SPECIFIC MEMORANDUM OF AGREEMENT (SMA)

between

The United States Department of Energy (DOE)

and

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

for

Joint Studies of Plutonium Concentration and Isotopic Composition Measurements for Plutonium Storage by Passive Gamma Spectroscopy

1. Introduction

Under Article II (Areas of Cooperation) 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"), DOE and PNC undertake to carry out a cooperative effort in plutonium concentration and isotopic composition measurements for plutonium product storage by passive gamma spectroscopy.

2. Scope of Work

This SMA provides for application of updated gamma-ray spectroscopy to plutonium product storage at the Tokai Reprocessing Plant (TRP). Work for this SMA shall be performed at the Los Alamos National Laboratory (LANL) and the PNC-TRP in accordance with the terms and conditions of the Agreement.

3. Program Management

LANL is the organization responsible for development of the software for plutonium concentration measurements with a technique called "Poor Man's Densitometry". The software development employs a modified version of the MGA2 code which was written at the Lawrence Livermore National Laboratory (LLNL). LANL is also responsible for rewriting the existing k-edge densitometry program for use on a personal computer (PC).

PNC is responsible for studies related to implementing the task and also for purchase of necessary hardware. The work to be done is identified in Appendix I and is limited to the development of methods, equipment, and techniques for safeguards.

It is understood by the Parties that LANL that activities to be carried out by DOE will be executed by LANL. LANL is obligated to comply with the terms and conditions of LANL management and the LANL/DOE operating contract when performing these and all other services for PNC. The use of LANL, LANL management, and LANL operating personnel,

in carrying out the work is authorized on a non-interference basis, i.e., the work performed under this SMA shall not interfere with work related to the prime mission of the Laboratory.

Although DOE commitment to this effort is equal to DOE mission programs, DOE programs may, for reasons related to national security or exigency, preempt efforts in support of this SMA.

Accordingly, DOE, LANL, and persons acting on their behalf shall make best efforts to perform services or furnish information or data hereunder.

PNC agrees to contribute funding for the costs of the development described in Appendix I and to establish priorities among tasks within the program. PNC funding shall be provided to LANL by DOE. DOE shall undertake to develop the software and technology on a best efforts basis within the availability of funding.

DOE and LANL shall work directly with PNC in planning tasks and resolving programmatic and technical questions. LANL shall start by developing and circulating a work plan with projected milestones for each task, and update the work plan as the work progresses. In addition, functional specifications shall be originated and circulated at the beginning of work on implementation of each work plan.

LANL shall prepare brief quarterly progress reports (in letter format) 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 PCG established under Article IV (Management) of the Agreement.

LANL shall implement an independent quality assurance and quality control activity for each task.

Unless otherwise mutually agreed, all equipment and test apparatus procured with funds provided by PNC shall be disposed of as directed by PNC.

No publicity releases (including news releases and advertising) relating to this SMA and the work hereunder shall be issued by either Party without prior coordination with the other Party. Any technical paper, article, publication or announcement of advances generated in connection with work done during the period of performance or in the future, shall give credit to PNC as a sponsor of the work and shall contain a mutually agreed disclaimer statement.

As noted in Article XII (Disclaimer) of the Agreement, all equipment supplied and information transmitted by one Party to the other Party under this SMA shall be appropriate and accurate to the best knowledge and belief of the Supplying and Transmitting Party. The Government, DOE, LANL, and persons acting on their behalf shall make best efforts to assure that the use of any such information or data to be furnished does not infringe privately owned rights.

4. Fiscal Management

Each Party shall bear the cost of its participation in the cooperative activities in the task. PNC shall make a cash contribution with the sum of 126,000 in United States dollars to conduct the activities related to the application of safeguards techniques at TRP as defined in Appendix I of this SMA in the following manner:

A contribution of 126,000 in United States dollars shall be paid in accordance with the following schedule:

First payment January 1991	$63,000
Second payment July 1991	$63,000.

All contributions by PNC shall be due and payable within 30 days of receipt by PNC of an invoice from DOE.

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 contribution 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 SMA 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 SMA 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 SMA, PNC shall provide sufficient funds in advance to reimburse DOE for causing the Laboratories to perform the work described in this SMA, 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-day advance of funds for expected DOE fund requirements during the life of this SMA. Advances shall be sufficient to cover expected termination costs that DOE would incur on behalf of PNC.

