

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report No. 99900509/79-02

Program No. 51200

Company: Stone and Webster  
Engineering Corporation  
P. O. Box 2325  
Boston, Massachusetts

Inspection at: Boston, Massachusetts

Inspection Conducted: May 7-11, 1979

Inspectors: C. J. Hale 5-22-79  
J. R. Costello, Principal Inspector, Vendor Date  
Inspection Branch

C. J. Hale 5-22-79  
R. L. Brown, Principal Inspector, Vendor Date  
Inspection Branch

Approved by: C. J. Hale 5-22-79  
C. J. Hale, Chief, Vendor Program Evaluation Date  
Section, Vendor Inspection Branch

Summary

Inspection on May 7-11, 1979 (99900509/79-02)

Areas Inspected: Implementation of 10 CFR 50, Appendix B criteria in the areas of procurement document control, procurement source selection and QA records. The inspection involved sixty (60) inspector-hours on site by two (2) USNRC inspectors.

Results: In the three (3) areas inspected, one (1) deviation and one unresolved item were identified in one (1) area and one (1) unresolved item was identified in another area.

618031

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## Details Section I

(Prepared by J. R. Costello)

A. Persons Contacted

J. H. Brodeur, Records Administrator  
C. E. Cole, Project Buyer  
\*W. R. Curtis, Engineering Assurance Engineer  
P. W. Daly, Assistant Chief Engineer  
P. W. Day, Lead Engineer  
R. E. Foley, Assistant to Chief, Engineering Mechanics Division  
W. O. Glass, Manager Office Management, Technical  
\*J. W. Kelly, QA Program Administrator  
D. L. Malone, Audit Supervisor  
\*J. Medeiros, Project Record Administrator  
E. O'Connor, Assistant Supervisor, Records Retention Center  
F. L. Qualter, Assistant Manager, Procurement Quality Assurance  
R. L. Schichtel, Supervisor Records Retention Center  
C. H. Wilbur, Coordinating Engineer  
R. J. Yanis, Engineering Assurance Engineer

\*Denotes those present at exit meeting.

B. QA Records1. Objectives

The objective of this area of the inspection was to examine the establishment and implementation of quality related procedures for collecting, filing, storing, maintaining, and dispositioning of QA records to verify that:

- a. A QA records system is defined, implemented, and enforced in accordance with approved procedures, instructions, or other documentation for all groups performing safety related activities including QA, design, procurement, administration, and services.
- b. QA records are legible, completely filled out, adequately identifiable to the item involved, validated, and listed in an index that indicates: the record retention time, where

the record is to be stored, and the location of the record in the storage area. Any changes or modifications to these records are controlled.

- c. A specific submittal plan for QA records is established between the licensee and contractor and records exist that acknowledge the licensee's receipt of QA records.
- d. A designated authority has been assigned to control the receipt of QA records by a system which includes a list of QA records required, a record of QA records received, and an inspection of incoming records including a current assessment of the status of incoming records.
- e. A custodian has been designated to assure that QA records are in accordance with b. above and to enforce a QA record storage filing system which includes a system description of the filing technique and storage area, rules for access and control of record files, accountability of records removed from record files and security requirements.

## 2. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

- a. Section 17 of the Final Safety Analysis Report (FSAR) for North Anna Power Station, Units 1 & 2.
- b. Section 17 of the Final Safety Analysis Report (FSAR) for Shoreham Nuclear Power Station.
- c. Implementing procedures to satisfy FSAR Quality Assurance Program commitments and to satisfy the intent of the objectives section above. These procedures are as follows:
  - (1) Quality Standard QS 17.1, Revision A, Quality Assurance Records System.
  - (2) Engineering Assurance Procedure EAP 17.1, Revision 1, Collection and Retention of Quality Assurance Records.
  - (3) Purchasing Department Instruction Manual, Section XII, Records and Files.
  - (4) Structural Division Administrative Guideline, No. SAG 2.6-0, Revision 0, Records Management.

