



8

昭和三十一年五月一日付公信写
重光外務大臣あて 左アメリカ合衆国谷特命全權大使発

米国の原子炉半額援助に関する件

四月二十日付貴信に關し、A E G に諮した結果左のとおり
の回答があつた。

一 米國から研究用原子炉を購入する件について、公式に発表され
たのはブラジルのみであり、ブラジルはスウイミング・プー
ル型（五千KW）をパブコックから購入し、総額についてはA E G
は言えないが、ブラジル又は会社から聞かれない一援助額は三
十五万弗である。一注、総額は最低七十万弗といわれている。
その他に公表されたものはないが、A E G 係官の了解するところ
では契約を了したものは日本のはじめ、スペイン（三千KW）プ
ール型（四型）、イタリ（五千KW）P 五型、アメリカ（
アンド・フアウンダリー）があるが、米政府の援助は未だ決つて

いない。他の購入価格もA E G からはいえない。この外に米会
社より購入を交渉中のものでしてデンマーク、オランダ、イス
ラエルがあり、小型動力炉はベルギーがウエステインダハス
より一、五〇〇KWの発電炉を購入する由である。

二 研究原子炉に対する米政府の援助は、別添資料(1)のとき付属
物を含む原子炉価格の半額で最高額三十五万弗である。

半額援助については、濃縮ウラン貸与の場合のときを契約書等は
考えられておらず、援助は次の手続により行われる。

(1) 大使よりA E G へて半額援助の正式申入れを行う。この際購
入炉についての計画を添付せられたる、その計画の中には少
くとも別添資料(2)の各項目並びに、原子炉価格と援助額との
差額に対する支払計画（日本政府が支払るか借入るか）を
を入れて頂きたい。この要求は原子炉について、受入国を

c111-016-012

この種の買付書は、もたなり条件をつけたりする意図によるもので、決
してなま受入国の購入する炉について予め相談するものなり。こ
国間協定の主旨と濃縮ウラン貸与半額援助等の援助の目的が
充分達せられるように炉の性能等について充分話合つておき
たいとの主旨によるものである。前記資料(四)の全項目が、
カーから購入者に提示された計画書中に入つておれば、その
コピーを提出されれば充分であるが、カーからの計画書
を提出されることは必ずしも必要ではない。

(四) 右(一)の書簡及び付属書をA E Oが検討し、必要があればA E O
により質問ないし技術的な点についてサジェストをするため
のネゴシエーションをすることがある。その結果右の計画に
ついてA E Oに異存がなければ最高三十五万弗の範囲におい
て半額援助額が日本政府又は日本政府の指定するものに支払
われる。半額援助を受けたためにその国に対し、特別の条件
をつけるつもりはない。

(四) 右(一)の申入れ及び(四)のネゴシエーションは原子炉購入契約調
印前にせられたい。

三 半額援助最高額はA E O 国務省及びI G Aの三者において相
談の上決定されたもので、今のところ変更される見込はない。
三十五万弗という金額は受入諸国になるべく均等に行きわた
るようにとの主旨に基き、最も多量の国が購入すると考えら
れる型の炉の価格の半額という基準で決定された。(提案さ
れた三つの型の炉について購入される度合のウエイトをつけ
て平均した価格の半分と考えて頂いてもよい。)

四 輸出入銀行の差額借款については、輸出入銀行が本件につい
て興味を有し、外国から申出のあつた時相談にのつてもら
たいとの申入れがA E Oに行われたものである。日本から同
銀行に借款を申入れる場合A E Oがその談合に参加してあつ
せんしてもよい。借款の条件については日本と輸出入銀行の
間で話合つてもらいたく、A E Oに案がある訳ではない。

