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

SUBJECT: MODIFICATION NO. 3 TO TASK ORDER NO. 6 ENTITLED, "TRAC-M CODE
CONSOLIDATION DEVELOPMENTAL ASSESSMENT" UNDER CONTRACT
NO. NRC-04-02-054

Dear Mr. Meyer:

The purpose of this modification is to allot incremental funds and to extend the expiration date of
the task order. The period of performance for Task Order No. 6 is changed to run from
September 10, 2002 through December 15, 2003. The task order estimated cost and fixed fee
is changed as follows:

	FROM:	BY:	TO:
Estimated Costs	$223,729	$394,864	$618,593
Fixed Fee	$17,300	30,441	47,741
CPFF Total	$241,028.	$425,304	$666,332

$425,304 in funds is hereby allotted to this task order which fully funds the task order. The
accounting data for this task order is set forth as follows: RES ID: RES-C03-058 APPN:
31X0200 B&R:36015110205 JCN:Y6673 BOC: 252A Amount Obligated This Action:$425,304

Please indicate your acceptance of Task Order No. 6 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. All other terms and
conditions of this task order remain unchanged.

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: _____ James F. Meyer   VP   6/25/03
NAME   TITLE   DATE

<u>STATEMENT OF WORK</u>
<u>TASK ORDER NO.6 MOD 3</u>
<u>Additional SBLOCA and LBLOCA TRACE Validation</u>

<u>BACKGROUND</u>

The TRACE (TRAC/RELAP Advanced Computational Engine) code (previously known as TRAC-M) is being developed by the NRC to perform large and small break loss of coolant accident and system transient analysis for a wide range of nuclear plants. This code will be used as an audit tool to analyze transient and accident analyses submitted by the vendors for licensing of reactors. The predictions of the TRACE code need to be assessed by comparing simulation results to experimental data. These comparisons help to quantify the conservatism of licensing calculations and ability of TRACE to model and simulate various thermal-hydraulic events.

<u>OBJECTIVE</u>

The objective of this work is to: 1. perform part of the developmental assessment of thermal-hydraulic capabilities of the TRACE code to calculate small break loss of coolant accident (SBLOCA) phenomena simulated in the Semiscale and BETHSY test facilities; 2. perform part of the developmental assessment of thermal-hydraulic capabilities of the TRACE code to calculate large break loss of coolant accident (LBLOCA) phenomena simulated in the CCTF and SCTF test facilities, and 3. quantify margins between code predictions and experimental data.

<u>WORK REQUIREMENTS</u>

Task 5: <u>Simulation of Semiscale Experiments Using TRACE</u>

A series of experiments performed in Semiscale MOD-2A are to be simulated with the latest version of TRACE, which is the name now used for the TRAC-M code. Input decks previously developed for TRAC and RELAP are to be obtained and reviewed, and any modifications necessary to run the decks with TRACE are to be made and documented. The following experiments are to be simulated:

(A) Semiscale MOD-2A Test S-LH-01 "5% CL SBLOCA with 0.9% bypass"
(B) Semiscale MOD-2A Test S-LH-01 "5% CL SBLOCA with 3% bypass"
(C) Semiscale MOD-2A Test S-NH-1 "0.5% CL SBLOCA"
(D) Semiscale MOD-2A Test S-NH-2 "2.1% CL SBLOCA"

Prepare a report to document any necessary input or code changes, and results of the simulations. The report should include comparisons of TRACE results for these cases to applicable experimental data. All TRAC-M input and output files are to be retained for archiving in the NRC data bank.

Estimated Level of Effort: 6.0 staff-months
Estimated Completion Date: 11/30/03

Task 6:   <u>Simulation of BETHSY Test 9.1B (ISP-27) Using TRACE</u>

BETHSY Test 9.1B (ISP-27) is to be simulated with the latest version of TRACE, which is the name now used for the TRAC-M code. Input decks previously developed for RELAP are to be obtained and converted to TRACE format, with any modifications necessary to run the deck with TRACE fully documented. Test 9.1B is a 2-Inch Cold Leg break without HPSI and with delayed ultimate procedure.

Prepare a report to document any necessary input or code changes, and results of the simulations. The report should include comparisons of TRACE results for these cases to applicable experimental data. All TRAC-M input and output files are to be retained for archiving in the NRC data bank.

Estimated Level of Effort: 6.0 staff-months
Estimated Completion Date: 12/15/03

Task 7:   <u>Simulation of CCTF Reflood Experiments Using TRACE</u>

A series of experiments performed in the Cylindrical Core Test Facility (CCTF) are to be simulated with the latest version of TRACE, which is the name now used for the TRAC-M code. Input decks previously developed for TRAC-P are to be obtained and reviewed, and any modifications necessary to run the decks with TRACE are to be made and documented. The following experiments are to be simulated:

(A) Test C2-01 (Run 55) "High pressure test"
(B) Test C2-04 (Run 62) "Reproducibility test"
(C) Test C2-05 (Run 63) "Low power test"
(D) Test C2-06 (Run 64) "Flat radial profile test"
(E) Test C2-08 (Run 67) "Low pressure test"
(F) Test C2-AA2 (Run 58) "Downcomer and CL combined injection test"
(G) Test C2-12 (Run 71) "Best Estimate Reflood Test"

Prepare a report to document any necessary input or code changes, and results of the simulations. The report should include comparisons of TRACE results for these cases to applicable experimental data. All TRAC-M input and output files are to be retained for archiving in the NRC data bank.

Estimated Level of Effort: 6.0 staff-months
Estimated Completion Date: 9/30/03

Task 8:   Simulation of SCTF Reflood Experiments Using TRACE

A series of experiments performed in the Slab Core Test Facility (SCTF) are to be simulated with the latest version of TRACE, which is the name now used for the TRAC-M code. Input decks previously developed for TRAC-P and TRAC-M are to be obtained and reviewed, and any modifications necessary to run the decks with TRACE are to be made and documented. The following experiments are to be simulated:

(A) Test S2-01 (Run 606) "Gravity reflood, steep radial profile test"
(B) Test S2-02 (Run 606) "Gravity reflood at low pressure test"
    3 Test S2-06 (Run 611) "Gravity reflood at low pressure with steep radial profile test"

Prepare a report to document any necessary input or code changes, and results of the simulations. The report should include comparisons of TRACE results for these cases to applicable experimental data. All TRAC-M input and output files are to be retained for archiving in the NRC data bank.

Estimated Level of Effort: 3.0 staff-months
Estimated Completion Date: 11/30/03