

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

DIVISION OF QUALITY ASSURANCE, SAFEGUARDS, AND INSPECTION PROGRAMS
VENDOR PROGRAM BRANCH

Report No.: 50-423/84-01

Docket No.: 50-423

Licensee: Northeast Nuclear Energy Company
P. O. Box 270
Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Power Station, Unit 3

Inspection at: Waterford, Connecticut

Inspection Conducted: January 16 to January 20, 1984

Inspectors: *E. W. Merschoff*
E. W. Merschoff, Sr. Reactor Construction Engineer
(Team Leader)

1/31/84
Date Signed

E. T. Baker
E. Baker, Reactor Construction Engineer, IE

1/31/84
Date Signed

D. Norman
for D. Norman, Mechanical Engineer, Region IV

1/31/84
Date Signed

Approved by: *U. Potapovs* 1-31-84
U. Potapovs, Chief
Vendor Program Branch
Division of Quality Assurance, Safeguards,
and Inspection Programs
Office of Inspection and Enforcement

Inspection Summary: Inspection on January 16, 1984, to January 20, 1984.
Report No. 50-423/84-01.

Areas Inspected: Licensee implementation of quality assurance program with respect to The Bahnson Company (HVAC equipment supplier); licensee implementation of quality assurance program for a sample of material suppliers; HVAC equipment supplied by The Bahnson Company installed in the field. The inspection involved 98 inspection-hours onsite.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Northeast Utilities Service Company (NUSCO)

- *M. Andrukiewicz, Project Discipline Engineer
- *K. Gray, Staff Assistant
- *R. Lefebvre, Project Staff Engineer
- *D. Nordquist, Manager Quality Assurance
- *S. Orefice, Project Engineer
- *V. Papadopolis, Supervisor Construction Quality Assurance
- *J. Putnam, Sr. Engineer NUSCO Project
- *R. Vogel, Asst. Project Engineer

Stone and Wester Corporation (S&W)

- M. Aiken, Project Quality Assurance
- *J. Capozzoli, Jr., Supervisor Construction Services
- *A. Dasenbrock, Resident Manager
- *E. Fleming, Division Chief Engineer
- *R. Hagerman, Field QC Chief Inspector
- *J. Kappas, Superintendent of Construction
- *K. Kirkman, Assistant Superintendent Construction Services
- *M. Matthews, Assistant Superintendent Field QC
- *P. Nelson, Engineering Assurance Engineer
- F. Qualter, Project Quality Assurance
- *R. Rudis, Engineering Assurance Engineer
- *R. Scannell, QA Program Administrator
- G. Timm, Power Facilities Engineer
- *G. Turner, Superintendent Field QC
- *W. Vos, Senior Engineer Field QC
- *J. Woods, Principal Power Engineer
- R. Zawacki, Field QC

USNRC

T. Rebelowski

*denotes attendees at exit meeting January 20, 1984.

NOTE: The inspectors also conferred with other licensee and contractor personnel during the course of the inspection.

2. Inspection Objectives

The purpose of this inspection was to follow-up on deficiencies noted during an NRC vendor inspection of The Bahnson Company (inspection report number 99900791/82-01), a heating, ventilation, and air conditioning (HVAC) component supplier.

Information from this inspection will be used to assist in the determination of what, if any, generic corrective action is needed at nuclear power plants which have been supplied HVAC equipment by The Bahnson Company.

In order to accomplish this, hardware was inspected by the NRC in the field prior to final quality assurance inspection and turnover. Quality assurance records were also reviewed prior to their receiving final S&W Project Quality Assurance (PQA) review for completeness. This has resulted in several NRC findings which may have been discovered during the normal quality assurance inspection and turnover process had this process been completed prior to the NRC inspection.

3. Material Substitution

The inspectors performed detailed inspections of ten safety-related HVAC units supplied by The Bahnson Company. The ten units inspected were:

3HVC*ACU1A	- Control Room Air Conditioning Unit (ACU)
3HVC*ACU1B	- Control Room ACU
3HVC*ACU2A	- Instrument Rack and Computer Room ACU
3HVC*ACU2B	- Instrument Rack and Computer Room ACU
3HVC*ACU3A	- Switchgear Rooms East and West ACU
3HVC*ACU3B	- Switchgear Rooms East and West ACU
3HVC*ACU4A	- Switchgear Rooms East and West ACU
3HVC*ACU4B	- Switchgear Rooms East and West ACU
3HVR*ACU1A	- Motor Control Center and Rod Control Area ACU
3HVR*ACU1B	- Motor Control Center and Rod Control Area ACU

The inspection was conducted using criteria established in the Bahnson and Aero-fin Drawings and the Seismic Qualification Reports listed in Attachment A. It involved visual inspection of a sample of ASME and AWS welds, verification of ASME materials, and verification of fastener type and material utilized in bolted connections.

Findings

Three instances of improper material substitution by The Bahnson Company were noted (two of these three instances had been previously identified by Stone and Webster). Specifically:

- Self tapping screws are being used to fasten the cooling coils to the HVAC unit frame whereas high strength (ASTM A 193 B8) bolts are required by the seismic analysis (identified by S&W).
- Stove bolts and wing nuts are being used to attach the fan motor belt guard whereas high strength (ASTM A 193 B7) bolts are required by the seismic analysis (identified by S&W).

- Low strength bolts are being used to attach the Barry Blower fans to the HVAC unit frame whereas high strength (ASTM A 449) are required by the seismic analysis (identified by NRC).

Additionally, improper material substitution by S&W was noted on three of the ten units (3HVC*ACU3B, 3HVC*ACU4A, and 3HVC*ACU4B) in that low strength drilled in anchors were used to anchor the air handling units to the floor whereas high strength (ASTM A325) anchor bolts were required by the seismic analysis and the Bahnson drawings (identified by NRC).

The inspectors did not identify any violations, but did inform the licensee that the material substitutions identified by the NRC are considered unresolved items pending the licensee's evaluation and NRC review during a subsequent inspection (423/84-01-01).

4. Material Traceability

The inspectors reviewed Stone and Webster's procurement specification, Bahnson's general arrangement drawings, Aerofin's general arrangement drawings and Bills of Materials, the Seismic Qualification Report for the HVAC units, and the Structural Analysis Report for the Aerofin cooling coils to establish base material and filler material requirements and associated recordkeeping requirements. The Certified Material Test Reports (CMTR) and Certificates of Compliance (CoC) supplied as part of the documentation package for the HVAC units were then compared with the material requirements for completeness. In reviewing the documentation package, several inconsistencies with the documents listed above were noted:

- CMTRs for two materials listed in the Aerofin structural analysis were missing, 2½" Sch 80 SA-53 Pipe and ½" SB-402 Plate
- Documentation packages for 8 of the 10 HVAC units stated that CMTRs for weld filler material were "NR", Not Required, contrary to the procurement specification
- Except for the inlet and outlet flanges and drain and purge line pipe caps, there were no heat numbers on individual pieces and the licensee did not have the necessary documents to link each CMTR to the material in any specific HVAC unit.

A conference call was held following the inspection on January 23, 1984, between S&W Millstone site personnel, S&W Boston personnel, Bahnson personnel, and a member of the NRC inspection team to verify whether or not Bahnson possessed the documentation necessary to provide traceability of the ASME materials. During this conference call, a review of the as-built drawings by Bahnson indicated that the heat numbers for the materials used for each HVAC unit are listed on the as-built drawings thus satisfying the ASME requirement for traceability which requires either marking identification numbers on individual pieces or identification through records traceable to the material. Additionally, the as-built drawings indicated that SA-106 2½" Sch 80 pipe had been substituted for the SA-53 pipe for which the CMTR was missing. S&W did possess a CMTR for the heat of SA-106 pipe noted on the drawings, but was not aware that a substitution had been made.

