

FOIA MARKER

This is not a textual record. This is used as an administrative marker by the Clinton Presidential Library Staff.

Folder Title:

North Korea, August 1994 [8]

Staff Office-Individual:

Nonproliferation and Export Controls-Aoki, Steven

Original OA/ID Number:

283

Row:	Section:	Shelf:	Position:	Stack:
41	5	5	2	V

Withdrawal/Redaction Sheet

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. paper	re cost of power plant (3 pages)	07/00/1994	P1/b(1)
002. paper	re North Korean LWR (3 pages)	07/00/1994	P1/b(1)
003. memo	Christoper Chyba et al to Steven Aoki re options (3 pages)	07/26/1994	P1/b(1)
004a. fax	cover, Treasury to NSC (1 page)	07/26/1994	P1/b(1)
004b. memo	Jerry Shafer to Daniel Poneman re assurances (2 pages)	07/26/1994	P1/b(1)
005. paper	re analysis of options (6 pages)	07/26/1994	P1/b(1)
006. cable	re Gallucci visit to Seoul (6 pages)	07/25/1994	P1/b(1)
007. cable	re Gallucci's consultations in Seoul (9 pages)	07/25/1994	P1/b(1)
008a. form	records routing, Holum to Lake re North Korea (1 page)	07/18/1994	P1/b(1)
008b. memo	Barbara Starr to William Itoh re memorandum on DPRK (1 page)	07/18/1994	P1/b(1)
008c. memo	John Holum to Anthony Lake re North Korea (2 pages)	07/18/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F

kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

PROCUREMENT OPTIONS FOR REMOVAL OF SPENT FUEL

- Option 1: Sole-source contract, based on unusual and compelling urgency, through one of the DOE laboratories, e.g., Sandia National Laboratory Albuquerque.
- Option 2: Sole-source contract, based on unusual and compelling urgency, awarded by Headquarters or a field office and administered/monitored by the Program Office, i.e., NN-40.

Under either option a sole-source contract can be awarded.

There are several basic actions that must be taken to facilitate the contract award:

1. Write the justification for the unusual and compelling urgency.
2. Identify the universe of contractors available (NAC, Transnuclear, possibly EG&G). Based on experience, cask availability, clearance status, NAC is the only logical choice.
3. Determine if the laboratory can implement a contract under the current scope of work in the existing contract with DOE. It has been determined that Sandia has a contract which contains the necessary scope of work.
4. Decide whether it is advantageous to have a laboratory monitor or otherwise administer the contract. The laboratory cannot merely be a conduit for the contract.
5. Draft a specific requested scope of work identifying the actions necessary to be taken by the contractor and any subcontractors. This can be done rapidly. Much of the preliminaries are already on hand.

The Procurement office advises that once these decisions are made, and particularly if the requested action is classified, that a letter contract can be in place in less than 30 days. Preliminaries to expedite completion of the paperwork can begin immediately.

Based on an assessment of the two options, there is virtually no difference in the time it would take to award the sole-source contract. There is a disadvantage in providing the sole-source through a laboratory because the laboratory will have to perform part of the work. Therefore, it seems the best approach would be to have DOE Headquarters Procurement award the contract with the Office of Arms Control and Nonproliferation being the Contracting Officers Technical Representative (COTR).

~~SECRET~~

~~SECRET~~
NATIONAL SECURITY COUNCIL
WASHINGTON, D.C. 20506

20885

July 27, 1994

ACTION

MEMORANDUM FOR SAMUEL R. BERGER

THROUGH: DANIEL PONEMAN *DP*

FROM: STEVEN AOKI *SA*

SUBJECT: Deputies' Meeting on Light Water Reactors in Korea
-- July ~~28~~ *29*, 1994, 10:00 - 11:~~30~~ *00* a.m.

Attached at Tab I is a proposed meeting notice, with an agenda attached at Tab A. Please note expanded list of attendees. The NEC and Office of Environmental Quality have expressed interest in this subject.

Concurrence by: Stanley Roth *SK fw/DP*

RECOMMENDATION

That you authorize William Itoh to sign the memorandum at Tab I and approve the Agenda at Tab A.

Approve _____ Disapprove _____

Attachments

Tab I Memorandum for Signature
Tab A Agenda

DECLASSIFIED E.O. 13526
White House Guidelines,
September 11, 2006
By *(M)* NARA, Date *07/27/15*
2009-0528-F

~~SECRET~~

Declassify on: OADR

TAB I

11

NATIONAL SECURITY COUNCIL

WASHINGTON, D.C. 20508

MEMORANDUM FOR

MR. LEON FUERTH
Assistant to the Vice
President for National
Security Affairs
Office of the Vice President

MR. MARC GROSSMAN
Executive Secretary
Department of State

MR. EDWARD KNIGHT
Executive Secretary
Department of Treasury

COLONEL ROBERT P. MCALEER
Executive Secretary
Department of Defense

MS. ANN LAVIN
Director, Executive
Secretariat
Department of Energy

MR. GORDON ADAMS
Associate Director for
National Security and
International Affairs
Office of Management and
Budget

AMB. RICK INDERFURTH
Office of the Representative
of the U.S. to the UN
U. S. Department of State

MR. DOUGLAS F. GARTHOFF
Executive Secretary
Central Intelligence Agency

MR. W. BOWMAN CUTTER
Deputy Assistant to the
President for Economic Policy
National Economic Council

AMB. RICK INDERFURTH
Office of the Representative
of the U.S. to the UN
U.S. Department of State

COLONEL T. R. PATRICK
Secretary
Joint Chiefs of Staff

MS. BARBARA STARR
Executive Secretary
Arms Control and Disarmament
Agency

MS. KATHLEEN MCGINTY
Deputy Assistant to the
President for Environmental
Policy and Director on
Environmental Policy

SUBJECT: Meeting of the Deputies on Light Water Reactors in
Korea (S)

A Deputies' meeting will be held on Thursday, July 28, 1994, from
10:00 - 11:30 a.m. in the White House Situation Room. Attendance
will be limited to principals only. (S)

DECLASSIFIED E.O. 13526
White House Guidelines,
September 11, 2006

By (M) NARA, Date 07/27/15
2009-0528-F

~~SECRET~~

Declassify on: OADR

~~SECRET~~

~~SECRET~~
2

A discussion paper will be circulated separately. An agenda is attached. (U)

William H. Itoh
Executive Secretary

Attachment
Tab A Agenda

~~SECRET~~

TAB A

7

NATIONAL SECURITY COUNCIL DEPUTIES' COMMITTEE MEETING

DATE: JULY 28, 1994
LOCATION: SITUATION ROOM
TIME: 10:00 - 11:30 a.m.

LIGHT WATER REACTORS IN KOREA

Agenda

- I. Introduction NSC
II. Light Water Reactors State
III. Interim Energy Replacement State
IV. Spent Fuel Removal Energy
V. Discussion All Participants
VI. Conclusion NSC

DECLASSIFIED E.O. 13526
White House Guidelines,
September 11, 2006

By W NARA, Date 07/27/15
2009-0528-F

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. paper	re cost of power plant (3 pages)	07/00/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P1 National Security Classified Information [(a)(1) of the PRA]
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P3 Release would violate a Federal statute [(a)(3) of the PRA]
P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

b(1) National security classified information [(b)(1) of the FOIA]
b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
002. paper	re North Korean LWR (3 pages)	07/00/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

CLINTON LIBRARY PHOTOCOPY

Light Water Reactor Supply

A. Preliminary

- grid analysis and demand survey
- site evaluation studies
- bid package
- select supplier
- contract agreed and signed
- financing package

B. Environment

- regulatory requirements
- safety analyses
- quality assurance and quality control
- training and manpower development
- systems integration and interface
- construction management

C. Construction

- site preparation
- nuclear island;
 - feedwater, condenser and circulating water systems
 - steam generators
 - electrical power and supply system
 - main heat removal system
 - reactor control system and instrumentation
- turbine generator system

CLINTON LIBRARY PHOTOCOPY

D. Fuel supply

- uranium supply

- enrichment services

- fuel fabrication

E. Reactor start-up

F. Operation and maintenance

US "Guarantees"

Essentially all direct US support would require a waiver of the provisions of the Trading with the Enemy Act. The President can do this. The provision of technology and services does not require an agreement for cooperation and could be done under an 810 DOE authorization. Under this route:

- a. The US could commit to permit one of its architect/engineering firms to manage the supply project by providing advice on all elements of the project.

- b. The US could commit to provide visas for education/training as needed for manpower development.

- c. The USG could commit to provide advice on the full range of infrastructure and operating requirements--regulatory, safety, environmental, etc.

