Agreement Number DE-GI-01-84NE34109

AGREEMENT BETWEEN THE JAPANESE PARTICIPANTS AND THE UNITED STATES DEPARTMENT OF ENERGY FOR JAPANESE PARTICIPATION IN THE THREE MILE ISLAND UNIT 2 RESEARCH AND DEVELOPMENT ACTIVITIES

This Agreement is made between the Japanese participants (the names of the participants are as listed at the end of this Agreement and the participants are hereinafter collectively called "the JAPANESE PARTIES") and the United States of America represented by the U.S. Department of Energy (DOE) for a program of participation by the JAPANESE PARTIES in the DOE Research and Development (R&D) program relating to the Three Mile Island Unit 2 (TMI-2) reactor plant as well as in the GPU Nuclear Corporation (GPUNC) R&D activities which comprise a part of the TMI-2 Program.

Whereas, DOE is conducting a R&D program relating to the damaged TMI-2 reactor plant;

and

Whereas GPUNC is conducting other R&D activities incident to its TMI-2 Program;

and

Whereas the JAPANESE PARTIES and DOE duly recognize that it will serve the mutual benefits of the parties hereto for the JAPANESE PARTIES to participate in various R&D programs and activities conducted by DOE and GPUNC as part of the R&D program and activities in connection with the TMI-2 reactor plant, such as comprehension of the impact of the accident on reactor plant facilities, evaluation and investigation of emergency countermeasures and reactor behavior, and development of industrial technologies with respect

to radioactive decontamination and waste treatment, to acquire information therefrom, and to utilize the results thus obtained for furthering the nuclear power development and the safe and stable operation of nuclear power plants in Japan;

and

Whereas, the JAPANESE PARTIES, in return for participation in this program and these activities, and acquisition of information, will make compensation in payments to DOE;

Now, therefore, the parties, on the basis of equality, equity and reciprocity, hereby agree as follows:

ARTICLE I SCOPE OF ACTIVITIES

A. DOE is presently conducting a R&D program relative to the technical implications of the TMI-2 accident. This program, which DOE expects will be carried out during the next five years, includes substantial data acquisition, development activities and related engineering tasks pertaining to such matters as the plant radiation and environment, electrical equipment and instrumentation survivability, reactor and core examination and defueling, and the handling and disposition of abnormal radioactive waste. The DOE R&D program is being conducted at the TMI site and in DOE laboratories and contractor facilities. An outline of the DOE R&D program is contained in Attachment A.

B. GPUNC is presently engaged in its own R&D activities incident to the overall TMI-2 Program. These R&D activities, which GPUNC expects will be completed over the next five years, include substantial data acquisition, systems and equipment development, and related engineering tasks pertaining to the TMI-2 facilities, systems, plant components and equipment, fuel, nuclear safety, nuclear waste management, and other technical aspects, that are needed to facilitate plant recovery from the accident. An outline of GPUNC R&D activities that include tasks having substantial R&D value is contained in Attachment B. Some of these activities are partially funded by DOE (and are also encompassed by Attachment A).

C. For the purpose of this Agreement, the DOE R&D program as described in paragraph A. above shall hereinafter be called the "DOE R&D program," and GPUNC R&D activities as described in paragraph B. above shall hereinafter be called the "GPUNC R&D activities," and both the DOE R&D program and GPUNC R&D activities shall hereinafter be collectively called "R&D work."

ARTICLE II PARTICIPATION BY THE JAPANESE PARTIES

The JAPANESE PARTIES and DOE agree that this Agreement is a cooperative agreement and not a procurement contract, and only the terms and conditions included in this Agreement will apply.

A. The JAPANESE PARTIES shall be entitled to participate in the DOE R&D program referred to in paragraph A. of Article I, and in the GPUNC R&D activities referred to in paragraph B. of Article I, in the following forms:

1. Assignment of technical personnel

a. The JAPANESE PARTIES may assign engineers employed by the JAPANESE PARTIES or engineers designated by the JAPANESE PARTIES in the manner described in item b. below, and have them, at the site, acquire technical information and knowledge, and/or learn through participation in the R&D work during the period of performance provided for in Article IV.

b. In regard to the DOE R&D program, the JAPANESE PARTIES may assign as many as:

(1) 2 engineers to work in the Technical Integration Office operated for DOE by its contractor, EG&G Idaho, Inc. at the TMI site; and

(2) 7 engineers to work at the DOE Idaho National Engineering Laboratory (INEL), operated for DOE by EG&G Idaho, Inc.

(3) 4 engineers to other DOE laboratories or contractors as may be mutually agreed by the parties to be appropriate as the DOE R&D program progresses.

