ACTION SHEET 34

between

The Power Reactor and Nuclear Fuel Development Corporation of Japan (PNC)
and
The United States Department of Energy (DOE)
for

Personnel Exchange on Remote Monitoring and Transparency

1. Introduction

Under Article III (Methods of Cooperation) of the Agreement between PNC and DOE for Cooperation in Research and Development Concerning Nuclear Material Control and Accounting Measures for Safeguards and Nonproliferation (herein called the "Agreement"), dated September 15, 1993, DOE and PNC undertake a personnel exchange to pursue joint activities in remote monitoring systems and technologies to promote transparency. Several of the remote monitoring systems and technologies which will be studied or used will be systems and technologies which were initially designed for nuclear safeguards applications.

2. Scope of Work

This Action Sheet provides for the exchange of personnel between Sandia National Laboratories (SNL) and PNC who will work in the areas of remote monitoring and transparency. The work performed under this Action Sheet shall be performed at PNC by the SNL staff member located in Oarai, Japan and at SNL by the PNC staff member located in Albuquerque, New Mexico.

The project at PNC entails: (1) a study on how remote monitoring techniques can be used to promote nonproliferation, environmental, and safety transparency, and (2) an experiment to demonstrate how remote monitoring can acquire and share data to promote transparency while protecting sensitive information. The project at SNL entails: (1) training and work in remote monitoring technology and (2) joint studies developing ideas to address nuclear transparency in Northeast Asia.

3. Program Management

SNL Staff Member at PNC: SNL will be responsible for conducting a study on how remote monitoring technologies can be used to promote transparency in Japan. SNL will also be responsible for conducting an experiment to demonstrate how remote monitoring data can be shared to promote transparency while protecting sensitive information. PNC will be responsible for providing guidance and assistance to enable successful study completion and experiment implementation.

PNC Staff Member at SNL: PNC will be responsible for assisting in Remote Monitoring System (RMS)/International Remote Monitoring Project (IRMP) work being done at SNL. PNC will also be responsible for working on nuclear transparency efforts through the SNL Cooperative Monitoring Center (CMC). SNL will be responsible for providing guidance and assistance for successful RMS/IRMP and CMC activity participation.

The work to be done is found in Appendix I. Appendix II identifies key personnel working on this project.

DOE, SNL, and PNC shall work together in planning tasks and resolving programmatic and technical questions.

SNL and PNC shall prepare progress reports at appropriate milestones in the work and if requested shall present written and oral reports at meetings of the Permanent Coordinating Group (PCG).

4. Fiscal Management

In accordance with Article VII of the Agreement, PNC and SNL will be responsible for the salaries, insurance, allowances, travel, and living expenses of its staff. A modification to Article VII is that travel requested by the host Party will be paid by the host Party.

5. Duration and Termination

This Action Sheet shall enter into force upon the later date of signature and shall continue in force for a 24 month period. In the case all the activities under this Action Sheet are not completed in the designated period above, the Action Sheet can be extended by consent of both parties. Both assignments, at SNL and at PNC, shall be for a period of 12 months; however, assignments for either or both exchange personnel may be shortened or extended if deemed appropriate by PNC and DOE. Assignments need not commence on the same dates.

For the Power Reactor and Nuclear Fuel Development Corporation of Japan

Signature: Yoshiaki Himeno

Printed Name: Yoshiaki Himeno

Title: Director, International Division

Date: March 2, 1998

For the United States Department of Energy

Signature: Kenneth E. Sanders

Printed Name: Kenneth E. Sanders

Title: Director, International Safeguards Div.

Date: 26 Feb. 1998

Signature: Ed Fei

Printed Name: Ed Fei

Title: Dep Director Policy. International Policy and Analysis Division

Date: 2/27/98

ACTION SHEET 34

APPENDIX I

Personnel Exchange on Remote Monitoring and Transparency

1. At PNC

The project which the SNL staff member located at PNC will undertake has two parts:

1. A study on how remote monitoring technologies can be used to promote nonproliferation, environmental, and safety transparency in Japan.
2. An experiment to demonstrate how remote monitoring data can be efficiently acquired and shared at different levels of access to promote transparency while protecting sensitive information.

A. The Study

The study will:

1. Investigate what remote monitoring data may be beneficial to acquire and understand about nuclear fuel cycle activities, i.e., export, waste management, fuel reprocessing & civil use of plutonium, and safety. Considered will be what interested parties want to know. Interested parties include scientists and on-site workers, foreign policy analysts and national security officials, regulatory officials, decision makers, the public, and regional neighbors.
2. Determine what existing and new technologies may be used to acquire this data. Technical and financial feasibility will also be considered.
3. Assess what data may be disclosed to promote transparency while protecting sensitive information.
4. Determine what data sharing methods may be used to provide access at different levels. Technical and financial feasibility will also be considered.
5. Discuss the motivation for sharing the data and the benefits and risks associated with sharing the data (locally, regionally, globally)
6. Solicit the opinions of policy and NGO figures, including those outside of PNC, on the future of nuclear energy in East Asia and the potential benefits of transparency. This activity may entail some visits to other Japanese sites.

The deliverable will be a report documenting the study findings.