- d. The US could provide simulators for training purposes.

- e. The US could supply components for the non-nuclear island.

The US could commit to pay for some or all of the above.

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
003. memo	Christoper Chyba et al to Steven Aoki re options (3 pages)	07/26/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
004a. fax	cover, Treasury to NSC (1 page)	07/26/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
004b. memo	Jerry Shafer to Daniel Poneman re assurances (2 pages)	07/26/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET

ROUTE SLIP

TO <u>Steve Aoki</u>	Take necessary action _____
_____	Approval or signature _____
_____	Comment _____
_____	Prepare reply _____
_____	Discuss with me _____
_____	For your information _____
_____	See remarks below _____
FROM <u>Dan Taft</u>	DATE <u>7/26/94</u>

REMARKS

OMB Comments

~~SECRET~~

THIS IS A COVER SHEET

FOR CLASSIFIED INFORMATION

ALL INDIVIDUALS HANDLING THIS INFORMATION ARE REQUIRED TO PROTECT IT FROM UNAUTHORIZED DISCLOSURE IN THE INTEREST OF THE NATIONAL SECURITY OF THE UNITED STATES.

HANDLING, STORAGE, REPRODUCTION AND DISPOSITION OF THE ATTACHED DOCUMENT MUST BE IN ACCORDANCE WITH APPLICABLE EXECUTIVE ORDER(S), STATUTE(S) AND AGENCY IMPLEMENTING REGULATIONS.

(This cover sheet is unclassified.)

~~SECRET~~

704-101
NSN 7540-01-213-7902

STANDARD FORM 704 (8-85)
Prescribed by GSA/ISOO
32 CFR 2003

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
005. paper	re analysis of options (6 pages)	07/26/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

South Korean Reaction to a Russian LWR in North Korea

Seoul has consistently and adamantly opposed construction of a Russian reactor in the North. Most South Koreans probably view all Russian reactors as unsafe, and it would be politically very difficult for Seoul to support construction of a Russian reactor in the North, particularly variants of VVER-440 or VVER-1000 models now in operation. Although Russia may propose to build one of their planned advanced reactor designs with safety features in line with current world standards, Seoul probably still would argue against using an untried Russian design.

South Korean Nuclear Reactors for North Korea

South Korea has built several models of pressurized light water reactors (PWRs), but has settled on a standardized 1,000 megawatt model based on a US design. The first unit of the standardized series, Uljin 3, is due to begin operation in 1998. Regardless of whether US or South Korean firms managed the project, Seoul would want to provide this standardized reactor model to North Korea in order to maximize compatibility with its own program, as well as to take advantage of the cost savings possible when producing multiple identical units.

Bases on the cost of the first two units, the cost of building a standardized reactor will be about \$2 billion. Construction times of 8 to 9 years are projected for standardized reactors in the South's program. Costs are likely to be greater and the construction time longer for at least the first unit of a such nuclear power plant in North Korea.

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
006. cable	re Gallucci visit to Seoul (6 pages)	07/25/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

Freedom of Information Act - [5 U.S.C. 552(b)]

P1 National Security Classified Information [(a)(1) of the PRA]
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P3 Release would violate a Federal statute [(a)(3) of the PRA]
P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

b(1) National security classified information [(b)(1) of the FOIA]
b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
--------------------------	---------------	------	-------------

007. cable	re Gallucci's consultations in Seoul (9 pages)	07/25/1994	P1/b(1)
------------	--	------------	---------

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

Freedom of Information Act - [5 U.S.C. 552(b)]

P1 National Security Classified Information [(a)(1) of the PRA]
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P3 Release would violate a Federal statute [(a)(3) of the PRA]
P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

b(1) National security classified information [(b)(1) of the FOIA]
b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

LWR SCENARIOS: U.S. LEGAL REQUIREMENTS

NOTE: Set forth below are the legal requirements for U.S. participation under several possible scenarios for supply of a light-water reactor to the DPRK. The details of these legal requirements are described in the attachment.

I. U.S. Performance Guarantee

Project Description: The U.S. would not provide equipment, construction services, or financing. It would actively promote the project by seeking to arrange suppliers and financing. It would guarantee that, in the event the reactor project is terminated, the U.S. would ensure provision of the reactor.

- o Agreement for Cooperation: Because the U.S. might have to supply the reactor or major reactor components in order to make good on its guarantee, the DPRK would have to accept as a condition of the guarantee that it would "enter into an agreement for nuclear cooperation in the event that the U.S. had to supply the reactor or major components thereof."
- A sample agreement for cooperation, tailored to the DPRK, should be attached to the guarantee letter in order to set the bounds of this condition. We will have to explain the agreement for cooperation, as some of its requirements will probably put off the DPRK initially.
- We could negotiate the agreement before the guarantee is triggered so that the Congressional review period of 90 continuous session days would not delay carrying out work under the guarantee.
- This approach could lead to contentious negotiations with the DPRK and contentious Congressional review of an agreement that ultimately may not be needed. Moreover, work would probably not be delayed anyway since the U.S. would take some time to get the project going.
- Congressional review could be avoided if the reactor were provided under an IAEA project agreement (which, pursuant to the U.S.-IAEA agreement for cooperation, would incorporate the same requirements as would be required of a U.S.-DPRK agreement for cooperation). The DPRK would have to rejoin the IAEA under this option.
- o Minor Components: If the U.S. had to provide minor components in order to make good on its guarantee, the DPRK would have to agree to safeguards, peaceful use, and no retransfer without U.S. consent. Safeguards and peaceful use will already be a condition of the guarantee, and the

DPRK will have already consented to the concept of no retransfer in connection with the draft agreement for cooperation. Therefore, no action would be needed prior to the need to export the components.

- o Technology: If the U.S. had to provide technology or other assistance requiring Energy Department authorization in order to make good on its guarantee, the steps already agreed to by the DPRK as a condition of the guarantee would probably provide a sufficient basis for the findings needed to authorize such assistance.
- In addition, we would have to determine whether the primary supplier would be using U.S. technology, in which case U.S. reexport restrictions might apply.
- o Nuclear Trade Sanctions: The relevant departments and agencies could begin the preliminary evaluations needed to support a waiver of nuclear trade sanctions under section 129 of the Atomic Energy Act. Actual processing of the waiver would not be necessary until the guarantee was triggered. In the meantime, we presumably would be developing a record of DPRK compliance with the conditions of the guarantee. (The waiver would be subject to Congressional review for 60 days of continuous session.)
- o Trading With the Enemy Act: Similarly, no specific steps would have to be taken under the Trading With the Enemy Act (TWEA) until actual transactions by U.S. persons with the DPRK were contemplated. However, it would be prudent to consult fully with Treasury's Office of Foreign Assets Control (OFAC) and Commerce so that any eventual transactions could be approved efficiently.
- o Terrorism Controls: As with TWEA, no specific steps would have to be taken before the guarantee was triggered, but consultations with the Commerce Department would be prudent.
- o Liability: Liability will pose a significant obstacle to U.S. contractors' involvement in the project. The U.S. should begin to evaluate the steps that would be necessary to meet contractors' concerns with a project in North Korea.
- o Environment: Preliminary environmental evaluations should begin, to the extent possible, before the guarantee is triggered.
- o Indemnification: If the ROK is the primary supplier of the reactor, we should consider obtaining an **indemnification pledge** so that the cost of any replacement reactor would be borne by the ROK. (Such indemnification is probably beyond the capability of the Russians.)

II. "Best Efforts" Guarantee

Project Description: The U.S. would not provide equipment, construction services, or financing. It would actively promote the project by seeking to arrange suppliers and financing. The "guarantee" would not legally commit the U.S. to provide a replacement reactor in the event the reactor project was terminated.

- The President could provide a political commitment to "use the full powers of his office" to ensure the supply of the LWR to the DPRK.
- Alternatively, the U.S. could provide a binding guarantee to "seek" to ensure the supply of the LWR, without undertaking to pay for a replacement.
- o Agreement for Cooperation: Since the U.S. would not be obliged to provide the reactor or any major components, even under the guarantee, an agreement for nuclear cooperation under section 123 of the Atomic Energy Act would not be required.
- o Minor Components: Similarly, no prior steps would be required for possible minor component exports under the guarantee.
- o Technology: The same would be true for possible transfers of nuclear technology (but we would still have to determine if U.S. technology was being used by the ROK or Russia).
- o Nuclear Trade Sanctions: No prior steps would be necessary, but it would be prudent to begin section 129 evaluations.
- o Trading With the Enemy Act: No prior steps would be necessary, but it would be prudent to consult with OFAC and Commerce.
- o Terrorism Controls: No prior steps would be necessary, but it would be prudent to consult with the Commerce Department.
- o Liability: Liability issues should be examined as early as possible.
- o Environment: Environmental evaluations should begin as early as possible.
- o Indemnification: An indemnification pledge from the primary supplier would be useful, but not as critical given the qualifications to this "guarantee."

