ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES: 1 | 8

IMPORTANT: Mark all packages and papers with contract and/or order numbers. BPA NO.

1. DATE OF ORDER: DEC - 8 2006
2. CONTRACT NO. (If any): NRC-03-03-038
3. ORDER NO.: T032 MODIFICATION NO.:
4. REQUISITION/REFERENCE NO.: NRR-03-03-038-032

5. ISSUING OFFICE (Address correspondence to)
U.S. Nuclear Regulatory Commission
Div. of Contracts
Attn: Kala Shankar 301-415-6310
Mail Stop T-7-I-2
Washington, DC 20555

6. SHIP TO:
a. NAME OF CONSIGNEE: U.S. Nuclear Regulatory Commission
b. STREET ADDRESS: Office of Nuclear Reactor Regulation
Attn: Karen Chapman 301-415-3653
Mail Stop: O12-E5
c. CITY: Washington | d. STATE: DC | e. ZIP CODE: 20555
f. SHIP VIA:

7. TO:
a. NAME OF CONTRACTOR: INFORMATION SYSTEMS LABORATORIES, INC
ISL
b. COMPANY NAME: ATTN: DR. JAMES F. MEYER
c. STREET ADDRESS: 11140 ROCKVILLE PIKE, SUITE 500
d. CITY: ROCKVILLE | e. STATE: MD | f. ZIP CODE: 20852

8. TYPE OF ORDER
[ ] a. PURCHASE
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.
[X] b. DELIVERY
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.

9. ACCOUNTING AND APPROPRIATION DATA
720-15-171-103 J-4037 252A 31X0200.720
Obligate $90,051
Contractors DUNS: 107928806

10. REQUISITIONING OFFICE: NRR

11. BUSINESS CLASSIFICATION (Check appropriate box(es))
[ ] a. SMALL [X] b. OTHER THAN SMALL [ ] c. DISADVANTAGED [ ] g. SERVICE-DISABLED VETERAN-OWNED
[ ] d. WOMEN-OWNED [ ] e. HUBZone [ ] f. EMERGING SMALLBUSINESS

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. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	Issuance of Task Order No. 32, Under Contract No. NRC-03-03-038 Title: "TRACE Input Deck Development for Revision 2 of ESBWR Design Certification Pertaining to LOCA Analysis" Period of Performance: Day of Award through 03/09/07 Estimated Reimbursable Cost: $83,382 Fixed Fee: $6,669 TOTAL COST AND FEE: $90,051 Funding in the amount of $90,051 is being provided. See attached pages for a description of the Task Order No.32 See attached Revised Statement of Work					

18. SHIPPING POINT | 19. GROSS SHIPPING WEIGHT | 20. INVOICE NO.

SEE BILLING INSTRUCTIONS ON REVERSE

21. MAIL INVOICE TO:
a. NAME: U.S. Nuclear Regulatory Commission
Payment Team, Mail Stop ~~T-9-H-4~~ T-7-I-2 DAK
b. STREET ADDRESS (or P.O. Box): Attn: (NRC-03-03-038 Task Order No. 32)
c. CITY: Washington | d. STATE: DC | e. ZIP CODE: 20555

17(h) TOTAL (Cont. pages)
17(i). GRAND TOTAL: 90,051

22. UNITED STATES OF AMERICA
BY (Signature): Donald A. King
23. NAME (Typed): Donald A. King
Contracting Officer
TITLE: CONTRACTING/ORDERING OFFICER

SUNSI REVIEW COMPLETE

ADMOO

AUTHORIZED FOR LOCAL REPRODUCTION
PREVIOUS EDITION NOT USABLE

OPTIONAL FORM 347 (REV. 4/2006)
PRESCRIBED BY GSA/FAR 48 CFR 53.213(f)

In accordance with Section G.4, Task Order Procedures, of contract no. NRC-03-03-038, this definitizes Task Order No. 032. The effort shall be performed in accordance with the attached Statement of Work.

Task Order No. 032 shall be in effect from the Day of Award through March 9, 2007, with a cost ceiling of $90,051.00. The amount of $83,382.00 represents the estimated reimbursable costs, and the amount of $6,669.00 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: Karen Chapman
Project Officer
301-415-3653

Contractual Matters: Kala Shankar
Contract Specialist
301-415-6310

Acceptance of Task Order No. 032 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

Senior V.P.
TITLE

12/08/06
DATE

T032

SUPPLEMENTAL INVOICING INFORMATION

If desired, this order (or copy thereof) may be used by the Contractor as the Contractor's invoice, instead of a separate invoice, provided the following statement, (signed and dated) is on (or attached to) the order: "Payment is requested in the amount of $__________. No other invoice will be submitted." However, if the Contractor wishes to submit an invoice, the following information must be provided: contract number (if any), order number, item number(s), description of supplies or services, sizes, quantities, unit prices, and extended totals. Prepaid shipping costs will be indicated as a separate item on the invoice. Where shipping costs exceed $10 (except for parcel post), the billing must be supported by a bill of lading or receipt. When several orders are invoiced to an ordering activity during the same billing period, consolidated periodic billings are encouraged.

RECEIVING REPORT

Quantity in the "Quantity Accepted" column on the face of this order has been: ☐ inspected, ☐ accepted, ☐ received by me and conforms to contract. Items listed below have been rejected for the reasons indicated.

SHIPMENT NUMBER	PARTIAL		DATE RECEIVED	SIGNATURE OF AUTHORIZED U.S. GOV'T REP.	DATE
	FINAL				
TOTAL CONTAINERS		GROSS WEIGHT	RECEIVED AT	TITLE	

REPORT OF REJECTIONS

ITEM NO.	SUPPLIES OR SERVICES	UNIT	QUANTITY REJECTED	REASON FOR REJECTION

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.

Statement of Work for
Task Order 32 Under NRC-03-03-038 JCN J-4037

Title: TRACE Input Deck Development for Revision 2 of ESBWR Design Certification Pertaining to LOCA Analysis

Technical Monitor: Veronica M. Klein, (vmk1@nrc.gov) 301-415-2888

TAC Number: MC8366

BACKGROUND

GE Nuclear Energy (GE) has developed the Economic Simplified Boiling Water Reactor (ESBWR) design and submitted it for design certification in August 2005. As part of the design certification review, the staff is performing independent calculations of the loss-of-coolant accident (LOCA) using the TRACE thermal hydraulics computer code. Under Task Order 26 of NRC Contract 03-03-038, Information Systems Laboratories, Incorporated (ISL) developed input decks of the ESBWR to be used with the TRACE code to perform LOCA evaluations. In Revision 2 of the Design Certification Documentation (DCD), GE incorporated design changes to certain systems that function as emergency core cooling systems for the LOCA event. As a result of this re-design, NRC needs the TRACE input decks to be updated. In addition, NRC/RES initiated an effort with ISL Under Contract GS23F0060L Purchase Order DR-04-06-071 to evaluate the applicability of TRACE for simulating ESBWR LOCAs. Task 7 of the project is to develop guidance for TRACE ESBWR input based upon TRACE simulations of experiments compared with measured test data. In this proposed new task, the TRACE ESBWR input model will be upgraded based on the model enhancements indicated through the assessment process.

OBJECTIVE

The objective of this task order is to obtain technical expertise from ISL to produce updated TRACE input decks based on Revision 2 of 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

Two Senior Engineers on full-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 26 perform model enhancements per the guidance suggested in Task 7 of NRC/RES contract GS23F0060L Purchase Order DR-04-06-071. Incorporate recommendations from Task Order 26 Technical Letter Reports under NRC/NRR Contract 03-03-038. Update the ESBWR TRACE input decks to incorporate design information from Revision 2 of the DCD provided by GE to analyze LOCA, for the baseline steady state and the 4 following LOCA events: (1) Main Steam Line (MSL), (2)	Six weeks after authorization of work

Gravity Driven Cooling System (GDCS), (3) Bottom Drain Line (BDL), and (4) Feedwater Line (FWL). Prepare a technical letter report.

2. Using the updated input decks from Task 1, assess the LOCA models by exercising the TRACE code with each input deck and performing the 4 transient analyses. Ensure all events run to at least 2000 seconds. 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. Prepare a technical letter report.

Six weeks after completion of Task 1

LEVEL OF EFFORT

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

Tasks	Level of Effort
1.	320
2.	320
Subtotal	640 hours

PERIOD OF PERFORMANCE

The projected period of performance is Three (3) months from the effective date of the task order.

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, MSL LOCA, GDCS LOCA, FWL LOCA and BDL LOCA input decks. Include nodalization diagrams, calculation notes including a list of important assumptions, describe major changes to the decks

2. At the completion of Task 2, submit a technical letter report that contains the results of the work performed in Tasks 1 and 2. Include updated input decks and a report that includes the following content:

- Assumptions.
- Nodalization diagrams. Include pipe length sizes and volumes for important systems. Cite sources for all modeling parameters obtained.
- Describe changes made that resulted from (1) changes to the design, (2) improvements recommended from Task Order 26, and (3) enhancements that were necessary to improve model robustness
- 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, core power level, void fraction, etc.
- Evaluation of the event scenario for each of the 4 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 4 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, core temperature and pressure, drywell and wetwell temperature and pressure, mass flow rate out the break, injection flow rate, and steam dome pressure.
- Possible model deficiencies and recommendations for improvement
- Comparison to GE models where possible

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: $ _____

Tasks	Planned Budget	Expenditures for the Period	Task Expenditures Cumulative	Percentage vs. Budget
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 following documents are required to complete the work in Task 1:

The following were generated by ISL and should be available internally at ISL. Copies will be provided by NRC upon request:

- Input decks from NRC Contract 03-03-038 Task Order 26
- Technical Letter Reports from NRC Contract 03-03-038 Task Order 26
- Draft guidance from NRC/RES giving guidelines for modeling ESBWR components using TRACE (Task 7 under NRC contract with ISL GS23F0060L Purchase Order DR-04-06-071)

The following information was sent to support NRC Contract 03-03-038 Task Orders 25, 26 and 27:

- CD-ROM containing Revision 2 ESBWR DCD

The following will be transmitted upon receipt by the NRC:

- CD-ROM containing TRACG input decks for the above LOCA events
- Applicable RAI responses

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 level of effort for Task 1 is based upon the following (1) draft guidance from Task 7 in RES Contract GS23F0060L Purchase Order DR-04-06-071, (2) recommendations from the technical letter reports produced from Task Order 26 (such as core pressure drop discrepancies, inclusion of HCU, modeling of heat structures in the drywell), and (3) ESBWR design changes (addition of ICS inventory, change in control logic in ADS).

All level of effort estimates assume that there are no major issues faced with the TRACE code itself and does not include any effort for code development.