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

NOV 19 1984

MEMORANDUM FOR: Thomas E. Murley, Regional Administrator, Region I
James G. Keppler, Regional Administrator, Region III
Robert D. Martin, Regional Administrator, Region IV
John B. Martin, Regional Administrator, Region V

THRU: Richard C. DeYoung, Director
Office of Inspection and Enforcement

FROM: J. Nelson Grace, Director
Division of Quality Assurance,
Safeguards and Inspection Programs
Office of Inspection and Enforcement

SUBJECT: POTENTIAL DEFICIENCIES RELATING TO THE CONSTRUCTION OF SAFETY-RELATED HVAC UNITS BY THE BAHNSON COMPANY, WINSTON-SALEM, NORTH CAROLINA

Inspections during February and March 1984, of Bahnson supplied HVAC equipment at the Bahnson manufacturing facility and at several plants under construction identified the following deficiencies:

1. Material Substitution - Low strength fasteners were used in locations where ASTM A449 and ASTM A193 B7 bolts were specified. Additionally, self tapping screws were used to secure the cooling coils to the structural frame where high strength nuts and bolts were required.

2. Missing and Defective Welds - Air handling units manufactured by the Bahnson Company contained missing welds, incorrect joint design, and poor weld quality.

3. Lack of Material Traceability - The quality assurance records were missing some required certified material test reports for ASME Section III material and weld rod.

4. Lack of Control Over Material Traceability Records - The applicant was relying on records maintained by the Bahnson Company to provide traceability of ASME Section III Material to the required certifications without passing down to Bahnson their FSAR commitments regarding record storage requirements.

As a result of these findings, IE Information Notice 84-30 was issued and Board Notifications were made by NRR for all plants that were identified as having Bahnson equipment and who were before a hearing board. In addition, NRR had planned to issue 50.54(f) letters to the licensees of operating plants which were supplied HVAC equipment by the Bahnson Company. However, to followup on the board notifications and to ensure that all remaining operating facilities are properly addressed, NRR has recommended that, since Regional inspections

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relating to this matter have been made at several facilities, this issue should be resolved through similar inspections at the remaining affected facilities in lieu of issuing 50.54(f) letters. I agree that this may be the more efficient means of addressing this issue. Therefore, if you have not already done so, please include a review of the quality of installed Bahnson HVAC equipment during your normally scheduled inspections at the facilities noted in Enclosure 1. For your convenience, copies of the inspections performed at V. C. Summer, Oconee, Catawba, Shearon Harris, and Millstone 3 are included as Enclosure 2.

Please notify me of the inspection reports which address the quality of Bahnson supplied equipment in the plants listed in Enclosure 1 so that we may work with NRR to close out this issue.

If you have any questions, please contact Mr. Ellis W. Merschoff of the Vendor Program Branch at FTS 492-9045.

ORIGINAL
SIGNED BY:

J. Nelson Grace, Director
Division of Quality Assurance,
Safeguards and Inspection Programs
Office of Inspection and Enforcement

Enclosures:
As stated

cc w/enclosure:
J. P. O'Reilly, Region II
H. R. Denton, HQ

DISTRIBUTION:
DMB:IE:09 (99900791)
VPB Reading
JTaylor
JGrace
JPartlow
EMerschoff
RCDeYoung

SC/VPB:DQASIP	BC/VPB:DQASIP	D/DIR:DQASIP	DIR:DQASIP	IE:D/DIR	IE:DIR
EMerschoff:sam	GGZech	JGPartlow	JNGrace	JMTaylor	RCDeYoung
11/9 /84	11/ 8/84	11/9 /84	11/13/84	11/19/84	11/20/84

11/14
#3

ENCLOSURE 1

Facilities With Bahnson HVAC Equipment For Which
Inspections May Not Have Been Conducted

Facility	Quantity/Type Unit
Shoreham	4 Air Handling Units
Wolf Creek	4 Air Handling Units
Callaway	4 Air Handling Units
WPPSS 1 & 4	24 Evaporative Air Coolers 12 Charcoal Absorption Units
Palo Verde	6 Charcoal Absorption Units

Enclosure 2

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

April 4, 1984

Docket No. 50-400

Carolina Power and Light Company
ATTN: Mr. J. A. Jones
Vice Chairman
411 Fayetteville Street
Raleigh, North Carolina 27602

Gentlemen:

Subject: Inspection No. 50-400/84-05

This refers to the inspection conducted February 6-February 10, 1984 by Messers. E. Baker, D. Norman, and W. Kleinsorge of this office at the Shearon Harris Nuclear Plant, Unit 1, New Hill, North Carolina, of activities authorized by NRC License No. CPPR-158 and to discussions of our findings held by E. Baker with Mr. R. M. Parsons, Project General Manager and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the NRC Office of Inspection and Enforcement Report which is enclosed with this letter. Within these areas the inspection consisted of selective examinations of procedures and representative records, installed hardware, interviews with personnel, and observations by the inspectors.

During the inspection, it was found that certain activities under your license appear to violate NRC requirements. This item and references to pertinent requirements are listed in the Potential Enforcement Actions enclosed herewith as Appendix A. The Potential Enforcement Actions have been referred to Region II for appropriate action.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within 10 days of the date of this letter and submit written application to withhold information contained therein within 30 days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

No reply to this letter is required. Your cooperation with us in this matter is appreciated.

Sincerely,

J. Nelson Grace, Director
Division of Quality Assurance, Safeguards,
and Inspection Programs
Office of Inspection and Enforcement

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Enclosures:
1. Appendix A, Potential Enforcement Actions
2. Inspection Report No. 50-400/84-05

cc w/enclosures:
R. M. Parson, Project General Manager

bcc w/enclosures:
NRC Resident Inspector
DCS
State of North Carolina

DISTRIBUTION:
DCS
VPB Reading
QASIP Reading
NRC PDR
Local PDR
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EMerschoff
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DNorman, Region IV
UPotapovs, Region IV
DEisenhut, NRR
JPO'Reilly, Region II
RCLewis, Region II
JOlshinski, Region II
J N. Grace

IE:VPB	IE:VPB	RII	IE:VPB	IE:VPB	IE:DD/QASIP	IE:DIR/QASIP
EBaker:esp	DNorman	WPKleinsorge	GZech	UPotapovs	JGPartlow	JNGrace
4/2/84	4/2/84	4/2/84	4/2/84	4/2/84	4/ /84	4/3/84

APPENDIX A

Potential Enforcement Actions

As a result of the NRC Vendor inspection conducted February 6 - February 10, 1984, the following items have been referred to NRC Region II as Potential Enforcement Actions (section references are to the detailed portion of the inspection report).

1. Contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7, several examples were identified where purchased equipment was installed but did not conform to procurement document requirements. Examples included structural steel welds that were missing, that did not conform to joint design, that failed to satisfy the visual inspection requirements of AWS D1.1 and Addendum A to Ebasco Specifications CAR-SH-BE-31 and CAR-SH-BE-08, that did not meet the liquid penetrant inspection acceptance standards; fasteners which were the wrong material, and missing fasteners. (Sections 5.a, 5.b, 6.a, 6.b)

2. Contrary to 10 CFR 50, Appendix B, Criterion XVI, as implemented by CP&L PSAR section 1.8.5.16, the applicant's programs have failed to assure that conditions adverse to quality have been properly identified and promptly corrected. Examples included a Corrective Action Report for DDR-1053, dated 10/28/82, which under "Preventative Measures" stated that preventative measures were "NA", Not Applicable, because the unit which was inspected and rejected was the last unit in production; the fact that CP&L inspected and rejected Air Handling Units AH-85, AH-86, AH-92, and AH-93 for numerous welding related deficiencies but did not initiate any reinspection of previously received Bahnson equipment; and last, the Corrective Action Report Form only addressed "Preventative Measures", not corrective action, which assumes that all defects will be detected on the first piece of equipment inspected.

