could be of significance for nuclear explosive purposes.

If the DOE official reviewing the export application does not believe the export represents a nuclear proliferation risk, he has authority to give DOE's approval of the export without any further review. However, if he has proliferation concerns, he advises Commerce to set the export application aside for further DOE examination. A DOE reviewer originally told us that because no criteria existed for DOE's review, he used his own knowledge to determine which export applications should be approved, which required further scientific review, and where they should be sent for such review. However, in commenting on a draft of this report, the DOE official who has overall responsibility for reviewing export applications stated criteria exist which include many factors considered in reviewing export applications.

DOE subsequently furnished us with a written summary of its export review process and a list of the criteria used to evaluate Department of Commerce export applications. The criteria appear to be broad and to allow the reviewers

considerable latitude and subjectivity in making export license determinations. For example, the DOE reviewer of the Iranian export sought scientific opinions on the export's proliferation potential only because he considered the sale price to be unusually expensive. Had the export price been less costly, he stated he would have approved the export without seeking any scientific opinion on the export's proliferation significance.

The implementation of the Nuclear Non-Proliferation Act of 1978 resulted in the promulgation of export licensing procedures that require closer scrutiny be given to export license applications involving potentially proliferation sensitive equipment. Basically, the procedures require

--Commerce and DOE to develop and maintain a list of commodities which could be of significance for nuclear explosive purposes,

--Commerce to consult DOE before issuing export licenses for commodities on that list, and

--Commerce and DOE to refer export applications to a special interagency group 1/ if either agency believes the applications should be denied or reviewed further.

Both DOE and Commerce have maintained such a list and DOE or its predecessor agencies have been consulted about exports on the list for over 30 years. Although the export to Iran was primarily reviewed prior to the formulation of the licensing procedures required by the act, there is no evidence that Commerce and DOE would have decided to refer the Iranian export to the special interagency group under current procedures.

Most commercial exports require either general or validated export licenses. A specific export application

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1/This group, the National Security Council Subgroup on Nuclear Export Coordination consists of representatives of the Departments of State, Defense, Commerce, and Energy; the Arms Control and Disarmament Agency; and the Nuclear Regulatory Commission.

must be approved by Commerce for those items required to have validated licenses. Other items can be exported under a general license without specific Commerce review. However, since the Government rarely inspects exports, it is unlikely to discover instances of an exporter avoiding Government export controls by shipping items under a general rather than a validated license.

CIRCUMSTANCES RELATED TO THE EXPORT OF LASERS AND LASER EQUIPMENT TO IRAN

The Export Administration Act of 1979 1/ guarantees the confidentiality of information provided by an exporter to the Department of Commerce when applying for an export license. In order to include such information in this report, we obtained a waiver of confidentiality from the exporter.

On February 7, 1978, Commerce received an application for an export license from Gifted, Inc. The case was referred to DOE and, on February 14, a DOE official reviewed the application and instructed Commerce not to issue an export license at that time, but requested that the application and related documents be sent to DOE for further review. About a month later, on March 17, DOE requested technical reviews of the proposed export from three DOE-related organizations. On March 23 and April 5, two of the organizations formally replied that they had no objections to the export. There is no evidence that the third organization ever provided its views. On June 13, DOE advised Commerce that DOE approved of the export, and shortly thereafter, on June 20, 1978, Commerce issued an export license. The equipment is reported to have been shipped to Iran in the fall of 1978.

DOE's export approval based on limited information

DOE officials told us that they review the proliferation significance of about 6,000 export license applications annually. DOE officials believe this export received a particularly intensive and thorough review, and stand by their determination that the lasers and related equipment did not present a proliferation risk. However, we found that DOE did not use or seek all available information

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1/Export Administration Act of 1979 Sec. 12.(c).

in making its determination, and because documentation was lacking in some instances, we could not determine the depth or thoroughness of DOE's review.

