



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

JUL 16 1980

MEMORANDUM FOR: Roger W. Woodruff, TP, ROI, IE
FROM: Virginia K. Tolson, RMB, XOMA, IE
SUBJECT: TASK ORDER INFORMATION FOR PIPING INTERFERENCE
ANALYSIS

The Task Order information transmitted with Ed Jordan's memo of May 9, 1980, to obtain the services of Computerized Interference Elimination (CIE) through the Parameter contract, is not descriptive enough. Please expand on each item and resubmit to me. Enclosed are examples of the two previous Task Orders to the Parameter contract which may assist you in rewriting.

If I can be of any assistance, please be sure to call.

Virginia K. Tolson

Virginia K. Tolson
Resource Management Branch
XOMA, IE

Enclosures:
Task Orders 1 & 2 to
Parameter Contract

A-25

TASK ORDER #1

1. Scope of Work:

Provide NRC-IE assistance as a technical consultant in the review of 1) concrete deficiencies, known as "honeycombing," found at the Marble Hill facility through visual observation, 2) the program to determine if internal voids exist, 3) the repair procedures, 4) the completed repairs, and 5) evaluation of the affected structures to meet the original design intent.

The effort will involve a review of the techniques used to locate voids, discontinuities, etc., to determine if all significant deficiencies have in all probability been detected. These techniques included coring and pulse echo. The repair procedures and repairs made as a result of the findings of the investigations are also to be reviewed for adequacy. The main basis of the consultant's review effort will be the report submitted by the licensee and its references as prepared by Sargent & Lundy, Report SL-3753, 11/20/79, "Evaluation of In-Place Concrete, Marble Hill Generating Station, Units 1 and 2," dated November 20, 1979.

2. Objectives of Tasks:

- a. To provide an independent assessment of the type and extent of deficiencies in concrete construction defined as honeycombing and/or voids that could have safety significance;
- b. to provide an independent assessment of any needed repairs or remedial actions;
- c. to provide independent conclusions regarding the capability of the affected structures to perform the intended design functions.

3. Statement of Work:

- a. Determine that any structurally significant honeycombing and/or voids visually detectable have been located and identified.
- b. Evaluate the need for and adequacy of the nondestructive techniques used by the licensee in the investigation of possible internal voids. If other techniques or additional investigation are necessary to assure structural adequacy, recommendations should be provided. This evaluation and any necessary recommendations should consider sample location and size.

- c. Review and evaluate the repair procedures the licensee has used or plans to use to correct deficiencies which have safety significance. If other techniques are more advantageous or will result in better assurance of restoration of the structure, recommendations should be provided.
- d. Review and evaluate typical areas requiring repair, if any, to determine whether procedures are or have been followed. If any repaired areas are subject to question, recommendations for additional investigation or repair are to be provided.
- e. Utilize the facts and engineering experience to evaluate the adequacy of the affected structures to meet the safety requirements defined in the original design criteria or any revised criteria as approved by the NRC.
- f. In the course of completing Items a-e above, it is to be understood that it may be necessary for travel to make observations in the field at the Marble Hill site, to meet with the licensee and his consultants, and to meet with the NRC. It is also possible that the effort may include providing expert testimony in public hearings and/or providing responses to Congressional committees. NRC representatives will accompany consultants.

4. Report Requirements:

- a. Weekly contact should be maintained with Region III, James G. Keppler, Director (AC 312/932-2500), or his designee regarding the progress of work, schedules, arrangements needed with the licensee and any other details. This contact can be by telephone.
- b. For each 120 hours of effort associated with this task a brief written summary (1-2 pages) should be provided noting all significant items in the effort that have been completed during the reporting period. Any significant problems which could affect resumption or continuation of concrete work by the licensee, shall be included. This shall be completed within (5) working days after end of the period.
- c. At the completion of each of the steps 3a-3e a written report shall be provided with the supported conclusions. This report shall be submitted in draft form within (10) ten working days after the specific work step is completed. The final report for each step is to be completed (7) seven working days after any NRC comments are provided.

- d. At the completion of all steps, 3a-3e, a draft report encompassing all aspects of the independent assessment will be provided. This shall be within (10) ten working days after the completion of the final report on the last step. The final report for the task is to be completed (7) seven working days after any NRC comments are provided.
- e. All written reports are to be provided in (20) twenty copies with (10) ten being sent to each of:
 - Mr. James G. Keppler, Director
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137
 - Mr. Harold D. Thornburg, Director
Division of Reactor Construction Inspection
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
- f. At the outset the consultants may agree to a consolidated report format with each signing in total or noting their specific view or each may submit separate reports. Once the pattern is set, all reporting will continue in that pattern.

5. Desired Completion Date:

December 31, 1980.

6. Special Instructions:

- a. Initiate task effort with a review of Vols. I & II of a report by Sargent and Lundy Engineers, entitled, "Evaluation of In-Place Concrete - Marble Hill Nuclear Generating Station, Units 1 and 2," dated November 20, 1979 (copy to be provided).
- b. It is imperative that all steps in this independent assessment be adequately documented and supported. Photographs, dictated tapes such as one might use in the field as well as written notes are recommended.