III. U.S.-ROK Joint Venture

A. Venture Accompanied by Binding Guarantee

Project Description: The ROK would provide the reactor, the construction services, and financing. The U.S. would provide certain project management services and would deal with the DPRK. It would also guarantee to the DPRK that, in the event the reactor project is terminated, the U.S. would ensure provision of the reactor.

- o Agreement for Cooperation: An agreement for nuclear cooperation would not be required.
 - The Atomic Energy Act provides that such activities may take place pursuant to an agreement for cooperation. Congress might expect negotiation of an agreement for cooperation due to the sensitivity of this case. However, an agreement for cooperation is not required.
 - However, the DPRK would have to accept as a condition of the guarantee that it would "enter into an agreement for nuclear cooperation in the event that the U.S. had to supply the reactor or major components thereof" under the guarantee.
- o Minor Components: If the U.S. were to provide minor components either as part of the primary project or in order to make good on its guarantee, the DPRK would have to agree to safeguards, peaceful use, and no retransfer without U.S. consent. As previously noted, the DPRK would have already agreed to these concepts in the guarantee letter.
- o Technology: The U.S. joint venture partner would have to obtain a **specific authorization** from the Department of Energy to engage in the North Korea project. Congress would have no statutory role in this process.
 - The steps agreed to by the DPRK as a condition of the guarantee might provide a sufficient basis for the findings needed to authorize such participation.
 - The U.S. firms participation could be approved incrementally, with broader activities being linked to DPRK nonproliferation actions.
 - In addition, we would have to determine if U.S. technology was being used by the ROK.
- o Nuclear Trade Sanctions: A waiver of sanctions under section 129 of the Atomic Energy Act would not be required (though the appropriate evaluations could begin in case nuclear exports from the U.S. were ultimately required under the guarantee).

- o Trading With the Enemy Act: The U.S. joint venture partner would have to obtain a license from OFAC for all of its transactions with the DPRK. Congress would have no statutory role in this licensing process. Consultations with OFAC would be advisable at the earliest opportunity.
- o Terrorism Controls: It would be prudent to consult with the Commerce Department to make sure that any exports anticipated by the U.S. joint venture partner pursuant to Commerce license could in fact be approved without delay.
- o Liability: Liability would pose a significant obstacle to U.S. contractors' involvement as joint venture partners.
 - Since the purpose of U.S. participation in the joint venture is primarily to make the proposal more palatable to the DPRK, the ROK should be asked to hold the U.S. joint venture partner harmless for liability incurred in connection with the project.
- o Environment: Environmental evaluations likely would not be required for U.S. participation in the joint venture (absent U.S. component exports).
- o Indemnification: The U.S. should obtain from the ROK an indemnification pledge so that the cost of any replacement reactor would be borne by the ROK. If the ROK wants this business, it should be willing to hold the U.S. harmless against the costs of its failure to perform.

B. Venture Accompanied by "Best Efforts" Guarantee

Project Description: The ROK would provide the reactor, the construction services, and financing. The U.S. would provide certain project management services and would deal with the DPRK. We would also guarantee that, in the event the reactor project is terminated, the U.S. would "seek" to ensure -- or use the full powers of the President to ensure -- the provision of the reactor to the DPRK. This "guarantee" would not legally commit the U.S. to provide a replacement reactor.

- o Agreement for Cooperation: An agreement for nuclear cooperation would not be required, nor would the DPRK have to accept in principle the terms of the agreement for nuclear cooperation.
- o Minor Components: If the U.S. were to provide minor components either as part of the primary project or in connection with its "guarantee," the DPRK would have to agree to safeguards, peaceful use, and no retransfer without U.S. consent.

- o Technology: As in the previous scenario, the U.S. joint venture partner would have to obtain a **specific authorization** from the Department of Energy (and we would have to determine if U.S. technology was being used by the ROK).
- o Nuclear Trade Sanctions: A waiver of nuclear trade sanctions under section 129 of the Atomic Energy Act would not be required (though the appropriate evaluations might begin in case we ultimately chose to export components under the "guarantee").
- o Trading With the Enemy Act: The U.S. joint venture partner would have to obtain a **license from OFAC**.
- o Terrorism Controls: No advance steps would be necessary in connection with U.S. terrorism controls, but again, it would be prudent to consult with the Commerce Department.
- o Liability: Liability would still pose a significant obstacle to U.S. contractors' involvement as joint venture partners.
 - Again, we should seek from the ROK a commitment to **hold the U.S. joint venture partner harmless** for liability incurred in connection with the project.
- o Environment: Environmental evaluations likely would not be required for U.S. participation in the joint venture (absent U.S. component exports).
- o Indemnification: The U.S. could obtain from the ROK a pledge to indemnify the U.S. in the event of nonperformance, but it would not be essential since the U.S. would not be legally bound to provide a replacement reactor.

IV. U.S. as General Contractor

Project Description: The legal issues under this approach would be roughly the same as under the U.S.-ROK joint venture scenario, assuming the general contractor would be a U.S. firm (the USG should not undertake such an effort itself). As in the joint venture scenario, this approach could be backed by a political commitment or a binding guarantee from the USG.

- o Agreement for Cooperation: The need for an agreement for cooperation (or an IAEA project agreement) might be greater since the U.S. firm would be directly responsible for completion of the project and might want the option of U.S. supply in the event that foreign equipment suppliers did not perform.

- o Indemnification: Under this approach, unlike the joint venture scenarios, a U.S. general contractor might not be able to obtain liability indemnification from its subcontractors -- even if ROK subcontractors would be performing most of the work.

V. Financial Guarantee

- o Project Description: The U.S. would not provide equipment, construction services, or financing. It would actively promote the project by seeking to arrange suppliers and financing. It would guarantee repayment of the loan (i.e., stand behind the DPRK if it fails to repay the lender -- most likely Japan or the ROK). This approach would address the financial risk involved in the project, but not the risk of nonperformance by the primary supplier.
- o Agreement for Cooperation: Unnecessary.
- o Minor Components: No steps necessary.
- o Technology: No steps necessary (but we would have to determine if U.S. technology was being used by the primary supplier).
- o Nuclear Trade Sanctions: No waiver necessary.
- o Trading With the Enemy Act: All necessary approvals would have to be obtained from OFAC and Commerce pursuant to TWEA.
- o Terrorism Controls: No steps necessary.
- o Environment: Environmental documentation likely would not be required.
- o Liability: Liability concerns would be virtually removed.
- o Indemnification: An indemnification pledge from the primary supplier would be advisable (particularly if the ROK were carrying out the project).

Drafted by: L/PM - Newell Highsmith

ATTACHMENT: U.S. LEGAL REQUIREMENTS

Atomic Energy Act: Agreement for Cooperation

- o The U.S. cannot transfer an LWR, major reactor components, or nuclear fuel to the DPRK until it has entered into an agreement for nuclear cooperation pursuant to section 123 of the Atomic Energy Act. (Major components are pressure vessels, primary coolant pumps, fuel charging or discharging machines, and control rods.)
 - In addition, a waiver of nuclear trade sanctions under section 129 of the Atomic Energy Act would be required, as well as the necessary licenses from the Nuclear Regulatory Commission, the Treasury Department (under the Trading With the Enemy Act), and the Commerce Department (terrorism controls). These requirements are discussed in subsequent sections.
- o In order to enter into an agreement under section 123, the DPRK will have to agree to the following:
 - A guarantee that it will maintain IAEA **safeguards** in perpetuity on items subject to the agreement.
 - A requirement, as a condition of continued U.S. nuclear supply, that it will maintain **full-scope IAEA safeguards**.
 - A provision permitting the United States to apply **fall-back safeguards** (i.e., U.S. inspections) in the DPRK in the event IAEA safeguards cannot be effectively applied.
 - A **peaceful use guarantee** (i.e., the DPRK will not use items subject to the agreement for any nuclear explosive device, for research on or development of any such device, or for any other military purpose.
 - A U.S. right to cease cooperation and **require the return** of items subject to the agreement if the DPRK detonates a nuclear explosive device or terminates or abrogates a safeguards agreement with the IAEA.
 - A guarantee that it will maintain adequate **physical security** with respect to items subject to the agreement.
 - A U.S. right of prior **consent** before the DPRK may **retransfer** to a third country items subject to the agreement.
 - A guarantee that it will not **reprocess, enrich, or alter in form or content** nuclear material subject to the agreement.