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

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

Report No.: 50-400/84-05

Docket No.: 50-400

Licensee: Carolina Power & Light Company
411 Fayetteville Street
Raleigh, North Carolina 27602

Facility Name: Shearon Harris Nuclear Power Plant (SHNPP), Unit 1

Inspection at: Shearon Harris Nuclear Power Plant, New Hill, North Carolina

Inspection Conducted: February 6 to February 10, 1984

Inspectors: E. T. Baker
E. T. Baker, Reactor Construction Engineer, IE (Team Leader) — 4/2/84 Date Signed

E. T. Baker for
D. Norman, Mechanical Engineer, IE — 4/2/84 Date Signed

E. T. Baker for
W. P. Kleinsorge, Metallurgical Engineer, Region II — 4/2/84 Date Signed

Approved by: O. Zola
~~for~~ Uldis Potapovs, Chief
Vendor Program Branch
Division of Quality Assurance, Safeguards,
and Inspection Programs
Office of Inspection and Enforcement

Inspection Summary: Inspection on February 6 to February 10, 1984.

Areas Inspected: This announced inspection involved 88 inspection hours onsite in the areas of licensee implementation of the SHNPP quality assurance program with respect to The Bahnson Company (HVAC equipment supplier) and the Heating, Ventilating, and Air Conditioning (HVAC) equipment supplied by The Bahnson Company installed in the field.

Results: In the areas examined two potential enforcement actions were identified and were provided to Region II for appropriate action; one potential enforcement action was found in the area of adequate corrective action and the other was for failure to control purchased equipment. Both potential enforcement actions are based on a failure to identify and correct nonconforming conditions on HVAC equipment.

DETAILS

1. Persons Contacted

Carolina Power & Light (CP&L)

N. J. Chiangi, Harris Plant QA/QC Manager
*D. Deal, Engineering
*G. L. Forehand, Director QA/QC
*P. Foscolo, Assistant General Project Manager
*E. M. Harris, Jr., Principle Mechanical Engineer
*K. V. Hate', Principle QA Engineer
J. Hooks, Engineering
*T. W. Johnson, Resident Engineer, HVAC
L. I. Loflin, Manager, Engineering
*D. A. McGaw, Superintendent - QA
*G. R. Osman, Principle QA/QC Specialist - NDE
*R. M. Parson, Project General Manager
W. Pere, Welding Inspector
J. Pierce, Engineering
*A. H. Rager, Resident Engineer - Hangers
*L. Rowell, Engineering
*G. M. Simpson, Principle Construction
*R. A. Stewart, Project Engineer
*M. F. Thompson, Jr., Principle Mechanical Engineer
*M. D. Vernon, Superintendent - QC
*R. A. Watson, Vice President - Harris Nuclear Project

Daniel Construction Company (DCC)

*W. D. Goodman, Project Manager

Westinghouse W

*B. Blevins, Engineering

USNRC

*J. J. Blake, Section Chief, Region II
*G. F. Maxwell, Senior Resident - Operations
*R. L. Prevatte, Senior Resident - Construction

*denotes attendees at exit meeting February 10, 1984.

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

2. Exit Interview

The inspection scope and findings were summarized on February 10, 1984, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and described in detail the inspection findings listed below.

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

3. Licensee Action on Previous Inspection Findings

Not applicable.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are violations or deviations. Unresolved items are discussed in paragraphs 5.d.(1), 5.d.(2), 6.a.(1), and 6.c.(1).

5. Heating, Ventilating, and Air Conditioning (HVAC) Air Cleaning Units

The inspectors performed detailed inspections of six safety related HVAC Air Cleaning Units manufactured by The Bahnson Company for CTI-Nuclear (CTIN) to be supplied to Carolina Power and Light (CP&L). The inspections as indicated below, were conducted using criteria established to the applicable Ebasco Specification (CAR-SH-BE-31), CTIN Drawings, Seismic Qualification Reports, and CP&L drawings, to determine whether the fabrication, receiving inspection, handling, and storage were consistent with applicable drawings, procedures, specifications and regulatory requirements. All the Air Cleaning Units had been accepted by CP&L.

a. Welding (Visual Inspection)

The inspectors made a visual examination of selected welds on the below listed units relative to the following: location, length, size and shape; weld surface finish and appearance; transitions between different wall thicknesses; weld reinforcement -- height and appearance; joint configuration of permanent attachments and structural supports; removal of temporary attachments; arc strikes and weld spatter; finish-grinding of machining of weld surface -- surface finish and absence of wall thinning; surface defects -- cracks, laps, and lack of penetration, lack of fusion, porosity, slag, oxide film and undercut exceeding prescribed limits.

Identification	System and Type
1A - SA	HVAC Air Cleaning Unit E-6
1B - SB	HVAC Air Cleaning Unit E-6
2A - SA	HVAC Air Cleaning Unit E-6
2B - SB	HVAC Air Cleaning Unit E-6
1A-SA-1B-SB	HVAC Air Cleaning Unit R-2
2A-SA-2B-SB	HVAC Air Cleaning Unit R-2

During the inspection the following conditions were observed:

(1) The weld requirements for attaching the High Energy Particulate Absorption (HEPA) filter rack (Item 2 on CTIN Drawing 32735A) to the unit housing are for a continuous fillet weld and an interrupted (2-10) flair bevel weld, (shown in Section C-C of the drawing).

Contrary to the above, both HEPA filter racks are attached to the unit housing with an intermittent (2-10) fillet weld and a continuous flair bevel weld. This condition existed on both R-2 units examined.

(2) The weld requirement for attaching Item 27 to Item 28, both 3" x 3" x 3/16" angle, on CTIN Drawing 32629 is a square bevel partial penetration butt, welded from both sides, (shown in section Z-Z of the drawing).

Contrary to the above, the welds attaching Item 27 to Item 28 are welded from one side only. This condition exists in four places on the 1B-SB E6 unit examined.

(3) The inspectors reviewed the documentation packages for the Air Cleaning Units to determine whether or not the nonconformances noted above had been documented and evaluated. There was no documentation to indicate that the nonconformances had ever been detected.

The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 1.

b. Welding (Liquid Penetrant Examination)

The inspectors selected a portion of a weld for reexamination that, fabrication records indicated, had been liquid penetrant examined by Bahnson as required by Ebasco specification CAR-SH-BE-31. This reexamination was made to determine whether the surface was suitable for liquid penetrant examination and acceptable to the applicable acceptance criteria.

The weld selected was a portion of the continuous flair bevel weld attaching the upstream HEPA filter rack to the top of the 2A-SA-2B-SB R2 unit housing. This examination was performed by a CP&L, Level II, liquid penetrant examiner, using the solvent removable method in accordance with CP&L Procedure 201 Revision 2. (This was the same type of liquid penetrant examination performed by Bahnson - color contrast, solvent removable.)

As a result of the liquid penetrant examination, the inspectors observed the following conditions:

(1) The surface was suitable for liquid penetrant examination.

(2) An area of lack of fusion at the toe of the weld between the weld and the HEPA filter rack was identified.

(3) An area of undercut at the fusion line between the weld and the HEPA filter rack was identified. Later measurement, by a CP&L welding inspector, revealed the undercut to be in excess of 1/64".

