

## **ACTION SHEET 15**

between

**The Department of Energy (DOE)**

and

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

for

**Joint Development of Waste Measurement Systems and Development and Application  
of Upgraded Glove Box Accounting Systems**

### **1. Introduction**

Under Article I (Objective) of the Agreement between PNC and DOE for Cooperation in Research and Development Concerning Nuclear Material Control and Accounting Measures for Safeguards (hereinafter called the "Agreement"), dated September 15, 1993, DOE and PNC undertake to carry out a cooperative effort on application of remote-controlled nondestructive assay (NDA) techniques for the PNC Plutonium Production Facility, an automated plant for remote production of MOX fuel.

### **2. Scope of work**

This Action Sheet (AS) provides for:

- 1) development and application of waste measurement systems to the PPFF and PCDF; and
- 2) development and application of upgrade MAGB Counters to the PPFF.

The work performed under this AS shall be performed at the Los Alamos National Laboratory (LANL) and the Tokai Fuel Plant (TFP) facilities, PPFF, PPFF, and PCDF in accordance with the terms and conditions of the Agreement.

### **3. Program Management**

LANL is the organization responsible for development of the remote-controlled NDA systems. The work to be done is identified in Appendix I and is limited to techniques for safeguards and materials control. PNC will participate jointly with LANL in the development of methods and techniques for safeguards. PNC is responsible for providing design information, operating data, and other information required for completion of the systems studies. In addition, PNC should assist LANL in obtaining information about planned inspection activities at PPFF, PPFF, and PCDF from the IAEA.

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 task and update the work plans with PNC concurrence as work progresses.

LANL shall prepare brief bi-monthly letter progress 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 \$1,640,000 in United States dollars to conduct the activities related to the completion of work for safeguards at the PFPF, PPFF, and PCDF as defined in Appendix I of this AS in the following manner:

- a. contribution of \$410,000 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 AS (expected somewhere around January 1994).
- b. a contribution of \$410,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April 1994. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1994.
- c. a contribution of \$410,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April 1995. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for Japanese Fiscal year 1995
- d. a contribution of \$410,000 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 30 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 AS 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 AS and receipt of the required payment in advance; and work shall not be continued after funds from PNC have been depleted. Throughout the duration of work under this AS, PNC shall provide sufficient funds in advance to reimburse DOE for causing LANL to perform the work described in this AS, 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 AS. Advances shall be sufficient to cover expected termination costs that DOE would incur on behalf of PNC.

For the United States  
Department of Energy

For the Power Reactor and Nuclear  
Fuel Development Corporation  
of Japan

SEB

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Kenneth L. Sanders

Name:

S. Yamaguchi

Title:

Director, International  
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Title:

Director, International  
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Date:

18 Nov. 1993

Date:

27 January, 1994

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### APPENDIX I

#### 1. Study Outline

This program involves the development, study, and test of NDA systems by LANL for use in the PPFF, PPFF, and PCDF for safeguarding special nuclear materials (SNM); MOX, pellets, powder, etc.

Phase I of this study will include feasibility analysis, conceptual calculation modeling, scale model tests, and prototype tests

Phase II will include engineering design, fabrication, and installation.

Phase III will involve calibration, performance testing, data evaluation, documentation, and reporting.

Studies and tests will reflect the results of remote operation of the NDA equipment, with authentication measures to include surveillance camera and recording measures for unattended operation.

##### A. Remote-controlled NDA system for MOX transfer containers.

In the process area of the MOX facility, the MOX is contained in transfer containers that can be moved by the robotics system. It is desired to measure the MOX in the transfer containers without taking destructive analysis samples from the transfer container at the sampling stages. An NDA system will be designed to measure the plutonium with the detectors on the outside of the glove box. A scale model prototype will be required to test the feasibility of the design before application in the process area.

##### B. Remote-controlled NDA system for a small amount of nuclear material with a large volume.

Studies will be performed to evaluate methods for the measurement of small amounts of plutonium in 2001 drum waste containers. The system includes the add-a-source technique that uses a small  $^{252}\text{Cf}$  source to determine the drum's matrix perturbation to the plutonium assay. After selection of an optimum approach, an NDA system will be designed for use in the MOX facility.

## 2. Site

### A. Phase I and II (except installation)

Los Alamos National Laboratory  
Los Alamos, New Mexico, USA

### B. Phase III (except Pre-calibration)

Power Reactor and Nuclear Fuel Development Corporation  
Tokai-mura, Japan

## 3. Programmatic Responsibilities

A. LANL will be responsible for providing its best efforts within the funding and schedule for the design, fabrication, and testing of the NDA system. Any tests or technical assistance shall be provided on a non-interference basis with existing programs.

B. PNC will be responsible for facility specific program direction, equipment installation and interface.

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

#### 4. Schedule\*

<u>Tasks</u> **	<u>Calendar Year</u>															
	<u>1994</u>				<u>1995</u>				<u>1996</u>				<u>1997</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>A. Transfer Container Systems</u>																
a. Phase I	x	x	x						x	x	x					
b. Phase II			x	x	x	x					x	x		x	x	
c. Phase III					x	x	x	x						x	x	x
<u>B. Waste Measurement Systems</u>																
a. Phase I	x	x	x	x					x	x	x			x		
b. Phase II			x	x	x	x					x	x		x	x	
c. Phase III					x	x	x	x						x	x	x

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

\*\* Phase I: R & D Studies, Conceptual Design, Scale and Prototype Tests  
 Phase II: Engineering Design, Fabrication, Installation  
 Phase III: Calibration, Performance Testing, Data Evaluation, Reporting

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### APPENDIX II

#### Power Reactor and Nuclear Fuel Development Corporation

##### 1. PNC Headquarters

###### Technical

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#### Development of Energy

##### 1. DOE Headquarters

###### Technical

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##### 2. Los Alamos National Laboratory

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