



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

June 22, 2007

Information Systems Laboratories
Attn: Mr. James Meyer
11140 Rockville Pike, Suite 500
Rockville, Maryland 20852

SUBJECT: TASK ORDER NO. 35 ENTITLED, "REVIEW OF SEVERE ACCIDENT
MITIGATION ALTERNATIVES (SAMAs) FOR INDIAN POINT LICENSE
RENEWAL APPLICATION" UNDER CONTRACT NO. NRC-03-03-038

Dear Mr. Meyer:

In accordance with the Section G.4, Task Order Procedures, of the subject contract, this letter definitizes Task Order No. 35. This effort shall be performed in accordance with the enclosed Statement of Work and the Contractor's technical proposal dated May 10, 2007, which is incorporated by reference and made a part of this task order. Verbal authorization to proceed with performance was given by the Contracting Officer on June 13, 2007, with a not to exceed spending limit of \$30,000.

Task Order number 35 shall be in effect from June 13, 2007, through June 12, 2008, with a cost ceiling of \$48,200. The amount of \$45,067 represents reimbursable costs, the amount of \$3,133 represent the fixed fee.

The obligated amount shall, at no time, exceed the task order ceiling. When and if the amount(s) paid and payable to the Contractor hereunder shall equal the obligated amount, the Contractor shall not be obligated to continue performance of the work unless and until the Contracting Officer shall increase the amount obligated with respect to this task order. Any work undertaken by the Contractor in excess of the obligated amount specified above is done so at the Contractor's sole risk.

This task order obligates funds in the amount of \$48,200, of which \$45,067 represents reimbursable costs, \$3,133 represents the fixed fee. Accounting data for this task order is as follows:

B&R NO.:	720-15-112-130
JOB CODE:	J5305
BOC:	252A
APPN. NO.:	31X0200.720
FFS NUMBER:	NRR-03-038-(035)
OBLIGATED AMOUNT:	\$48,200.00

The following individual is considered to be essential to the successful performance of the work hereunder: [REDACTED] The Contractor agrees that such personnel shall not be removed from the effort under the task order without compliance with the Contract Clause H.4 Key Personnel.

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

JUL 12 2007

ADM002

Your contacts during the course of this task are:

Technical Matters: Rachel Glaros
Project Officer
(301) 415-3672
Robert Palla
Technical Monitor
(301) 415-1095
Contractual Matters: Jennifer DeFino
Contract Specialist
(301) 415-6714

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, who is authorized to bind your organization, execute three (3) copies of this document in the spaces provided and return two copies to the U.S. Nuclear Regulatory Commission, Attn: Ms. Jennifer DeFino, ADM/DC/CMB1, Mail Stop T-7-I-2, Washington, D.C. 20555. You should retain the third copy for your records.

If you have any questions regarding this matter, please contact Jennifer DeFino on (301) 415-6714, facsimile (301) 415-8157, or e-mail at JAD2@NRC.gov.

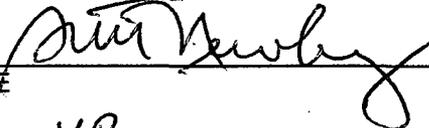
Sincerely,



Joyce A. Fields, Contracting Officer
Division of Contracts
Office of Administration

Enclosure:
As stated

ACCEPTED:


NAME

VP
TITLE

6/28/07
DATE

**Statement of Work for
J-4064 Task Order No. 35**

Title: Review of Severe Accident Mitigation Alternatives (SAMAs) for Indian Point License Renewal Application

NRC Project Manager: Rachel Glaros, CMT/FMB/PMDA 301-415-3672

NRC Technical Monitor: Robert Palla, APLA/DRA 301-415-1095

TAC Number: TBD

B&R Number: 720-15-112-130

BACKGROUND

In the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437) the staff found that it would be premature to generically conclude that a consideration of severe accident mitigation alternatives (SAMAs) is not required for license renewal, since regulatory programs related to severe accidents were still ongoing at that time. Accordingly, 10 CFR 51.53(c)(3)(ii)(L) effectively requires the NRC to include consideration of SAMAs in the environmental impact review performed as part of license renewal if the staff has not previously considered SAMAs for the license renewal applicant's plant. The purpose of this evaluation is to determine whether any SAMAs warrant implementation to further reduce the environmental impacts of severe accidents. Although the U.S. Court of Appeals decision which formed the basis for this requirement (Limerick Ecology Action v. NRC, 869F.2d 719 [3rd Cir. 1989]) dealt specifically with design alternatives for "mitigating" severe accidents, previous SAMA evaluations have more broadly interpreted the scope of potential improvements to include alternatives for preventing severe accidents, accident management measures, and reliability assurance programs. Although the scope of the earliest SAMA evaluations focused on the risk from internally-initiated events, the risk from externally-initiated events (e.g., seismic events and fires) has also been addressed in more recent evaluations to the extent supported by available information. The impact of uncertainties in the cost and benefit analysis on the findings of the SAMA evaluation has also received increased attention. Potential improvements expected to be evaluated include: engineering changes to risk-significant systems, structures, and mechanical components; improvements to technical specifications and in-service inspection activities; and improvements to emergency operating procedures and severe accident management guidelines.

