

# ACTION SHEET 19

between

**The Power Reactor and Nuclear Fuel Development Corporation of Japan (PNC)  
and**

**The Department of Energy (DOE)**

**for**

**Development of a Safeguards System for Measuring Vitrified High Level Waste Canisters**

## 1. Introduction

Under Article II (Area 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 (hereinafter called the "Agreement"), dated September 15, 1993, DOE and PNC undertake to carry out a cooperative effort to develop a safeguards system for verifying plutonium content in canisters containing vitrified high level waste at the Tokai Vitrification Facility (TVF) in Japan.

## 2. Scope of work

This Action Sheet provides for the development of a nondestructive assay (NDA) system for verifying the plutonium content in the canisters containing vitrified high level waste at the TVF. This work will be in two phases. The Phase I activity includes a feasibility study for the options to verify the plutonium content in vitrified high level waste canisters and based on the results of the feasibility study, an option will be chosen and a conceptual design will be completed. The Phase II activity includes the detailed design, fabrication and testing, of the NDA instrument selected in Phase I, and the software integration and authentication and installation and calibration of the unattended monitoring measurement system.

## 3. Program Management

LANL is the organization responsible for development of unattended monitoring measurement system. Work to be done is identified in Appendix I and is limited to techniques for nuclear safeguards applications. PNC is responsible for providing design information, operating data, and other information required for completion of the joint studies. Appendix II identifies key personnel working on this project.

DOE and LANL shall work directly with PNC in planning tasks and resolving programmatic and technical questions. LANL shall start by developing and circulating separate work plans

with projected milestones for each phase and update the work plans with PNC concurrence as work progresses.

LANL shall prepare brief quarterly status reports on each task and circulate them to PNC, DOE, and to other pertinent organizations as requested by PNC.

LANL and PNC shall prepare and present written and oral reports at meetings of the Permanent Coordinating Group (PCG).

#### 4. Fiscal Management

PNC shall make cash contributions with the sum of \$120,000 for Phase I and \$340,000 for Phase II in United States dollars to conduct the activities related to the completion of work for safeguards at the Tokai Vitrification Facility as defined in Appendix I of this Action Sheet in the following manner:

- a. a contribution of \$120,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued upon or shortly after the date of signature of this Action Sheet.
- b. a contribution of \$340,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April 1996. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1996.

All contributions by PNC shall be due and payable within thirty days of receipt by PNC of an invoice from DOE, subject to the availability of appropriated funds to PNC.

DOE shall be responsible for the budget planning and financial management and shall make best efforts to complete the PNC-funded activities in Appendix I satisfactorily and within the cash contributions by PNC. DOE costs are determined in accordance with DOE's policy for costing work it performs for others as set forth in 10 CFR Part 1009. The total cost to PNC for DOE's performance of work under this Action Sheet shall not, without PNC's prior consent, exceed the contributions set forth above.

DOE shall not begin or carry out work prior to entry into force of the Agreement and Action Sheet and receipt of the required payment in advance. Work shall not be continued after funds from PNC have been depleted.

Throughout the duration of work under this Action Sheet, PNC shall provide sufficient funds in advance to reimburse DOE for causing LANL to perform the work described in this Action Sheet, and DOE shall have no obligation to perform in the absence of adequate advance funds.

Payment in advance from PNC shall be sufficient to cover the expected obligation and cash requirements of the work until a subsequent request for payment in advance can be made, collected, and recorded. In this regard, sufficient advance funds shall be provided to maintain, at a minimum, a continuous 90-days advance of funds for expected DOE fund requirements during the life of this Action Sheet. Advances shall be sufficient to cover expected termination costs that DOE would incur on behalf of PNC.

5. Duration and Termination

This Action Sheet shall enter into force upon the later date of signature and shall continue in force for an 18 month period or until mutually agreed by the parties that all activities under this Action Sheet are completed.

