



RELEASED TO THE PDR  
6-9-94  
date initials

May 20, 1994

**POLICY ISSUE**

SECY-94-138

**(Information)**

**FOR:** The Commissioners  
**FROM:** James M. Taylor  
Executive Director for Operations  
**SUBJECT:** CONFIRMATORY HIGH PRESSURE INTEGRAL SYSTEM TESTING OF THE WESTINGHOUSE AP600 SAFETY SYSTEMS

PURPOSE:

1. To inform the Commission of the status of ROSA/AP600 confirmatory testing.
2. Following the SRM dated August 11, 1992, to inform the Commission that the total cost of Phase I testing in the ROSA/AP600 test facility is now projected to exceed \$10M.
3. Following the SRM dated September 16, 1992, to provide the Commission with: (1) the final contract for the ROSA/AP600 facility modifications; (2) resolution of the intellectual property issue; (3) resolution of protection of proprietary information; and (4) information on the program test matrix and instrumentation.
4. To inform the Commission of the staff's plans to perform a Phase II testing program in the ROSA/AP600 test facility.

SUMMARY:

The staff is proceeding to perform an AP600 confirmatory testing program in the ROSA facility. Modifications to the ROSA facility to simulate the AP600 safety systems have been completed. A series of facility shakedown and characterization testing were performed. The first matrix test was completed on April 14, 1994.

The total cost of the ROSA/AP600 (Phase I) is estimated to be \$10.5M. This is an increase of \$0.7M from the staff's estimate provided in SECY-92-219. The cost increase resulted from: (1) appreciation of the Japanese yen with respect

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to the dollar; (2) the addition of a Japanese national consumption tax of 3%; (3) recent AP600 design changes that had to be accommodated with additional facility modifications; and (4) additional structural analysis and strengthening of the In-Containment Refueling Water Storage Tank (IRWST) to ensure structural integrity with respect to ADS discharge loads.

The final contract with Sumitomo Heavy Industries (SHI) for modifying the Rig of Safety Assessment (ROSA) Test Facility for Westinghouse AP600 reactor confirmatory safety system testing is provided as Enclosures A through H. The intellectual property rights (IPR) issue was resolved by employing the IPR clauses previously used for the U.S.-Japan Science and Technology Cooperation Agreement, signed by President Reagan and the Japanese Prime Minister on June 20, 1988. These IPR clauses were provided to the Commission as part of SECY-92-219 dated June 16, 1992. A non-disclosure agreement was signed between Westinghouse Electric Corporation (W) and the Japan Atomic Energy Institute (JAERI) to protect W proprietary information (Enclosure I). A similar non-disclosure agreement was signed between NRC and SHI (Enclosure J). The test matrix for Phase I testing is provided as Enclosure K and a summary table of the instrumentation as Enclosure L.

A Phase II testing program in the ROSA/AP600 facility was planned under the bilateral NRC/JAERI agreement on the ROSA/AP600 program. NRR requested that RES focus the Phase II testing program to obtain information on AP600 safety system behavior for beyond-design basis accident conditions. The staff intends to proceed with the Phase II testing, currently planned to be carried out during calendar year 1995. The staff estimates that the Phase II program will cost up to an additional \$3.5M to review and analyze data, including pre-test and post-test calculations (JAERI will pay for facility operation) and potential facility modifications. Funding for the Phase II program is included in the RES budget projections for FY95-97.

#### BACKGROUND:

In SECY-92-219 dated June 16, 1992, the staff sought Commission approval for conducting confirmatory safety system testing for the W AP600 passive reactor design. In its SRM dated August 11, 1992, the Commission authorized the staff to proceed with facility modifications and to perform confirmatory AP600 tests in the ROSA-V test facility, with the instruction that the staff advise the Commission if the cost exceeded \$10 million. The SRM requested the staff complete a non-disclosure agreement before a cooperative testing agreement was entered with JAERI. In the SRM dated September 16, 1992, the staff was further instructed to provide, when available, for Commission information: (1) a copy of the final contract; (2) information on how the intellectual property issue was resolved; (3) similar information on non-disclosure agreements; and (4) information on the test program matrix and instrumentation. This paper responds to the above two SRMs, as well as informing the Commission of the staff's plans for Phase II testing in the ROSA/AP600 test facility.

DISCUSSION:

## 1. ROSA/AP600 Facility Status

SHI completed modifications to the ROSA-V test facility in early 1994 according to the contractual requirements and has checked out the modified facility. The performance of SHI in carrying out this work is noteworthy given that a contract was only concluded in April 16, 1993. SHI has prepared final reports describing the facility design, instrument calibration, and facility characterization tests. JAERI also performed additional characterization testing. Matrix testing began on April 14, 1994. This represents a delay of about six months from the schedule envisaged in SECY-92-219 and about 3 months from the schedule anticipated at the time the SHI contract was awarded. The three month delay is due to additional time required to correct leakage uncovered during characterization testing, changes to DP cells, and additional facility modifications to implement AP600 design changes.

## 2. Total Cost of Facility and Phase I Testing

In SECY-92-219 dated June 16, 1992, we reported that the total estimated cost was \$9.8M to modify the ROSA facility and conduct a Phase I test program. Of this, \$6.3M was for facility modifications including instrumentation, \$3.0M for analysis of test data, \$0.4M for a resident engineer at the ROSA site, and \$0.1M for travel. Our current estimate is for an increase in cost of facility modifications from \$6.3M to \$7M. Estimates for analysis, resident engineer, and travel remain the same. This brings the total cost for ROSA Phase I testing to \$10.5M. Funding for these increased facility costs is already covered within the RES budget.

Four factors accounted for the increase in cost of facility modifications. First, the SECY-92-219 estimate was based on a currency exchange ratio of 120 yen to \$1. The Japanese yen subsequently appreciated to approximately 115 yen to \$1 which formed the basis when Contract Modification No. 3 was signed on April 16, 1993. This fixed the cost for most of the items in the contract. The exchange ratio difference between 120 yen to \$1 and 115 yen to \$1 raised the cost by \$0.3M. Subsequently, further appreciation to the yen has resulted in exchange rate losses to SHI.

Second, a 3% consumption tax was levied by the Japanese Government, amounting to \$0.2M. The staff investigated whether this consumption tax could be waived since the ROSA modification work was funded by the U.S. Government, however, we found no provisions that would allow exemption.

Third, there have been some AP600 design changes since the contract for facility modification was signed. For example, based on its recent test results, Westinghouse changed the core makeup tank (CMT) design to incorporate a flow diffuser. To be consistent with the AP600 design, the ROSA CMT design was also revised. In addition, Westinghouse recently revised the design of the automatic depressurization system. The staff obtained information on these design changes from Westinghouse and implemented necessary changes in the ROSA facility.

Fourth, additional structural analyses and strengthening of the IRWST was performed to accommodate discharge loads from operation of the ADS. The last two items total approximately \$0.2M.

Additionally, as Phase I testing proceeds, it may be advantageous to have additional INEL staff on site during and after testing to facilitate timely data interpretation and reporting of test results. Such assistance has already been informally requested by JAERI. We intend to explore providing this additional assistance and it should be noted that this may also result in a small cost increase to the project (\$150K).

### 3. Final Contract

Sumitomo Heavy Industries (SHI) was selected for a sole source contract to modify the existing ROSA-V test facility (Enclosure A). The objective was to convert the existing facility to the one that simulates the AP600 safety systems. An initial proposal and cost estimate was submitted by SHI for facility modifications on November 4, 1992. A letter contract was concluded with SHI on November 27, 1992, authorizing SHI to proceed with designing the facility components (Task 1) to be added or modified while the remainder of contract was negotiated. The negotiations that followed led to the following contract modification steps.

1. Contract Modification No. 1 (Enclosure B), December 24, 1992, extended date for submission of best and final offer to February 19, 1993.
2. Contract Modification No. 2 (Enclosure C), February 17, 1993, extended date for submission of best and final offer to March 15, 1993.
3. Contract Modification No. 3 (Enclosure D), April 16, 1993, resulted in a firm fixed price contract for \$6,467,269 (not including 3% tax) excluding the reimbursable amount for travel of \$67,278.
4. Contract Modification No. 4 (Enclosure E), June 25, 1993, provided some clarifications which resulted in some minor changes in technical requirements of the contract.
5. Contract Modification No. 5 (Enclosure F), September 30, 1993, was to install a steam distributor at the inlet of each of the two core makeup tanks (CMTs).
6. Contract Modification No. 6 (Enclosure G), January 7, 1994, extended contract period of performance to September 30, 1994, and revised dates for completion of some reports.

7. Contract Modification No. 7 (Enclosure H), March 24, 1994, provided for design changes such as upgrading the In-Containment Refueling Water Storage Tank (IRWST) to withstand postulated loads generated by rapid condensation of steam from the discharge pipe of automatic depressurization system (ADS).

4. Intellectual Property Rights (IPR)

The Intellectual Property Rights (IPR) clauses used in the ROSA/AP600 cooperative agreement with JAERI are based on IPR previously used in the U.S.-Japan Science and Technology Cooperation Agreement, signed by President Reagan and the Japanese Prime Minister on June 20, 1988. These IPR clauses were provided to the Commission as part of the draft ROSA-AP600 agreement which was attached to SECY-92-219. The final agreement signed with JAERI contains the same IPR clauses.

5. Non-Disclosure Agreement

Westinghouse and JAERI signed a non-disclosure agreement (Enclosure I) on August 19, 1992, to protect W proprietary information related to the AP600. In addition, NRC and SHI signed a similar non-disclosure agreement (Enclosure J). This agreement provides similar protection for SHI for certain fabrication drawings.

6. ROSA/AP600 Phase I Test Matrix

By early 1995, twelve tests will be run in three general categories: (1) loss-of-coolant accidents resulting from breaks in the cold leg, pressure balance line, and direct vessel injection line; (2) steam generator tube rupture; and (3) main steam line break. These tests are mainly for design basis accidents except for a small break LOCA test with multiple failures of automatic depressurization system stages 1 through 3 valves. Additional details are shown in Enclosure K. Many of the design basis accident tests are also counterpart tests with those being conducted by Westinghouse in their SPES and Oregon State University facilities.

7. ROSA/AP600 Facility Instrumentation

The instruments selected for the ROSA/AP600 testing were limited to those already available commercially without further development because of schedule and cost constraints. The instruments were selected to track mass and energy distributions in the experiments. The type and quantity of instruments are shown in Enclosure L. The instrumentation layout is shown in Enclosure M.

8. ROSA/AP600 Phase II Testing

Under the ROSA/AP600 Phase I testing, 12 tests will be conducted mainly for design basis accident evaluation. NRR requested that RES perform additional tests under the Phase II testing program mainly for beyond design basis scenario evaluation (Enclosure N). These additional tests will provide information on robustness of the AP600 safety system design under various accident scenarios which are not covered by the Phase I Program. Tests

contemplated under the Phase II testing will provide additional confirmatory information on AP600 safety-system behavior.

The existing cooperative agreement between the NRC and JAERI for ROSA/AP600 testing provides the NRC with the ability to run an additional twelve tests under the Phase II program. The staff proposes twelve tests covering small break loss-of-coolant accidents combined with various multiple hardware failures, main steam line break combined with steam generator tube rupture, and station blackout (Enclosure O). This list is still preliminary since the results of Phase I testing and other issues may alter relative priorities of the proposed tests.

The Phase II testing arrangement will be the same as for Phase I testing. JAERI will maintain and operate the facility, while the NRC will specify test conditions and perform analyses of test data. For these tasks, our funding estimate is \$3.5M, as follows.

Test Planning and Specifications	\$0.4M
Data Analysis	\$1.6M
Resident Engineer	\$0.4M
Travel	\$0.1M
Instrumentation and Facility Modification Provisions	\$1.0M
Total	<u>\$3.5M</u>

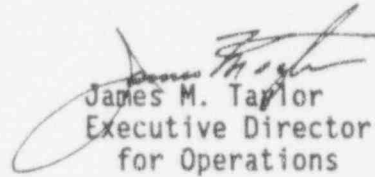
#### CONCLUSION:

The ROSA/AP600 testing program (Phase I) is progressing close to the plan described in SECY-92-219. The total cost is estimated to be \$10.5M. Additional support may be provided to JAERI to facilitate timely data analysis and reporting which could add a small additional cost. The staff plans to conduct a Phase II testing program that will provide additional information on performance of passive safety systems under beyond design basis accident scenarios. Funding for Phase II testing is included in RES budget projections.

The Commissioners

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The ACRS reviewed the instrumentation and Phase I Testing Plans and provided comment in its letter of November 18, 1993. We intend to continue our interactions with the ACRS on both Phases of the ROSA test program.

  
James M. Taylor  
Executive Director  
for Operations

Enclosures:  
As stated

cc: SECY  
OGC  
ACRS  
OCA  
OPA

DISTRIBUTION:  
Commissioners  
OGC  
OCAA  
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OPP  
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ACRS  
SECY



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

November 13, 1992

SENT VIA FACSIMILE

Mr. Hiroshi Ochi  
Manager  
Plant and Engineering Division  
International Operations  
Sumitomo Heavy Industries, Ltd.  
Mitoshiro-cho 1, Kanda, Chiyoda-Ku  
Tokyo, Japan

Dear Mr. Ochi:

Subject: Letter Contract No. NRC-04-93-057 Entitled "ROSA  
Facility Modification"

Pending negotiation of formal Contract No. NRC-04-93-057 and contingent upon your acceptance of the terms and conditions of this Letter Contract, Sumitomo Heavy Industries (SHI) is authorized and directed effective November 17, 1992 to initiate Task 1 work in accordance with Request For Proposal No. RES-92-079, Amendment No. 1 thereto dated September 24, 1992, and SHI's technical proposal No. 92-4706 dated November 4, 1992 all of which are made apart of this Letter Contract.

52.216-23 EXECUTION AND COMMENCEMENT OF WORK (APR 1984)

The Contractor shall indicate acceptance of this letter contract by signing three copies of the contract and returning them to the Contracting Officer not later than November 16, 1992. Upon acceptance by both parties, the Contractor shall proceed with performance of the work, including purchase of necessary materials.

(End of clause)  
(R 7-802.2 1964 MAR)

52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding \$750,000 U.S.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is \$750,000 U.S.

(End of clause)  
(R 7-802.3 1967 OCT)



52.216-25 CONTRACT DEFINITIZATION (APR 1984)

(a) A firm fixed price type definitive contract is contemplated. The Contractor agrees to begin promptly negotiating with the Contracting Officer the terms of a definitive contract that will include (1) all clauses required by the Federal Acquisition Regulation (FAR) on the date of execution of the letter contract, (2) all clauses required by law on the date of execution of the definitive contract, and (3) any other mutually agreeable clauses, terms, and conditions. The Contractor agrees to submit a firm fixed price proposal and cost or pricing data supporting its proposal.

(b) The schedule for definitizing this contract is:

- (1) Date for submission of Best and Final Offer: December 11, 1992.
- (2) Target date for contract definitization: December 23, 1992,

(c) If agreement on a definitive contract to supersede this letter contract is not reached by the target date in paragraph (b) above, or within any extension of it granted by the Contracting Officer, the Contracting Officer may, with the approval of the head of the contracting activity, determine a reasonable price or fee in accordance with Subpart 15.8 and Part 31 of the FAR, subject to Contractor appeal as provided in the Disputes clause. In any event, the Contractor shall proceed with completion of the contract, subject only to the Limitation of Government Liability clause.

(1) After the Contracting Officer's determination of price or fee, the contract shall be governed by--

(i) All clauses required by the FAR on the date of execution of this letter contract for either fixed-price or cost-reimbursement contracts, as determined by the Contracting Officer under this paragraph (c);

(ii) All clauses required by law as of the date of the Contracting Officer's determination; and

(iii) Any other clauses, terms, and conditions mutually agreed upon.

(2) To the extent consistent with subparagraph (c)(1) above, all clauses, terms, and conditions included in this letter contract shall continue in effect, except those that by their nature apply only to a letter contract.

(End of clause)  
(R 7-802.5(a) 1969 DEC)

## 52.216-26 PAYMENTS OF ALLOWABLE COSTS BEFORE DEFINITIZATION (APR 1984)

(a) Reimbursement rate. Pending the placing of the definitive contract referred to in this letter contract, the Government shall promptly reimburse the Contractor for all allowable costs under this contract at the following rates:

(1) One hundred percent of approved costs representing progress payments to subcontractors under fixed-price subcontracts; provided, that the Government's payments to the Contractor shall not exceed 80 percent of the allowable costs of those subcontractors.

(2) One hundred percent of approved costs representing cost-reimbursement subcontracts; provided, that the Government's payments to the Contractor shall not exceed 85 percent of the allowable costs of those subcontractors.

(3) Eighty-five percent of all other approved costs.

(b) Limitation of reimbursement. To determine the amounts payable to the Contractor under this letter contract, the Contracting Officer shall determine allowable costs in accordance with the applicable cost principles in Part 31 of the Federal Acquisition Regulation (FAR). The total reimbursement made under this paragraph shall not exceed 85 percent of the maximum amount of the Government's liability, as stated in this contract.

