

**ORDER FOR SUPPLIES OR SERVICES**

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

BPA NO.

1. DATE OF ORDER <b>DEC 22 2009</b>		2. CONTRACT NO. (If any) NRC-42-07-483		6. SHIP TO:	
3. ORDER NO. 0022		MODIFICATION NO.		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
		4. REQUISITION/REFERENCE NO. 0748322015		b. STREET ADDRESS Tracy Clark 301-415-1474	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Kala Shankar 301-492-3638 Mail Stop TWB 01-B10M Washington, DC 20555				c. CITY Washington	
				d. STATE DC	e. ZIP CODE 20555
7. TO:				f. SHIP VIA	
a. NAME OF CONTRACTOR ENERGY RESEARCH INC				8. TYPE OF ORDER	
b. COMPANY NAME				<input type="checkbox"/> a. PURCHASE <input checked="" type="checkbox"/> b. DELIVERY	
c. STREET ADDRESS 6167 EXECUTIVE BLVD				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.	
d. CITY ROCKVILLE				e. STATE MD	f. ZIP CODE 208523901
9. ACCOUNTING AND APPROPRIATION DATA 1025-15-171-111; JC:Q-4015; BOC: 252A; 31X0200 Obligate: \$75,000 Contractor DUNS: 621211259				10. REQUISITIONING OFFICE NRO	
11. BUSINESS CLASSIFICATION (Check appropriate box(es))				12. F.O.B. POINT Destination	
<input checked="" type="checkbox"/> a. SMALL <input type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> g. SERVICE-DISABLED VETERAN-OWNED					
<input type="checkbox"/> d. WOMEN-OWNED <input type="checkbox"/> e. HUBZone <input type="checkbox"/> f. EMERGING SMALLBUSINESS					
13. PLACE OF		14. GOVERNMENT B/L NO.		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)	16. DISCOUNT TERMS NET 30
a. INSPECTION		b. ACCEPTANCE			

17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	Issuance of Task Order No. 22 under Contract No. NRC-42-07-483  Title: "Review of WCAP-17116P Westinghouse BWR ECCS Evaluation Model: Supplement 5 - Application to the ABWR"  Period of Performance: 01/04/2010 - 01/03/2012 Estimated Reimbursable Cost: \$240,220.54 Fixed Fee: \$12,011.03 Total Cost Plus Fixed Fee: \$252,231.56  Funding in the amount of \$75,000 is being provided.  See attached pages for a description of Task Order 22 and Statement of Work.					

18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.	
21. MAIL INVOICE TO:					
a. NAME U.S. Nuclear Regulatory Commission Payment Team, Mail Stop TWB 01-B10M					
b. STREET ADDRESS (or P.O. Box) Attn: NRC-42-07-483, Task Order 22					
c. CITY Washington		d. STATE DC	e. ZIP CODE 20555	\$75,000.00	

17(h) TOTAL (Cont. pages)

17(i) GRAND TOTAL

22. UNITED STATES OF AMERICA BY (Signature) <i>Kala Shankar</i>		23. NAME (Typed) Kala Shankar Contracting Officer TITLE: CONTRACTING/ORDERING OFFICER	
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In accordance with Section G.4, Task Order Procedures, of Contract No. NRC-42-07-483, this definitizes Task Order No. 22. The effort shall be performed in accordance with the attached Statement of Work.

Task Order No. 22 shall be in effect from 01/04/2010 through 01/03/2012, with a cost ceiling of \$252,231.56. The amount of \$240,220.54 represents the estimated reimbursable costs, and the amount of \$12,011.03 represents the fixed fee.

The amount obligated by the Government with respect to this task order is \$75,000, of which \$71,428.57 represents the estimated reimbursable costs, and the amount of \$3,571.43 represents the fixed fee.

The issuance of this task order does not amend any terms or conditions of the subject contract.

Your contacts during the course of this task order are:

Technical Matter: Tracy Clark  
Project Officer  
301-415-1474

Contractual Matters: Kala Shankar  
Contract Specialist  
301-492-3638

Acceptance of Task Order No. 22 should be made by having an official, authorized to bind your organization, execute three copies of this document in the space provided and return two copies to the Contract Specialist at the address identified in Block No. 5 of the OF 347. You should retain the third copy for your records.

