

NRC TASK ORDER 010

ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES

1 2

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

BPA NO.

1. DATE OF ORDER 12-16-2009		2. CONTRACT NO. (if any) NRC-04-06-068		6. SHIP TO:	
3. ORDER NO. NRC TASK ORDER 010		4. REQUISITION/REFERENCE NO. 04-06-068T009M001		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: H. (Eddie) Colón, Jr., 301-492-3620 Mail Stop TWB-01-10M Washington, DC 20555		7. TO:		b. STREET ADDRESS Attn: Shawn Marshall, 301-251-7523 Mail Stop: C3-A07M 11545 Rockville Pike	
a. NAME OF CONTRACTOR INFORMATION SYSTEMS LABORATORIES ISL		b. CITY Rockville		d. STATE MD	e. ZIP CODE 20852
b. COMPANY NAME ATTN: DR. JAMES P. MEYER		c. CITY Rockville		f. SHIP VIA	
c. STREET ADDRESS 11140 ROCKVILLE PIKE STE 500		e. STATE MD		f. ZIP CODE 208523106	
8. ACCOUNTING AND APPROPRIATION DATA 060-15-171-277 N6969 252A 31X0200.060 OBLIGATE: \$48,367 (FPS Commitment #:RES-C10-508)		8. TYPE OF ORDER <input type="checkbox"/> a. PURCHASE <input checked="" type="checkbox"/> b. DELIVERY REFERENCE YOUR Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated. Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.			
9. BUSINESS CLASSIFICATION (Check appropriate box(es)) <input type="checkbox"/> a. SMALL <input type="checkbox"/> d. WOMEN-OWNED <input checked="" type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> e. HUBZone <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> f. EMERGING SMALLBUSINESS <input type="checkbox"/> g. SERVICE-DISABLED VETERAN-OWNED		10. REQUISITIONING OFFICE RES			
11. PLACE OF a. INSPECTION b. ACCEPTANCE		13. PLACE OF		12. F.O.B. POINT Destination	
14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date) N/A		16. DISCOUNT TERMS Net 30	

17. SCHEDULE (See reverse for Rejections) See CONTINUATION Page

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	<p>TASK ORDER NO. 010 ENTITLED "DEVELOPMENT OF AP1000 PLANT INPUT MODELS FOR TRACE CODE AND ASSOCIATED DOCUMENTATION"</p> <p>Refer to your Rev. 2 technical & cost proposals dated 12/2009, and discussions with Shawn Marshall. The attached SOW reflects the agreed upon period, deliverable, and estimated delivery schedule.</p> <p>In accordance with Section G.4 entitled "Task Order Procedures" of the subject contract, this order definitizes Task Order No. 010, which shall be performed in accordance with the enclosed Statement of Work (SOW).</p> <p>Task Order No. 010 shall be effective December 16, 2009 - May 31, 2010 with a total cost ceiling of \$48,367 of which the amount \$44,786 represents the estimated cost and the amount of \$3,581 represents the fixed fee.</p>					

18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.	
21. MAIL INVOICE TO:					
a. NAME Department of Interior National Business Center					
b. STREET ADDRESS (or P.O. Box) Attn: Fiscal Services Branch - D2270 7301 W. Mansfield Avenue					
c. CITY Denver		d. STATE CO	e. ZIP CODE 80235-2230		17(h) TOTAL (Cont. pages)
22. UNITED STATES OF AMERICA By (Signature) <i>Heriberto Colón, Jr.</i> VICE-PRESIDENT 12/16/09				23. NAME (Typed) Heriberto Colón, Jr. Contracting Officer TITLE: CONTRACTING/ORDERING OFFICER	

OBLIGATED: \$48,367.00

17(i) GRAND TOTAL

AUTHORIZED FOR LOCAL REPRODUCTION PREVIOUS EDITION NOV 1999

OPTIONAL FORM 347 (REV. 4/2006) PRESCRIBED BY GSA/FAR 48 CFR 53.213(f)

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

DEC 17 2009

ADM001

NRC TASK ORDER 010

**ORDER FOR SUPPLIES OR SERVICES
SCHEDULE - CONTINUATION**

PAGE NO.
2

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

DATE OF ORDER

12-16-2009

CONTRACT NO.