- A U.S. right to approve in advance storage facilities for separated plutonium, uranium 233, and highly enriched uranium subject to the agreement (though it is not anticipated that the DPRK would possess such materials).
- A prohibition on the transfer of sensitive nuclear technology and restricted data under the agreement.
- A guarantee that all key conditions and controls will remain in force in perpetuity with respect to items subject to the agreement, even if the agreement expires or is terminated.
- o This agreement would have to be submitted to Congress for a review period of 90 continuous session days. Congress could disapprove the agreement during that time by joint resolution (which the President could veto, requiring a 2/3 majority for override).
- Congress has never disapproved a nuclear cooperation agreement, but in the case of U.S.-China agreement, it imposed stringent conditions on the commencement of exports pursuant to the agreement (which have never been met).
- In this case, the LWR agreement will already impose stringent nonproliferation conditions on the DPRK, which might satisfy Congress's concerns. **However, Congress likely would reject the agreement if the DPRK had not yet allowed special inspections to take place.**
- o An agreement for cooperation does not commit the United States to any specific exports or other activities, but rather establishes a framework of conditions and controls to govern subsequent transactions, if any.
- We might mollify Congressional concerns by proposing an agreement for cooperation with the DPRK that would permit only this one reactor project (i.e., any additional cooperation would require amendment of the agreement, which Congress would again review for 90 continuous session days).
- o Even with an agreement in force, significant exports made pursuant to it require a license from the U.S. Nuclear Regulatory Commission.
- o IAEA Project and Supply Agreement: The U.S. could supply a reactor to the DPRK **through** the IAEA, subject to the U.S.-IAEA agreement for cooperation.

- This approach would not require an agreement for cooperation between the U.S. and the DPRK (though the DPRK would have to agree to the same requirements in its project agreement with the IAEA and the U.S.).
- Congress would not have a role in approving a project agreement (as would be the case with an agreement for cooperation).
- The DPRK would have to rejoin the IAEA to become eligible for such a project.

Atomic Energy Act: Export of Minor Components

- o An agreement for nuclear cooperation is not needed for exports of minor reactor components (basically, all nuclear reactor components other than pressure vessels, primary coolant pumps, fuel charging or discharging machines, and control rods).
 - For export of a minor component, section 109(b) of the Atomic Energy Act requires guarantees from the recipient government that (1) safeguards will be applied to the item, (2) the item will be used exclusively for peaceful purposes, and (3) the item will not be retransferred without U.S. consent.

Atomic Energy Act: Technology Transfers

- o An agreement for nuclear cooperation is not needed for a transfer of nuclear technology to the DPRK. (Technology would include everything from a reactor design to reactor safety knowhow. It would include any transfer of information or knowhow, including during consultations, seminars, exchanges, studies, evaluations, etc. It does not include "public information" -- i.e., information available to the public in books, periodicals, electronic media, public libraries, open meetings, etc.)
- o The basic requirement for a transfer of nuclear technology to the DPRK would be issuance of a specific authorization by the Department of Energy based on a finding that the transfer "will not be inimical to the interest of the United States." This finding would require the concurrence of State and consultation with Defense, ACDA, Commerce, and the Nuclear Regulatory Commission.
 - Neither an agreement for cooperation nor full-scope safeguards is strictly required, though effective full-scope safeguards is typically an important factor in the finding of noninimicality.

- o If another country were supplying the reactor, we would have to determine whether the reactor incorporated U.S. technology, in which case reexport controls might apply. The U.S. does not typically obtain reexport consent rights in connection with nuclear technology transfers, but it has done so in a few cases.

Atomic Energy Act: Nuclear Trade Sanctions

- o The U.S. could not transfer an LWR, major reactor components, nuclear fuel, or minor reactor components unless the President waived the prohibition in section 129 on such trade.
- o Section 129 prohibits such nuclear trade on two grounds that are applicable to the DPRK: (1) where a nonnuclear-weapon state has materially violated an IAEA safeguards agreement; and (2) where a nonnuclear-weapon state has "engaged in activities involving source or special nuclear material and having direct significance for the manufacture or acquisition of nuclear explosive devices, and has failed to take steps which, in the President's judgment, represent sufficient progress toward terminating such activities."
 - The stringent nonproliferation commitments in the LWR agreement could form the basis for a determination by the President that the DPRK had taken sufficient steps to terminate its proliferant activities, thereby avoiding sanctions under the second provision cited above.
- o Either provision could be waived if the President determined that cessation of nuclear trade "would be seriously prejudicial to the achievement of United States nonproliferation objectives or otherwise jeopardize the common defense and security."
 - This waiver determination would have to be submitted to Congress for 60 days of continuous session before it took effect.
 - Congress could disapprove the waiver during that time by joint resolution or other enactment (which the President could veto, requiring a 2/3 majority for override).

Trading With the Enemy Act

- o The President has exercised his authority under TWEA to ban all trade and financial transactions with North Korea absent a license from the Treasury Department's Office of Foreign Asset Controls (OFAC). (For exports of Commerce-controlled items, OFAC defers to Commerce's decision on issuing an export license.)

- o OFAC could issue the required license, or the President could relax the ban. Neither action would require Congressional consent or consultation.

EAA Terrorism Controls

- o The DPRK was designated a "terrorist country" in 1988 for purposes of the terrorism controls in the Export Administration Act. It therefore is subject to an outright ban on exports of munitions list items, as well as a requirement of an individual validated licenses for some other items.
- o Prior to the export of an item, the Secretary of State would have to determine whether the item "could make a significant contribution to the military potential of such country, including its military logistics capability, or could enhance the ability of such country to support acts of international terrorism."
 - If the item could not make such a contribution, Commerce could issue an individual validated license for its export.
 - If the item could make such a contribution, Commerce could still issue an individual validated license, but only after providing 30 days advance notice to Congress.
- o The criteria for removing a country from the terrorist list are demanding and would be difficult to meet in the case of the DPRK (e.g., a Presidential certification that there has been a fundamental change in the leadership and policies of the country, that the country is no longer supporting acts of terrorism, and that the government has provided assurances that it will not support terrorist acts in the future).

Liability for Accidents

- o U.S. firms have been somewhat reluctant to participate in efforts to improve the safety of Russian reactors due to their concern that they would be targeted in the event of a nuclear accident.
- o The same concern would likely exist in this case whether U.S. firms were involved in a Russian or South Korean reactor project. (Even with a U.S. reactor, there might be concerns that North Korean operators could not be relied upon to operate the reactor properly.)
- o Accordingly, if U.S. firms were to participate, there would probably have to be arrangements to ensure that such firms were not exposed to unlimited liability.

- One step might be for the DPRK to adhere to the Vienna Convention on Civil Liability for Nuclear Damage.
- A U.S. firm in a joint venture with South Korean firms might seek an **indemnification agreement** from those firms.

Environmental Requirements

- o The National Environmental Policy Act (NEPA) would not apply to this overseas project.
- o Instead, E.O. 12114 covers major Federal actions with environmental effects abroad.
- o The "Federal action" in this case would be the government approvals necessary for U.S. participation in the reactor project.
- o If the USG were approving the **export of reactor components**, the appropriate environmental documentation likely would be required.
 - This requirement would not apply if the approval action were taken either (1) by the President, or (2) at the direction of the President or a Cabinet officer when the national security is involved.
- o If the Department of Energy were approving the **participation of U.S. firms** in the North Korean reactor project, environmental documentation likely would not be required.
 - The procedures adopted to implement E.O. 12114 focus on the provision of a "physical project" and exempt actions taken under section 57 of the Atomic Energy Act, which includes DOE approval of nuclear-related activities overseas.