(c) Invoicing. Payments shall be made promptly to the Contractor when requested as work progresses, but (except for small business concerns) not more often than every 2 weeks, in amounts approved by the Contracting Officer. The Contractor may submit to an authorized representative of the Contracting Officer, in such form and reasonable detail as the representative may require, an invoice or voucher supported by a statement of the claimed allowable cost incurred by the Contractor in the performance of this contract.

(d) Allowable costs. For the purpose of determining allowable costs, the term "costs" includes--

(1) Those recorded costs that result, at the time of the request for reimbursement, from payment by cash, check, or other form of actual payment for items or services purchased directly for the contract;

(2) When the Contractor is not delinquent in payment of costs of contract performance in the ordinary course of business, costs incurred, but not necessarily paid, for--

(i) Materials issued from the Contractor's stores inventory and placed in the production process for use on the contract;

(ii) Direct labor;

(iii) Direct travel;

(iv) Other direct in-house costs; and

(v) Properly allocable and allowable indirect costs as shown on the records maintained by the Contractor for purposes of obtaining reimbursement under Government contracts; and

(3) The amount of progress payments that have been paid to the Contractor's subcontractors under similar cost standards.

(e) Small business concerns. A small business concern may receive more frequent payments than every 2 weeks and may invoice and be paid for recorded costs for items or services purchased directly for the contract, even though it has not yet paid for such items or services.

(f) Audit. At any time before final payment, the Contracting Officer may have the Contractor's invoices or vouchers and statements of costs audited. Any payment may be (1) reduced by any amounts found by the Contracting Officer not to constitute allowable costs or (2) adjusted for overpayments or underpayments made on preceding invoices or vouchers.

(End of clause)  
(R 7-802.4(a) 1972 MAY)

Please indicate your acceptance of this Letter Contract by signing and returning three (3) copies of the document as soon as possible. The fourth copy is for your records.

Sincerely,




Mary H. Mace, Contracting Officer  
Division of Contracts and  
Property Management  
Office of Administration

Enclosure:  
As Stated

ACCEPTED:

Sumitomo Heavy Industries, Ltd.

Name: H. OCHI, 

Title: MANAGER, PLANT & ENG. DIV. INTERNATIONAL OPERATIONS

Date: 27<sup>TH</sup> NOVEMBER, 1992

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

Enclosure B

2. AMENDMENT/MODIFICATION NO. ONE (1)		3. EFFECTIVE DATE DEC 24 1992		4. REQUISITION/PUR		5E. REQ. NO.		5. PRC	
6. ISSUED BY U.S. Nuclear Regulatory Commission Division of Contracts & Property Management Washington, DC 20555		CODE		7. ADMINISTERED BY (If other than Item 6)		CODE			

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Sumitomo Heavy Industries, Ltd. Plant and Engineering Division International Operations Mitoshiro-cho 1, Kanda Chiyoda-Ku Tokyo, Japan Principal Investigator/Technical Contact: Mr. Hiroshi Ochi, Manager Telephone No. (81) 3-3233-9421		9A. AMENDMENT OF SOLICITATION NO.	
CODE		9B. DATED (SEE ITEM 11)	
FACILITY CODE		10A. MODIFICATION OF CONTRACT/ORDER NO. Letter Contract No.: NRC-04-93-057	
		10B. DATED (SEE ITEM 11)	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (a) By completing items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)  
 B&R No.: 36019201100    FIN No.: L2550    APPN No.: 31X0200.360    OBLIGATED AMT: \$750,000.

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority):  
Mutual agreement of the parties.

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 3 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  
 FAR 52.216-25 (b) is hereby modified as follows:  
 (1) Date for submission of Best and Final Offer: February 19, 1993  
 (2) Target date for contract definitization: February 26, 1993

This modification also incorporates the Accounting and Appropriation Data set forth in Block 12 of this document.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) HOCHI, MANAGER, PLANT+ENG. DIV.		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Mary H. Mace	
15B. CONTRACTOR/OFFEROR 		16B. UNITED STATES OF AMERICA BY	
15C. DATE SIGNED 6TH/JAN/93		16C. DATE SIGNED 12/22/92	

1. CONTRACT ID CODE

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

2. AMENDMENT/MODIFICATION NO. Two (2)		3. EFFECTIVE DATE FEB 17, 1993	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY U.S. Nuclear Regulatory Commission Div. of Contracts & Property Management Washington, DC 20555		CODE	7. ADMINISTERED BY (If other than item 6) CODE	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Sumitomo Heavy Industries, Ltd. Plant and Engineering Division International Operations Mitoshiro-cho 1, Kanda Chiyoda-Ku Tokyo, Japan Principal Investigator/Technical Contact: Mr. Hiroshi Ochi, Manager Telephone No. (81) 3-3233-9421	(f)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
		10A. MODIFICATION OF CONTRACT/ORDER NO. Letter Contract No. NRC-04-93-057
		10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (a) By completing items 6 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14

(v) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

X Mutual agreement of the parties.

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible)

FAR 52.216-25 (b) is hereby modified as follows:

- (1) Date for submission of Best and Final Offer: March 15, 1993
- (2) Target date for contract definitization: March 22, 1993

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) H. OCHI, MANAGER PLANTS ENG. DIV. INTERNATIONAL OPERATIONS	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Mary H. Mace
15B. CONTRACTOR/OFFEROR 	16B. UNITED STATES OF AMERICA BY
15C. DATE SIGNED Feb 17, 93	16C. DATE SIGNED 2-17-93

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE

1 1 1

2. AMENDMENT/MODIFICATION NO.

Three (3)

3. EFFECTIVE DATE

3/23/93

4. REQUISITION/PURCHASE REQ. NO.

5. PROJECT NO. (If applicable)

6. ISSUED BY

CODE

7. ADMINISTERED BY (If other than Item 6)

CODE

U.S. Nuclear Regulatory Commission  
Division of Contracts & Property Management  
Washington, DC 20555

U.S. Nuclear Regulatory Commission  
Div. of Contracts & Property Mgmt.  
Contract Administration Br.; P-902  
Washington, DC 20555

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

Sumitomo Heavy Industries, Ltd.  
Plant and Engineering Division  
International Operations  
Mitoshiro-cho 1, Kanda Chiyoda-Ku  
Tokyo, Japan

Principal Investigator/Technical

Contact: Mr. Hiroshi Ochi, Manager

Telephone No. (81) 3-3233-9421

9A.

AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

Letter Contract No.:  
NRC-04-93-057

10B. DATED (SEE ITEM 11)

11/13/92

CODE

FACILITY CODE

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
(a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

See below

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(D).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

FAR 52-216-25 Contract Definitization

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 3 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

This modification definitizes and supersedes the above letter contract pursuant to FAR 52.216-25. The NRC hereby accepts SHI'S technical proposal dated October 1992 and technical revisions thereto dated December 14, 1992 (SHI Ref. No. PES/JA2021U) and March 12, 1993 (includes 35 thermocouples for PRHR) to perform the services specified in RFP No. RES 92-079, as amended. This is a firm fixed price contract with cost reimbursable line items. The firm fixed price and obligated amount of \$750,000 under the above Letter Contract is hereby increased by \$5,717,269 to \$6,467,269. The obligated reimbursable amount for travel is \$67,278. Accounting and Appropriation Data in the total obligated amount of \$6,534,547 is as follows: B&R No.: 36019201100, FIN No.: L2550, Appn. No.: 31X0200.360, Document ID# RES-C93-089.

15A. NAME AND TITLE OF SIGNER (Type or print)

M. Inoue, Manager Nuclear Business  
Development Division Sales Dept.

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

4-16-93

16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

Mary H. Mace

16B. UNITED STATES OF AMERICA

BY *Mary H. Mace*  
(Signature of Contracting Officer)

16C. DATE SIGNED

3-31-93

(Signature of person authorized to sign)

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## PART I - THE SCHEDULE

## SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

## B.1 PROJECT TITLE

The title of this project is as follows:

ROSA Facility Modification

## B.2 BRIEF DESCRIPTION OF WORK (MAR 1987)

To design, fabricate, and install instrumentation and equipment to modify the ROSA Large Scale Test Facility in order to obtain experimental data from a scaled integral test facility which reproduces major phenomena of interest in an AP600 plant. The ROSA Large Scale Test Facility is located at the Japan Atomic Energy Research Institute (JAERI), Tokai, Japan.

## B.3 SUPPLIES OR SERVICES AND PRICES/COSTS

Item No.	Description	Qty.	Unit	Amount (Yen)	Amount (Dollar)
1.	Detailed design drawings	1	Lot	Y89,628,000	\$779,374.
2.	Fabrication and delivery of components and hardware	1	Lot	Y243,380,000	\$2,116,348.
3.	Fabrication, delivery, and calibration of instrumentation controls	1	Lot	Y118,242,000	\$1,028,191.
4.	Modification of ROSA support structures	1	Lot	(Priced in Item 5)	
5.	Installation	1	Lot	Y271,054,000	\$2,356,991.
6.	Facility inspection/acceptance testing	1	Lot	Y21,432,000	\$186,365.
				TOTAL FIXED PRICE AMOUNT:	\$6,467,269.
7.	Reimbursable Travel*	NA		Y7,737,000	\$67,278.

8. Reimbursable Consumption Tax Not to Exceed 3% of Contract Value**	NA	Y22,544,000	\$196,035.
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TOTAL ESTIMATED REIMBURSABLE COSTS: \$263,314.

TOTAL FIXED PRICE AMOUNT AND ESTIMATED REIMBURSABLE COSTS: \$6,730,583.

The above pricing schedule is based on 115 Japanese yen to the \$1.00.

NOTE: \*Required travel (Item 7 above) directly associated with this effort will be reimbursed to the contractor at actual cost in accordance with Section G.4 herein.

\*\*NRC and SHI will pursue the applicability of the consumption tax to this contract. Should this consumption tax apply, it will be paid on a cost-reimbursement basis with NO indirect costs nor profit added.

B.4 CONSIDERATION AND OBLIGATION--FIRM FIXED PRICE  
(JUN 1988)

The firm fixed price of this contract is \$6,467,269.

[End of Clause]

B.5 CONSIDERATION AND OBLIGATION--COST PLUS FIXED FEE  
(JUN 1988)

a. The total estimated cost to the Government for full performance of cost reimbursable travel under this contract is \$67,278, of which the sum of \$62,294 represents the estimated reimbursable costs, and of which \$4,984 represents the fixed fee.

b. There shall be no adjustment in the amount of the Contractor's fixed fee by reason of differences between any estimate of cost for performance of the work under this contract and the actual cost for performance of that work.

c. The amount obligated by the Government with respect to the cost plus fixed fee line item is \$67,278.

(End of Clause)

B.6 CONSIDERATION AND OBLIGATION--COST REIMBURSEMENT (JUN  
1988)

a. The total estimated cost to the Government for Japanese Consumption Taxes under this contract is \$196,035.

b. The amount obligated by the Government with respect to this contract is \$0.00.

(End of Clause)

## SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

## C.1 STATEMENT OF WORK

## C.2 BACKGROUND

Westinghouse Corporation is developing a new pressurized water reactor (PWR) called Advanced Passive (AP) 600. The AP600 uses passive safety features as backup to active systems to mitigate transients. Plant response when utilizing these passive systems is different from existing PWRs and depends on gravity drain and natural circulation. The potential for thermal hydraulic interactions between these systems under off-normal conditions needs to be studied. Interactions from hydraulic coupling of passive gravity drain systems as well as between safety and nonsafety systems need to be considered. The NRC is soliciting a proposal to modify the ROSA Large Scale Test Facility to provide the capability to reproduce major phenomena/processes of interest in the AP600. The ROSA Large Scale Test Facility is located at the Japan Atomic Energy Research Institute (JAERI), Tokai, Japan.

To be compatible with the schedule for AP600 design approval in November 1994 and design certification in May 1996 (Reference SECY-91-161), the ROSA facility modifications need to be started by October 31, 1992 and completed by December 31, 1993. A test program will be carried out by JAERI in 1994. The test program may be extended for an additional year. THE TEST PROGRAM SHALL BE CONDUCTED BY JAERI AND IS NOT A REQUIREMENT UNDER THIS CONTRACT.

## C.3 OBJECTIVE

The objective of this effort is to reconfigure the ROSA Large Scale Test Facility in order to obtain experimental data from a scaled integral test facility which reproduces major phenomena of interest in an AP600 plant.

## C.4 GENERAL INFORMATION

The modified ROSA facility should be able to simulate all AP600 passive core cooling safety systems and reproduce all controlling phenomena. The information to be obtained will be used for code assessment and validation. Experimental investigations will include the capability of passive safety systems to remove core decay heat, and the potential for interactions between gravity drain or pressure balancing lines and the reactor coolant system. The effectiveness of initial draining of the In-containment Refueling Water Storage Tank (IRWST) will also be studied.

The AP600 design emphasizes certain phenomena and processes to a different extent than current reactors. The NRC must, therefore, confirm the applicability of associated modeling in its codes through comparison with relevant data. Beyond a certain break size, break flow will exceed makeup capacity, thereby resulting in Automatic Depressurization System (ADS) actuation. Thus, small break loss-of-coolant accident (LOCA) response will differ significantly from current reactors. A further question is whether there could be unexpected systems interactions between passive and pumped systems (startup feedwater, normal residual heat removal and chemical and volume control system). Wherever mention is made of the use of pumped systems in ROSA testing, this refers to use of the existing ROSA hardware.

Preservation of thermal hydraulic phenomena expected in the reference AP600 plant is of major importance. The scaling used in the Design Requirements for ROSA Modification (Attachment 5) attempts to emphasize and preserve the phenomena thought to be of first-order importance in the prototypic system. All components relevant to safety research needs are included in those Design Requirements. The resultant ROSA facility is expected to be flexible enough to include scenarios that address current licensing events as well as transients not presently considered in safety analyses. The facility is expected to be capable of simulating the response to these events as expected during real time accident progression, i.e., including operator actions and non-safety systems.

The scaling used in the Design Requirements for ROSA Modifications attempts to minimize distortions to processes (particularly flow regime transitions, mass and energy transfer) and to time scales, since even small distortion may lead to different events in the progression of transients. Additionally, although thermal hydraulic computer codes are the primary means whereby scaled facility results are extrapolated to full scale, the modified ROSA facility design is expected to minimize activities necessary to draw inferences about plant behavior.

For the AP600 design, traditional pumped systems are used for accident prevention and the first level of defense should an accident occur. The major design differences involve the safety systems which are actuated following an upset condition. These new safety systems are gravity driven. For example, the Passive Residual Heat Removal system (PRHR) replaces the safety function of the current pumped auxiliary feedwater system in the steam generator secondary. Gravity driven Core Makeup Tanks (CMTs) replace the pumped high pressure safety injection system. The safety injection leads to the downcomer, rather than the cold leg as in current designs. An ADS has been added, which actuates on water level in the CMT. No such counterpart exists in operating PWRs,

although Boiling Water Reactors have an ADS.

The phenomena/processes of main interest can be divided according to: (1) full pressure behavior of the primary system; (2) depressurization phase; and (3) initiation of long term cooling at low pressure. The most significant new process during the high pressure phase of AP600 transients is the CMT gravity draining which is strongly affected by overall system response and by CMT and pressure balance line condensation. At least four scenarios must be considered at high pressure: small break loss-of-coolant; pressure balance line break; steam generator tube rupture; and steam line break. For these events, passive systems may be required to function while the system is at high pressure.

The AP600 design provides for full pressure decay heat removal using a PRHR. Areas of interest include: PRHR energy removal capability during loss of secondary heat sink transients and Anticipated Transient Without Scram (ATWS); natural circulation flow rate and flow stability; possible interactions affecting natural circulation flow rates; transition from forced flow to natural circulation, IRWST conditions (temperature, level, mixing); effects associated with operation of multiple PRHR heat exchanger (HX) sections; interactions with reactor coolant system loop flows; and effect of noncondensables during condensation heat transfer in the PRHR.

In a small break LOCA, the CMTs add inventory while the ADS reduces the reactor coolant system pressure to the accumulator injection pressure and further to the IRWST injection pressure. The depressurization phase involves actuation of four stages of depressurization valves, three at the top of the pressurizer and the fourth on both of the hot legs. An area of interest is how quickly the pressure in the primary system is reduced to allow gravity draining of the IRWST, and how much inventory remains in the primary system at the end of blowdown. Of particular interest is critical flow at relatively low pressures (up to a few hundred psi) and flow quality out the three stages at the top of the pressurizer, which will depend on level swell in the pressurizer, entrainment/deentrainment, and delivery of two-phase flow from the hot leg, through the surge line, to the pressurizer.

Draining rate of the CMTs is important for two reasons: (1) actuation of the four ADS stages is tied to CMT level; and (2) knowing the draining rate helps in determining the primary system inventory as a function of time. The general response of the CMTs includes how the inlet flows from the two pressure balance lines and interact with the liquid in the CMTs, and how the draining flow competes with accumulator flow below 700 psi. The latter has the potential to interrupt draining of the CMT. Of interest is flow through the pressure balancing lines, interactions between emergency core coolant (ECC) flows and break flow and other loop flows, and condensation in the

CMTs and the balancing lines.