NRC-04-06-068

ORDER NO.

NRC TASK ORDER 010

ITEM NO. (A)	SUPPLIES OR SERVICES (B)	QUANTITY ORDERED (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)	QUANTITY ACCEPTED (G)
<p>The issuance of this task order does not amend any other terms or conditions of the subject contract.</p> <p>Please indicate your acceptance of this Task Order.</p> <p>ACCEPTED:</p> <p>Name _____</p> <p>Title _____</p> <p>Date _____</p>						

TOTAL CARRIED FORWARD TO 1ST PAGE (ITEM 17(H))

Page 2

**STATEMENT OF WORK FOR COMMERCIAL
TASK ORDER NO. 10 under Contract No. NRC-04-06-068**

TITLE: Development of AP1000 Plant Input Models for TRACE Code and Associated Documentation

BACKGROUND

The TRAC/RELAP Advanced Computational Engine (TRACE) system code is to be used for confirmatory analyses of the AP1000 plant. An initial component of confirmatory analyses is assessment of the TRACE code using the results from integral test facilities, including Rig of Safety Assessment/AP600 (ROSA/AP600) and Advanced Plant Experiment/AP1000 (APEX/AP1000). Once the code is judged to be applicable, robust AP1000 TRACE models are necessary in order to support various types of plant simulations, including steady-state and large break loss of coolant accident (LBLOCA), small break loss of coolant accident (SBLOCA), and non-LOCA transients [main steam line break (MSLB), steam generator tube rupture (SGTR), and station blackout (SBO)]. In addition, complete calculation notebooks, plant simulation reports, assessment reports of integral facility models, and applicability reports are necessary in order to document the TRACE models and their assessments.

OBJECTIVE

This task order resumes the development of APEX/AP1000 TRACE models and documentation that was part of TRACE Development, Assessment and Applicability for AP1000 (Contract GS23F0060L NRC-DR-04-07-085, Modification No.4).

This work is in response to the User Need Request by NRC Office of New Reactors (NRO-2008-005).

SCOPE OF WORK

Task 1: Continue the Development of APEX Model for AP1000

Task 1.1: Revise Input Models

The contractor shall continue the development of the following TRACE APEX/AP1000 models developed with the referenced contract:

- a. NRC-AP1000-01
- b. NRC-AP1000-03
- c. NRC-AP1000-05
- d. NRC-AP1000-04
- e. NRC-AP1000-06
- f. NRC-AP1000-11
- g. NRC-AP1000-08

The contractor shall revise the input models in order to improve the TRACE results relative to the experimental data until comparisons are deemed acceptable or the reasons for differences are understood and documented. The contractor shall immediately notify the NRC Project Manager if there are large discrepancies between TRACE and experimental results.

Input Specifications

All TRACE models discussed within this task order shall meet the specifications discussed below. The models shall be robust and minimize run time. Input model development shall adhere to the guidance provided in the User's Manual for the TRACE 5.0 code and to AP1000 specific user guidance. The models shall be reviewed to ensure correct model inputs. The models shall implement the PWR steady-state parameter checklist, and PWR input deck assessment checklist as listed under the NRC-Furnished Material section of the Statement of Work.

The contractor shall prepare well-structured and formatted steady state and transient input files for SNAP and TRACE and shall develop preliminary as well as final input decks to facilitate timely review and testing by the NRC staff. The model design and preliminary results shall be presented to NRC staff (such as at a TRACE Users Group Meeting). A draft "final" report, which incorporates NRC comments of the preliminary report, shall be provided to allow sufficient time for review by NRC staff.

In order to maintain control over the development of steady state plant models, the TRACE transient input files shall be restarts from steady state. The SNAP transient files shall be created by importing the TRACE transient restart decks into the steady state SNAP model.

Task 1.2: Run Demonstration Calculations, Prepare Calculation Notebook, Revise Assessment Report, and Resolve Open Items

A TRACE calculation notebook and an assessment report shall be fully completed during the contract period. Calculations shall be documented in a TRACE Model User Description and Analysis Report written in Framemaker. All figures present in the report documents shall exist as separate files on disk and linked to the files using the "import by reference feature" of Framemaker. The reports shall also be made available in Adobe PDF and Rich Text Format (RTF). All SNAP and TRACE input files, AVScript files (old and the new SNAP AVF plug-in formats), calculation notebook files and other extraneous scripts or files necessary to reproduce the work shall be provided on a compact disk (CD) for subsequent download and use on a Windows/PC platform.

The cases associated with the TRACE code runs shall use AVScript input files and code input files prepared for each case. Where applicable, results for each case shall be compared to previous analyses (results of analyses published in DCD, UFSARs, LOCA LTRs, test facility reports, etc.).

A consistent SNAP version and TRACE executable shall be used for all model development and simulation throughout this Task Order; the NRC Project Manager shall provide technical direction as it relates to code version. All models shall run on Microsoft Windows platforms within acceptable CPU times and without user intervention. Run time goals are as follows:

- For the steady state, real-time execution is preferred (CPU time = modeling time). No steady state run shall take longer than three times the modeling time to converge.
- For LBLOCAs the code should be able to sustain a timestep range of 0.005 - 0.02 sec

during blowdown, 0.0025 - 0.005 sec during refill and early reflood and 0.01 - 0.02 sec during middle and late reflood (after accumulators empty for PWRs).

- For SBLOCAs the code should be able to sustain a timestep range of 0.025 - 0.1 seconds through the entire event. Once the ADS system is actuated, the timestep range may approach those values listed above for LBLOCA simulations.
- Frequent timestep modifications to overcome "code difficulties" should not be used. The model should be robust so that the number of timestep modifications is small.

The above criteria assume that all TRACE modeling guidelines are followed. Exceptions to this requirement shall be approved by the NRC Project Manager. Status of the input deck development should be communicated with the NRC Project Manager early in the contract stage to confirm the acceptability of run time and timestep values if they fall outside the specifications described above. The NRC Project Manager shall be notified as soon as possible and a bug report shall be submitted if fatal run-time errors occur when running the TRACE code.

This task shall include time set aside to respond to the staff's questions and to resolve issues raised during preliminary and final acceptance reviews.

Estimated level of total effort for contract period: 2 staff-months

Estimated completion date: Preliminary Model/Reports 10 weeks after contract award, Final Model/Reports 18 weeks after contract award

RESEARCH QUALITY

The quality of NRC research programs are assessed each year by the Advisory Committee on Reactor Safeguards. Within the context of their reviews of RES programs, the definition of quality research is based upon several major characteristics:

Results meet the objectives (75% of overall score)
Justification of major assumptions (12%)
Soundness of technical approach and results (52%)
Uncertainties and sensitivities addressed (11%)

Documentation of research results and methods is adequate (25% of overall score)
Clarity of presentation (16%)
Identification of major assumptions (9%)

It is the responsibility of the contractor to ensure that these quality criteria are adequately addressed throughout the course of the research that is performed. The NRC project manager and technical monitor will review all research products with these criteria in mind.

TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

Only those members of the contractor's staff with a proven record of delivering high-quality TRACE decks to the NRC shall be assigned as key personnel on any of the identified tasks.

PERIOD OF PERFORMANCE

The estimated period of performance of this task order is December 16, 2009 through May 31, 2010.

REPORTING REQUIREMENTS

NRC Project Managers will provide a concise list of reports to be provided; the desired level of contractor management review of reports; and the frequency, content, and distribution of the reports.

Monthly Letter Status Report.

A Monthly Letter Status Report (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:

Resource Name: RESDSAMLSR.Resource@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 and will contain information as directed in NRC Management Directive 11.1. 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.

PUBLICATIONS NOTE

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 3.7, "NUREG Series Publications," 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 NRC 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, please submit your final manuscript that has been approved by your NRC Project Manager 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 Publishing Services Branch will inform the NRC Project Manager for the publication of the assigned designator when the final manuscript is sent to the printer.