Drafted by: L/PM - Newell Highsmith

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
008a. form	records routing, Holum to Lake re North Korea (1 page)	07/18/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
008b. memo	Barbara Starr to William Itoh re memorandum on DPRK (1 page)	07/18/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

Withdrawal/Redaction Marker

Clinton Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
008c. memo	John Holum to Anthony Lake re North Korea (2 pages)	07/18/1994	P1/b(1)

COLLECTION:

Clinton Presidential Records
National Security Council
Steven Aoki (Nonproliferation and Export Controls)
OA/Box Number: 283

FOLDER TITLE:

North Korea, August 1994 [8]

2009-0528-F
kc1570

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

- P1 National Security Classified Information [(a)(1) of the PRA]
- P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
- P3 Release would violate a Federal statute [(a)(3) of the PRA]
- P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
- P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
- P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

Freedom of Information Act - [5 U.S.C. 552(b)]

- b(1) National security classified information [(b)(1) of the FOIA]
- b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
- b(3) Release would violate a Federal statute [(b)(3) of the FOIA]
- b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
- b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
- b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
- b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
- b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]



United States Department of State

Washington, D.C. 20520

Bureau of Politico-Military Affairs

Only UNCLASSIFIED Materials May Be Transmitted via FAX

TO: DAN PONEMAN / STEVE ADK NSC RM 380
(Name) (Office)

FAX #: 395-1185

TEL #: 395-3440

FROM: MARK WESTERGREEN PM
(Name) (Office)

FAX #: (202) 647-1346

TEL #: 736-7143

SUBJECT: FOUR REPORTS FROM IAEA ON DPRK

Number of Pages Transmitted in this FAX

19 + cover

7 July 1994

ASSESSMENT OF THE 5 MWe REACTOR OPERATING HISTORY**Background**

Verification of the irradiation history of the recently discharged 5 MWe reactor core was a vital part of the IAEA's assessment of the correctness and completeness of the DPRK initial declaration. The goal was the detection, at a high level of confidence, of any total or partial core replacement during a reactor shutdown prior to the reactor coming under safeguards in 1992. Since the verification measures foreseen and requested by the IAEA could not be carried out during the May/June 1994 fuel discharge, other potential methods for verifying the declared operating history have been carefully reviewed by the IAEA in recent weeks.

Verification methods reviewed were:

- non destructive analysis (NDA) of recent and previously discharged fuel,
- measurements on core structural materials, and
- advanced environmental sampling techniques.

Each of the proposed methods has been evaluated against the following objectives:

- to provide conclusive results about the core history;
- to allow implementation and evaluation within a short time period, i.e. in a matter of months;
- to avoid rejection by the DPRK for operational reasons.

The most important criterion is that the method must provide conclusive information on the operating history at a high confidence level.

Discussion**Fuel NDA**

Non-destructive assay of discharged fuel was the method originally proposed by the IAEA for verifying the declared operating history. Approximately 300 rods from IAEA specified locations were to be selected and segregated during fuel

discharge in preparation for a series of measurements to be made within a few months. Additionally, 2 rods discharged in 1992 and placed under IAEA seal in July 1992 and 21 unsealed rods, now located in the dry storage pit together with other discharged rods were to be examined. These measurements would have permitted the IAEA to draw conclusions about the reactor operating history with a reasonably high confidence level.

However, in May/June 1994, the DPRK discharged the fuel without allowing the IAEA to select a representative sample of fuel rods. Moreover, the operator did not keep verifiable records on the original position of fuel rods in the core nor on the target location in the spent fuel storage. Generally, operator record keeping has been weak. For example, the IAEA inspectors have observed the lack of identification numbers on fuel rods, the distribution of neighboring rods into different storage baskets, the presence of records showing the same rod being unloaded repeatedly at different times and the presence of forgotten rods in the reactor in the final stage of core discharge.

Now, after fuel discharge, without the possibility to select and measure fuel rods from known positions in the core, NDA can no longer provide reliable information on the operating history of the reactor. On the one hand, the ability to detect partial core refuelling has been irretrievably lost. On the other hand, the measurement of fuel from a specific core channel (8-8-6) might have indicated - with a low confidence level - whole core refuelling, if and only if one could accept the operator's statement that no rod reshuffling has been done in the past. According to the operator's records, the four rods from this channel and from four neighboring channels are stored in a single basket. But it must be emphasized that these measurements would be based on the acceptance of unverified operator records. Any attempt by the operator to substitute fuel from other locations would be difficult to detect. It is noted that the importance of channel 8-8-6 was most probably known to the operator.

The measurements on previously discharged rods (the two rods under seal and 21 defective rods placed in dry storage) would be of interest, if the 21 rods could be segregated from a total of 670 rods now in dry storage and if the condition of the defective fuel rods would allow handling and measurements. The information contained in the previously discharged rods (1991 and 1992) has indeed not been affected by the recent fuel discharge procedure. However, recovery of the 21 rods has become practically impossible, since nearly 650 additional rods have been indiscriminately placed in the dry storage pit. Furthermore, health hazards to the inspectors would be associated with fuel handling in the dry store.

Core Structural Material

Analysis of core structural materials can provide information on

the integral power generation of a reactor. Materials considered by the IAEA for the 5 MWe reactor included the control rods, stainless steel absorber rods, pressure vessel, and graphite moderator. Because the control rods and absorber rods are removable and could have been replaced, they have been dismissed as candidates. For the pressure vessel, it was determined that the low core exposure could not have produced significant and relevant changes in the materials. This leaves the core graphite moderator as the only possible candidate.

The proposal for determining total reactor power generation from analysis of graphite impurities has been carefully looked at by the IAEA. While the use of this method for high-power plutonium production reactors of the U.S. Weapon Programme was said to be satisfactory, its applicability to the DPRK reactor was dismissed due to the low fluence and the need to take destructive samples that would damage the reactor moderator.

Environmental Sampling

On the basis of its experience in Iraq and in the development of environmental sampling for future safeguards implementation, the IAEA has evaluated several advanced environmental sampling methods for near-term use in the DPRK. The IAEA has concluded that such methods cannot provide conclusive evidence of past operating history of the reactor nor of the volume of reprocessing carried out in the DPRK.

Conclusions

Based on extensive technical discussions in house and with technical experts from several countries familiar with gas-cooled graphite reactors, the IAEA has concluded that NDA of the discharged fuel can no longer provide information of a sufficiently high confidence level about the core history. At this stage, the NDA methods would have to rely on unverified operator's records, a fact which is in contradiction with the role of the IAEA which is indeed to verify operator's statements and to reach its own independent conclusions.

The other methods considered cannot provide sufficiently reliable information, have a potential for ambiguous results, or imply taking samples that would damage the reactor core structure.

Consequently the possibility to verify the core history has been irretrievably lost.

Paper # 2

MEASURES FOR THE VERIFICATION OF THE INITIAL INVENTORY OF THE DPRK

Having lost the opportunity to verify the declared operating history of the 5MWe Reactor, as a direct result of the DPRK's non compliance with its Safeguards Agreement, and with the DPRK's denial of Agency access to carry out special inspections with regard to additional information and the two waste-related sites, certain measures should be taken to compensate for this loss with a view toward assessing the possibility of verifying the completeness of the DPRK's initial report on nuclear material.

Most of these measures fall within the ambit of the Safeguards Agreement concluded between the DPRK and the IAEA. While some of the measures are not explicitly provided for in the Agreement, they are consistent with the Agreement and could be taken on the initiative of the DPRK.

Among the necessary measures are those identified in the attachments to this paper with respect to the 5MWe Reactor and to the special inspection in connection with the waste sites. The following are measures of general application in the DPRK which, taken together with those identified in the attachments, would assist the IAEA in verifying the correctness and completeness of the DPRK's initial report.

Sites, information and equipment

The DPRK should:

- * provide complete disclosure of all past and present aspects of its nuclear programs, including all holdings of nuclear material, nuclear-related equipment and production and support facilities and locations. To this end, the DPRK should allow the IAEA to discuss matters related to the nuclear program with any personnel at a site or facility under inspection, or with any State official whom the Agency deems as necessary in connection with its verification of the initial report.
- * provide the Agency with a complete inventory of all nuclear material, including that resulting from uranium mining.
- * provide the Agency with an inventory of all nuclear and non-nuclear material, equipment and items included identified in INFCIRC/254/Rev.1/Parts 1 and 2, with a view toward ensuring that such items are all used in connection with declared nuclear activities, or in the case of dual-use items, that they are not being used in undeclared nuclear activities.

2

- * provide an inventory of all facilities, installations and sites where there have been, or are being, carried out, or are suitable of carrying out in, nuclear activities of any form, including but not limited to research facilities, laboratory-scale installations and pilot plants.

Access to information, locations, equipment and personnel

The DPRK should:

- * provide the IAEA immediate and unrestricted access to any and all information, locations, equipment, records and personnel deemed relevant by the IAEA to the Agency's verification activities.
- * provide full, complete and prompt responses to any questions or requests for additional information from the IAEA relevant to the IAEA's verification activities.
- * permit the IAEA to inspect any number of verification-relevant sites or facilities simultaneously or sequentially, and to conduct unannounced inspections and inspections upon short notice.
- * allow the IAEA to implement additional modes of inspection and verification, including prolonged or continuous presence of inspectors.
- * permit the IAEA to install containment and surveillance equipment and devices and facilities for observation, testing and verification activities. These measures could include the use of new instruments and technologies, such as remote and environmental monitoring and other monitoring techniques.
- * permit the IAEA to physically verify the inventories of nuclear material, and to take and to analyze samples of nuclear material and other items relevant to the Agency's verification activities, as well as to remove and export samples from the DPRK for analysis.
- * permit the IAEA to mark, to tag and to otherwise identify any material or other items relevant to its verification activities.
- * should assure the Agency the right to request, receive, examine and copy any record, data or information and to retain, move, or photograph, including videotape, any item relevant to the Agency's verification activities.