DOE records show that the DOE reviewer requested three organizations to provide scientific comments--Lawrence Livermore Laboratory, DOE's Office of Laser Fusion, and DOE's Office of Advanced Systems and Materials Production. 1/

The DOE reviewer claimed he received favorable comments from all three organizations; however, he was unable to provide evidence of approval from Livermore. On two separate occasions, the Associate Director for Lasers, who heads Livermore's laser enrichment research program, told us no record of Livermore's response existed because he never approved the export as DOE claimed, but rather had only requested that additional information be supplied. He told us he did not believe it was appropriate for anyone to approve the Iran export given the incomplete technical data contained in the export license application, particularly because of the absence of any data concerning the lasers' power. However, in commenting on our draft report, DOE officials told us they had recently obtained a letter from the Associate Director at Livermore indicating his approval of the export. Our later review of that letter showed this not to be the case, but rather that the Associate Director indicated that the information Livermore had received from DOE was incomplete. Furthermore, he stated "It is clear that as a group we did not do our best professional job on this particular case."

DOE's then Office of Advanced Systems and Materials Production was also asked to review the proposed export. An official from that office told us its pro-export decision was based primarily on the assumption that the equipment to be exported could not help anyone enrich uranium, because in the past DOE had not been able to successfully use similar equipment for uranium enrichment. However, our review of that office's files revealed an absence of technical information that other experts described as necessary to making an informed proliferation determination.

1/Since renamed the Advanced Nuclear Systems and Projects Division.

DOE's Office of Laser Fusion was the third of the three organizations asked to comment on the export application. It had no objection to the proposed export of lasers to Iran.

Some confusion exists over the contributions of a fourth organization--Los Alamos Scientific Laboratory--to DOE's technical review. According to the Division Leader in charge of Los Alamos' laser enrichment program, Los Alamos did not review the export application for DOE. However, by this time, Los Alamos had already received about $60 million from DOE for the specific purpose of doing research on molecular laser enrichment. This is an area in which the items listed on the export application could be potentially useful. DOE knew of Los Alamos' expertise and the extensive work it was doing for the Government in this area and should have requested its official opinion before approving the export, as it did with other organizations.

After reviewing a draft of our report, DOE officials told us that although they had not requested Los Alamos to formally review the export application, they had in fact discussed its approval with Los Alamos over the phone. This new information contradicts that originally provided to us by the head of Los Alamos' program and was not documented in either DOE's or Los Alamos' records when we reviewed them.

Laser manufacturer never contacted

Commerce, DOE and the three organizations DOE asked to review the export application did not contact Lischem Corporation, even though the export application clearly showed Lischem as the producer of the commodity to be exported. Had Lischem been contacted and questioned about its lasers, the Government may have learned three things.

First, that Lischem was in the business of producing lasers and laser equipment which they claimed was suitable for uranium enrichment use. This would have been valuable information because the export application did not show enrichment as the export's intended end use, and it did not require the applicant to show possible end uses. Second, DOE may have learned that while working for Garrett Airesearch Manufacturing Company of California, Dr. Eerkens, now president of Lischem Corporation, was given access to certain classified enrichment information. Although this information was not directly related to laser enrichment, Dr. Eerkens did work on laser enrichment research while at Garrett and, in fact, participated in developing a laser enrichment funding proposal

which Garrett submitted to DOE. 1/ Third, contact with Lischem may have provided DOE with an opportunity to obtain additional technical data on the manufacturer's enrichment methodology. Obviously, contact with the manufacturer may have provided useful information which was never considered during DOE's review of the export license.

Prior proliferation concern not matched to export

In 1976, Dr. Eerkens requested DOE's approval to discuss his enrichment technology with the Iran Atomic Energy Organization. DOE expressed serious proliferation concerns over Dr. Eerkens' request. At that time, DOE's Division of Classification objected to Dr. Eerkens discussing his enrichment process with Iran because it thought

> "it probable that additional work on the process would soon reveal where the key deficiencies of the process are and how to circumvent them. Such a development may very well result in a process that would have reasonable potential of separating practical quantities of special nuclear material."