The details of such assignments may be mutually agreed upon in writing without the need for any amendment to this Agreement.

c. In regard to the GPUNC R&D activities, the JAPANESE PARTIES may assign as many as 9 engineers to the TMI site, provided however, that if DOE and the JAPANESE PARTIES cannot agree on appropriate sites for 4 engineers as set forth in item b.(3) above, the JAPANESE PARTIES may assign, instead, those engineers to the TMI site for GPUNC R&D activities in addition to 9 engineers set forth here above.

d. The respective total numbers of personnel mentioned above refer to the total numbers of individuals who may actually be assigned and participate at any time over the period of this Agreement.

e. Each assigned individual shall be mutually agreed to by DOE and the JAPANESE PARTIES for DOE R&D program assignments, and by GPUNC and the JAPANESE PARTIES for GPUNC R&D activities assignments, as suitable for the nature of the tasks involved. Except as the pertinent parties may otherwise agree in specific instances, such individual assignments shall be for at least one year duration.

f. The JAPANESE PARTIES and DOE or GPUNC, and the JAPANESE PARTIES and a pertinent DOE contractor, as the case may be, shall enter into personnel assignment agreements (in a form satisfactory to both parties) with respect to all assignments of personnel. Such agreements shall set forth all other details respecting the assignments, which details shall be consistent with the provisions of this Agreement.

g. Although the personnel assigned shall not become employees of DOE, its contractors, or GPUNC, the organization to which each individual is assigned shall exercise administrative and technical supervision and control of the occupational activities of each assignee during the period of the assignment. In general, assigned personnel shall follow the normal work practices and routine, and may perform assigned work as if they were technical staff members of the organizations to which they are assigned. Yet in this respect, it is understood that assigned personnel will engage solely in support of the R&D work. They shall conform to the general rules of work and safety requirements in effect at the particular organization and work sites. In the event, however,

that such rules and requirements differ from the safety standards adopted by assigning companies, the stricter standards of the assigning companies shall apply. If adherence to such stricter standards would cause problems at the work site, the assigned personnel shall be relieved of such assignment. Assigned personnel will be afforded reasonable time to make periodic reports to the JAPANESE PARTIES, and to represent the JAPANESE PARTIES in making recommendations and participating in technical reviews and evaluations as provided for below.

h. In the event that the personnel assigned by the JAPANESE PARTIES become constantly engaged in work involving radiation exposure, or in the event that they are required to enter a controlled area, the receiving party shall have a physical examination carried out periodically, at the time the personnel are stationed in the facility, and every six months (or every 3 months for items (4) and (5) below) thereafter for the following items:

(1) Investigation of past records of radiation exposure (for individuals with past records of radiation exposure, items related to place of work, kinds of work and their duration, accumulated radiation exposure dosage and radiation injury, and other items related to radiation exposure will be investigated).

(2) Examination of the number of white blood corpuscles, and its percentage in the total composition of white blood corpuscles.

(3) Examination of the number of red blood corpuscles, and hemoglobin content or specific gravity of whole blood.

(4) Examination of the eye related to the cataract.

(5) Examination of the skin.

In the event the physician determines that the examination of the eye designated in item (4) is unnecessary, the examination may be omitted. The costs related to such physical examination will be borne by the receiving party.

i. Each of the assigned personnel shall remain an employee of the company or governmental agency from which assigned, and such company or agency shall continue to be responsible for the salaries, insurance, allowances, and all other expenses of assigned personnel except travel costs and subsistence expenses pertaining to travel in furtherance of the assignment that is approved by the organization to which assigned; such costs and expenses shall be paid by and shall accord with the general policy of said organization.

j. It is understood that this provision shall be subject to and in accordance with the laws of the country on whose territory damages will have been incurred.

(1) The JAPANESE PARTIES and DOE or GPUNC shall respectively be responsible for any injury or damage to the person or property of its own personnel and facilities that may occur in the course of implementation of this Agreement and shall hold the opposite party harmless therefrom, provided, however, that this shall not apply when the occurrence thereof has been caused by the intentional misconduct or the gross negligence on the part of the opposite party.

(2) The JAPANESE PARTIES shall not be responsible for any injury or damage to or loss of the person or property of any third party that may occur in the performance of work under this Agreement, and DOE and GPUNC shall hold the JAPANESE PARTIES harmless therefrom, provided, however, that this shall not apply when the occurrence thereof has been caused by the intentional misconduct or the gross negligence on the part of the JAPANESE PARTIES. The payment to be made by the JAPANESE PARTIES to DOE under Article III A. shall be used as necessary to provide third party liability insurance for activities by the JAPANESE PARTIES at GPUNC, and DOE sites to the extent practicable.

k. The provisions of the Price-Anderson Act shall apply for the benefit of the JAPANESE PARTIES as well as the Japanese assigned personnel. To the extent that the JAPANESE PARTIES are fully protected against any liability arising out of a nuclear incident by reason of the provisions of the Price-Anderson Act, the provisions of such Act shall govern in respect of such liability in lieu of paragraph j.

l. DOE, its contractors and GPUNC, to whom personnel are assigned, will respectively render administrative assistance in arranging for accommodations for assigned personnel and their families and in connection with their travel to assigned locations, and their acquisition of visas as indicated in the personnel assignment agreements.

