

AWARD/CONTRACT

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CONTRACT (Proc. Inst. Ident.) NO. **NRC-04-82-017**

2 EFFECTIVE DATE

3 REQUISITION-PURCHASE REQUEST/PROJECT NO. **RES-82-017**

4 CERTIFIED FOR NATIONAL DEFENSE UNDER RDSA REG. 2 AND/OR DMS REG. 1. RATING:

ISSUED BY **U. S. Nuclear Regulatory Commission  
 Division of Contracts  
 Washington, DC 20555**

6 ADMINISTERED BY (If other than block 5)

7 DELIVERY FOR DESTINATION  NATION  OTHER (See below)

CONTRACTOR NAME AND ADDRESS **ANCO Engineers, Inc.  
 9937 Jefferson Boulevard  
 Culver City, CA 90230**

9 DISCOUNT FOR PROMPT PAYMENT **N/A**

10 SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN BLOCK 12

11 SHIP TO/MARK FOR **U. S. Nuclear Regulatory Commission  
 Office of Nuclear Regulatory Research  
 ATTN: John O'Brien  
 Washington, DC 20555**

12 PAYMENT WILL BE MADE BY **U. S. Nuclear Regulatory Commission  
 Office of Resource Management  
 Division of Accounting and Finance  
 Washington, DC 20555**

13 THIS PROCUREMENT WAS  ADVERTISED,  NEGOTIATED, PURSUANT TO:  10 U.S.C. 2304 (a)(1)  41 U.S.C. 252 (a)(1)

14 ACCOUNTING AND APPROPRIATION DATA  
 B&R NO. 601921 FIN NO. B8261 Total Amount: \$19,745.00

| 15 ITEM NO. | 16 SUPPLIES/SERVICES   | 17 QUANTITY | 18 UNIT | 19 UNIT PRICE | 20 AMOUNT |
|-------------|--|-------------|---------|---------------|-----------|
|             | "PIPE TESTS TO OBTAIN EXPERIMENTAL DATA ON THE BEHAVIOR OF NUCLEAR POWER PLANT PIPING SUBJECTED TO MULTIPLE INDEPENDENT SUPPORT MOTION INPUTS" |             |         |               |           |

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 PDR CONTR  
 NRC-04-82-017 PDR

TOTAL AMOUNT OF CONTRACT \$ 19,745.00

21. CONTRACTING OFFICER WILL COMPLETE BLOCK 22 OR 26 AS APPLICABLE

22.  CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return \_\_\_\_\_ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

23. NAME OF CONTRACTOR **ANCO ENGINEERS INC**  
 BY **Craig B. Smith**  
 (Signature of person authorized to sign)

24. NAME AND TITLE OF SIGNER (Type or print)  
**Craig B. Smith  
 President**

25. DATE SIGNED  
**29 July 82**

26.  AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number \_\_\_\_\_, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

27. UNITED STATES OF AMERICA  
 BY **[Signature]**  
 (Signature of Contracting Officer)

28. NAME OF CONTRACTING OFFICER (Type or print)  
**Kellogg V. Morton**

29. DATE SIGNED  
**7-28-82**

## SCOPE OF WORK, TERMS AND CONDITIONS

ARTICLE I - STATEMENT OF WORKA. Introduction

The purpose of this research is to obtain experimental data on the behavior of nuclear power plant piping subjected to multiple independent support motion inputs. This data will be used to experimentally verify computer models of piping response to seismic excitation. Brookhaven National Laboratory at the request of the Office of Nuclear Regulatory Research, has assisted in formulating the test matrix and will undertake predictions of the results of the experiments.

B. General Background

Appendix B, Section III, of 10 CFR 50 (entitled, "Design Control") and the Standard Review Plan (NUREG-0800, July 1981) require that the adequacy of computer programs used in safety assessments be confirmed. This present research supports one aspect of confirming the adequacy of computer programs used to predict the dynamic behavior of nuclear power plant piping under seismic environments. The adequacy is expressed in terms of the relative differences between predicted results and observed results.

C. Discussion of Technical Problem

The unique technical problem addressed in this research deals with the behavior of mechanical systems where the seismic input motion varies spacially among the supports. In a practical sense, this problem is important primarily for piping which is supported between buildings or between floors of the same building. (Steam generators supported at different elevations could also be within the scope of this investigation, but are excluded to focus and strengthen the effort on piping). Theoretical developments in this area evolved only during the last few years and have not been verified by experiments.

D. Contract Objectives

The contract objective is to undertake pipe tests at ANCO Engineers during the summer of 1982 using facilities, specimens, and instrumentation already in place to support the NRC/RES Piping Benchmarks Program at Brookhaven National Laboratory. (FIN No. 3225).

