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OPTIONAL FORM 348 (Rev. 4/2008)

Task Order NRC-HQ-60-14-T-0001

B.1 PRICE/COST SCHEDULE

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.1	PRICE/COST SCHEDULE		
Base P	eriod (February 20, 2014 – February 19,	2015	
CLIN	DESCRIPTION	ESTIMATED COST PLUS FIXED- FEE	
0001	Contractor performance of statement of work requirements described under Section C.	Direct Labor: Overhead/Fringe: Subcontractors: Subcontract M&S Overhead: Other Direct Costs/Travel: Consultants: G&A: Estimated Costs: Fixed Fee:	
Total -	Base Year		\$898,850.23
Option	Year One (February 20, 2015 – Februar	y 20, 2016)	
CLIN	DESCRIPTION	ESTIMATED COST PLUS FIXED-FEE	
1001	Contractor performance of statement of work requirements described under Section C.	Direct Labor: Overhead/Fringe: Subcontractors: Subcontract M&S Overhead: Other Direct Costs/Trave!: Consultants: G&A: Estimated Costs: Fixed Fee:	
Total -	Option Year One		\$925,514.33
	Year Two (February 20, 2016 – Februa	ry 20, 2017	
CLIN	DESCRIPTION	ESTIMATED COST PLUS FIXED-FEE	
2001	Contractor performance of statement of work requirements described under Section C.	Direct Labor: Overhead/Fringe: Subcontractors: Subcontract M&S Overhead: Other Direct Costs/Travel: Consultants: G&A: Estimated Costs: Fixed Fee:	
Total -	Option Year Two		\$952,998.4 3

CLIN	DESCRIPTION	ESTIMATED COST PLUS FIXED-FEE
3001	Contractor performance of statement of work requirements described under Section C.	Direct Labor: Overhead/Fringe: Subcontractors: Subcontract M&S Overhead: Other Direct Costs/Travel: Consultant: G&A: Estimated Costs:
Total -	- Option Year Three	\$981.308.08

CLIN	DESCRIPTION	ESTIMATED COST PLUS FIXED-FEE	
4001	Contractor performance of statement of work requirements described under Section C.	Direct Labor: Overhead/Fringe: Subcontractors: Subcontract M&S Overhead: Other Direct Costs/Travel: Consultant: G&A: Estimated Costs:	
		Fixed Fee:	
Total -	Option Year Four	· · · · · · · · · · · · · · · · · · ·	
	ESTIMATED CEILING AMOUNT - AND OPTION YEARS		\$4,769,121.42

B.2 CONSIDERATION AND OBLIGATION-COST-PLUS-FIXED-FEE (AUG 2011) ALTERNATE I (AUG 2011)

(a) The total estimated cost to the Government for full performance of this task order is 898,850.23, of which the sum of the second represents the estimated reimbursable costs, and of which the sum of the fixed-fee.

(b) There shall be no adjustment in the amount of the Contractor's fixed fee.

(c) The amount currently obligated by the Government with respect to this task order is \$375,000.00.

(d) It is estimated that the amount currently obligated will cover performance through July 1, 2014.

(e) This is an incrementally-funded task order and FAR 52.232-22 - "Limitation of Funds" applies.

(f) In accordance with FAR 52.216-8 - Fixed Fee, it is the policy of the NRC to withhold payment of fee after payment of 85 percent of the fee has been paid in order to protect the Government's interest. The amount of fixed-fee withheld from the contractor will not exceed 15 percent of the total fee or \$100,000, whichever is less. Accordingly, the maximum amount of fixed-fee that may be held in reserve is \$8,783.32.

Statement of Work Maintenance of NRC Computer Codes II Task Order NRC-HQ-60-14-T-0001

C.1 PURPOSE:

The contractor shall provide Thermal-hydraulic (T/H) code and model development and improvements, as well as configuration control, correction of code errors, documentation updates, and user support to the NRC, its contractors, and members of CAMP and the domestic user community. The NRC will provide the contractor with the required codes.