ACCEPTANCE:

Mohd Khalid-Rah  
NAME

PRESIDENT  
TITLE

12/22/2009  
DATE

## TASK ORDER STATEMENT OF WORK

JCN Q-4015	Contractor ERI	Task Order No. NRC 42-07-483-22
Applicant STP STP Nuclear Operating Company	Design/Site ABWR/South Texas Project- Units 3/4	Docket No. PROJ0772
Title/Description WCAP-17116P, "Westinghouse BWR ECCS Evaluation Model: Supplement 5 – Application to the ABWR"		
TAC No. RX0711	B&R Number 025-15-171-111	SRP or ESRP Section(s) SRP 15.6.5, 15.0.2, 6.3
NRC Task Order Project Officer (PO)		
Tracy Clark	301-415-1474	Tracy.Clark@nrc.gov
NRC Technical Monitor (TM)		
Jaclyn Dorn	301-415-0517	Jaclyn.Dorn@nrc.gov

### 1.0 BACKGROUND

Combined Operating License (COL) Applications are submitted pursuant to Part 52 of Title 10 of the *Code of Federal Regulations* (10 CFR 52), "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." The U.S. Nuclear Regulatory Commission (NRC) reviews COL Applications based on information furnished by electric utility companies pursuant to 10 CFR 52.79, "Contents of Applications Technical Information."

A Standard Review Plan (NUREG-0800) is prepared for the guidance of staff reviewers in the Office of New Reactors in performing safety reviews of applications to construct or operate nuclear power plants and the review of applications to approve standard designs and sites for nuclear power plants. The principal purpose of the SRP is to assure the quality and uniformity of staff safety reviews.

The staff publishes the results of these reviews in a Safety Evaluation Report (SER).

### 2.0 OBJECTIVE

The U.S. Advanced Boiling Water Reactor (ABWR) is a certified standard design which is described in Title 10 of the Code of Federal Regulations, Part 52, Appendix A (10 CFR 52, App. A). The applicant for certification of the U.S. ABWR design was GE Nuclear Energy. The ABWR has been certified to the requirements of Subpart B of 10CFR52. All design analyses were based on approved GE Nuclear Energy (now GE Hitachi Nuclear Energy) methods. It is expected that the applicant will submit a license amendment to change the fuel design after the issuance of COL from GEH fuel to Westinghouse (W) fuel. South Texas Units 3/4 initial core design will be based on W transient and accident analysis methods.

The objective of this task order is to obtain technical expertise from the contractor to assist the NRC staff in determining whether WCAP-17116-P meets appropriate regulatory requirements. Specifically, technical assistance is required to assist the staff in determining the adequacy of WCAP-17116-P relating to the regulatory acceptance of the Westinghouse BWR ECCS

Evaluation Model to the ABWR. The technical review should be based on the staff guidance used in SRP Sections 6.3, 15.6.5 and 15.0.2.

**3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES**

Tasks/Standards	Scheduled Completion	Deliverables
<p>1. <b>REQUIREMENT:</b> Become familiar with SRP Sections 6.3 and 15.0.2</p> <p><b>STANDARD:</b> Written confirmation that familiarization is complete</p>	<p>40 Hrs, 1 week after authorization of work</p>	<p>Documentation that assigned personnel have reviewed references</p>
<p>2. <b>REQUIREMENT:</b> Participate in an orientation/kick-off meeting with the NRC staff to discuss the scope of the work, expectations and contract management</p> <p><b>STANDARD:</b> Attendance by individuals designated by NRC.</p>	<p>16 Hrs, 2 weeks after authorization of work</p>	<p>N/A</p>
<p>3a. <b>OPTIONAL TASK:</b> This task will commence only on request of the NRC technical monitor. Note that the level of effort for this task is included in the Task 3 effort in Section 8.</p> <p><b>Perform four ABWR plant specific confirmatory calculations for high pressure core flooder line break, main steam line break, feedwater line break, and residual heat removal line break using TRACE input decks provided by the NRC.</b></p> <p><b>STANDARD:</b> Discussion of the confirmatory runs included in the Task 3b Technical Evaluation Report and RAIs.</p>	<p>500 Hrs, PTER and RAIs: 10 weeks after receiving TRACE input decks</p>	<p>Discussion of the confirmatory runs included in the Task 3b TER and any associated RAIs</p>

