



*Mace, Mary*

**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001  
**APR 06 2000**

Purdue Research Foundation  
ATTN: Edie Doland  
1063 Hovde Hall, Purdue University  
West Lafayette, IN 47907-1063

Dear Ms. Doland:

**SUBJECT: TASK ORDER NO. 8 MODIFICATION NO. 5 ENTITLED "IMPROVEMENTS TO PARCS" 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. 8 Modification No. 5. This effort shall be performed in accordance with the enclosed Statement of Work.

The period of performance for Task Order No. 8 is changed to run June 1, 1998 through September 30, 2000. The total estimated cost for full performance of this task order is increased by \$50,000 from \$218,908 to \$268,908. Funds obligated to this task order are hereby increased by \$50,000 from \$218,908 to \$268,908. The Contractor shall not incur costs for this task order which exceed the cumulative obligated amount of \$268,908.

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

B&R No.: 06015110135  
Job Code: W-6749  
BOC Code: 252A  
RES ID: RES-C00-382  
Appropriation No.: 31X0200  
Obligated Amount This Action: \$50,000  
FY 98 Obligations: \$59,654  
FY 99 Obligations: \$ 89,497  
FY 00 Obligations \$ 119,757  
Cumulative Obligations: \$268,908

The following individuals are considered by the Government to be essential to the successful performance of the work hereunder:

Thomas Downar

The contractor agrees that such personnel shall not be removed from the effort under this task order without compliance with Contract Clause H.2-Key Personnel

Template = ADM001

ADM02

Purdue

Contract No. NRC-04-97-046

Task Order No. 8 MOD 5

Page 2 of 2

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) 415-6023

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  
Division of Contracts and Property  
Management

Enclosure:

As stated

ACCEPTED: TASK ORDER NO. 8 MOD 5

  
NAME

APR 18 2000

DATE

Peter E. Dunn  
Assistant Vice President for Research

TITLE

Modification (No. 5) to the Statement of Work of Task Order # 8, "Improvements to PARCS," under Contract # NRC-04-97-046 and Job Code W6749, "Thermal-Hydraulic Research"

## **Additional Work Requirements**

### **Task 7. Make PARCS More Efficient and User Friendly**

This task consists of two subtasks to make PARCS more efficient and user friendly.

#### **Subtask 7.1 Merge General Interface (GI) with PARCS**

In order to run TRAC-M/PARCS at the present time, three separate codes (GI, TRAC-M and PARCS) must be run together using the PVM data passing software. Although this method of operation was designed to retain the maximum flexibility to allow independently modifying the separate codes, this methodology leads to slower execution of the coupled codes because of the computational overhead associated with the PVM data passing. In order to reduce this computational overhead and increase computational speed, it is desirable to eliminate the PVM data passing from PARCS to GI. This can be done through merging of GI with PARCS and the PARCS Data Mapping Routine (PDMR) so that GI accesses data directly from PDMR rather than through PVM. However, GI will still be preserved as a module within PARCS in order to retain a high degree of flexibility as discussed above.

Estimated Level of Effort: 1.5 staff-months

Estimated Completion Date: April 30, 2000

#### **Subtask 7.2 Generate 3D Data Mapping Table**

A user of TRAC-M/PARCS is currently required to generate a 3D data mapping table that is a geometric area mapping of the neutronic nodes to the thermal-hydraulic sectors or channels. User generation of this table has been time consuming and prone to errors. The purpose of this subtask is to eliminate this process through an automatic generation of the data mapping table.

This subtask is divided into two phases. Phase 1 will implement the non-fractional auto-mapping feature into the merged GI-PARCS package (under Subtask 7.1) for both PWR and BWR applications. Phase 2 will implement the fractional auto-mapping feature, which is designed for advanced users and code developers, into the merged GI-PARCS package.

Estimated Level of Effort: 2 staff-months

Estimated Completion Date: June 30, 2000

### **Task 8. Modify TRAC-M Data Mapping Routine (TDMR)**

TDMR is a subroutine of TRAC-M that is responsible for passing physical parameters such as fuel temperatures and moderator densities to the merged GI-PARCS package. TDMR also processes the passing of power density distributions from the GI-PARCS package to TRAC-M. It was recently decided, at a TRAC-M coordination meeting, to replace the present cell face aligned conduction nodes with cell center aligned heat structures. This TRAC-M modification

will affect the TDMR in two areas, namely, power mapping and nodal average fuel temperature calculations. As a result, TDMR needs to be modified to accommodate the changes to TRAC-M. In addition, the mapping routine in the merged GI-PARCS package needs to be modified accordingly.

Estimated Level of Effort: 1.7 staff-months  
Estimated Completion Date: September 30, 2000

Task 9. Provide On-Call Assistance to NRC

During the review of the RETRAN-3D code, NRC/NRR requested EPRI to assess RETRAN against the SPERT rod ejection experiment (IDO-17281, "Reactivity Accident Test results and Analyses for the SPERT III E-Core," Phillips Petroleum Company, March 1969). In response, EPRI submitted RETRAN calculations and comparisons with SPERT data in September 1999. As a result, it has become desirable for NRC/RES to use the same experiment to assess PARCS. This task provides on-call assistance to NRC/RES in performing the PARCS calculations for the SPERT rod ejection experiment.

Estimated Level of Effort: 0.5 staff-month  
Estimated Completion Date: September 30, 2000