- * should assure the Agency the right to take and retain continuous custody of any material or item designated by the IAEA when, in its judgement, it is necessary to do so to maintain the integrity of the verification activities.

General privileges and immunities

- * The DPRK should ensure prompt and unrestricted entry into and exit from the State of IAEA officials, and IAEA property, supplies and equipment. For example, Agency officials should be permitted to enter the State with a United Nations Laissez Passer or Certificate, without being required to secure a visa or with assurances of automatic granting of visas of unlimited duration.
- * IAEA officials, and IAEA property, supplies and equipment, shall be granted unrestricted freedom of movement within the State in connection with the implementation of IAEA verification activities.
- * The DPRK should promptly accept the designation of the ten IAEA inspectors as proposed in the IAEA's letters of 18 December 1992 and 10 March 1993, and the designation of other additional inspectors, as required by the Agency.
- * The IAEA should be assured the right to communicate within the DPRK and from the field with IAEA Headquarters in Vienna without any hindrance, by radio, satellite telephone or other forms of communication, including those of the IAEA.
- * The IAEA should be assured the right to use coded communications within the DPRK and between Agency officials in the field and in Headquarters.

1994-07-01

SPECIAL INSPECTION

DRAFT, Rev 1.

- * To solve the question of inconsistencies arising from the sample analysis of the reprocessing plant a request for access to additional information and two possible waste sites was done in efforts to verify the correctness and completeness of the initial declaration.
- * The carrying out of the special inspection becomes now more important part than ever before, because, due to the improper discharge procedure applied by the operator, the opportunity for the IAEA of the confirmation of the irradiation history of the core the 5 MWe reactor has been irretrievably lost. The loss of this information needs to be compensated, to the extent possible, by other measures.
- * The conduct of the inspection depends greatly on the co-operation provided by the DPRK. The nature of such co-operation extends from the provision of information to actual work at the sites.
- * Since a considerable time has passed from the request for a special inspection, it should be noted that there could have been enough time for concealment or sanitizing of the sites and destroying as well as hiding of information.

1. Information requirements

- * The DPRK should provide the information on its research and development programme for reprocessing, including the chronology and location of any experimental facilities and laboratories for irradiation and processing. The DPRK should also provide operating records and reports of such installations, including origin and quantities of nuclear materials irradiated and processed, the current location of the nuclear material, and the quantities and locations of waste produced.
- * The DPRK should provide all the information regarding nuclear waste treatment including the R&D programs, and the chronologies and locations of any experimental facilities and laboratories. Operating records and reports of such installations including the origin and quantities of materials processed, and current location of such materials, should also be provided.
- * The DPRK should provide design drawings and drawings as built for the LRT waste site (Site B) and the site near the reprocessing plant (Site A), as well as the chronology of their construction and the use, and the inventory of waste.

2. Site A activities

- * Examine information and declarations received. Analyze it against other available information and establish the inspection plan accordingly.
- * Characterize the construction of the waste site by making accurate measurements of outer dimensions and compare them with the as built drawings; make photographic records.

- * Characterize the surroundings of the building using ground penetrating radars to detect any cavities or pipelines within 100 meters from the building and compare against the drawings.
- * Make gamma and neutron mapping on the floor and surroundings and take smear samples (these are samples prior any destruction of construction) and soil samples .
- * Remove the soil from three sides of the building. Characterize the underground parts of the building by measuring its dimensions: identify possible penetrations and measure wall thicknesses. Make a complete photo recording.
- * Make a gamma and neutron mapping around the building for the ground wall and take smear samples at selected points (e.g. at penetrations).
- * Based on the information above, decide on the points of access to the inner parts of the building. Take samples from construction materials to determine any recent construction work.
- * Drill holes to access the inner parts, repeat measurements and take samples for analysis. Take photographic records.

3. Site B activities

- * Examine information and declarations received. Analyze it against other available information and establish the site activities accordingly
- * Uncover the site by moving the soil from the top of the storage. Collect soil samples for analysis.
- * Characterize the construction by recording accurate dimensions and compare them to the as built drawings; make complete photographic records.
- * Take smears from the top of the storage, perform gamma and neutron mapping of open pits. Compare the results with the declared contents of pits.
- * Characterize the surroundings of the storage around the radius of 100 m. Use ground penetrating radar to detect any cavities or pipelines. Collect soil samples for analysis at selected points.
- * Take samples from pits for the destructive analysis.
- * Uncover the sides of the storage at selected points to detect any recent construction work. Compare with the as built drawings, repeat gamma and neutron mapping, collect smear and other samples, and complete the photographic records.

1. Services required (non-routine inspection equipment)

For the implementation of the measures identified under 2. and 3. of this paper, co-operation between the IAEA and the DPRK is essential, as implementation of those measures will require the application of the inspection equipment not normally used in ad hoc or routine inspections. In particular the DPRK should provide assistance in the following areas:

- * radiation protection staff and equipment
- * soil movement (bull dozer, trucks, labor, jack hammer and other drilling equipment)
- * sample treatment laboratory (to prepare samples for shipment)
- * supply of liquid nitrogen

Furthermore the IAEA will have to use the following instruments and equipment:

- * complementary radiation protection gear
- * sampling and sample transportation gear
- * communication system for the field use (satellite with a fax, two sets)
- * local communication system (walkie talkies)
- * ground penetrating radars
- * equipment to measure wall thicknesses
- * neutron and gamma mapping equipment
- * video recording and photographing (inclusive digital) gear

special/1994-06-30

SPENT FUEL OPTIONS AT NYONGBYON

1. Background Information

The reactor in question ceased operation on 8 April 1994 and the core containing about 8000 rods of natural uranium metal fuel in Magnox Zr-55 cladding was gradually unloaded during the month of May. Burn-up of the fuel is reported to range between 200 and 1200 MW d/t with an average of about 800 MW d/t. Transfer of the fuel from the reactor to the interim spent fuel storage facilities was carried out, one basket at a time, in a concrete transfer cask. Each basket consists of six circumferential segments each of which can hold six or seven fuel rods for an average of about 40 fuel rods per basket. The material of the baskets is thought to be mild steel coated with a brown-coloured, anti-corrosion paint. However, the available information about the material of the baskets is conflicting. It has been variously reported to be unpainted mild steel or stainless steel badly corroded at the welds. The transfer cask runs on a small trolley through a tunnel about 50 m long between the reactor hall and the spent fuel storage building. Each fuel rod is about 50 cm in length and about 29 mm in diameter including the cladding.

The procedure once the transfer cask arrived in the decontamination bay in the spent fuel storage building appears to have been the following. The basket of fuel contained in the cask was transferred by crane to one of two pools 7.5 m deep or, if there were indications that the basket contained a damaged fuel rod, the basket was transferred to a "dry" storage bay. Most of the fuel is stored in about 200 baskets stacked up to three baskets high in the two connected pools, leaving about 600 rods in the dry storage bay. About half of these 600 rods were transferred during the period from 1989 to April 1994 as fuel failures occurred in the reactor. The other half were transferred during the most recent unloading as mentioned above. It should be noted that not all of the rods in the dry storage are damaged and equally, there is no reason to believe that all of the rods in the two pools are sound. Therefore, we must assume that there are some failed fuel rods in the pools as well as in the dry storage bay.

Although the pools are 7.5 m in depth there is only 5 m of water in the them. This is "purified" by gradual circulation at a rate of 5 m³/h. The water temperature is around 30° C and its activity is reported to be 100,000 Bq/l. Bubbles apparent at the surface of the water are attributed to NaOH additions although there is some concern that they could be due to corrosion of the cladding.

The spent fuel storage facilities were not designed for long term interim storage but were designed under the assumption that the fuel would be sent for reprocessing after an appropriate cooling period. It is apparent that the pools do not have adequate filtering and purification systems, since it has been reported that the water is almost opaque. Nevertheless, dirty water is not necessarily bad water from the point of view of corrosion of the Magnox cladding, which is of paramount concern. The rate of corrosion of the cladding will be dictated by water chemistry parameters such as the pH and concentrations of deleterious ionic species, especially chlorine. The detailed water chemistry of the pools in question is unknown at this time.

