AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

BPA NO.	1. CONTRACT ID CODE	PAGE	OF PAGES
		1	2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
M002	see block 16b	RES-04-065 5/16/2006	

6. ISSUED BY CODE

U.S. Nuclear Regulatory Commission
Division of Contracts
Attn: T-7-I-2
Contract Management Branch No. 2
Washington DC 20555

7. ADMINISTERED BY (If other than Item 6) CODE 3100

U.S. Nuclear Regulatory Commission
Div of Contracts
Two White Flint North - MS T-7-I-2

Washington, DC 20555

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

INFORMATION SYSTEMS LABORATORIES

11140 ROCKVILLE PIKE STE 500

ROCKVILLE MD 208523106

CODE 150135445 FACILITY CODE

(X) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-04-04-065 T007

X 10B. DATED (SEE ITEM 13) 09-26-2005

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
660-15-113-277 N6216 252A 31X0200.660
OBLIGATE: $53,136 FFS#: RES-C06-625

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
Mutual Agreement of the Parties

D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to increase the ceiling amount and obligated amount of the task order by $53,136 and to revise the Statement of Work as attached.
Task Order Ceiling: $324,672 (changed)
Obligated Amount: $324,672 (changed)
Period of Performance: 9/6/2005 through 10/06/2006 (changed)

See Continuation Page

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
James E. Meyer, Sr. V.P.	Donald A. King Contracting Officer
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED 9/11/06
16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED 9/6/06

STANDARD FORM 30 (REV. 10-83)

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

ADM002

This modification definitizes verbal authorization that was provided to Information Systems Laboratories, Inc. (ISL) on July 29, 2006 to continue work under Task Order No. 007 with a temporary ceiling of $294,536.

The purpose of this modification is to:

1. Increase the ceiling amount of the task order by $53,136 from $268,536 to $321,672.

2. Provide incremental funding in the amount of $53,136 thereby increasing the obligated amount of the task order from $268,536 to $321,672.

3. Extend the period of performance through October 6, 2006. Previous to this modification the period of performance was through September 15, 2006.

4. Revise the Statement of Work as attached.

ALL OTHER TERMS AND CONDITION REMAIN UNCHANGED

Total FY05 Obligations:	$242,400
Total FY06 Obligations:	$ 79,272
Total Obligations:	$321,672

Attachment: Statement of Work (revised)

STATEMENT OF WORK
NRC-04-04-065 TASK ORDER NO. 7 MOD 1

TITLE: TRACE Assessment of PUMA Test Data

I. BACKGROUND

The General Electric Company (GE) proposed ESBWR design is currently undergoing certification review by the USNRC. The ESBWR was submitted for Design Certification in August 2005. The NRC will use the TRACE code for audit calculations of the ESBWR design. The TRACE code must be assessed against applicable integral system test data to show that it can simulate the system response of the ESBWR under accident conditions. The NRC constructed the Purdue University Multi-Dimensional Integral Test Assembly (PUMA) integral test facility to collect data that is applicable to SBWR/ESBWR systems. Other tests have also been conducted at PUMA, PANDA and the University of California at Berkeley (UCB) to study film condensation in tubes at conditions relevant to the ESBWR.

II. OBJECTIVE

The objective of this task order is to obtain technical expertise from Information Systems Laboratory (ISL) to assess TRACE against PUMA Gravity Drain Line Break and Bottom Drain Line Break tests, PUMA tube bank separate effects tests, PANDA tube bank separate effects tests, and UCB-Kuhn single tube condensation separate effects tests.

III. SCOPE OF WORK

Task 1. Review Nodalization Provided for MSLB PUMA Input Deck

ISL will review the nodalization provided for the MSLB PUMA input deck and make changes to ensure consistency with the plant nodalization used for the pre-application LOCA calculations. ISL will review information on the PUMA test facility, tests to be simulated, and data. A simplified noding scheme may be used since these calculations are scoping calculations in nature. The calculations will be refined under a future task. ISL will then make required changes to the input deck and document the input model in a calculation notebook. All TRACE input files are to be retained for archival in the NRC Data Bank.

Task 2. Perform and Document Assessment Calculation for PUMA MSLB Test

ISL will compare TRACE calculated quantities to PUMA test data and make conclusions on the adequacy of the code predictions for key quantities such as vessel and core inventory and containment pressure for each phase of the accident simulation. ISL will document any code deficiencies and make recommendations for refining the noding used in the input deck. All TRACE input files are to be retained for archival in the NRC Data Bank.

Task 3. **Perform and Document Assessment Calculation for PUMA GDLB Test**

ISL will compare TRACE calculated quantities to PUMA test data and make conclusions on the adequacy of the code predictions for key quantities such as vessel and core inventory and containment pressure for each phase of the accident simulation. ISL will document any code deficiencies and make recommendations for refining the noding used in the input deck. All TRACE input files are to be retained for archival in the NRC Data Bank.

