



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

January 18, 2002

Purdue Research Foundation  
ATTN: Mr. Thomas B. Wright  
1063 Hovde Hall  
West Lafayette, IN 47907-1063

SUBJECT: MODIFICATION NO. 8 TO TASK ORDER NO. 1  
UNDER CONTRACT NO. NRC-04-97-046

Dear Mr. Wright:

This confirms verbal authorization provided via e-mail on January 17, 2002, for commencement of work on January 16, 2002, with a temporary ceiling of \$5,000.

This letter definitizes Modification No. 8 to Task Order No. 1. Accordingly, this task order modification shall be performed in accordance with the attached Statement of Work and in accordance with the contractor's technical proposal dated January 8, 2002. This modification increases the ceiling and obligated amounts by \$101,348 from \$1,493,259 to \$1,594,607 and extends the period of performance through November 30, 2002. The effective date of this modification is January 16, 2002. Accordingly, the task order is hereby modified as follows:

The total estimated cost for full performance of Task Order #1 is \$1,594,607 with a period of performance of September 30, 1997 through November 30, 2002. Funds in the amount of \$101,348 are being obligated for performance of this modification which hereby increases the obligated amount. The Contractor shall not incur costs for this task order which exceed the cumulative obligated amount of \$1,594,607.

Accounting Data for Task Order No. 1, Modification No. 8, are as follows:

B&R No.:	26015110205
APPN No.:	31X0200.260
Job Code:	W6749
BOC:	252A
RES ID:	RES-C02-344
Obligated Amount of this Action:	\$101,348

A summary of obligations under this task order, from the date of award through this modification are provided below:

Total FY 97 NRC Obligations:	\$406,734
Total FY 98 NRC Obligations:	\$208,000
Total FY 99 NRC Obligations:	\$280,000
Total FY 00 NRC Obligations:	\$289,877
Total FY 01 NRC Obligations:	\$298,648

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TEMPLATE ADM 001

ADM 02

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NRC-04-97-046  
Task Order No. 1  
Modification No. 8

Total FY 02 NRC Obligations: \$101,348  
Cumulative Obligations: \$1,594,607

This modification obligates FY 02 funds in the amount of \$101,348

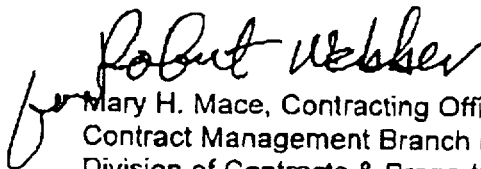
All other terms and conditions remain unchanged.

Please indicate your acceptance of this task order modification by having an official, authorized to bind your organization, execute three(3) copies of this document in the space provided and return two(2) copies to Deborah Neff, Contract Specialist, at the address listed below. You should retain the thlrd copy for your records.

U.S. Nuclear Regulatory Commission  
Division of Contracts & Property Management  
Mail Stop T-7-I-2  
Washington, DC 20555


If you have any questions concerning this action, please contact Ms. Neff at 301-415-8160.

Sincerely,

  
Mary H. Mace, Contracting Officer  
Contract Management Branch No. 1  
Division of Contracts & Property Management  
Office of Administration

Enclosure:  
As stated

ACCEPTANCE:

  
Name  
Eric E. Fulkerson  
Sr. Contract Manager

Title

JAN 24 2002  
Date

Modification (No. 8) to the Statement of Work of Task Order #1, "Interfacial Area Transport," under Contract # NRC-04-97-046 and Job Code W6749, "Thermal-Hydraulic Research"

**Additional Work Requirements (1/16/02 - 11/30/02)**

Revise Task 13 and incorporate new Tasks 19 and 20.

**Task 13. Provide Technical Support**

Provide technical support in terms of making presentations, attending meetings, and reviewing technical reports as requested by the NRC Technical Monitor. Provide administrative support including contract modifications and fund transfer to the subcontractors under this contract.

Estimated Level of Effort: 0.5 staff-month (for this performance period)

Estimated Completion Date: November 30, 2002 (new date)

**Task 16. Perform Experiments and Develop Models for Interfacial Area Transport in Horizontal 45° Elbows and in the Vessel Downcomer**

This task performs experiments and develops models for interfacial area transport in horizontal 45° elbows (at 2" and 4" ID, respectively) and in a scaled vessel downcomer. These configurations can be found in the prototypical nuclear reactor designs, and the knowledge on two-phase flow regime transition in the configurations is needed for small-break LOCA analyses.

Measurements of interfacial area and void fraction at the inlet and outlet of the configurations will be made. The data will be used to develop correlations for the variation of the interfacial area concentration in these configurations, and they will provide a sufficient database for the interfacial area transport as applied to the constitutive relations for the two-fluid model formulation. Furthermore, flow visualization through transparent test sections will provide information to understand the phenomena of two-phase flow inside the configurations.

A scaled downcomer and 45° elbows will be installed to the existing air-water flow loops at the University of Wisconsin-Milwaukee. Since the probes for measuring local interfacial area and void fraction for the bubbly, stratified, and plug/slug two-phase flow patterns have already been developed, they will be used in the experiments under this task.

Estimated Level of Effort: 6 staff-months (for this performance period)

Estimated Completion Date: November 30, 2002 (new date)

**Task 19. Second Stage Of Experiments In Vertical, Co-Current Downward Flow**

Because of the importance of downward flow in reactor safety, Purdue University has completed the first stage of experiments for vertical, co-current downward flow in the bubbly flow regime inside the 1-inch and 2-inch pipes (Task 18). This task performs the second stage of experiments in the vertical, co-current downward flow for higher liquid and gas flow rates in the bubbly and slug flow regimes in the 1-inch and 2-inch pipes.

Estimated Level of Effort: 5 staff-months

Estimated Completion Date: November 30, 2002

ons 1 800 533-3322  
s 1 800 638-5567

### **Improve the Two-Group, Interfacial Area Transport Equation For Vertical Upward Flow**

collects additional data and improves the two-group, interfacial area transport equation for upward flow that was developed under this project.

Level of Effort: 1 staff-month

Completion Date: November 30, 2002

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s 1 800 638-5567

#### **and Travel:**

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actor will attend a one-day meeting at the NRC office in Rockville, Maryland. For purpose, the meeting will involve two persons. However, any travel must be approved by the NRC Technical Monitor.