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By *JW* MAPA Date *8-12*

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SUBJECT: CHUNG SHAN NUCLEAR RESEARCH INSTITUTE
REF: TAIPEI 0828 - *FSE 13 CHINAT*
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REGIN SUMMARY: RECENT DISCUSSIONS WITH ROC OFFICIALS ON THE GERMAN REPROCESSING PLANT PROBLEM AND THE CHUNG SHAN NUCLEAR INSTITUTE HAVE FURNISHED INFORMATION NOT PREVIOUSLY AVAILABLE ON ROC NUCLEAR ACTIVITIES. THE NEW INFORMATION DERIVED FROM SEVERAL SOURCES HAS HELPED TO ANSWER SOME BUT BY NO MEANS ALL OF THE QUESTIONS ON THE INSTITUTE'S ACTIVITIES. END SUMMARY.

1. THE NUCLEAR FACILITIES IN THE CHUNG SHAN INSTITUTE WERE FORMALLY TURNED OVER TO THE CHINESE ATOMIC ENERGY COUNCIL (CAEC) BY THE CHINESE MILITARY IN FEBRUARY 1968, BUT THERE IS STILL A STRONG MILITARY ELEMENT IN THE ACTUAL ADMINISTRATION OF THE INSTITUTE. BOTH CHIEN CHI-PENG, THE DIRECTOR OF THE NUCLEAR RESEARCH INSTITUTE, AND HIS VICE DIRECTOR, LI YU-HAO, CAME TO THE CHUNG SHAN INSTITUTE FROM THE MILITARY, WHERE THEY WORKED UNDER GENERAL TANG CHUN-PO, WHO HAD THEM SPECIALLY TRAINED FOR NUCLEAR RESEARCH. GENERAL TANG MAINTAINS A STRONG INTEREST IN THE NUCLEAR INSTITUTE'S PROGRAM, AND CHIEN IS BELIEVED BY THE CIVILIAN ELEMENT TO BE UNDER HIS THUMB.

2. THE BUDGET OF THE NUCLEAR RESEARCH INSTITUTE FOR FY/1973 WAS APPROXIMATELY US\$10 MILLION, OF WHICH \$8 MILLION WILL

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GO TO PAY INSTALLMENT ON \$35 MILLION CANADIAN REACTOR.

3. THE CANADIAN RESEARCH REACTOR (WHICH IS SIMILAR TO THE CANADIAN NRX) WENT CRITICAL ON JANUARY 3 AND SHOULD REACH FULL POWER IN FEBRUARY. AFTER A 15-DAY TEST RUN AT FULL POWER, WHICH SHOULD BE COMPLETED IN MARCH, IT WILL BE TURNED OVER TO THE CHINESE AND ALL CANADIAN PERSONNEL EXCEPT ONE WILL LEAVE. SEVERAL CANADIANS HAVE ALREADY LEFT. THE ONE CANADIAN WILL REMAIN SEVERAL MONTHS UNTIL THE EXPIRATION OF THE CONTRACTUAL GUARANTEE. VICTOR CHENG, SECRETARY GENERAL OF THE CAEC, HAS COMPLAINED THAT THIS REACTOR, OF WHICH A MODEL HAS BEEN EXHIBITED IN GENEVA, IS STILL CONSIDERED A MILITARY SECRET IN TAIWAN. IT WAS BEEN MANAGED FROM THE BEGINNING BY ADMIRAL HSIA HSIN (GENERAL TANG CHUN-PO'S DEPUTY) OSTENSIBLY BECAUSE HSIA IS A CIVIL ENGINEER.