Task 4. **Perform and Document Assessment Calculation for PUMA BDLB Test**

ISL will compare TRACE calculated quantities to PUMA test data and make conclusions on the adequacy of the code predictions for key quantities such as vessel and core inventory and containment pressure for each phase of the accident simulation. The contractor will document any code deficiencies and make recommendations for refining the noding used in the input deck. All TRACE input files are to be retained for archival in the NRC Data Bank.

Task 5. **PUMA Separate-Effects PCCS Tests**

Compare TRACE calculated quantities to PUMA test data and make conclusions on the adequacy of the code predictions for key quantities for the 14 following tests:

PUMA PCCS HX Separate Effects Test TRACE Simulation Matrix

Test #	Test Series	m	P	NC	Pool Level	Q	U	h	Comment
		kg/sec	kPa	%	m	kW	W/m^2-K	W/m^2-K	
BL804AR	Bypass	0.0699	220	0	0.92	105.1	2959	5021	
BL723D	Bypass	0.062	220	10	0.92	52	2037	3695	
BL723C	Bypass	0.071	300	0	0.92	131.34	2411	3980	Compares to BL804AR for pressure effect, compares to BL723F for NC effect at 300 kPa.
BL723F	Bypass	0.056	300	10	0.92	73.7	1953	2846	Compares to BL723C and BL723G for NC effect at 300 kPa.
BL723G	Bypass	0.0554	300	15	0.92	64.28	1779	2511	Highest pressure test with highest amount of NC. May be typical of drywell conditions at time of peak pressure
CY602A	Cyclic venting	0.031	220	0	0.92	66.86	2825	5066	Compares with CY903D4 for NC effect at low pressure
CY903D4	Cyclic venting	0.033	220	4	0.92	51	1994	2910	This and CY903F4 give pressure sensitivity at NC = 4.
CY602B	Cyclic venting	0.033	240	0	0.92	71.55	2680	4634	Compare pressure effect by comparing CY602A, CY602B and CY903C. No NC
CY604E2	Cyclic venting	0.034	240	2	0.92	62.37	2715	3931	
CY903C	Cyclic venting	0.033	260	0	0.92	69.28	2039	3037	
CY903F4	Cyclic	0.033	260	4	0.92		2527	3557	

	venting								
LM807A	Long term cooling	0.0254	200	<1	0.62	51.35	2558	4199	This and LT912A compare effect of low water level at low pressure.
LT912A	Long term cooling	0.0257	200	<1	0.92	55.66	2707	4621	
LT823D	Long term cooling	0.0278	300	<1	0.92	58.75	2334	3424	Low flow, high pressure case. Compare to BL723C for flow sensitivity with no NC

(Ref. M Ishii, et al, "PCCS Separate Effects Tests in the PUMA Facility, PU/NE-05-17, October 2005).

Document any code deficiencies and make recommendations for refining the noding used in the input deck. All TRACE input files are to be retained for archival in the NRC Data Bank. Input decks, AVscript files, and calculation notebooks are to be prepared and provided to the staff. Prepare assessment reports in FrameMaker format.

Task 6. PANDA Separate-Effects PCCS Tests

ISL will compare TRACE calculated quantities to PANDA test data and make conclusions on the adequacy of the code predictions for key quantities defined in Task 5 for Tests S-1 through S-6, and S-13.

Task 7. UCB Kuhn Tests

ISL will compare TRACE calculated quantities to UCB-Kuhnz test data described below and make conclusions on the adequacy of the code predictions for key quantities defined in Task 5.

7.1) Tests 3.1-4, 3.2-4, 3.3-4, and 3.5-4 which are at 30 g/s, 4 bar, and vary non-condensibles from 1-40% (no test at 20%).

7.2) Tests 3.1-3, 3.2-3, 3.3-3, 3.4-3, and 3.5-3 which are at 30 g/s, 3 bar, and vary non-condensibles from 1-40%.

7.3) Tests 4.1-3, 4.2-3, 4.3-3, 4.4-3, and 4.5-3 which are at 60 g/s, 3 bar, and vary non-condensibles from 1-40%.

7.4) Tests 4.1-2, 4.2-2, 4.3-2, 4.4-2, and 4.5-2 which are at 60 g/s, 2 bar, and vary non-condensibles from 1-40%.

7.5) Test 3.4-2, which is at 30 g/s, 2 bar and 20% non-condensibles

IV. REPORTING REQUIREMENTS

1. ISL shall prepare a PUMA nodalization and technical reports as described in section V.,

Deliverables and Delivery Schedule.