Tasks/Standards	Scheduled Completion	Deliverables
<p>3b. REQUIREMENT: Review the LTR WCAP-17116-P to determine the adequacy of the analyses. Determine the methods and approach in the LTR meet the review guidance in SRP Sections 6.3 and 15.0.2. Identify issues and the need for any additional or clarifying information (requests for additional information, RAIs). Identify those aspects of the application that need additional or clarifying information (RAIs). Prepare a Technical Evaluation Report.</p> <p>STANDARD: Completed Technical Evaluation Report that follows the NRC provided template without deviation. No deviation from the guidance defined in Section III, RAI Guidance of Attachment 1. One round of comment incorporation is acceptable.</p>	<p>1000 Hrs, 21 weeks after authorization of work</p>	<p>Preliminary Technical Evaluation Report and RAIs</p>
<p>3c. Completion of the Task.</p>	<p>16 Hrs, 2 weeks After receipt of the staff comments</p>	<p>Final RAIs</p>
<p>4. REQUIREMENT: Review response to the RAIs to determine if they adequately resolve the outstanding issues. Identify any other open items. Incorporate the review results in the evaluation report completed under Task 3.</p> <p>STANDARD: Completed Technical Evaluation Report that follows the NRC provided template without deviation. No deviation from the guidance defined in Section III, RAI Guidance of Attachment1. One round of comment incorporation is acceptable.</p>	<p>175 Hrs, 4 weeks after receipt of the responses.</p>	<p>Revised Technical Evaluation Report</p>

Tasks/Standards	Scheduled Completion	Deliverables
<p>5. REQUIREMENT: <i>(If applicable)</i> Prepare for and travel to the applicant's office and participate in an NRC review team to:</p> <ul style="list-style-type: none"> <li>a. Audit</li> <li>b. Evaluate and discuss the applicant's responses to the unresolved issues identified in Task 4 to determine if the outstanding issues are adequately resolved.</li> <li>c. Prepare a trip report (as an input to NRC Audit Report) to summarize the information reviewed, results of the audit, and meeting discussions.</li> </ul> <p>STANDARD: Complete evaluation as defined in Task. Submit Trip Report within 2 weeks of site review.</p>	<p>80 Hrs, Planning: 2 weeks before the audit report (schedule TBD)</p> <p>Trip Report: 2 weeks after the audit</p>	<p>Trip Report</p>
<p>6. REQUIREMENT: Review the applicant's response to the open items identified as a result of the design audit (Tasks 4 &amp; 5). Identify any unresolved issues and prepare a safety evaluation report w/open items if any, as a Technical Evaluation Report.</p> <p>STANDARD: Complete Technical Evaluation Report that follows the NRC provided template without deviation.</p>	<p>120 Hrs, 4 weeks after receipt of responses</p>	<p>Safety Evaluation Report Input w/open items</p>
<p>7. REQUIREMENT: As needed and requested by the staff, provide technical support to the staff during related ACRS meetings and hearing proceedings.</p> <p>STANDARD: Ensure presentation materials are reviewed and approved by NRC staff.</p>	<p>TBD</p>	<p>Prepare Presentation Materials. Attend Meetings, if required</p>

\* These Work Schedules are subject to change by the NRC Contracting Officer (CO) to support the needs of the NRC Licensing Program Plan.

The Technical Monitor may issue technical instruction from time to time throughout the duration

of this task order. Technical instructions must be within the general statement of work delineated in the task order and shall not constitute new assignments of work or changes of such a nature as to justify an adjustment in cost or period of performance. The contractor shall refer to Section G.1 of the base contract for further information and guidance on any technical directions issued under this task order.

Any modifications to the scope of work, cost or period of performance of this task order must be issued by the CO and will be coordinated with the NRO Project Officer.

#### **4.0 TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED**

As specified in the base contract, the contractor shall provide individuals who have the required educational background and work experience to meet the objectives of the work specified in this task order. Specific qualifications for this effort include:

(A minimum of a Bachelor's Degree in Engineering/Science or equivalent experience and at least seven years direct nuclear power related experience in each of the disciplines is required.)

Reactor Core Analysis  
Reactor Physics  
Reactor Fuel  
New Reactor Designs  
Plant (Systems) Engineering  
Thermal Hydraulics and Fluid Dynamics  
Reactor Systems  
Instrumentation & Control Systems

The contractor shall provide a contractor project manager (PM) to oversee the effort and ensure the timely submittal of quality deliverables so that all information is accurate and complete as defined in the base contract.