2. Sharing of information

Comprehensive information and data directly acquired from the R&D work will be provided to the JAPANESE PARTIES on a routine, timely basis in accordance with this Agreement.

If the DOE or GPUNC organization manager deems it necessary, he may establish for the assigned personnel a certain period of non-disclosure to any third party with respect to the following types of information.

Technical progress reports

Program schedules

Significant data, examination and evaluation reports

Engineering studies for major recovery operations

Program planning reports

Specifications for principal equipment and tooling development

R&D topical reports

GEND reports (both informal and formal)

Core Examination Plan, and associated examination procedures

Other specific technical documents, as mutually agreed

3. Participation in technical reviews and evaluations

Such of the assigned personnel as the JAPANESE PARTIES shall designate for the purpose will be provided reasonable opportunity for appropriate participation in periodic and significant technical reviews of the R&D work. Such designated personnel will also be provided reasonable opportunity for appropriate participation in technical

evaluation group meetings under DOE or GPUNC cognizance. The number and types of personnel to participate in such reviews and evaluations shall be subject to mutual agreement by the JAPANESE PARTIES and DOE or GPUNC, as pertinent.

4. Opportunity for recommendations by the JAPANESE PARTIES

The JAPANESE PARTIES shall be provided reasonable opportunity, through assigned personnel, to make appropriate recommendations to DOE and GPUNC regarding the examination or testing of plant components, instrumentation, electrical equipment, reactor internals and core, or radioactive waste, that are within the scope of planned or ongoing R&D work. It is understood that the JAPANESE PARTIES shall not be reimbursed for any of its recommendations that are adopted or utilized by DOE, its contractors, or GPUNC.

5. Independent examination or testing

Should the JAPANESE PARTIES wish to perform independent examination or testing of specific subcomponents, materials or radioactive waste samples, DOE or GPUNC, as pertinent, shall endeavor, on a case-by-case basis, to agree with the JAPANESE PARTIES on the provision of a reasonable number of sample items for such purpose. The provision, shipment, examination, and testing of such items shall be subject to the requirements of any applicable laws or regulations of the United States or other governmental entities; the JAPANESE PARTIES shall be obliged to procure all necessary permits or licenses, including any nuclear material licenses. In this connection, DOE or GPUNC, as pertinent, shall extend necessary cooperation in the procurement of such permits or licenses from the United States governmental

entities. All costs for the packaging, shipment and examination or testing of such items shall be borne by the JAPANESE PARTIES. The results of such independent analyses, including any reports or technical papers, will be supplied to DOE and GPUNC on a timely basis.

B. Joint Review Committee

1. A Joint Review Committee shall be established and maintained during the period of this Agreement to periodically review the status of the JAPANESE PARTIES participation and to recommend any reasonable adjustments to the assignment of personnel or changes to the methods or extent of information and data-transfer, or other pertinent areas of participation that may be desirable to improve the value and effectiveness of the JAPANESE PARTIES participation. The JAPANESE PARTIES shall be entitled to express, whenever they see fit, at this Committee any comments with respect to the establishment of the plans for the program activities to be conducted in the successive year under the R&D work set forth in Article I, and also to review the annual report set forth in Article VII.

This Committee shall be composed of senior representatives of the JAPANESE PARTIES, DOE, and GPUNC to be designated by the respective parties at the time this Agreement is signed. The Committee shall meet annually, or more often as mutually agreed, at the TMI site or other locations if appropriate.

2. The final decision on allocation of the funds provided by the JAPANESE PARTIES shall be made on an annual basis by mutual agreement of the JAPANESE PARTIES, DOE, and GPUNC through the Joint Review Committee. The decision on whether particular activities shall be considered to be "substantially funded" by the JAPANESE PARTIES as described in Article V D. shall also be made by mutual agreement of the JAPANESE PARTIES, DOE and GPUNC through the Joint Review Committee, simultaneously with the said final decision on allocation of the funds provided by the JAPANESE PARTIES. It is specifically confirmed that DOE and GPUNC shall make every effort to apply the Japanese funds to the most meaningful R&D work, such as the fields of data acquisition, waste immobilization, nuclear reactor core examination, and nuclear reactor evaluation.

ARTICLE III PAYMENTS BY THE JAPANESE PARTIES

A. The JAPANESE PARTIES shall, in consideration of their participation in the R&D work under this Agreement, their acquisition of technical information therefrom and related benefits, pay DOE the sum of three million U.S. dollars (U.S. $3,000,000.00) in May 1984 after receipt of payment instructions from DOE. Prior to this initial payment, DOE shall provide detailed information on the R&D technical results and progress for the past years. Payments thereafter will be made promptly after receipt of the annual report of each year as provided for in Article VII in this Agreement for the next five years. The six equal payments, totalling eighteen million U.S. dollars (U.S. $18,000,000.00) shall be made in U.S. dollars. Payments made by the JAPANESE PARTIES hereunder shall not be applied to work other than the R&D work hereunder.