2. Monthly Letter Status Report (MLSR)

A MLSR is to be submitted to the NRC Project Manager by the 20th of the month following the month to be reported with copies provided to the following:

Division Management Analyst, (Mail Stop T-10E32)
Division of Contracts, Office of Administration - an electronic copy only to Joyce Fields, email address jaf1@nrc.gov and to Beverly Anker, email address bfa@nrc.gov.

The MLSR will identify the title of the project, the job code, the Principal Investigator, the period of performance, the reporting period, summarize each month's technical progress, list monthly spending, total spending to date, and the remaining funds. Any administrative or technical difficulties which may affect the schedule or costs of the project shall be immediately brought to the attention of the NRC project manager.

V. DELIVERABLES AND DELIVERY SCHEDULE

1. The proposed PUMA integral test facility nodalization to the staff on the date established by the NRC Technical Monitor.

2. The PUMA, PANDA, and UCB-Kuhn draft assessment reports by September 15, 2005 (revised Task 5 by August 15, 2006) or the date established by the NRC Technical Monitor.

3. The draft MSLB assessment report is to the staff on the date established by the NRC Technical Monitor.

4. The draft GDLB assessment report is to the staff by September 30, 2005 or the date established by the NRC Technical Monitor.

5. PUMA, PANDA, and UCB-Kuhn final assessment reports by October 30, 2005 (revised Task 5 by September 15, 2006) or the date established by the NRC Technical Monitor.

6. The draft BDLB assessment report to the staff by December 31, 2005, or the date established by the NRC Technical Monitor.

7. Final MSLB and GDLB assessment reports are to the staff by November 30, 2005, or the date established by the NRC Technical Monitor.

8. Final BDLB assessment report to the staff by January 30, 2006, or the date established by the NRC Technical Monitor.

9. Completion report for this task order and all deliverables to the staff by February 28, 2006, or the date established by the NRC Technical Monitor.

Input decks, and AVscript files are to be prepared and provided to the staff. The assessment

reports are to be prepared in FrameMaker format.

VI. MEETINGS AND TRAVEL REQUIREMENTS

Three trips for two persons for one day each from Idaho Falls, ID to NRC Headquarters. Meetings are to take place with the NRC staff at the NRC headquarters facilities or the ISL Rockville office. Travel such as technical professional society meetings to present papers may be considered if needed, but must be approved by the NRC Project Manager. Foreign travel must be approved by processing NRC Form 445, in addition to being provided as part of the approved proposal.

VII. LEVEL OF EFFORT

The total level of effort is estimated at 14.5 staff-months at the Senior Engineer level or higher.

VIII. PERIOD OF PERFORMANCE

The period of performance of this Task Order is September 6, 2005 until September 15, 2006.

IX. TECHNICAL DIRECTION

Technical direction will be provided by the Project Manager, Michael B. Rubin, and the Technical Monitor, David Bessette, who can be reached at:

Mail Stop: (T-10 K08)
U. S. Nuclear Regulatory Commission
Washington DC 20555-0001
Phone: (301) 415-7002
Fax: (301) 415-5160
Email: (jls4@nrc.gov)

X. PUBLICATIONS

RES encourages the publication of the scientific results from RES sponsored programs in refereed scientific and engineering journals as appropriate. If the laboratory proposes to publish in the open literature or present the information at meeting in addition to submitting the required technical reports, approval of the proposed article or presentation should be obtained from the NRC Project Manager. The RES Project Manager shall either approve the material as submitted, approve it subject to NRC suggested revisions, or disapprove it. In any event, the RES Project Manager may disapprove or delay presentation or publication of papers on information that is subject to Commission approval that has not been ruled upon or which has been disapproved. Additional information regarding the publication of NRC sponsored research is contained in NRC Management Directives 3.8, "Unclassified Contractor and Grantee Publications in the NUREG Series," and 3.9, "NRC Staff and Contractor Speeches, Papers, and Journal Articles on Regulatory and Technical Subjects."

If the presentation or paper is in addition to the required technical reports and the RES Project Manager determines that it will benefit the RES project, the Project Manager may authorize

payment of travel and publishing costs, if any, from the project funds. If the Project Manager determines that the article or presentation would not benefit the RES project, the costs associated with the preparation, presentation, or publication will be borne by the contractor. For any publication or presentations falling into this category, the NRC reserves the right to require that such presentation or publication will not identify the NRC's sponsorship of the work.

NEW STANDARDS FOR CONTRACTORS WHO PREPARE NUREG-SERIES MANUSCRIPTS

The U.S. Nuclear Regulatory Commission (NRC) began to capture most of its official records electronically on January 1, 2000. The NRC will capture each final NUREG-series publication in its native application. Therefore, commencing January 1, 2000, please submit your final manuscript that has been approved by your NRC Project Officer in both electronic and camera-ready copy.

All format guidance, as specified in NUREG-0650, Revision 2, will remain the same with one exception. You will no longer be required to include the NUREG-series designator on the bottom of each page of the manuscript. The NRC will assign this designator when we send the camera-ready copy to the printer and will place the designator on the cover, title page, and spine. The designator for each report will no longer be assigned when the decision to prepare a publication is made. The NRC's Publishing Services Branch will inform the NRC Project Officer for the publication of the assigned designator when the final manuscript is sent to the printer.

For the electronic manuscript, prepare the text in WordPerfect 8 (or more recent), and use any of the following file types for charts, spreadsheets, and the like.

File Types to be Used for NUREG-Series Publications	
File Type	File Extension
WordPerfect®	.wpd
Microsoft® PowerPoint®	.ppt
Corel® QuattroPro®	.wb3
Corel® Presentations	.shw
Lotus® 1-2-3	.wk4
Portable Document Format	.pdf

This list is subject to change if new software packages come into common use at NRC or by our licensees or other stakeholders that participate in the electronic submission process. If a portion of your manuscript is from another source and you cannot obtain an acceptable electronic file type for this portion (e.g., an appendix from an old publication), the NRC can, if necessary, create a tagged image file format (file extension.tif) for that portion of your report.

Note that you should continue to submit original photographs, which will be scanned, since digitized photographs do not print well.

If you chose to publish a compact disk (CD) of your publication, place on the CD copies of the manuscript in both (1) a portable document format (PDF); (2) a WordPerfect 8/9 file format, and (3) an Adobe Acrobat Reader, or, alternatively, print instructions for obtaining a free copy of Adobe Acrobat Reader on the back cover insert of the jewel box.

XI. QUALITY ASSURANCE

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554) directs the Office of Management and Budget (OMB) to issue government-wide guidelines (FR Vol. 67, No. 36, pp. 8452-8460) that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." NRC Information Quality Guidelines are provided in FR Vol. 67, No. 190, pp. 61695-61699.

The Contractor shall cite contractor quality assurance procedures used in the conduct of this work that provide for compliance with OMB and NRC guidelines.

XII. NRC-FURNISHED MATERIALS

The NRC will provide to ISL facility and test information on the PUMA and PANDA test facilities and a TRACE input deck and calculation notebook for a Main Steam Line Break test run at the PUMA facility. A FrameMaker template to be used for code assessment reports will also be provided.

Proprietary submitted documentation will be provided by the NRC in the form of CD-ROMs.

XIII. TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

ISL shall provide personnel that are experienced in TRACE input deck development and code assessment and the requirements for simulating the ESBWR reactor design.

It is the responsibility of the contractor to assign technical staff, employees, subcontractors, or specialists who have the required educational background, experience, or combination thereof to meet the technical objectives of the work specified in this SOW. The NRC will rely on representations made by the contractor concerning the qualifications of the personnel assigned to this task order including assurance that all information contained in the technical and cost proposal, including resumes, is accurate and truthful. In addition, the contractor and personnel assigned to this work must be approved for handling and working with proprietary information.

The use of key personnel and any proposed change to key personnel on this contract is subject to the NRC Project Manager's approval. This includes proposed use of principal persons (i.e., key contributors) during the life of the contract.

For any work to be subcontracted or performed by consultants ISL shall obtain the NRC Project Manager's written approval of the subcontractor or consultant prior to initiation of the subcontract effort. Conflict of interest considerations shall apply to any subcontracted effort.

XIV. REFERENCES AND ATTACHMENTS

None.

XV. CONFLICT OF INTEREST

List any work in the proposal that is similar to that previously performed or is to be performed by the contractor on behalf of another sponsor that might give rise to an apparent (perceived) or actual organizational conflict of interest, including duplication of effort.

XVI. SUBCONTRACT/CONSULTING INFORMATION

Describe any technical support effort that is proposed to be performed by a subcontractor or consultant. Identify the level of effort, by task, of any proposed subcontractor or consultant and provide an explanation of the need for subcontracting that portion of the effort. Note that "pass through" contracting is not allowed under the requirements of the DOE/NRC Memorandum of Understanding. For the purposes of this effort, a "pass through" contract is generally defined as subcontracting 50 percent or more of the technical effort. For any subcontract or consultant effort, describe the following:

-the necessity of subcontracting,
-the tasks and sub-tasks the subcontractor or consultant will perform,
-the level of effort proposed for the subcontract effort,
-the conflict of interest considerations to be taken into account,
-the status and expected time frame for selection,
-the method of selection of the subcontractor or consultant.

XVII. LICENSE FEE RECOVERY

The work specified in this SOW is not license fee recoverable.