The low pressure long-term cooling domain begins with coolant provided via flow from the IRWST when the difference in pressure between primary system and containment is reduced sufficiently to allow gravity draining of the IRWST (about 15 psig). Of interest is the gravity drain rate from the IRWST and steam flows from the primary system. The IRWST provides a maximum 36 ft of driving head for the longer term injection. This driving force is small, so the injection rate will be sensitive to primary system and containment pressure perturbations and interactions with the existing flow paths in the primary system. The pressure difference driving the IRWST injection can be affected by increased vapor generation in the core, should recovery of an uncovered core occur. Similarly, the pressure difference may be reduced should ADS flow transition from vapor flow to two phase flow, reducing the depressurization rate. This will be followed by a decrease in reactor vessel pressure and resumption of IRWST injection. The primary system and CMTs provide multiple loops which may serve as relief paths or otherwise affect the IRWST response.

#### C.5 WORK REQUIREMENTS

Period of Performance: 11/17/92 to 1/15/94  
Estimated Level of Effort: 380 Man-months (MM)

#### C.6 SPECIFIC TASKS

The contractor shall perform the tasks specified below to modify the ROSA facility. All of these tasks shall be performed in accordance with all applicable Japanese national and local building codes and standards. If the contractor anticipates any variance in the schedule requirements set forth herein, he shall immediately notify the Contracting Officer of such anticipated variance and receive prior verbal Contracting Officer approval followed by written confirmation.

Any numbers regarding estimated level of effort are for reference purposes only. The Contractor further understands that the schedule for completion of each task is detailed below.

##### Task 1. Detailed Design Drawings

Engineering Level of Effort--21 MM  
Technician Level of Effort--8 MM

The contractor shall review the NRC Design Requirements for ROSA Modifications, provided as Attachment 5, to assure compatibility with the existing ROSA facility. Based on the information provided in this Statement of Work and Attachment 5, prepare detailed design drawings.

These drawings will provide all of the details necessary for fabrication of new components and hardware and installation in the ROSA facility. Instrumentation and controls shall also be indicated in the drawings. Submit the detailed design drawings to the NRC for review and approval. At the same time, provide a copy of drawings to the JAERI. Because of the short time schedule, the drawings should be submitted as they are completed (rather than submitted as a complete package) so that fabrication can proceed as early as possible after the NRC approval. NRC will review and provide necessary comments within two weeks after the receipt of drawings. The drawings for the entire facility modifications shall be completed by April 10, 1993.

Drawings are to include:

- o Piping (isometric) and vessel drawings, including instrumentation, orifices, and valves;
- o Piping specification lists;
- o Equipment specification lists;
- o Check, manual, and remote operated valve specification lists;
- o Instrument specification lists;
- o Control system logic diagrams

Acceptance of individual drawings will be by signature of the NRC Project Officer. Completion of this task is defined as acceptance of all drawings necessary for fabrication and/or procurement of material specified under C.7 and C.8, as further described in Attachment 5.

#### Task 2. Fabrication and Delivery of Components and Hardware

Engineering Level of Effort--12 MM  
Technician Level of Effort--70 MM

In accordance with the NRC-approved drawings and design specifications, the contractor shall fabricate or procure, as appropriate, the new components and other hardware, which shall be free from defects and shall conform with all requirements necessary to meet the stated objectives of this contract. The principal components are listed below, under "NEW COMPONENTS". Delivery of components, other hardware and the fabrication of all components shall be completed by August 31, 1993. Provide written confirmation upon completion of this task by September 2, 1993.



The contractor is responsible for fabrication and/or procurement of material according to Task 1, for meeting the fabrication schedule, and for quality control and quality assurance (QC/QA). The NRC may perform periodic inspections to ensure that satisfactory progress is being made toward completion, to check the QC/QA procedures and results, and to ensure conformance to the requirements of Task 1. Inspections will be conducted by the NRC resident engineer or, as necessary, by supplemental U.S. personnel.

Completion of this task is defined as fabrication and/or procurement of components and hardware that conform to the description in the drawings under Task 1, as confirmed in writing by the contractor and accepted by the NRC Project Officer.

Task 3. Fabrication, Delivery and Calibration  
of Instrumentation and Controls

Engineering Level of Effort--12 MM  
Technician Level of Effort--24 MM

In accordance with the NRC-approved drawings and design specifications and drawings, the contractor shall fabricate, procure, and deliver as appropriate, instrumentation and other electrical equipment needed for measurement and control, which shall be free from defects and shall conform with all requirements necessary to meet the stated contract objectives. The principal measurement requirements are listed below, under "INSTRUMENTATION". All instruments and control devices shall also be acquired and delivered by August 31, 1993. Provide written confirmation upon completion of this task by September 2, 1993.

The contractor shall calibrate all instrumentation in accordance with the approved calibration plan. For each instrument, calibration of instrumentation means the instrument reads to within its specified uncertainty, over its entire specified range, for conditions of temperature and pressure representative of operating conditions.

Prior to installation, the contractor shall calibrate all instruments in a manner that is free of defects and that conforms with the requirements necessary to meet the stated contract objectives. A work plan for performing this task shall be submitted to the NRC for approval by July 31, 1993. At the same time, the contractor shall provide this same plan to JAERI. The contractor shall include in the calibration plan all process calculations necessary to convert measurement signals to engineering data measurements of venturi flow, orifice flow, and differential pressure. The NRC shall provide its review

within two weeks after receipt of the work plan. A camera-ready instrument calibration report shall be prepared upon completion of this task no later than January 15, 1994. The report shall contain information described in the calibration plan and shall be part of the final report describing acceptance testing.

The contractor is responsible for meeting the schedule for fabrication and/or procurement and for quality control and quality assurance (QC/QA). The NRC may perform periodic inspections to ensure that satisfactory progress is being made toward completion, to check the QC/QA procedures and results, and to ensure conformance with the design drawings of Task 1. Inspections will be conducted by the NRC resident engineer or, as necessary, by supplemental U.S. personnel.

Completion of this task is defined as fabrication and/or procurement of all material that conforms to the description in the drawings under Task 1 and calibration of all instrumentation in accordance with the approved calibration plan, as confirmed in writing by the contractor and accepted by the NRC Project Officer.

#### Task 4. Modification of ROSA Support Structures

Engineering Level of Effort--9 MM  
Technician Level of Effort--30 MM

In accordance with the NRC-approved drawings and design specifications and drawings, the contractor shall modify the existing ROSA facility support structures, as necessary, to provide structural and seismic support for the new components. This task shall be completed by November 15, 1993.

Completion of this task means construction and/or modification, as appropriate, of all load bearing structural supports necessary for installation of material acquired under Tasks 2 and 3.

#### Task 5 Installation

Engineering Level of Effort--17 MM  
Technician Level of Effort--150 MM

In accordance with the NRC-approved drawings and design specifications and drawings, the contractor shall install all components and other hardware, including instrumentation and controls, by November 15, 1993. This includes, but is not limited to, the following:

- a. Placement of major components (CMTs, pressurizer, PRHR, IRWST);

- b. Attachment of connecting piping (pressure balance lines, direct vessel injection lines, CMT discharge lines, accumulator discharge lines, PRHR lines, IRWST lines, ADS lines, surge line);
- c. Other modifications (accumulator standpipes, reduced cold leg loop seal);
- d. Installation/attachment of instrumentation to components;
- e. Installation of heat tracing and insulation; and
- f. Installation/attachment of cabling from instrumentation to signal processing and data acquisition system; and
- g. Installation of new controls and instrumentation in the control room.

Completion of this task means installation of all material fabricated and/or procured under Tasks 2 and 3. It does not mean that all instrumentation and controls are checked out and operable at this stage. The NRC Project Officer, based on recommendations from the NRC Resident Engineer and JAERI personnel, as appropriate, will provide written acceptance of the completed work under this task.

NOTE: The contractor shall be responsible for storage of all components and hardware at the site until NRC's final acceptance.

#### Task 6. Facility Inspection and Acceptance Testing

Engineering Level of Effort--8 MM  
Technician Level of Effort--16 MM

The contractor shall perform quality assurance inspections of facility modifications, and facility characterization and acceptance testing, by December 30, 1993. The contractor shall prepare and submit for NRC approval a plan and procedures for inspection and test by August 1, 1993. Signature by the NRC Project Officer will constitute acceptance of this plan. At the same time, the contractor shall provide this same plan to JAERI. The NRC shall provide its review within two weeks after receipt of this work plan.

The contractor shall ensure satisfactory operation of all instruments and controls. The contractor's inspections will ensure that all equipment has been installed in accordance with Design Drawings. Prior to start of acceptance testing, the contractor shall submit copies of

all test procedures to the NRC for review.

Inspection and shakedown testing will be performed in accordance with the approved plan and procedures. Acceptance testing consists of two phases: (1) component checkout; and (2) systems operations. The first verifies performance of individual components such as pressurizer heaters and valves. The second verifies subsystems and systems. Completion of this task shall mean the following:

- a. Verify that equipment is installed according to drawings.
- b. Pressurization of the entire system to full system pressure indicates leak rates from any of the new equipment or their attachments to the unmodified parts of the LSTF that meets the same leakage requirements as existing LSTF equipment.
- c. All new instruments are verified to be operable, where operable means providing correct readings to within the uncertainty band, with readings recorded on the data acquisition system.
- d. All new valves and controls are verified to be operable, where operable means:
  - o Valves are leak tight when shut. Manual valves move from fully shut to fully open smoothly and without binding. Remote operated valves can be fully stroked from the control room, using control switches in the manual mode.
  - o Control logic is checked on pressurizer level, pressurizer pressure, "S" signal, PRHR actuation, ADS actuation.

Completion of Task 6 shall be confirmed by January 14, 1994 by the contractor by issuance of a report describing the results of inspection and acceptance testing, and acceptance of this report by the NRC Project Officer.

#### C.7 NEW COMPONENTS:

The following provides general requirements for components. Attachment 5 provides more detailed Design Requirements for ROSA Modifications, which shall serve as the basis for detailed engineering design of components and controls.

1. Core Makeup Tanks (2). These tanks shall be cylindrical full height, volume scaled (1:30), with preservation of elevation.

2. Pressure Balance Line piping connecting the CMT header to the top of the pressurizer. Each pressure balance line shall include a check valve. Elevations shall be preserved. (two trains)
3. Pressure Balance Line piping connecting the CMT header to the cold leg of the loop that does not contain the pressurizer (each CMT header). Pressure Balance Line piping connecting the CMT header to the cold leg of the loop that contains the pressurizer (one CMT header). Each line shall include a check valve and a remote operated isolation valve, which is controlled to open on low pressurizer pressure and low pressurizer level. Elevations shall be preserved. The piping design shall allow for varying the frictional pressure drop.
4. CMT header joining the pressurizer pressure balance line and the cold leg pressure balance line to the top of the CMT, and allowing purging of condensate from the pressurizer pressure balance line. (two trains)
5. CMT discharge line connecting the bottom of the CMT to the Direct Vessel Injection line. The piping design shall allow for varying the frictional pressure drop. (two trains)
6. Accumulator discharge line connecting the bottom of the accumulator to the Direct Vessel Injection line. The piping design shall allow for varying the frictional pressure drop. Accumulator standpipe to provide the correct scaled volumes of liquid and nitrogen in the accumulator. Accumulator initial pressure is set at 700 psi. (two trains)
7. IRWST discharge line connecting the bottom of the IRWST to the Direct Vessel Injection line. The piping design shall allow for varying the frictional pressure drop. (two trains)
8. Direct Vessel Injection line connecting the discharge lines of the CMT, accumulator, and IRWST to the vessel downcomer. (two trains)
9. Passive Residual Heat Removal System (PRHR) consisting of a heat exchanger located in the IRWST, inlet piping connecting the hot leg containing the pressurizer (at the same location as the fourth stage ADS) to the top of the PRHR heat exchanger; return piping connecting the bottom of the PRHR heat exchanger to the cold leg; and remote operated isolation valve. The piping design shall allow for varying the frictional pressure drop. The heat exchanger shall be full height (straight tube) with full size (length and diameter) tubes, with simplified inlet and outlet plena.

10. IRWST (at representative elevation) to provide a heat sink for PRHR and ADS stages 1, 2 and 3, and as a water source for low pressure gravity drain injection. The size may be reduced from the scaled volume.
11. ADS stages 1, 2, and 3 to connect from top of pressurizer to catch tank. Stage 1 consists of two 4-inch valves in the AP600. Stage 2 consists of two 8-inch valves. Stage 3 consists of two 8-inch valves.
12. ADS stage 4 to connect each hot leg to its separate catch tank. Stage 4 consists of two 12-inch valves in the AP600. Level signal will be provided by differential pressure measurements.
13. Pressurizer. This will be full height, volume scaled (1:30), with representative inlet and heater support structures to obtain prototypic hydraulic diameter and inlet mixing. Elevation shall be preserved.
14. Surge line attaching to existing hot leg connection.
15. Reduced cold leg loop seal to minimum readily achievable size (1.2 meter).

#### C.8 INSTRUMENTATION:

The following provides general requirements for instrumentation. Instrument penetrations shall be insulated to minimize heat losses. Attachment 5 provides the Design Requirements, which will serve as the basis for detailed engineering design of instrumentation.

The new components shall be equipped with instruments to measure temperatures, pressures, coolant distribution, and various flows including countercurrent conditions. The goal is that flow regimes at points of interest and condensation phenomena should be identifiable and quantifiable, to the extent possible, with provided instrumentation.

The experimental facility must have measurement capabilities that support the identification and quantification of controlling phenomena and the relationships among these phenomena for a wide range of single and two phase flow conditions. Typical phenomena and processes to be expected can be found in NUREG/CR 5853 "Investigation of the Applicability and Limitations of the ROSA-IV LSTF for AP600 Safety Assessment". These measurements and quantities derived from them will provide a data base that will be used for the development and assessment of mathematical models and thermal hydraulic computer codes, and will provide a basis for the assessment of the performance of the safety systems. The instrumentation to be used should be of proven design. The objectives of the measurements include, but are not limited to, the following:

- o Information necessary to determine global (system) mass and energy balances;
- o Data from which local thermodynamic and hydraulic conditions can be established;
- o Data from which local mass and energy balances can be established; and
- o Information necessary for facility control and protection during operation.

The objective is to electronically record, store, and archive test data to a permanent medium. Therefore, the contractor shall connect the new instrumentation to the existing ROSA Data Acquisition System. The following typical measurement types are specified for the system components and boundaries.

1. CMTs: pressure, differential pressure, fluid and wall temperature.
2. Pressurizer pressure balance line: pressure, differential pressure, flow, fluid temperature.
3. Cold leg pressure balance line: pressure, differential pressure, flow, fluid and wall temperature, density.
4. CMT header: differential pressure, fluid and wall temperature.
5. CMT discharge line: differential pressure, flow, fluid temperature.
6. Accumulator and discharge line: absolute pressure, gas temperature, wall temperature, differential pressure, flow, fluid temperature.
7. IRWST discharge line: differential pressure, flow, fluid temperature.
8. Direct vessel injection line: differential pressure, flow, fluid temperature.
9. PRHR: differential pressure, flow, fluid temperature.
10. IRWST: pressure, differential pressure, fluid temperature.
11. ADS stages 1, 2, 3: pressure, differential pressure, fluid temperature, density, mass flow (catch tank differential pressure).
12. ADS stage 4: pressure, differential pressure, fluid temperature, density, mass flow (catch tank differential

pressure).

13. Pressurizer: pressure, differential pressure, fluid temperature.
14. Surge line: pressure, differential pressure, fluid temperature, density, flow, wall temperature.
15. Cold leg loop seal: differential pressure, fluid temperature.

C.9 TRAVEL APPROVALS (MAR 1987)

a. All domestic travel requires the prior approval of the Project Officer.

b. All foreign travel must be approved in advance by the NRC on NRC Form 445 and shall be in compliance with 52.247-63, Preference For U.S. Flag Air Carriers. Such approval will be communicated in writing through the Contracting Officer.

[End of Clause]



SECTION D - PACKAGING AND MARKING

D.1 PACKAGING AND MARKING

(a) The contractor shall preserve and pack all deliverable items under this contract in accordance with best commercial practices and adequate to ensure both acceptance by common carrier and safe transportation at the most economical rates.

(b) The contractor shall prepare packing lists in English to be timely submitted to the NRC Resident Engineer for his cargo receipt inspection on site.

(End of Clause)

## SECTION E - INSPECTION AND ACCEPTANCE

## E.1 PLACE OF INSPECTION AND ACCEPTANCE

The ROSA AP600 Acceptance Criteria Document, Attachment 8, sets forth the criteria essential to accomplish the effort hereunder.

(a) Inspection and acceptance of the deliverable items to be furnished hereunder shall be made by the Project Officer at the destination.

(b) The NRC's Resident Engineer, in close connection with and support from JAERI, will determine, on behalf of the NRC, whether the contractor has fulfilled the Tasks where such a determination cannot be quickly made by the NRC.

