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DEPARTMENT OF STATE

Memorandum of Conversation

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DATE: August 29, 1973

SUBJECT: ROC Nuclear Energy Plans

PARTICIPANTS: Dr. Abraham Friedman, Director of International Programs, AEC and several members of his staff
 Mr. Victor Cheng, Secretary General of the Republic of China's AEC
 Mr. David Chu, Vice President of Taiwan Power Company
 Several officials from the ROC Embassy
 Joseph W. Moyle, Country Officer, ROC Affairs

Distribution: Taipei, Hong Kong, Peking, INR, CIA, AEC, SCI, ACDA

Summary - Dr. Friedman said the AEC has very serious problems with ROC's desire to establish a nuclear reprocessing plant on Taiwan after 1985. These reservations, he said, included unwillingness to train people in reprocessing technology. He added that IAEA's relationship with the ROC would almost certainly be severed if the ROC proceeded with its plans for a reprocessing plant; this in turn would imperil the ROC's entire nuclear energy program. Dr. Friedman also said he hoped to be able to visit Taiwan soon with a few of his colleagues. Secretary General said he would be welcome to come. An additional problem discussed was the inclusion of plutonium in ROC fuel elements when this process becomes commercially feasible.
End Summary.

A. Dr. Friedman to Visit Taiwan; Amendment to US/ROC Nuclear Cooperation Agreement

Dr. Friedman opened the conversation by saying that he had never visited Taiwan. He hoped to visit it soon with a few of his colleagues to see what the ROC is doing in the nuclear energy field.

Mr. Cheng said that he would welcome a visit by Dr. Friedman. He noted that Dr. Bruce Billings, former Special Assistant to the Ambassador for Science and Technology; Dr. Chester Clark, present incumbent of that job; and the AEC's Tokyo representative, Mr. Helfridge, have all toured ROC nuclear facilities.

EA/ROC: JW Moyle: jw
 (Drafting Office and Officer)

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DECLASSIFIED	
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SECRET

- 2 -

Mr. Cheng said that the ROC had examined the draft amendment to the US/ROC Nuclear Cooperation Agreement and stated he believed that the ROC will accept the amendment. However, he said, he would like to clarify a point regarding plutonium. It is not clear in the agreement, he said, whether plutonium created in Taipower reactors may be used in refabricated fuel materials. It will be economically feasible in the next few years to use plutonium in refabricated fuel materials. The inability of Taipower to use plutonium generated in its own reactors would seriously affect its economic calculations.

Dr. Friedman responded that the proposed amendment does not attempt to address all potential problems which may come up during the life of the agreement. These problems can be resolved, he said, as they arise. Mr. Cheng then asked Mr. David Chu to give a rundown on Taipower's nuclear power program.

B. Taiwan's Nuclear Energy Program

Mr. Chu began by saying that the ROC was determined to reduce its dependence on the Middle East as a source of energy. By 1985, he said, the ROC will have a six or seven million kilowatt nuclear power capacity. This will amount to over 50% of the ROC's total electrical energy resources.

Fuel

He said that in view of the importance to the ROC of nuclear electrical power, it is determined to contract for uranium supplies on a long-term basis. The ROC, he said, has already arranged for uranium to be procured from the United States, South Africa, Gulf of Canada and Exxon.

Fabrication

Mr. Chu said that fabrication of fuel elements for Taipower reactors will initially be undertaken by the General Electric Corporation, but will later be contracted out to Edison. He said that after Taipower reaches a nuclear generation capacity of about 3,000 megawatts (1979 or later), the ROC will encourage companies such as General Electric or Exxon to establish a fuel fabrication facility on Taiwan in order to save on fabrication and transportation costs.

SECRET

DECLASSIFIED
Authority NND 969 050
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SECRET

-3-

Reprocessing

Mr. Chu said that reprocessing of spent fuel cores would initially be done by BNFL.* However, the ROC believes that it will be more economical to reprocess on Taiwan. He said that ROC did not know if reprocessing was truly economical but that it did believe that preparations for reprocessing should commence. The procedure he said would be as follows:

1. Train technicians in reprocessing technology.
2. Three or four years after training had commenced, a feasibility study will be made on the desirability of local reprocessing as against foreign reprocessing.
3. At this point the United States Government would again be consulted.
4. At some future point, the possibility of recycling plutonium on Taiwan will have to be considered. The ROC would like to use recycled plutonium in Taipower reactors and would like some indication of USG's thinking on this subject.

C. Dr. Friedman's Response

Dr. Friedman made the following responses to Mr. Chu's remarks:

Fuel

Dr. Friedman agreed that long-term contracts for uranium supply were desirable.

Enrichment

Dr. Friedman noted that the supply ceilings for enriched nuclear materials in the proposed amendment to the US/ROC Nuclear Cooperation Agreement are not a commitment but simply figures established for planning purposes. He added that the AEC just does not know at this point if it will be able to meet all future needs. Further, he said, it is anticipated that by late 1974 private industry will have decided to build its own enrichment plants. Once these plants are constructed, the AEC will defer to private industry.

Fabrication

Dr. Friedman had no comment.

* British Nuclear Fuel Laboratories

SECRET

DECLASSIFIED	
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SECRET

- 4 -

Reprocessing

Dr. Friedman said that he could understand the ROC's rationale in contracting for reprocessing with BNFL. He said the AEC finds this approach reasonable. He noted, however, that there may be some problems involved in shipping reprocessed fuel to the United States for fabrication, which will have to be explored.

Mr. William Yeomans of the AEC then asked Mr. Cheng if the ROC had discussed with IAEA the question of safeguarding fuel reprocessed in England. Mr. Cheng responded that the ROC had not yet contacted IAEA on this subject; he added that the ROC felt that if it could first obtain USG agreement to reprocessing in England, it would be able to proceed.

Dr. Friedman said that the AEC has very serious problems with reprocessing nuclear fuels on Taiwan, in part because of the safeguards question. He said that we know that IAEA is under serious pressure to withdraw all contact with Taiwan, including safeguards. IAEA he said, to its credit, has resisted these pressures and continues low-key safeguard activities on Taiwan. Dr. Friedman stated that he was sure that IAEA, however, would not be able to resist this pressure if intensive safeguards of the type required by a reprocessing plant were required. This action, he said, could prejudice the entire ROC nuclear power program. Dr. Friedman said he felt it would be extremely imprudent for the ROC to begin planning for a reprocessing plant and that he wished to discourage the ROC from proceeding with any such plans. The AEC's negative view, he said, included not being willing to accept people for training in reprocessing technology.

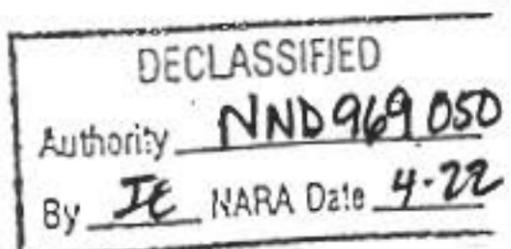
Dr. Friedman said that the ROC ought to explore possible alternatives. One such alternative might be the establishment of a regional reprocessing plant in, say, Korea where IAEA safeguards would be possible. Such an arrangement would save on shipping costs and would also give the ROC greater security.

Dr. Friedman concluded his remarks on this subject by again saying that "we strongly discourage you from proceeding with your plans."

Plutonium

Dr. Friedman said that it makes sense for the ROC to plan on future use of recycled plutonium in its fuel elements. The use of plutonium in fuel elements may be economically feasible soon, perhaps by the mid-1980's. The necessary technology is already available and

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SECRET

- 5 -

it is merely a question of economics. Licensing, he said, may also be a problem. He noted that recycling of plutonium is more economic when done on a large scale. He said he would recommend that fuel elements incorporating plutonium be fabricated in the United States.

Mr. Cheng in response noted that the ROC will have its fuel elements fabricated abroad until 1985. After 1985, he said, it will be economical to fabricate fuel on Taiwan. He also said that he thought that under the proposed amendment it would be possible for the ROC to recycle plutonium on Taiwan.

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