The site is located around 50 to 60 km from the coast. Consequently, one of the major sources of airborne chlorine can be ruled out. But the chlorine content of the water source used to fill the pools is unknown.

2. The Problems

There are two major problems that can be dealt with separately:

1. The fuel currently in the pools, and
2. the fuel in the dry storage area.

In both cases the key issue is the very high susceptibility of Magnox fuel to cladding corrosion in water or a humid environment. It is important to note that damp storage is significantly worse than wet storage, leading to grave concerns about the fuel in the so-called dry storage pit.

Corrosion of the cladding takes two forms:

- general superficial corrosion, and
- localised or pitting corrosion.

Of these, the first is by far the easiest to slow down, through control of the water chemistry of the pools. The second is very difficult to inhibit and is of most concern in the present case. Pitting corrosion is initiated at existing cracks, crevices or indeed any scratch on the surface where the protecting surface oxide has been removed during handling. The reports that we have received about the handling of the fuel do not give us much confidence that the fuel is free of such sites where pitting can be initiated. Pitting corrosion rates are known to be accelerated by orders of magnitude over general corrosion rates and are influenced by the presence of chlorine ion concentrations, $[Cl^-]$, at or in excess of 2 ppm, Magnox sludge and any carbon deposited on the fuel during its time in the reactor. The temperature of the pool water is also a determining factor. At temperatures around ambient, general corrosion rates double for an increase of only 8° C.

Pool storage life under unfavourable conditions is likely to be in the range of 10-20 weeks. It is clear that actions to take precise control over the water chemistry in the pools must be initiated without delay.

The major cause of concern with the damaged fuel in the "dry" store is the possible formation of uranium hydride at places where the cladding is breached. Uranium hydride is a pyrophoric material posing the continual possibility of auto-combustion on exposure to air.

3. Guiding principles

From experience with handling thousands of tonnes of spent Magnox fuel one guiding principle has prevailed. Only fuel that has been dry throughout its life time has been sent to dry storage and elaborate precautions have been taken to ensure that

the conditions are either truly dry in the case of air or inert in the case of other gases. Once wetted, Magnox fuel is always stored and transported under water with carefully controlled water chemistry. Therefore, the conversion from wet storage to dry storage is not recommended. However, if for other pressing reasons, a conversion to dry storage is still considered a viable option, the possibilities are presented in Appendix 1.

4. Options for the Fuel in the Pools

4.1 Short Term Options

The short term options for dealing with the spent fuel are limited. The first is to leave it in place. This would require purifying the water in the pools to improve its clarity and implementing as soon as possible strict control over the pH of the water and the concentrations of certain ionic species to slow down the corrosion of the cladding. The second is to transfer the fuel to wet storage casks or containers, if they are available. The time scales involved here are, about 1 year without separate wet containers, and up to 5 years with specially designed wet containers with very high pH water separated from the water in the pool (as described below).

Without a more detailed knowledge of the water chemistry parameters of the pools it is impossible to say with any certainty how long the fuel can be stored under the present conditions. However, with every day that passes the situation is most likely to be worsening with both general and localised (pitting) corrosion of the fuel cladding taking place. Without careful control of the water chemistry more and more of the fuel elements will fail with time leading to increased fission product release and increasing radiological hazards to the operators. We have received information that the pH in the pools is maintained at about 11 but that the concentration of the most deleterious ionic species, $[Cl^-]$, is not known. The pH of the water in the pools should be maintained in the range $11.5 < pH < 12$ and $[Cl^-]$ should be less than 0.5 g.m^{-3} to inhibit localised corrosion of the cladding. It is important to note that the reduction of $[Cl^-]$ can only be attained by renewing the water with demineralised water. Storage life in the less than favourable conditions pertaining at present is likely to be counted in weeks, with the most likely attack being by pitting corrosion releasing caesium and other soluble nuclides into the pool water and allowing the uranium metal to start corroding.

The expertise is available in the UK and France to advise the operators in the DPRK on how to optimise and maintain the water quality to extend the safe interim storage in place for one to two years maximum, which is the limit of experience with wet storage of Magnox fuels under optimised water chemistry conditions to date. Because the fuel has already been stored under less than ideal conditions for up to two months, we cannot count on safe, extended storage for more than about a year, and then only if the water chemistry is optimised in the next few weeks.

By increasing the pH to 13 with a total chloride and sulphate level of less than 0.5 ppm, 5 years of storage life can be obtained without cladding deterioration. However, in order to achieve these conditions it is necessary to place the fuel inside

containers to avoid depletion of the caustic level due to reaction with dissolved carbon dioxide in the pools. This would require mechanical handling equipment to be installed at the pools and may be unattractive from a safeguards point of view. Nevertheless, the use of such wet containers is standard practice in the storage of Magnox fuels in the UK, and they could be made available to help solve the problem at hand.

4.2 Long Term Options

There appears to be only one viable long term option and that is to transport the fuel for reprocessing in the DPRK or abroad.

5. Options for the Fuel in Dry Storage

Damaged fuel elements, at present in the so-called dry storage, should be of special concern and improving the conditions of their storage should be a high priority since they constitute a possible fire hazard (by auto-combustion of uranium hydride in air) in their present condition.

5.1 Short Term Options

Mechanical handling of the damaged fuel should be kept to a minimum and carried out with great care. It must be assumed that some uranium hydride has formed and is unstable in air. Once control of the water chemistry of the pools has been taken in hand, some serious thought should be given to flooding the dry store and treating it as a third pool. In the meantime, anything that can be done to dry the air in the dry store, or maintain a heavier than air inert gas over the fuel would be helpful. In addition, if the store can be split into units, so that any fire that erupts is confined, it would prevent the involvement of the whole inventory.

5.2 Long Term Options

Again there appears to be only one viable option and that is to package the fuel and transport it to be reprocessed. However, in this case the damaged fuel should be sealed into cans under an inert atmosphere prior to transportation.

6. Transportation

Both overland and trans-oceanic transportation of similar Magnox fuels (frequently with much higher burn-ups) has taken place on a routine basis over the last 40 years. The fuel transport casks used to transport Magnox fuel from Japan to the UK might be used to transport the fuel in question to almost any location. A standard cask for the transportation of Magnox fuel is available in the UK. It weighs 60 tonnes and contains water with the pH > 11.5 obtained by adding NaF. Cogema in France has similar casks (TU 17) which weigh about 50 tonnes. Our information is that the capacity of the crane in the storage facility is only 35 tonnes. Besides the problem of dealing with the weight of these casks, some slight modifications of the internals of the casks may be necessary to cope with the different fuel geometry. In both cases,

the casks are capable of holding about five tonnes of fuel. Consequently, in principle 9 or 10 casks would be required to ship the whole inventory. However, since the packing fraction for this particular design of fuel is unknown, considerably more than 10 flasks might be necessary. Although both damaged and sound fuel can be shipped together in these flasks, some assessment of the fuel would have to be made on site to ensure that an excess of damaged fuel did not go in any one flask. It is estimated that if the IJK flasks were chosen to transport this fuel, and a sufficient number could be made available on time, it would take nine months to get all of the fuel off the site.

It seems unlikely that lighter casks used for shipment of dry spent fuel from research reactors could be adapted and tested for wet transportation in time to be of use. Thus it appears that some ingenious way of dealing with the heavier casks will have to be found. One possibility is to import a crane of the appropriate size and, either remove the roof of the building, or dig a temporary pool outside the building and use the existing transport flask as an intermediary between the inside pool and the outside pool. Since this will be a time consuming business, and we may have only a year to play with, action to plan the transport of the fuel should begin as soon as possible.

The minimum cooling time for fuel prior to shipment in Magnox casks is 90 days. By the time that any arrangements could be made for transporting the fuel, it is unlikely that any further cooling time for the fuel would be necessary.

7. Decommissioning the wet storage

Storage pools for Magnox fuels have been decontaminated and decommissioned. The procedures have been set out in detail and are fairly straightforward although time consuming and costly. In particular, any active sludge at the bottom of the pools would have to be chemically treated and/or consolidated prior to being sent for final disposal.

8. Recommendations

The nature of the Magnox fuel is such that it will almost certainly have to go for reprocessing somewhere in the not too distant future. While the discussions are ongoing, probably the safest and most economical of the interim storage options is to leave the bulk of the fuel where it is in the two pools on site. The water chemistry should be optimised without delay and maintained to minimise the corrosion rate of the fuel cladding. Dealing with the damaged fuel is more problematic. It should not be left in its current condition in a humid "dry" store. If possible, it is recommended that the dry store be converted to a third pool with the prescribed, optimised water chemistry.

