December 10, 1980 SECY-80-534

COMMISSIONER ACTION

For: The Commissioners

From: William J. Dircks
Executive Director for Operations

Subject: APPROVAL OF A PROPOSED LICENSE TO EXPORT A RESEARCH REACTOR TO MALAYSIA (LICENSE NO. XR-125)

Purpose: Commission review of proposed issuance of subject license to General Atomic Company

Review Dates: 60-day period expires on December 29, 1980
120-day period expires on February 27, 1981

Discussion: On January 19, 1977, General Atomic Company filed an application for a license to export a TRIGA Mark II research reactor to Malaysia (Appendix A). The reactor, which has a pulsing capability and a nominal steady-state power of 1,000 kilowatts thermal, will be owned and operated by the Tun Ismail Atomic Research Center of the Malaysia Ministry of Science, Technology and Environment. The research center is approximately 20 miles from Kuala Lumpur.

The TRIGA Mark II is an above-ground, water-filled, pool type reactor utilizing standard TRIGA fuel elements of stainless-steel clad uranium-zirconium hydride. The uranium is enriched to a maximum of 19.2 percent. The reactor will be used for research and training in nuclear science and for isotope production.

In response to our request for views on the proposed export, the Executive Branch, in a letter received on October 30 (Appendix B), (1) concluded that the requirements of the Atomic Energy Act of 1954, as amended, and P.L. 95-242 have been met and that issuance of the proposed license would not be inimical to the common defense and security of the United States; (2) confirmed that the reactor will be subject to the terms and conditions of the U.S.-IAEA Agreement for Cooperation, as amended, and the consolidated U.S.-Malaysia-

Contact:
Janice D. Lee, IP
49-27984

Discussion: (Continued)

IAEA Trilateral Project and Supply Agreement and the accompanying exchange of notes between the U.S. and Malaysia; and (3) noted that the IAEA and the Government of Malaysia have adhered to all provisions of their agreements.

Among other things, the Executive Branch notes that Malaysia was one of the original parties to the NPT and plays an active role in IAEA affairs. Malaysia also is a prominent developing country which advocates regional and international cooperation to promote economic and technological development.

In addition, the Executive Branch states that the research reactor proposed for export is one that utilizes low enriched uranium, which advances U.S. interests in reducing commerce in highly enriched fuels. The Executive Branch also states that the Project and Supply Agreement and accompanying exchange of notes fully meet the provisions of the amended U.S.-IAEA Agreement for Cooperation which entered into force in May 1980. The Supply Agreement and exchange of notes are attached to the Executive Branch views.

Earlier this year DOE forwarded to IP the draft U.S./IAEA/Malaysia Project and Supply Agreement and accompanying exchange of notes with Malaysia for review of a subsequent arrangement.

In our July 15 response to DOE (Appendix C), copies of which were forwarded to Commissioner assistants, the staff raised the following issues, which related to the exchange of notes:

(1) Whether U.S. visits to Malaysia for the purpose of exchanging information on physical security measures would be precluded since the note provided that such information be exchanged through the IAEA; and

(2) Whether the note should contain specific information which provides for the U.S. to receive information concerning safeguards implementation and the Malaysia state system of accounting and control.

(3) The difference between the language in the note and that in the 1974 Japanese Agreement for Cooperation with respect to the automatic application of fallback safeguards in the event IAEA safeguards are no longer applied.

Discussion: (Continued)

In its September 2 response to our letter (Appendix D), DOE provided the following comments keyed to the issues above:

(1) DOE has no basis for concluding that the U.S. physical security visits would be precluded. In this connection, DOE cited an earlier case involving such visits to Mexico under similar arrangements.

(2) The Executive Branch believes present arrangements are adequate to ensure the U.S. ability to assess the adequacy of IAEA safeguards implementation.

(3) The provision for application of safeguards, if IAEA safeguards are not applied, in the exchange of notes is sufficient to meet U.S. requirements since that provision is the functional equivalent of a similar provision in the fallback safeguards rights accorded in the Japanese Agreement for Cooperation. DOE further concluded that rights accorded bilaterally between the U.S. and Malaysia "would become operative concurrently with rather than consecutive to the commitment to enter into alternative (safeguards) arrangements with Malaysia and the IAEA."

Issue (2) above, is addressed further in the "International Safeguards and Foreign Physical Security Review" section below.

(With regard to the general matter of supply agreements, while the Malaysian Agreement was handled at the staff level, in the future we plan to submit such agreements to the Commission for review, as we do with agreements for cooperation.)