7. Place of Performance:

- a. Marble Hill Nuclear Generating Station construction site near Madison, Indiana.

- b. Sargent and Lundy offices in Chicago, Illinois.
- c. Public Service of Indiana offices in Plainfield, Indiana.
- d. Region III offices in Glen Ellyn, Illinois.
- e. NRC offices in Bethesda, Maryland and Washington, D. C.

8. Cost Ceiling

\$50,000

PARAMETER INC.
NRC IE CONTRACT - NRC 05-80-251
TASK ORDER NO. 2

1. Scope of Work

Provide NRC-IE assistance and services in the independent metallurgical analysis of cracked stud bolts as outlined in the statement of work below.

2. Background

Duke Power Co. reported to NRC-IE on June 26, 1980 that during scheduled steam generator tubing maintenance at Oconee Unit 3, visual and ultrasonic examinations indicated cracking in 8 of the 64 stud bolts used to attach the upper and lower manway access covers on the steam generators. All studs for the manway covers will be replaced in kind.

These studs are 2-inch diameter (8 thread/inch) studs reportedly manufactured by B&W from certified SA 340 grade L-43 low alloy steel supplied by Ryerson Steel Co. and were furnished with the steam generators. Since the studs are a critical part of the reactor coolant boundary integrity, it is essential that the nature and probable cause of the cracking be determined so that appropriate steps can be taken to prevent recurrence of the problem.

3. Statement of Work

The actual laboratory analysis and evaluation shall consist of the following:

- (1) Photographs will be taken of the two studs in the "as received" condition to preserve physical features, especially crack areas, prior to specimen removal for other tests. If some decontamination to reduce radioactivity levels is necessary, this is to be done using appropriate methods and solvents which will not result in removal of surface deposits, characteristics or otherwise damage the cracked sections for failure analysis studies.
- (2) Perform optical examination of the stud surfaces at suitable magnifications to determine crack initiation sites. Surface conditions and characteristics of defect sites (cracks, mechanical abuse, machining deficiencies, etc.) are to be photographically recorded.
- (3) Perform optical metallography of selected specimen sections containing cracks. Provide evaluation of grain structure, carbide substrates, nature of cracking and other microstructure anomalies observed.

- (4) Based on optical metallography studies, conduct scanning electron metallography studies and EDAX analysis on representative crack areas. Provide an evaluation of the following:
 - (a) Characterization of fracture surfaces - initiation sites, fracture morphology with respect to fatigue, stress corrosion, stress overload, etc.
 - (b) Analysis of identified deposits on thread and crack surfaces, and qualitative correlation with chemical analysis of base material.
- (5) Perform hardness survey of crack areas and correlate to mechanical properties evaluation.
- (6) Perform quantitative chemical analysis of both studs by the most appropriate method to suitably characterize the stud material and determine conformance to specification limits.
- (7) Perform two room temperature tensile tests of each stud in accordance with applicable ASTM Standards for materials testing and determine conformance of stud mechanical properties (e.g., yield strength, ultimate strength elongation, R.A., etc.) to specification requirements.

4. Report Requirements

Upon receipt of the stud samples at the designated laboratory for analysis, the following reports are required:

- (a) Results of laboratory analysis and evaluation as the work progresses shall be verbally communicated to the IE Headquarters Project Officer on a weekly basis.
- (b) A preliminary report on the complete analysis and evaluation shall be submitted within 20 days for the Project Officer's review.
- (c) Forty (copies) of a written final report shall be submitted to the IE Project Officer within 45 days.

5. Special Instructions

The NRC shall reimburse the contractor as invoiced for allowable costs incurred in shipment of the stud samples to the designated laboratory for analysis.

All unconsumed portions of the studs are to be properly identified and retained by the designated laboratory, or contractor, for a period of three months or until advised by NRC-IE Headquarters regarding disposition.

6. Place of Performance

(a) Parameter Inc.

(b) BCL

(c) University of Wisconsin

7. Cost Ceiling

\$45,000

ACTION

7/23/80

A Ask R III to select a plant.

B. Revise Memo to Rose to add to the "Task Order Info":

1. Move description as attached plus space size
2. Describe drawing 5 and shipping of Ham
3. No field trips by CIE
4. Add separate Bkgd section refing IEB 79-14.

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ATTACHMENT TO PSMS FORM

Work Content

At a nuclear reactor to be selected by IE, perform an interference analysis for safety-related piping. The input to the analysis shall be design drawings of piping, structures, cable trays, and other systems, components, and equipment, as appropriate, which are located in space or spaces selected by the contractor, licensee, and IE. Geometries of these systems, components, and equipment shall be input into an existing computer program which determines points of interference. The scope of the work is to be limited so that the total cost does not exceed \$10,000.

Planned Accomplishments for FY 80

1. Visit the selected plant site to:
 - a. Select, in conjunction with the licensee and IE, the space or spaces to be analyzed.
 - b. Obtain input for the analysis from design