As a result of the inspection and subsequent conference call, no violations were identified, but the inspector expressed his concern to the licensee and S&W that neither the licensee nor S&W had control of the records that established material traceability. The traceability of the 1/2" SB-402 plate and the lack of weld filler material traceability remain unresolved items pending the licensee's evaluation and NRC review. (423/84-01-02)

A review of Bahnson's as-built drawings will be performed during a subsequent NRC inspection at the Bahnson facility to verify the adequacy of material traceability records.

5. QA Records Storage

The inspector reviewed the licensee's and S&W's commitments to regulatory guidance on QA records storage, S&W's QA manual, and the requirements included in the procurement specification in regard to QA records storage. Both the licensee and S&W committed to Regulatory Guide 1.88, "Collection, Storage, and Maintenance of Nuclear Power Plant QA Records", which endorses ANSI N45.2.9. In accordance with the regulatory guide and ANSI standard, the S&W QA manual requires that permanent plant records be identified and that applicable specifications and procurement documents specify the records to be generated and their disposition. A review of the procurement specification indicated that the records to be generated and their distribution were included. However, Bahnson was not told which records were permanent, how long to store them, or under what conditions they must be stored. It was not obvious that S&W normally includes a listing of permanent records or the applicable record storage facility requirements when relying on QA records stored at a manufacturer's facility for traceability.

As stated in item 4 above, the licensee is depending on subcontractor-stored QA records to establish material traceability. An example of these records are the as-built drawings annotated with the applicable material heat numbers. These drawings are only available at the Bahnson manufacturing facility and the recordkeeping requirements committed to by the licensee and S&W were not invoked in the procurement specification.

The inspector did not identify any violations, but did inform the licensee that this is considered an unresolved item pending the licensee's evaluation and NRC review during a subsequent inspection. (423/84-01-03)

6. Welding Procedures

The inspectors reviewed Bahnson's and Aerofin's Welding Procedure Specifications and Procedure Qualification Records for compliance with requirements specified in ASME Section IX and AWS D1.1. (See Attachment A for complete list).

No violations or deviations were identified in this area.

7. Material Suppliers and Vendor Interface

An indepth review of the procurement records for the Bahnson HVAC equipment was conducted, including the pre-award survey, vendor audit reports, corrective action reports, the quality rating list, and material receipt

inspections. The procuring agent's (S&W) procurement system, in general, appears to be effective, although one instance was noted where the same deficiency (Bahnson's lack of the applicable ASME Code) noted in the pre-award survey was also noted in a followup audit, indicating ineffective corrective action.

Additionally, a small sample of heat numbers was selected in the field for ASME piping and structural steel, and traced back to the procurement documents. In all cases, the material supplier was listed on the quality rating list, was surveyed and audited in accordance with regulatory commitments, and had supplied the required material certifications.

No violations or deviations were identified in this area.

8. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are violations or deviations. Unresolved items are discussed in paragraphs 3, 4, and 5.

9. Exit Meeting

The inspectors met with licensee and architect-engineer/construction representatives (see paragraph 1) at the end of the inspection on January 20, 1984. The inspectors summarized the purpose and scope of the inspection and identified the inspection findings.

At no time during this inspection was written material provided to the licensee by the inspectors.

ATTACHMENT A

DOCUMENTS REVIEWED

The documents listed below were reviewed by the inspection team members to the extent necessary to satisfy the objectives of the inspection. References to specific documents are contained within the body of the report.