Damaged wet fuel from the pools must not be allowed to come into contact with the air. If it cannot be shipped in a wet container, it should be carefully dried in a hot, inert gas atmosphere and sealed in an inert atmosphere in cans.

The pools should be cleaned up as soon as possible with the help of portable technology from the West. It is essential to have clear water to be able to see what is going on and to be able to manipulate underwater equipment and tools.

9. Task List

9.1 Short Term

1. The pH of the water in the pools must be kept in excess of 11.5. This should be checked on a routine basis and proper records kept. Pure NaOH should be used to maintain the pH.
2. A source of demineralised water capable of replacing at least 10% of the water capacity of the pools per day must be found or portable equipment provided from abroad.
3. Measurement of the [Cl] in the pools must be made and repeated on a routine basis. If necessary with a portable measurement set provided from abroad.
4. The water in the pools must be continually purged with demineralized water to reduce and maintain the [Cl] at or below 0.5 g.m^{-3} .
5. The dry store fuel should be put under an inert gas atmosphere or flooded and the dry store treated as a separate pool. If neither of these solutions is practicable, then the fuel should be physically separated as well as possible, so that in the unfortunate event of a fire, it is confined to a small unit.

9.2 Longer Term

1. A self-contained, submersible, ion-exchanger complete with its own pump, zeolite filter and resins should be imported to remove nuclides from the water. Besides helping to reduce the radiological hazard to the operators, it will avoid later problems with radiation fields in the filters.
2. A portable water chiller should be imported to reduce the temperature of the water in the pools to about 15 or 16° C. This will achieve two important goals. The first is a substantial decrease (about fourfold) in the rate of corrosion, and the second is to inhibit the growth of algae and hence improve the clarity of the pools.
3. Sulphate and carbonate ions should be reduced to less than 0.2 g.m^{-3} and 3 kg.m^{-3} , respectively, again by purging with demineralised water.
4. Actions to plan and implement the transport of the fuel should be initiated as soon as possible.

15

APPENDIX 1

Conversion to Dry Storage

Dry storage of Magnox fuels has been successfully carried out and is ongoing at several sites. However, dry storage of this fuel must be really dry and although this does not involve high technology the buildings and air or gas control systems are fairly elaborate and could not be constructed rapidly at the site in question. In addition, it would not be an ideal solution for the damaged fuel which would have to be dealt with separately. It is important to note that bulk dry storage of Magnox fuel has only been carried out on fuel that has remained dry throughout its life. No conversion of wet storage to dry storage has ever been attempted because of the difficulties of drying wet fuel and the dangers of handling failed fuel in which pyrophoric uranium hydride may have been formed.

Dry Storage

It is very important to note that any damaged fuel at present in the pools, or fuel which becomes damaged by corrosion between now and the time it may be decided to switch to dry storage, should not be allowed to come into contact with air because of the risk of auto-combustion mentioned above. Consequently, an accurate method of sorting the spent fuel into sound rods and rods with penetrated cladding, without exposing them to the air, would be necessary. In addition, the damaged fuel rods would have to be dealt with separately, either by sealing them into containers under inert gas after careful drying them in a hot inert gas atmosphere or maintaining them in wet storage. Because of these difficulties, the conversion from wet to dry storage is not advisable.

However, if for other reasons, a switch to dry storage is still considered a viable option, probably the simplest and most economical dry store to build and operate would be based on CANDU concrete silos or a mini version of the Wylfa dry storage facility used to store Magnox fuel in the UK. With some modifications the standard design of CANDU silos could be adapted to house the fuel in question, if it can be thoroughly dried. It is estimated that about 20 silos would be required to house the 8000 rods. In a dry vault of the Wylfa type, the building is maintained at a slight negative pressure with dry, filtered air cooling the fuel in vertical open tubes by natural convection.

Given the relatively low burn-up of the fuel in question, it is unlikely that further cooling of the fuel would be necessary prior to its transfer to most forms of dry storage.

Page 4

Possible assistance from IAEA for Introduction of LWR Technology in DPRK

As a part of the technical assistance programme to Member States, the Agency can provide advice on planning and implementation of a nuclear power programme. The assistance is directed towards creating national capabilities for discharging the owner's functions and regulatory functions which are a minimum requirement.

The current Agency advice to Member States is to consider implementation of a nuclear power project only if there is a continuing nuclear power programme since the infrastructure necessary for a successful programme is quite extensive.

The first decision to be made by the State is whether a nuclear power programme is economically justifiable for the country taking into consideration other generation options. For this purpose, the Agency recommends undertaking an energy and nuclear power planning study. Assistance can be provided by the Agency to undertake this study.

In case of a positive outcome from the study, it will be necessary to carry out additional studies to support the decision for a nuclear power programme. In particular a feasibility study must be conducted to ensure that an NP Programme is a viable one from the technical and financial viewpoints. Sources of financing for the project have to be established.

The next important aspect is the type and size of the plant and the type of contract for the first NPP.

In the case of DPRK the assumption is that the technology to be chosen would be based on Light Water Reactors (LWR). There are two types of LWR's, namely pressurized light water reactor (PWR) and boiling water reactor (BWR). There are vendors for LWRs in many countries including China, France, Germany, Japan, Russian Federation, Sweden, and the U.S.A. Since PWRs constitute the largest share of all LWRs in the world and particularly within the region, the likely choice for DPRK would be a PWR.

If the Yongbyun nuclear complex site of DPRK is not suitable for switching from graphite reactors to LWR's, an appropriate site has to be selected. In addition, decisions have to be taken as to the extent of the national participation in the project and conditions have to be created for successful transfer of technology. In all these areas, the IAEA has demonstrated capabilities to provide expertise and assistance to Member States.

The required infrastructure for nuclear power has to be established in DPRK to the extent necessary. This includes national legislation regarding atomic energy, regulatory organization, owner's organization capable of taking up the responsibilities for safety and nuclear liability. A core of manpower trained in all the technical aspects of the LWR technology, would also be an essential requirement. The Agency can provide assistance in the development of this infrastructure. The Agency has ready programmes to assist Member States in setting up training centers and the use of a systematic approach to training (SAT) in their efforts to develop qualified manpower for implementation of a nuclear power programme. The training process can be facilitated significantly by taking advantage of the excellent training infrastructure created with Agency assistance in countries of the region.

For the first NPP, a turn-key type of contract is the most appropriate since it simplifies the

owners' functions considerably and provides an opportunity for owner's staff to learn on-the-job. In the case of DPRK, it is believed that considerable assistance would be required in pre-project activities such as bid invitations, bid specifications, technical and economic evaluation of bids, finalizing contract conditions, supervising the implementation of the NP project as well as taking up the responsibility for quality assurance. The Agency can provide significant assistance in all the above areas.

In 1993, a publication on *"Policy Planning for Nuclear Power: An overview of the main issues and requirements"*, has been brought out, a copy of which is attached. This document summarizes all the requirements for a successful nuclear power programme and also details the assistance that could be provided by the IAEA.

IAEA's assistance to DPRK in infrastructure building and training could be provided through extra-budgetary contributions. Given the appropriate Board approvals, the Agency would be in a position to respond quickly to a request by Member States for an extra-budgetary programme to assist DPRK in switching over from Graphite Gas-cooled reactor technology to LWR technology. The Agency would take the role of the principal coordinator of the activities and programmes which would be funded by interested Member States. The amount of effort necessary to achieve the programme can only be assessed after undertaking a "fact-finding mission" to the country in order to determine the current preparedness and infrastructure available from the experience in building and operating a small nuclear power plant and research reactors.

**Types of assistance by the IAEA
for the introduction of nuclear power,
in particular light-water Technology (LWR)
in a Member State**

The IAEA has and can provide the following assistance:

1. Assistance in the analysis and projection of electricity demand and supply
2. Assistance in the optimization of the electricity generation mix
 - fossil
 - nuclear
 - others
3. Assistance in establishing the basic infrastructure in support of the nuclear power programme
 - regulatory authority
 - project organization and management
 - quality assurance programme of the owner
4. Assistance in manpower development programmes
 - safety assessment
 - fuel management optimization
 - operations management
 - maintenance organization
 - quality assurance in operation
5. Assistance in the plant acquisition phase
 - technical specifications
 - bid evaluation
 - selection of suppliers
 - contracting terms and conditions
6. Assistance in defining the functions, roles and responsibilities of the plant owner organization, and in their execution
7. Assistance in safety review and assessment
8. Assistance in establishing requirements for training and retraining programmes, and for qualification of operation personnel