

2. AMENDMENT/MODIFICATION NO. 0007 3. EFFECTIVE DATE See Block 15c. 4. REQUISITION/PURCHASE REQ. NO. NRC-42-07-036 T39 M7 0703639160 5. PROJECT NO. (If applicable)

6. ISSUED BY CODE 3100 7. ADMINISTERED BY (If other than Item 6) CODE 3100
 U.S. Nuclear Regulatory Commission
 Div. of Contracts
 Attn: Jeffrey R. Mitchell, 301-492-3639
 Mail Stop TWB 01-B10M
 Washington, DC 20555 U.S. Nuclear Regulatory Commission
 Div. of Contracts
 Mail Stop TWB 01-B10M
 Washington, DC 20555

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)
 INFORMATION SYSTEMS LABORATORIES, INC
 ISL
 ATTN: DR. JAMES F. MEYER
 11140 ROCKVILLE PIKE, SUITE 500
 ROCKVILLE MD 20852
 CODE 107928806 FACILITY CODE 9A. AMENDMENT OF SOLICITATION NO. (X) 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-42-07-036 0039 10B. DATED (SEE ITEM 13) X 05-21-2008

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) 025-15-171-103 Q4160 252A 31x0200.025 Obligate \$50,000.00

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(X) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
 B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
 X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Bilateral Mutual Agreement of the Parties
 D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by LCF section headings, including solicitation/contract subject matter where feasible.)
 Task Order Ceiling Amount: \$310,887.00 (changed)
 Total Obligated Amount: \$299,687.00 (changed)
 Period of Performance: 05/21/2008 - 12/31/2010 (unchanged)

See continuation pages

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Bruce B. Mrowca V.P. 15B. CONTRACTOR OFFICER (Signature of person authorized to sign) [Signature] 15C. DATE SIGNED 4/14/2010 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Jeffrey R. Mitchell Contracting Officer 16B. UNITED STATES OF AMERICA BY [Signature] (Signature of Contracting Officer) 16C. DATE SIGNED 4/14/2010

The purpose of this modification is to (1) to incorporate the revised task order Statement of Work, (2) increase the contract ceiling by \$55,935.00 from \$254,952.00 to \$310,887.00, (3) provide incremental funding in the amount of \$50,000.00 thereby increasing the total obligations from \$249,687.00 to \$299,687.00 and (4) accept ISL's 2009 Provisional Billing/Forward Pricing Rates for this Task Order No. 39. Accordingly, the subject task order is modified as follows:

Refer to the Task Order No. 39 "Statement of Work" is here by deleted in its entirety and replaced with the following Statement of Work attached to this Modification No. 7 entitled "Statement of Work Rev 5".

Page 2, paragraphs 2 and 3 of the task order award document are revised to read as follows:

Task Order No. 39 shall be in effect from May 21, 2008 through December 31, 2010, with a cost ceiling of \$310,887.00. The amount of \$293,715.00 represents the estimated reimbursable costs, and the amount of \$17,172.00 represents the fixed fee.

The amount obligated by the Government with respect to this task order is \$299,687.00, of which \$283,134.00 represents the estimated reimbursable costs, and the amount of \$16,553.00 represents the fixed fee.

A.1 2052.216-71 INDIRECT COST RATES (JAN 1993)

(a) Pending the establishment of final indirect rates which must be negotiated based on audit of actual costs, the contractor shall be reimbursed for allowable indirect costs as follows:

APPLIES ONLY TO TASK ORDER NO. 39, UNDER NRC-42-07-036

| INDIRECT COST POOL | RATE | BASE | PERIOD |
|--------------------|---|-----------------------------------|--------------------------------------|
| Fringe Benefits |  | Direct Labor | January 1, 2009 - Task 39 Expiration |
| Overhead | | Direct Labor | January 1, 2009 - Task 39 Expiration |
| G&A | | Total Value Added Cost Input | January 1, 2009 - Task 39 Expiration |
| Material Handling | | Materials and Subcontractor Costs | January 1, 2009 - Task 39 Expiration |

(b) The contracting officer may adjust these rates as appropriate during the term of the contract upon acceptance of any revisions proposed by the contractor. It is the contractor's responsibility to notify the contracting officer in accordance with FAR 52.232-20, Limitation of Cost, or FAR 52.232-22, Limitation of Funds, as applicable, if these changes affect performance of work within the established cost or funding limitations.