For the electronic manuscript, the Contractor shall prepare the text in Microsoft Word, 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
Microsoft® Word®	.doc
Microsoft® PowerPoint®	.ppt
Microsoft® Excel	.xls
Microsoft® Access	.mdb
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 choose 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 Microsoft Word 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.

DELIVERABLES/SCHEDULE AND/OR MILESTONES

1. TRACE input models shall be developed for steady-state and transients for the APEX/AP1000 integral test facility. For each model, preliminary as well as final input

decks shall be delivered to facilitate timely review and testing by the NRC staff. During the review period, the approval of the Project Manager is required to make any major changes in the functionality of the plant decks.

2. Monthly letter status reports should be provided as done for the referenced contract.
3. TRACE input decks and documentation, including calculation notebook and plant specific TRACE Model User Description and Analysis Assessment Report documenting the results from the demonstration TRACE calculations as described in Task 1.2, as well as all modified AVScripts, TRACE input files, and SNAP input files shall be prepared and provided to the staff. The contractor shall deliver the above TRACE models, reports, AVScripts, TRACE input files, and SNAP files to the NRC as per the delivery milestones below:

Task	Delivery Dates (weeks after award)	
	Preliminary Model/Reports	Final Model/Reports*
Task 1	10 weeks	18 weeks

The quality of the preliminary model and report should be that of a final deliverable, lacking only the modifications that may become necessary due to NRC comments.

* Draft "final" reports, which include NRC comments from the preliminary models/reports, shall be provided at least two weeks prior to delivery date of final report for one last review.

ORGANIZATIONAL CONFLICT OF INTEREST DISCLOSURE
(to be inserted by Division of Contracts)

MEETINGS AND TRAVEL
None.

NRC-FURNISHED MATERIAL

- The TRACE Version executable with compatible SNAP counterpart will be provided or specified by the staff

APPROPRIATE USE OF GOVERNMENT FURNISHED INFORMATION TECHNOLOGY (IT) EQUIPMENT AND/ OR IT SERVICES/ ACCESS (APRIL 2003)

As part of contract performance the NRC may provide the contractor with information technology (IT) equipment and IT services or IT access as identified in the statement of work or subsequently as identified in the project. Government furnished IT equipment, or IT services, or IT access may include but is not limited to computers, copiers, facsimile machines, printers, pagers, software, phones, Internet access and use, and email access and use. The contractor (including the contractor's employees, consultants and subcontractors) shall use the NRC furnished IT equipment, and/or IT provided services, and/or IT access solely to perform the necessary efforts required under the contract. The contractor (including the contractor's employees, consultants and subcontractors) are prohibited from engaging or using the NRC IT

equipment and government provided IT services or IT access for any personal use, misuse, abuses or any other unauthorized usage.

The contractor is responsible for monitoring its employees, consultants and subcontractors to ensure that NRC furnished IT equipment and/or IT services, and/or IT access are not being used for personal use, misused or abused. The NRC reserves the right to withdraw or suspend the use of its government furnished IT equipment, IT services and/ or IT access arising from contractor personal usage, or misuse or abuse; and/or to disallow any payments associated with contractor (including the contractor's employees, consultants and subcontractors) personal usage, misuses or abuses of IT equipment; IT services and/or IT access; and/or to terminate the project arising from violation of this provision.

TECHNICAL DIRECTION

Technical direction will be provided by the Project Manager, Shawn Marshall, and Technical Monitor, Joseph Borowsky, who can be reached at:

Shawn Marshall
Mail Stop: C3A7M
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Phone: (301) 251-7523
Fax: (301) 251-7423
Email: (Shawn.Marshall@nrc.gov)

Joseph Borowsky
Mail Stop: C3A7M
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Phone: (301) 251-7902
Fax: (301) 251-7423
Email: (Joseph.Borowsky@nrc.gov)

Express mail should be sent to:
U. S. Nuclear Regulatory Commission
Mail Stop: C3A7M
11545 Rockville Pike, Rockville, MD 20852-2738