5. Indemnification

PNC agrees to indemnify and hold harmless the U.S. Government including DOE and LANL, and persons acting in their behalf in connection with work under this SMA from all liability, including costs and expenses incurred, resulting from use or disclosure by PNC of any information in whatever form, furnished hereunder.

6. Intellectual Property Rights

All provisions of Articles V (Information), VI (Patents), and VII (Copyrights) of the Agreement are incorporated by reference herein. These provisions shall apply to all activities carried out under this SMA.

7. Duration and Termination

This SMA shall enter into force upon the later date of signature, and shall continue in force for a two year period, or until mutually agreed by the Parties that all activities under this SMA are completed.

Executed at Tokyo on this 26th of March, 1991

For the United States Department of Energy	For the Power Reactor and Nuclear Fuel Development Corporation of Japan
Name:	Name:
Printed Name: Edward J. McCallum	Printed Name: Tadatomo Yamaguchi
Date: March 15, 1991	Date: March 26,1991

APPENDIX I

1. Study Outline

This program involves plutonium concentration and isotopic composition measurements for plutonium product storage at TRP using passive gamma spectroscopy methods.

Phase I will include modification of the high resolution gamma spectroscopy (HRGS) program, MGA2, for the so called "Poor Man's Densitometry" which can provide concentration information from passive gamma assay without external sources such as ^{75}Se and ^{57}Co.

Phase II will include rewriting existing software for the k-edge densitometer to make it available for personal computer based hardware.

Phase III will involve examination of the applicability of the "Poor Man's Densitometry" for safeguards at the plutonium product storage area of TRP. In addition, the implementation of the MGA2 program and k-edge densitometry program for personal computer based instruments will also be done in Phase III.

2. Site

A. Phase I and Phase II
Software
LANL, Los Alamos, New Mexico, USA
(LLNL, Livermore, California, USA)
Hardware
PNC-TRP, Tokai-mura, Ibaraki-ken, Japan

B. Phase III
PNC-TRP, Tokai-mura, Ibaraki-ken, Japan

3. Programmatic Responsibilities

A. LANL, through its best efforts within the funding and schedule, will be responsible for development of the software for plutonium concentration measurements using the "Poor Man's Densitometry". Software will be based on a modified version of MGA2 that is being prepared through a consulting agreement with Ray Gunnink of LLNL. LANL is also responsible for upgrading k-edge densitometry software for a personal computer in order to establish easy operation during future inspections at TRP.

B. PNC is responsible for studies related to implementation of the task and for purchasing necessary hardware.

APPENDIX II

KEY PERSONNEL

Power Reactor and Nuclear Fuel Development Corporation

1. PNC Headquarters

Technical

Masayuki Iwanaga, General Manager
Safeguards Office
Power Reactor and Nuclear Fuel Development Corporation
9-13, 1-Chome, Akasaka
Minato-Ku, Tokyo, 107, JAPAN

Administrative

Masayori Tsutsumi, Deputy Director
International Division
Power Reactor and Nuclear Fuel Development Corporation
9-13, 1-Chome, Akasaka
Minato-Ku, Tokyo, 107, JAPAN

2. Tokai Reprocessing Plant

Project Leader

Takao Akiyama
Tokai Reprocessing Plant
Tokai Works

Deputy Project Leader

Soichi Sato
Tokai Reprocessing Plant
Tokai Works

Department of Energy

1. DOE Headquarters

   Technical and Administrative

   Kenneth Sanders, Chief
   International Branch
   Office of Safeguards and Security
   Department of Energy
   Washington, DC 20585

   Gerald Bosler
   International Branch
   Office of Safeguards and Security
   Department of Energy
   Washington, DC 20585

2. DOE-Albuquerque Operations Office

   Field Point of Contact

   Robert Y. Lowery, Director and Samuel Mares
   Reimbursable and Defense Technologies Division
   DOE/Albuquerque Operations Office
   P.O. Box 5400
   Albuquerque, NM 87115

3. Los Alamos National Laboratory

   Project Leader

   S. T. Hsue
   MS E540, Group N-1
   Los Alamos National Laboratory
   Los Alamos, NM 87545

   Deputy Project Leader

   G. W. Eccleston. Deputy Project Leader
   MS E540, Group N-1
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