(4) Paragraph 16, of the HVAC Addendum A, to Ebasco Specification CAR-SH-BE-31, "Air Cleaning Units", prohibits any lack of fusion, and undercut in excess of 1/64". The inspectors reviewed the documentation packages for the Air Cleaning Units to determine whether or not the nonconformances noted in (2) and (3) above had been documented and evaluated. There was no documentation to indicate that the nonconformance had ever been detected.

The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

c. Bolting (Visual Inspection)

The inspectors made a visual examination of selected connections for appropriate fastener material type, size, traceability, and material.

No violations or deviations were found in this area.

d. Review of Quality Records

The inspectors reviewed the documentation packages for the 1A-SA-1B-SB and 2A-SA-2B-SB R-2 HVAC air cleaning units to determine conformance with procurement, storage, and fabrication specifications, and regulatory requirements. The review revealed the following conditions:

(1) Records for the liquid penetrant examination performed by Bahnson on July 16, 1982, and partially reexamined as described in paragraph c, above revealed the following statement:

> "Item 2 to housing, Typ. area, 100%, reject
> RW July 16, 1982, Repair Accept July 16, 1982."

It should be noted that there are two number 2 items installed in each R2 unit and there are welds on both the upstream and downstream sides of each item 2, attaching them (Item 2) to the u[illegible] housing, that require liquid penetrant examination, as specified by CTIN drawing 32735-A Section C C. At the time of this inspection, it could not be determined whether the above statement meant that all of the welds attaching all of the Item 2s to the

housing of the 2A-SA-2B-SB R-2 unit had been repaired or just some of them. The licensee indicated that they would investigate the above matter and make a determination as to the number of welds repaired. Pending NRC review of the licensee's investigation, this matter will be identified as unresolved item 400/84-05-01: "HVAC Weld Repairs."

(2) The 2A-SA-2B-SB R2 unit was subjected to a vigorous receipt inspection by CP&L which resulted in the issuance of DDR-1053. DDR-1053 accepted "as-is" all weld defects including two cracks, on the 2A-SA-2B-SB R2 unit. At the time of this inspection the licensee could not provide a justification for leaving the two cracks uncorrected in the unit. Pending resolution of the above issue this matter will be identified as unresolved item 400/84-05-02: "Cracks in R2 HVAC Unit."

(3) The "Preventative Measures" block of the Corrective Action Report for DDR-1053 was marked "NA", Not Applicable, with an accompanying note which stated that preventative measures were not applicable because the Air Cleaning Unit inspected and rejected was the last unit in production. No reinspection of previously received units of Bahnson equipment was initiated. The inspectors informed CP&L management that failure to perform adequate corrective action is contrary to 10 CFR 50, Appendix B, Criterion XVI, as implemented by CP&L PSAR section 1.8.5.16. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 2.

6. Heating, Ventilating, and Air Conditioning (HVAC) Air Handling Units

The inspectors performed detailed inspections of 17 of the 47 safety related HVAC Air Handling Units manufactured by The Bahnson Company for CP&L's Shearon Harris Project. The inspections were conducted using criteria established in the applicable Ebasco Specification (CAR-SH-BE-08), Bahnson Drawings (drawing only available for four units), and Seismic Qualification Reports to determine whether the fabrication, receiving inspection, handling and storage were consistent with applicable drawings, procedures, specifications and regulatory requirements. All the Air Handling Units inspected had been accepted by CP&L.

a. Welding (Visual Inspection)

The inspectors made a visual examination of accessible welds on the below listed units relative to the following: location, length, size, and shape; weld surface finish and appearance; weld reinforcement-height and appearance; joint configuration of permanent attachments and structural supports; arc strikes and weld splatter; finish grinding or machining of weld surface - surface finish and absence of wall thinning; surface defects - cracks, laps, lack of penetration, lack of fusion, porosity, slag and undercut exceeding prescribed limits. During the inspection the following conditions were observed:

Identification	Defect Description
AH-5 (1A-SA)	Missing floor to frame welds, missing weld on cooling coil frame
AH-5 (1B-SB)	Lack of fusion, burn through on side panel frames
AH-6 (1A-SA)	None
AH-7 (1A-SA)	Crack in skin to frame weld; weld craters, lack of fusion, burn through, overlap in skin to frame welds and side panel frames
AH-15 (2A-SA)	No weld symbol on drawing for skin to cooling coil frame channel stitch weld
AH-17 (1-4A-SA)	Stitch fillet weld on fan housing did not extend to end of joint, end weld less than 2" long, lack of fusion, insufficient weld reinforcement, unconsumed weld rod protruding from weld joint, tack welds not removed or incorporated into final weld in panel frame welds and skin to frame welds
AH-17 (1-4B-SB)	In addition to nonconformances noted under AH-17 (1-4A-5A), floor panel joints were mismatched, roof skin to cooling coil frame welds were corroded, one fan housing anchor bolt missing, and 7 cooling coil mounting bolts were an incorrect material
AH-19 (1A-SA)	Missing nut on coiling coil mounting bolt, missing cooling coil mounting bolt
AH-19 (1B-SB)	Missing welds on side panel framing
AH-20 (1A-SA)	None
AH-20 (1B-SB)	None
AH-25 (1X-SB)	Missing welds on cooling coil frame and side panel frames, undercut and lack of fusion on skin to frame welds, missing side panel frame welds, missing cooling coil mounting bolts
AH-28 (1A-SA)	Lack of fusion, weld craters in side panel frames and skin to frame welds, pitch on stitch weld more than 10" center to center
AH-28 (1B-SB)	Missing 2 welds on cooling coil channel
AH-29	Missing side panel frame welds, missing cooling coil mounting bolts, skin to frame welds less than 2" long

Identification	Defect Description
AH-85 (1A-SA)	None

(1) The Bahnson Company considers their drawings proprietary information and therefore CP&L did not have copies of the drawings. CP&L did request that The Bahnson Company supply drawings for three units selected by the NRC inspectors, units AH-15, AH-28, and AH-85. The remaining units were inspected for weld location and joint design based on typical weld details contained on the drawings for units AH-15, AH-28, and AH-85. At the time of this inspection, it could not be determined, except for units AH-15, AH-28, and AH-85, with 100% confidence that the welds listed as missing in the remaining units were required by the drawings for the specific unit. However, the welds listed as missing on side panel frames were typically required to be welded all the way around and were actually only welded on two or three sides. The licensee indicated that they would investigate the above matter and make a determination as to the number and location of missing welds. Pending NRC review of the licensee's investigation, this matter will be identified as unresolved item 400/84-05-03: "Missing HVAC Welds", except for those welds found missing on Unit AH-28 (1B-SB) [see para. 6.a.(3)].

(2) Inspection of weld quality was based on Ebasco Specification CAR-SH-BE-05, Addendum A, "Quality Assurance Requirements for Nuclear Safety Related HVAC Equipment", which invokes AWS D1.1 and specifically prohibits cracks, craters, lack of fusion, and undercut which exceeds 1/64". As noted in the listing above there were seven Air Handling Units which did not meet the acceptance criteria for welds.

(3) The inspectors reviewed the documentation packages for the Air Handling Units to determine whether or not the missing welds in Unit 28 (1B-SB) and the weld quality nonconformances in the other units had been documented and evaluated. There was no documentation to indicate the nonconformances had ever been detected. The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

b. Bolting (Visual Examination)

(1) The inspectors made a visual examination of selected connections for appropriate fastener material type, size, and material traceability. One instance of substituting carbon steel bolts for stainless steel bolts and four

instances of missing fastener hardware were discovered by the inspectors.