B. Should the period of performance under this Agreement be terminated by DOE or the JAPANESE PARTIES pursuant to Article IV B., D. or E., the JAPANESE PARTIES or DOE shall promptly notify the other party accordingly, and the JAPANESE PARTIES shall be released of their obligation to make any further annual payments due pursuant to paragraph A. above. The JAPANESE PARTIES, DOE and GPUNC will not be liable for any termination costs incurred by the other parties as a result of termination of this Agreement.

C. Even if the budget for the R&D program by DOE increases substantially from the original estimate, the JAPANESE PARTIES shall not bear any additional burdens, while the rights of the JAPANESE PARTIES hereunder shall remain unchanged.

ARTICLE IV PERIOD OF PERFORMANCE

A. The period of performance under this Agreement shall end on May 31, 1989. The JAPANESE PARTIES shall be jointly and severally responsible for performance of payment obligations as provided for in Article III A. in this Agreement.

B. DOE or the JAPANESE PARTIES reserve the right to terminate the period of performance at an earlier date in the event either party finds that GPUNC has ceased its R&D activities or DOE does not have available sufficient appropriated funds to enable DOE's continued conduct of the R&D program that is the subject of this Agreement.

C. At the end of the period of performance specified in paragraph A. above, the JAPANESE PARTIES will continue to be provided the information referred to in paragraph A.2 of Article II without any additional payment in the event DOE continues its R&D program and/or GPUNC continues its R&D activities described in paragraphs A. and B. of Article I.

D. The JAPANESE PARTIES reserve the right to terminate this Agreement by giving to DOE ninety (90) days prior notice in the event that the acquiring of information or the dispatch of personnel as contemplated under this Agreement cannot be carried out due to circumstances in the United States, including but not limited to the Nuclear Regulatory Commission or other United States governmental agencies not giving necessary licenses, permits or clearances.

E. Both parties reserve the right to terminate this Agreement with ninety (90) days prior notice:

1. In the event that a substantial portion of the R&D work provided for in Attachments A and B cannot be performed.
2. In the event that the performance of any of the provisions provided for in this Agreement becomes substantially unenforceable by reason of law or regulation.
3. In the event that either party is in breach of its obligations under this Agreement.

F. The DOE and GPUNC will make every effort to maintain the schedule as described in Attachments A and B, as of the date of the signing of this Agreement. However, if the DOE and GPUNC are unable to maintain the above mentioned schedule, this Agreement shall be extended as mutually agreed consistent with the period of delay. Any such extension shall be under the same terms and conditions as are presently included in this Agreement, including the assignment of personnel and patent and information rights, except that no additional payment by the JAPANESE PARTIES beyond the total financial participation agreed to in Article III will be required.

ARTICLE V PATENTS AND INFORMATION

A. 1. Non-proprietary information shall be provided to the JAPANESE PARTIES by DOE and by GPUNC pursuant to paragraph A.2 of Article II, and non-proprietary information first produced by personnel assigned to DOE, its contractor organizations and GPUNC shall be provided to DOE by the JAPANESE PARTIES. Details for such provision shall be set forth in each personnel assignment agreement. DOE, GPUNC and the JAPANESE PARTIES shall have the right to use, duplicate, or disclose such non-proprietary information in whole or in part, in any manner and for any purpose whatsoever, and to permit others to do so.

2. DOE, GPUNC, and the JAPANESE PARTIES shall provide the other parties with proprietary information under their control which is owned by each party under or directly related to the Agreement. DOE, GPUNC and the JAPANESE PARTIES shall have the right to use or duplicate such proprietary information in whole or in part, in any manner and for any purpose whatsoever, and to permit others to do so.

3. With regard to proprietary information of third parties, neither DOE, GPUNC, nor the JAPANESE PARTIES shall be entitled to such information without the written consent of the owner. Any such proprietary information which bears a restrictive designation shall be respected by the receiving party.

4. For the purpose of this Agreement "proprietary information" shall mean industrial property of a proprietary nature including trade secrets, inventions, patent information and know-how, which is owned or acquired by DOE, GPUNC, or the JAPANESE PARTIES, during, prior to or outside the course of these activities, and which bears a restrictive designation. Such property is defined as -

a. of a type customarily held in confidence by commercial firms;

b. not generally known or publicly available from other sources;

c. not having been made available previously by the transmitting party to others without an agreement concerning its confidentiality; and

d. not already in the possession of the receiving party or its contractors.

5. Copyrights of either DOE or the JAPANESE PARTIES or of cooperating organizations and persons shall be accorded treatment consistent with internationally recognized standards of protection. As to copyrights of material owned or controlled by DOE or GPUNC, DOE or GPUNC shall make efforts to grant to the JAPANESE PARTIES a license to reproduce copyrighted material.