(c) The Government has the right to reject defective components, supplies, or services within a reasonable time after delivery by written notification to the Contractor. The Contractor shall, in such event, promptly replace, correct, or repair the rejected components, supplies, or services at the Contractor's expense.

(d) After inspection and acceptance, the NRC Resident Engineer will issue to the Contractor a Component Conformance Certificate that reads as follows:

"I certify that on \_\_\_\_\_ (date), SHI furnished components in accordance the "ROSA AP600 Acceptance Criteria Document," Attachment 8, that meets or exceeds all applicable requirements. I further certify that the components are of the quality specified and conform in all respects with the contract requirements, including specifications, drawings, preservation, packaging, packing, marking requirements, and physical item identification (part number), and are in the quantity shown on this or on the attached acceptance criteria document."

Date of Execution: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

(End of Clause)

## E.2 52.246-4 INSPECTION OF SERVICES--FIXED-PRICE (FEB 1992)

(a) Definitions. "Services," as used in this clause, includes services performed, workmanship, and material furnished or utilized in the performance of services.

(b) The Contractor shall provide and maintain an inspection

system acceptable to the Government covering the services under this contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and for as long afterwards as the contract requires.

(c) The Government has the right to inspect and test all services called for by the contract, to the extent practicable at all times and places during the term of the contract. The Government shall perform inspections and tests in a manner that will not unduly delay the work.

(d) If the Government performs inspections or tests on the premises of the Contractor or a subcontractor, the Contractor shall furnish, and shall require subcontractors to furnish, without additional charge, all reasonable facilities and assistance for the safe and convenient performance of these duties.

(e) If any of the services do not conform with contract requirements, the Government may require the Contractor to perform the services again in conformity with contract requirements, at no increase in contract amount. When the defects in services cannot be corrected by reperformance, the Government may (1) require the Contractor to take necessary action to ensure that future performance conforms to contract requirements and (2) reduce the contract price to reflect the reduced value of the services performed.

(f) If the Contractor fails to promptly perform the services again or to take the necessary action to ensure future performance in conformity with contract requirements, the Government may (1) by contract or otherwise, perform the services and charge to the Contractor any cost incurred by the Government that is directly related to the performance of such service or (2) terminate the contract for default.

[End of Clause]

NOTE: Pursuant to FAR Clause 52.246-4 (b) above, complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and two years thereafter.

## SECTION F - DELIVERIES OR PERFORMANCE

## F.1 52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

NUMBER	TITLE	DATE
52.212-13	STOP-WORK ORDER	AUG 1989

## F.2 PREPARATION OF TECHNICAL REPORTS (JUN 1991)

All technical reports required by Section C and all Technical Progress Reports required by Section F are to be prepared in accordance with the attached NRC Handbook 3.8. NRC Handbook 3.8 is not applicable to any Contractor Spending Plan (CSP) and any Financial Status Report that may be included in this contract. (See Section J for List of Attachments).

[End of Clause]

## F.3 TECHNICAL PROGRESS REPORT (OMB CLEARANCE NUMBER 315G-0112) (JUN 1988)

The Contractor shall provide a monthly Technical Progress Report to the Project Officer and the Contracting Officer. The report is due within 15 calendar days after the end of the report period and shall identify the title of the project, the contract number, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report shall include the following for each discrete task:

- a. A listing of the efforts completed during the period; milestones reached or, if missed, an explanation provided;
- b. Any problems or delays encountered or anticipated and recommendations for resolution; (if the recommended resolution involves a contract modification, e.g., change in work requirements, level of effort (cost) or schedule delay, the Contractor shall submit a separate letter to the Contracting Officer identifying the required change and estimated cost impact).
- c. A summary of progress to date; and
- d. Plans for the next reporting period.

[End of Clause]

## F.4 PLACE OF DELIVERY--REPORTS (JUN 1988)

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

- (a) Project Officer (5 copies)

US Nuclear Regulatory Commission  
Attn: Gene Rhee - NLN-353  
Office of Nuclear Regulatory Research  
Washington, DC 20555

- (b) Contracting Officer (1 copy)

[End of Clause]

## F.5 F.O.B. DESTINATION

The Government shall not be liable for any delivery, storage, demurrage, accessorial, or other charges involved before the actual delivery (or "constructive placement" as defined in carrier tariffs) or the supplies to the destination, unless such charges are caused by an act or order of the Government acting in its contractual capacity.

The Contractor shall--

(1) (1) Pack and mark the shipment to comply with contract specifications; or

(11) In the absence of specifications, prepare the shipment in conformance with carrier requirements;

(2) Prepare and distribute commercial bills of lading;

(3) Deliver the shipment in good order and condition to the point of delivery specified in the contract;

(4) Be responsible for any loss of and/or damage to the goods occurring before receipt of the shipment by the consignee at the delivery point specified in the contract;

(5) Furnish a delivery schedule and designate the mode of delivering carrier;  
and

(6) Pay and bear all charges to the specified point of delivery.

(End of Clause)

## F.6 ADDITIONAL REPORTING REQUIREMENTS

All required reporting shall be in English.

1. Provide final design report of Task 1, including all drawings on detailed facility design and instrumentation layout. Due 4/10/93.
2. Provide an approved plan for instrument calibration. Due 7/31/93.
3. Provide a work plan for final facility inspection, characterization, and acceptance testing. Due 8/1/93.
4. Provide status report, in letter form, upon completion of Tasks 2 and 3 (except for in-situ calibration of instruments) Due 9/2/93.
5. Provide status report, in letter form, upon completion of Tasks 4 and 5. Due 11/30/93.
6. Provide a report on instrumentation calibration, facility characterization, and acceptance testing and certifying the facility has been constructed and checked out. A camera-ready NUREG report is due 1/15/94.
7. Provide an updated final design report, describing any previous Task 1 modifications to the final design report, reflecting as-built conditions. Due 12/31/93.

(End of Clause)

## F.7 DURATION OF CONTRACT PERIOD (MAR 1987)

This contract shall commence on November 17, 1992, and will expire on January 15, 1994.

(End of Clause)

## SECTION G - CONTRACT ADMINISTRATION DATA

G.1 PROJECT OFFICER AUTHORITY (MAR 1987)  
ALTERNATE II (MAR 1987)

(a) The Contracting Officer's authorized representative hereinafter referred to as the Project Officer for this contract is:

Name: Gene Rhee

Address: US Nuclear Regulatory Commission  
Office of Nuclear Regulatory Research  
Washington, DC 20555

—\*—  
—\*—

Telephone Number: (301) 492-3564

(b) The Project Officer is responsible for:

(1) Monitoring Contractor performance and recommending to the Contracting Officer changes in requirements.

(2) Inspecting and accepting products/services provided under the contract.

(3) Reviewing all Contractor invoices/vouchers requesting payment for products/services provided under the contract and making recommendations for approval, disapproval, or suspension.

(c) The Project Officer is not authorized to make changes to the express terms and conditions of this contract.

[End of Clause]

## G.2 REMITTANCE ADDRESS (MAR 1987)

Remittance address is as follows:

Name: Sumitomo Heavy Industries, Ltd.

Address: Sumitomo Bank, Tokyo Main Office  
C. P. O., Box 4  
Tokyo 199-91 - Japan

[End of Clause]

## G.3 PAYMENT SCHEDULE

In consideration of the requirements set forth herein, including acceptance testing, the NRC will compensate the contractor in U.S. currency provided that the contractor submits proper invoices in accordance with the "Billing Instructions" (Attachment 1). Payment to be as follows:

Upon completion of Task 1	\$779,374
Upon completion of Tasks 2	\$2,116,348
Upon completion of Tasks 3	\$1,028,191
Upon completion of Tasks 4 & 5	\$2,356,991
Upon completion of Task 6	\$186,365

Reimbursement of all travel costs will be made in accordance with G.4 below.

Reimbursement of the consumption tax, if required, will be based upon actual costs not to exceed 3% of contract value. See Section B.3.8. herein.

(End of Clause)

## G.4 TRAVEL REIMBURSEMENT

Airfare costs shall be economy class. When economy class is not available and appropriate justification is provided, the Contracting Officer may approve airfare costs in excess of economy class. However, approval must be received in advance of such travel and all travel must be below first class.

The contractor will be reimbursed for reasonable domestic travel costs incurred directly and specifically in the performance of this contract.

The rates for foreign travel are established by the U.S. Department of State and are listed in a publication entitled "Maximum Travel Per Diem Allowances For Foreign Areas." Copies of this publication may be obtained from the U.S. Government Printing Office, Washington, D.C. USA.

(End of Clause)

## G.5 CONVERSION OF JAPANESE YEN TO UNITED STATES DOLLARS FOR PAYMENT UNDER THIS CONTRACT

NRC and SHI have agreed to a "fixed conversion rate" from Japanese yen to United States dollars for all payments under this contract.



This rate, agreed upon in advance, will ensure that sufficient funding is available throughout the life of this contract.

The fixed conversion rate is as follows:

\$1.00 equals 115 Japanese yen

All invoices will be submitted in United States dollars, using the conversion rate stated above.

(End of Clause)

## SECTION H - SPECIAL CONTRACT REQUIREMENTS

## H.1 KEY PERSONNEL (JUN 1988)

a. The following individuals are considered to be essential to the successful performance of the work hereunder:

K. Katagiri	K. Naito
T. Kobayashi	M. Tokumaru
T. Tarui	S. Iwakubo
T. Suzuki	

The Contractor agrees that such personnel shall not be removed from the contract work or replaced without compliance with paragraphs b and c hereof.

b. If one or more of the key personnel for whatever reason becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the Contractor shall immediately notify the Contracting Officer and shall, subject to the concurrence of the Contracting Officer, promptly replace such personnel with personnel of at least substantially equal ability and qualifications.

c. All requests for approval of substitutions hereunder must be in writing and provide a detailed explanation of the circumstances necessitating the proposed substitutions. They must contain a complete resume for the proposed substitute, and other information requested by the Contracting Officer to approve or disapprove the proposed substitution. The Contracting Officer will evaluate such requests and promptly notify the Contractor of his/her approval or disapproval thereof in writing.

d. If the Contracting Officer determines that:

(1) Suitable and timely replacement of key personnel who have been reassigned, terminated or have otherwise become unavailable for the contract work is not reasonably forthcoming; or

(2) That the resultant reduction of effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the Contracting Officer for default or for the convenience of the Government, as appropriate. If the Contracting Officer finds the Contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss or damage.

[End of Clause]

## H.2 PRIVATE USE OF CONTRACT INFORMATION AND DATA (JUN 1988)

Except as specifically authorized by this contract, or as otherwise approved by the Contracting Officer, information and other data developed or acquired by or furnished to the Contractor in the performance of this contract shall be used only in connection with the work under this contract.

[End of Clause]

## H.3 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST (DEC 1991)

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor:

(1) Is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract; and

(2) Does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor as defined in Section I, "Scope of Policy," paragraph C, of document entitled "NRC Organizational Conflicts of Interest" (see Section J, List of Attachments).

(c) Work for others.

(1) Notwithstanding any other provision of this contract, during the term of this contract the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization, the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe, with respect to itself or any employee, that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer prior to execution of such contractual arrangement.

(2) The contractor may not represent, assist, or otherwise support an NRC licensee or applicant undergoing an NRC audit, inspection, or review where the activities that are the subject of the audit, inspection, or review are the same as or substantially similar to the services within the scope of this contract (or task order as appropriate), except where the NRC licensee or applicant requires the contractor's support to explain or defend the contractor's prior work for the utility or other entity which NRC questions.

(3) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site, the contractor shall neither solicit nor perform work at the site or work in the same technical area for that licensee or applicant organization for a period commencing with the award of the task order or beginning of work on the site (if not a task order contract) and ending one year after completion of all work under the associated task order, or last time at the site (if not a task order contract).

(d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, it does not have any organizational conflicts of interest as defined in Section II, "Definitions," paragraph F, of the document entitled "NRC Organizational Conflicts of Interest" (see Section J, List of Attachments).

(2) The contractor agrees that, if after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(3) It is recognized that the scope of work of a task-order-type contract necessarily encompasses a broad spectrum of activities. Consequently, if this is a task-order-type contract, the contractor agrees that it will disclose all proposed new work involving NRC licensees or applicants that comes within the scope of work of the underlying contract. Such disclosure must be made before the submission of a bid or proposal to the utility or other regulated entity whenever possible, and must be received by the NRC at least 15 days before the proposed award date in any event. The disclosure must include the statement of work and any other documents that are needed to fully describe the proposed work for the regulated utility or other regulated entity. NRC may deny approval of the disclosed work only when the NRC has issued a task order which includes the technical area and, if site-specific, the site, or has plans to issue a task order which includes the technical area and, if site-specific, the site, or when such work violates (c)(3), above.

(e) Access to and use of information.

(1) If in the performance of this contract the contractor obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)) or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the Government based on the information until one year after the release of the information to the public; or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)) or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) Subject to the Nondisclosure Agreement (Attachment 6), the patent and security provisions of this contract, the contractor shall have the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in Section II, "Definitions," paragraph I, of the document entitled "NRC Organizational Conflicts of Interest" (see Section J, List of Attachments), the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms contract, contractor, and contracting officer, must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract, or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing to the contracting officer in accordance with the procedures outlined in Section VII, "Waiver," paragraph A, of the document entitled "NRC Organizational Conflicts of Interest" (see Section J, List of Attachments).

(1) Follow-on effort. The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefore (solicited or unsolicited) which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor may not perform any technical consulting, management support services work, or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of the products or services.

(1) If the contractor, under this contract, prepares a complete or essentially complete statement of work or specifications, the contractor is not eligible to perform or participate in the initial contractual effort which is based on the statement of work or specifications. The contractor may not incorporate its products or services in the statement of work or specifications unless so directed in writing by the contracting officer, in which case the restrictions in this paragraph do not apply.

(2) Nothing in this paragraph precludes the contractor from offering or selling its standard commercial items to the Government.

[End of Clause]

#### H.4 DISSEMINATION OF CONTRACT INFORMATION

The Contractor shall comply with the requirements of the attached NRC Handbook 3.8 and, if applicable, NRC Manual Chapter 3206 (See Section J for List of Attachments) regarding publications or dissemination to the public of any information, oral or written, concerning the work performed under this contract as it pertains to Section F.6, Additional Reporting Requirements, Paragraph 6. Failure to comply with this clause shall be grounds for termination of this contract.

(End of Clause)

#### H.5 DRAWINGS, DESIGNS, AND SPECIFICATIONS

Except as provided in the Non-disclosure Agreement (Attachment 6), all drawings, sketches, designs, design data, specifications, notebooks, technical and scientific data, and all photographs, negatives, reports, findings, recommendations, data and memoranda of every description relating thereto, as well as all copies of the foregoing relating to the work or any part thereto, are subject to inspection by the Commission at all reasonable times (for which inspection the proper facilities must be afforded the Commission by the Contractor and its subcontractors), are the property of the Government and may be used by the Government for any purpose whatsoever without any claim on the part of the Contractor and its subcontractors and vendors for additional

compensation and must, subject to the right of the Contractor to retain a copy of the material for its own use, be delivered to the Government, or otherwise disposed of by the Contractor either as the Contracting Officer may from time to time direct during the progress of the work or in any event as the Contracting Officer shall direct upon completion or termination of this contract. The Contractor's right of retention and use is subject to the security, patent, and use of information provisions, if any, of this contract.

(End of Clause)

#### H.6 NRC FURNISHED MATERIAL

The NRC will furnish the contractor with the Description of Design Requirements for ROSA Modifications to Simulate AP600 Phenomena, which is provided as Attachment 5.

(End of Clause)

#### H.7 SUBCONTRACTOR INFORMATION

##### Subcontracting

The Contractor shall notify the NRC Contracting Officer in writing at least 7 calendar days in advance of entering into any major or significant technical service subcontract not contained in the original proposal. "Major or significant" must be used with judgement and related to the total value of the project and/or impact on the results. This advance notification shall include but is not limited to:

1. A description of services to be called for by the subcontract;
2. Identification of the proposed subcontractor;
3. The proposed subcontract costs (in total); and
4. A statement that the proposed subcontract will not result in a real or apparent conflict of interest situation.

(End of Clause)

#### H.8 NONDISCLOSURE AGREEMENT

In addition to the provisions of Sections H.2, H.4, H.5 and any other requirements of a proprietary nature set forth under this contract, the contractor shall honor and be bound by the Nondisclosure Agreement which has been executed by the parties and is provided as Attachment 6 to this contract.

(End of Clause)

## H.9 CHOICE OF LAW

The rights and obligations of the parties to this contract shall be ascertainable by recourse to the laws of the United States of America. However, if any condition or provision of the contract is in conflict or would breach the laws, rules, statutes or regulations of Japan, or its local government, NRC shall agree that the Contractor should observe and comply with those laws, rules, statutes or regulations with the necessary modification of the Contractual conditions.

Except as provided under FAR 52.229-6, NRC shall further agree that the Contractor shall make tax return at the Japanese taxation authorities to fulfill the obligations for tax payment under the Laws of Japan.