(2) The inspectors informed CP&L management that failure to identify nonconforming bolted connections and fastener materials in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

c. Review of Quality Records

(1) The inspectors reviewed the Ebasco procurement specification, Bahnson general arrangement drawing and Bill of Material (BOM) for unit AH-17 (1-4A-SA) to establish material requirements. The Certified Material Test Reports (CMTR) or Certificates of Compliance (COC) supplied with the documentation package for the unit were then compared with the material requirements. The review revealed the following conditions:

(a) The BOM and procurement specification were inconsistent on material requirements in the following areas:

- Interior Casing (Fan and Coil Sections) Specification required 20ga ASTM A240, Type 304. The BOM specified 20ga 304 stainless steel with no ASTM designation.

- Floor (Coil and Fan Sections) Specification required 20ga ASTM A240, Type 304. The BOM specified 10 ga 304 stainless steel with no ASTM designation.

- Drain Pan Liner Specification required 10ga ASTM A240, Type 304. The BOM specified 20ga stainless steel with no ASTM designation.

(b) The following questions or inconsistencies resulted from reviewing the data package:

- An Edcomb Metals COC was for 18-8 Type 304 stainless steel with no ASTM designator.

- No material CMTR's or COC's were provided for the fan housing which was supplied by Westinghouse and required to be ASTM A283.

- COC's or CMTR's for the following materials, specified in the BOM could not be found;

Unit Casing Exterior - 14ga ASTM A366

Interior Casing in fan and coil sections - 20ga Type 304 stainless steel

Drain Pan Liner - 20ga Type 304 stainless steel

- The Ebasco release for shipment report was signed and stated that there were no special conditions and deviations from purchase contract; however, there was an open DDR (No. 80-0070) and attached correspondence permitting shipment with open documentation and without fan motors.

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, this matter will be identified as unresolved item 400/84-05-04: "Material Substitutions".

(2) CP&L instituted a 100% receipt inspection at the Shearon Harris Plant site in approximately September 1982. Bahnson supplied air handling units AH-85, AH-86, AH-92, and AH-93 were received after the institution of the 100% receipt inspection program. The inspectors reviewed the CP&L receipt inspection reports and accompanying deficiency documentation reports. CP&L had rejected all the units for a combination of nonconforming weld quality, weld joint configuration, and missing welds. At the time of the inspection, Units AH-85, AH-86, and AH-93 had already been repaired and accepted by CP&L. However, CP&L had not performed any kind of reinspection on air handling units received prior to instituting the 100% receipt inspection.

The inspectors informed CP&L management that failure to perform adequate corrective action is contrary to 10 CFR 50, Appendix B, Criterion XVI, as implemented by CP&L PSAR section 1.8.5.16. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 2.

(3) The inspectors reviewed reports of Ebasco facility evaluations and Bahnson commitment to corrective actions to cited deficiencies for 1977, 1978, 1980, and 1983. The review revealed the following conditions:

The corrective actions committed to by Bahnson indicated a lack of adequate measures to prevent recurrence of the problems; however, most commitments were never questioned by Ebasco and there was no evidence that Ebasco performed followup to review implementation of corrective action until the next facility evaluation was performed. The following areas of Bahnson's QA program were repetitively cited by Ebasco and reflects a lack of adequate corrective action by Bahnson and a lack of vendor control by Ebasco:

- Failure to maintain adequate vendor program control for nuclear suppliers

- Failure to maintain adequate controls of procedures and personnel relating to performance of the quality function including NDE.

This is an example of the findings which led to Potential Enforcement Action 2.

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. Ebasco specification CAR-SH-BE-08
2. Addendum A to CAR-SH-BE-08
3. Ebasco specification CAR-SH-BE-31
4. Addendum A to CAR-SH-BE-31
5. Seismic Qualification Report 9Q-BE-08-20-S1
6. Seismic Qualification Report 9Q-BE-08-20-S1B1
7. Seismic Qualification Report 9Q-BE-08-20-S1B2
8. Documentation Package for AH-5 (1A-SA) and (1B-SB)
9. Documentation Package for AH-15 (2A-SA)
10. Documentation Package for AH-17 (1-4A-SA) and (1-4B-SB)
11. Documentation Package for AH-85 (1A-SA)
12. Documentation Package for AH-93
13. Documentation Package for R2 (1A-SA-1B-SB)
14. Documentation Package for R2 (2A-SA-2B-SB)
15. CTIN Drawing 32735A
16. CTIN Drawing 32629
17. Bahnson Drawings for AH-15, AH-28, and AH-85
18. Bahnson WPS GMI-1/2/3
19. Bahnson WPS GM8-1/2
20. Bahnson WPS GT 1-1
21. Bahnson WPS GT 8-4
22. Bahnson WPS SMI-6/7/8
23. Reports for Ebasco Facility Evaluation at Bahnson for years 1977, 1978, 1980, and 1983
24. Drawing 2728-1-7 (Air Handling Unit AH-17)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

South Carolina Electric and Gas Company
ATTN: Mr. O. W. Dixon, Jr.
Vice President, Nuclear Operations
P. O. Box 764 (Mail Code F-04)
Columbia, SC 29218

Gentlemen:

SUBJECT: REPORT NO. 50-395/84-06

On March 6, 1984, NRC inspected activities authorized by NRC License No. NPF-12 for your Summer facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in NRC's Public Document Room unless you notify this office by telephone within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of the letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this letter, please contact us.

Sincerely,

David M. Verrelli, Chief
Project Branch 1
Division of Project and
Resident Programs

Enclosure:
Inspection Report No. 50-395/84-06

cc: (See page 2)

Dupe
8404170418

cc w/encl:
O. S. Bradham, Director, Nuclear Plant
Operations
B. G. Croley, Group Manager
Technical & Support Services
D. A. Lavigne,
Associate Manager, QA
J. B. Knotts, Jr.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-395/84-06

Licensee: South Carolina Electric and Gas Company
Columbia, SC 29218

Docket No.: 50-395

License No.: NPF-12

Facility Name: Summer

Inspection at SCE&G Corporate Headquaters in Columbia, South Carolina

Inspector: _____ March 15, 1984
W. P. Kleinsorge Date Signed

Approved by: _____ 3/16/84
J. F. Blake, Section Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on March 6, 1984

Areas Inspected

This special, announced inspection involved 9 inspector-hours at SCE&G headquarters in the areas of heating ventilating and air conditioning (HVAC).

Results

No violations or deviations were identified.

Dupe
8404170422

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*O. W. Dixon, Vice President - Nuclear Operations
*D. A. Nauman, Director Nuclear Services
*D. R. Moore, Group Manager Quality Services
*F. J. Leach, QA Manager
*P. V. Fant, QC Manager
*T. Frady, Assoc. Manager Procurement Systems
*T. A. McAlister, QA Supervisor

Other licensee employees contacted included office personnel.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 6, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Inspector Followup Item 395/84-06-01: "Piedmont Welding Materials" - paragraph 5b(1)

(Open) Inspector Followup Item 395/84-06-02: "Applicable Code Addenda" - paragraph 5b(2)

(Open) Inspector Followup Item 395/84-06-03: "Unclear Filler Material Type" - paragraph 5b(3)

(Open) Inspector Followup Item 395/84-06-04: "Unavailable WQTR" - paragraph 5b(4)

(Open) Inspector Followup Item 395/84-06-05: "Welder Qualification Position Restriction Control" - paragraph 5b(5)

(Open) Inspector Followup Item 395/84-06-06: "Welding Filler Material Issue Control" - paragraph 5b(6)

(Open) Inspector Followup Item 395/84-06-07: "Vendor Evaluation and Receiving Inspection Procedures" - paragraph 5b(7)