6. The application or use of any non-proprietary information and proprietary information provided or transferred under this Agreement shall be the responsibility of the party receiving it, and the transmitting party does not warrant the suitability, completeness, or accuracy of such non-proprietary and proprietary information for any particular use or application.

7. With regard to Japanese personnel assigned, procedures for release of information to the public under this Agreement shall be the same as provided for DOE, its contractor organizations and GPUNC.

B. Non-proprietary and proprietary information and patent rights of both parties shall be subject to the export control laws of both the United States and Japan. Each party shall notify each other of the countries as to which restrictions apply by the effective date of this Agreement. Any changes to the list of restricted countries shall be reported promptly to the other party.

C. With respect to any invention conceived or first actually reduced to practice in the course of or under this Agreement by personnel assigned by the JAPANESE PARTIES pursuant to paragraph A.1 of Article II or from activities funded by the JAPANESE PARTIES under this Agreement:

1. The JAPANESE PARTIES shall acquire all rights, title, and interest in and to any such invention in Japan, except where rights are retained by GPUNC contractors under pre-existing contracts, subject to a nonexclusive, irrevocable, royalty-free license with the right to grant sublicenses, to DOE, its Government, and its nationals designated by it. The JAPANESE PARTIES agree that they will not transfer rights, title or interest to third parties in a way which would affect the license rights described in the previous sentence.

2. DOE shall acquire all rights, title, and interest in and to any such invention in the United States and third countries, except where rights are retained by GPUNC contractors under pre-existing contracts, subject to a nonexclusive, irrevocable, royalty-free license with the right to grant sublicenses, to the JAPANESE PARTIES, its Government, and its nationals designated by it. DOE agrees that it will not transfer rights, title or interest to third parties in a way which would affect the license rights described in the previous sentence.

3. DOE and GPUNC shall make a diligent search as to whether there are any pre-existing contracts which would adversely affect the rights of the JAPANESE PARTIES hereunder. If such pre-existing contracts exist, the JAPANESE PARTIES shall be promptly notified of such fact, and DOE and GPUNC shall make every effort to re-negotiate the contracts to obtain licence rights to use inventions for the benefit of the JAPANESE PARTIES.

D. With respect to any patents resulting from the R&D work substantially funded by the JAPANESE PARTIES, except where rights have previously been waived by DOE or retained by contractors under United States law or under pre-existing GPUNC contracts, DOE or GPUNC shall grant a non-exclusive, irrevocable, royalty-free license in Japan and third countries to the JAPANESE PARTIES, its Government, and its nationals designated by it. DOE agrees that it will not transfer rights, title or interest to third parties in a way which would affect the license rights described in the previous sentence. Paragraph C.3 of this Article shall apply mutatis mutandis to this paragraph D.

E. In addition to the rights, title, interest or license that shall be acquired by or given to the JAPANESE PARTIES pursuant to paragraphs C. and D. above:

1. The JAPANESE PARTIES shall have the right to receive a non-exclusive license subject to royalty payments, for use in Japan under the best available conditions, for all patents resulting from the R&D work for which DOE or GPUNC has title and the right to transfer such license.
2. The JAPANESE PARTIES shall have the right to apply for a non-exclusive license, subject to royalty payments, for use in third countries and the United States, under normal conditions, for all patents resulting from the R&D work for which DOE or GPUNC has title and the right to transfer such license. Due consideration shall be given the participation and assistance of the JAPANESE PARTIES in the R&D work.

F. DOE, DOE contractor organizations, GPUNC, and the JAPANESE PARTIES shall maintain active and effective procedures to ensure that inventions are promptly identified and timely reported. Details of such procedures for the JAPANESE PARTIES shall be set forth in each personnel assignment agreement.

G. Paragraphs C., D. and E. of this Article shall apply mutatis mutandis to design protection.

H. The JAPANESE PARTIES and DOE shall each assume the responsibility to pay awards or compensation required to be paid to its own nationals according to its own laws. In view of the provisions of Article 35 of the Japanese Patents Act of April 13, 1959, the JAPANESE PARTIES shall, prior to the assignment of any personnel to such DOE contractor organizations or GPUNC as both parties agree upon, secure from the Japanese employer of such personnel, a commitment that the employer agrees to hold the Government of the United States of America and its contractors harmless with respect to any claim of the employee for compensation under Article 35 of the Japanese Patent Act with respect to any inventions within the scope of this Article.

I. With regard to inventions arising out of independent examination or testing made by the JAPANESE PARTIES as set forth in paragraph A.5 of Article II, the JAPANESE PARTIES shall acquire all rights, title and interest in and to any such inventions in Japan and in third countries subject to a non-exclusive, irrevocable royalty-free license with the right to sublicense to DOE, its Government, and its nationals designated

by it. DOE shall acquire all rights, title and interest in the United States, subject to a non-exclusive irrevocable, royalty-free license with the right to sublicense to the JAPANESE PARTIES, its Government, and its nationals designated by it. Both parties agree that neither party will transfer rights, title or interest to third parties in a way which would affect the other party's license.