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 proposals, including resumes, is accurate and truthful. The resume for each professional proposed to work under this task order (contractor, subcontractor, or consultant) shall describe the individual's experience in applying his or her area of engineering specialization to work in the proposed area. The use of particular personnel on this contract is subject to the NRC technical monitor's (TM's) approval. This includes any proposed changes to key personnel during the life of the task order.

#### **5.0 REPORTING REQUIREMENTS**

##### **Task Order Progress Report**

The contractor shall provide a bi-weekly progress report summarizing accomplishments, expenditures, contractor staff hours expended, percent completed for each task under this task order, and any problems encountered by the contractor. The report shall be sent via e-mail to the NRC TM, Task Order Project Officer (PO) and CO.

Please refer to Section F of the basic contract award document for contract reporting

requirements.

### **Technical reporting requirements**

Unless otherwise specified above, the contractor shall provide all deliverables as draft products. The NRC TM will review all draft deliverables (and coordinate any internal NRC staff review, if needed) and provide comments back to the contractor. The contractor shall revise the draft deliverable based on the comments provided by the TM, and then deliver the final version of the deliverable. When mutually agreed upon between the contractor and the TM, the contractor may submit preliminary or partial drafts to help gauge the contractor's understanding of the particular work requirement.

The contractor shall provide the following deliverables in hard copy and electronic formats. The electronic format shall be provided in MS Word or other word processing software approved by the TM. For each deliverable, the contractor shall provide one hard copy and electronic copy to both the PM and the TM. The schedule for deliverables shall be contained in the approved project plan for the task order effort.

In all correspondence, include identifying information: JCN No. Q-4015; Technical Assignment Control No. (TAC) RX0711; Task Order No. 22; the licensee: STP Nuclear Operating Company; and, the site: South Texas Project.

1. At the completion of Task 3, submit a Technical Evaluation Report (TER) that contains, for each Sub-section of the SER (see **Attachment 1** for the outline, format and content of the report): a description of the information proposed by the applicant including the assumptions for the analysis, design, and references to consensus standards; review findings (including the basis for the findings), as a result of comparison with the review guidelines; and a list of "Requests for Additional Information (RAIs). See **Attachment 1** in the base contract SOW for the guidelines for developing RAIs.
2. At the completion of Task 4, submit a TER (**see Attachment 1**) that contains a summary of the review results and the updated report completed under Task 3 incorporating the findings from the resolution of the RAIs. Include a separate list of the remaining open items and the basis for such determination.
3. At the completion of Task 5, submit a trip report, as an input to NRC audit report, that contains a summary of documents audited, a summary of meeting discussion conducted with the applicant, list of outstanding issues, significance of these issues, and the basis for the conclusion. Incorporate the findings in the report developed under Task 3.
4. At the completion of Task 6, submit a TER (**see Attachment 1**) that contains a safety evaluation report with open items resulting from the work performed in Task 4 & 5, and update of the Technical Evaluation Report developed under Task 5.

### **6.0 MEETINGS AND TRAVEL**

One 2-person, 1-day working meeting to kickoff project and contractor orientation.\*

One 1-person, 5-day trip to the applicant's facility (Task 5).



One 1-person, 1-day working meeting at NRC headquarters to review deliverables.\*

One 1-person, 2-day meeting, if needed, for hearing or ACRS meeting.

*(Any additional trips that may be required)*

\*At the discretion of the NRC TM, meeting may be conducted via telephone or video conference.

## 7.0 NRC FURNISHED MATERIAL

The following NRC furnished materials will be provided to the contractor together with SOW:

Copy of WCAP-17116P

## 8.0 LEVEL OF EFFORT

The estimated level of effort in professional staff days apportioned among the tasks and by labor category is as follows:

Task(s)	Labor Category	Level of Effort FY-10 (hours)	Level of Effort FY-11 (hours)	Level of Effort FY-12 (hours)
1	Nuclear Engineer	40		
2	Nuclear Engineer	16		
3	Nuclear Engineer, I & C Engineer	1200	300	16
4	Nuclear Engineer	140	36	
5	Nuclear Engineer	64	16	
6	Nuclear Engineer	96	24	
7	Nuclear Engineer			8

Task(s)	Labor Category	Level of Effort FY-10 (hours)	Level of Effort FY-11 (hours)	Level of Effort FY-12 (hours)
Task 1 - 7	Project Manager	150	50	8
Task 1 - 7	Admin Support	40	32	4
<b>Total</b>		1746	458	36

## 9.0 PERIOD OF PERFORMANCE

The projected period of performance is 24 months from date of task order award.