C.2 SPECIFIC TASKS:

Task 1 - TRACE/PARCS Code Development and Maintenance

The contractor shall:

- Maintain and develop TRACE/PARCS and provide a single point of contact for satisfying code users' requests for documentation, code versions or updates, modeling changes, improved user convenience, assistance and diagnosis of user problems, correction of code bugs, code changes, and updating of code documentation. Unless authorized by NRC, modifications shall be backwardly compatible with plant input models that were developed for older versions of the code.
- Support TRACE/PARCS on the following platforms: Windows PC 32 bit*, Windows PC 64 bit*, Linux PC 32 bit*, Linux PC 64 bit*, and Mac/OSX (or later)* running the following Fortran compilers and tools: Intel Visual Fortran (for Linux and Windows)* and Microsoft Visual Studio*, Totalview Fortran debugger for Linux*, NAG Fortran compiler for Mac/OSX*, Lahey (Linux and Windows)*, Compaq Visual Fortran, Salford compiler, IBM xlf compiler (for Apple), g95 compiler, Portland Group compiler, PathScale compiler, and gfortran compiler.
- 3. Ensure that the above compilers and platforms with asterisks next to them are in place for the entire period of performance. Also ensure that these tools and platforms are maintained at their most current release levels throughout the task order (to the extent that the compilers will successfully compile NRC codes and the compilers and platforms reflect what is being used in the user community). Other tools and platforms can be acquired later on direct instruction from the NRC Contracting Officer Representative (COR). The contractor may be asked to extend support to other platforms and tools not listed (i.e., Sun Unix, HP Unix, etc.) to reflect changing user needs.
- 4. Develop and maintain customized installation packages that are to be used when distributing TRACE/PARCS – one variant with source code, and one variant without source code (executable only). If an installation package does not exist, the contractor shall create one. Installation packages should include, at a minimum, a README file

explaining how to install and run the code, sample inputs and outputs, all relevant code documentation, auxiliary tools or programs, and optimized and debug 32 and 64-bit executables for Linux and Windows. Installation packages should be user-friendly in that clear installation instructions are available and the necessary software files can be installed in an automated fashion. Unless otherwise directed, installation packages shall be checked to ensure they do not contain proprietary information. Sample distribution CD's shall be provided to the NRC COR before their first release.

- 5. Perform verification and validation (V&V) of new models and TRACE/PARCS code versions, as directed by NRC. This includes the preparation of existing assessment cases into an automated execution framework (i.e. AVScript or AVF plugin) and the preparation of assessment reports in Framemaker format (using templates provided by the NRC). When a new version of a code is created or new experimental data becomes available, and when requested, the contractor shall provide the NRC COR with a plan for developmentally assessing the code. Such a plan should include a proposed assessment matrix based on a review of the relevant models and correlations in the code and ranges of conditions over which they apply, as well as a proposed milestone schedule and the required level of effort.
- 6. Maintain cognizance of national and international developments in the area of thermalhydraulic codes/experiments. Based on this knowledge, as appropriate, propose modeling improvements to TRACE/PARCS and additions to the developmental assessment matrix to ensure that TRACE/PARCS retains a state-of-the-art thermalhydraulic analysis capability.
- 7. Maintain a CD/DVD library (using archival quality media) of TRACE/PARCS code versions developed by the contractor. Include all files necessary to understand, reproduce, document and test these code versions, including ancillary data files and plotting routines. Restrict READ/WRITE access to supervised employees. While the NRC currently maintains configuration control of TRACE/PARCS using a version control system called Subversion, the NRC may, at its discretion, ask the contractor to assume this responsibility.
- 8. Maintain a Bugzilla-based (or similar) tool for user trouble reports and user change requests. The NRC COR shall be notified immediately if changes that need to be addressed urgently are identified.
- Prior to the release of any revised versions of TRACE/PARCS, submit to the NRC COR, for review and approval, all documentation that reflects the changes made to the code(s), including assessment and user guidance. All NRC-approved released versions of TRACE/PARCS shall be provided to the NRC COR.

Task 2 – RELAP5 Code Maintenance

The contractor shall:

1. Maintain and develop RELAP5, as directed by the NRC, and provide a single point of contact for satisfying code users' requests for documentation, code versions or updates,

modeling changes, improved user convenience, assistance and diagnosis of user problems, correction of code bugs, code changes, and updating of code documentation. Unless authorized by NRC, modifications shall be backwardly compatible with plant input models that were developed for older versions of the code.