J. Unless otherwise expressly agreed upon by the parties hereto, all the license rights granted under this Article V shall survive the expiration or termination of this Agreement.

ARTICLE VI DISPUTES

Any dispute between DOE and the JAPANESE PARTIES concerning the application or interpretation of this Agreement shall be settled by the parties by mutual agreement.

ARTICLE VII ANNUAL REPORT

DOE shall submit to the JAPANESE PARTIES an annual report of the status of the DOE R&D program and the GPUNC activities at each anniversary of the effective date of this Agreement.

ARTICLE VIII OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

ARTICLE IX COVENANT AGAINST CONTINGENT FEES

The parties to this Agreement warrant that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by any of the parties for the purpose of securing business. For breach or violation of this warranty, either of the other parties shall have the right to annul this Agreement without liability, or in its discretion to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

ARTICLE X SUPERVISION AND CONTROL

A. The parties hereto acknowledge that prior to this Agreement becoming effective, DOE and GPUNC shall enter into a companion contract that is consistent with the provisions of this Agreement.

B. DOE shall, with respect to any and all such obligations as are provided herein to be performed by GPUNC for the interest of the JAPANESE PARTIES, cause GPUNC to fully perform the same pursuant to the said obligations.

C. In the event that DOE shall cause any of its contractors to perform a part of DOE's obligations hereunder, DOE shall fully control and supervise such contractors so as to in no way injure or diminish any of the rights and interests to which the JAPANESE PARTIES are entitled hereunder.

ARTICLE XI NOTICE AND CONTACT

All notices or contacts to be made in the course of performing this Agreement shall be made in writing in English and be submitted to the following address by registered air mail or by telex or telefax, to be subsequently confirmed by registered air mail.

TO DOE:

Contracting Officer (Thomas S. Keefe), MA-453.1
Office of Procurement Operations
U.S. Department of Energy
Washington, D.C. 20585
Telex No. 7108280475

TO THE JAPANESE PARTIES:

Secretary (Yousuke Ojiri)
Japanese Committee on Japan-U.S.
WR Research and Development
Kogyo Building 9F
43, Kanda Higashi Matsushita cho,
Chiyoda-ku
Tokyo 101, Japan
Telefax No. 3-258-0082

All notices or contacts to and from the above-mentioned Secretary of the Japanese Committee shall be conclusively deemed to be simultaneously communicated to and from all the JAPANESE PARTIES.

Either party shall promptly notify the other party of any change of its address in the manner set forth above.

ARTICLE XII COMPARABLE AGREEMENTS WITH OTHER COUNTRIES

In the event DOE enters into a comparable agreement for TMI-2 Research and Development with other countries on more favorable terms, DOE shall give the JAPANESE PARTIES a prompt notice of such fact, and this Agreement shall then be modified to provide the JAPANESE PARTIES with comparable terms in relevant areas.

ARTICLE XIII EFFECTIVENESS OF AGREEMENT

This Agreement shall become effective upon 1) the approval hereof by the Japanese Government under the Foreign Exchange and Foreign Trade Control Law; and 2) the review and written consent by the JAPANESE PARTIES to the personnel assignment agreement format.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in the English and Japanese languages, each equally authentic, this 16th day of April, 1984.

FOR THE JAPANESE PARTIES

The Hokkaido Electric Power Co., Inc.

NAME: Tomoo Nakano

TITLE: President

DATE: MAR. 14. 1984

Tohoku Electric Power Co., Inc.

NAME: Toshio Tamakawa

TITLE: President

DATE: MAR. 14. 1984

The Tokyo Electric Power Co., Inc.

NAME: Gaishi Hiraiwa

TITLE: President

DATE: MAR. 14. 1984

FOR THE UNITED STATES DEPARTMENT OF ENERGY

NAME: Shelby T. Brewer

TITLE: Assistant Secretary for Nuclear Energy

DATE: April 16, 1984

NAME: Thomas S. Keefe

TITLE: Contracting Officer

DATE: April 16, 1984

Chubu Electric Power Co., Inc.

Seiichi Tanaka

NAME: Seiichi Tanaka

TITLE: President

DATE: MAR. 14. 1984

The Hokuriku Electric Power Co., Inc.

Yoshio Morimoto

NAME: Yoshio Morimoto

TITLE: President

DATE: MAR. 14. 1984

The Kansai Electric Power Co., Inc.

Shoichiro Kobayashi

NAME: Shoichiro Kobayashi

TITLE: President

DATE: MAR. 14. 1984

The Chugoku Electric Power Co., Inc.

Kenichiro Matsutani

NAME: Kenichiro Matsutani

TITLE: President

DATE: MAR. 14. 1984

The Shikoku Electric Power Co., Inc.

S. Hirai

NAME: Shigeji Hirai

TITLE: President

DATE: MAR. 14. 1984

The Kyushu Electric Power Co., Inc.

