

**SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30**

2. CONTRACT NO. GS23F0110M		3. AWARD/EFFECTIVE DATE SEP 16 2004	4. ORDER NO. DR-04-04-089	5. SOLICITATION NO.	1. REQUISITION NO. RES-04-089	BPA NO.
7. FOR SOLICITATION INFORMATION CALL:		a. NAME		b. TELEPHONE NO. (No Collect Calls)		8. SOLICITATION ISSUE DATE

9. ISSUED BY U.S. Nuclear Regulatory Commission Div of Contracts Two White Flint North - MS T-7-I-2 Attn: Rachel Glaros, (301) 415-0115 Washington, DC 20555	CODE 3100	10. THIS ACQUISITION IS <input type="checkbox"/> UNRESTRICTED <input type="checkbox"/> SET ASIDE: % FOR <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> 8(A) NAICS: 541330 SIZE STANDARD:	11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) <input type="checkbox"/>	12. DISCOUNT TERMS N/A
15. DELIVER TO U.S. Nuclear Regulatory Commission Office of Research Attn: Richard Lee Mail Stop T-10-K-8 Washington DC 20555		CODE	16. ADMINISTERED BY U.S. Nuclear Regulatory Commission Div of Contracts Two White Flint North - MS T-7-I-2 Attn: Rachel Glaros, (301) 415-0115 Washington, DC 20555	CODE 3100

17a. CONTRACTOR/OFFEROR ENERGY RESEARCH, INC. 6167 EXECUTIVE BLVD. ROCKVILLE MD 208523901 TELEPHONE NO. 301-881-0866 - Tracey Mullinix	CODE	FACILITY CODE	18a. PAYMENT WILL BE MADE BY U.S. Nuclear Regulatory Commission Payment Team, Mail Stop T-9-H-4 Attn: DR-04-04-089 Washington DC 20555	CODE
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER			<input type="checkbox"/> 18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED <input type="checkbox"/> SEE ADDENDUM	

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	<p>The contractor shall provide technical support to the NRC Office of Research with evaluation of severe accident phenomena for the ACR-700 design. All professional engineering services shall be performed in accordance with GS-23F-0110M and Attachment One - Statement of Work.</p> <p>Billing Instructions are found as Attachment Two.</p> <p>Labor-Hour Order with fixed ceiling of \$149,966.22. Refer to page no. 2 of the delivery order for labor rates/estimated labor hours, travel, and other direct costs</p> <p>The period of performance is date of award through December 31, 2006.</p> <p>NRC Project Officer: Richard Lee, 301-415-6795 VENDOR DUNS 62-121-1259</p>				
SUBTOTAL					

25. ACCOUNTING AND APPROPRIATION DATA B&R No.: 46015115107; Job Code: N6064; BOC: 252A Appropriation No.: 31X0200.460 Amount \$149,966.22	26. TOTAL AWARD AMOUNT (For Govt. Use Only) \$149,966.22
<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.	<input type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4, FAR 52.212-5 IS ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.

28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN <u>2</u> COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.	29. AWARD OF CONTRACT: REFERENCE _____ OFFER DATED _____ YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN IS ACCEPTED AS TO ITEMS:
30a. SIGNATURE OF OFFEROR/CONTRACTOR <i>Mohsen Khattib-Rahbar</i>	31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) <i>Mary H. Mace</i>
30b. NAME AND TITLE OF SIGNER (TYPE OR PRINT) MOHSEN KHATTIB-RAHBAR, President	31b. NAME OF CONTRACTING OFFICER (TYPE OR PRINT) MARY H. MACE CONTRACTING OFFICER
30c. DATE SIGNED 9/16/2004	31c. DATE SIGNED 9-14-04

A.1 NRC ACQUISITION CLAUSES - (NRCAR) 48 CFR CH. 20

A.2 SEAT BELTS

Contractors, subcontractors, and grantees, are encouraged to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented, or personally owned vehicles.

A.3 2052.209-72 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST (JAN 1993)

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor:

(1) Is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract; and

(2) Does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor, as defined in 48 CFR 2009.570-2 in the activities covered by this clause.

(c) Work for others.

(1) Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe, with respect to itself or any employee, that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer before the execution of such contractual arrangement.

(2) The contractor may not represent, assist, or otherwise support an NRC licensee or applicant undergoing an NRC audit, inspection, or review where the activities that are the subject of the audit, inspection, or review are the same as or substantially similar to the services within the scope of this contract (or task order as appropriate) except where the NRC licensee or applicant requires the contractor's support to explain or defend the contractor's prior work for the utility or other entity which NRC questions.

(3) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site, the contractor shall neither solicit nor perform work in the same or similar technical area for that licensee or applicant organization for a period commencing with the award of the task order or beginning of work on the site (if not a task order contract) and ending one year after completion of all work under the associated task order, or last time at the site (if not a task order contract).

(4) When the contractor performs work for the NRC under this contract at any NRC licensee or applicant site,

(i) The contractor may not solicit work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate.

(ii) The contractor may not perform work at that site for that licensee or applicant during the period of performance of the task order or the contract, as appropriate, and for one year thereafter.

(iii) Notwithstanding the foregoing, the contracting officer may authorize the contractor to solicit or perform this type of work (except work in the same or similar technical area) if the contracting officer determines that the situation will not pose a potential for technical bias or unfair competitive advantage.

(d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, that it does not have any organizational conflicts of interest as defined in 48 CFR 209.570-2.

(2) The contractor agrees that if, after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(3) It is recognized that the scope of work of a task-order-type contract necessarily encompasses a broad spectrum of activities. Consequently, if this is a task-order-type contract, the contractor agrees that it will disclose all proposed new work involving NRC licensees or applicants which comes within the scope of work of the underlying contract. Further, if this contract involves work at a licensee or applicant site, the contractor agrees to exercise diligence to discover and disclose any new work at that licensee or applicant site. This disclosure must be made before the submission of a bid or proposal to the utility or other regulated entity and must be received by the NRC at least 15 days before the proposed award date in any event, unless a

written justification demonstrating urgency and due diligence to discover and disclose is provided by the contractor and approved by the contracting officer. The disclosure must include the statement of work, the dollar value of the proposed contract, and any other documents that are needed to fully describe the proposed work for the regulated utility or other regulated entity. NRC may deny approval of the disclosed work only when the NRC has issued a task order which includes the technical area and, if site-specific, the site, or has plans to issue a task order which includes the technical area and, if site-specific, the site, or when the work violates paragraphs (c)(2), (c)(3) or (c)(4) of this section.

(e) Access to and use of information.

(1) If in the performance of this contract, the contractor obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the Government based on the information until one year after the release of the information to the public; or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. Section 552a (1988)), or the Freedom of Information Act (5 U.S.C. Section 552 (1986)), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) Subject to patent and security provisions of this contract, the contractor shall have the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 48 CFR 2009.570-2, the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms contract, contractor, and contracting officer, must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing to the contracting officer in accordance with the procedures outlined in 48 CFR 2009.570-9.

(i) Follow-on effort. The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefor (solicited or unsolicited), which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor may not perform any technical consulting or management support services work or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of the products or services.

(1) If the contractor, under this contract, prepares a complete or essentially complete statement of work or specifications, the contractor is not eligible to perform or participate in the initial contractual effort which is based on the statement of work or specifications. The contractor may not incorporate its products or services in the statement of work or specifications unless so directed in writing by the contracting officer, in which case the restrictions in this paragraph do not apply.

(2) Nothing in this paragraph precludes the contractor from offering or selling its standard commercial items to the Government.

A.4 2052.215-70 KEY PERSONNEL (JAN 1993)

(a) The following individuals are considered to be essential to the successful performance of the work hereunder:

Dr. Mohsen Khatib-Rahbar
Dr. Hossein Esmaili
Mr. Michael Zavisca
Mr. Zhe Yuan

Executive
Senior Engineer/Scientist
Senior Engineer/Scientist
Engineer/Scientist

The contractor agrees that personnel may not be removed from the contract work or replaced without compliance with paragraphs (b) and (c) of this section.

(b) If one or more of the key personnel, for whatever reason, becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the contractor shall immediately notify the contracting officer and shall, subject to the concurrence of the contracting officer, promptly replace the personnel with personnel of at least substantially equal ability and qualifications.

(c) Each request for approval of substitutions must be in writing and contain a detailed explanation of the circumstances necessitating the proposed substitutions. The request must also contain a complete resume for the proposed substitute and other information requested or needed by the contracting officer to evaluate the proposed substitution. The contracting officer and the project officer shall evaluate the contractor's request and the contracting officer shall promptly notify the contractor of his or her decision in writing.

(d) If the contracting officer determines that suitable and timely replacement of key personnel who have been reassigned, terminated, or have otherwise become unavailable for the contract work is not reasonably forthcoming, or that the resultant reduction of productive effort would be so substantial as to impair the successful completion of the contract or the service order, the contract may be terminated by the contracting officer for default or for the convenience of the Government, as appropriate. If the contracting officer finds the contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss, or damage.

**ATTACHMENT 1 TO DR-04-04-089
STATEMENT OF WORK
EVALUATION OF SEVERE ACCIDENT PHENOMENA FOR ACR-700
RES-04-089**

1.0 BACKGROUND

Currently, the U.S. Nuclear Regulatory Commission (NRC) is conducting a pre-application review of the AECL Technologies Inc. ACR-700 reactor. The pre-application review will be completed by October 2004. AECL plans to submit a ACR-700 design certification in March 2005.

The ACR-700 reactor has unique features that are different from the U.S. light water reactors (PWRs and BWRs). The ACR-700 reactor has a series of horizontal parallel pressure tubes rather than a single pressure vessel. The tubes are horizontally positioned in a calandria (tank) of heavy water moderator. Natural and slightly enriched uranium oxide fuel are located in CANFLEX bundles. Because of the unique features of ACR-700, the events leading to severe accidents and system response to severe accidents are expected to be different from U.S. light water reactors. Hence, some of the severe accident phenomena (e.g., the fuel and fuel channel behavior under degraded cooling conditions, fuel and fuel channel failure) are believed to be vastly different, while some of them are expected to be similar (e.g., source term releases, aerosol deposition, and transport; core concrete interaction and non-condensable gas production). Hence, there are differences between ACR-700 and U.S. LWRs for severe accident analysis.

To plan for the anticipated technical review of the ACR-700 reactor design starting in March 2005, RES needs to undertake MELCOR code modifications and assessment in order to perform severe accident analysis to support NRR certification of the ACR-700 design.

2.0 OBJECTIVE

The objective of this contract is to assess the current MELCOR code limitation for ACR - 700 analysis, perform a peer review the AECL source term(s) for ACR-700, and to provide technical assistance to NRC in the design review of the ACR-700.

3.0 SCOPE

3.1 Assessment of current MELCOR limitation for ACR-700 analysis

The dominant accident scenarios that may progress to severe accidents for ACR-700 include event initiators involving single pressure tube with the possibility to propagate to whole-core damage, or initiators that directly result in whole-core damage events. Perform MELCOR (version 1.8.5) analysis to ascertain the limit of applicability to ACR-700 analysis. This will include but not limited to the determination and assessment on establishing the initial and boundary conditions (thermal-hydraulic) for MELCOR severe accident analysis.