With regard to the criteria in Section 127 and 128 of the Atomic Energy Act, as amended:

-- Malaysia, as a party to the NPT, has accepted IAEA safeguards on all its nuclear installations. Furthermore, the Project and Supply Agreement contains an obligation for Malaysia to accept IAEA safeguards in perpetuity on the research reactor and fuel being acquired from the U.S. This reinforces the IAEA safeguards on this facility and fuel which Malaysia must accept pursuant to Article III of the NPT.

Discussion: (Continued)

-- As a party to the NPT, Malaysia is committed not to develop or use nuclear explosive devices for any purpose. This, of course, applies to materials, facilities, sensitive technology, and special nuclear materials used in and produced through the use thereof. Also, in Article VII.1 of the Consolidated Project and Supply Agreement, Malaysia is precluded from engaging in any research and development on any nuclear explosive device involving any U.S.-supplied material or facilities or any special nuclear material derived therefrom.

-- With respect to the physical security program in Malaysia, the U.S. has assurance that Malaysia is committed to providing adequate physical security for its nuclear programs, including a level of protection comparable to that envisioned by the recommendations in IAEA INFCIRC/225/Rev. 1. This assurance is contained in Article XII of the Consolidated Project and Supply Agreement.

-- Article III.4 of the Consolidated Project and Supply Agreement provides that the supplied reactor and materials and any nuclear material produced through their use including subsequent generations of produced fissionable material, shall be used exclusively by, and remain at, the Tun Ismail Research Center, unless otherwise agreed by the Parties to the Agreement. As one of the Parties, U.S. approval is thus required for retransfer of the proposed export or any special nuclear material produced through its use.

-- With regard to reprocessing, Article III.5 of the Consolidated Project and Supply Agreement stipulates that U.S.-supplied material, including irradiated fuel containing U.S.-supplied material, may be reprocessed or altered in form or content only in facilities acceptable to the U.S. and Malaysia. The Agreement further provides that such material shall not be further enriched unless Malaysia and the U.S. agree.

-- The proposed export does not involve the transfer of sensitive nuclear technology.

-- With regard to Section 128 of the AEA, Malaysia, as a party to the NPT, has accepted IAEA safeguards on all its nuclear activities.

Health & Safety: The Commission, in its order CLI-80-15 of May 6, 1980 in the Phillipine reactor case, decided to "...consider those health, safety and environmental impacts arising from exports of nuclear reactors that affect the territory of the United States and the global commons." Although the order does not explicitly exclude research reactors, the staff assumes that the Commission did not intend for the staff to perform a separate environmental analysis for research reactor exports. In this connection, the "Unified

Health & Safety: (Continued)

Procedures Applicable to Major Federal Actions Relating to Nuclear Activities Subject to Executive Order 12144" issued by the Executive Branch on September 4, 1979 define, for purposes of the proposed procedures, a "physical project" as one which means, inter alia, "any nuclear reactor capable of producing more than 15 thermal megawatts" (the TRIGA Mark II reactor is rated at 1 megawatt).

International Safeguards and Foreign Physical Security Review:

As a party to the NPT, Malaysia has accepted IAEA safeguards on all source and special nuclear material under its jurisdiction. Its NPT Safeguards Agreement entered into force on February 29, 1972. The subject research reactor will be exported under the U.S.-Malaysia-IAEA Trilateral Project and Supply Agreement, and subject to the international safeguards and physical protection provisions of both this agreement and the U.S./IAEA Agreement for Cooperation.

Although insufficient information is available to evaluate the adequacy of safeguards in Malaysia, staff believes that the control of and accounting for the fuel elements for this reactor, on an item basis, would be within the capabilities of both Malaysia and the IAEA.

Staff has reviewed the plan for physical protection of the Tun Ismail Atomic Research Center, and found it in accordance with the requirements of 10 CFR 110.43. (A U.S. physical security review team visited the Tun Ismail Center in July 1977. Implementation information is not available, as the Center was not completed at that time. However, such information is not required for reactor exports.)

Conclusion:

Based on the above, the staff has concluded that the proposed export meets the requirements of the Atomic Energy Act of 1954, as amended, and that issuance of the proposed license would not be inimical to the common defense and security of the United States.

Recommendation:

That the Commission authorize the issuance of the proposed license to General Atomic Company.