E. Scope of Work

The contractor shall furnish all personnel, materials, equipment, facilities and services necessary to perform pipe testing with the following restrictions and within the following test matrix:

Test Matrix

1. All testing desired by the NRC under this contract will be in the linear range of response.

2. Input time histories will include both sine sweeps and simulated earthquakes.
3. The following specific tests will be performed:
  - a) Two end supports in synchronized motion, center support disconnected, sine sweeping.
  - b) Two end supports 180° out of phase, center support disconnected, sine sweeping.
  - c) Three supports connected, same simulated earthquake in phase at each support.
  - d) Three supports connected, same simulated earthquake at each support, one end support 180° out of phase with the remaining two.
  - e) Three supports connected, each support experiencing simulated earthquake motions which do not correlate.
  - f) Three supports connected, sine sweeping with supports synchronized.
  - g) Pressurize pipe to 1500 psig (for this test only) and repeat sine sweep of (f) above.
  - h) Repeat sine sweep in (f) above, but with a different pipe mass distribution and impressurized pipe.

#### Restrictions

1. The test specimen will be the so-called Z-bend already fabricated at EPRI expense at ANCO Engineers.
2. Instrumentation will be that available from the EPRI test series.
3. Loading will be achieved using the three sleds and hydraulic actuators already in place.
4. Impact testing will be used to search for the first 10 modes of vibration. Sine sweeping will be used to drive those modes which can be excited by unidirectional inputs, subject to the capability of the dynamic test assembly.
5. Testing will be conducted at the earliest date consistent with previous ANCO obligations. Such testing appears feasible sometime during the interval 15 August - 15 October 1982.

#### F. Deliverables

The contractor will provide the NRC or its agent data tapes of all tests and a report which in summary fashion describes the contents of the tapes and the conditions under which the tests were performed. No analyses, con-

clusion, recommendations, evaluations or interpretations of the test results are required from the contractor. All deliverables will be provided within three months of the conclusion of the test series. All data acquired under this procurement may be used in NRC publications as well as in external publications. Acknowledgement of EPRI cooperation will be cited in each case. All data will be released to EPRI.

## ARTICLE II - PERIOD OF PERFORMANCE

The performance of work described in ARTICLE I hereof shall commence as of the effective date of this contract and shall continue to completion thereof, estimated to occur within 12 months after said contract is effective.

## ARTICLE III - CONSIDERATION AND PAYMENT

### A. Estimated Cost, Fixed Fee and Obligation

1. It is estimated that the total cost to the Government for full performance of this contract will be \$19,745.00 of which the sum of \$            represents the estimated reimbursable costs, and of which \$            represents the fixed fee.
2. There shall be no adjustment in the amount of the contractor's fixed fee by reason of differences between any estimate of cost for performance of the work under this contract and the actual cost performance of that work.
3. The amount presently obligated by the Government with respect to this contract is \$19,745.00 .

### B. Payment

The Government shall render payment to the contractor in approximately thirty (30) days after submission of proper and correct invoices or vouchers.

Additional provisions relating to payment are contained in Financial Provisions No. 5 of the General Provisions hereto.

## ARTICLE IV - OVERHEAD/GENERAL AND ADMINISTRATIVE RATES

- A. Pending the establishment of final overhead and G&A rates which shall be negotiated based on an audit review of actual costs, the contractor shall be reimbursed for allowable overhead costs at the fixed rate of        of Total Direct Labor and for G&A costs at the fixed rate of        of Total Direct Labor.
- B. Notwithstanding A. above, said provisional overhead and G&A rates may be adjusted as appropriate during the term of the contract upon the acceptance of such revised rates by the Contracting Officer.

ARTICLE V - KEY PERSONNEL

Pursuant to this ARTICLE (Key Personnel), the following individuals are considered to be essential to the successful performance of the work hereunder and shall not be replaced without the prior approval of the Contracting Officer. In such event, the contractor agrees to substitute persons possessing substantially equal abilities and qualifications satisfactory to the Contracting Officer.

George E. Howard

ARTICLE VI - TECHNICAL DIRECTION

- A. Performance of the work under this contract shall be subject to the technical direction of the NRC Project Officer named in ARTICLE VII of this contract. The term "Technical Direction" is defined to include the following:
1. Technical direction to the contractor which shifts work emphasis between areas of work or tasks, requires pursuit of certain lines of inquiry, fills in details or otherwise serves to accomplish the contractual scope of work.
  2. Providing assistance to the contractor in the preparation of drawings, specifications or technical portions of the work description.
  3. Review and where required by the contract, approval of technical reports, drawings, specifications and technical information to be delivered by the contractor to the Government under the contract.
- B. Technical direction must be within the general scope of work stated in the contract. The Project Officer does not have the authority to and may not issue any technical direction which:
1. Constitutes an assignment of additional work outside the general scope of the contract.
  2. Constitutes a change as defined in the clause of the General Provisions, entitled "Changes."
  3. In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.
  4. Changes any of the expressed terms, conditions or specifications of the contract.
- C. ALL TECHNICAL DIRECTIONS SHALL BE ISSUED IN WRITING BY THE PROJECT OFFICER OR SHALL BE CONFIRMED BY SUCH PERSON IN WRITING WITHIN TEN (10) WORKING DAYS AFTER VERBAL ISSUANCE. A copy of said written direction shall be submitted to the Contracting Officer.

