

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
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2. AMENDMENT/MODIFICATION NO. 6	3. EFFECTIVE DATE 8/10/89	4. REQUISITION/PURCHASE REQ. NO. RES-88-072 dtd 9/21/89	5. PROJECT NO. (If applicable)
6. ISSUED BY U.S. Nuclear Regulatory Commission Division of Contracts & Property Management Washington, D.C. 20555		7. ADMINISTERED BY (If other than Item 6) CODE	

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) Materials Engineering Associates, Inc. 9700-B Martin Luther King Jr. Highway Lanham, Maryland 20706-1837	(W)	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-04-88-072
		10B. DATED (SEE ITEM 13) 9/27/88
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 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)
N/A

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

(W)	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	Changes Clause in the Contract.
	D. OTHER (Specify type of modification and authority)

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.)

PLEASE SEE THE FOLLOWING PAGE.

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) MARSHAL GREENBLATT, PRES	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Sharon Bell
15B. CONTRACTOR/OFFEROR Marshal Greenblatt (Signature of person authorized to sign)	15C. DATE SIGNED 11/8/89
16B. UNITED STATES OF AMERICA BY Sharon Bell (Signature of Contracting Officer)	16C. DATE SIGNED 11/2/89

NRC-04-88-072
Modification No. 6
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The purpose of this modification is to raise the contract ceiling to provide for additional within scope efforts as described in Enclosure 1 "Statement of Work for Modification to Contract No. NRC-04-88-072". As a result of this action, the contractor's proposal of August 4, 1989 is hereby accepted and incorporated by reference. Now, therefore, the following change is hereby made:

1. Section B.2 CONSIDERATION AND OBLIGATION — COST PLUS FIXED FEE (MAR 1987) BASIC CONTRACT EFFORT, paragraph a. is revised and read as follows:

"a. It is estimated that the total cost to the Government for full performance of this contract will be \$2,447,660.00, of which the sum of \$2,256,784.00 represents the estimated reimbursable costs, and of which \$190,876.00 represents the fixed fee."

All other terms and conditions remain the same.

Enclosure 1
STATEMENT OF WORK
FOR
MODIFICATION TO CONTRACT
NRC-04-88-072

1. Provide detailed data from MEA experiments to Oak Ridge National Lab. for incorporation into USNRC Embrittlement Data Base. The data shall include instrumented Charpy data available for all tested specimens. The data shall be provided in one of the following forms in the order of preference:
 - o Floppy disk formatted in DOS, ASCII coding of data;
 - o Floppy disk HP format, data coded in HP-Basic;
 - o Nicolet disks;
 - o Undistorted graphs or screen photographs with axis clearly labelled.

Data to be provided includes the following:

- a. The MEA-PSF series (two welds, two plates, and two forgings); only instrumented C_v curves are still needed.
- b. The MEA Dose Rate Effects series (two welds and two plates)

Linde 80 weld code W8A	0.39 Cu, 0.67 Ni
Linde 0091 weld code W9A	0.38 Cu, 0.70 Ni
ASTM A302-B reference plate code 23F	0.21 Cu, low Ni
MEA A533-B reference plate	0.20 Cu, high Ni.

c. The MEA Annealing and RE-irradiation series
(four welds, detailed reembrittlement path)

Linde 80 weld code W8A	0.39 Cu, 0.67 Ni
Linde 0091 weld code W9A	0.41 Cu, 0.70 Ni
Linde 80 weld code WW7	0.35 Cu, 0.10 Ni
Linde 124 weld code WW4	0.16 Cu, 0.65 Ni

d. The MEA Copper-Nickel Interaction series (five plates)

- (1) Sensitivities in Irradiated Condition
- (2) Sensitivities in Irradiated-Anneal Condition

Plate 5C	0.16 Cu, 0.27 Ni, 0.002 P
Plate 5D	0.16 Cu, 0.68 Ni, 0.002 P
Plate 6A	0.28 Cu, 0.05 Ni, 0.002 P
Plate 6B	0.28 Cu, 0.27 Ni, 0.002 P
Plate 6C	0.28 Cu, 0.69 Ni, 0.002 P

e. The MEA Copper-Phosphorus Interaction series (five plates)

- (1) Sensitivities in Irradiated Condition
- (2) Sensitivities in Irradiated-Annealed Condition

Plate 67B	0.002 Cu, 0.70 Ni, 0.015 P
Plate 67C	0.002 Cu, 0.70 Ni, 0.025 P
Plate 68A	0.30 Cu, 0.70 Ni, 0.003 P
Plate 68B	0.30 Cu, 0.70 Ni, 0.016 P
Plate 68C	0.30 Cu, 0.70 Ni, 0.028 P,

f. The NRL Multicycle IAR series (two welds)

Linde 80 weld V86	0.35 Cu, 0.71 Ni, 0.015 P
Linde 1092 weld V84	0.35 Cu, 0.62 Ni, 0.013 P

- g. Plate codes CAB and CBB of the NRL-EPRI series under research project 886-2 (report EPRI NP-2782, 1982). These are commercial fabrication plates:

CAB	0.12 Cu, 0.46 Ni, 0.008 P
CBB	0.13 Cu, 0.55 Ni, 0.006 P

- h. Weld code MY of the NRC-NRC series of commercial fabrication materials (NUREG/CR-1053, 1980).
Plate 1 and Plate 2 of same series.

Background Requirements

Existing documentation (publications, reports, etc.)

- Materials:
- o Fabrication outline, including heat treatment
 - o Type of microstructure
 - o Complete chemistry, including gases; if possible, which fraction of copper is in solid solution.
- Irradiation:
- o Reactor, neutron fluence, neutron flux (1.0 MeV)
 - o Temperature
 - o If annealing, temperature and time at temperature
- Mechanical Data:
- o C_V energy, lateral expansion, and fracture appearance versus temperature
 - o At least two instrumented C_V curves in upper-shelf regime for each capsule and condition (unirradiated, irradiated, annealed, etc.)
 - o Tensile properties (yield, ultimate yield, etc.)

Miscellaneous: o If other observations exist such as hardness, TEM, FIM, SANS, etc., references would be most useful.

o Indicate if a given material has been used for other experiments not mentioned on the list under Item 2 below.

2. Provide assistance to the Joint Coordinating Committee for Civilian Nuclear Reactor Safety in the form of presentations on research work performed at NEA and evaluation of presentations by USSR. The meeting is projected for Summer 1990; to be held in Russia.
3. Represent the NRC at the International Cyclic Crack Growth Rate Group meeting and prepare a report on the proceedings. The meeting will be held in Jeckel Island, Georgia, August 10 - 12, 1989.

Estimated Level of Effort

The estimated level of effort for performance of work described herein is 3 staff months.

All work shall be performed within the current contract period of performance.