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Heating, Ventilating and Air Conditioning (HVAC)

The purpose of this special 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, and the Harris site (NRC Region II Report No. 50-400/84-05). The inspector performed detailed inspections involving safety-related HVAC air handling units manufactured by the Bahnson Company. The inspections as indicated below, were conducted using criteria established in the applicable Gilbert and Associates, Inc. (GAI) Specification, Bill of Materials, SCE&G Procedures, and Bahnson drawings, to determine whether the fabrication, receiving inspection, handling, and storage were consistent with applicable drawings, procedures specifications and regulatory requirements.

a. Unit Identification

There are 21 nuclear safety-related air handling units and 10 non nuclear safety air handling units manufactured by the Bahnson Company at their Winston Salem Plant installed and operating at the Summer site. The following is a list of the safety-related units:

SAFETY-RELATED UNITS

UNIT ID	DESCRIPTION
XAH-1A-VL	Charging/SI Pump Room #1 Cooling Unit
XAH-1B-VL	Charging/SI Pump Room #3 Cooling Unit
XAH-2-VL	Charging/SI Pump Room #2 Cooling Unit
XAH-4A-VL	RHR/Spray Pump Room #1 Cooling Unit
XAH-4B-VL	RHR/Spray Pump Room #2 Cooling Unit
XAH-6-VL	ESF Swg. Room/DA Cooling Unit
XAH-8-VL	ESF Swg. Room/DB Cooling Unit
XAH-9A-VL	Service Water Booster Pump Area Cooling Unit
XAH-9B-VL	Service Water Booster Pump Area Cooling Unit
XAH-11A-VL	Emergency Feedwater Pump Area Cooling Unit
XAH-1113-VL	Emergency Feedwater Pump Area Cooling Unit
XAH-12A-AH	Control Room Cooling Unit
XAH-12B-AH	Control Room Cooling Unit
XAH-13A-AH	Relay Room Cooling Unit
XAH-13B-AH	Relay Room Cooling Unit
XAH-19A-VL	Speed Switch Room Cooling Unit
XAH-19B-VL	Speed Switch Room Cooling Unit
XAH-24A-AH	Battery Room Supply Unit
XAH-24B-AH	Battery Room Supply Unit
XAH-32-VL	Motor Control Center Cooling Unit
XAH-33-VL	Switchgear Room 63-01 Cooling Unit

b. Review of Quality Records

The inspector selected for review the following units: XAH-11A-VL, XAH-2-VL, XAH-32-VL and XAH-2413-AH. This inspection was performed to determine compliance with procurement, storage, fabrication specification, and regulatory requirements. The below listed documents were examined. The applicable code for fabrication of the units was AWS D1.1-75 with revision 1-76, Welder and Procedure Qualification was required to be in accordance with ASME B and PV Code Section IX 74W75.

Documents Examined

Gilbert and Associates Inc. (GAI) Bill of Materials SM-22 For Heating, Ventilating, Air Conditioning and Air Handling Systems - dated February 10, 1977, October 24, 1977 and November 29, 1978

GAI Specification SP-622-044461-000 dated March 1, 1976 "Air Handling Units"

SCE&G Certificates of Inspection for All Receiving Inspections of the Safety Related Units

SCE&G Material Receiving Report for All Safety Related Units

Bahnson Document Package for XAH-11A-VL, XAH-2-VL, XAH-32 -VL, and XAH-24B-AH

With regard to the above inspection the inspector noted the following:

(1) All the welding filler material used in the fabrication of the four units, represented by the document packages examined, was provided by Piedmont Welding Supply Company of Charlotte, North Carolina, and none of certified material test reports for that material contained tensile test results. This fact is documented and accepted in GAI Deviation/Change Request No. CWR-9. At the time of this inspection it could not be determined whether any of the welding filler material used in any of the 21 safety-related units had documented tensile test reports. Further, it could not be determined whether SCE&G had audited Bahnson in the area of welding filler material procurement. The licensee indicated that they would look into this matter further. The above will be identified as Inspector Followup Item 395/84-06-01: "Piedmont Welding Material."

(2) The GAI Bill of Materials SM-22 specifies welds and brazing of cooling coils that require an "N" stamp shall be in accordance with ASME B and PV Code Section III Subsection ND 74W75. The Code N-1 form states that 74S76 is the applicable code for all four unit documentation packages examined. The licensee indicated that

they would look further into the matter. The above will be identified as Inspector Followup Item 395/84-06-02: "Applicable Code Addenda."

(3) The Welder Qualification Test Record (WQTR) for the 1G test for welder 3 and BL and the 3G test for welder BL indicate that Type E-70S filler material of SFA 5.18 was used for the qualification test. SFA 5.18 does not include a type 70S filler material. The licensee indicated that they would look into the matter further. This will be Inspector Followup Item 395/84-06-03: " Unclear Filler Material Type."

(4) Document Package XAH-2-AH indicated that welder "BS" welded on that unit. At the time of this inspection the Welder Qualification Test Records (WQTR) for "BS" could not be located. This matter will be identified as Inspector Followup Item 395/84-06-04: "Unavailable WQTR."

(5) The document packages indicated that none of Bahnson's welders were qualified in the 2G and 5G positions and only a portion of the welders were qualified in the 4F position. At the time of this inspection it could not be determined what controls, if any, Bahnson used to assure that welders only welded in positions for which they had qualified. The licensee indicated that they would look further into the matter. The above will be Inspector Followup Item 395/84-06-05: "Welder Qualification Position Restriction Control."

(6) The document packages examined indicated that the welders who checked out welding filler materials were not always the same welders that checked in that same material. At the time of this inspection it could not be determined whether Bahnson had adequate control of welding filler material issue. The licensee indicate that they would look further into the matter. The above will be Inspector Followup Item 395/84-06-06: "Welding Filler Material Issue Control."

(7) At the time of this inspection the appropriate revision of the SCE&G procedures that controlled vendor evaluation and receiving inspection for the 21 Bahnson units was not available. This will be Inspector Followup Item 395/84-06-07: "Vendor Evaluation and Receiving Inspection Procedures."

Within the areas examined no violations or deviations were identified.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

KLEINSORGE

MAR 20 1984

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-269/84-05, 50-270/84-05, AND 50-287/34-05

On March 5, 1984, NRC inspected activities authorized by NRC Operating License Nos. DPR-38, DPR-47, and DPR-55 for your Oconee facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in NRC's Public Document Room unless you notify this office by telephone within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of the letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this letter, please contact us.

Sincerely,

Hugh C. Dance

Hugh C. Dance, Chief
Project Branch 2
Division of Project and
Resident Programs

Enclosure:
Inspection Report Nos. 50-269-84-05,
50-270/84-05, and 50-287/84-05

cc w/encl:
M. S. Tuckman, Station Manager

Dupe

~~8404170032~~

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-269/84-05, 50-270/84-05, and 50-287/84-05

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-269, 50-270, and 50-287

License Nos.: DPR-38, DPR-47, and DPR-55

Facility Name: Oconee 1, 2, and 3

Inspection at Oconee site near Seneca, South Carolina

Inspector: _____ March 16, 1984
A. P. Kleinsorge Date Signed

Approved by: _____ 3/16/84
J. J. Blake, Chief Date Signed
Materials and Process Section
Engineering Inspection Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on March 5, 1984

Areas Inspected

This special, announced inspection involved seven inspector-hours on site in the areas of heating, ventilation and air conditioning (HVAC).