Much work in the area of severe accidents has already been completed by the license renewal applicants and the NRC, and is expected to form a basis for the evaluation of SAMAs. Pursuant to Generic Letter 88-20, licensees have completed an Individual Plant Examination (IPE) to identify important risk contributors and potential vulnerabilities for internally-initiated events. They also performed an individual plant examination for externally-initiated events (IPEEE) with similar objectives. Results and insights from these risk studies are documented in NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," and NUREG-1742, "Perspectives Gained from the Individual Plant

Examination of External Events (IPEEE) Program," respectively. The NRC has sponsored analyses of severe accident progression and containment challenges as part of the NUREG-1150 study and the Severe Accident Research Program. Severe accident phenomena considered in these programs include direct containment heating, core concrete interactions, and steam explosions. Analyses of potential improvements for various types of reactor containment buildings have also been performed as part of the NRC Containment Performance Improvement (CPI) program.

Pursuant to 10 CFR 51.53(c)(3)(ii)(L), license renewal applicants are required to submit the results of their assessment of SAMAs as part of their Environmental Report. This information must be systematically assessed by the staff to develop insights into the adequacy of the applicant's assessment and whether any potential design improvements appear to be justified. Numerous plant-specific SAMA reviews have been completed within the last few years and are illustrative of the type of evaluation that is needed. These include the SAMA reviews performed for: (1) plants that have or are renewing their licenses under 10 CFR Part 54, (e.g., NUREG-1437, Supplements 1 through 30), (2) the advanced light water reactor designs, e.g., ABWR (NUREG-1503, Section 20.5.1), and AP-1000 (NUREG-1793, Section 19.4), and (3) the operating plants licensed following the Court of Appeals decision, e.g., Watts Bar (NUREG-0498, Supplement 1). An Environmental Standard Review Plan has also been developed to provide guidance regarding the review of SAMAs for license renewal (NUREG-1555, Supplement 1, Section 7.3).

In FY2006, under JCN J3270, Task Order #20, ISL completed a review of SAMAs for the Oyster Creek, Pilgrim, and Vermont Yankee plants, and under Task Order #28, ISL is performing a review of SAMAs for Susquehanna, Wolf Creek, and Shearon Harris. The license renewal application for Indian Point Units 2 and 3 is scheduled to be received in April 2007, and will be reviewed under the subject task order.

OBJECTIVE OF PROPOSED WORK

The objectives of this project are to initiate and complete the SAMA review for Indian Point Units 2 and 3.

TECHNICAL AND OTHER SPECIAL QUALIFICATIONS REQUIRED

The contractor shall provide a responsible Project Manager and support personnel as may be required for performance of the task. The scope of work involves the application of the following types of disciplines: risk and reliability assessment; knowledge of plant systems and operational considerations important to risk, such as emergency power generating and distribution systems, technical specifications, and emergency operating procedures; severe accident and offsite consequence analysis; and regulatory (cost/benefit) analysis.

SUMMARY OF PRIOR EFFORTS

ISL personnel have reviewed numerous Level 1 and 2 probabilistic safety assessments for operating plants, and reviewed the SAMA analyses submitted in support of previous license renewal applications.