For the Power Reactor and Nuclear Fuel  
Development Corporation of Japan

For the United States  
Department of Energy

Signature: Masami Katsuragawa

Signature: Kenneth E. Sanders *JKP*

Printed  
Name: Masami Katsuragawa

Printed  
Name: Kenneth E. Sanders

Title: Director  
International Division

Title: Director  
International Safeguards Division

Date: July 5, 1995

Date: July 31, 1995

## ACTION SHEET 19

### APPENDIX I

#### 1. Study Outline

This project involves a cooperative effort to develop an unattended monitoring safeguards system for verifying plutonium content in canisters containing vitrified high level waste. Software for operating and controlling the system is being adapted from similar software applications. In addition to installing the system at the Tokai Vitrification Facility (TVF), this Action Sheet provides for integration of the software and hardware and for acceptance testing of the complete system.

Phase I will perform a feasibility study to select the method for verifying plutonium content in vitrified high level waste at TVF and prepare a conceptual design of the selected system. LANL will also assist PNC with the neutron calibration for dose measurements on a vitrified canister, using hot cell facilities at LANL.

Phase II will start with a PNC and IAEA approved conceptual design and perform the following:

1. Provide a detailed design of the nondestructive assay (NDA) instrument that is selected.
2. Review the design of the NDA instrument with PNC and the IAEA and modify as necessary.
3. Fabricate and test the instrument with participation by PNC and the IAEA.
4. Provide software and authentication for an unattended NDA system with continuous mode operation.
5. Integrate all components into a test bed at LANL, use the test bed to simulate field operation for acceptance testing of the complete system.
6. After acceptance tests of the hardware and software at LANL, install and calibrate the system at TVF.
7. Provide training to PNC, JNSB, and the IAEA on the operation of the system at TVF.
8. Provide manuals and documentation on the use of the NDA system.

## 2. Sites

### Phase I

Los Alamos National Laboratory  
Los Alamos, New Mexico, USA

### Phase II

Los Alamos National Laboratory  
Los Alamos, New Mexico, USA  
and  
Tokai Vertification Facility  
Tokai, Japan

## 3. Programmatic Responsibilities

- A. LANL will be responsible for providing its best efforts within the funding and schedule for Phases I and II. Technical assistance shall be provided on a non-interference basis with existing programs.
- B. PNC will be responsible for facility specific program direction and equipment installation interface.

As more detailed program plans are developed, specific responsibilities will be better defined and delineated.

## 4. Schedule \*

<u>Phases</u>	<u>Calendar Year</u>							
	<u>1995</u>				<u>1996</u>			
	1	2	3	4	1	2	3	4
I.			x	x	x			
II.					x	x	x	x

- \* The schedule will be followed on a best-effort basis depending on receipt of funding and availability of parts.

## ACTION SHEET 19

### APPENDIX II

#### Power Reactor and Nuclear Fuel Development Corporation

##### 1. PNC Headquarters

Tetsuo Ohtani, General Manager  
Safeguards Office  
Nuclear Material Control Division  
Power Reactor and Nuclear Fuel Development Corporation  
Sankaidoh Building  
9-13, 1-Chome, Akasaka  
Minato-Ku, Tokyo, 107, JAPAN

Toshihito Noda, General Manager  
International Cooperation Office  
International Division  
Power Reactor and Nuclear Fuel Development Corporation  
Sankaidoh Building  
9-13, 1-Chome, Akasaka  
Minato-Ku, Tokyo, 107, JAPAN

#### Development of Energy

##### 1. DOE Headquarters

Kenneth Sanders, Director  
International Safeguards Division (NN-44, GA-017)  
Office of Arms Control and Nonproliferation  
Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

John Puckett  
International Safeguards Division (NN-44, GA-017)  
Office of Arms Control and Nonproliferation  
Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

2. DOE-Albuquerque Operations Office

James R. Anderson, Director  
Science and Technology Transfer Division  
DOE/Albuquerque Operations Office  
P.O. Box 5400  
Albuquerque, NM 87115

3. Los Alamos National Laboratory

Howard O. Menlove  
Group NIS-5, MS E540  
Los Alamos National Laboratory  
Los Alamos, NM 87545

Gerald E. Bosler  
Group NIS/SG, MS E550  
Los Alamos National Laboratory  
Los Alamos, NM 87545