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AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE 1 OF PAGES
2. AMENDMENT/MODIFICATION NO. 16	3. EFFECTIVE DATE NOV 29 1999	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO. (If applicable)
6. ISSUED BY U.S. Nuclear Regulatory Commission Division of Contracts and Property Mgt. Attn: T-7-I-2 Contract Management Branch 1 Washington DC 20555		CODE	7. ADMINISTERED BY (If other than Item 6) CODE	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Risk Engineering, Inc. ATTN: Robin McGuire, Prin. Investigator 4155 Darley Avenue, Suite A Boulder, CO 80393	(X)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
		10A. MODIFICATION OF CONTRACT/ORDER NO. Con# NRC-04-96-037
	X	10B. DATED (SEE ITEM 13) 04-04-1996
CODE	FACILITY CODE	

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 of 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) 31X0200.060 W6248 06015110120
252A Amount Obligated: \$192,242

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).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER (Specify type of modification and authority) Changes - Cost Reimbursement - Alternate V (Apr. 1984)

E. IMPORTANT: Contractor is not, is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

(see page 2)

DFO2

15A. NAME AND TITLE OF SIGNER (Type or print) ROBIN K. MCGUIRE, PRESIDENT		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Mary Mace, Contracting Officer	
15B. CONTRACTOR OFFICER <i>Robin McGuire</i> (Signature of person authorized to sign)	15C. DATE SIGNED 29 NOV 99	16B. UNITED STATES OF AMERICA BY <i>Mary Mace</i> (Signature of Contracting Officer)	16C. DATE SIGNED 11/15/99

PDR CONTR

The purpose of this modification is to (1) provide incremental funds of \$153,478 to fully fund the subject contract through Modification No. 15, (2) incorporate the within-scope work to the subject contract as referenced in the Statement of Work (ATTACHMENT 1) and the contractor's revised proposal dated 11/2/99 is incorporated herein, (3) increase the contract ceiling amount by \$38,764 for the within-scope work from \$1,212,534 to \$1,251,298, and (4) increase the obligated amount by \$192,242.00 from \$1,059,056 to \$1,251,298. Accordingly, the contract is hereby modified as follows:

1. Section B.3, CONSIDERATION AND OBLIGATION--COST PLUS FIXED FEE (JUNE 1988) ALTERNATE I (JUNE 1991), paragraphs a, b, and c are deleted in their entirety and the following paragraphs are substituted in lieu thereof:
 - "a. The total estimated cost to the Government for full performance of this contract is \$1,251,298, of which the sum of \$1,245,451 represents the estimated reimbursable costs, and of which \$5,847 represents the fixed fee.
 - b. The amount currently obligated by the Government with respect to this contract is \$1,251,298.
 - c. It is estimated that the amount currently allotted will cover performance through 8/31/2000."

All other terms and conditions under this contract remain unchanged.

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

Total FY 96 Obligation Amount:	\$ 275,000.00
Total FY 97 Obligation Amount:	\$ 260,000.00
Total FY 98 Obligation Amount:	\$ 250,000.00
Total FY 99 Obligation Amount:	\$ 274,056.00
Total FY 2000 Obligation Amount:	\$ 192,242.00

Cumulative Total of NRC Obligations: \$1,251,298.00

This modification obligates NRC FY 2000 funds in the amount of \$192,242.

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

1. BACKGROUND

Two meetings of the technical team (Risk Engineering, Inc., et al) with the peer review panel and NRC staff were held; the first on May 25-26, 1999, the second on September 29-30, 1999. During the May meeting the peer review panel had a number of comments on the draft final report, one requiring additional work by the technical team. Specifically, in Section 3, the peer review panel recommended that the report include populations of time-histories for Central and Eastern United States (CEUS) magnitude-distance bins. Because there are large uncertainties associated with the development of artificial time-histories to populate the CEUS bins, the peer review panel is recommending that these time-histories be developed by the technical team.

The NRC staff agrees with the peer review panel comments and recommendations and has concluded that their advice can be accommodated within the scope characterized by the first project objective (collect an earthquake strong motion time history database for use in developing response spectra and analyses).

2. CONTRACT OBJECTIVES

The goal of this procurement is to (1) collect an earthquake strong motion time history database for use in developing response spectra and analyses, (2) develop recommendations for seismic design response spectra to be used for nuclear power plants considering engineering characteristics and different site and geographical conditions, and (3) develop recommendations for minimum power spectral density (or equivalent) requirements for the proposed spectral shapes. These results will be included as technical input by the NRC staff in its revision of Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants."

3. SCOPE OF WORK

3.1 Time-Histories for Central and Eastern United States (CEUS) Bins

Provide populations of time-histories for the CEUS rock magnitude-distance bins by populating the CEUS bins with Western United States (WUS) bin records properly adjusted to CEUS crust. For those cases in which the ensemble average shape of the bin records loosely matches the bin average spectral shape (i.e., weak matching for multiple time histories), the report should provide guidelines for this procedure and provide example(s). The matching process should reasonably preserve frequency-to-frequency and record-to-record variability, while ensuring that the average spectrum meets the matching criteria described in Section 5 of the draft final report. The weak matching procedure results in each record's spectrum being close to the bin target spectrum while preserving variability.

~~The CEUS bins should include deep soil time histories.~~

RKM


3.2 Final Report on Tasks 1, 2, 3, and 6

The submittal of the draft final report to the NRC staff and peer review panel for review and comment was delayed from May 3, 1999, to May 25, 1999. Accordingly, the technical team's receipt of comments was extended from June 10, 1999 to June 30, 1999. However, NRC staff comments were not provided to the technical team until August 30, 1999. Because of this delay: (1) the meeting of the technical team with the peer review panel (meeting P₆) that was scheduled for early September 1999, in Oakland, CA, was canceled, and (2) the meeting of the technical team and peer review panel with the NRC staff (meeting N7) scheduled for September 30, 1999, in Rockville, MD, was expanded to two days (September 29-30, 1999).

Revision 1 of the draft final report was provided to the NRC staff and peer review panel on September 29, 1999. NRC staff review of the draft final report is scheduled to be completed by November 5, 1999 (Modification No. 15 schedule). Schedule a meeting of the technical team with the NRC staff in Rockville, MD, close to November 5, 1999, to discuss NRC staff comments on the draft final report. Recommend if the peer review panel members (all or a few) should attend this meeting. This will replace meeting P₆, adjust cost estimates accordingly.

4. PERIOD OF PERFORMANCE

The period of performance will be from the start of the modification through July 2, 2000. The period from July 2, 2000, to August 31, 2000 (the contract period of performance), is to allow time to address issues pertaining to the publication of the report on the trial application of the procedures.