- (5) Electrical Division Technical Procedure No. EAG-XXXIV-1-1, Revision 1, Records Management.
  - (6) Engineering Assurance Division Technical Procedure No. 01-07-0, Revision 0, Records Management.
  - (7) North Anna Project Procedure 1.2, Revision 4, Review of Boston Purchased Category I items Documentation.
  - (8) North Anna Project Procedure 1.9, Revision 3, Collection and Retention of Records.
  - (9) North Anna Project Procedure 2.9, Revision 0, Collection and Retention of Quality Assurance Records.
  - (10) Field Quality Control Procedure QC-5.3, Revision 0, Standard File and Record System.
  - (11) Construction Department Standard CMP No. 11.1-3.77, March 1977, Jobsite Document Control.
  - (12) Construction Department Standard CMP No. 11.2-11.75, November 1975, Indexing and Retrieval of Nuclear Plant Documentation.
- d. Documents to verify implementation of FSAR Quality Assurance Program commitments and to satisfy the intent of the objectives sections. These documents are as follows:
- (1) CSTG-15.76.7-0, Revision 0, Installation Criteria for Safety Related Instruments and Sensing Lines.
  - (2) CSTG-10.5-0, Revision 0, Review of Reliability and Availability Calculations for Instrumentation and Control.
  - (3) EAG-XXVII-12-1, Electrical Design Criteria.
  - (4) STD-ME-29-40, Revision 2, Seismic Cable Tray Supports.
  - (5) DC 3908, March 31, 1978, Electrical Independence, Category 1.
  - (6) EATP 3.6, Revision 0, Engineering Assurance Development of Audit Plans.

618034

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- (7) EATG 50-100, Revision 0, Engineering Assurance Pre-award Surveys of Engineering Services Suppliers.
- (8) EMAG 37, Revision 0, Conceptual Design Review.
- (9) EMTR 400, Revision A, Material Properties for Pipe Rupture Analysis.
- (10) ME-023-0303, Seismic Analysis of Piping Systems (SHOCK 3).
- (11) GAG-3.8, Revision 2, Geotechnical Design Criteria.
- (12) HTG-6.1, Revision 0, Determination of Hydraulic Head Losses Through Cooling Water Systems.
- (13) W53M Weld Procedure, J. O. No. 12560.07.
- (14) METG-1-0, Change 1, Preparation and Issuance of Weld Procedures.
- (15) North Anna Project Records Type List, Revision 0.
- (16) Greene County Project Records Type List, Revision 2.
- (17) Purchase Order Register for North Anna Power Station, Units 1 and 2.
- (18) PR-P-44, February 18, 1975, Problem Report Response - Temporary Strainers for Canal.
- (19) Engineering Assurance Record Index, January 31, 1979.
- (20) Engineering Assurance Audit of Beaver Valley Unit 2 August 2, 1978.
- (21) P.O. NA1127, January 27, 1970, Recirculation Spray Pumps - Bingham Willamette.
- (22) P.O. NA1456, February 26, 1976, Safety and Relief Valves - Crosby Valve and Gage Company.
- (23) P.O. NA 1574, December 8, 1978, Neutron Shield Material - Chemtrol Corporation.
- (24) P.O. NA 442, January 2, 1976, Spent Fuel Storage Racks - NUS Corporation.

618035

### 3. Findings

#### a. Deviation

See enclosure No. 1, Notice of Deviation.

- b. North Anna Project Procedure 1.9, Revision 3, (Collection and Storage of Records) has a requirement in paragraph 7.1.3 that all QA records forwarded to the PPF/PRCF files shall be sent via a transmittal or Document Checklist with a receipt acknowledgement required. In establishing the PRCF (Project Record Copy File) for North Anna 2, existing engineering files were being incorporated into the PRCF file without transmittal or Document Issue checklist receipt acknowledgement. It does not appear to be a viable requirement to require receipt acknowledgement for existing engineering files on this report.

Procedure No. 1.9, was revised during the period of this inspection to remove this anomaly. The procedure was changed to read as follows:

All QA record transmittals from the Boston office to the PPF or from the construction office to the PPF shall be made using a transmittal or Document Issue checklist. Receipt acknowledgement is required.

#### c. Unresolved Item

Stone and Webster Quality Standard QS-17.1, Revision A dated September 30, 1977, (Quality Assurance Records System) states in part (paragraph 4.3.4), "The Project Management Department is responsible for . . . Establishing written procedures for the operation of the RRC (Record Retention Center)." QS-17.1 also states in part (paragraph 4.3.6), "The Office Facilities Department is responsible for implementing written procedures for maintaining the RRC facility."

At present time procedures prepared by the Project Management Department for the operation of the RRC are in draft form and have not been issued. As a consequence, the Office Facilities Department has not been able to establish the implementing written procedures for maintaining the RRC facility. This item will be further inspected during the next regular inspection.

