

**ACTION SHEET 37**  
**between**  
**The United States Department of Energy (DOE)**  
**and**  
**The Japan Nuclear Cycle Development Institute (JNC)**  
**for**  
**Development of Plutonium Isotopic Systems for Measuring Containers in the Advanced**  
**Material Accountancy Glove Box at PFPF**

1. Introduction

Under Article II (Area of Cooperation) of the Agreement between JNC 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 JNC undertake to develop a high resolution gamma spectroscopy (HRGS) system for measuring plutonium isotopic composition in transfer containers of the Advanced Material Accountancy Glove Box (A-MAGB) at the Plutonium Fuel Production Facility (PFPF) in Japan.

2. Scope of Work

This Action Sheet (AS) is the second phase of a conceptual design study that was done through Action Sheet 36. In Phase II, two HRGS measurement systems will be developed for measuring plutonium isotopic composition. Instead of traditional liquid nitrogen cooling, mechanical cooling will be used for the HRGS. This configuration will enable unattended operation of the HRGS. Systems will be installed at the locations of the two A-MAGB neutron counting stations at PFPF. The basic system design will be based on attended mode operation using approved IAEA software. Spare parts will be provided with the systems.

Work under this Action Sheet shall be performed at the Los Alamos National Laboratory (LANL) and Plutonium Fuel Production Facility (PFPF) in Japan in accordance with the terms and conditions of the Agreement.

3. Program Management

LANL is responsible for developing, fabricating, and installing the measurement system for determining the plutonium isotopic composition of materials in the A-MAGB counters at PFPF. The work to be done is identified in Appendix I and is limited to development of equipment and techniques for nuclear safeguards applications. JNC is responsible for providing pertinent design information, operating data, and any other information required for the development of the HRGS system and for providing facilities needed to complete and install the measurement systems.

Appendix II identifies key personnel associated with this project.

DOE and LANL shall work directly with JNC in planning tasks and resolving programmatic and technical questions. LANL shall start by developing and circulating a work plan with projected milestones and shall update the work plan with JNC concurrence as work progresses.

LANL shall prepare brief semiannual letter progress reports on activities associated with this Action Sheet and circulate them to JNC, DOE, and other pertinent organizations as requested by JNC.

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

#### 4. Fiscal Management

JNC shall make a cash contribution in the sum of \$490,000 in United States dollars to conduct the activities related to the completion of joint studies into safeguards techniques as defined in Appendix I of this Action Sheet in the following manner:

- a.) A contribution of \$220,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in Japanese Fiscal Year (JFY) 1998 after the date of signature of the Action Sheet.
- b.) A contribution of \$220,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April 1999. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for JFY 1999.
- c.) A contribution of \$50,000 in United States dollars shall be due and payable upon receipt of an invoice to be issued in April 2000. This payment is subject to approval and the appropriation of necessary funding by the Japanese Government for JFY 2000.

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

DOE shall be responsible for the budget planning and financial management and shall make best efforts to complete the JNC-funded activities in Appendix I satisfactorily and within the cash contribution made by JNC. 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 JNC for DOE's performance of work under this Action Sheet shall not, without JNC'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 JNC have been depleted.

Throughout the duration of work under this Action Sheet, JNC 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 JNC 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 JNC.

5. Duration and Termination

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

For the United States Department of Energy

Signature: 

Printed

Name: Kenneth E. Sanders  
Title: Director  
International Safeguards Division

Date: 18 Dec. 1998

For the Japan Nuclear Cycle  
Development Institute

Signature: 

Printed

Name: Masayuki Iwanaga  
Title: Director  
International Cooperation and  
Nuclear Material Control Division

Date: \_\_\_\_\_

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### APPENDIX I

#### Development of Plutonium Isotopic Systems for Measuring Containers in the Advanced Material Accountancy Glove Box at PFPF

##### 1. Study Outline

This program involves the development, fabrication and installation at PFPF of systems for measuring plutonium isotopic composition. The study outline is as follows:

- A. LANL will obtain facility specifications and information on any constraints from JNC.
- B. Based on the results of the study done in Action Sheet 36, LANL will do an engineering design of the measurement systems.
- C. LANL will procure components and fabricate the measurement systems.
- D. LANL will adapt software for the measurement systems.
- E. LANL and JNC will do pre-installation testing and training on the systems.
- F. LANL and JNC will install the systems at PFPF and make a performance test.
- G. LANL, JNC, IAEA and JAEB will do an acceptance test of the systems.
- H. LANL will provide documentation for the systems.

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

##### 2. Sites

This work will be conducted at:

Los Alamos National Laboratory		Japan Nuclear Cycle Development Institute
Los Alamos, New Mexico, USA	and	Plutonium Fuel Production Facility
		Tokai, Japan

##### 3. Programmatic Responsibilities

- A. With best efforts and within funding and schedule, LANL will provide the plutonium isotopic composition measurement systems.
- B. JNC will be responsible for providing facility specifications and information on any constraints.
- C. JNC and LANL will jointly participate in the installation and testing of the systems.
- D. JNC and LANL will jointly participate in technical review meetings and the final evaluation.

#### 4. Schedule

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

ID	Task Name	1999				2000				
		Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	<b>Development of Plutonium Isotopic System for Measuring Containers in the Advanced Material Accountancy Glove Box at PFPF</b>		[Redacted]							
2	Obtain facility specifications and information on constraints from JNC		[Redacted]							
3	Do engineering design of the measurement systems			[Redacted]						
4	Procure components and fabricate measurement systems				[Redacted]					
5	Adapt software for systems					[Redacted]				
6	Preinstallation testing and training						[Redacted]			
7	Install systems at PFPF and make performance test							[Redacted]		
a	Multi-party acceptance tests								[Redacted]	
9	Documentation on the systems								[Redacted]	

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### APPENDIX II

#### Development of Plutonium Isotopic Systems for Measuring Containers in the Advanced Material Accountancy Glove Box at PFPF

##### Japan Nuclear Cycle Development Institute

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