B. The Experiment

The experiment will demonstrate how data from remote monitoring instrumentation may be securely and efficiently acquired, processed/packaged, and shared with different parties. As a first step to this experiment, candidate experiments will be identified after a sufficient

amount of research has been conducted for the study. Sandia and PNC will then jointly determine which candidate experiments(s) will be most feasible and useful to undertake. Though it is envisioned that other candidate experiments will be identified after working on the study, three potential candidate areas for an experiment in transparency are as follows:

1. an experiment using data form the RMS at the JOYO facility
2. an experiment in waste management associated with planned Sandia activity at PNC
3. an experiment with radionuclide monitoring technology

The deliverable will be a demonstration along with experiment documentation.

C. Optional Activities

The main assignment will be the remote monitoring study and experiment. Optional activities will be undertaken if and only if there is interest on the part of DOE/PNC and sufficient time and funding is available to implement those activities. One optional additional activity would be to demonstrate how airborne or space-based remote sensing technology may be used to promote transparency. This activity would entail acquiring multispectral, hyperspectral, and/or panchromatic imagery of select PNC facilities, geometrically/radiometrically correcting the data as needed, processing the imagery to highlight specific features of interest, and generating annotated hardcopy outputs with a report. Other optional activities may be identified during this personnel exchange period.

2. At SNL

The PNC staff member located at SNL will have involvment in two areas.

1. Remote monitoring systems
2. Nuclear transparency

The work in nuclear transparency is secondary to the work in remote monitoring systems.

A. Remote Monitoring

Become knowledgeable in the Remote Monitoring System (RMS) work being done at SNL. Assist in the modification of RMS to reflect IAEA requirements. This will include modifying sensor hardware and software, DAS and DIRS software testing, and systems integration testing.

1. Assist SNL engineers in the design of RMS currently being developed for Japan projects to include MONJU, PFPF Item Identification, RETF, and JOYO systems. Support SNL by applying knowledge of Japanese requirements for system design and installation at Japanese nuclear facilities, including any safety aspects.
2. Participate in data acquisition from RMS installations and subsequent analysis of the acquired data.

3. Participate in design and testing of RMS systems in other cooperating countries in the IRMP. This may include systems for Australia and Argentina.

B. Nuclear Transparency

Become familiar with cooperative programs and workshops at the SNL Cooperative Monitoring Center (CMC), particularly those developing ideas for nuclear transparency in Northeast Asia.

1. Advise CMC staff on cultural aspects of transparency issues
2. Assist with visits involving Japanese guests, if appropriate
3. Draw on technical knowledge of the Japanese nuclear industry to help CMC staff identify practical and useful transparency measures for further investigation

ACTION SHEET 34

APPENDIX II

Key Personnel

Power Reactor and Nuclear Fuel Development Corporation

1. PNC Headquarters

Toshiro Mochiji, Deputy General Manager
Office of Nuclear Non-proliferation
Nuclear Material Control Division
Power Reactor and Nuclear Fuel Development Corporation
9-13, l-Chome, Akasaka
Minato-Ku, Tokyo, 107, JAPAN

Tasuka Hanai, Senior Staff
Office of Nuclear Non-proliferation
Nuclear Material Control Division
Power Reactor and Nuclear Fuel Development Corporation
9-13, l-Chome, Akasaka
Minato-Ku, Tokyo, 107, JAPAN

2. Oarai Engineering Center

Yu Hashimoto, Senior Staff
Experimental Reactor Division
Oarai Engineering Center
Power Reactor and Nuclear Fuel Development Corporation
4002 Narita, Oarai-machi
Ibaraki-ken, 3 11- 13, JAPAN

Makoto Hashimoto, Engineer
Safety Control Division
Oarai Engineering Center
Power Reactor and Nuclear Fuel Development Corporation
4002 Narita, Oarai-machi
Ibaraki-ken, 3 1 1- 13, JAPAN

Department of Energy

1. DOE Headquarters

Kenneth Sanders, Director
International Safeguards Division
Office of Nonproliferation and National Security (NN-44, GA045)
Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

John Cappis, Technical Staff
International Safeguards Division
Office of Nonproliferation and National Security (NN-44, GA045)
Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

Cherie Fitzgerald, Director
International Policy and Analysis Division
Office of Nonproliferation and National Security (NN-42, GA007)
Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

Ed Fei, Deputy Director
International Policy and Analysis Division
Office of Nonproliferation and National Security (NN-42, GA007)
Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

2. Sandia National Laboratories

Arian Pregenzer, Manager
Cooperative Monitoring Center and Regional Security, Organization 534 1
Sandia National Laboratories
Albuquerque, NM 87 185-l 373

John Olsen, Principal Member of Technical Staff
Cooperative Monitoring Center and Regional Security, Organization 5341
Sandia National Laboratories
Albuquerque, NM 87 185- 1373

Don Glidewell, Principal Member of Technical Staff
Transparency and Verification Analysis, Organization 539 1
Sandia National Laboratories
Albuquerque, NM 87 185- 12 13

Sheila Motomatsu, Senior Member of Technical Staff
Cooperative Monitoring Center and Regional Security, Organization 5341
Sandia National Laboratories
Albuquerque, NM 87 185- 1373