A summary of obligations for this contract, from award date through the date of this action, is given below:

| | |
|--------------------------------------|---------------------|
| Total FY08 Obligation Amount: | \$ 76,327.00 |
| Total FY09 Obligation Amount: | \$109,360.00 |
| Total FY10 Obligation Amount: | <u>\$114,000.00</u> |
| Cumulative Total of NRC Obligations: | \$299,687.00 |

****ALL OTHER TERMS AND CONDITIONS OF THE SUBJECT TASK ORDER REMAIN UNCHANGED****

MODIFICATION NO. 7
TASK ORDER STATEMENT OF WORK
REVISION NO. 5

| | | |
|--|--|---|
| JCN Q4160 | Contractor ISL, Inc. | Task Order No. 39 (Mod 7) |
| Applicant Westinghouse | Design/Site AP1000 Design Certification | Docket No. 05200006 |
| Title/Description Evaluation of AP1000 DCA Sump Screen Downstream Effects on Long-Term Core Cooling | | |
| TAC No. RX0313 | B&R Number 025-15-171-103 | SRP or ESRP Section(s) Sections 6.3 and 15.6.5 |
| NRC Task Order Project Officer (PO) | | |
| Min Lee | 301-415-0502 | Min.Lee@nrc.gov |
| NRC Technical Monitor (TM) | | |
| Tanya Ford | 301-415-1194 | Tanya.Ford@nrc.gov |

1.0 BACKGROUND

In 2007 Westinghouse submitted to U.S. Nuclear Regulatory Commission (NRC) an application for AP1000 Design Certification amendment (DCA) 16. DCA 16 includes changes to AP1000 Design Certification Document (DCD), Section 6.3.2.2.7, "IRWST and Containment Recirculation Screens." Although the primary review responsibility of the IRWST and containment recirculation screens lies in the Containment and Ventilation Branch (SPCV), downstream effects of the debris loading on the sump screens on long-term cooling are under the purview of the Reactor Systems, Nuclear Performance & Code Review Branch (SRSB). The SRSB is required to provide technical support and conduct detailed review to determine the acceptability of the proposed changes to these sections.

Westinghouse has also submitted Technical Report (TR) APP-GW-GLR-079, "AP1000 COL Standard Technical Report Submittal of APP-GW-GLR-079 (TR26), Revision 3." This TR provides the bases for closing Combined Operating License (COL) Information Item 6.3-2, "Verification of Containment Resident Particulate Debris Characteristics." This revision updates TR26 to include information from the following three sources: 1) Head loss testing that was done specifically for AP1000; 2) A downstream effects evaluation of the Passive Core Cooling System (PXS) piping system; and 3) A downstream effects evaluation of the amount of chemical that might plate out on the fuel. The NRC staff's review of the ECCS changes will follow the guidance of Standard Review Plan (SRP) (NUREG-0800) Section 6.3, "Emergency Core Cooling System," SRP 15.6.5, "Loss-of-Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary," regarding long-term cooling, and Regulatory Guide (RG) 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant-Accident," to assure the quality and uniformity of staff safety reviews. As part of the full scope of AP1000 ECCS review, The SRSB staff will conduct review of changes related to the section of AP1000 ECCS that are under the SRSB purview. Specifically, the SRSB's review responsibility includes Item 3 above, downstream effects of the amount of chemical that might plate out on the fuel.

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

2.0 OBJECTIVE

The objective of this task order is to obtain technical expertise from ISL, Inc. to assist the NRC SRSB staff in the review of the proposed changes to the AP1000 design certification amendment associated with resolution of GSI-191.

3.0 WORK REQUIREMENTS, SCHEDULE AND DELIVERABLES

| Tasks Requirements and Standards | Scheduled Completion | Deliverables |
|---|---|---|
| <p>1. REQUIREMENT: Become familiar with (1) SRP Sections 6.2 and 6.3, "Emergency Core Cooling System," (2) the AP1000 Design and AP1000 DCD, including Chapter 6.3 "Passive Core Cooling System" and Chapter 15.6.5, on long term cooling, and (3) the following documents:</p> <ul style="list-style-type: none"> • WCAP-16793 • GSI-191 • GL-2004-02 • RG 1.82 <p>STANDARD: Written confirmation that familiarization is complete</p> | <p>1 week after authorization of work.</p> | <p>Documentation that assigned personnel have reviewed references</p> |
| <p>2. REQUIREMENT: Participate in an orientation/kick-off meeting with the NRC staff to discuss the scope of work, expectations, and task order management. Also to be discussed are the technical areas of review that are under the SRSB's purview.</p> <p>STANDARD: Attendance by the contractor project manager and assigned technical reviewers</p> | <p>1.5 weeks after authorization of work.</p> | <p>N/A</p> |