(End of Clause)

## H.10 OBJECTIVE OF GUARANTEE AND WARRANTY AND CONTRACT FINALIZATION

The Contractor shall not be responsible for guaranteeing system function at the ROSA facility nor performance of the ROSA facility, but shall be only responsible for any mechanical and instrumental defects in the components, electricals, instruments or devices to be supplied by the Contractor under the Contract ("Defects") which may be detected during the period of warranty, one (1) year after the Acceptance and the completion of all Tasks 1, 2, 3, 4, 5, and 6, under the Contract ("Acceptance"). Upon the final acceptance by the NRC, the NRC shall issue the Acceptance Certificate to the Contractor. Upon the Acceptance, all the responsibilities, liability and obligations of the Contractor, save those for the one (1) year warranty period, under the contract shall be deemed to have been fulfilled. The one year warranty period shall become effective upon completion of contract performance and final NRC acceptance.

(End of Clause)

## H.11 RESPONSIBILITIES OF THE OWNER (NRC)

Notwithstanding the foregoing provisions, NRC shall, as required by the contract, be responsible for the following matters:

- (1) Payments of the contract amount due to the contractor to which any additions or reductions may be made by reason of the modification of the contract, variation orders, or arrears within the period set forth herein against the invoices presented by the Contractor.
- (2) Granting approvals of drawings, data, lists to be submitted by the Contractor within fourteen (14) calendar days after NRC receipt of request of the Contractor, or other period set forth under the contract.



- (3) Timely instructions or orders to the contractor, which may be necessary for the implementation of the project under the contract.

(End of Clause)

H.12 CONTRACTOR ACQUIRED GOVERNMENT EQUIPMENT/PROPERTY  
(JUN 1988)

The contractor is authorized to acquire and/or fabricate the equipment/property, specified under the applicable tasks of Section C, for use in the performance of this contract. This equipment/property is subject to the provisions of the "Government Property" clause.

(End of Clause)

## PART II - CONTRACT CLAUSES

## SECTION I - CONTRACT CLAUSES

## I.1 52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

## I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

NUMBER	TITLE	DATE
52.202-1	DEFINITIONS	SEP 1991
52.203-1	OFFICIALS NOT TO BENEFIT	APR 1984
52.203-3	GRATUITIES	APR 1984
52.203-5	COVENANT AGAINST CONTINGENT FEES	APR 1984
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT	JUL 1985
52.203-7	ANTI-KICKBACK PROCEDURES	OCT 1988
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	JAN 1990
52.209-6	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	NOV 1992
52.215-1	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL	FEB 1993
52.215-2	AUDIT - NEGOTIATION	FEB 1993
52.215-22	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA	JAN 1991
52.215-24	SUBCONTRACTOR COST OR PRICING DATA	DEC 1991
52.215-31	WAIVER OF FACILITIES CAPITAL COST OF MONEY	SEP 1987
52.215-33	ORDER OF PRECEDENCE	JAN 1986
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES	APR 1984
52.225-11	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES	MAY 1992
52.225-14	INCONSISTENCY BETWEEN ENGLISH VERSION AND TRANSLATION OF CONTRACT	AUG 1989
52.229-6	TAXES - FOREIGN FIXED-PRICE CONTRACTS	JAN 1991
52.232-1	PAYMENTS	APR 1984
52.232-8	DISCOUNTS FOR PROMPT PAYMENT	APR 1989
52.232-11	EXTRAS	APR 1984
52.232-23	ASSIGNMENT OF CLAIMS	JAN 1986

52.232-25	PROMPT PAYMENT	SEP 1992
52.232-28	ELECTRONIC FUNDS TRANSFER PAYMENT METHODS	APR 1989
52.233-3	PROTEST AFTER AWARD	AUG 1989
52.242-13	BANKRUPTCY	APR 1991
52.243-1	CHANGES - FIXED-PRICE Alternate I (APR 1984)	AUG 1987
52.244-1	SUBCONTRACTS (FIXED-PRICE CONTRACTS)	APR 1991
52.244-5	COMPETITION IN SUBCONTRACTING	APR 1984
52.245-18	SPECIAL TEST EQUIPMENT	FEB 1993
52.246-25	LIMITATION OF LIABILITY - SERVICES	APR 1984
52.247-63	PREFERENCE FOR U.S.-FLAG AIR CARRIERS	APR 1984
52.249-4	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (SERVICES) (SHORT FORM)	APR 1984
52.249-8	DEFAULT (FIXED-PRICE SUPPLY AND SERVICE)	APR 1984
52.233-1	DISPUTES - Alternate I	DEC 1991
52.227-16	ADDITIONAL DATA REQUIREMENTS	JUN 1987

[End of Clause]

I.2 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL  
OR IMPROPER ACTIVITY (SEP 1990)

(a) The Government, at its election, may reduce the price of a fixed-price type contract or contract modification and the total cost and fee under a cost-type contract or contract modification by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or his or her designee determines that there was a violation of subsection 27(a) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in the FAR.

In the case of a contract modification, the fee subject to reduction is the fee specified in the particular contract modification at the time of execution, except as provided in subparagraph (b)(5) of this clause.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(1) The base fee established in the contract at the time of contract award;

(11) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(1) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(11) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts or contract modifications, by 10 percent of the initial contract price; 10 percent of the contract modification price; or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award or modification.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

[End of Clause]

### I.3 52.227-23 RIGHTS TO PROPOSAL DATA (TECHNICAL) (JUN 1987)

Except for data contained on pages \_\_\_\_\_, it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the Rights in Data--General clause contained in this contract) in and to the technical data contained in the proposal dated \_\_\_\_\_, upon which this contract is based.

[End of Clause]

I.4 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS)  
(DEC 1989)

(a) Government-furnished property. (1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for property furnished "as-is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property. (1) The Contracting Officer may, by written notice, (i) decrease the Government-furnished property provided or to be provided under this contract, or (ii) substitute other Government-furnished property for the property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or

(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property. (1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall Government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(1) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and

(ii) Title to all other material shall pass to and vest in the Government upon--

(A) Issuance of the material for use in contract performance;

(B) Commencement of processing of the material or its use in contract performance; or

(C) Reimbursement of the cost of the material by the Government, whichever occurs first.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property administration. (1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause.

When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

(1) Any delay in delivery of Government-furnished property;

(2) Delivery of Government-furnished property in a condition not suitable for its intended use;

(3) A decrease in or substitution of Government-furnished property; or

(4) Failure to repair or replace Government property for which

the Government is responsible.

(i) Final accounting and disposition of Government property. Upon completing this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property (including any resulting scrap) not consumed in performing this contract or delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as the Contracting Officer directs.

(j) Abandonment and restoration of Contractor's premises. Unless otherwise provided herein, the Government--

(1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and

(2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or upon contract completion). However, if the Government-furnished property (listed in the Schedule or specifications) is withdrawn or is unsuitable for the intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside of the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

[End of Clause]

NOTE: All equipment under this contract to which the Government retains title will be installed in the Japan Atomic Energy Research Institute's ROSA AP600 facility in Tokai, Japan.

The disposition of this equipment, including the U.S. Government's right to abandon such equipment, will be governed by the terms of the NRC/JAERI International Agreement which is NOT a part of this contract.



I.5 52.246-19 WARRANTY OF SYSTEMS AND EQUIPMENT UNDER  
PERFORMANCE SPECIFICATIONS OR DESIGN CRITERIA  
(DEC 1989)

(a) Definitions. "Acceptance," as used in this clause, means the act of an authorized representative of the Government by which the Government assumes for itself, or as an agent of another, ownership of existing and identified supplies, or approves specific services rendered, as partial or complete performance of the contract.

"Correction," as used in this clause, means the elimination of a defect.

"Defect," as used in this clause, means any condition or characteristic in any supplies or services furnished by the Contractor under the contract that is not in compliance with the requirements of the contract.

"Supplies," as used in this clause, means the end items furnished by the Contractor and related services required under this contract. Except when this contract includes the clause entitled Warranty of Data, supplies also means "data."

(b) Contractor's obligations. (1) The Contractor's warranties under this clause shall apply only to those defects discovered by either the Government or the Contractor as specified herein.

(2) If the Contractor becomes aware at any time before acceptance by the Government (whether before or after tender to the Government) that a defect exists in any supplies or services, the Contractor shall (i) promptly correct the defect or (ii) promptly notify the Contracting Officer, in writing, of the defect, using the same procedures prescribed in paragraph (b)(3) of this clause.

(3) If the Contracting Officer determines that a defect exists in any of the supplies or services accepted by the Government under this contract, the Contracting Officer shall promptly notify the Contractor of the defect, in writing as specified herein. Upon timely notification of the existence of a defect, or if the Contractor independently discovers a defect in accepted supplies or services, the Contractor shall submit to the Contracting Officer, in writing, as specified herein, a recommendation for corrective actions, together with supporting information in sufficient detail for the Contracting Officer to determine what corrective action, if any, shall be undertaken.

(4) The Contractor shall promptly comply with any timely written direction from the Contracting Officer to correct or partially correct a defect, at no increase in the contract price.

(5) The Contractor shall also prepare and furnish to the Contracting Officer data and reports applicable to any correction required under this clause (including revision and updating of all

other affected data called for under this contract) at no increase in the contract price.

(6) In the event of timely notice of a decision not to correct or only to partially correct, the Contractor shall submit a technical and cost proposal to amend the contract to permit acceptance of the affected supplies or services in accordance with the revised requirement, and an equitable reduction in the contract price shall promptly be negotiated by the parties and be reflected in a supplemental agreement to this contract.

(7) Any supplies or parts thereof corrected or furnished in replacement and any services reperformed shall also be subject to the conditions of this clause to the same extent as supplies or services initially accepted. The warranty, with respect to these supplies, parts, or services, shall be equal in duration to that set forth in paragraph (b)(1) of this clause, and shall run from the date of delivery of the corrected or replaced supplies.

(8) The Contractor shall not be responsible under this clause for the correction of defects in Government-furnished property, except for defects in installation, unless the Contractor performs, or is obligated to perform, any modifications or other work on such property. In that event, the Contractor shall be responsible for correction of defects that result from the modifications or other work.

(9) If the Government returns supplies to the Contractor for correction or replacement under this clause, the Contractor shall be liable for transportation charges up to an amount equal to the cost of transportation by the usual commercial method of shipment from the place of delivery specified in this contract (irrespective of the f.o.b point or the point of acceptance) to the Contractor's plant and return to the place of delivery specified in the contract. The Contractor shall also bear the responsibility for the supplies while in transit.

(10) All implied warranties of merchantability and "fitness for a particular purpose" are excluded from any obligation under this contract.

(c) Remedies available to the Government. (1) The rights and remedies of the Government provided in this clause--

(1) Shall not be affected in any way by any terms or conditions of this contract concerning the conclusiveness of inspection and acceptance; and

(11) Are in addition to, and do not limit, any rights afforded to the Government by any other clause of this contract.

(2) As specified herein after receipt of the Contractor's recommendations for corrective action and adequate supporting information, the Contracting Officer, using sole discretion, shall give the Contractor written notice not to correct any defect, or

to correct or partially correct any defect within a reasonable time as specified herein.

(3) In no event shall the Government be responsible for any extension or delays in the scheduled deliveries or periods of performance under this contract as a result of the Contractor's obligations to correct defects, nor shall there be any adjustment of the delivery schedule or period of performance as a result of the correction of defects unless provided by a supplemental agreement with adequate consideration.

(4) This clause shall not be construed as obligating the Government to increase the contract price.

(5) (1) The Contracting Officer shall give the Contractor a written notice specifying any failure or refusal of the Contractor to--

(A) Present a detailed recommendation for corrective action as required by paragraph (b)(3) of this clause;

(B) Correct defects as directed under paragraph (b)(4) of this clause; or

(C) Prepare and furnish data and reports as required by paragraph (b)(5) of this clause.

(ii) The notice shall specify a period of time following receipt of the notice by the Contractor in which the Contractor must remedy the failure or refusal specified in the notice.

(6) If the Contractor does not comply with the Contracting Officer's written notice in paragraph (c)(5)(i) of this clause, the Contracting Officer may by contract or otherwise--

(i) Obtain detailed recommendations for corrective action and either--

(A) Correct the supplies or services; or

(B) Replace the supplies or services, and if the Contractor fails to furnish timely disposition instructions, the Contracting Officer may dispose of the nonconforming supplies for the Contractor's account in a reasonable manner, in which case the Government is entitled to reimbursement from the Contractor, or from the proceeds, for the reasonable expenses of care and disposition, as well as for excess costs incurred or to be incurred;

(ii) Obtain applicable data and reports; and

(iii) Charge the Contractor for the costs incurred by the Government.

[End of Clause]

## PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

## SECTION J - LIST OF ATTACHMENTS

## J.1 ATTACHMENTS (MAR 1987)

<u>Attachment Number</u>	<u>Title</u>
1	Billing Instructions
2	NRC Contractor Organizational Conflicts of Interest
3	NRC Handbook 3.8
4	Publishing Documents in the NUREG Series, NUREG-0650, Revision 1
5	Description of Design Requirements for ROSA Modifications to Simulate AP600
6	Fully Executed Nondisclosure Agreement dated 3/16/93
7	NRC Manual Chapter 3206
8	ROSA AP600 Acceptance Criteria

# AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1.1 CONTRACT CODE PAGE OF PAGES  
1 4

2. AMENDMENT/MODIFICATION NO. Four (4)  
3. EFFECTIVE DATE JUN 25 1992  
4. REQUISITION/PURCHASE RE. NO.  
5. PROJECT NO. (if applicable)

6. ISSUED BY CODE US Nuclear Regulatory Commission  
Division of Contracts & Property Management  
Washington, DC 20555  
7. ADMINISTERED BY (if other than item 6) CODE US Nuclear Regulatory Commission  
Division of Contracts & Property Management  
Contract Administration Branch, P-902  
Washington, DC 20555

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  
Sumitomo Heavy Industries, Ltd.  
Plant and Engineering Division  
International Operations  
Mitoshiro-cho 1, Kanda Chiyoda-Ku  
Tokyo, JAPAN  
Principal Investigator/Technical  
Contact: Mr. Hiroshi Ochi, Manager  
Telephone No. (81) 3-3233-9421  
9A. AMENDMENT OF SOLICITATION NO.  
9B. DATED (SEE ITEM 11)  
10A. MODIFICATION OF CONTRACT/ORDER NO. X NRC-04-93-057  
10B. DATED (SEE ITEM 13) 11/13/92  
CODE FACILITY CODE \*

### 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
(a) By completing items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)  
N/A

### 13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.  
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation acct, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(D).  
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:  
D. OTHER (Specify type of modification and authority) X FAR 52.243-1 (Alternate 1) and by mutual agreement of the parties.

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 3 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  
The purpose of this modification is as specified on the following pages.  
This is a no cost modification.

EXCEPT AS PROVIDED HEREIN, ALL TERMS AND CONDITIONS OF THE DOCUMENT REFERENCED IN ITEM 9A OR 10A, AS HERETOFORE CHANGED, REMAINS UNCHANGED AND IN FULL FORCE AND EFFECT.

15A. NAME AND TITLE OF SIGNER (Type or print) M. Inoue Manager Nuclear Business Development Division Sales Dept.  
15B. CONTRACTOR/OFFEROR  
15C. DATE SIGNED 7 1 '92  
15A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Mary H. Mace  
15B. UNITED STATES OF AMERICA  
15C. DATE SIGNED 1-7-94

Revisions to this contract are as follows:

- Task 1: Detailed Design Drawings: The proposed revisions to this Task are hereby accepted and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J.
- Task 2: Fabrication and Delivery of Components and Hardware: The proposed revisions to this Task are acceptable and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J.
- Task 3: Fabrication, Delivery, and Calibration of Instrumentation and Controls: The proposed revisions to this Task are hereby accepted and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J. However, for purposes of English clarification the sentence after the instrument table shall read as follows:

"Completion of this task is defined as fabrication and/or procurement of principal instruments and control devices that conform to the description in the drawings under Task 1, calibration of all instrumentation in accordance with the approved calibration plan, and its delivery to destination, as confirmed in writing by the contractor and accepted by the NRC Project Officer or NRC Resident Engineer."

Tasks 2 and 3 should be directed to the main components with the understanding that miscellaneous components such as pipes, fittings, cables, and connectors shall be delivered to the ROSA facility site (at a later mutually agreed upon time) for installation of main components.

It is mutually agreed that the following note shall be inserted at the end of Task 3:

"Note: For completion of Tasks 4 and 5 hereunder, the contractor shall be responsible for fabrication and/or procurement and timely delivery of all materials for Tasks 2 and 3 other than the principal components, instruments and control devices specified under Tasks 2 and 3."

- Task 4: Modification of ROSA Support Structures: The proposed revisions to this Task are hereby accepted and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J.
- Task 5: Installation: The proposed revisions to this Task are hereby accepted and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J.
- Task 6: Facility Inspection and Acceptance Testing: Is hereby revised to read as follows:
- "The contractor shall perform quality assurance inspections of facility modifications, limited facility characterization testing, and acceptance testing by December 30, 1993. The contractor shall prepare and submit for NRC approval a plan and procedures for inspection and tests by September 30, 1993."
- "Inspection and tests shall be performed in accordance with the approved plan and procedures."
- C.7. New Components: Items 2, 4, 11, 12, and 15—The proposed revisions to these Items are hereby accepted and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract under Section J as Attachment 10.
- Item 3. The proposed revision is hereby accepted and is in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract under Section J as Attachment 10. However, the English is improved to read:
- "Each line shall include a remotely operated isolation valve, which is controlled to open on low pressurizer pressure and low pressurizer level. Elevations shall be preserved as practicable as possible."
- C.8 Instrumentation: Items 2, 4, 10, 12, and 14—The proposed revisions to these Items are hereby acceptable and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract under Section J as Attachment 10.

F.6 Additional Reporting Requirements: Items 1, 4 and 5-- The proposed revisions to this requirement are hereby acceptable and are in accordance with SHI's letter dated 4/30/93 which is incorporated into this contract as Attachment 10 under Section J.

Item 3. This Item is revised to incorporate the following:  
"Provide a work plan for final facility inspection, limited facility characterization testing, and acceptance testing. Due 9/30/93."

Item 6. Is revised to incorporate the following: "Provide a report on instrumentation calibration, limited facility characterization testing and acceptance testing, and certifying the facility has been constructed and checked out."

J.1 Attachments: Is hereby revised as follows:

Attachment 5, "Description of Design Requirements for ROSA Modifications to Simulate AP600 (Rev. September 1992) is hereby deleted and substituted herewith Attachment 5, "Description of Design Requirements for ROSA Modifications to Simulate AP600 (Rev. May 24, 1992).

Additionally, Attachment 9, "Contractor's Technical Description is incorporated herewith into the contract.

NOTE: Wherever Attachment 5 is referred to in the contract, shall mean Attachment 5 and Attachment 9. Any discrepancies between those Attachments shall be mutually agreed upon.

#### ROSA/AP600 Acceptance Criteria

The last paragraph is revised to read, "Some of these inspections will be performed as the modifications are being done and the instruments installed; some will necessarily be performed during the limited system characterization testing."

H.1 Key Personnel is revised to delete "S. Iwakubo" and substitute "K. Hirata"



52.215-31 Waiver of Facilities Capital Cost of Money.

As prescribed in 15.904(b), insert the following clause:

WAIVER OF FACILITIES CAPITAL COST OF MONEY (SEP 1987)

The Contractor did not include facilities capital cost of money as a proposed cost of this contract. Therefore, it is an unallowable cost under this contract.

(End of clause)

52.203-12 Limitation on Payments to Influence Certain Federal Transactions.

As prescribed in 3.808, insert the following clause:

LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS  
(JAN 1990)

(a) Definitions.

'Agency,' as used in this clause, means executive agency as defined in 2.101.

'Covered Federal action,' as used in this clause, means any of the following Federal actions:

- (a) The awarding of any Federal contract.
- (b) The making of any Federal grant.
- (c) The making of any Federal loan.
- (d) The entering into of any cooperative agreement.
- (e) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

'Indian tribe' and 'tribal organization,' as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C.450B) and include Alaskan Natives.

'Influencing or attempting to influence,' as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

'Local government,' as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

'Officer or employee of an agency,' as used in this clause, includes the following individuals who are employed by an agency:

- (a) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.
- (b) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.
- (c) A special Government employee, as defined in section 202, title 18, United States Code.
- (d) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

'Person,' as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

'Reasonable compensation,' as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

'Reasonable payment,' as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

'Recipient,' as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

'Regularly employed,' as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

'State,' as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific

solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, 'professional and technical services' shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer

that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the Preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(c) Disclosure.

(1) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(2) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(i) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(ii) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(iii) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(3) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.

(4) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(d) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(e) Penalties.

(1) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause

shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

(End of clause)



◆ Sumitomo Heavy Industries, Ltd.

1, KANDA MITOSHIRO-CHO, CHIYODA-KU,  
TOKYO 101, JAPAN  
Cable Ad: SUMIUKI TOKYO TLX: J24580 (AAB SUMIUKA)  
TEL. 03-3233- FAX. 03-3233-

TOKYO 30th April, 1993

Ref.No. PES/JA2042

Nuclear Regulatory Research  
Washington D.C. 20555  
USA

ATTACHMENT 10  
TO M004

Attention : Ms. Mary H. Mace, Contracting Officer  
Division of Contract and Property Management  
Office of Administration  
Fax No. 01-301-492-9065

Attention : Dr. Louis M. Shotkin, Chief NL/N-353  
Reactor & Plant System Branch  
Division of Systems Research  
Office of Nuclear Regulatory Research  
Fax No. 01-301-492-3585

Copy to : Japan Atomic Energy Reserch Institute  
Dr. Y. Kukita  
Department of Reactor Sfety Reserch

Dear sirs,

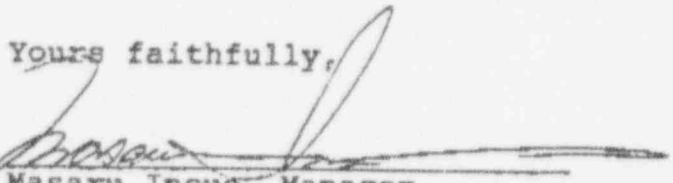
Subject : Contract No. NRC-04-93-057, Modification No. 3

Reference : AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT  
NO. NRC-04-93-057, EFFECTIVE DATE 3/23/93

Reference is made to AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT No. NRC-01-93-057. EFFECTIVE DATED 3/23/93 ("the Amendment") that is duly signed and transmitted by our fax No. PES/JA2041 dated 16th April 1993, we would request you to incorporate agreed final specification into your official form after your review and to give us unknown FAR Clauses, whose details are mentioned in the attached documents.

We will send to you our technical description as Attachment 9 by courier which reflects requirements made by NRC as of March 12, 1993.

We look forward to receiving your revised official request for contract soon.

Yours faithfully,  


Masaru Inoue, Manager  
Nuclear Business Development Division  
Sales Department



4I. Amendment on Technical Matters

SECTION C - DESCRIPTION/SPECIFICATION/WORK STATEMENT

C.6 SPECIFIC TASKS

Task 1. Detailed Design Drawings

"The drawings for the entire facility modification shall be completed by April 10, 1993" shall read,  
"The drawings for the entire facility modification shall be completed by July 31, 1993"

"Acceptance of individual drawings will be by signature of the NRC Project Officer. Completion of this task is defined as acceptance of all drawings necessary for fabrication and/or procurement of material specified under C.7 and C.8, as further described Attachment 5." shall read,  
"Completion of this task is defined as acceptance of all drawings for approval stated in Document Status List necessary for fabrication and/or procurement of material specified under C.7 and C.8 as further described in Attachment 5. & 9."

Task 2.

"Delivery of components, other hardware and the fabrication of all components shall be completed by August 31, 1993. Provide written confirmation upon completion of this task by September 2, 1993." shall read,  
"Delivery of principal components listed below shall be completed by September 15, 1993. Provide written confirmation upon completion of this task by September 17, 1993."

Principal Components

*Core Makeup Tanks	2 Units
*Pressurizer	1 Units
*Passive Residual Heat Removal System	1 Unit
*IRWST	1 Unit
*Catch Tank	2 Units"

"Completion of this task is defined as fabrication and/or procurement of components and hardware that conform to the description in the drawings under Task 1, as confirmed in writing by contractor and accepted by the NRC Project Officer" shall read,

"Completion of this task is defined as fabricator and/or procurement of the principal components that conform to the description in the destination, as confirmed in writing by the contractor and accepted by the NRC Project Officer or NRC resident engineer."

Task 3.

"All instruments and control devices shall also be acquired and delivered by August 31, 1993. Provide written confirmation upon completion of this task by September 2, 1993." shall read,  
"All principal instruments and control devices listed below shall be acquired and delivered by October 31, 1993. Provide written confirmation upon completion of this task by November 2, 1993.

Principal Instruments and Control Devices

*Pressure Transmitter	All Units
*DP Transmitter	All Units
*Thermocouples	All Units
*Flow meter	All Units
*Heater for Pressurizer	1 Unit"

"Completion of this task is defined as fabrication and/or procurement of all material that conforms to the description in the drawings under Task 1 and calibration of all instrumentation in accordance with the approved calibration plan, as confirmed in writing by the contractor and accepted by the NRC Project Officer." shall read,  
"Completion of this task is defined as fabrication and/or procurement of principal instrumentations and control devices that conforms to the description in the drawings under Task 1, calibration of all instrumentation plan in accordance with the approved calibration and its delivery to destination, as confirmed in writing by the contractor and accepted by the NRC Project Officer or NRC resident engineer."

We exclude some hardware, components, instrumentation materials, such as pipe, fittings, cables, connectors, etc. from definition of completion of task 2 & 3 as proposed above since those are needed only during the period of site modification & installation work, rather early delivery of the same is likely to create material handling/control problems. We, certainly, procure and deliver those to the site in timely manner as required under the contract.

We, therefore, propose to insert the note as follows at the end of article Task 3, if you consider it necessary.

"Note: The contractor shall be responsible for fabrication and/or procurement and delivery of all materials for Task 2 & 3 other than principal components and instruments and control devices stated in Task 2 & 3 in timely manner to complete Task 4 & 5.

Task 4.

"This Task shall be completed by November 15, 1993." shall read,

"This Task shall be completed by December 20, 1993"

Insert the following sentence at the last of Task 4.

"The NRC Project Officer, based on recommendation from the NRC Resident Engineer and JAERI personnel, as appropriate, will provide written acceptance of completed work under this task."

Task 5.

"In accordance with the NRC-approved drawings and design specification and drawings, the contractor shall install all components and other hardware, including instrumentation and controls, by November 15, 1993.: shall read,

"In accordance with the NRC-approved drawings and design specification and drawings, the contractor shall install all components and other hardware, including instrumentation and controls, by December 20, 1993."

Task 6.

"The contractor shall perform quality assurance inspection of facility modifications, and facility characterization and acceptance testing, by December 30, 1993. The contractor shall prepare and submit for NRC approval a plan and produces for inspection and test by August 1993." shall read,

"The contractor shall perform quality assurance inspections of facility modifications and acceptance testing, by December 30, 1993. The contractor shall prepare for inspection and test by September 30, 1993."

"Inspection and shakedown testing will be performed in accordance with the approved plan and procedures." shall read,

"Inspection will be performed in accordance with the approved plan and procedures."

C.7 NEW COMPONENTS

ITEM 2.

"Elevations shall be preserved.(two trains)" shall read,  
"Elevations shall be preserved as practicable as possible.  
(two trains)"

ITEM 3.

"Each line shall include a check valve and a remote operated isolation valve, which is controlled to open on low pressurizer pressure valve and low pressurizer level. Elevations shall be preserved." shall read,  
"Each line shall include a remote operated isolation valve, which is controlled to open on low pressurizer pressure valve, and low pressurizer level. Elevations shall be preserved as practicable as possible."

ITEM 4.

"CMT header joining the pressurizer pressure balance line and the cold leg pressure balance line to the top of the CMT, and a allowing purging of condensate from the pressurizer pressure balance line. (two trains)" shall read,  
"CMT header joining the pressurizer pressure balance line and the cold leg pressure balance line to the top of the CMT."

ITEM 11.

"ADS stages 1, 2, and 3 to connect from top pressurizer to catch tank." shall read,  
"ADS stages 1, 2, and 3 to connect from top of pressurizer to catch tank (IRWST)."

The following sentences shall be deleted:  
"Stage 2 consists of two 4-inch valves in AP600. Stage 2 consists of two 8-inch valves. Stage 3 consists of 8-inch valves."

ITEM 12.

"Stage 4 consists of two 12-inch valves in AP600." shall be deleted.

ITEM 15.

"Reduced cold leg loop seal to minimum readily achievable size (1.2meter)." shall read,  
"Reduced cold leg loop seal to minimum readily achievable size."

C.8 INSTRUMENTATION

ITEM 2.

"Pressurizer pressure balance line: pressure, differential pressure, flow, fluid temperature." shall read,  
"Pressurizer pressure balance line: differential pressure, flow, fluid temperature."

ITEM 4.

"CMT header: differential pressure, fluid and wall temperature." shall read,  
"CMT header: differential pressure, fluid temperature."

ITEM 10.

"IRWST: pressure, differential pressure, fluid temperature." shall read,  
"IRWST: differential pressure, fluid temperature."

ITEM 12.

"ADS stage 4: pressure, differential pressure, fluid temperature, density, mass flow (catch tank differential pressure)." shall read,  
"ADS stage 4: differential pressure, fluid temperature, density, mass flow (catch tank differential pressure)."

ITEM 14.

"Surge Line: pressure, differential pressure, fluid temperature, density, flow, wall temperature." shall read,  
"Surge line: differential pressure, fluid temperature, density, flow, wall temperature."

SECTION F - DELIVERIES OR PERFORMANCE

F.2 PREPARATION OF TECHNICAL REPORTS (JUN1991)

We would request you to inform us of the content which shall be integrated in and to send us the sample of "Contractor Spending Plan(CSP)" and "Financial Status Report"

F.6. ADDITIONAL REPORTING REQUIREMENTS

ITEM 1.

"Provide final design report of Task 1, including all drawings on detailed facility design and instrumentation layout. Due 4/10/93." shall read,  
"Provide final design report of Task 1, including all drawings on detailed facility design and instrumentation layout. Due 7/31/93."

ITEM 3.

"Provide a work plan for final facility inspection, characterization, and acceptance testing. Due 8/1/93." shall read,  
"Provide a work plan for final facility inspection and acceptance testing. Due 9/30/93."

ITEM 4.

"Provide status report, in letter form, upon completion of Task 2 and 3 (except for in-situ calibration of instruments) Due 9/2/93" shall read,  
"Provide status report, in letter form, upon completion of Task 2 and 3 (except for in-situ calibration of instruments) Due 9/17/93 and 11/2/93 respectively."

ITEM 5.

"Provide status report, in letter form, upon completion of Task 4 and 5. Due 11/30/93." shall read,  
"Provide status report, in letter form, upon completion of Task 4 and 5. Due 12/22/93."

ITEM 6.

"Provide a report on instrumentation calibration, facility characterization, and acceptance testing and certifying the facility has been constructed and checked out." shall read,  
"Provide a report on instrumentation calibration and acceptance testing and certifying the facility has been constructed and checked out."

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.1. KEY PERSONNEL

" S.Iwakubo" shall read "K.Hirata"

PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

J.1 ATTACHMENTS (MAR 1987)

We would request you to send us one set of Attachment Number 4 Title "Publishing Documents in NUREG Series, NUREG-0650, Revision 1"

Our "Contractor's Technical Description" dated 30th April 1993 shall be added as Attachment Number 9 and it will supersede your Attachment Number 5 Title "Description of Design Requirements for ROSA Modification to Simulate AP600" since some description of such Attachment 5 is obsolete. Accordingly, description in your contract of "Attachment 5" shall be amended as "Attachment 5 and 9" everywhere in your request for proposal.

However, if such amendment is inconvenient for you, we shall have no objection to accept your description of design requirements duly amended based on our technical description above.

# ROSA/AP600 ACCEPTANCE CRITERIA

The last paragraph of DRAFT FOR REVIEW - 03/03/93-1 shall be amended as follows.

"Some of these inspections will be performed as the modifications are being done and the instruments installed; some will necessarily be performed during the system characterization testing." shall read,  
"Some of these inspections will be performed as the modification are being done and the instruments installed; some sill be necessarily be performed."



II. FAR CLAUSES

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.1 52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN1988)

We would request you to inform us of the full text of the following FAR Clauses as newly added to your contract.

52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN  
FEDERAL TRANSACTIONS JAN 1990

52.215-31 WAIVER OF FACILITIES CAPITAL COST OF MONEY SEP  
1987

- OVER -



AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES 1   3
2. AMENDMENT/MODIFICATION NO. Five (5)	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO. RES-93-057 dtd 8/27/93	5. PROJECT NO. (if applicable)
ISSUED BY	CODE	7. ADMINISTERED BY (if other than Item 6)	CODE

S. Nuclear Regulatory Commission  
Division of Contracts & Property Management, P-902  
Washington, DC 20555

NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Sumitomo Heavy Industries, Ltd. Attn: Mr. M. Inoue, Manager Nuclear Business Development Division 1, Kanda Mitoshiro-cho, Chiyoda-ku, Tokyo 101, Japan Principal Investigator/Technical Contact: J. Katagiri Telephone No. ( )	6A. AMENDMENT OF SOLICITATION NO.
	9A. DATED (SEE ITEM 11)
	10A. MODIFICATION OF CONTRACT/ORDER NO. X NRC-04-93-057
	10B. DATED (SEE ITEM 11) 11/13/92

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS  
The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
(a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

ACCOUNTING AND APPROPRIATION DATA (if required)  
S&R No.: 36019201100 Job Code: L2550 APPN No.: 31X0200.360 BOC: 2542 AMOUNT OBLIGATED: \$17,200.00

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation doc, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.163(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)  
FAR 52.243-1 CHANGES - FIXED PRICE (AUG 1987) ALTERNATE I (APR 1984)

IMPORTANT: Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.

DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible)

SEE ATTACHED

Document ID# RES-C93-203

15A. NAME AND TITLE OF SIGNER (Type or print) Masaru Inoue, Manager Nuclear Business Development Div. Sales Dept.	15B. CONTRACTOR/OFFEROR <i>(Signature)</i>	15C. DATE SIGNED SEP 30 1993	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Joyce A. Fields, Contracting Officer	16B. UNITED STATES OF AMERICA BY <i>(Signature of Contracting Officer)</i>	16C. DATE SIGNED SEP 28 1993
---	---	---------------------------------	--	---	---------------------------------

Except as provided herein, all terms and conditions of the document referenced in Items 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

The purpose of this modification is to: (1) increase the fixed price amount of this contract by \$17,200.00 from \$6,467,269.00 to \$6,484,469.00 and increase the cost reimbursement amount by \$516.00 from \$196,035.00 to \$196,551.00, (2) provide funding in the amount of \$17,200.00 for the firm fixed price portion of this contract and (3) provide for a within scope change in accordance with the contractor's proposal dated September 9, 1993 for the design change to 2 CMT Spargers. Accordingly, the contract is hereby modified as follows:

1.) Section B.2 SUPPLIES OR SERVICES AND PRICES/COSTS item 1 is modified to reflect an increase of Y18,060,000 in yen and \$17,200.00 in dollars and item 8 is will reflect an increase of Y54,180 in yen and \$516.00 in dollars:

Item No.	Description	Qty.	Unit	Amount (Yen)	Amount (Dollar)
1.	Detailed design drawings	1	Lot	Y91,434,000	\$186,365.00

TOTAL FIXED PRICE AMOUNT: \$6,484,469.00

8.	Reimbursable Consumption Tax Not to Exceed 3% of Contract Value**	N/A		Y22,598,180	\$247,635.00
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TOTAL ESTIMATED REIMBURSABLE COSTS: \$314,913.00

The above modifications to the pricing schedule is based on 115 Japanese yen to \$1.05. Pricing arrangements prior to this modification were based on 115 Japanese yen to \$1.00.

2.) Section B.4 CONSIDERATION AND OBLIGATION—FIRM FIXED PRICE (JUN 1988) is deleted in its entirety and replaced with the following:

The firm fixed price of this contract is \$6,484,469.00.

3.) Section B.6 CONSIDERATION AND OBLIGATION—COST REIMBURSEMENT (JUN 1988) is deleted in its entirety and replaced with the following:

a. The total estimated cost to the Government for Japanese Consumption Taxes under this contract is \$196,551.00.

b. The amount obligated by the Government with respect to this contract is \$0.00.

4.) In accordance with Section C.6 SPECIFIC TASKS, Task 1. "Detailed Design Drawings" the contractor will provide a design change in the steam flow inlet to the 2 CMT Spargers as proposed in the contractor's proposal dated September 9, 1993.

A summary of obligations for this contract, from award through the date of this action is given below:

Total FY93 Obligation Amount \$6,551,747.00

Cumulative total of NRC obligations \$6,551,747.00

This modification obligates \$17,200.00 in FY93 funds.

All other terms and conditions including the ceiling amount of \$6,747,782.00.

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>			1. CONTRACT ID CODE	PAGE OF PAGES 1   2
2. AMENDMENT/MODIFICATION NO. <b>Six (6)</b>	3. EFFECTIVE DATE <b>"JAN" 07, 1994</b>	4. REQUISITION/PURCHASE REQ. NO. <b>RES-93-057 dtd 12/22/93</b>	5. PROJECT NO. (if applicable)	
6. ISSUED BY <b>U.S. Nuclear Regulatory Commission Division of Contracts &amp; Property Management Washington, DC 20555</b>		7. ADMINISTERED BY (if other than Item 6)		

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) <b>Sumitomo Heavy Industries, Ltd. Attn: Mr. M. Inoue, Manager Nuclear Business Development Division 1, Kanda Mitoshiro-cho, Chiyoda-ku Tokyo 101, Japan Principal Investigator/Technical Contact: J. Katagiri Telephone No. ( )</b>		9. SA. AMENDMENT OF SOLICITATION NO.
CODE		10. DATED (SEE ITEM 11)
FACILITY CODE		10A. MODIFICATION OF CONTRACT/ORDER NO. <b>X NRC-04-93-057</b>
		10B. DATED (SEE ITEM 11) <b>11/13/92</b>

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

11. ACCOUNTING AND APPROPRIATION DATA (if required)  
**N/A**

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO (specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (specify type of modification and authority)

**X FAR 52.243-1 CHANGES- FIXED PRICE (AUG 1987) ALTERNATE I (APR 1984)**

**E. IMPORTANT:** Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.

**F. DESCRIPTION OF AMENDMENT/MODIFICATION (Organize it by DCF section headings, including solicitation/contract subject matter where feasible.)**

SEE ATTACHED.

Ex: opt as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) <b>M. Inoue, Manager Nuclear Business Development Division Sales Dept.</b>	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) <b>JOYCE A. FIELDS, CONTRACTING OFFICER</b>
15B. CONTRACTOR/OFFEROR <i>[Signature]</i>	15C. DATE SIGNED <b>1-7-'94</b>
16B. UNITED STATES OF AMERICA <i>[Signature]</i>	16C. DATE SIGNED <b>1/7/94</b>

The purpose of this modification is to: 1.) correct Item No. 1 of Modification No. Five (5), 2.) extend the contract period to September 30, 1994 and 3.) revise the completion dates of Task 6 of the Statement of Work and the reporting requirements for items 6 and 7 of section "F.6 ADDITIONAL REPORTING REQUIREMENTS". Accordingly, the contract is hereby modified as follows:

1.) Section B.2 SUPPLIES OR SERVICES AND PRICES/COSTS item 1 is corrected as follows:

Item No.	Description	Qty.	Unit	Amount (Yen)	Amount (Dollar)
1.	Detailed design drawings	1	Lot	Y91,434,000	\$796,574.00

TOTAL FIXED PRICE AMOUNT: \$6,484,469.00

2.) The completion date in Section C.6 SPECIFIC TASKS, Task 6 is revised to read February 28, 1994 in lieu of January 14, 1994.

3.) The due dates in Items 6 and 7 of "F.6 ADDITIONAL REPORTING REQUIREMENTS" are changed to read: 2/28/94.

4.) Item F.7 DURATION OF CONTRACT PERIOD (MAR 1987) is revised as follows:

This contract shall commence on November 17, 1992 and will expire on September 30, 1994.

A summary of obligations for this contract, from award through the date of this action is given below:

Total FY93 Obligation Amount \$6,551,747.00

Cumulative total of NRC obligations \$6,551,747.00

This modification obligates \$17,200.00 in FY93 funds.

All other terms and conditions including the ceiling amount of \$6,748,298.00 remain unchanged.



1/5

◆ Sumitomo Heavy Industries, Ltd.

1, KANDA MITOSHIRO-CHO, CHIYODA-KU,  
TOKYO 101, JAPANCable Ad: SUMIJUKI TOKYO TLX: J24580 (AAB SUMIJUKA)  
TEL. 03-3233- FAX. 03-3233-

TOKYO, March 24, 1994

Ref. No. PES/NR0324A1

U. S. Nuclear Regulatory Commission  
Washington D.C. 20555  
USAAttention : Ms. RoseMary Mann, Contract Administrator  
Contract Administration Branch No.3  
Division of Contract and Property Management P-902  
Fax No. 301-492-7617

Dear Madams,

Subject : Contract No. NRC-04-93-057  
Modification No. Seven (7)In response to your fax dated March 18, 1994 for the subject,  
we are pleased to submit the Contract modification No. 7 signed  
by Mr. M. Inoue herewith.Please proceed with making payment of the invoiced amounts stated  
in our fax dated February 25, 1994.We will be pleased to send back you two copies of the original as  
instructed with Mr. Inoue's signature on them.

Very truly yours,

Masaru Ishii  
Plant & Engineering  
International Operations

Attachment: As stated above.

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>		1. CONTRACT ID CODE	2. PAGE OF PAGE 1   4
3. EFFECTIVE DATE Seven (7)	4. REQUISITION/PURCHASE REQ. NO. RPPA No. RES-93-057 dtd 2/9/94	5. PROJECT NO. (if applicable)	
6. ISSUED BY S. Nuclear Regulatory Commission Division of Contracts & Property Management Washington, DC 20555	7. ADMINISTERED BY (if other than Code 6)	CODE	

NAME AND ADDRESS OF CONTRACTOR (City, State and ZIP Code) Sumitomo Heavy Industries, Ltd. Attn: Mr. M. Inoue, Manager Nuclear Business Development Division 1, Kasuda Mitoshiro-cho, Chiyoda-ku Tokyo 101, Japan Principal Investigator/Technical Contact: J. Katagiri Telephone No. ( )	6/1	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	II	10A. MODIFICATION OF CONTRACT/ORDER NO. NEC-04-93-057
		10B. DATED (SEE ITEM 11) 11/13/92

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of offers  is amended,  is not amended.

You must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:  
 (1) By completing Items 8 and 15, and returning copies of this amendment; (2) By acknowledging receipt of this amendment on each copy of the offer submitted; or (3) By separate letter or telegram which includes a reference to the solicitation and amendment number. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

COURTESY AND APPROPRIATION DATA (if required)  
 B&E No.: 46019201100 Fin No.: I2550 APPN No.: 31XD200.460 BOC #: 252A Amount Obligated: \$111,657.00


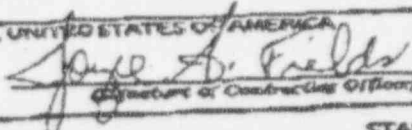
12. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

- A. THIS CHANGE ORDER IS ISSUED PURSUANT TO (circle one) THE CHANGE SET FORTH IN ITEM 14.
- B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(a).
- C. THE SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF (circle one) FAR 43.103(b) (circle one) FAR 43.103(c)
- D. OTHER (Specify type of modification and authority)
- X. FAR 52.243-1 CHANGES- FIXED PRICE (AUG 1987) ALTERNATE I (APR 1984)

E. IMPORTANT: Contractor  is not,  is required to sign this document and return 2 copies to the issuing office.  
 F. DESCRIPTION OF AMENDMENT/MODIFICATION (Required by DCF action handling, including solicitation/contract/order number where feasible)

SEE ATTACHED.

Document ID No.: RES-C94-070

15A. NAME AND TITLE OF SIGNER (Type or print) M. Inoue, Manager, Nuclear Business Development Division Sales Dept.		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) JOYCE A. FIELDS, CONTRACTING OFFICER	
15B. CONTRACTOR OFFICER 	15C. DATE SIGNED Mar. 24, '94	16B. UNITED STATES OF AMERICA 	16C. DATE SIGNED MAR 18 1994

3/5

NRC-04-93-057  
 Modification No. Seven (7)  
 Page 2 of 4

The purpose of this modification is to incorporate within scope changes in accordance with the contractor's technical proposal dated August 4, 1993 and the terms negotiated January 6 & 7, 1994. The following changes are hereby made to the contract: (1) revise the price schedule to incorporate items 7 through 10 for a total fixed price amount of \$111,657.00, (2) increase the fixed price amount of this contract by \$111,657.00 from \$6,484,469.00 to \$6,596,126.00 and increase the cost reimbursement amount by \$3,343.00 (consumption tax) from \$196,551.00 to \$199,894.00. Accordingly, the contract is modified as follows:

1.) Section B.2 SUPPLIES OR SERVICES AND PRICES/COSTS item 1 is corrected as follows:

Item No.	Description	Qty.	Unit	Amount (Yen)	Amount (Dollar)
1.	Detailed design drawings	1	Lot	Y 91,434,000	\$ 796,574.00
2.	Fabrication and delivery of components and hardware	1	Lot	Y243,380,000	\$2,116,348.00
3.	Fabrication, delivery and calibration of instrumentation controls	1	Lot	Y118,242,000	\$1,028,191.00
4.	Modification of ROSA support structures	1	Lot	(Priced in Item 5)	
5.	Installation	1	Lot	Y271,054,000	\$2,356,991.00
6.	Facility inspection/ acceptance testing	1	Lot	Y 21,432,000	\$ 186,365.00
7.	Route Change of PRHR Inlet Line	1	Lot	Y 4,849,936	\$ 43,303.00
8.	Upgrading IRWST and its support structure	1	Lot	Y 6,024,400	\$ 53,790.00
9.	Repairment of DP Transmitters	1	Lot	Y 1,631,168	\$ 14,564.00
10.	Placement of Blind Flange	1	Lot	(At no additional cost)	

TOTAL FIXED PRICE AMOUNT: \$6,596,126.00



HNC 04 02 057  
Modification No. Seven (7)  
Page 3 of 4

11.	Reimbursable Travel*	NA	Y 7,737,000	\$ 67,278.00
12.	Reimbursable Consumption Tax Not to Exceed 3% of Contract Value**	NA	Y 22,972,596	\$ 199,894.00
TOTAL ESTIMATED REIMBURSABLE COSTS				\$267,173.00
TOTAL FIXED PRICE AMOUNT AND ESTIMATED REIMBURSABLE COSTS:				\$6,863,299.00

The modifications to the pricing schedule is based on 112 Japanese yen to \$1.00. The pricing arrangement of Modification No. 5 was based on 115 Japanese yen to \$1.05. The pricing arrangements prior to Modification No. 5 were based on 115 Japanese yen to \$1.00.

NOTE: \*Required travel (item 11 above) directly associated with this effort will be reimbursed to the contractor at actual cost in accordance with Section 6.4 of the contract.

\*\*NRC and SHI will pursue the applicability of the consumption tax to this contract. Should this consumption tax apply, it will be paid on a cost-reimbursement basis with NO indirect costs nor profit added.

2.) Section B.4 CONSIDERATION AND OBLIGATION—FIRM FIXED PRICE (JUN 1988) is deleted in its entirety and replaced with the following:

The firm fixed price of this contract is \$6,596,126.00.

3.) Section B.6 CONSIDERATION AND OBLIGATION—COST REIMBURSEMENT (JUN 1988) is deleted in its entirety and replaced with the following:

a. The total estimated cost to the Government for Japanese Consumption Taxes under this contract is \$199,894.00.

b. The amount obligated by the Government with respect to this contract is \$0.00.

5/5

NRC-04-93-057  
Modification No. Seven (7)  
Page 4 of 4

A summary of obligations for this contract, from award through the date of this action is given below:

Total FY93 Obligation Amount \$6,551,747.00  
Total FY94 Obligation Amount \$ 111,657.00

Cumulative total of NRC obligations \$6,663,404.00

This modification obligates \$111,657.00 in FY94 funds.

All other terms and conditions including the ceiling amount of \$6,863,298.00 remain unchanged.



Westinghouse  
Electric Corporation

Energy Systems

Box 355  
Pittsburgh Pennsylvania 15230-0355

NSRA-APSL-92-0172

August 25, 1992

Mr. Y. Kukita, Head  
Thermal-hydraulic Safety Research Laboratory  
Department Reactor Safety Research  
Tokai Research Establishment  
Tokai-Mura, Naka-Gun  
Ibaraki-Ken  
Japan

Dear Mr. Kukita,

Attached is an original of the nondisclosure agreement signed by Mr. Carlo L. Caso, General Manager of the Nuclear and Advanced Technology Division, on behalf of Westinghouse Electric Corporation. I appreciate the efforts on your behalf at working out the issues that were encountered along the way. I look forward to working with you on the design of the ROSA V test facility.

Please contact me at 412-374-4334 (FAX 412-374-5005) if you have any questions concerning this agreement.

Sincerely,

Brian A. McIntyre, Manager  
Advanced Plant Safety and Licensing

cc: B. W. Sheron  
F. W. Hasselberg  
D. Abeles

USNRC  
USNRC  
W Law Department

JAERI - CONFIDENTIALITY AGREEMENT  
PROPRIETARY INFORMATION AGREEMENT

For and in consideration of the disclosure by Westinghouse Electric Corporation, Pittsburgh, Pennsylvania USA (hereinafter referred to as "Westinghouse") to one or more representatives of the Thermal-Hydraulics Safety Research Laboratory, Department of Reactor Safety Research, of the Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken Japan (said representatives and organization being severally and collectively hereinafter referred to as the "Research Institute") of information in oral, written or physical form, including information specifically relating to the Westinghouse AP600 advanced passive reactor design, which is identified by Westinghouse as proprietary and which Westinghouse considers to be proprietary and treats as secret and confidential, the Research Institute, to the extent that the Research Institute is authorized to use such proprietary information, accepts and receives such proprietary information in confidence and trust, subject to the following terms and conditions:

1. Westinghouse discloses such proprietary information to the Research Institute solely for the purpose of enabling the Research Institute to conduct a joint research project with the United States Nuclear Regulatory Commission (USNRC) having as its objective the testing of the Westinghouse AP-600 reactor design using the Research Institute's ROSA-IV test facility.
2. The Research Institute shall maintain the proprietary information so imparted, secret and confidential. This obligation not only extends to the Westinghouse proprietary information supplied, either directly or indirectly, by Westinghouse, but also extends to any information that may be derived from such proprietary information.
3. The Research Institute shall not use such proprietary information for any purpose other than the purpose set forth in paragraph 1 above.
4. Except for disclosures to the USNRC on a confidential basis in furtherance of the above purpose, the Research Institute shall not transmit or further disclose such proprietary information to any party other than Westinghouse.
5. The Research Institute shall not make any copy or in any way reproduce or excerpt such proprietary information except where necessary for the purposes set forth in paragraph 1, hereof, or as authorized by Westinghouse in writing. To the extent possible, any such copies shall include Westinghouse's proprietary notice. The information provided hereunder and any such copies shall be returned to Westinghouse upon its written request or its destruction certified.
6. Nothing herein shall apply to any information:
  - (a) which is now generally known or readily available to the trade or public or which becomes so known or readily available without fault of the Research Institute;
  - (b) which is possessed by the Research Institute prior to its disclosure hereunder; or
  - (c) which is acquired from a third party without restriction, provided that the Research Institute does not know, or have reason to know or is not informed subsequent to disclosure by such third party and prior to disclosure by the Research Institute that such information was acquired under an obligation of confidentiality.

7. Except to the extent provided for below in paragraph 11, it is mutually understood that nothing herein shall be construed as granting or implying any right under any letters patent or to use any information covered thereby, or as permitting the Research Institute or Westinghouse to unfairly obtain the right to use information which becomes publicly known through an improper act or omission on its part.
8. Except as specifically provided herein, neither Westinghouse, the Research Institute, nor their respective suppliers or subcontractors of any tier shall be liable with respect to or resulting from the use (or the results of such use) or misuse of any information furnished hereunder.
9. Nothing in this Agreement shall obligate Westinghouse or the Research Institute to provide any specific information to the other, that it otherwise is not required to provide under their respective agreements with the USNRC.
10. The Research Institute hereby consents to the USNRC providing copies of the information, that the USNRC receives from the Research Institute in furtherance of this program, to Westinghouse with unrestricted rights to use the information in the ordinary course of its commercial nuclear activities. To the extent that such information is marked proprietary or confidential, Westinghouse agrees to limit the use and disclosure of such information in the same manner as it restricts the use and disclosure of its own information of a corresponding nature.
11. Each party grants the other a royalty-free, nonexclusive license under any intellectual property, which it may own or control, generated in the course of the research project referred to in paragraph 1, which is reasonably required for a party to fully exercise its rights provided for in this Agreement to use information.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their respective duly authorized representatives, this \_\_\_\_\_ day of \_\_\_\_\_, 1992.

RESEARCH INSTITUTE

*Y. Kukita*

By Y. Kukita

Title Head

Thermal-Hydraulics Safety Research Laboratory  
Department of Reactor Safety Research

Date July 21, 1992

WESTINGHOUSE ELECTRIC CORPORATION

By *[Signature]*

Title General Manager  
Nuclear and Advanced Technology Division

Date August 19, 1992

NON-DISCLOSURE AGREEMENT

This Agreement made and entered into on 16th day of March 1993 between the United States Nuclear Regulatory Commission (NRC) and Sumitomo Heavy Industries, Ltd., Japan (SHI) supersedes and replaces the Non-Disclosure Agreement dated August 26, 1992.

Whereas, NRC has a project for the modification of the existing ROSA V Facility located at Tokai Research Establishment of Japan Atomic Energy Institute (JAERI) to simulate the Westinghouse Electric Corporation ("Westinghouse") AP-600 design ("Project").

Whereas, NRC is desirous of receiving the proposal from SHI for the Project ("Proposal").

Whereas, for the purpose of SHI preparing the Proposal, and if the contract for the Project is concluded between NRC and SHI, for the purpose of implementation of such contract, NRC will furnish SHI with technical information which may contain information proprietary to any third party to be involved in the Project, and likewise, the information to be disclosed by SHI to NRC may contain information proprietary to JAERI and/or ("Proprietary Information").

As a condition of receipt of said Proprietary Information, both parties agree to the following conditions.

1. No Proprietary information will be released to any third party without the written consent of the disclosing party.
2. Except as reasonably necessary in furtherance of this Agreement, no copies of the Proprietary Information will be made without the written consent of the disclosing party.
3. No Proprietary Information can be disclosed to any third party, or employee of recipient not bound by a corresponding written obligation of confidentiality, or used for any purpose other than preparing the proposal for NRC and performing work on any resultant contract, without the written consent of the disclosing party.
4. Upon the request of the disclosing party, the Proprietary Information shall be returned to the disclosing party upon completion or termination of negotiations or upon completion or termination of the contract for the Project.
5. Any breach of the confidential obligations hereunder will likely result in irreparable damage to the disclosing party for which injunctive relief is appropriate.
6. Westinghouse is a third party beneficiary of this Agreement.

7. SHI agrees that the information it will furnish to the USNRC and JAERI under its contract for the modification of the ROSA V Facility to perform tests related to the Westinghouse Electric Corporation AP600 design shall consist of all information needed to perform analyses of experimental results of the modified ROSA facility. Such information will not contain any information which SHI claims to be proprietary background information of SHI or third parties other than JAERI, Westinghouse or the USNRC.

However, subject to condition 8 below, SHI may claim as proprietary information the fabrication drawings containing instructions on how to manufacture or fabricate the components, hardware, instrumentation and other electrical equipment for the following components :

- (1) CMT-A/B (Assembly Drawings and Nozzle Drawings);
- (2) PZR (Assembly Drawing, Nozzle Drawing and Heater Flange Drawing);
- (3) PRHR (Assembly Drawing, Nozzle Drawing and Tube Support Drawing);
- (4) IRWST (Assembly Drawing, Nozzle Drawing and Platform and Ladder Drawing);
- (5) CT (Assembly Drawing and Nozzle Drawing).

Also, SHI may claim as proprietary the design calculations for the strength of vessels, piping and structures relating to SHI's software for analysis.

8. SHI agrees that the information it claims as proprietary shall not contain information proprietary to Westinghouse. Further, SHI agrees that when NRC needs information contained in the fabrication drawings claimed as proprietary under condition 7 above, SHI will provide such proprietary information as requested by NRC. Such information will be used and protected by NRC in accordance with this Agreement.

I hereby agree to conditions 1 through 8 of this Non-Disclosure Agreement.

U.S. Nuclear Regulatory Commission

Sumitomo Heavy Industries, Ltd.

Mary H. Mace  
Signature

[Signature]  
Signature

MARY H. MACE  
Printed Name

H. OCHI  
Printed Name

Contracting Officer  
Title

MANAGER, PLANT & ENGINEERING  
INTERNATIONAL OPERATIONS  
Title

Office of Administration  
Organization

SUMITOMO HEAVY INDUSTRIES, LTD  
Organization

3/16/93  
Date

16<sup>th</sup> March, 1993  
Date



TABLE 1.1 ROSA-AP600 TEST MATRIX: PHASE I

No	Experiment Description	Experiment Justification - Comments <sup>a,b,c,d,e,f</sup>
1	1-inch CL break	Counterpart to SPES 1 and OSU SB 5 experiments.
2	1/2-inch cold leg (CL) break	Very small break LOCA. Designed to study effect of break size and location in combination with other matrix experiments.
3	DVI line break	Double ended guillotine break (DEGB). Counterpart to SPES 6 and OSU SB 11 experiments.
4	Inadvertant ADS Stage 1 opening	Limiting design base accident (DBA) for ADS. Counterpart to SPES H-07 and OSU SB 14 experiments.
5	2-inch CL break	Designed to study effect of break size and location in combination with other matrix experiments. Assume CVCS, NRHR and SFWS operational. Counterpart to SPES 4 and OSU SB 7 experiments.
6	1-inch CL break	Failure of both trains of ADS Stages 1, 2, and 3. All ADS Stage 4 valves are working.

<sup>a</sup> CVCS, NRHR, and SFWS assumed to be off unless otherwise specified.

<sup>b</sup> Nitrogen injection from accumulators allowed in each experiment.

<sup>c</sup> All experiments will be run with the Loop Seal Bypass Line (LSBL) removed in C-Loop and blanked-off at downstream end in P-Loop. To minimize confusion, the loop with the pressurizer is called the P-Loop and the loop with the CMT PBL takeoff (normal configuration) is called the C-Loop. P-Loop is equivalent to the LSTF A-Loop and the C-Loop is equivalent to the LSTF B-Loop.

<sup>d</sup> All CL breaks assumed to be oriented downward unless otherwise noted.

<sup>e</sup> One of ADS Stage 4 valves fails in all tests unless indicated otherwise.

<sup>f</sup> All breaks located in C-Loop unless indicated otherwise.

TABLE 1.1 ROSA-AP600 TEST MATRIX: PHASE I (continued)

No	Experiment Description	Experiment Justification - Comments <sup>a,b,c,d,e</sup>
7	2-inch CL PBL break	Designed to study effect of break size and location in combination with other matrix experiments. Counterpart to SPES 7 and OSU SB 9 experiments.
8	2-inch CL PBL break	One reactor coolant pump remains on (located in loop with CMT PBL takeoff).
9	CL PBL break	100% break. Possible counterpart with SPES 8 and OSU SB 10 experiments.
10	SGTR - one U-tube	DBA for SGTR event.
11	SGTR - multiple U-tubes	Possible failure of seven tubes should be basis of experiment. Major experimental objective: actuate ADS.
12	Main steam line break	Largest possible MSLB line break that can be conducted in ROSA-AP600 program - size to be determined. Possible counterpart to SPES 12 experiment.

<sup>a</sup> CVCS, NRHR, and SFWS assumed to be off unless otherwise specified.

<sup>b</sup> Nitrogen injection from accumulators allowed in each experiment.

<sup>c</sup> All experiments will be run with the Loop Seal Bypass Line (LSBL) removed in C-Loop and blanked-off at downstream end in P-Loop. To minimize confusion, the loop with the pressurizer is called the P-Loop and the loop with the CMT PBL takeoff (normal configuration) is called the C-Loop. P-Loop is equivalent to the LSTF A-Loop and the C-Loop is equivalent to the LSTF B-Loop.

<sup>d</sup> One of ADS Stage 4 valves fails in all tests unless indicated otherwise.

<sup>e</sup> All breaks located in C-Loop unless indicated otherwise.

Table 1 Summary of measurement Types and Locations

Instrument/Measurement	Symbol	Pressure Vessel	Primary System	Steam Generators	Pressurizer	Secondary System	Suppression Tank and Break Units	Other	Total
Fluid Temperature	TE	191	60	246	17	15	17	97	643
Wall Temperature	TW	485	50	92	16		4	9	656
Differential Temperature	DT	112	24	70	2				208
Conductance Probe	CP	143	20	20	4		1		188
Conductance Probe with TC	CPT		10	224					234
Flow Rate	F	2	4	12	3	8	4	25	58
Pitot-tube Velocimeter	PIT		3						3
Liquid Level	L	1		8	1	1	4	4	19
Pressure	P	3	10	2	8	5	10	4	42
Differential Pressure	DP	24	62	22	9		6	2	125
Gamma Densitometer(1 Beam)	GD <sub>1</sub>		3	1	3				7
Gamma Densitometer(3 Beam)	GD <sub>3</sub>		6	1			3		10
Drag Disk Flow Meter	DD		26		6		4		36
Video Probe	VP	2	6						8
Rotation Speed	RE		2						2
Pump oscillation	VE		2						2
Pump Torque	TQ		2						2
Power	WE	11	8	16	4			4	43
<b>Total</b>		<b>974</b>	<b>298</b>	<b>714</b>	<b>73</b>	<b>29</b>	<b>53</b>	<b>145</b>	<b>2286</b>

Table 2

Summary of Instrumentation in New ROSA/AP600 Components									
	Level	DPs	P	Fluid TCs	Metal TCs	DTs	Spool Pieces <sup>1</sup>	Flow	g-D
CMTs	8	2	2	48		26			
PZR PBLs		4		6	2			2	
CL PBLs		6	2	8	4		2	2	2
CMT Headers		2		2					
CMT Dschrgs		2		4				2	
ACC Dschrgs		2	2	8	2			2	
IRWST Dschrg		2		2				2	
DVI Lines		2	4	2			2 <sup>2</sup>	2	
PRHR	1	5		33	22			1	
IRWST		2		19					
ADS-1,2,3		5	2	2	1		1		1
ADS-4		4		4					2
Pressurizer	1	8	2	6	6				
Surge Line		2							1
Loop Seals		4		2	2			2	

<sup>1</sup>The instruments included in the spool pieces have been included in the table.

<sup>2</sup> These spool pieces will be used only during a DVI break scenario.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

February 1, 1994

MEMORANDUM FOR: Eric S. Beckjord, Director  
Office of Nuclear Regulatory Research

FROM: Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation

SUBJECT: USER NEED FOR PHASE 2 TESTING IN THE ROSA/AP600 FACILITY

The Office of Nuclear Reactor Regulation (NRR) requests that the Office of Nuclear Regulatory Research (RES) develop and implement a Phase 2 test program to be carried out during CY 1995 in the ROSA/AP600 test facility at the Japan Atomic Energy Research Institute (JAERI), Tokai-mura, Japan.

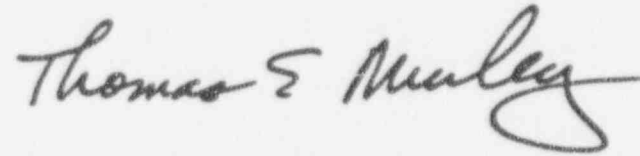
The current Phase 1 test program for ROSA/AP600, to be performed during CY 1994, consists of 12 tests. The test matrix has been developed jointly by RES and NRR, to address issues related primarily to design-basis accident (DBA) response in the AP600. Many of these tests are similar to those being performed in Westinghouse's integral test facilities, and will provide a broad basis for comparison of the results from integral facilities at different scales. Two tests are included in Phase 1 to look at beyond-design-basis accident (BDBA) conditions involving multiple failures: a small-break LOCA with failure to open all stage 1, 2, and 3 ADS valves; and a small-break LOCA with failure to trip a reactor coolant pump.

While design-basis-related testing is essential to assist in the confirmation of Westinghouse's AP600 accident analyses, NRR requests that RES conduct additional confirmatory testing to extend the experimental database for code assessment beyond the conventional design basis of an accident or transient initiator plus a single active failure. The focus of additional testing would be to explore the "robustness" of the passive safety systems, i.e., their capability to bring the plant to a stable, cooled condition and maintain it there, if multiple failures of safety system components should occur. It is also important to establish whether there are any "cliffs" just beyond design-basis conditions, where a slight degradation in safety system performance could lead to an inability to maintain core cooling. We believe that this type of testing is appropriate to a confirmatory program providing data for code assessment, to help establish the margins to safety of a passive plant. We therefore request that your staff work with NRR to develop a Phase 2 test matrix of approximately 12 tests, to be performed in the ROSA/AP600 facility in CY 1995. The primary focus of the Phase 2 program should be on BDBAs, with insights on the most risk-dominant multiple failure scenarios to be drawn from the AP600 probabilistic safety assessment. However, we also realize that additional DBA-related tests may be desirable in Phase 2, to follow up on issues raised during the Phase 1 tests.

The schedule for development of the Phase 2 test matrix should be consistent with RES's need to coordinate these plans with JAERI. However, we should also anticipate and allow time for review of these plans by the ACRS, the NSRRC, and the Commission.

February 1, 1994

Please work with Ashok Thadani of my staff in the development of the Phase 2 test program.

A handwritten signature in cursive script that reads "Thomas E. Murley". The signature is written in dark ink and is positioned above the typed name.

Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation

TABLE 1.2 DRAFT ROSA-AP600 TEST MATRIX: PHASE II

No	Experiment Description	Experiment Justification - Comments <sup>a</sup>
1	Main steam line break	Failure: SGTR.
2	1-inch break	Failures: Both trains of 4th stage ADS.
3	PRHR line break	Break size and failure undefined.
4	Loss of feedwater system	Failures: PRHR system.
5	2-inch CL break	One of four ADS valves fail. Designed to study effect of break size and location in combination with other matrix experiments. Counterpart experiment with SPES Matrix Experiment 3.
6	2-inch break	Failures: One CMT check valve in each CMT train is assumed to close and not reopen. Manual opening of ADS.
7	Station blackout	
8	Non-condensables in PBL	
9 <sup>b</sup>	PRHR tube rupture	Failures undefined.
10 <sup>b</sup>	2-inch break	Failure: One CMT check valve assumed to close and not reopen.
11 <sup>b</sup>	2-inch break	Failure: SGTR when primary pressure level below secondary pressure level.
12 <sup>b</sup>	4-inch CL break	No single failure. Designed to study effect of break size and location in combination with other matrix experiments.
13 <sup>b</sup>	Long CMT recirculation	ADS actuation and only 1 of 2 gravity injection valves opens.

<sup>a</sup> The maximum break size that can be simulated in LSTF is undefined at present.

<sup>b</sup> Low priority tests to be replaced with other higher priority tests. Total number of tests limited to 12.