C. Exit Meeting

A meeting was conducted with management representatives at the conclusion of the inspection on May 11, 1979. In addition to the individuals indicated by an asterisk in the Details Sections those in attendance were:

F. B. Baldwin, Assistant Manager, Quality Assurance  
R. G. Burns, Chief Engineer, Quality Systems Division  
G. J. Burroughs, Project Manager  
R. B. Kelly, Quality Assurance Manager  
L. S. Maciejewski, Vice President, Engineering Manager  
L. D. Nace, Chief, Engineer, Engineering Assurance  
G. M. Schierberg, Manager, Procurement Quality Assurance  
H. W. Zassenhaus, Manager Records Management Division

The inspector summarized the scope and findings of the inspection for those present at the meeting. Management representatives acknowledged the statements of the inspector.

618037

## Details Section II

(Prepared by Ross L. Brown)

A. Persons Contacted

- J. Carney, Assistant Project Engineer
- \*E. B. Fleming, Senior QA Program Administrator
- R. E. Fortier, Principal Nuclear Engineer
- G. E. Gula, QA Engineer
- G. R. Heine, Lead Control Engineer
- E. L. Prendable, Engineering Aide
- F. L. Qualter, Assistant Manager, Procurement QA
- T. A. Rothschild, Principal Piping Engineer

\*Attended exit meeting.

B. Procurement Document Control1. Objectives

The objectives of this area of the inspection were to verify that procedures have been prepared and are being implemented to assure that:

- a. The organizations involved in the execution of procurement activities have been identified and their responsibilities delineated.
- b. Procurement documents include the scope of work to be performed by the supplier, the technical requirements, material and equipment specifications, procedures and instructions, test and inspection requirements, acceptance requirements, and identification, packaging, handling and shipping requirements.
- c. Procurement documents require that the supplier have a documented quality assurance program consistent with 10 CFR 50, Appendix B.
- d. The supplier is required to incorporate appropriate quality assurance program requirements in sub-vendor procurement documents.
- e. Procurement documents provide rights of access to the supplier's plant facilities and records, identification of manufacturing hold points, witness points and notification of the time of

618038

these events, documentation requirements, records requirements, and requirements for reporting and approving of the disposition of nonconformances.

- f. Procurement documents are reviewed by the QA organization before transmittal to the prospective suppliers and these reviews are documented.
- g. Changes to procurement documents undergo the same degree of review and controls as the original documents.
- h. Measures to control the release and distribution of procurement documents are being implemented.

## 2. Methods of Accomplishment

The preceding objectives were accomplished by examination of:

- a. Chapter 17 of the Final Safety Analysis Report (FSAR) for Job Order No. 11600, Section 17.1.4B requires the Stone and Webster (S&W) QA program to provide for the control of procurement documents, and to assure that the engineering and quality requirements are translated into procurement specification and associated drawings.
- b. Quality Assurance Directive Technical No. QAD-7.8 provides instructions for handling vendor documents including, the required documents, content, disposition and storage.
- c. Engineering Assurance Procedure EAP 15.2 provides instructions to engineering personnel for receipt, disposition, distribution and filing of all Nonconformity and Disposition (N&D) Reports forwarded to the project headquarters.
- d. The documents relative to procurement of the following Category I items for Job Order No. 11600.
  - (1) Purchase Order (PO) No. 310475 for shop fabricated pipe and associated documents:
    - (a) Specification No. SH1-024.
    - (b) Inspection reports for 1977, 1978 and 1979.
    - (c) Ten (10) N&D reports and the resolutions.

618039

- (2) Purchase Order No. 310489 for service water pumps and related documents;
  - (a) Specification No. SH1-057.
  - (b) Inspection reports for 1978 and 1979.
  - (c) Twelve (12) N&D reports and the resolutions.
- (3) Purchase Order No. 310680 for safety and relief valves, ASME III and the related documents;
  - (a) Specification No. SH1-191.
  - (b) Inspection reports for 1978 and 1979.
  - (c) Four (4) N&D reports and the resolution.
- (4) Several of the documents (survey reports, audit reports, evaluation reports, etc) are referenced in Paragraph C.2 of this Details Section.

### 3. Findings

In this area of the inspection, no deviations from commitments or unresolved items were identified.