William J. Dircks
Executive Director for Operations

Appendices:
See next page

Appendices:
Appendix A: Application for license to export a TRIGA Mark II dtd 1/19/77
Appendix B: Memo10/29/80 L. Nosenzo to Shea
Appendix C: Ltr 7/15/80 Shea to Bengelsdorf
Appendix D: Ltr 9/2/80 Bengelsdorf to Shea
Appendix E: Proposed license

Commissioners' comments should be provided directly to the Office of the Secretary by c.o.b. Thursday, December 18, 1980.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT December 16, 1980, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

DISTRIBUTION
Commissioners
Commission Staff Offices
Exec Dir for Operations
Secretariat

APPENDIX A

GENERAL ATOMIC COMPANY
P.O. BOX 81608
SAN DIEGO, CALIFORNIA 92138
(714) 455-3000

In Reply
Refer To: IEL-

January 19, 1977

XR- 12.5
5-590
5-579
77025

Director of Nuclear Material Safety
and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Application for Utilization Facility Export License

Gentlemen:

This application is made under 10CFR50.65 for a license to export to Malaysia a TRIGA MARK II Research Reactor, which the applicant manufactures. The export of the SNM in the reactor fuels and fission chambers will be the subject of a separate application under 10CFR70. The export of the required Americium-Beryllium (AmBe) neutron sources will be made under the 10CFR36 General License.

The applicant is General Atomic Company, a California partnership, whose address is shown above. The applicant is engaged in the development, manufacture and marketing of reactors, nuclear fuels and systems.

The applicant's partners are Gulf Oil Corporation and Scallop Nuclear, Inc., Pennsylvania and Delaware Corporations, respectively, whose addresses are:

Gulf Oil Corporation Gulf Building Pittsburgh, PA 15230	and	Scallop Nuclear, Inc. One Rockefeller Plaza New York, New York 10020

The partnership conducts its business principally at San Diego, California. It is not owned, controlled or dominated by an alien, a foreign corporation, or foreign government within the meaning of the Atomic Energy Act of 1954, as amended, and of NRC's regulations. In making this application, General Atomic is not acting as an agent or representative of any other person.

dupe
8011250704

The purchaser and ultimate consignee of the reactor is the Tun Ismail Atomic Research Centre of the Ministry of Science Technology and Environment in Malaysia. It is our understanding Malaysia is a signator to the Nuclear Nonproliferation Treaty (NPT) and the reacto· will be used for research and training in nuclear science and for isotope production.

The first shipment of reactor components made under the requested license is scheduled on or about July 1, 1977. Final component shipment and the fuel shipment is scheduled for not later than March 1979. Fuel loading and reactor checkout are scheduled for completion by May 1979.

The total value of all items to be exported under the requested license will be approximately $1,600,000 including the value of the owned uranium in the fuels.

Th or being exported is a TRIGA Mark II with pulsing capability and a nc teady-state power of 1000 KW thermal. The TRIGA Mark II is an above-ground, water-filled, pool-type reactor. The initial reactor core will consist of standard TRIGA fuels containing stainless-steel clad Uranium-Zirconium Hydride. The uranium is enriched in U-235 to less than 20% (nominal enrichment 19.9%). Additionally, Attachment A provides a list of the basic operating characteristics of the TRIGA Mark II.

The location of the research center, which contains the reactor is: Sungei Buloh estate, Selangor, Malaysia, located approximately twenty miles from Kuala Lumpur, Malaysia.

Items being exported under the requested license will consist of instrumentation systems and components, reactor mechanical components, reactor cooling system components, fuel handling equipment, experimental facilities, a complement of spares and replacement components and such equipment and tools needed to service the reactor. Certain other items will be exported for temporary use. Such items described under 10CFR50.65(c)(2)(vi), include specialized tools, instruments and associated start-up monitoring equipment. These certain items exported for temporary use will be returned to the applicant upon completion of the reactor checkout.

We request the timely issuance of a Utilization Facility Export License authorizing the export of a TRIGA Mark II Research Reactor to Malaysia. We request the license have a validity period through May 1980 to accommodate possible schedule slippage during the construction and start up of the reactor.

Very truly yours,

William R. Mowry
Licensing Administrator
Nuclear Materials Control Division

WRM:ts

Attachment A

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

After being duly sworn, the person known to me to be William R. Mowry, Licensing Administrator, Nuclear Materials Control Division, General Atomic Company, signed the above document this 20th day of January 1977.

