



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

July 12, 2000

Science Applications International
Corporation Energy Systems Group
ATTN.: Ms. Helena Yowell
Sr. Contract Representative
20201 Century Boulevard
Germantown, Maryland 20874

SUBJECT: MODIFICATION NO. 3 TO TASK ORDER NO. 40 ENTITLED "TECHNICAL ASSISTANCE FOR THE SABOTAGE EVALUATION OF SPENT FUEL STORAGE CASK" UNDER CONTRACT NO. NRC-02-95-003

Dear Ms. Yowell:

In accordance with the task order procedures of the subject contract, this letter definitizes Modification No. 3 to Task Order No. 40 for the performance of services as described in the attached Statement of Work. As a result, the task order ceiling amount is hereby increased by \$77,470.00 from \$321,091.00 to \$398,561.00. The sum of \$367,337.00 represents the reimbursable costs and the sum \$31,224.00 represents the fixed fee.

The Period of Performance for Task Order No. 40 expires July 28, 2000. No funds are being obligated under this Modification No. 3.

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

FY 00 Obligated Amount:	\$261,959.00
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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.

The following individuals are considered 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 Contract Clause H.5, Key Personnel.

Your contacts during the course of this task are:

Technical Matters: Donald Stout, Technical Monitor
(301) 415-7218

Edwin Flack, Technical Monitor
(301) 415-8115

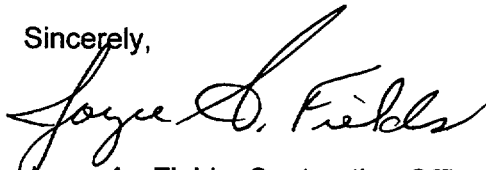
Penelope Kinney, Project Officer
(301) 415-7805

Contractual Matters: Joyce Fields, Contracting Officer
(301) 415-6564

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 below and return two (2) copies to the U.S. Nuclear Regulatory Commission, ATTN.: Ms. Joyce Fields, Division of Contracts and Property Management, T-712, ADM/DCPM/CMB2, Washington, D.C. 20555. You should retain the third copy for your records.

Sincerely,



Joyce A. Fields, Contracting Officer
Contract Management Branch No. 2
Division of Contracts and Property
Office of Administration

Enclosure:

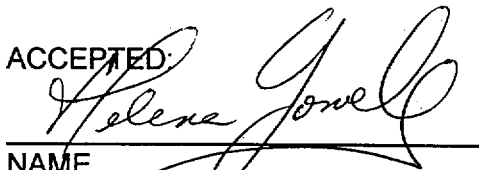
As stated

ACCEPTED:

NAME

TITLE

DATE


Helena Yowell
Senior Contract Representative
7/17/00

Contract/Task Title:	Sabotage Evaluation of Spent Fuel Storage Casks
Contractor:	SAIC
Contract No.:	NRC-02-95-003
Task Order Number:	40
Task/Job Control Number:	J5074
B&R Number:	5015201110
Technical Project Manager (TPM):	DStout/EFlack
Technical Assistance Project Manager (TAPM):	Penelope Kinney
Fee Recoverable:	No

STATEMENT OF WORK

1.0 Background

In 1995 Science Applications International Corporation (SAIC) analyzed the potential impact of a vehicle bomb attack on three spent fuel storage casks. This work was done for the NRC as Task Order 31 under contract NRC-02-90-009. Under this task order, SAIC delivered several Safeguards Information reports to the NRC, including the following:

- J. R. Stokley, G. I. Kent, P. C Owczarski, *et al*, "Effect of Spent Fuel Cask Design on Mitigation of Radiological Impacts From Vehicle Bomb Attack," Oct. 27, 1995
- J. R. Stokley, G. I. Kent, D. E. Ranta, "Sensitivity Study of Models for Characterizing the Structural Response of Nodular Cast Iron Casks at ISFSIs to Vehicle Bomb Attack," Dec. 1995
- J. R. Stokley, G. I. Kent, D. E. Ranta, R. J. Britt, "Structural Response of Two Representative Casks at ISFSIs to Vehicle Bomb Attack," Dec. 1995

The analysis of another spent nuclear fuel storage system is now needed by the NRC and contractor assistance is required to complete this task.