The contractor shall proceed promptly with the performance of technical directions duly issued by the Project Officer in the manner prescribed by this article and within such person's authority under the provisions of this article.

If, in the opinion of the contractor, any instruction or direction issued by the Project Officer is within one of the categories as defined in B(1) through (4) above, the contractor shall not proceed but shall notify the Contracting Officer in writing within five (5) working days after the receipt of any such instruction or direction and shall request the Contracting Officer to modify the contract accordingly. Upon receiving such notification from the contractor, the Contracting Officer shall issue an appropriate contract modification or advise the contractor in writing that, in the Contracting Officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the Changes Clause.

- D. Any unauthorized commitment or direction issued by the Project Officer may result in an unnecessary delay in the contractor's performance, and may even result in the contractor expending funds for unallowable costs under the contract.
- E. A failure of the parties to agree upon the nature of the instruction or direction or upon the contract action to be taken with respect thereto shall be subject to the provisions of the contract clause entitled "Disputes."

ARTICLE VII - PROJECT OFFICER

Mr. John O'Brien is hereby designated as the Contracting Officer's authorized representative (hereinafter called Project Officer) for technical aspects of this contract. The Project Officer is not authorized to approve or request any action which results in or could result in an increase in contract cost; or terminate, settle any claim or dispute arising under the contract; or issue any unilateral directive whatever.

The Project Officer is responsible for: (1) monitoring the contractor's technical progress, including surveillance and assessment of performance, and recommending to the Contracting Officer changes in requirements; (2) interpreting the scope of work; (3) performing technical evaluation as required; (4) performing technical inspections and acceptances required by this contract; and (5) assisting the contractor in the resolution of technical problems encountered during performance. Within the purview of this authority, the Project Officer is authorized to review all costs requested for reimbursement by contractors and submit recommendations for approval, disapproval, or suspension for supplies, services required under the contract. The Contracting Officer is responsible for directing or negotiating any changes in terms, conditions, or amounts cited in the contract.

For guidance from the Project Officer to the contractor to be valid, it must: (1) be consistent with the description of work set forth in the contract; (2) not constitute new assignment of work or change to the expressed terms, conditions or specifications incorporated into this contract; (3) not constitute a basis for an extension to the period of performance or contract delivery schedule; and, as stated above, (4) not constitute a basis for any increase in the contract cost.

## ARTICLE VIII - CONFLICT OF INTEREST

(a) Purpose. The primary purpose of this article is to aid in ensuring that the contractor:

- (1) is not placed in a conflicting role because of current or planned interest (financial, contractual, organizational, or otherwise) which relates to the work under this contract, and
- (2) does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described herein shall apply to performance or participation by the contractor as defined in 41 CFR §20-1.5402(f) in the activities covered by this article.

(c) Work for others. Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization, the results of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees who are employed full time under this contract and employees designated as key personnel, if any, under this contract abide by the provision of this article. If the contractor believes with respect to itself or any such employee that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the Contracting Officer prior to execution of such contractual arrangement.

(d) Disclosure after award.

- (1) The contractor warrants that to the best of its knowledge and belief and except as otherwise set forth in this contract, it does not have any organizational conflicts of interest, as defined in 41 CFR §20-1.5402(a).
- (2) The contractor agrees that if after award it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the Contracting Officer. This statement shall include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract for convenience if it deems such termination to be in the best interests of the government.

(e) Access to and use of information.

- (1) If the contractor in the performance of this contract obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (Pub. L. 93-579), or data which has not been released to the public, the contractor agrees not to: (i) use such information for any private purpose until the information has been released to the public; (ii) compete for work for the Commission based on such information for a period of six (6) months after either the completion of this contract or the release of such

information to the public, whichever is first, (iii) submit an unsolicited proposal to the government based on such information until one year after the release of such information to the public, or (iv) release the information without prior written approval by the Contracting Officer unless such information has previously been released to the public by the NRC.

- (2) In addition, the contractor agrees that to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (Pub. L. 93-579), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat such information in accordance with restrictions placed on use of the information.
- (3) The contractor shall have, subject to patent and security provisions of this contract, the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 41 CFR §20-1.5402(h), the contractor shall include this article, including this paragraph, in subcontracts of any tier. The terms "contract," "contractor," and "Contracting Officer," shall be appropriately modified to preserve the government's rights.

(g) Remedies. For breach of any of the above proscriptions or for intentional nondisclosure or misrepresentation or any relevant interest required to be disclosed concerning this contract or for such erroneous representations as necessarily imply bad faith, the government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies as may be permitted by law or this contract.

(h) Waiver. A request for waiver under this clause shall be directed in writing through the Contracting Officer to the Executive Director for Operations (EDO) in accordance with the procedures outlined in §20-1.5411.

ARTICLE IX - GENERAL PROVISIONS/ALTERATIONS

This contract is subject to the attached provisions of Appendix A, General Provisions, entitled "Cost Type Research and Development Contracts with Commercial Organizations" dated 12/1/81.