Results

No violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

*M. S. Tuckman, Station Manager
*R. J. Brackett, Senior QA Engineer
*R. T. Bond, Compliance Engineer
*J. W. Baggett, QA Specialist - Vendors
*T. C. Matthews, Compliance Technical Specialist

Other licensee employees contacted included office personnel.

NRC Resident Inspector

*D. P. Falconer

*Attended the exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 5, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Inspector Followup Item 269,270,287/84-05-01: "Unavailable Drawings and Stress Reports" paragraph 5b(1).

(Open) Inspector Followup Item 269, 270, 287/84-05-02: "Undetermined Weld Inspection Acceptance Criteria " paragraph 5b(2).

(Open) Inspector Followup Item 269, 270, 287/84-05-03: "Welding Filler Material Type" paragraph 5b(3).

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Heating, Ventilating and Air Conditioning (HVAC)

The purpose of this special 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, and the Harris Site (NRC Region II report No. 50-400/84-05). The inspector performed detailed inspections of safety-related HVAC air handling units manufactured by the Bahnson Company. The inspections as indicated below, were conducted using criteria established in the applicable Duke Specification, Duke procedures and Bahnson drawings, to determine whether the fabrication, receiving inspection, handling, and storage were consistent with applicable drawings, procedures specifications and regulatory requirements.

a. Unit Identification

There is one nuclear safety-related air handling unit installed at the Oconee site manufactured by the Bahnson Company at their Winston-Salem Plant. There are no non nuclear safety-related units. The Unit, Tag No. OSSF-1 AC, is the "Safe Shutdown Facility Self Contained Air Conditioning Unit." As the safe shut down facility is not yet operational the unit is not currently performing a nuclear safety-related function.

b. Review of Quality Records

The inspector reviewed the below listed documents to determine conformance with procurement, storage, and fabrication specification, and regulatory requirements.

Documents Examined

DPC-Specification No. OS-235-I "Safe Shutdown Facility Self Contained Air Conditioning Unit"

DPC-Recieving Inspection Reports dated August 29, 1981 and November 4, 1981

DPC-Purchase Order E-86095-74 dated August 22, 1979

Bahnson Document Package for Unit OSSF-1AC Shop Order No. 0188.

With regard to the inspection above the inspector noted the following:

(1) At the time of this inspection the drawings used for inspection by Bahnson, (2843-1-5 and 2843-1-6) and the stress report were not available. This will be inspector followup item 269, 270, 287/84-05-01: "Unavailable Drawings and Stress Report"

(2) ASME B and PV Code Section IX 1977 edition was identified as the applicable code for welder and welding procedure qualification. Specification OS-235-I does not specify a standard for fabrication or visual weld inspection acceptance criteria. The licensee indicated that the criteria may be specified in documents not available at the time of this inspection. This matter will be

identified as inspector followup item 269, 270, 287/84-05-02: "Undetermined Weld Inspection Acceptance Criteria."

(3) Welding Filler Material was supplied by Piedmont Welding Supply Company of Charlotte, N.C. The welding filler material used was type E-70S-3 heat No. 357944 and type N-101 heat No. 645225. At the time of this inspection it could not be determined what type N-101 was. This matter will be identified as inspector followup item 269, 270, 287/84-05-03: "Welding Filler Material Type."

Within the areas examined no violations or deviations were identified.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

MAR 23 1984

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-413/84-28 AND 50-414/84-16

On March 7 - 8, 1984, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-116 and CPPR-117 for your Catawba facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

The inspection findings indicate that certain activities violated NRC requirements. The violations, references to pertinent requirements, and elements to be included in your response are presented in the enclosed Notice of Violation.

Your attention is invited to unresolved items identified in the inspection report. These matters will be pursued during future inspections.

In accordance with 10 CFR 2.790(a), a copy of this letter, its enclosures, and your reply will be placed in NRC's Public Document Room upon completion of our evaluation of the reply. If you wish to withhold information contained therein, please notify this office by telephone and include a written application to withhold information in your response. Such application must be consistent with the requirements of 2.790(b)(1).

The responses directed by this letter and the enclosures are not subject to the clearance procedures of the Office of Management and Budget issued under the Paperwork Reduction Act of 1980, PL 96-511.

Should you have any questions concerning this letter, please contact us.

Sincerely,

R. C. Lewis

Richard C. Lewis, Director
Division of Project and
Resident Programs

Enclosures: (See page 2)

Dupe

8405300666

Enclosures:
1. Notice of Violation
2. Inspection Report Nos. 50-413/84-28 and 50-414/84-16

cc w/encls:
R. L. Dick, Vice President - Construction
J. W. Hampton, Station Manager

ENCLOSURE 1

NOTICE OF VIOLATION

Duke Power Company
Catawba

Docket Nos. 50-413, 50-414
License Nos. CPPR 116, 117

The following violation was identified during an inspection conducted on March 7 - 8, 1984. The Severity Level was assigned in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C).

10 CFR 50, Appendix B, Criterion VII as implemented by Duke Power Company (DPC) Topical Report "Duke 1-A", Section 17, Paragraph 17.1.7, requires measures be established to assure that purchased equipment conforms to procurement documents. DPC Specification CNS-1211.00-00-0010, "Control Room Area Engineered Safeguards Large Capacity Air Handling Units," Revision 9, Paragraph 10.4.d requires welder qualification certificates to be submitted with the shipment of the equipment. DPC specification CNS-1211.00-00-0010 and Purchase Order E-2157-21 requires the control room area air handling units to be fabricated in accordance with AWS D1.1-77, and The Bahnson Quality Program. The Bahnson Quality Program required that the control room area air handling units be examined for missing welds, welds with overlap undersize welds and undercut.

Contrary to the above, adequate measures were not established to assure that purchased equipment conformed to procurement documents, in that the following examples were noted relative to the accepted and installed control room area air handling units, Tag Nos. 1-CRA-AHU-1 and 2-CRA-AHU-1:

1. Welder qualification certificates were not submitted by the manufacturer. This fact was not identified by the licensee.

2. Numerous examples of missing welds, welds with overlap, undersized welds, and undercut were noted by the inspector and not identified by the licensee prior to installation.

This is a Severity Level IV violation (Supplement II).

Pursuant to 10 CFR 2.201, you are required to submit to this office within 30 days of the date of this Notice, a written statement or explanation in reply, including: (1) admission or denial of the alleged violations; (2) the reasons for the violations if admitted; (3) the corrective steps which have been taken and the results achieved; (4) corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown. Security or safeguards information should be submitted as an enclosure to facilitate withholding it from public disclosure as required by 10 CFR 2.790(d) or 10 CFR 73.21.

Date: MAR 23 1984

Dupe

~~8405300670~~

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-413/84-28 and 50-414/84-16

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: _____ March 16, 1984
W. P. Kleinsorge Date Signed

Approved by: _____ 3/16/84
J. J. Blake, Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on March 7-8, 1984

Areas Inspected

This special, announced inspection involved 15 inspector-hours on site in the areas of licensee actions on previous enforcement matters, and heating ventilating and air conditioning (HVAC).

Results

Of the two areas inspected, no violations or deviations were identified in one area; one apparent violation was found in one area (Violation - "Failure to Establish Adequate Procurement Controls" - paragraphs 5b(1) and 5d). No deviations were found.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. L. Dick, Vice President, Construction
*T. B. Bright, Construction Engineering Manager
*W. O. Henry, QA Manager Tech. Services
*J. W. Baggett, QA - Vendors
*P. White, Design Engineering
*J. C. Shropshire, QA
*T. H. Propst, Construction Technician
*D. P. Hensley, QC Technician

Other licensee employees contacted included construction craftsmen, technicians, and office personnel.