| Tasks Requirements and Standards | Scheduled Completion | Deliverables |
|---|---|--|
| <p>3. REQUIREMENT: Review APP-GW-GLR-079 (TR26), APP-GW-GLE-002, technical report regarding long-term cooling sensitivity study (to be submitted by Westinghouse in April 2008), the proposed changes to the AP1000 DCD associated with resolution of GSI-191, and WCAP-17028-P (submitted by Westinghouse on 2/11/09 to supersede a previous document sent in for review). The contractor should discuss with the NRC SRSB technical monitor (TM) to identify the review scope. The review should use SRP 6.3 and RG 1.82 as guidance, and verify that the proposed changes to the DCD associated with the containment recirculation screen and IRWST screen properly maintain long-term core cooling following a LOCA.</p> <p>STANDARD: Complete preliminary Technical Evaluation Report (TER) that follows the NRC provided template. No deviation from the guidance defined in Section III, RAI guidance of Attachment 1.</p> | <p>10 weeks after authorization of work</p> | <p>Technical Evaluation Report and RAIs, if applicable</p> |
| <p>a. Prepare a preliminary TER related to the ECCS changes, identify technical issues and those aspects of the application that need additional or clarifying information and generate draft requests for additional information (RAIs).</p> | <p>8 weeks after the authorization of work.</p> | <p>PSER and Draft RAIs</p> |
| <p>b. Discuss with NRC technical monitor any draft RAIs. Participate in conference calls with the applicant to discuss the draft RAIs and additional supporting materials needed to support the official RAI and TER development. Based on these discussions, generate formal RAIs to be sent to the applicant for their response.</p> | <p>2 weeks after completion of Task 4a.</p> | <p>Final RAIs</p> |

| Tasks Requirements and Standards | Scheduled Completion | Deliverables |
|--|---|--|
| <p>4. REQUIREMENT: Evaluate the RAI responses to determine if they adequately resolve the outstanding issues. Discuss with the NRC TM and identify open items that were not resolved from the RAI responses. Prepare a Draft TER with open items. Additional work needed now that a subsequent document (WCAP-17028-P) has been submitted for review under this task order. Westinghouse has recently sent the staff additional revisions to several previously submitted documents for review. Westinghouse has also submitted two new documents for review (a statistical analysis and boron precipitation report) which were conducted in support of the DCD amendment application. Additional effort is needed to review and address the information provided in these recent submittals. An audit is also needed to review testing and analysis calculations and interview Westinghouse technical experts.</p> <p>STANDARD: Complete draft TER that follows the NRC provided template without deviation.</p> | <p>April 9, 2010</p> | <p>Draft TER with Open Items (if any)</p> |
| <p>5. REQUIREMENT: Participate with the NRC staff and the applicant in the discussion of open items. Evaluate applicant's responses to open items. Identify any unresolved issues with open items if any, as a TER based on staff's comments.</p> <p>STANDARD: Complete TER that follows the NRC provided template without deviation.</p> | <p>2 weeks after completion of Task 4.</p> | <p>Final TER</p> |
| <p>6. REQUIREMENT: If required, develop ACRS presentation slides and material for staff to review. Support staff's ACRS presentations.</p> <p>STANDARD: Ensure presentation materials are reviewed and approved by NRC staff.</p> | <p>TBD pending the ACRS meeting schedule.</p> | <p>ACRS presentation material. Attend ACRS meeting if required</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 expertise in:

- Light-Water Reactor Design
- Nuclear Fuel Design
- Thermal-hydraulic Design
- Emergency/Passive Core Cooling Systems
- LOCA analysis including long-term cooling

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 contract is subject to the NRC technical monitor's (TM's) approval. 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 a bi-weekly progress report 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.

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 PM 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 Q4160; Task Order 39 TAC No. **RX0313**; the applicant: Westinghouse.

1. At the completion of Task 3a, submit a Technical Evaluation Report (TER) that contains, for each Sub-section of the SER (see Attachment 1 for the list of the SER sections and the outline, format and content of the report): 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; and a list of "Requests for Additional Information (RAIs). See Attachment 1 in the base contract SOW for the guidelines for developing RAIs.
2. At the completion of Task 4, submit a TER (see Attachment 1) that contains a summary of the review results and the updated report completed under Task 3 incorporating the findings from the resolution of the RAIs. Include a separate list of the remaining open items and the basis for such determination.
3. At the completion of Task 5, submit a TER (see Attachment 1) that contains a safety evaluation report with open items resulting from the work performed in Task 4, and update of the Technical Evaluation Report developed under Task 4.

6.0 MEETINGS AND TRAVEL

One 1-person, 1-day working meeting to kickoff project and contractor orientation.*

One 1-person, 1-day working meetings at NRC headquarters to review deliverables*

One 1-person, 1-day meeting (if needed) for hearing or ACRS meeting

*At the discretion of the NRC TM, meeting may be conducted via telephone or video conference.