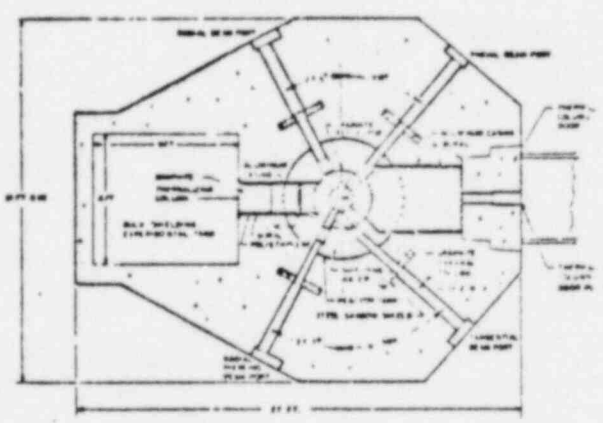
OFFICIAL SEAL
NANCY G. JENSEN
NOTARY PUBLIC - CALIFORNIA
SAN DIEGO COUNTY
My Commission Expires Mar. 26, 1978

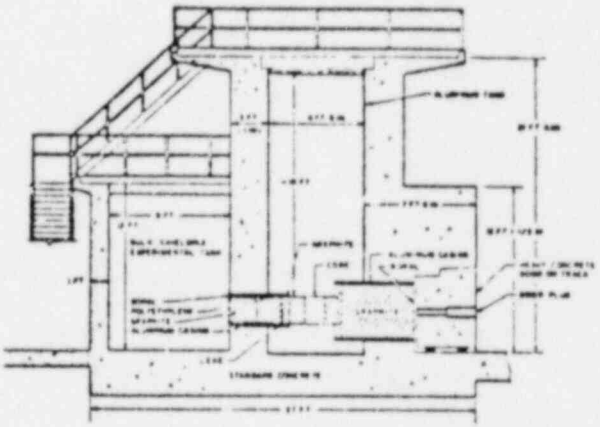
Nancy G. Jensen
Notary Public

TRIGA Mark II Reactor

GENERAL

Shield Dimensions





REACTOR ROOM

68 ft x 75 ft x 31 ft from floor to crane hook (recommended)

50 ft x 60 ft x 31 ft from floor to crane hook (minimum)

STANDARD EQUIPMENT

40-position rotary specimen rack (∿2600 cm^3 irradiation volume)

pneumatic transfer system

central thimble (1.33 in. i.d.)

4 beam tubes

thermal column

POWER LEVELS - (SS-clad fuel)

Steady State: 250 to 2000 kW, U-$ZrH_{1.6}$ fuel
(∿3000 kW if forced convection cooling is used)

Pulsing: ∿2,000,000 kW nominal
High pulsing option: ∿6,400,000 kW

FLUX (Maximum) - n/cm^2-sec

	1000 kW Steady State	1000 MW Pulse
Thermal (<0.21 eV)	3.5×10^{13}	3.5×10^{16}
Fast (>10 keV)	4.0×10^{13}	4.0×10^{16}

NUCLEAR PARAMETERS

Fuel: About 80 fuel elements (for 1000 kW) 1.47 in. o.d. x 28.37 in. each containing about 39 gm U-235 for a loading of ∿3.1 kg U-235, giving ∿4.5% δk/k excess reactivity

Prompt Temperature Coefficient (50°C): 1.2×10^{-4} δk/k-°C

Prompt Neutron Lifetime: 65 μsec

APPENDIX B

DEPARTMENT OF STATE

Washington, D.C. 20520

BUREAU OF OCEANS AND INTERNATIONAL
ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

OCT 2 9 1980 XR-125

MEMORANDUM FOR JAMES R. SHEA
NUCLEAR REGULATORY COMMISSION

Enclosed is an Executive Branch analysis covering a license application for the export of a research reactor to Malaysia. In accordance with P.L. 95-242, the analysis explicitly addresses how the requirements of Section 126 a.(1) of the Atomic Energy Act are met, including the specific criteria of Sections 127 and 128, as well as certain additional factors, envisaged by Section 126 a.(1).

The Executive Branch, on the basis of its review of these applications has concluded that the requirements of the Atomic Energy Act, as amended, and P.L. 95-242 have been met and that the proposed export would not be inimical to the common defense and security of the United States. Moreover, Malaysia has adhered to the provisions of its Agreements with the International Atomic Energy Agency and the United States and the Agency has adhered to the provisions of its Agreement with the United States.

Therefore, the Executive Branch recommends issuance of the requested export license.

Louis V. Nosenzo
Deputy Assistant Secretary

Enclosure:
As stated.

DUPLICATE

dupe 8011060796

RECEIVED
U.S. NRC

1980 OCT 30 PM

EXPORT
IMPORT
INTERNAT'L SFGRDS