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

NOV 3 0 2000

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

Dear Mr. Wright

SUBJECT: TASK ORDER NO. 5 MODIFICATION NO. 8 ENTITLED "SUBCOOLED BOILING AT LOW PRESSURE" UNDER CONTRACT NO. NRC-04-97-046

In accordance with Section G.4, Task Order Procedures, of the subject contract, this letter definitizes Task Order No. 5 Modification No. 8. This effort shall be performed in accordance with the enclosed Statement of Work.

The period of performance for this task order is changed to run from January 14, 1998 through November 30, 2001. The total estimated cost for full performance of this task order is increased by $120,000 from $451,160 to $571,160. $120,000 in funding is hereby allotted to Task Order No. 5. This action changes the total cumulative funds obligated for performance of this task order from $446,910 to $566,910. The Contractor shall not incur costs for this task order which exceed the cumulative obligated amount of $566,910. All other terms and conditions of Task Order No. 5 remain unchanged.

Accounting data for Task Order No. 5 Modification No. 8 is as follows:

B&R No. 16015110135
Job Code: W6749
BOC Code: 252A
RES ID: RES-C01-319
Appropriation No.: 31X0200
Obligated Amount This Action: $120,000
FY 98 Obligated Amount: $151,960
FY 99 Obligated Amount: $145,000
FY 00 Obligated Amount: $149,950
FY 01 Obligated Amount: $120,000
Total Cumulative Obligations: $566,910

Template=ADM-001

ADM02

Purdue

Contract No. NRC-04-97-046
Task Order No. 5 Mod 8

The issuance of this task order does not amend any terms or conditions of the subject contract. Your contacts during the course of this task order are:

Technical Matters: James Han, Project Officer (301) 415-6773

Contractual Matters: Stephen Pool, Contract Specialist (301) 415-8168

Please indicate your acceptance of this task order by having an official, authorized to bind your organization, execute three copies of this document in the space provided and return two copies to the Contract Specialist. You should retain the third copy for your records.

Sincerely,

Stephen M. Pool, Contracting Officer
Contract Management Branch No. 1
Division of Contracts and
Property Management

Enclosure:
As stated

ACCEPTED: TASK ORDER NO. 5 Mod 8

Peter E. Dunn — DEC 8 2000
NAME — DATE

Peter E. Dunn
Assistant Vice President for Research
TITLE

Modification (No.8) to Task Order #5, "Subcooled Boiling at Low Pressure," under Contract # NRC-04-97-046 and Job Code W6749, "Thermal-Hydraulic Research"

Additional Work Requirements (12/1/00 - 11/30/01)

Complete the remaining work in Task 7, which is listed below with some modifications. Continue Task 8 for this performance period.

Task 7. Perform 9-Rod Bundle Tests and Develop Models

This task performs at least 90 tests in the 9-rod (3x3 electrically-heated rods with 36" uniformly-heated length) rod bundle, which was designed and constructed under Task 5. Measurements for each test include wall heat flux, wall superheat, single-phase and two-phase heat transfer coefficients, liquid temperature profile, onset of nucleate boiling, onset of significant voids, bubble diameter at departure, bubble release frequency, number density of nucleation sites, void fraction, pressure, and mass flow rate in the bundle.

Test conditions will cover a broad spectrum of key parameters - pressure in the range of 1 to 5 bars (1 bar = 14.5 psia), mass flux in the range of 100 to 1000 $kg/m^2 s$, fluid subcooling at bundle inlet in the range of 0 to 50 °C, and heater rod wall heat flux in the range of 0.5 to 35 W/cm^2.

Based on the data obtained (including any other relevant data available in the literature), analytical models and correlations on wall heat transfer partitioning, interfacial heat transfer, and interfacial friction will be developed for subcooled boiling at low pressure. Perform additional experiments if necessary.

Complete a NUREG/CR report to discuss the models and correlations developed for subcooled flow boiling at low pressure; comparison with other relevant models/correlations in the literature should also be included in the report. Provide electronically to NRC all the test data in the NRC databank format.

Estimated Level of Effort: 19.5 staff-months (for this performance period)
Estimated Completion Date: November 30, 2001 (new date)

Task 8. Provide Technical Support

This task provides technical support in terms of attending meetings, making presentations, reviewing technical reports, and conducting additional tests as requested by the NRC Technical Monitor.

Estimated Level of Effort: 0.5 staff-month (for this performance period)
Estimated Completion Date: November 30, 2001 (new date)

Meetings and Travel:

The contractor will attend two meetings at the NRC office in Rockville, Maryland. For planning purpose, each meeting will involve two people for two days. The contractor will be also allowed to attend a domestic technical meeting sponsored by ANS, ASME, or other national organizations. However, any travel must be approved in advance by the NRC Technical Monitor.