- 2. Support RELAP on the following platforms: Windows PC 32 bit, Windows PC 64 bit, Linux PC 32 bit, Linux PC 64 bit, and Mac/OSX (or later) running the following Fortran compilers and tools: Intel Visual Fortran (for Linux and Windows) and Microsoft Visual Studio, Totalview Fortran debugger for Linux, NAG Fortran compiler for Linux, NAG Fortran compiler for Mac/OSX, Lahey (Linux and Windows), Compaq Visual Fortran, Salford compiler, IBM xlf compiler (for Apple), g95 compiler, Portland Group compiler, PathScale compiler, and gfortran compiler. The contractor may be asked to extend support to other platforms and tools not listed (i.e., Sun Unix, HP Unix, etc.) to reflect changing user needs.
- 3. Develop and maintain customized installation packages that are to be used when distributing RELAP one variant with source code, and one variant without source code (executable only). If an installation package does not exist, the contractor shall create one. A typical installation package should include the RELAP software itself, documentation, sample test problems and outputs, installation and/or build scripts, auxiliary support tools, and README files or similar installation instructions. Installation packages should be user-friendly in that clear installation instructions are available and the necessary software files can be installed in an automated fashion. Unless otherwise directed, installation packages shall be checked to ensure they do not contain proprietary information. Sample distribution CD's shall be provided to the NRC COR before their first release.
- 4. Perform V&V of new models and RELAP5 code versions, as directed by NRC. When a new version of a code is created or new experimental data becomes available, and when requested, the contractor shall provide the NRC COR with a plan for developmentally assessing the code. Such a plan should include an assessment matrix based on a review of the relevant models and correlations in the code and ranges of conditions over which they apply, as well as a proposed milestone schedule and the required level of effort.
- Maintain configuration control, and a CD/DVD library (using archival quality media) of RELAP5 code versions. Include all files necessary to understand, reproduce, document and test these code versions, including ancillary data files and plotting routines. Restrict READ/WRITE access to supervised employees.
- 6. Maintain a file of user trouble reports and user change requests. On a quarterly basis, provide to the NRC COR a report that describes how error corrections were/will be made with a proposed prioritization schedule, and estimated staff effort to meet these requests. The NRC COR shall be notified immediately if changes that need to be addressed urgently are identified. The report shall include a description of the procedures used for quality assurance for error corrections and code revisions.

 Prior to the release of any revised versions of RELAP5, submit to the NRC COR, for review and approval, all documentation that reflects the changes made to the code(s), including assessment and user guidance. All NRC-approved released versions of RELAP5 shall be provided to the NRC COR.

Task 3 - Maintain the NRC Reactor Safety Data Bank

The contractor shall maintain the NRC Reactor Safety Data Bank. This shall include any or all of the following:

- Convert new (or other unconverted) experimental data to the platform independent binary (PIB) format as .bin files. All converted data shall be verified for completeness and correctness. Also, converted files shall be delivered to NRC in formats appropriate for both inclusion in the standard Data Bank hierarchy and archival into the NRC ADAMS system.
- 2. Update existing Data Bank files, as necessary, to ensure completeness and correctness
- 3. Locate references and documents associated with existing or pertinent experiments for inclusion in the Data Bank

Task 4 - CAMP Program Management

The contractor shall:

- Provide user support to CAMP members as required by the CAMP agreements. This
 includes providing a single point of contact for answering general code related questions
 and satisfying requests for documentation, code versions or updates (with NRC
 approval), installation support, modeling changes, improved user convenience,
 assistance and diagnosis of user problems, correction of code bugs, code changes, and
 updating of code documentation.
- 2. Provide general administrative, technical, and logistical support, participate in, and make presentations at CAMP semi-annual meetings. Such support may include (but is not necessarily limited to) preparation of invitation letters and registration materials, preparation and distribution of handout materials (CD's and paper copies of presentations), preparation of agendas, registration of attendees, interfacing with conference center or NRC support staff, and audio-visual support. The contractor shall also prepare CAMP and Technical Program Committee (TPC) meeting minutes. These minutes shall be made available to all CAMP representatives no less than 2 months in advance of the next CAMP meeting.
- 3. Prepare annual summary reports of in-kind contributions performed by CAMP participants.
- Assist NRC in maintaining an up-to-date list of official CAMP representatives and CAMP code users.

- 5. Provide telephone assistance to NRC staff and domestic code users during regular business hours, i.e., 8:00 AM to 5:00 PM local time, Monday through Friday, to diagnose their difficulties with the code and offer solutions to code problems. Code problems that are discovered shall be tracked using Bugzilla-based (or similar) tracking tools.
- 6. Distribute code versions to approved foreign code users in a form compatible with the user's computer system (workstation). In the case of non-CAMP member organizations, this shall include handling all invoicing and fee collection as directed by the NRC. The contractor shall manage the disbursement and collection of signed non-disclosure agreements with potential code users. When all supporting documentation has been filed and fees have been paid, the NRC will provide authorization via e-mail to the contractor to distribute the code. This e-mail will include relevant information on the approved users.

Any funds received by the contractor from CAMP members or other authorized code users for services required under this contract, which the contractor has billed the NRC shall be credited to this task order and such credit deducted from the next invoice submitted for payment. Invoices shall clearly track these credits as a separate item, including current and cumulative totals.

Task 5 - Domestic User Support

The contractor shall:

- Provide user support to NRC staff and authorized domestic code users. This includes providing a single point of contact for answering general code-related questions and satisfying requests for documentation, code versions or updates (with NRC approval), installation support, modeling changes, improved user convenience, assistance and diagnosis of user problems, correction of code bugs, code changes, and updating of code documentation.
- 2. Maintain an up-to-date list of authorized domestic code users.
- 3. Provide telephone assistance to NRC staff and domestic code users during regular business hours, i.e., 8:00 AM to 5:00 PM local time, Monday through Friday, to diagnose their difficulties with the code and offer solutions to code problems. Code problems that are discovered shall be tracked using Bugzilla-based (or similar) tracking tools.
- 4. Distribute code versions to approved users in a form compatible with the user's computer system (workstation). This shall include handling all invoicing and fee collection according to the standard fee structure used by NRC (see <u>http://www.nrc.gov/about-nrc/regulatory/research/obtainingcodes.html</u>) for obtaining access to NRC codes). The contractor shall manage the disbursement and collection of signed non-disclosure agreements with potential code users (the NRC currently handles this function itself). When all supporting documentation has been filed and fees have been paid, the NRC will provide authorization via e-mail to the contractor to distribute the code. This e-mail will include relevant information on the approved users.

Any funds received by the contractor from domestic code users for services required under this contract, for which the contractor has billed the NRC shall be credited to this task order and such credit deducted from the next invoice submitted for payment. Invoices shall clearly track these credits as a separate item, including current and cumulative totals.

Task 6 - Training

The contractor shall:

- Conduct TRACE and/or RELAP5 training workshops (at the beginning, intermediate, or advanced levels) for up to 5 days on a yearly basis unless otherwise instructed by the NRC COR. The workshops shall be for 20-40 users of the code (from beginners to advanced). The location of the workshop shall, in general, be in the Washington, DC area.
- Revise current and develop new training manuals and materials for the TRACE and RELAP5 training workshop, as identified by the NRC COR. All training manuals and materials shall be property of the NRC.

Task 7 - General

The contractor shall:

- 1. Confer as necessary with the NRC COR to discuss the progress of the task order and any other technical details.
- Maintain and develop a T/H User Support website. The website is intended to be used by the NRC staff as well as approved CAMP and domestic code users. This website will host a Bugzilla bug tracking system.
- 3. On a biannual basis, commencing on the effective date of the contract, publish a newsletter for the NRC and code users that includes users' experiences not otherwise reported, and advises them of code updates, documentation changes, workshops, and other items of interest to the users. Distribute this newsletter to an approved list of recipients and publish it to the T/H User Support website.
- 4. Provide technical assistance to the NRC COR. Examples include technical presentations and tutorial sessions, conference calls, meetings, and written correspondence to help the NRC staff gain adequate expertise to perform code development and maintenance functions. This task does not imply direct or day-to-day supervision of contractor employees by NRC staff. All technical assistance requests will be coordinated via email through the NRC COR.

C.3 TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

This task order requires contractor personnel that have experience (enough to train others) of (a) various versions of TRACE, RELAP5, PARCS, SNAP, TRITON, GENPMAXS, APTPlot, AVScript, ACAP and the NRC Data Bank, (b) thermal-hydraulic and reactor physics principles,

(c) numerical methods, (d) code uncertainty analysis, and (e) modeling for both transient and accident analyses of both operating and advanced PWRs and BWRs. Since analysis using PARCS may involve the generation of cross section libraries, the task order will also require contractor personnel that have expertise in the use of lattice physics codes like SCALE, CASMO and HELIOS. Individuals must also possess strong programming skills in Fortran 90/95/2003. In addition, contractor personnel will need to have appropriate computer capabilities to perform code development and validation are required. Finally, contractor personnel also must possess appropriate diversity in computer hardware availability (specifically, SUN, IBM, Intel (32 & 64 bit), AMD (32 & 64 bit), Linux, Windows, Apple Mac/OSX) and compiler technologies (Compaq Visual Fortran, Intel Visual Fortran, NAG, Lahey. Salford, g95, PathScale, & Absoft) used for compiling and running TRACE by most of the users.

C.4 ESTIMATED REQUIREMENTS FOR MEETINGS AND TRAVEL

Two trips to Rockville, MD per year for two contractor personnel for two days each to participate in ACRS meetings (dates to be determined).

Two trips to Rockville, MD per year for two contractor personnel for 2 day(s) each for program review (dates to be determined).

One trip within the U.S. per year for two contractor personnel to participate in the CAMP meeting for 3 days (dates and location to be determined).

One trip to the CAMP conference in a foreign country for one contractor person for 3 days (dates and location to be determined).

One trip per year to the Rockville, MD area for three contractor personnel to provide TRACE training workshop for up to 5 days (dates to be determined).

C.5 DELIVERABLES/SCHEDULES AND/OR MILESTONES

- On a semi-annual basis, commencing on the effective date of the task order, publish a newsletter for the NRC and code users that includes users' experiences not otherwise reported and advises them of code updates, documentation changes, workshops, and other items of interest to the users.
- 2. Code versions (and associated installation packages) to be distributed to COR-approved users in a form compatible with the user's computer system.
- 3. On a semi-annual basis, within one month following June and December, provide to the NRC COR a report that describes any outstanding errors or modeling deficiencies in RELAP5, how error corrections were/will be made with a proposed prioritization schedule, and estimated staff effort to meet these requests.
- 4. The contractor shall provide CD/DVD's to the COR containing converted electronic data as .bin files in PIB format, as well as any associated documentation, technical reports,

and/or supporting material in electronic format for inclusion in the NRC Data Bank. The submittal shall also include files in a format appropriate for archival into the NRC's ADAMS document management system

C.6 NRC-FURNISHED MATERIAL

- 1. Current and historical source code for versions of TRACE, RELAP5 and related codes, as needed, supporting code & SQA documentation, and relevant code assessment matrices within two weeks of task order startup.
- 2. A list of approved users for TRACE and related codes to whom the contractor shall supply services described above. As needed, the NRC will provide revised lists.
- 3. Current TRACE and RELAP5 training manuals and materials.
- 4. Experimental data in raw electronic format as well as any supporting documentation, as needed.
- 5. A sample CAMP agreement and code non-disclosure agreement
- 6. Framemaker templates for preparation of TRACE assessment documentation
- 7. Thermal Hydraulic Code Development Plan

C.7 CONTRACTOR ACQUIRED EQUIPMENT/PROPERTY

The contractor may purchase, upon the NRC Contracting Officer's advance written approval, electronic and information technology (EIT, as defined in FAR 2.101) items (either new or upgrades to existing EIT) needed during the period of the task order to assure that the codes properly utilize state-of-the-art workstation capabilities and to maintain compatibility with the workstations used by NRC, its contractors and CAMP members. Identification of upgrade and/or replacement EIT shall be presented to the NRC Contracting Officer and COR in writing at least 120 days before such EIT would be needed by the contractor, and purchases may be made by the contractor only after the contractor receives written approval from of the NRC Contracting Officer to do so. Such items would be treated as an other direct cost, and funds would be obligated on the task order accordingly for that purpose. Any EIT purchased by the contractor under this task order becomes the property of the NRC.

C.8 2015.211-71 TECHNICAL PROPGRESS REPORT

The contractor shall comply with the requirements under Section F.3 of the base contract.

C.9 2015.211-72 FINANCIAL STATUS REPORT

The contractor shall comply with the requirements under Section F.4 of the base contract.

C.10 NRCF010 PLACE OF DELIVERY-REPORTS

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

Name:	Christopher Murray
Address:	U.S. Nuclear Regulatory Commission
	Office of Nuclear Regulatory Research
	Mail Stop: CSB C3A16
	Washington, DC 20555
Telephone Number:	(301) 251-7513
E-mail Address:	Christopher.Murray@NRC.GOV
Name:	Michael Turner
Name: Address:	Michael Turner U.S. Nuclear Regulatory Commission
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	U.S. Nuclear Regulatory Commission
	U.S. Nuclear Regulatory Commission Office of Administration
	U.S. Nuclear Regulatory Commission Office of Administration Mail Stop: 3WFN 05-C64MP

C.11 PERIOD OF PERFORMANCE

This task order consists of a base period of one year and four one-year options to extend the term of the contract in accordance with FAR clause 52.217-9 in the IDIQ contract. This task order will commence on February 20, 2014, and will expire on February 19, 2015. The government may extend the period of performance for 4 one-year periods, pursuant with FAR Clause 52.217-9.