7.0 NRC FURNISHED MATERIAL

The following NRC furnished materials will be provided to the contractor together with SOW:

- a. CD-ROM containing AP1000 DCD, AP1000 DCA Revision 16, Sections 6.3 and 15.6.5
- b. Technical Reports:

- 1) APP-GW-GLR-079, **Revision 6 (Proprietary)**, "AP1000 Verification of Water Sources for Long-Term Recirculation Cooling Following a LOCA"
 - 2) APP-GW-GLR-134, "AP1000 DCD Impacts to Support COLA Standardization"
 - 3) APP-GW-GLE-002, "Impacts to AP1000 DCD to Address Generic Safety Issue (GSI) 191"
 - 4) APP-PXS-GLR-001, **Revision 3**, "Impact on AP1000 Post-LOCA Long Term Cooling of Postulated Containment Sump Debris."
- c. Topical Reports:
- 1) WCAP-16793-NP, "Submittal of WCAP-16793-NP, Revision 0, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous and Chemical Debris in the Recirculating Fluid"
 - 2) WCAP-16406-P-A Revision 1, "Evaluation of Downstream Sump Debris Effects in Support of GSI-191"
 - 3) WCAP-17028-P, **Revision 3**, "Evaluation of Debris-Loading Head-Loss Tests for AP1000 Fuel Assemblies During Loss of Coolant Accidents."
- d. CD-ROM containing the NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design."
- e. Electronic copies of all **the revised and new** documents submitted by Westinghouse in **February and March of 2010** including technical reports, topical reports, and RAI responses.

8.0 PERIOD OF PERFORMANCE

The period of performance is from May 21, 2008 through December 31, 2010.

9.0 OTHER APPLICABLE INFORMATION

a. License Fee Recovery

All work under this task order is fee recoverable and must be charged to the appropriate TAC number(s).

b. Assumptions and Understandings:

The level of effort for Task 1 is based on the volume of materials to be reviewed; this task is for familiarity and not for evaluation.

The level of effort for Task 3 is based on the assumption that the contractor is familiar with the review procedures of SRP Section 6.2.1, "Containment Functional Design," SRP Section 6.3, "Emergency Core Cooling System," SRP Section 15.6.5, "Loss-of-Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary," regarding long-term cooling, RG 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant-Accident," and GSI-191, "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance."

The level of effort for Task 4 is based on the assumption that there will be 20 RAIs and it will take, on the average, 4 hours to review and address each response.

The level of effort for Task 5 is based on the need to resolve 10 open items and it will take, on the average, 4 hours to review and resolve each open item, and prepare an SER.

The level of effort in Task 6 is based on requiring one trip to NRC headquarters.

It is assumed that the contractor has access to the NRC furnished material available on the Internet.

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.

Attachments:

1. Outline, Format, and Content for the TER Input

Outline, format, and sample for the TER (draft SER input)

X.Y.Z Title of Section

X.Y.Z.1 Regulatory Criteria

Develop an outline that follows the format and topics presented in the AREAS OF REVIEW section of the appropriate SRP section. This information will correspond to the SRP sections that are the subject of this Task Order. For each unique SRP review area contained in the TER, the contractor should specify the acceptance criteria that were used for its review. Summarize the applicable regulations and other regulatory references, including regulatory guides, generic letters, or NRC staff positions, that are relevant to this topic.

Technical reviewers are encouraged to use the descriptions of acceptance criteria from previously issued Safety Evaluation Reports for completed design certifications (e.g., NUREG-1793 for the AP1000 Final Safety Evaluation Report) when applicable.

X.Y.Z.2 Summary of Technical Information

Describe the key technical points that were made in the application. It is not necessary to restate the application verbatim or to address all the details in the application.

X.Y.Z.3 Technical Evaluation

Document the contractor's evaluation of the application against the relevant regulatory criteria. The evaluation should support the contractor's conclusions as to whether the regulations are met. State what the contractor did to evaluate the applicant's submittal. The contractor's evaluation may include verification that the applicant followed applicable regulatory guidance, performance of independent calculations, and validation that the appropriate assumptions were made. The contractor may state that certain information provided by the applicant was not considered essential to the contractor's review and was not reviewed by the contractor. While the contractor may summarize the information offered by the applicant in support of its application, the contractor should clearly articulate the bases for its conclusions.

Contractor should provide a clear and concise description of any request for additional information (RAIs). The description should include a justification of the requested information that the requested information is not provided in the application and is absolutely needed to determine or confirm whether the relevant regulatory requirements (articulate specific requirements) have been met. The contractor should discuss its technical evaluation of the licensee's response to the RAIs and determine whether it is acceptable. The contractor should clearly articulate the bases for its acceptance or rejection. If the RAI response is not acceptable, it will be classified as an 'open item'. All open items will be resolved in Phase 3.

X.Y.Z.4 Conclusions

Summarize the contractor's conclusions regarding the application, including words such as the following. As set forth above in Sections X.Y.Z.2 and X.Y.Z.3 of this report, [provide specific bases for conclusions that follow]. Accordingly, the staff concludes that the application meets [or, if applicable, does not meet] the relevant requirements of 10 CFR Part XX and is [or, if applicable, is not] acceptable.

X.Y.Z.5 References