## C. Procurement Source Selection

### 1. Objectives

The objectives of this area of the inspection were to verify that procedures have been established and implemented for the selection of qualified suppliers of services, materials, parts and components that provide for:

- a. Requirements for evaluation of the potential supplier's capability to provide items or services in accordance with the technical and quality assurance specifications of the procurement documents.
- b. Methods of evaluating potential suppliers that are consistent with applicable regulatory, code and contract requirements and should include source evaluation audits, review of historical performance, and/or review and evaluation of the supplier's QA program, manual and procedures.

618040

- c. Consideration of the complexity, inspectability and safety significance of purchased items or services when selecting the method of source evaluation.
- d. Performance of source evaluation audits that include appropriate checklists or instructions for systematic review of the prospective supplier's QA system.
- e. Qualification requirements for personnel performing source evaluation audits.
- f. Source selection being based on historical product performance that includes review of past procurement and operating experience with identical or similar items and is limited to relatively simple services or off-the-shelf items.
- g. Periodic re-evaluation of suppliers and that an up-to-date listing of the evaluation status is being maintained.
- h. Distributing of supplier evaluation status documents to purchasing and assuring that contracts are awarded only to companies designated in these documents.
- i. Measures to assure that the supplier's bid conforms to the procurement document requirements and that resolution of unacceptable conditions identified during bid evaluation are corrected before the contract award.

## 2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of Chapter 17, Section 17.1.15B of the FSAR applicable to Job No. 11600, which requires a semi-annual summary review of all unsatisfactory conditions to ascertain significant trends.
- b. Review of the Quality Assurance Directives - Technical, Section 7, Procedure QAD-7.9 that describes the system, that includes the responsibilities and procedures used to determine prospective vendor's capability to conform to the procurement quality requirements.
- c. Review of QAD-4.2 which describes the system for accumulating information from surveys, audits, evaluations, and other

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references of performance in order to evaluate and rate the quality capability of vendors.

- d. Review of QAD-4.3 that describes the system for the evaluation of the bidders QA manual and facility survey if required.
- e. Review of Engineering Assurance Procedure EAP 4.1 that describes the activities of the engineering department in the system used to recommend bidders, evaluate bidders, evaluate bidder's proposal and select suppliers.
- f. Review of EAP 7.1 which establishes the methods and responsibilities for evaluation and monitoring of an engineering services supplier.
- g. Examination of documents pertinent to supplier selection to verify conformance with the requirements referenced in Paragraphs C.2.a, b, c, d, and e of this Details Section;
  - (1) P.O. No. 310475;
    - (a) Survey report.
    - (b) Vendor Evaluation Reports for 1976, 1977, 1978 and 1979.
    - (c) Recommended Vendor List (including the successful bidder).
  - (2) P.O. No. 310489;
    - (a) Facility Survey Reports for 1973, 1975 and 1976.
    - (b) Vendor Evaluation Reports for 1977, 1978 and 1979.
    - (c) Audit Report for audit conducted on March 12-15, 1979.
    - (d) Recommended Vendor List for this P.O.
  - (3) P.O. No. 310680;
    - (a) Facility Survey Reports for 1972, 1974, 1975 and re-evaluation reports for 1976, 1977, 1978 and 1979.
    - (b) Recommended Vendor List.
    - (c) Negative report file, which includes the deficiencies identified against this vendor for all S&W purchase orders with this supplier.

3. Findings

a. No deviations from commitments were identified in this area of the inspection, however, one unresolved item was identified.

b. Unresolved Item

It does not appear that S&W is imposing adequate requirements on their vendors in the case of significant conditions adverse to quality for assuring in a timely manner that the cause of the condition is determined and that corrective action is taken to preclude repetition.

The Nonconformance and Disposition Report No. 0684 describes one example of a condition which apparently should have been analyzed by the vendor to determine the cause of the discrepancy and assign preventive action. This report states that the wall thickness of several valve pressure parts was below the thickness specified on the vendor drawing. It appears that this condition should have been analysed by the vendor to determine if the manufacturing process should be changed or if the drawing requirement is in conformance with the technical requirements. More especially the discrepancies should have been identified, justified, and submitted by the vendor to S&W project engineering for evaluation and disposition prior to the S&W Shop Inspector's inspection and his identifying and reporting (via the N&D report) the discrepancies to S&W project engineering for action.

This area will be inspected further during a subsequent inspection.

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