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

APR 0 8 2003

Information Systems Laboratories, Inc.
ATTN James Meyer
11140 Rockville Pike, Suite 500
Rockville, MD 20852

SUBJECT: MODIFICATION NO. 2 TO TASK ORDER NO. 8 ENTITLED, "ESBWR
            UPGRADES TO TRAC-M" UNDER CONTRACT NO. NRC-04-02-054

Dear Mr. Meyer:

This letter definitizes Task Order No. 8 Mod 2 in accordance with the enclosed statement of work. The period of performance for Task Order No. 8 remains September 17, 2002 through May 31, 2003 The task order estimated cost and fixed fee is increased as follows:

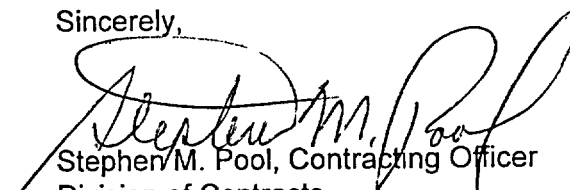|	From	By:	To
Estimated Costs	$186,737	$10,529	$197,266
Fixed Fee:	$13,628	839	$ 14,467
CPFF Total	$200,365	$11,368	$211,733

$35,955 in funds is hereby allotted to this task order. The total funding allotted are now $210,955 of which $196,541 represents funds for the estimated cost and $14,414 represents funds for the fixed fee. This funding is estimated to cover performance through May 15, 2003. The accounting data for this task order mod is set forth as follows:
RES-C03-043 31X0200 36015115107 Y6660 252A $25,365
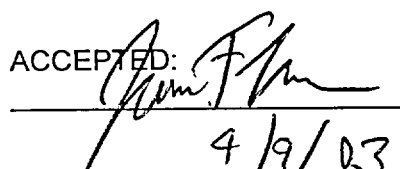RES-C03-044 31X0200 36015115107 Y6660 252A $10,590

Please indicate your acceptance of Task Order No 8 Mod 2 by having an official authorized to bind your organization execute three copies of this document, by signing in the space provided, and return two copies to me. You should retain the third copy for your records.

Should you have any questions, regarding this task order, please contact me on (301) 415-8168.

Sincerely,

Stephen M. Pool, Contracting Officer
Division of Contracts
Office of Administration

ACCEPTED: _____   NAME___V P___   TITLE _____

_____
DATE 4/9/03

STATEMENT OF WORK
TASK ORDER NO. 8, MOD 2
ESBWR UPGRADES TO TRAC-M

BACKGROUND

The TRAC-M code has been successfully coupled to the CONTAIN code and the coupled TRAC-M/CONTAIN version used to simulate a large break LOCA in AP1000. The coupling was performed using the External Communications Interface (ECI) and was originally intended to provide a coupled code environment for AP1000 and PWRs. The coupled version, while general enough to allow communication at multiple locations, was only tested for AP1000 type transient behavior, in which the flow direction was from the vessel to containment. Reverse flow from containment to the reactor primary system was restricted to single phase steam.

OBJECTIVE

The objective of this part of Task Order no. 4 is to test the coupling to insure that the TRAC-M/CONTAIN version can handle flow conditions similar to those in the ESBWR. In modeling the ESBWR, the CONTAIN portion of the coupled codes would model the containment, including the dry well and GDCS pool. Two-phase break flow from the vessel will go into the dry well. At the GDCS, water will flow back into the reactor vessel. Thus, CONTAIN will "receive" a two-phase mixture at one location from TRAC-M, but "return" a single phase liquid at another location. A test case is needed to examine this bi-directional flow between TRAC-M and CONTAIN.

In addition, there are periods in PWR and BWR transients in which gas may flow from containment to the vessel through the break. This flow can be assumed to be air, which is a non-condensable gas. To make the coupling more accurate for modeling reverse flow from the containment to the vessel, modifications need to be made to allow the return flow to be a non-condensable gas.

WORK REQUIREMENTS

Task 10:   Develop a Test Case and Verify Coupling for Bi-Directional Communication

Propose a test case that will examine the coupling when flow returns from CONTAIN to TRAC-M. The case should include two-phase flow from the TRAC-M vessel component to CONTAIN at one location, and single phase liquid flow from CONTAIN to TRAC-M at a second location. Flow areas, pressures and velocities should be similar to those expected in an ESBWR transient. The case is to demonstrate that mass, momentum, and energy is conserved at the coupled locations and that the coupling is sufficiently general to model bi-directional flow between the two codes. The test case is to be discussed with the NRC Technical Monitor before final calculations are made. Any coding errors involving the coupling that are identified by the test case are to be corrected.

Prepare a report to document any necessary code changes, the test case, and results of the simulation.

Estimated Level of Effort: 0.30 staff-months
Estimated Completion Date: 4/30/03

Task 11:   Generalize Coupling to Allow Flow of Noncondensable Gas from CONTAIN to TRAC-M

Modify the coupling to allow the flow of a non-condensable gas from CONTAIN to TRAC-M. Add the necessary arrays so that if backflow occurs, the user can specify if the return flow is single phase steam, single phase water, or a non-condensable gas.

Estimated Level of Effort: 0.30 staff-months
Estimated Completion Date: 4/30/03