T. Kawai

NAME: Tatsuo Kawai

TITLE: President

DATE: MAR. 14. 1984

The Japan Atomic Power Company

Minoru Okabe

NAME: Minoru Okabe

TITLE: President

DATE: MAR. 14. 1984

Toshiba Corporation

S. Saba

NAME: Shoichi Saba

TITLE: President and Chief Executive Officer

DATE: MAR. 14. 1984

Hitachi, Ltd.

K. Mita

NAME: Katsushige Mita

TITLE: President

DATE: MAR. 14. 1984

Mitsubishi Heavy Industries, Ltd.

S. Suenaga

NAME: Soichiro Suenaga

TITLE: President

DATE: MAR. 14. 1984

JGC Corporation

NAME: Haruo Shinoda

TITLE: President

DATE: MAR. 14. 1984

Toyo Engineering Corporation

NAME: Masao Sakurai

TITLE: President

DATE: MAR. 14. 1984

Nuclear Power Engineering Test Center

NAME: Takashi Fujii

TITLE: President

DATE: MAR. 14. 1984

Japan Atomic Energy Research Institute

NAME: Tsuneo Fujinami

TITLE: President

DATE: MAR. 14. 1984

Attested by

The Federation of Electric Power Companies

NAME: Tadao Ohgaki
TITLE: Vice Chairman

The United States Department of Energy

NAME: Franklin E. Coffman
TITLE: Director
Office of Terminal Waste Disposal and Remedial Action
Office of Nuclear Energy

Japanese Committee on Japan - U.S. WR Research and Development

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Attachment A

DOE TMI-2 R&D PROGRAM OUTLINE

The following outlines the tasks comprising the DOE TMI-2 R&D program. This information is current as of the date of the signing of this Agreement, and subject to change as the program progresses.

DATA ACQUISITION PROGRAM

1. Examination, testing and evaluation of plant instrumentation, electrical components, and electrical cable, connectors and penetrations. Examinations are conducted both in-situ and following removal from the Reactor Containment Building. In addition to its use to improve component standards and qualification and installation requirements, this information is of substantial benefit in conducting the Recovery Program.

2. Conduct Mass Balance-Source Term program that includes developing an overall radionuclide mass balance to provide the data to re-evaluate the source term, Probabilistic Risk Assessment Consequence calculations, emergency planning requirements, and plant siting policy.

3. Development and demonstration of decontamination techniques and equipment for the Reactor Containment Building.

4. Measurement and assessment of damage, and the chemical and radiological characterization of the structures, systems and environment within the Reactor Containment Building. This information is used for accident analysis and evaluations that should significantly affect future regulatory requirements, and the safety related systems, features and procedures to meet these requirements. This information also is valuable in improving the plant working environment and decontamination activities.

5. Provide and operate a mobile radiochemical laboratory at the TMI site to facilitate the analyses of coolant and material samples.

CORE ACTIVITIES PROGRAM

1. Modification of DOE facilities in Idaho as necessary to receive and safely store the core, and remove items for examination.

2. Development of equipment and instrumentation needed for examination of the core and other reactor internal samples that are accomplished at DOE facilities in Idaho.

3. Development of techniques and equipment required for in-place data and sample acquisition from the reactor internals and core, and analyses of these samples.

4. Comprehensive examination of the core and other reactor internal components. This work will be done mainly after the core has been shipped from the TMI site.

5. Evaluation of TMI-2 core handling and storage requirements at DOE facilities in Idaho, such as the effects on "wet storage" (fuel canisters containing a large amount of water).

REACTOR EVALUATION PROGRAM

1. Reactor internal examinations and data acquisition prior to and following reactor head removal, to meet DOE Core Activities/Data Acquisition Program objectives, and to provide essential information to plan and conduct reactor head and plenum removal, and defueling. These tasks include:

   - Internal visual examinations and radiation level measurements
   - Examination of control rod mechanism lead screws that were removed
   - Analyses of reactor coolant water samples
   - Development and use of core debris grab samplers and core topography system

2. Support of the R&D portions of the tasks required for reactor head removal and for reactor plenum removal, including:

   - Study of requirements and alternatives
   - Special preparations on the reactor vessel
   - Fuel transfer canal water flooding preparations and cleaning system
   - Head lift and storage provisions
   - Parts of plenum removal engineering and operations
   - Special plenum removal tooling
   - Fuel transfer system modifications
   - Fuel pool A (AFH Building) refurbishment for interim fuel storage.

3. Support of appropriate portions of concept development, engineering, and special tooling and equipment development for reactor defueling, fuel transfer and interim fuel storage.

4. Planning and preparations for shipment of the damaged core to DOE facilities in Idaho for R&D.

5. Provision of a defueling test assembly that will be used to study and demonstrate reactor disassembly/defueling procedures and techniques.

WASTE IMMOBILIZATION PROGRAM

1. Analyses of EPICOR-II liners to establish handling, shipping and disposal requirements. Development of gas sampler to sample, vent and purge these liners for safe shipment.