1. Documentation Package for 3HVC*ACU1A
2. Documentation Package for 3HVC*ACU1B
3. Documentation Package for 3HVC*ACU2A
4. Documentation Package for 3HVC*ACU2B
5. Documentation Package for 3HVC*ACU3A
6. Documentation Package for 3HVC*ACU3B
7. Documentation Package for 3HVC*ACU4A
8. Documentation Package for 3HVC*ACU4B
9. Documentation Package for 3HVR*ACU1A
10. Documentation Package for 3HVR*ACU1B
11. Documentation Package for Coils for 3HVR*ACU1A
12. Documentation Package for Coils for 3HVR*ACU1B
13. SWEC Quality Rating List dated 8/1/81 (Partial Only)
14. SWEC Quality Rating List dated 6/1/82 (Partial Only)
15. SWEC Survey of Bahnson Company dated 1/28/81
16. SWEC Audit of Bahnson dated 3/1/82 and Corrective Actions
17. SWEC Spec #2176.430-648
18. S&W Dwg. No. 12179-EB-39A-14 - Air Cond & Ventilation Control Building SH-1
19. S&W Dwg. No. 12179-EM-6D-9 - Machine Location Auxiliary Building Plan
E1 66'-6"
20. S&W Dwg. No. 12179-EB-39D-13 - Air Cond & Ventilation Control Building
SH-4
21. Correspondence w/Client File 2176.430-648
22. Correspondence w/Vendor File 2176.430-648
23. Correspondence w/Boston File 2176.430-648
24. 2176.430-648 Inspection Reports (Receipt Inspections)
25. 2176.430.648 Test and Inspection Data (TIDs)
26. SWEC Quality Assurance Manual (Partial)
27. 2176.430.648 ASME Welding Procedures
28. Bahnson Dwg. No. 2908-2-1 Rev. 5
29. Bahnson Dwg. No. 2908-1-3 Rev. 5
30. Bahnson Dwg. No. 2908-1-2 Rev. 4
31. Bahnson Dwg. No. 2908-1-1 Rev. 4
32. Bahnson Dwg. No. 2908-1-6 Rev. 4
33. Bahnson Dwg. No. 2908-1-4 Rev. 4
34. Bahnson Dwg. No. 2908-1-5 Rev. 5
35. Brasch Dwg. No. DP-1181 Rev. B
36. Brasch Dwg. No. DH-1180 Rev. B
37. Ruskin Dwg. No. 8090 Issue A
38. SWEC E&DCR No. F-S-9185
39. SWEC Vendor Information Request No. V-2032
40. SWEC E&DCR No. F-S-7847
41. SWEC E&DCR No. F-S-3959

DOCUMENTS REVIEWED (CONTINUED)

42. SWEC E&DCR No. F-B8545
43. SWEC Vendor Information Request No. V-2066
44. SWEC N&D Report No. 1906
45. SWEC N&D Report No. 2716
46. Seismic Qualification Report No. A-401-81
47. Aerofin Dwg. N-C-1
48. Aerofin Dwg. BM-C-12
49. Aerofin Dwg. BM-C-15
50. Aerofin Dwg. BM-C-16
51. SWEC Inspection Report M2050854
52. SWEC Inspection Report M2050469
53. SWEC Inspection Report M20501038
54. SWEC Inspection Report M20503714
55. SWEC Inspection Report M20504364
56. SWEC Inspection Report M20504812
57. SWEC Material Receiving Report MMR 82-4293
58. SWEC Material Receiving Report MMR 82-15515
59. SWEC Material Receiving Report MMR 82-16824
60. Seismic Qualification Report for Air Handling Units dated 7/31/81
61. Addendum 1 to Seismic Qualification Report for Air Handling Units dated 5/7/82
62. Aerofin Structural Analysis dated 5/3/82
63. SWEC QA Manual Section 17 QA Records
64. SWEC QA Manual Appendix VIII Response to Regulatory Guidance
65. APS-25-P-18 (Aerofin)
66. APS-25-P-27 (Aerofin)
67. GMI-1 (Bahnson)
68. GMI-2 (Bahnson)
69. GMI-3 (Bahnson)
70. GT8-4 (Bahnson)