## 10.0. OTHER APPLICABLE INFORMATION

### a. License Fee Recovery

All work under this task order is fee recoverable and must be charged to the appropriate TAC number(s).

### b. Assumptions and Understandings:

The level of effort for Task 3 is based on the assumption that the contractor is familiar with the review procedures of SRP) Sections 6.3, 15.6.5 and 15.0.2.

The level of effort for Task 4 is based on the assumption that there will be 70 RAIs and it will take, on the average, 2.5 hours to review and address each response.

The level of effort for Task 5 is based on one, 1-person, 5-day trip (including travel time) plus 4 days to prepare for the trip and to write the trip reports.

The level of effort for Task 6 is based on the need to resolve 30 open items and it will take, on the average, 4 hours to review and resolve each open item, and prepare an SER.

The level of effort in Task 7 is based on requiring one trip to the site and one trip to NRC headquarters.

It is assumed that the contractor has access to the NRC furnished material available on the Internet.

It is understood that the scope of the review consists of conference calls with the NRC staff, and with the NRC staff and the applicant, to discuss open items in an attempt to obtain additional information or reach resolution.

The primary deliverable, or output of this regulatory review, shall be the Technical Evaluation Report (TER). The TER will serve as input to the NRC staff's Safety Evaluation Report (SER) which will document the NRC's technical, safety, and legal basis for approving the fuel design change amendment. The TER must provide sufficient information to adequately explain the NRC staff's rationale for why there is *reasonable assurance* that public health and safety is

protected. The TER, and ultimately the SER, should be written in a manner whereby a person with a technical (non-nuclear) background and unfamiliar with the applicant's request could understand the basis for the staff's conclusions. The TER format is described in Attachment 1 to this Task Order Statement of Work.

Attachments:

1. Outline, Format, and Content for the TER Input

**Attachment 1**  
**Outline, format, and sample for the TER (draft SER input)**

**X.Y.Z Title of Section**

**X.Y.Z.1 Regulatory Criteria**

Develop an outline that follows the format and topics presented in the AREAS OF REVIEW section of the appropriate SRP section. This information will correspond to the SRP sections that are the subject of this Task Order. For each unique SRP review area contained in the TER, the contractor should specify the acceptance criteria that were used for its review. Summarize the applicable regulations and other regulatory references, including regulatory guides, generic letters, or NRC staff positions, that are relevant to this topic.

Technical reviewers are encouraged to use the descriptions of acceptance criteria from previously issued Safety Evaluation Reports for completed design certifications (e.g., NUREG-1793 for the AP1000 Final Safety Evaluation Report) when applicable.

**X.Y.Z.2 Summary of Technical Information**

Describe the key technical points that were made in the application. It is not necessary to restate the application verbatim or to address all the details in the application.

**X.Y.Z.3 Technical Evaluation**

Document the contractor's evaluation of the application against the relevant regulatory criteria. The evaluation should support the contractor's conclusions as to whether the regulations are met. State what the contractor did to evaluate the applicant's submittal. The contractor's evaluation may include verification that the applicant followed applicable regulatory guidance, performance of independent calculations, and validation that the appropriate assumptions were made. The contractor may state that certain information provided by the applicant was not considered essential to the contractor's review and was not reviewed by the contractor. While the contractor may summarize the information offered by the applicant in support of its application, the contractor should clearly articulate the bases for its conclusions.

Contractor should provide a clear and concise description of any request for additional information (RAIs). The description should include a justification of the requested information that the requested information is not provided in the application and is absolutely needed to determine or confirm whether the relevant regulatory requirements (articulate specific requirements) have been met. The contractor should discuss its technical evaluation of the licensee's response to the RAIs and determine whether it is acceptable. The contractor should clearly articulate the bases for its acceptance or rejection. If the RAI response is not acceptable, it will be classified as an 'open item'. All open items will be resolved in Phase 3.

#### X.Y.Z.4 Conclusions

Summarize the contractor's conclusions regarding the application, including words such as the following. As set forth above in Sections X.Y.Z.2 and X.Y.Z.3 of this report, [provide specific bases for conclusions that follow]. Accordingly, the staff concludes that the application meets [or, if applicable, does not meet] the relevant requirements of 10 CFR Part XX and is [or, if applicable, is not] acceptable.

#### X.Y.Z.5 References