2. Studies of zeolite resin mixtures required for optimum performance of SDS liners. Development of a catalyst recombiner, vacuum drying system to resolve a radiolytic gas problem encountered with these liners.

3. Shipment of EPICOR-II and SDS liners to DOE facilities for interim storage and ultimate disposal.

4. Measurements and analyses of the plant reactor coolant purification system demineralizer resin to establish removal and disposal requirements. Development of a sluicing method for resin removal.

5. Development, test and demonstration of a high integrity container for EPICOR-II liner disposal.

6. Research on EPICOR-II liners, including demonstration of resin immobilization techniques, measurement of resin degradation with time, and liner integrity studies.

7. Development and demonstration of SDS liner immobilization by a vitrification process.

8. Development of methods for removal and disposal for other abnormal radioactive wastes.

DOE R&D PROGRAM

PROJECTED FUNDING ALLOCATION

	THRU FY '83	FY '84	TO COMPLETION	TOTAL
DATA ACQUISITION	25.9	7.1	10	43
CORE ACTIVITIES	4.2	5.8	14	24
WASTE IMMOBILIZATION	15.2	3.8	2	21
REACTOR EVALUATION	26.3	20.3	24.4	71
TOTAL	71.6	37.0	50.4	159

(FISCAL YEAR - OCTOBER 1 TO SEPTEMBER 30)

NOTE:

Approximately one-half of the total DOE R&D Program funding, amounting to about $80 million, pays for tasks included in the GPUNC TMI-2 Program as shown in Attachment B.

Attachment B

GPUNC TMI-2 PROGRAM R&D ACTIVITIES

The following outlines the GPUNC TMI-2 Program R&D activities that have been arranged under the same three categories (Data Acquisition, Waste Immobilization and Reactor Evaluation) as the DOE program to simplify a comparison. This information is current as of the date of the signing of this Agreement, and subject to change as the program progresses.

DATA ACQUISITION PROGRAM

1. Characterization of Reactor Building etc. (Reactor Containment Building (RCB), Auxiliary/Fuel Handling Building (AFHB), Core Cooling System, other systems and equipments in RCB and AFHB) with respect to radiological conditions, surface contamination, physical conditions etc.

   - Development and refinement of data acquisition technique.

   - Development and refinement of analytical models useful in a complex environment with multiple radiation sources.

2. Identification of measures to improve working conditions and to maintain personnel radiation exposure as low as reasonably achievable (ALARA) based on the analytical model and other information.

3. Development and evaluation of full-scale applicability of decontamination technique for buildings and systems.

4. Development of methods and equipments for personnel protection in high radiation area.

WASTE IMMOBILIZATION PROGRAM

1. Development of technique and systems for liquid waste processing (EPICOR II, SDS).

2. Development of systems for safe interim storage of waste products on-site, and ultimate safe transportation and disposal.

3. Selection and development of means to deal with liquid waste to be produced during decontamination.

4. Development of means and equipments to identify and characterize abnormal waste.

5. Development of waste packaging/solidification systems.

REACTOR EVALUATION PROGRAM

1. Underhead characterization

   - Development of video examination systems and sampling systems etc.

   - Development of analysis equipments.

   - Analysis and evaluation of obtained samples.

2. Criticality and other safety analyses.

3. Development of technique for defueling and reactor disassembly.

   - Development and evaluation of applicability of specialized equipments such as underwater manipulator and cutting equipment, and identification of the optimum procedure.

4. Development of fuel/waste canisters.

5. Development of equipments and methods for fuel shipment and storage.

GPUNC TMI-2 PROGRAM

PROJECTED FUNDING ALLOCATION
(expressed in $ millions)

	THRU CY '83		CY '84		TO COMPLETION		TOTAL	
DATA ACQUISITION	20	(48.9)	3	(7.2)	78	(195.8)	101	(251.9)
WASTE IMMOBILIZATION	33	(95.3)	5	(13.1)	26	(74.9)	64	(183.3)
REACTOR EVALUATION	27	(53.5)	21	(41.6)	61	(122.4)	109	(217.5)
SUBTOTAL	80	(197.7)	29	(61.9)	165	(393.1)	274	(652.7)
Other Support Activities, Facilities	0	(218.3)	0	(15.7)	0	(88.0)	0	(322.0)
TOTAL	80	(416)	29	(77.6)	165	(481.1)	274	(974.7)

(CY - CALENDAR YEAR - JANUARY 1 THROUGH DECEMBER 31)

Notes:

1. The above values in parentheses are total cost estimates for TMI-2 activities arranged under the three categories listed. The preliminary estimates of the R&D part of these total costs are underlined. These R&D values, estimated by DOE, will be more accurately determined on a task by task basis as the specific tasks are defined.

2. The total GPUNC TMI-2 Program funding includes approximately $80 million from the DOE R&D Program.