

## ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES

1 9

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

BPA NO.

1. DATE OF ORDER

MAY 09 2006

2. CONTRACT NO. (If any)  
NRC-03-03-038

6. SHIP TO:

3. ORDER NO.  
T026

MODIFICATION NO.

4. REQUISITION/REFERENCE NO.  
NRR-03-03-038-026

a. NAME OF CONSIGNEE

U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation

5. ISSUING OFFICE (Address correspondence to)

U.S. Nuclear Regulatory Commission  
Div. of Contracts  
Attn: Jeffrey R. Mitchell, 301-415-6465  
Mail Stop T-7-I-2  
Washington, DC 20555

b. STREET ADDRESS

Attn: Bernard L. Grenier, 301-415-2726  
Mail Stop: 09-E3

c. CITY

Washington

d. STATE

DC

e. ZIP CODE

20555

7. TO:

f. SHIP VIA

a. NAME OF CONTRACTOR

INFORMATION SYSTEMS LABORATORIES, INC

b. COMPANY NAME

ATTN: DR. JAMES F. MEYER

8. TYPE OF ORDER

☐ a. PURCHASEReference 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.☒ b. DELIVERYExcept for billing instructions on the reverse, this  
delivery/task 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.

c. STREET ADDRESS

11140 ROCKVILLE PIKE, SUITE 500

d. CITY

ROCKVILLE

e. STATE

MD

f. ZIP CODE

20852

9. ACCOUNTING AND APPROPRIATION DATA

620-15-113-103 J-3272 252A 31x0200.620  
Obligate \$73,100.00  
Contractors DUNS: 107928806

10. REQUISITIONING OFFICE NRR

11. BUSINESS CLASSIFICATION (Check appropriate box(es))

☐ a. SMALL☒ b. OTHER THAN SMALL☐ c. DISADVANTAGED☐ g. SERVICE-  
DISABLED  
VETERAN-  
OWNED☐ d. WOMEN-OWNED☐ e. HUBZone☐ f. EMERGING SMALL  
BUSINESS

12. F.O.B. POINT

Destination

13. PLACE OF

a. INSPECTION

b. ACCEPTANCE

14. GOVERNMENT B/L NO.

15. DELIVER TO F.O.B. POINT  
ON OR BEFORE (Date)

16. DISCOUNT TERMS

Net 30

17. SCHEDULE (See reverse for Rejections)

| ITEM NO.<br>(A) | SUPPLIES OR SERVICES<br>(B)   | QUANTITY<br>ORDERED<br>(C) | UNIT<br>(D) | UNIT<br>PRICE<br>(E) | AMOUNT<br>(F) | QUANTITY<br>ACCEPTED<br>(G) |
|-----------------|---|----------------------------|-------------|----------------------|---------------|-----------------------------|
|                 | <p>Issuance of Task Order No. 26, Under Contract No.<br/>NRC-03-03-038</p> <p>Title: "TRACE Input Deck Development for ESBWR Design<br/>Certification Pertaining to Loss-of-Coolant<br/>Accident (LOCA) Analysis"</p> <p>Period of Performance: 05/15/2006 through 10/31/2006<br/>Estimated Reimbursable Cost: \$67,701.00<br/>Fixed Fee: \$5,414.00.00<br/>TOTAL COST AND FEE: \$73,115</p> <p>Funding in the amount of \$73,100.00 is being provided.</p> <p>See attached pages for a description of the Task Order No.26</p> |                            |             |                      |               |                             |

18. SHIPPING POINT

19. GROSS SHIPPING WEIGHT

20. INVOICE NO.

21. MAIL INVOICE TO:

SEE BILLING  
INSTRUCTIONS  
ON  
REVERSE

a. NAME

U.S. Nuclear Regulatory Commission  
Payment Team, Mail Stop T-9-H-4

b. STREET ADDRESS (or P.O. Box)

Attn: (NRC-03-03-038 Task Order No. 26)

c. CITY

Washington

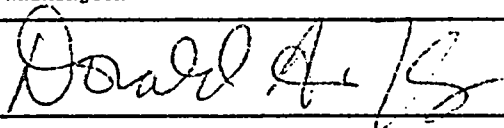
d. STATE

DC

e. ZIP CODE

20555

\$73,115.00

17(h)  
TOTAL  
(Cont.  
pages)17(i).  
GRAND  
TOTAL22. UNITED STATES OF AMERICA  
BY (Signature)

23. NAME (Typed)

Donald A. King  
Contracting Officer

TITLE: CONTRACTING/ORDERING OFFICER

AUTHORIZED FOR LOCAL REPRODUCTION  
PREVIOUS EDITIONS NOT USABLE

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

OPTIONAL FORM 347 (REV. 3/2005)  
PRESCRIBED BY GSA/FAR 48 CFR 53.213(e)

ADM002

In accordance with Section G.4, Task Order Procedures, of contract no. NRC-03-03-038, this definitizes Task Order No. 026. The effort shall be performed in accordance with the attached Statement of Work.

Task Order No. 026 shall be in effect from May 15, 2006 through October 31, 2006, with a cost ceiling of \$73,115.00. The amount of \$67,701.00 represents the estimated reimbursable costs, and the amount of \$5,414.00 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: Bernard L. Grenier  
Project Officer  
301-415-2726

Contractual Matters: Jeffrey R. Mitchell  
Contract Specialist  
301-415-6465

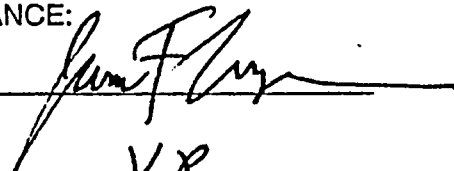
Acceptance of Task Order No. 026 should be made by having an official, authorized to bind your organization, execute three copies of this document in the space provided and return two copies to the Contract Specialist at the address identified in Block No. 5 of the OF 347. You should retain the third copy for your records.

ACCEPTANCE:

NAME

TITLE

DATE

  
V.P.  
5/11/06



**DELIVERY ORDER TERMS AND CONDITIONS NOT SPECIFIED IN THE CONTRACT**

**A.1 NRC Acquisition Clauses - (NRCAR) 48 CFR Ch. 20**

**A.2 Other Applicable Clauses**

☐ See Addendum for the following in full text (if checked)

☐ 52.216-18, Ordering

☐ 52.216-19, Order Limitations

☐ 52.216-22, Indefinite Quantity

☐ 52.217-6, Option for Increased Quantity

☐ 52.217-7, Option for Increased Quantity Separately Priced Line Item

☐ 52.217-8, Option to Extend Services

☐ 52.217-9, Option to Extend the Term of the Contract

**A.3 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.

**Contract No. NRC-03-03-038  
Task Order 26  
Statement of Work**

**Title:** TRACE Input Deck Development for ESBWR Design Certification Pertaining to Loss-of-Coolant Accident (LOCA) Analysis

**TAC Number:** MC8366  
**Job Code:** J-3272

**BACKGROUND**

GE Nuclear Energy (GE) has developed the E-Simplified Boiling Water Reactor (ESBWR) design. There was a pre-application review in which GE submitted the TRACG thermal hydraulics code to analyze the loss-of-coolant accident (LOCA) event for ESBWR. During that review, NRC Division of Safety Systems (DSS) (formerly Division of Systems Safety and Analysis, DSSA) contracted assistance from Information Systems Laboratories, Incorporated (ISL) to develop input decks for the NRC developed TRACE thermal hydraulics code to perform confirmatory analysis of the TRACG code. On August 24, 2005, GE formally submitted the design certification application for the ESBWR to the NRC for review. GE has revised their design from that which was analyzed during pre-application such that the TRACE input decks will need to be updated and refined and new input decks will need to be developed for events not analyzed during the pre-application phase.