DOE's Office of Advanced Isotope Separation was also concerned and reported that "spin-offs in this area of research could occur, given a sufficient level of funding and U.S. technology, which could lead to a viable [uranium] separation technique." An attorney representing Lischem Corporation and Gifted Inc., told us to the best of his knowledge DOE had not advised them of its concerns when the subsequent export license was reviewed. Although Dr. Eerkens had asked DOE to hold his request to discuss uranium enrichment with the Iranian Government in abeyance, the Los Angeles Times reported that he visited Iran at about this time. We are unaware of any evidence indicating

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1/The proposal was actually made to one of DOE's predecessor organizations, the Atomic Energy Commission (AEC). The Energy Reorganization Act of 1974 (Public Law 93-438) abolished the AEC and on January 19, 1975, established the Nuclear Regulatory Commission and the Energy Research and Development Administration (ERDA). ERDA became part of the Department of Energy (DOE) on October 1, 1977. Throughout this report, AEC and ERDA are referred to as DOE.

that Dr. Eerkens discussed any matters prohibited by DOE regulations 1/ with the Iranian Government.

The DOE official reviewing the export application did not know of DOE's earlier proliferation concerns, even though the information was already in DOE's file, apparently because the records were maintained under Dr. Eerkens' name and the export application was made under the exporter's name, Gifted Inc. Even though Dr. Eerkens was the president of the manufacturing firm shown on the export application, DOE did not discover this during its review of the application. Had it matched the two files, it would have learned that Dr. Eerkens was now involved in an export of lasers and equipment to the same Iran Atomic Energy Organization with whom he had earlier requested permission to discuss a joint uranium enrichment venture. Knowledge of this prior request would have been useful information, because the export application did not show, or in any way indicate, uranium enrichment as a possible end use for the export.

An export application is only required to show the export's intended end use, which in this case was stated as laboratory plasma research. Had DOE known that Dr. Eerkens was involved in the export, and had DOE known of its own previous proliferation concerns about his proposed uranium enrichment involvement with the Iran Atomic Energy Organization, DOE may then have questioned the export's stated end use and, hopefully, conducted a more thorough review of the export application. If it had been determined that uranium enrichment was the end use, the Secretary of Energy's personal approval would then have been required by law, and a more complete review, possibly including a visit to the laser equipment manufacturer, may have been made. DOE may have also requested assurances from the Government of Iran as to the equipment's end use.

DOE concerned about unclassified enrichment process

DOE has not classified 2/ Dr. Eerkens' uranium enrichment process, because, in DOE's opinion, it had

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1/10 CFR, Part 810.

2/Information is classified when it contains national security information or restricted data. Executive Order 12065 provides the basis for determining which information is national security information, and the Atomic Energy Act of 1954, as amended, provides the basis for determining which information is restricted data.

> "* * * not reached the point of showing a reasonable potential for the separation of practical quantities of special nuclear material * * *."

However, as mentioned earlier, DOE's Division of Classification, which made the decision not to classify Dr. Eerkens' process, expressed concern over his plans to discuss it with the Iran Atomic Energy Organization. The Division was concerned that additional work on the process could lead to the successful enrichment of uranium. It is hard to reconcile this concern with its decision not to classify the process.

SUBSEQUENT EVENTS

Almost a year after the export license was issued, and after the Los Angeles Times had inquired about DOE's actions, DOE informed Los Alamos of the export and formally solicited its after-the-fact opinion on the export's proliferation potential.

The Division Leader in charge of Los Alamos' laser enrichment research program responded, "that there most likely has been no compromise of strategic materials restrictions." However, he also indicated that he was unable to rule out the proliferation risks of the equipment because he lacked certain technical information. DOE did not request this Los Alamos opinion until almost a year after the export license was issued, and therefore, DOE was not aware of this concern when it approved the export.