This statement of work is being modified to incorporate revisions to Sections 3.0, 6.0, 9.0 and 11.0. The revisions are highlighted in the appropriate sections below.

2.0 Objective

The objective of this task order is to obtain technical assistance with the analysis of a Holtec International HI-STORM 100 spent nuclear fuel storage system and to obtain a final report which documents all findings.

3.0 Work Required

The contractor shall conduct an analysis of a Holtec International HI-STORM 100 spent nuclear fuel storage system in lieu of the casks previously studied under task order no. 31 of contract no. NRC-02-90-009. The evaluation will be conducted for an explosive charge size to be determined in advance of the analyses by the NRC TPM and the contractor. The contractor shall conduct and report on an engineering analysis to estimate the potential radiological impacts from the detonation of a bulk explosive charge, such as that from a vehicle bomb in the immediate vicinity of the HI-STORM 100 spent nuclear fuel storage cask. The contractor

may assume the worst case scenario in which the explosives are placed adjacent to the spent fuel cask.

The HI-STORM 100 is a vented modular design, consisting of a sealed metal canister, referred to as the MPC, within an overpack that has an air vent for heat removal. There are 3 MPC designs. Each has a different internal basket design to accommodate different fuel types. (The external dimensions of the MPC are identical.) MPC-24 and MPC-32 will contain up to 24 and 32 pressurized water reactor (PWR) assemblies, respectively. MPC-68 will contain up to 68 boiling water reactor (BWR) assemblies. Work will only be performed on the MPC-68 and possibly the MPC-24 designs.

The contractor shall perform all work for this task in accordance with the subtasks delineated below. The contractor shall provide the personnel, standardized computer codes, and equipment necessary to perform this work. All or portions of the work conducted under this task may be either classified Confidential NSI or unclassified sensitive information that must be protected from unauthorized disclosure as Safeguards Information.

The four areas of expertise which are essential for performing this study are:

1. Structural engineering as applied to specific cask storage.
2. Calculation and modeling of explosive effects on structural materials, such as reinforced concrete and steel used for storage of spent fuel.
3. Calculation and evaluation or modeling of the effects of shock waves on spent fuel, i.e., determining the quantity of respirable contamination resulting from the interaction of a blast wave on irradiated fuel elements.
4. Calculation and evaluation or modeling the potential radionuclide release source terms, meteorologic dispersion of the release radionuclides, direct radiation and contamination exposure pathways to workers and members of the public and the environment, radiation dose assessment and risk/consequence analysis.

Results for each HI-STORM cask design evaluated shall yield calculated radiation doses (rem) to an individual 100 meters away from the spent fuel storage cask.

Subtask A: The contractor shall perform an evaluation of the MPC-68 design and document the results in a letter report in accordance with item A under Section 6.0 below.

Subtask B: The contractor shall perform a blast analysis and dose assessment for the MPC-68 design of the HI-STORM 100 cask. All results shall be documented in a letter report in accordance with item B under Section 6.0.

Subtask C: If the assumed detonation of an explosive charge adjacent to the cask results in a breach of the cask, then the contractor shall determine stand-off distances needed between the cask and the explosive charge to preclude a breach of the cask and document the results in a letter report in accordance with item C under Section 6.0 below.

NRC has reviewed all of the findings submitted for Subtasks A, B, and C and has determined to perform Subtasks D and E.

Subtask D: Repeat Tasks B and C above for the MPC-24 design of the HI-STORM 100 cask with an explosive charge size as determined by the NRC TPM and the contractor.

Subtask E: Repeat Tasks B and C above for the MPC-68 with an explosive charge size different from the initial evaluation as determined by the NRC TPM and the contractor.

4.0 Key Personnel

The contractor shall ensure that the project team has the right mix of recognized technical experts, i.e. scientists and/or engineers with training and experience in modeling effects of high explosives on spent fuel and structural materials. Structural engineers and environmental health physicists or scientists and engineers with training and experience in modeling abnormal radionuclide release scenarios, source terms (specifically aerosol physics and chemistry), meteorologic dispersion of the released radioactive materials, radiation exposure pathways to workers and members of the public, dose assessment, and consequence/risks analysis are also required.

5.0 Technical Reporting Requirements

The contractor shall provide letter reports that detail the results of the evaluation conducted (For detailed milestones, see Section 6.0 below). The letter reports must detail analyses performed under the task, a description of computer codes used in the analysis, assumptions, limitations and results of the analysis. At the end of Task C, data must be provided to the NRC TPM so that the NRC can determine whether to proceed with optional Subtask D. In addition, the contractor shall provide a draft final report at the conclusion of Subtask C if the NRC decides not to proceed with Subtask D. If the NRC decides to proceed with Subtask D, the draft final report is due at the end of the study. The draft final report shall include all information provided by the letter reports required by this section and conclusions and recommendations reached by the contractor. The draft final report shall be reviewed by NRC and NRC comments incorporated into a final report.

All reports are to be prepared in accordance with Section F.2 - Preparation of Technical Reports in the basic contract.

6.0 Deliverables/Milestones

The contractor shall submit the following deliverables to the NRC TPM in accordance with the following time frames.

- A. Initial letter report including the status of data needed, computer codes to be utilized, and the methodology to be used. (2 weeks after study initiation)
- B. Letter report (7 weeks after study initiation)
- C. Interim Report for Subtasks A, B, and C (10 weeks after study initiation)
- D. Draft Final Report (July 14, 2000)
- E. Final Report (July 28, 2000)

7.0 Meetings and Travel

Meetings shall be held between participating contractor personnel and NRC personnel as required to coordinate project efforts. Three meetings will be held at NRC Headquarters in Rockville, Maryland as follows: first meeting upon task initiation; second meeting between Milestones B and C; third meeting to brief NRC on the study results. No foreign travel will be required or authorized. All meetings will be scheduled by the NRC TPM.

8.0 NRC Furnished Material

The NMSS TPM will provide the contractor with guidance on the work to be performed and with copies of NRC studies or other background information pertinent to this effort.

9.0 Period of Performance

The period of performance for this task shall begin on the effective date of the task order and will continue for a period of 3.5 months **with all work to be completed by July 28, 2000.**

10.0 Quality Assurance

All deliverables must be reviewed by the contractor's management and approved with two signatures. One signature is required from contractor management at a level above the program manager.

For all draft and final reports delivered under this task order, the contractor shall assure that an independent review and verification of all numerical computations, mathematical equations, and derivations are performed by qualified personnel other than the original authors(s) of the reports. If the contractor proposes to verify/check less than 100 percent of all computations and mathematical equations and derivations in the report(s) (such as might be the case when there are a large number of routine, repetitive calculations), the contractor must first obtain written approval from the NMSS TPM. Computer-generated calculations will not require verification where the computer program has already been verified. The NMSS TPM has the option of auditing all documentation including project correspondence, drafts, calculations, and unrefined data.

11.0 Level of Effort

The estimated level of effort to complete all the tasks is 1.46 staff years (.750 for Subtasks A, B, and C; .375 for Subtask D and .335 for Subtask E).

12.0 Financial and Technical Progress Status Reports

The contractor shall submit a monthly Technical Progress Report in accordance with Section F.3 - Technical Progress Reports and a Financial Status Report in accordance with Section F.4 - Financial Status Reports of the basic contract. The reports are due within 15 calendar days after the end of the report period.

13.0 Technical/Project Direction

The NMSS TPM is responsible for providing technical guidance to the contractor regarding staff interpretations of the technical aspects of regulatory requirements, along with copies of relevant documents when requested. Technical instructions may be issued from time to time

during the duration of this work. Technical instructions shall not constitute new assignments of work or changes of such nature as to justify an adjustment in cost or period of performance. The NMSS TPM is not authorized to unilaterally make changes to the approved work scope or schedule or give the contractor any direction that would increase costs over approved levels. The Contracting Officer is the only individual authorized to make changes to this task.

The NMSS TAPM is the focal point for all contract related activities. All work assignments and program funding actions are initiated by the NMSS TAPM who submits all requests to the Division of Contracts and Property Management (DCPM) for processing. All proposed work scope or schedule changes must be submitted through the NMSS TAPM for DCPM.

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