**OBJECTIVE**

The objective of this task order is to obtain technical expertise from ISL to produce updated TRACE input decks based on the ESBWR design certification application to be used by the staff to analyze LOCA events contained in that application.

**TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED**

One Senior Engineer on an intermittent, part-time basis with strong background using the TRACE code; experience with the on-going TRACE input deck development for ESBWR preferred.

**NOTE:** Work on this task order will involve the handling of proprietary information associated with GE ESBWR application.

**WORK REQUIREMENTS AND SCHEDULE**

**Tasks**

**Completion Schedule**

1. Using the input decks developed under Task Order 4 and the updated design certification values and parameters provided by GE to analyze LOCA, develop the ESBWR TRACE stand-alone model for baseline steady state, Main Steam Line Break (MSLB) and Gravity Driven Cooling System (GDCCS) LOCA analysis using design certification information. Prepare a technical letter report.

Two weeks after the PI receives the responses with additional design information.

## WORK REQUIREMENTS AND SCHEDULE (CONTINUED)

### Tasks

### Completion Schedule

- |  |  |
|--|--|
| 2. Using TRACE input decks developed under previous ISL task orders as a baseline input deck, develop the ESBWR TRACE stand-alone modeling for the Feedwater Line Break (FWLB) LOCA analysis using design certification information. Prepare a technical letter report.  | Four weeks after completion of Task 1.               |
| 3. Using the updated input decks from Tasks 1 and 2, assess the following LOCA models by performing the transient analysis. Consult with the Technical Monitor as necessary to discuss and change in the parameters or other values when the results of the analyses do not attain or yield the expected outcomes; make the agreed-upon adjustments and complete the analysis. |  |
| a. MSLB LOCA; prepare a technical letter report.   | Two weeks after completion of Task 2.                |
| b. GDCS LOCA; prepare a technical letter report.   | Two weeks after completion of Subtask 3.a.           |
| c. FWLB LOCA; prepare a technical letter report.   | Two weeks after completion of Subtask 3.b.           |
| 4. Based on the work performed in the above Tasks and the results attained, prepare a technical letter report.   | Three weeks after completion of work on Subtask 3.c. |

## PERIOD OF PERFORMANCE

The projected period of performance is from May 15, 2006 through October 31, 2006.

## DELIVERABLES

### Technical Reporting Requirements

**NOTE:** All reports are to be submitted electronically using WordPerfect 10 (Font Arial regular 11 point) or compatible software program to the Technical Monitor with a copy provided to the Project Officer. Input decks and associated files are to be submitted electronically or via CD to the Technical Monitor with a copy provided to the Project Officer. In all correspondence, include the following information: JCN No., Task No., the applicant (General Electric), the facility (ESBWR), TAC No. (MC8366), and NRC/NRR Branch: Nuclear Performance and Code Review Branch, DSS, NRR.

1. At the completion of Task 1, submit a technical letter report that contains the updated steady state TRACE standalone 4500 MWt LOCA, MSLB LOCA and GDCS LOCA input decks, nodalization diagram of steady state and GDCS and MSLB LOCA decks, calculation notes including a list of important assumptions
2. At the completion of Task 2, submit a technical letter report that contains the FWLB LOCA TRACE standalone 4500 MWt input deck, nodalization diagram and calculation notes including a list of important assumptions
3. At the completion of Subtask 3.a., submit a technical letter report that contains applicable plots of thermal hydraulic parameters vs. time for the MSLB LOCA analysis, updated input deck if necessary description of changes made if any, updated nodalization diagrams if different, calculation notes on updates
4. At the completion of Subtask 3.b., submit a technical letter report that contains applicable plots of thermal hydraulic parameters vs. time for the GDCS LOCA analysis, updated input deck if necessary description of changes made if any, updated nodalization diagrams if different, calculation notes on updates
5. At the completion of Subtask 3.c., submit a technical letter report that contains applicable plots of thermal hydraulic parameters vs. time for the FWLB LOCA analysis, updated input deck if necessary description of changes made if any, updated nodalization diagrams if different, calculation notes on updates
6. At the completion of work on Task 4, submit a technical letter report that contains the full results of the work performed in Tasks 1, 2 and 3 documenting the assessment of the LOCA cases in the following format and content:

#### Technical Reporting Requirements

- Assumptions.
- Nodalization diagrams.
- Table of steady-state parameters. The table shall include but not necessarily be limited to: steam dome pressure, feedwater temperature, feedwater flow, downcomer flow, downcomer level, core inlet subcooling, core exit void fraction.
- Plots of important steady state thermal hydraulic parameters such as void fraction in the hot channel as a function of core height and axial power distribution
- Evaluation of the event scenario for each of the 3 LOCA events. This shall include a narrative description of the LOCA event including: the reactor scram signal, initiation of ECCS injection, etc.
- Plots of important thermal hydraulic phenomena for each of the 3 LOCA events. Plots should include all important phenomena for evaluating the LOCA events and should include at a minimum a plot of the following parameters vs. time: PCT, level in the core/chimney and downcomer, void fraction in the PCT node, core temperature and pressure, drywell and wetwell temperature and pressure, mass flow rate out the break, injection flow rate, and steam dome pressure.

Include as an attachment, CDs which contain input decks, output files, and restart files used to perform the above evaluations

#### Monthly Business Letter Report

A spending plan by Task is to be included in the standard monthly business letter report, as follows:

A budget is to be developed for each Task based on the agreed upon allocation of the level of effort among the Tasks using the following format:

| Authorized Cost Ceiling: \$ _____ |                       |  | Funds Obligated to date: \$ _____       |                                  |
|-----------------------------------|-----------------------|--|---|----------------------------------|
| <u>Tasks</u>                      | <u>Planned Budget</u> | <u>Expenditures<br/>for the Period</u> | <u>Task Expenditures<br/>Cumulative</u> | <u>Percentage<br/>vs. Budget</u> |
| 1.                                | \$ _____              | \$ _____                               | \$ _____                                | %                                |
| 2.                                | \$ _____              | \$ _____                               | \$ _____                                | %                                |
| 3.                                | \$ _____              | \$ _____                               | \$ _____                                | %                                |
| 4.                                | \$ _____              | \$ _____                               | \$ _____                                | %                                |
| Total                             | \$ _____              | \$ _____                               | \$ _____                                | %                                |

Any increase greater than 15 percent for any Task will be reported immediately to the Technical Monitor and the Project Officer.

#### MEETINGS AND TRAVEL

None.

#### NRC-FURNISHED MATERIALS

The updated information required to perform the work under this task order is contained in the GE ESWR application which was provided to the ISL Project Manager under Task Order 4, contract no. NRC-03-03-038, on or about August 2005 as follows:

- CD-ROM containing ESWR Design Control Document (DCD)
- CD-ROM containing TRACG input decks for the above LOCA events
- CD-ROM containing TRACE input developed by NRC/RES for 4000 MWt ESWR design

Additional design information requested of GE under Task Order 4 (JCN J-3149) will be provided to the PI via e-mail from the Technical Monitor upon receipt of responses from GE.

#### OTHER APPLICABLE INFORMATION

##### License Fee Recovery

The work specified in this SOW is license fee recoverable and must be charged to TAC number MC8366.

##### Assumptions and Understandings

The schedule and level of effort assumption for Task 1 is based on the fact that minimal effort is required to input the most recent GE design information.



The schedule and level of effort for development of input decks assume that complete information has been provided by GE. This also assumes the timely response of GE for requests made for additional design information as part of previous task orders.

All assumptions for level of effort also assume that there are no major issues faced with the deck development or the TRACE code itself.