

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES
2. AMENDMENT/MODIFICATION NO. Six (6)	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO. RFPA RES-92-050 dtd 2/10/94	5. PROJECT NO. (if applicable) (#RES-C94-362)
6. ISSUED BY J.S. Nuclear Regulatory Commission Division of Contracts & Property Management, P- 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) University of California Contracts and Grants Santa Barbara, CA 93106		9A. AMENDMENT OF SOLICITATION NO.
Principal Investigator/Technical Contact: David Mayo		9B. DATED (SEE ITEM 11)
Telephone No. (805) 893-3890		10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-04-92-050
CODE		10B. DATED (SEE ITEM 11) 11/25/91

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.

11. ACCOUNTING AND APPROPRIATION DATA (if required)
 31X0200.460 46019202400 BOC No.: 252A L1802 OBLIGATED AMOUNT: \$38,912.00

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

<input type="checkbox"/>	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.
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as change in paying office, appropriation acct, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input checked="" type="checkbox"/>	D. OTHER (Specify type of modification and authority) Mutual agreement of parties

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)

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Except as provided herein, all terms and conditions of the document referenced in item 8A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Donna G. Jones Contract and Grant Officer	15B. CONTRACTOR/OFFEROR <i>Donna G. Jones</i> (Signature of person authorized to sign)	15C. DATE SIGNED MAY 20 1994	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Joyce A. Fields, Contracting Officer	16B. UNITED STATES OF AMERICA BY <i>Joyce A. Fields</i> (Signature of Contracting Officer)	16C. DATE SIGNED APR 25 1994
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The purpose of this modification is to (1) increase the ceiling of the subject contract, and (2) provide funding in the amount of \$38,912.00 which increases the obligated amount from \$489,577.00 to \$528,489.00. This increase is for replacement of the accelerometer equipment that was destroyed by lightning as detailed in the December 17, 1993 letter from the University of California, Santa Barbara (UCSB) (Attachment 1). The letter and replacement cost proposal (also provided by UCSB) are hereby incorporated under the subject contract (Attachment 2). Accordingly, the subject contract is modified as follows:

1. Under Section B.3, "CONSIDERATION AND OBLIGATION--COST PLUS FIXED FEE," paragraphs a and c are hereby revised to read as follows:
 - "a. The total estimated cost to the Government for full performance on this contract is \$528,489.00."
 - "c. The amount obligated by the Government with respect to this contract is \$528,489.00."

All other terms and conditions under this contract remain unchanged.

Total FY 92 Obligation Amount:	\$150,000.00
Total FY 93 Obligation Amount:	\$223,000.00
Total FY 94 Obligation Amount:	\$155,489.00
Cumulative Total of NRC Obligations:	\$528,489.00

This modification obligated FY 94 funds in the amount of \$38,912.00.



December 17, 1993

Dr. Andrew Murphy
Office of Nuclear Regulatory Research
U. S. Nuclear Regulatory Commission
5650 Nicholson Lane
Rockville, MD 20852

Dear Andy,

In our monthly report of March 12, 1993, for the NRC contract NRC 04-92-050, we reported that the electronics of the accelerometer at 55 m depth were destroyed by a lightning. We need to replace this crucial instrument. This accelerometer is the critical link to our understanding of the transfer function between the bedrock and the soil column above. The accelerograms collected at 55 m are the benchmark for the response of the granite 'halfspace.' The most common assumption in site response studies is that the granitic medium is totally transparent to the seismic waves, i.e., the granite has nearly zero effect on the attenuation/amplification of the seismic waves. But this assumption may not be true. By comparing the data at 55 m with that at 220 m we can determine the rock response that is later used to deduce the soil response of the medium above 55 m. The data at 55 m also represent the amount of energy leaking back into the bedrock below the weathered granite/soil column. In a sense the 55 m accelerometer is the gate between the bedrock and the soil. If we don't understand how this gate operates, we will have a large uncertainty in our analysis of the linear/nonlinear response of the soil column.

We are proposing a different method of coupling the accelerometer to the borehole that will allow us to extract the accelerometer in case of any future damage. Of course, we will not be casing this hole with steel. The new design calls for using a packer to push the accelerometer against the borehole wall. The accelerometer casing and the packer are one integrated package to be built by Baski, Inc. Tests done by the Southwest Research Center show that oscillations arising from motions of the packer are above 1500 Hertz—well out of the range of frequencies being measured.

A proposed budget is attached. One final note: the cost of a dual-gain downhole accelerometer has gone up by 37% in the past year. Thank you for your consideration.

Sincerely,

Ralph J. Archuleta
Professor of Geophysics

cc: Mary Jo Mattia, NRC, Contracts and Grants
Donna Jones, UCSB, Contracts and Grants

Enclosure: 55 Meter Accelerometer Estimated Expenses

55 METER ACCELEROMETER ESTIMATED EXPENSES

DESCRIPTION	MODEL	VENDOR	QUAN.	\$ EACH	\$ TOTAL
ACCELEROMETER/PACKER ASSEMBLY					
Downhole Accelerometer	FBA-13DH	Kinematics	1	\$6,500	\$6,500
Downhole Cable		South Bay	240	\$5.50	\$1,320
Accelerometer/Cable Connector Set		Sea Con	1	\$1,400	\$1,400
Packer/Accelerometer Housing Assembly		Baski	1	\$10,000	\$10,000
TOTAL ACCELEROMETER					\$19,220
DOWNHOLE INSTALLATION					
Drill and Case Hole, Help With Installation †		Crum	1	\$8,435	\$8,435
Oil Field Tubing, 2-3/8"			240	\$8	\$1,920
TOTAL DOWNHOLE INSTALLATION					\$10,355
MISCELLANEOUS					
Additional Lightning Protection			1	\$250	\$250
Misc. Hardware - Cable Protectors, Support Structure, Etc.			1	\$2,000	\$2,000
Travel, 4 People, 2 Days †			8	\$75	\$600
Machining - Support Structure, Etc. †		UCSB Geology	1	\$300	\$300
Car Rental †			2	\$60	\$120
TOTAL MISCELLANEOUS					\$3,270
SUBTOTAL					\$32,845
SALES TAX - 7.75%					\$1,813
OVERHEAD - 45%					\$4,255
TOTAL					\$38,912

† Subject to overhead, no sales tax.