4. THE CANADIAN REACTOR COST \$35 MILLION PLUS LOCAL CONSTRUCTION COSTS. THE STATED USE OF THE REACTOR IS FOR "RESEARCH IN THE FUEL CYCLE" BUT THE LACK OF A RESEARCH PROGRAM FOR THE REACTOR HAS CAUSED CONSIDERABLE COMMENT AMONG CHINESE AND FOREIGNERS. THERE IS ONLY ONE RESEARCH PROJECT IN SIGHT, A FAST NEUTRON CHOPPER WHICH WILL BE SHIPPED FROM THE USAEC. THUS FAR, THERE IS NO INDICATION THE INSTITUTE HAS ANY SIGNIFICANT EXPERIMENTS FOR THE REACTOR NOR HAS IT STARTED FABRICATION OF ANY IN-PILE LOOPS.

5. THE ONLY REACTOR OPERATOR IN TAIWAN LICENSED BY USAEC IS CHIEN CHI-PENG. OTHER OPERATORS, HOWEVER, HAVE OPERATED THE TSINGHUA REACTOR FOR YEARS, AND MORE ARE BEING TRAINED IN CANADA.

6. IN 1972, THE ROC IMPORTED 12 TONS OF METALLIC URANIUM FROM SOUTH AFRICA. THE URANIUM WAS SAID TO BE IN INGOTS NUMBERED TO FACILITATE INSPECTION, TO HAVE BEEN PLACED ON IAEA INVENTORY LISTS FOR SAFEGUARD PURPOSE AS SOON AS IT ARRIVED, AND INSPECTED BY IAEA INSPECTORS IN NOVEMBER, 1972. ROC OFFICIALS SAY THAT THE URANIUM IS INTENDED FOR USE IN THE THIRD CORE OF THE CANADIAN RESEARCH REACTOR AND THAT THE CORE WILL BE FABRICATED BY THE NUCLEAR RESEARCH INSTITUTE. THE ROC SAYS IT HAS ENOUGH URANIUM (APPARENTLY FOR THE HEAVY WATER REACTOR) TO LAST "FOR A LONG PERIOD" AND HAS NO PLANS TO IMPORT MORE.

7. THERE ARE NO URANIUM SOURCES IN TAIWAN EXCEPT MONAZITE SANDS IN CHIAYI, WHICH CONTAIN A LOW (AND UNKNOWN) CONCENTRATION OF THORIUM, AND FOR EVERY 2,000 GMS OF THORIUM ONLY 3 GMS OF URANIUM.

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VICTOR CHENG OF CAEC SAYS THE MONAZITE IS NOT WORTH EXPLOITING.

8. A PILOT REPROCESSING LABORATORY, WHICH CAN HANDLE GRAM-SIZED QUANTITIES ONLY, IS UNDER CONSTRUCTION. (IT COULD DISSOLVE ONE FUEL ELEMENT OF THE 95 IN THE ONE-MEGAWATT TSINGHUA UNIVERSITY REACTOR EVERY TWO MONTHS.) THE ROC IS CONSTRUCTING THIS REPROCESSOR ITSELF, BUT WITH IMPORTED PARTS; A MANIPULATOR FROM THE UK, SPECIAL WINDOWS FROM THE US, AND THE REST FROM SEVERAL OTHER SOURCES, MAINLY EUROPEAN. THE ROC HAS NO PLANS FOR THE END PRODUCT OF THE DISSOLVED ELEMENTS, WHICH WOULD BE IN THE FORM OF URANYL NITRATE. IT IS THINKING VAGUELY OF ORDERING A SMALL WATER BOILER TYPE REACTOR SIMPLY TO USE THIS END PRODUCT. THE EMPTY BUILDING INTENDED TO HOUSE THIS LABORATORY WAS SHOWN TO THE IAEA INSPECTORS IN NOVEMBER.

