CNWB URF

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MAY 2 2 2000

Energy Research Inc.
Attn: Dr. Moshen Khatib-Rahbar
P.O. Box 2034
Rockville, MD 20847

Dear Dr. Khatib-Rahbar:

SUBJECT: TASK ORDER NO. 3 ENTITLED "SEVERE ACCIDENT AND THERMAL-HYDRAULIC CODE ASSESSMENT AND PHENOMENOLOGICAL ISSUES" UNDER CONTRACT NO. NRC-04-97-040

In accordance with Section G.4(c) of the subject contract, this letter definitizes the subject task order. This effort shall be performed in accordance with the enclosed Statement of Work and the contractor's technical proposal dated March 30,2000, which is hereby incorporated by reference and made a part of the subject task order.

Task Order No. 3 shall be in effect from May 22, 2000 through May 21, 2001. The total estimated ceiling for this task order is $55,657.85.

The Accounting Data for this task order is as follows:

B&R No.:	06060401710
Job Code No.:	F6280
APPN No.:	31X0200.060
BOC No.:	252A
Obligated Amt.:	$55,657.85

The following individuals are considered to be essential to the successful performance of the work hereunder: Dr. M. Khatib-Rahbar, Mr. M. Zavisca, Dr. H. Esmaili and Mr. Y. Jain.

The contractor agrees that such personnel shall not be removed from the effort under this task order without compliance with Contract Clause H.2, Key Personnel.

Template= ADM001

ADM02

Technical Matters: Chester G. Gingrich
Project Officer/Technical Monitor
(301) 415-6780

Contractual Matters: Amy J. Siller
Contract Specialist
(301) 415-6747

The contractor shall not exceed the ceiling amount under this task order unless a formal modification is issued by the Contracting Officer.

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

Please indicate your acceptance of this task order by having an official, authorized to bind your organization, execute three (3) copies of this document in the space provided and return two (2) copies to the U.S. Nuclear Regulatory Commission, ATTN: Ms. Amy Siller, Division of Contracts and Property Management, Contract Management Branch 1, M/S T-7-I-2, Washington, D.C. 20555. You should retain the third copy for your records.

Should you have any questions concerning the letter, please contact Ms. Siller on (301) 415-6747.

Sincerely,

Mary H. Mace, Contracting Officer
Contract Management Branch 1
Division of Contracts and Property Management
Office of Administration

Enclosure:
As stated

ACCEPTED:

NAME Dr. Mohsen Khatib-Rahbar

President
TITLE

May 22, 2000
DATE

Contract NRC-04-097-040

TASK ORDER 3: SEVERE ACCIDENT AND THERMAL-HYDRAULIC CODE ASSESSMENT AND PHENOMENOLOGICAL ISSUES

1. BACKGROUND

The U. S. Nuclear Regulatory Commission (NRC) is sponsoring the development of severe accident and thermal-hydraulic computer codes to be used for confirmatory analysis of accidents in Light Water Reactors (LWRs). The MELCOR and SCDAP/RELAP5 computer codes are system-level severe accident codes. MELCOR is used for providing an integrated system-wide analysis, whereas SCDAP/RELAP5 is used to provide a more detailed phenomenological assessment capability. The NRC is also in the process of completing work on TRAC-M, an updated thermal-hydraulic computer code that is based on the TRAC-P, and TRAC-B computer codes.

Independent assessment of new and revised models in any of the aforementioned computer codes is required. This assessment activity includes both experimental bench-marking studies, developmental assessment aimed at ensuring that code results are consistent with past experience, and/or other comparable code calculations. In addition, these computer codes are actively being used to support the resolution and/or regulatory closure of various severe accident, thermal hydraulic and/or other safety issues.

This task is to provide technical support in the areas of severe accident and/or thermal-hydraulic code assessment and analysis of various thermal-hydraulic and severe accident issues. The focus of this task is to assist the staff in performing analyses, to independently perform confirmatory analyses as requested by the staff, and to provide independent code assessment.

2. OBJECTIVE

The objective of this task is to assist the staff in performing independent confirmatory analyses, independent code assessment studies, and studies to support NRC regulatory research activities.

3. WORK REQUIREMENTS

Task 3.1: Independent Assessment of Thermal-hydraulic and Severe Accident Computer Codes

The contractor should provide support to the NRC in independent assessment of thermal-hydraulics and severe accident computer codes. This includes both analysis of selected integral and/or separate effects experiments, and code to code comparison studies. In addition, the impact of new modeling features, numerical methods, or any other changes being introduced in these codes may need to be evaluated, and reported to the NRC staff.

As part of the ongoing program, the NRC is planning to release the TRAC-M computer code. As part of the pre-release analyses, several test problems will be defined. The

contractor will be required to perform verification calculations identifying and reporting any code problems resulting from the pre-release assessment activities to the NRC staff.

The MELCOR code which is being developed and maintained by Sandia National Laboratories (SNL), has undergone extensive experimental assessment as part of the MELCOR Code Assessment Program (MCAP). In a move to consolidate various severe accident computer codes, the NRC is sponsoring work at SNL to upgrade the existing MELCOR models or to import modules of more detailed phenomenological models from other computer codes (e.g., SCDAP/RELAP5) into MELCOR. This activity requires independent assessment either by comparison of results to the available experimental data or other computer codes.

Task 3.2: Independent Confirmatory Analysis of Selected Thermal-Hydraulics and Severe Accident Phenomenological Issues

The contractor should provide independent technical support to NRC in confirmatory analysis of selected thermal-hydraulics and severe accident issues using any of the available NRC computer codes. Selected issues that may be considered as part of this activity include support on further analysis of the steam generator tube rupture issue, analysis of potential accidents involving spent fuel pools, hydrogen distribution and combustion, loading of in-containment equipment during severe accidents (equipment qualification), and other containment loads and accident source terms issues.

4. REPORTING REQUIREMENTS

In addition to monthly progress reports addressing each sub-task the contractor should prepare and submit detailed task summary draft reports for NRC comments. Subsequently NRC comments should be addressed, and the final reports submitted within 3 weeks of receiving NRC comments.

The reports on sub-task 1 should contain a brief background description of the code, a section on how the code was assessed and why the proposed assessment was preformed, a section detailing the actual assessment, and a conclusion/summary section that discusses the code features and limitations.

The reports on sub-task 2 should contain a background section provide the scope and objectives of the analysis and any prior work, an introductory section indicating the approach and steps taken in the analysis, a calculations section giving details of the analysis, a results section clearly showing the results of the analysis, and finally a conclusions/summary section summarizing the results with respect to the presentation given in the background and introductory sections.

5. PERIOD OF PERFORMANCE

12 months from the effective date of this task order

6. GOVERNMENT FURNISHED MATERIAL

- The latest versions of computer codes to be assessed including their documentation.

- Experimental data and any supporting documentation associated with the requested analysis.

7. ESTIMATED LEVEL OF EFFORT

280 staff-hours.

8. TRAVEL

Only local travel is required.