WORK REQUIREMENTS

Task A. Review of Site SAMA Analyses

1. Preliminary Evaluation

- a. ISL shall conduct a preliminary review of the applicant's SAMA analysis. The emphasis of the review shall be on the completeness of design alternatives considered by the applicant and the reasonableness of the applicant's analyses of risk reduction and costs for each candidate improvement. In assessing completeness, ISL shall evaluate the rigor of the process used by the applicant to identify potential SAMAs (e.g., importance analyses or cutset examination), and shall consider the results of the process relative to the leading plant-specific risk contributors, as well as the plant improvements/risk reduction strategies identified in: (i) the applicant's IPE and IPEEE submittals and the NRC's review of these submittals, (ii) insights from the NRC's review of industry IPE and IPEEE submittals, as documented in NUREG-1560 and NUREG-1742, (iii) previous SAMA reviews documented in NUREG-1437 and its supplements, (iv) technical reports developed as part of the Containment Performance Improvement program, (v) the accident management strategies identified in NUREG/CR-5474, and (vi) mitigation strategies to further enhance the plant's capabilities in maintaining core cooling and containment integrity identified through licensee and NRC security assessments. Particular attention shall be paid to plant-specific SAMAs that prevent core damage, because previous experience has shown that these are the SAMAs that have greatest potential to be cost beneficial. Although the greatest level of risk reduction might be achieved by major plant modifications, lower cost alternatives (e.g., procedure vs hardware, non-safety vs safety-related equipment, temporary vs permanent connections) might eliminate a substantial fraction of the risk and have a greater net benefit. The review shall confirm that low cost alternatives have been appropriately considered. The applicant's cost/benefit methodology shall be assessed for consistency with the regulatory analysis guidance provided in NUREG/BR-0058, Rev. 4, and NUREG/BR-0184. ISL shall review the treatment of externally-initiated events and uncertainty in core damage frequency and risk estimates within the applicant's analysis, and address these factors in their assessment of the adequacy of the SAMA identification and evaluation process. ISL shall also consider the findings from the industry peer-review of the plant-specific PRA, and the potential impact of these findings on the SAMA evaluation. Limited independent calculations shall be performed, as needed, to address the impact of key issues raised in the review.
- b. ISL shall document the results of the preliminary evaluation with possible open items in a draft TER containing the following: (i) an assessment of the adequacy of the applicant's evaluation of SAMAs, in terms of completeness, reasonableness of results, and potential for further risk reductions, (ii) identification of any additional SAMAs which should be considered further, and (iii) independent estimates of risk reduction and costs for selected SAMAs, as appropriate. Recent SAMA evaluations, documented in the latest available supplements to NUREG-1437, shall be used as a template for the TER.
- c. ISL shall identify any additional information needed to resolve possible open items identified in Task A.1.b. This information shall be provided to the NRC in the form of an RAI for transmittal to the applicant. The RAIs shall be reviewed against NEI 05-01, "Severe Accident Mitigation Alternatives (SAMA) Analysis, Guidance Document," to confirm that the RAIs are within the scope of the review.

d. ISL shall support interactions with the applicant to ensure that the requests are well understood and the resulting responses can be expected to assure a comprehensive evaluation of SAMAs.

2. Final Evaluation

a. ISL shall review the applicant's RAI responses, and perform additional assessments, as appropriate. Any additional information needed to resolve the previous open items shall be identified by ISL, and provided to the NRC in the form of an RAI for follow-up discussion with the applicant. ISL shall support further interactions with the applicant, as appropriate, to ensure that the issues are well understood and to arrive at an acceptable path to resolution.

b. ISL shall update the draft TER to include discussions reflecting the resolution of any previously identified open items, and overall conclusions of the review.

c. ISL shall incorporate NRC comments on the updated TER and issue the document as a final TER.

Task B. Project Management

The contractor shall provide overall project control. Costs and schedules shall be planned and tracked. The Monthly Letter Status Report shall be written. Project control interactions with the NRC Project Manager and Technical Monitor shall be provided throughout the project.

SCHEDULE

The work shall be performed on the following schedule. This schedule may be adjusted in consultation with the NRC Technical Monitor.

<u>Deliverable</u>	<u>Due Date</u>
Task A1 - RAIs and draft TER	8 weeks after receipt of Environmental Report
Task A2 - Updated TER	4 weeks after receipt of RAI responses
Final TER	2 weeks after receipt of NRC comments

LEVEL OF EFFORT

The total level of effort is estimated as 8.0 professional staff weeks distributed as follows:

Task A1

Task A2

Task B – Project Management

Level-of-Effort
(Professional Staff Weeks)

	4.0
	3.0
	1.0

Total	8.0

PERIOD OF PERFORMANCE

The period of performance is date of task order award through the following 12 months.

MEETINGS AND TRAVEL

The following meeting and travel requirements are anticipated for planning purposes:

- Two two-person, half-day meetings at NRC Headquarters or telecons for the purpose of clarifying possible RAIs.
- Two one-person, one-day trips for the purpose of discussing the licensee's SAMA analysis, touring the site, and participating in the public meeting on the draft environmental impact statement.

NRC-FURNISHED MATERIALS

Any reports, documents, equipment, and other materials that the contractor will require to perform the work will be provided by NRC.

OTHER APPLICABLE INFORMATION

The work specified in this statement of work is licensee fee recoverable.