9. THE PLAN TO PURCHASE A GERMAN REPROCESSING PLANT WITH A CAPACITY OF 50 TONS A YEAR WAS INSTIGATED BY CHIEN CHI-PENG. SEVERAL OTHER MEMBERS OF THE CAEC HAVE SAID THAT CHIEN DID NOT HAVE THE AUTHORITY TO PURCHASE THE GERMAN REPROCESSING UNIT, WHICH WOULD HAVE COST SEVERAL MILLION DOLLARS. CHIEN HIMSELF HAS SAID (IN OTHER CONTEXTS) THAT HE PREFERRED TO USE MILITARY PROCUREMENT CHANNELS, SINCE THEY HAVE LESS RED TAPE THAN CIVILIAN CHANNELS. IT IS POSSIBLE THAT CHIEN, A FORMER MILITARY MAN, DID HAVE AUTHORITY TO ISSUE LETTERS OF COMMITMENT OR SIGN CONTRACTS USING MILITARY FUNDS, BUT NOT WITH CAEC FUNDS.

10. AN AMERICAN FIRM, JERSEY NUCLEAR, PROPOSED A JOINT VENTURE IN THE MANUFACTURE OF URANIUM OXIDE ELEMENTS FOR THE TAIWAN POWER COMPANY (TAIPOWER) REACTORS. IN ORIGINAL BIDS ON NUCLEAR UNITS 3 AND 4, TWO US FIRMS (PRESUMABLY B&W AND COMBUSTION) RAISED POSSIBILITY OF JOINT VENTURE FACILITY IN TAIWAN FOR LONG-TERM FUEL FABRICATION. HOWEVER, THEIR BIDS WERE NOT ACCEPTED. IN SUBSEQUENT SOLICITATION OF INTEREST ON FUEL ELEMENT SUPPLY ONLY, THESE FIRMS DID NOT REPEAT OFFER. TAIPOWER IS CHIEFLY CONCERNED WITH LONG-TERM STEADY SUPPLY OF FUEL FOR AS POWER REACTOR AND IS SEEKING BIDS FROM ALL MAJOR US SUPPLIERS ON A 18-YEAR SUPPLY OF NUCLEAR FUEL. L.K. CHEN, THE PRESIDENT OF TAIPOWER, IS UNINTERESTED IN REPROCESSING, AND WAS UNAWARE THAT THE CHUNG SHAN INSTITUTE INTENDED TO REPROCESS FUEL FROM TAIPOWER'S REACTOR. HIS IS OPPOSED TO THE IDEA, SINCE HE SUSPECTS THAT TAIPOWER WOULD BE EXPECTED TO BEAR THE

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COST OF THE REPROCESSING PLANT.

11. THE INSTITUTE OF NUCLEAR RESEARCH HAS A WASTE DISPOSAL FACILITY FOR LOW-LEVEL LIQUID WASTE, INCLUDING THREE 200-TON TANKS WHERE MATERIALS ARE STORED BEFORE PROCESSING, AND TWO 200-TON TANKS FOR TEMPORARY STORAGE OF TREATED WATER FOR DISPOSAL. THERE IS ALSO A LOW-LEVEL SOLID WASTE DISPOSAL FACILITY WHERE SOLID RADIOACTIVE WASTE IS TO BE PROCESSED FOR SEPARATE STORAGE.

12. THERE IS ALSO AN EXTREMELY ELABORATE AND COMPLEX DECONTAMINATION FACILITY, CONTAINING A ROOM LARGE ENOUGH FOR A CONTAMINATED VEHICLE TO BE DRIVEN INTO IT FOR DECONTAMINATION. MOREOVER, THERE IS A FRENCH ALPHA RADIATION DECONTAMINATION CELL INTO WHICH A MAN IN A "SPACE SUIT" CAN BE ADMITTED. CLOSED CIRCUIT TELEVISION IS INSTALLED IN THIS CELL TO PERMIT THE MONITORING OF THE ACTIVITIES OF THE MAN IN THE SPACE SUIT.

13. FOR VIENNA ACTION REQUESTED: WOULD APPRECIATE VERIFICATION OF ROC NOTIFICATION OF URANIUM IMPORT TO IAEA, FORM OF URANIUM (I.E., WHETHER METAL OR OTHER FORM). WOULD ALSO APPRECIATE ANY INSPECTION REPORTS AVAILABLE TO USMISSION [IAEA-GDS
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