NRC Resident Inspectors

*P. K. VanDoorn
P. H. Skinner

*Attended the exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 8, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Violation 50-413/84-28-01, 414/84-16-01: "Failure to Establish Adequate Procurement Controls" - paragraphs 5b(1) and 5d.

(Open) Unresolved Item 50-413/84-28-02: "Air Handler Structural Integrity" - paragraph 5b(2).

(Open) Unresolved Item 50-413/84-28-03, 414/84-16-03: "Filter Frame Rivets" - paragraph 5c.

3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item 413/82-15-02 and 414/83-12-02: "Column Bearing" This item concerns reduced column bearing due to welding operations. The inspector discussed the above with the licensee, who demonstrated to the satisfaction of the inspector that the reduced bearing area resulted from welding. The licensee provided calculations to demonstrate that the reduced bearing area was consistent with the original design parameters. The inspector had no further questions. This matter is considered closed.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraphs 5b(2) and 5c.

5. Heating, Ventilating and Air Conditioning (HVAC)

The purpose of this special inspection was to follow-up on deficiencies noted during a NRC vendor inspection of the Bahnson Company (inspection report number 99900791/82-01), a heating, ventilation, and air conditioning (HVAC) component supplier, and the Harris Site (NRC Region II Report No. 50-400/84-05). The inspector performed detailed inspections of safety-related HVAC air handling units manufactured by the Bahnson Company. The inspections as indicated below, were conducted using criteria established in the applicable Duke Specification, Duke Procedures, Seismic Qualification Reports, and Bahnson drawings, procedures specifications and regulatory requirements. The applicable code for the fabrication of the units examined is AWS D1.1-77. ASME Section IX was identified as the applicable code for welder and welding procedure qualification.

a. Unit Identification

There are two nuclear safety-related air handling units installed at the Catawba Site manufactured by the Bahnson Company at their Winston-Salem Plant. There are no non nuclear safety-related units. The units, Tag Nos. 1-CRA-AHU-1 and 2-CRA-AHU-1 are the "Control Room Area Engineering Safeguards Large Capacity Air Handling Units." These units are installed and have been turned over to steam production.

b. Visual Inspection (Welding)

The inspectors made a visual examination of selected welds on the above accepted and installed units relative to the following: location, length, size and shape; weld surface finish and appearance; transitions between different wall thicknesses; weld reinforcement -- height and appearance; joint configuration of permanent attachments and structural supports; removal of temporary attachments; arc strikes and weld spatter; finish grinding or machining of weld surface -- surface finish and absence of wall thinning; surface defects -- cracks, laps, and lack of penetration, lack of fusion, porosity, slag, oxide film and undercut exceeding prescribed limits.

(1) With regard to the above inspection the inspector noted numerous examples of missing welds, welds with overlap, undersized welds, and undercut. This is contrary to, DPC Specification CNS-1211.00-00-0010, "Control Room Area Engineered Safeguards Large Capacity Air Handling Units," Revision 9, which requires the

control room area air handling units to be fabricated in accordance with AWS D1.1-77 and the Bahnson Quality Program. The Bahnson Quality Program required that the control room area air handling units be examined for missing welds, welds with overlap, undersize welds, and undercut.

Therefore, equipment was inspected, accepted and installed without detecting the fact that material did not conform to specification requirements.

This is an example of Violation 413/84-28-01 and 414/84-16-01 discussed further in paragraph 5d.

(2) With regard to the inspection above the inspector noted a flame cut hole in roof support angle beam of the Unit I air handler. At the time of this inspection, it could not be determined whether the above condition denigrated the structural integrity below design limits. The licensee indicated that they would evaluate the above condition. The inspector stated, pending NRC review of the licensee's evaluation the above matter would be identified as unresolved item 413/84-28-02: "Air Handler Structural Integrity."

c. Visual Examination (Bolting)

The inspector made a visual examination of selected connections for appropriate fastener material type, size, material and traceability.

With regard to the inspection above the inspector noted the following:

- The location of filter frame rivets, in some cases, were different than shown on Bahnson Drawing 2682-18-4 (four on each vertical side and three on each horizontal side).
- One missing filter frame rivet
- Numerous rivets installed without washers
- The bill of materials on all drawings examined only listed 3/16-inch diameter rivets. The Seismic Qualification Report for the units in question assumed 1/4-inch diameter stainless steel mandrel G-51 rivets in the filter frame. At the time of this inspection it could not be determined whether the installed rivets were 3/16-inch or 1/4-inch diameter.

The inspector discussed the above with the licensee who indicated they would determine the significance of the missing rivet and missing washers, and determine the actual size and of the installed rivets. The inspector stated that pending NRC review of the licensee's evaluation this matter will be identified as unresolved item 413/84-28-03, 414/84-16-03: "Filter Frame Rivets."

d. Review of Quality Records

The inspector reviewed the document packages for the two control room area air handling units to determine conformance with procurement, storage, and fabrication specifications, and regulatory requirements. The following Documents were examined:

Documents Reviewed

DPC-Specification No. CNS-1211.00-10, Revision 9, "Control Room Area Engineered Safeguards Large Capacity Air Handling Units"

DPC Purchase Order No. 2157

DPC Letter of April 9, 1979

DPC Vendor Surveillance Reports dtd.
December 11, 1978
May 18, 1979
February 21, 1980

DPC-Receiving Inspection Report

Bahnson Drawings
2682-18-1 Rev. 1
2682-18-2 Rev. 2
2682-18-3 Rev. 3
2682-18-4 Rev. 3
2682-18-5 Rev. 4
2682-18-6 Rev. 1
2682-18-7 Rev. 2
2682-18-8 Rev. 2
2682-18-9 Rev. 2
2682-18-10 Rev. 4

With regard to the above inspection the inspector determined that the licensee had accepted and installed the control room area air handling units and the associated documentation packages without Welder Qualification Certificates.

The above is contrary to, DPC Specification CNS-1211.00-00-0010, "Control Room Area Engineered Safeguards large capacity air handling units," Revision 9, paragraph 10.4.d which requires welder qualification certificates to be submitted with the shipment of the equipment.

The above failure of receiving inspection document review to identify a violation of specification requirements combined with the example of acceptance of nonconforming equipment discussed in paragraph 5b(1) indicates that the licensee had not established adequate measures to assure purchased equipment conformed to procurement documents. Failure to establish adequate controls for the purchase of material is in violation of 10 CFR 50, Appedix B Criteria VII. This violation will be

identified as 413/84-28-01, 414/84-16-01: "Failure To Establish Adequate Procurement Controls."

Within the areas examined no violations or deviations were identified except as noted in paragraphs 5b(1) and 5d.

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: _____ 1/31/84
E. W. Merschoff, Sr. Reactor Construction Engineer (Team Leader) — Date Signed

_____ 1/31/84
E. Baker, Reactor Construction Engineer, IE — Date Signed

For _____ 1/31/84
D. Norman, Mechanical Engineer, Region IV — Date Signed

Approved by: _____ 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 96 inspection-hours onsite.

Results: No violations were identified.

