

**ORDER FOR SUPPLIES OR SERVICES**

PAGE OF PAGES

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

BPA NO.

1. DATE OF ORDER <b>3/1/2010</b>		2. CONTRACT NO. (if any) NRC-42-07-482		6. SHIP TO:	
3. ORDER NO. 0037		MODIFICATION NO.		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Mark Lohrmann 301-492-3461 Mail Stop T-7-I-2 Washington, DC 20555		4. REQUISITION/REFERENCE NO. NRC-42-07-482 (TO 37)		b. STREET ADDRESS Attn: Robert Fretz 301-415-1980 Mail Stop: T6-C34	
7. TO:		c. CITY Washington		d. STATE DC	e. ZIP CODE 20555
a. NAME OF CONTRACTOR ENERGY RESEARCH INC		f. SHIP VIA		8. TYPE OF ORDER	
b. COMPANY NAME		<input type="checkbox"/> a. PURCHASE		<input checked="" type="checkbox"/> b. DELIVERY	
c. STREET ADDRESS P.O. Box 2034		d. CITY ROCKVILLE		e. STATE MD	
9. ACCOUNTING AND APPROPRIATION DATA 025-15-171-103; Q4158; 252A; 31X0200 FFS # 0748237158 \$23,000 Contractor DUNS: 621211259		f. ZIP CODE 20847		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.	
11. BUSINESS CLASSIFICATION (Check appropriate box(es))		12. F.O.B. POINT Destination		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.	
<input checked="" type="checkbox"/> a. SMALL		<input type="checkbox"/> b. OTHER THAN SMALL		<input type="checkbox"/> c. DISADVANTAGED	
<input type="checkbox"/> d. WOMEN-OWNED		<input type="checkbox"/> e. HUBZone		<input type="checkbox"/> f. EMERGING SMALL BUSINESS	
<input type="checkbox"/> g. SERVICE-DISABLED VETERAN-OWNED		13. PLACE OF		14. GOVERNMENT B/L NO.	
a. INSPECTION		b. ACCEPTANCE		15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)	
16. DISCOUNT TERMS NET 30		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. 37 under Contract No. NRC-42-07-482  Title: "ESBWR PCCS Hydrogen Detonation Review Support"  Period of Performance: 03/01/2010-02/28/2011 Estimated Reimbursable Cost: \$46,077.70 Fixed Fee: \$2,303.89 Total Cost Plus Fixed Fee: \$48,381.59  Funding in the amount of \$23,000 is being provided.  See attached pages for a description of Task Order 37					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		17(h) TOTAL (Cont. pages)  17(i) GRAND TOTAL
	21. MAIL INVOICE TO:						
	a. NAME Department of the Interior/NBC ( NRCPayment_NBCDenver@NBC.gov )						
	b. STREET ADDRESS (or P.O. Box) Attn: Fiscal Services Branch-D 2770; 7301 W. Mansfield Avenue						
c. CITY Denver		d. STATE CO	e. ZIP CODE 80235-2230				

22. UNITED STATES OF AMERICA BY (Signature)		23. NAME (Typed) Donald A. King Contracting Officer TITLE: CONTRACTING/ORDERING OFFICER	
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In accordance with Section G.4, Task Order Procedures, of Contract No. NRC-42-07-482, this definitizes Task Order No. 37. The effort shall be performed in accordance with the attached Statement of Work.

Task Order No. 37 shall be in effect from March 01, 2010 through February 28, 2011, with a cost ceiling of \$48,381.59. The amount of \$46,077.70 represents the estimated reimbursable costs, and the amount of \$2,303.89 represents the fixed fee.

The amount obligated by the Government with respect to this task order is \$23,000, of which \$21,904.76 represents the estimated reimbursable costs, and the amount of \$1,095.24 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	Henry Wagage
	Project Officer	Technical Monitor
	301-415-1474	301-415-1840

Contractual Matters: Mark Lohrmann  
Contract Specialist  
301-492-3461

Acceptance of Task Order No. 37 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:

Moham Kadir-Rah  
NAME

President  
TITLE

3/1/2010  
DATE

### TASK ORDER STATEMENT OF WORK

JCN/Contract No. Q4158      NRC-42-07-482	Contractor Energy Research, Inc.	Task Order No. 37
Applicant GE-Hitachi	Design/Site ESBWR DC	Docket No. 05200010
Title/Description ESBWR PCCS Hydrogen Detonation Review Support		
TAC No. RX0	B&R Number 025-15-171-103	SRP Section(s) 6.2.1.1.C, 6.2.2
NRC Task Order Project Officer (PO) Tracy Clark                      (301) 415-1474 <a href="mailto:Tracy.Clark@nrc.gov">Tracy.Clark@nrc.gov</a>		
NRC Technical Monitor (TM) Henry A. Wagage DSRA/SBCV      (301) 415-1840 <a href="mailto:Henry.Wagage@nrc.gov">Henry.Wagage@nrc.gov</a>		

#### 1.0 BACKGROUND

Design Certificate (DC) Applications are submitted pursuant to Section 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."

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

#### 2.0 OBJECTIVE

The objective of this task order is to obtain technical expertise from the contractor to assist the staff in determining the adequacy of the Design Certificate (DC) Application relating to the ESBWR DCD.

The primary deliverable, or output, of this regulatory review shall be the Letter Report (LR). The LR will serve as input to the NRC staff's SER which will document the NRC's technical, safety, and legal basis for approving the DC. The LR must provide sufficient information for the NRC staff to perform the design safety review. The LR, 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.

ESBWR has an inert containment with nitrogen alleviating concerns of global hydrogen combustion in the containment following a loss-of-coolant accident. However, a possibility exists for hydrogen and oxygen generated by core radiolysis to accumulate in the passive core cooling system (PCCS) leading to high concentrations after a LOCA. Such hydrogen and oxygen accumulation could lead to local hydrogen detonations in the PCCS. GEH is designing the PCCS to maintain its integrity following postulated hydrogen detonations. The Containment and Ventilation Branch 2 (SBCV) is seeking technical expertise to review hydrogen detonation loading, which is under SBCV's purview.

The contractor will review GEH's calculated PCCS hydrogen detonation pressures and durations and perform necessary confirmatory analysis. The contractor will make presentations to the Advisory Committee on Reactor Safeguards, as necessary.

**3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES**

Tasks/Standards	Scheduled Completion	Deliverables
<p>1. REQUIREMENT: Review GEH's calculated PCCS hydrogen detonation pressures and durations and perform necessary confirmatory analysis. Make presentations to the Advisory Committee on Reactor Safeguards, as necessary</p> <p>STANDARD: Completed LR that follows the NRC provided template without deviation. No deviation from the guidance defined in Section III, RAI Guidance of Attachment 1 to the basic contract SOW. One round of comment incorporation acceptable.</p>	<p>* 12 months after authorization of work</p>	<p>LR</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 basic task ordering agreement, 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 subject matter expert with extensive experience in reviewing hydrogen detonation loading.

The contractor shall provide a 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 (principal investigators, technical staff, employees, consultants, specialists or subcontractors) 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 task order is subject to the NRC technical monitor's (TM's) approval and the resume for each shall be provided. 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 weekly progress reports as needed 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, TAPM and CO at email addresses delineated on page 2 of this RFP.

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 TAPM 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.: Q4158; Task Order No.: 37 the Applicant: GE-Hitachi.

At the completion of Task 1, submit a LR that contains: 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.

## **7. MEETINGS AND TRAVEL**

The following travel assumptions should be considered in planning the work effort. The actual travel contingent will be determined by the NRC TM after discussion with the contractor PM. Travel in excess of the total number of person-trips must be approved by the NRC Contracting Officer; travel within the work scope limits will be approved by the NRC TM.

- (If required) Two 1-person, 4 hrs meeting, for hearing or ACRS meeting

At the discretion of the NRC TM, quarterly progress meetings may be conducted at the contractor's office or via telephone or video conference.

## **8.0 NRC FURNISHED MATERIAL**

The following NRC furnished materials will be provided to the contractor together with SOW: GEH's submittals relating to hydrogen detonation in PCCS.

## **9. OTHER APPLICABLE INFORMATION**

### License Fee Recovery

- All work under this task order is fee-recoverable under 10 CFR Part 170 and shall be charged to the appropriate TAC number(s).

### Assumptions and Understandings:

- 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.

During the course of the review, the TM, and possibly other NRC personnel, may travel to the contractor site to discuss the status of the review and participate in the resolution of open items. It is assumed that the level of effort covers such a meeting.

## **10. REFERENCES**

1. NRO Office Instruction, NRO-REG-100, "Acceptance Review Process for Design Certification and Combined License Applications" [ML071980027].