In April 1979, 10 months after the export license was issued, but still before he knew about the export to Iran, the Division Leader at Los Alamos wrote DOE's Division of Classification about Lischem Corporation, a laser manufacturer publicly advertising the sale of laser equipment capable of enriching uranium. He wrote:

> "Needless to say, the sale of such equipment, either domestically or foreign, could cause us considerable problems with respect to proliferation. I have no idea, at this point in time, of the reliability or producibility of the equipment described in these brochures, but believe it is important that we all determine if that is correct."

The laser system appearing in the advertisement that concerned Los Alamos enough to bring it to DOE's attention is manufactured by the same company, Lischem Corporation,

that produced the lasers and optical absorption cells exported to Iran. The advertised equipment have the same model numbers as the equipment listed on the export application.

Federal investigations

DOE's Office of Safeguards and Security began an investigation of Dr. Eerkens' activities in August 1979, following its receipt of a letter from the Garrett Airesearch Manufacturing Company of California about the activities of this former employee. DOE's records indicate that in the past, DOE had approved Dr. Eerkens' access to classified uranium enrichment information. After receiving the Garrett information, DOE conducted a brief review and then took no further action until it referred the letter to the FBI a few months later, after we made inquiries with both DOE and the FBI concerning this case. A DOE investigator in Los Angeles had interviewed Garrett officials concerning this same individual about 9 months before Garrett wrote its letter to DOE. An official of DOE's California office told us the report of its earlier investigation was sent to the now Director of DOE's Division of Security for action. The Director of that office told us he had no record of this classified document. Had Garrett not reported to DOE a second time, there is no reason to believe DOE would have begun an investigation into this matter.

At the time of our review, the FBI had just initiated an inquiry to determine if there had been a violation of applicable Federal law, and the Department of Commerce was conducting a preliminary inquiry of the export to determine whether the Export Administration Act or other regulations had been violated. In addition, the Customs Service of the Treasury Department was also investigating the circumstances surrounding the export to determine whether the Currency and Foreign Transactions Reporting Act had been violated.

DOE AND COMMERCE COMMENTS

In its oral and written comments on a draft of this report, DOE disagreed with our assessment and stated that its review of the export was adequate. We addressed DOE's major oral comments in the report; however, we did not include its written comments because they contain export license data considered confidential under the Export Administration Act of 1979.

The Department of Commerce provided oral comments of a factual nature on the report, which were incorporated as appropriate.

CONCLUSIONS

Most of the scientists we contacted agree that the nuclear weapons proliferation risks associated with the export of four lasers and related equipment to Iran are small. The absence of sufficient information on the exact nature of the DOE review of the export prevented us from attempting to reach an independent conclusion about its proliferation significance. The DOE review did not unearth prior proliferation concerns DOE itself had raised over the laser manufacturer's earlier request to discuss the joint development of a uranium enrichment technique with the Iran Atomic Energy Organization, nor did it consider all relevant technical information. We are particularly troubled by inconsistencies in statements made at the time of our review and by DOE when commenting on a draft of this report. We believe the inconsistencies are a symptom of DOE's failure to adequately document the scope and depth of its review.

Although export licensing procedures implemented as a result of the Nuclear Non-Proliferation Act of 1978 provide that closer scrutiny be given to certain proliferation sensitive exports, the changes that would have applied to the review of this export were already being practiced. Therefore, there is no reason to expect that DOE would have conducted a more thorough review had the act been in effect at the time the subject export application was examined.

RECOMMENDATION

Although we limited our review specifically to the Iran export, we believe the results of that review raise enough questions about DOE's overall export approval process to cause concern. Therefore, we recommend that the Secretary of Energy have a study made of DOE's export approval process for the purpose of evaluating how well the total process is working and, if necessary, make the appropriate improvements.

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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request. As always, we are available to discuss this report with you should you so desire.

Sincerely yours,

Comptroller General
of the United States

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