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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. Papadopoli, Supervisor Construction Quality Assurance
*J. Putnam, Sr. Engineer NUSCO Project
*R. Vogel, Asst. Project Engineer

Stone and Webster 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 Aerofin 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 ¼" 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 ½" 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 permanant 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 1/28/31
16. SWEC Audit of Bahnson dated 3/1/82 and Corrective Actions
17. SWEC Spec #2716.430-648
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 El 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-88545
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-I
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)

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

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

Report No.: 50-400/84-05

Docket No.: 50-400

Licensee: Carolina Power & Light Company
411 Fayetteville Street
Raleigh, North Carolina 27602

Facility Name: Shearon Harris Nuclear Power Plant (SHNPP), Unit 1

Inspection at: Shearon Harris Nuclear Power Plant, New Hill, North Carolina

Inspection Conducted: February 6 to February 10, 1984

Inspectors: E. T. Baker — 4/2/84
E. T. Baker, Reactor Construction Engineer, IE (Team Leader) — Date Signed

E. T. Baker for — 4/2/84
D. Norman, Mechanical Engineer, IE — Date Signed

E. T. Baker for — 4/2/84
W. P. Kleinsorge, Metallurgical Engineer, Region II — Date Signed

Approved by: [signature]
~~for~~ Uldis Potapovs, Chief
Vendor Program Branch
Division of Quality Assurance, Safeguards,
and Inspection Programs
Office of Inspection and Enforcement

Inspection Summary: Inspection on February 6 to February 10, 1984.

Areas Inspected: This announced inspection involved 88 inspection hours onsite in the areas of licensee implementation of the SHNPP quality assurance program with respect to The Bahnson Company (HVAC equipment supplier) and the Heating, Ventilating, and Air Conditioning (HVAC) equipment supplied by The Bahnson Company installed in the field.

Results: In the areas examined two potential enforcement actions were identified and were provided to Region II for appropriate action; one potential enforcement action was found in the area of adequate corrective action and the other was for failure to control purchased equipment. Both potential enforcement actions are based on a failure to identify and correct nonconforming conditions on HVAC equipment.

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DETAILS

1. Persons Contacted

Carolina Power & Light (CP&L)

N. J. Chiangi, Harris Plant QA/QC Manager
*D. Deal, Engineering
*G. L. Forehand, Director QA/QC
*P. Foscolo, Assistant General Project Manager
*E. M. Harris, Jr., Principle Mechanical Engineer
*K. V. Hate', Principle QA Engineer
J. Hooks, Engineering
*T. W. Johnson, Resident Engineer, HVAC
L. I. Loflin, Manager, Engineering
*D. A. McGaw, Superintendent - QA
*G. R. Osman, Principle QA/QC Specialist - NDE
*R. M. Parson, Project General Manager
W. Pere, Welding Inspector
J. Pierce, Engineering
*A. H. Rager, Resident Engineer - Hangers
*L. Rowell, Engineering
*G. M. Simpson, Principle Construction
*R. A. Stewart, Project Engineer
*M. F. Thompson, Jr., Principle Mechanical Engineer
*M. D. Vernon, Superintendent - QC
*R. A. Watson, Vice President - Harris Nuclear Project

Daniel Construction Company (DCC)

*W. D. Goodman, Project Manager

Westinghouse W

*B. Blevins, Engineering

USNRC

*J. J. Blake, Section Chief, Region II
*G. F. Maxwell, Senior Resident - Operations
*R. L. Prevatte, Senior Resident - Construction

*denotes attendees at exit meeting February 10, 1984.

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

2. Exit Interview

The inspection scope and findings were summarized on February 10, 1984, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and described in detail the inspection findings listed below.

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

3. Licensee Action on Previous Inspection Findings

Not applicable.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are violations or deviations. Unresolved items are discussed in paragraphs 5.d.(1), 5.d.(2), 6.a.(1), and 6.c.(1).

5. Heating, Ventilating, and Air Conditioning (HVAC) Air Cleaning Units

The inspectors performed detailed inspections of six safety related HVAC Air Cleaning Units manufactured by The Bahnson Company for CTI-Nuclear (CTIN) to be supplied to Carolina Power and Light (CP&L). The inspections as indicated below, were conducted using criteria established to the applicable Ebasco Specification (CAR-SH-BE-31), CTIN Drawings, Seismic Qualification Reports, and CP&L drawings, to determine whether the fabrication, receiving inspection, handling, and storage were consistent with applicable drawings, procedures, specifications and regulatory requirements. All the Air Cleaning Units had been accepted by CP&L.

a. Welding (Visual Inspection)

The inspectors made a visual examination of selected welds on the below listed units relative to the following: location, length, size and shape; weld surface finish and appearance; transitions between different wall thicknesses; weld reinforcement -- height and appearance; joint configuration of permanent attachments and structural supports; removal of temporary attachments; arc strikes and weld spatter; finish-grinding of machining of weld surface -- surface finish and absence of wall thinning; surface defects -- cracks, laps, and lack of penetration, lack of fusion, porosity, slag, oxide film and undercut exceeding prescribed limits.

Identification	System and Type
1A - SA	HVAC Air Cleaning Unit E-6
1B - SB	HVAC Air Cleaning Unit E-6
2A - SA	HVAC Air Cleaning Unit E-6
2B - SB	HVAC Air Cleaning Unit E-6
1A-SA-1B-SB	HVAC Air Cleaning Unit R-2
2A-SA-2B-SB	HVAC Air Cleaning Unit R-2

During the inspection the following conditions were observed:

(1) The weld requirements for attaching the High Energy Particulate Absorption (HEPA) filter rack (Item 2 on CTIN Drawing 32735A) to the unit housing are for a continuous fillet weld and an interrupted (2-10) flair bevel weld, (shown in Section C-C of the drawing).

Contrary to the above, both HEPA filter racks are attached to the unit housing with an intermittent (2-10) fillet weld and a continuous flair bevel weld. This condition existed on both R-2 units examined.

(2) The weld requirement for attaching Item 27 to Item 28, both 3" x 3" x 3/16" angle, on CTIN Drawing 32629 is a square bevel partial penetration butt, welded from both sides, (shown in section Z-Z of the drawing).

Contrary to the above, the welds attaching Item 27 to Item 28 are welded from one side only. This condition exists in four places on the 1B-SB E6 unit examined.

(3) The inspectors reviewed the documentation packages for the Air Cleaning Units to determine whether or not the nonconformances noted above had been documented and evaluated. There was no documentation to indicate that the nonconformances had ever been detected.

The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 1.

b. Welding (Liquid Penetrant Examination)

The inspectors selected a portion of a weld for reexamination that, fabrication records indicated, had been liquid penetrant examined by Bahnson as required by Ebasco specification CAR-SH-BE-31. This reexamination was made to determine whether the surface was suitable for liquid penetrant examination and acceptable to the applicable acceptance criteria.

The weld selected was a portion of the continuous flair bevel weld attaching the upstream HEPA filter rack to the top of the 2A-SA-2B-SB R2 unit housing. This examination was performed by a CP&L, Level II, liquid penetrant examiner, using the solvent removable method in accordance with CP&L Procedure 201 Revision 2. (This was the same type of liquid penetrant examination performed by Bahnson - color contrast, solvent removable.)

As a result of the liquid penetrant examination, the inspectors observed the following conditions:

(1) The surface was suitable for liquid penetrant examination.

(2) An area of lack of fusion at the toe of the weld between the weld and the HEPA filter rack was identified.

(3) An area of undercut at the fusion line between the weld and the HEPA filter rack was identified. Later measurement, by a CP&L welding inspector, revealed the undercut to be in excess of 1/64".

(4) Paragraph 16, of the HVAC Addendum A, to Ebasco Specification CAR-SH-BE-31, "Air Cleaning Units", prohibits any lack of fusion, and undercut in excess of 1/64". The inspectors reviewed the documentation packages for the Air Cleaning Units to determine whether or not the nonconformances noted in (2) and (3) above had been documented and evaluated. There was no documentation to indicate that the nonconformance had ever been detected.

The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

c. