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PAGE 01 OF 02 STATE 197132  
ORIGIN SS-39

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STATE 197132

INFO OCT-00 ADS-00 SSO-00 /030 R

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STATE DEPT. DECLASSIFICATION REVIEW  
 Retain Class'n  Change to  
Declassify in part and excise as shown  
EO 12958, 25X( ) ( ) ( )  
 Declassify  After  
With concurrence of [initials]

P 252214Z JUL 80  
FM SECSTATE WASHDC  
TO AMEMBASSY OTTAWA PRIORITY

6695137 / 66  
Date (S/O) obtained  
JUL 12 2002

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E.O. 12065: RDS-3 7/25/00 (NOSENZO, LOUIS V.) OES/N

TAGS: ENRG, TECH, PARM, CA, TW

SUBJECT: TAIWAN RESEARCH REACTOR

1. (S - ENTIRE TEXT)

2. U.S./GOC TALKS ON STEPS THAT CAN BE TAKEN TO SUBSTANTIALLY REDUCE NON-PROLIFERATION CONCERNS CAUSED BY PLUTONIUM PRODUCTION CAPABILITY AND BY ACCUMULATING PLUTONIUM INVENTORY IN THE SPENT NATURAL URANIUM FUEL OF THE TAIWAN RESEARCH REACTOR (TRR) HAVE BEEN HELD PERIODICALLY SINCE 1977. THESE TALKS INCLUDED CONSULTATIONS WITH THE GOC ON THE NON-PROLIFERATION ISSUES INVOLVED AND, ALSO, CONSULTATIONS WITH CANADIAN EXPERTS ON TECHNICAL AND ECONOMIC ISSUES AND ON PROGRESS OF U.S. AND JOINT U.S./TAIWAN STUDIES. THE NON-PROLIFERATION STEPS THAT HAVE BEEN DISCUSSED ARE: (1) CONVERSION OF TRR FROM USE OF NATURAL URANIUM FUEL TO USE OF 20 -ENRICHED URANIUM FUEL IN ORDER TO SUPPRESS PLUTONIUM PRODUCTION, AND (2) SYSTEMATIC TRANSFER TO THE U.S. FROM TAIWAN OF THE ACCUMULATED SPENT NATURAL URANIUM FUEL INVENTORY OF THE TRR FOR REPROCESSING AND DISPOSAL IN ORDER TO REMOVE THE CONTAINED PLUTONIUM INVENTORY FROM TAIWAN.

3. IN THE COURSE OF THE TALKS, THE GOC AGREED IN PRINCIPLE TO THE DESIRABILITY OF THESE NON-PROLIFERATION STEPS FOR TRR AND ALSO TENTATIVELY AGREED TO SUPPORT AND COOPERATE WITH THE USG IN A NUMBER OF WAYS IF IT WERE DECIDED TO FORMALLY PURSUE IMPLEMENTATION OF THESE STEPS BY TAIWAN. THE USG HAS NOW COMPLETED ITS TECHNICAL AND ECONOMIC STUDIES AND HAS DECIDED TO PRESS TAIWAN TO IMPLEMENT BOTH FUEL CONVERSION AND SPENT FUEL TRANSFER BEGINNING AS SOON AS POSSIBLE. A PACKAGE HAS BEEN PREPARED FOR PRESENTATION TO TAIWAN THAT WE BELIEVE WILL BE ACCEPTABLE TO THEM. THE PACKAGE CONTAINS A NUMBER OF COST AND TECHNICAL SUPPORT ITEMS FOR WHICH THE USG IS DEPENDENT ON CANADIAN SUPPORT TO MAKE THE PACKAGE VIABLE. CANADIAN AGREEMENT TO ACCEPT RESPONSIBILITY FOR THESE ITEMS IS NECESSARY BEFORE THE PACKAGE CAN BE FORMALLY PRESENTED TO TAIWAN.

4. ACCORDINGLY, THE EMBASSY IS REQUESTED TO APPROACH APPROPRIATE GOC AND AECL OFFICIALS TO SET UP A 1-2 DAY MEETING AS SOON AS PRACTICABLE IN OTTAWA TO DISCUSS THESE MATTERS. IN THIS MEETING THE USG WOULD REVIEW THE RESULTS OF THE TECHNICAL AND ECONOMIC STUDIES THAT FORM THE BASIS OF THE TRR POLICY DECISION, REVIEW DETAILS OF THE PACKAGE

TO BE PROPOSED TO TAIWAN, AND DISCUSS IN DETAIL THOSE OBLIGATIONS THAT CANADA IS BEING ASKED TO ASSUME. CANADIAN SUGGESTIONS FOR REVISIONS TO THE DRAFT TRR PACKAGE WOULD BE WELCOMED.

5. IN PRESENTING THIS REQUEST FOR A MEETING THE EMBASSY SHOULD GIVE THE GOC A WRITTEN COPY OF THE NON-PAPER CONTAINED IN PARAS 6-12. PLEASE REPORT GOC REACTIONS SOONEST INCLUDING ALTERNATIVE DATES AND PROBABLE GOC REPRESENTATIVES.

6. THE USG HAS COMPLETED ITS STUDIES OF ALTERNATIVE STEPS TO REDUCE PROLIFERATION CONCERNS ASSOCIATED WITH CONTINUED OPERATION OF THE TAIWAN RESEARCH REACTOR (TRR) ON NATURAL URANIUM FUEL. BASED ON THESE STUDIES, THE DECISION HAS BEEN MADE TO PRESS TAIWAN TO AGREE TO BEGIN IMPLEMENTATION AS SOON AS POSSIBLE OF TWO ACTIONS: (1) CONVERSION OF THE REACTOR FROM USE OF NATURAL URANIUM FUEL TO USE OF 20 -ENRICHED FUEL, AND (2) SYSTEMATIC TRANSFER OF THE INVENTORY OF SPENT NATURAL URANIUM FUEL HELD AT THE REACTOR TO THE U.S. FOR REPROCESSING AND DISPOSITION. THE GOC IS FAMILIAR WITH THE ISSUES INVOLVED HERE, AND WITH THE REASONS FOR U.S. INTEREST IN THIS MATTER, AS A RESULT OF THE SEVERAL POLICY AND TECHNICAL LEVEL TALKS WE HAVE HELD ON THIS TOPIC SINCE 1977. CANADIAN TECHNICAL AND POLICY CONTRIBUTIONS TO U.S. STUDIES ON TRR ISSUES HAVE, OF COURSE, STRONGLY INFLUENCED U.S. POSITIONS.

7. THE USG IS NOW SEEKING AN EARLY MEETING WITH THE GOC TO DISCUSS DETAILS OF THE DRAFT AGREEMENTS PACKAGE THAT HAS BEEN PREPARED FOR PRESENTATION TO TAIWAN. CONSISTENT WITH OUR CLOSE COLLABORATION ON THIS MATTER SINCE 1977, THE USG WILL WELCOME CANADIAN COMMENTS AND SUGGESTIONS ON THE PACKAGE. CONSULTATIONS WITH CANADA ON THIS PACKAGE PRIOR TO ITS PRESENTATION TO TAIWAN ARE ALSO NECESSARY INASMUCH AS THE PACKAGE CONTAINS A NUMBER OF COST AND TECHNICAL SUPPORT ITEMS FOR WHICH THE USG IS DEPENDENT ON CANADIAN SUPPORT TO MAKE THE PACKAGE VIABLE. SOME OF THESE ITEMS ARE POINTS ON WHICH THE GOC HAS AGREED IN PRINCIPLE IN THE PAST, OTHERS ARE NEW ITEMS. THE FOLLOWING PARAGRAPHS CONTAIN A SUMMARY OF THE KEY POINTS OF THE PROPOSED U.S. POLICY PACKAGE ON TRR, AND A SUMMARY OF THE PRINCIPAL SUPPORT ITEMS NEEDED FROM CANADA.

8. TECHNICAL FEASIBILITY OF CONVERTING TRR TO 20 -ENRICHED URANIUM THROUGH USE OF FUEL SIMILAR TO THE 7-PIN U-AL FUEL NOW USED IN NRX HAS BEEN ESTABLISHED. TAIWAN ACCEPTS THIS. HOWEVER, THE CONVERSION IMPLEMENTATION PLAN THAT HAS BEEN DISCUSSED WITH THE GOC IN THE PAST (I.E., THE PLAN THAT INVOLVES BILLET FABRICATION IN THE U.S., FUEL FABRICATION IN CANADA, AND TRANSHIPMENT OF FUEL THROUGH THE U.S. TO TAIWAN) IS, WE BELIEVE, UNWORKABLE. THE PLAN ASKS TAIWAN TO DEPEND ON AN UNKNOWN FOREIGN FUEL SUPPLIER FOR THE INDEFINITE FUTURE. THE LEGAL PROBLEMS OF MAINTAINING CANADIAN PARTICIPATION A SECRET, ESPECIALLY OVER AN INDEFINITE TIME SPAN, ARE TOO GREAT. U.S. COMMITMENTS TO SUPPORT THE FUEL SUPPLY LINE CANNOT BE ASSURED OVER AN INDEFINITE TIME SPAN. THE PLAN DOES NOT PROVIDE AN ALTERNATIVE USE FOR THE FACILITY AND STAFF OF THE EXISTING TRR FUEL FABRICATION PLANT. NO WARRANTY CAN BE GIVEN ON THE FUEL.

9. IT IS THEREFORE PROPOSED TO OFFER TAIWAN AN ALTERNATIVE CONVERSION PLAN IN WHICH CANADA WOULD HAVE NO DIRECT ROLE (EXCEPT IN MANUFACTURE OF NEEDED SHUTOFF AND ADJUSTER RODS). UNDER THE ALTERNATIVE PLAN A COMPLETE 20 -ENRICHED FUEL FABRICATION CAPABILITY WOULD ULTIMATELY BE SET UP ON TAIWAN. THE CURRENT TRR NATURAL URANIUM METAL FUEL PRO-

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DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW  
1ST REVIEW DATE: 5/1/03  
AUTHORITY: 10 USC 3504  
NAME: [initials]  
2ND REVIEW DATE: 5/2/03  
AUTHORITY: [initials]  
1. CLASSIFICATION (CIRCLE NUMBER)  
2. CLASSIFICATION CHANGED TO  
3. CONTAINS NO DOE CLASSIFIED INFO  
4. COORDINATE WITH:  
5. CLASSIFICATION CANCELLED  
6. CLASSIFIED INFO RECLASSIFIED  
7. OTHER (SPECIFY)

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SECRET  
Department of State

OUTGOING  
TELEGRAM

PAGE 02 OF 02 STATE 197132

STATE 197132

DUCTION FACILITY WOULD BE CONVERTED TO A 20 -ENRICHED FUEL FABRICATION FACILITY. THE BASIC IMPLEMENTATION PLAN WOULD BE TO INITIALLY SET UP A FUEL FABRICATION LINE UNDER A DOE CONTRACT AND THEN TO PROGRESSIVELY TRANSFER THIS TECHNOLOGY TO TAIWAN. BOTH THE ACTIVITIES IN THE U.S. AND THE ACTIVITIES IN TAIWAN WOULD BE CARRIED OUT BY A JOINT U.S./TAIWAN TECHNICAL TEAM. IN THE FINAL CONFIGURATION,

FUEL MANUFACTURING TECHNOLOGY TO TAIWAN AND ACTUAL MANUFACTURE OF FUEL ELEMENTS ON TAIWAN.

CHRISTOPHER

THE U.S. WOULD CONTINUE TO SELL 20 -ENRICHED URANIUM METAL TO TAIWAN, BUT ALL OTHER STEPS OF FUEL MANUFACTURE WOULD BE DONE ON TAIWAN.

10. THE KEY TO THE VIABILITY OF THIS ALTERNATIVE FUEL CONVERSION PLAN IS FOR CANADA TO ACQUIESCE IN BOTH THE NECESSARY FUEL DESIGN AND MANUFACTURING TECHNOLOGY TRANSFER TO TAIWAN FROM THE U.S. AND THE ACTUAL FUEL MANUFACTURE ON TAIWAN. THE FUEL MANUFACTURING LINE ON TAIWAN WOULD BE SIMILAR IN CERTAIN ASPECTS TO THAT USED AT CHALK RIVER ALTHOUGH DOE WILL BE DEVELOPING A NEW MANUFACTURING PROCEDURE FOR TRANSFER TO TAIWAN. THE FUEL SUBSEQUENTLY MANUFACTURED ON TAIWAN WOULD BE SIMILAR IN DESIGN TO THE CURRENT FUEL USED IN NRX.

11. CONSISTENT WITH EARLIER U.S./GOC DISCUSSIONS, THE U.S. IS ASKING THE GOC TO ACCEPT RESPONSIBILITY FOR THE COST OF TRANSPORTING 475 SPENT NATURAL URANIUM FUEL ELEMENTS FROM A TAIWAN PORT TO THE U.S. INCLUDING THE COST OF CASK RENTAL DURING THE TIME THE CASKS ARE ON TAIWAN BEING LOADED. TAIWAN WOULD BE ASKED TO PAY THE COST OF TRANSPORTATION, PACKAGING, TESTING, AND LOADING OPERATIONS ON TAIWAN. THE USG WOULD PAY THE COST OF SUBSEQUENT REPROCESSING AND WASTE DISPOSAL FOR THE 475 ELEMENTS AND WOULD PROVIDE ALL NECESSARY MANAGEMENT AND TECHNICAL CONSULTING SERVICES TO THE FUEL TRANSFER OPERATIONS. OUR BEST ESTIMATE OF THE COSTS INVOLVED FOR THE 475 ELEMENTS IS (IN 1980 U.S. DOLLARS) \$2 MILLION TO THE U.S., \$3.2 MILLION TO CANADA (FOR SPENT FUEL TRANSPORTATION COSTS), AND \$1.2 MILLION TO TAIWAN NOT REPEAT NOT INCLUDING ANY CONTINGENCY OR ESCALATION. FYI: INCLUDING 30% CONTINGENCY ON THE UNCERTAIN ITEMS, AND PROVIDING FOR 2-1/2 YEARS OF ESCALATION, THESE BEST ESTIMATE NUMBERS BECOME \$3 MILLION FOR THE U.S., \$5.2 MILLION FOR CANADA, AND \$1.8 MILLION FOR TAIWAN. THIS WILL BE DISCUSSED WITH THE CANADIANS AT THE PROPOSED MEETING. END FYI.

12. THESE FIGURES DO NOT INCLUDE ANY TAIWAN CAPITAL, MATERIAL OR OPERATING COSTS FOR CANNING, NOR DO THEY INCLUDE THE ADDITIONAL TRANSPORTATION COSTS TO BE INCURRED BY DOE, CANADA, AND TAIWAN AS A RESULT OF CANNING.

13. THE REASON FOR THE INCREASE IN THE SPENT FUEL TRANSPORTATION COST ESTIMATE FROM THE \$1.26 MILLION DOLLARS DISCUSSED WITH THE CANADIANS IN APRIL 1978, BESIDES ESCALATION, IS THE DECREASE IN THE ESTIMATE OF THE NUMBER OF ELEMENTS THAT CAN BE SHIPPED PER CASK. THE CURRENT ESTIMATE OF THE NUMBER OF CASK SHIPMENTS REQUIRED IS

25 COMPARED TO 15 ESTIMATED EARLIER. THIS CURRENT SPENT FUEL TRANSPORTATION ESTIMATE WILL BE DISCUSSED IN DETAIL AT THE PROPOSED MEETING.

14. IN ORDER TO PROCEED WITH THE PRESENTATION OF THE POLICY PACKAGE TO TAIWAN, THE USG WOULD HOPE TO OBTAIN FROM CANADA: (1) A GENERAL COMMITMENT TO SUPPORT ITS SHARE OF THE TRANSFER OPERATION FOR 475 ELEMENTS, (2) PROVISION OF \$500,000 (U.S.) AS SOON AS POSSIBLE TO PERMIT THE FIRST PHASE OF TRANSFER OPERATIONS TO BEGIN, AND (3) CANADIAN NON-OBJECTION TO TRANSFER OF NECESSARY

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