（本件については輸出入銀行につき調査の上、近日中に報告する。）



ITEMS WHICH COULD BE INCLUDED
IN A RESEARCH REACTOR PROJECT

Reactor -- will include

- A. Moderator and Reflector. The moderator and reflector in quantity and form ready for insertion in the reactor. The materials available include heavy water, graphite, beryllium, beryllium oxide and of course light water.
- B. Core Structure. This structure contains and provides support for the fuel and moderator and may also contain the reflector and thermal shield. This structure is complete with a closure where required, supports, internal structure to hold or align all elements piercing the core or contained therein, and fittings for attachment of controls, safeties, instruments, cooling system, service system and experimental access channels.
- C. Shield. Shielding as required to reduce radiation levels to tolerance dosages for equipment and personnel. This shielding includes removable plugs or other means of access to the high flux regions for experimental purposes as well as necessary piercing passages for controls, instrumentation and other reactor auxiliary systems.
- D. Cooling System. This system, if required, will be complete with heat exchangers, pumps and drives, piping, valves and pressure temperature and flow instrumentation. Equipment for coolant purity control and make-up is included.
- E. Controls and Instrumentation. A complete control system for the operation of the reactor. This system will provide for normal operation of the reactor at a present level and incorporate a number of safety features such as automatic alarms, power set-backs and reactor shutdown. It is intended to include (1) the basic sensing elements of the control system (fission and gamma chambers, thermocouples, pressure gages, flow meters, etc.), (2) the electronic and electromechanical equipment required to translate signals received from the sensing elements into motion (amplifiers, differential amplifiers, solenoid release circuits, etc.), (3) the control elements (neutron absorbing regulating and safety rods and their drives), and (4) a control console (operator's desk with key control buttons and switches and a bank of recording and indicating instruments.)
- F. Miscellaneous Equipment and Facilities Directly Related to the Reactor. Equipment and facilities as needed for normal operation of the reactor, including: special handling tools to be used in loading and unloading fuel, including transfer and shipping coffins, health physics instruments, off gas disposal equipment, sampling systems, etc.
- G. Design, Installation and Start-up. In addition to the detail design, procurement and fabrication of the components listed above, installation of

these components

- 2 -

these components, start-up and initial operation of the plant to demonstrate satisfactory performance.

Reactor Project

In addition to the Reactor, a Reactor project will include:

- A. Fuel. Initial fuel and fuel elements, in accordance with the agreement for cooperation, will be leased to the country concerned. The fuel will be in the form of a solution or mechanical assemblies, whichever is appropriate, ready for insertion in the reactor.
1. Use charge. An annual charge of 4% (adjusted annually for burn-up) based on a price of \$25 per gram of contained U-235 in uranium enriched to 20%, and proportionately less for material of lesser enrichment;
- A consumption charge (burn-up and losses), based on a price of \$25 per gram of contained U-235, as above.
2. Recovery Costs. (1) Decontamination and recovery of uranium, and (2) loss in value due to depletion of isotopic dilution of uranium.
- And, if applicable: (1) fabrication costs, and (2) packaging and shipping charges to and from the United States.
- B. Building and Ancillary Facilities. The design and erection of the building or buildings, including foundation, superstructure, overhead crane, utilities, heating and ventilation, laboratory shops and office space, site improvements.
- C. Experimental Equipment. Equipment to be used in conjunction with experiments utilizing the reactor or its products.
- D. Disposal System. Disposal system for solid and liquid radioactive wastes.
- E. Consultant. The payment of qualified consultants to assist in the selection of the reactor and the installation of the reactor project.
- F. Training. The on-site training of operating personnel for the reactor and its associated equipment. The off-site and on-site training of the technical staff utilizing the reactor.

MINIMUM POINTS TO BE COVERED IN
FOREIGN RESEARCH REACTOR PROPOSALS

1. A description of the reactor, including details of:
 - a. Fuel, moderator--coolant arrangement, and specifications of these materials.
 - b. Reactor control system.
 - c. Experimental facilities.
 - d. Shielding
 - e. Expected operating levels--excess radioactivity, availability for experiments, etc.
2. A description of all the facilities, including research facilities, related directly to operation and utilization of the reactor.
3. Indication of the principal organizations with which contracts will be entered into in connection with construction of the project, including the organization which will fabricate fuel elements.
4. A detailed breakdown of the estimated cost of all facilities towards which the United States' financial contribution would be applied. (Where possible, supporting bids should be provided.)
5. A schedule for construction and completion of the project, indicating dates fuel material will be required, start-up of reactor, etc.
6. A description of the organization planned to operate and utilize the facility, with indication of the training and competence of the personnel involved.
7. A description of any plans to meet requirements for technical personnel by such means as utilizing personnel of qualified commercial firms during design, construction, start-up and early operation.
8. An estimate of fuel requirements for the initial five years, i.e., total inventory requirements, burn-up, reprocessing and recharging rate, etc.
9. A description of the site of the project, including maps, with discussion of utilities, environmental points of importance from the stand-point of reactor hazards, and operational limits imposed, and other procedures to be established, to provide for safety and health.
10. A brief characterization of the proposed technical programs for utilization of the reactor.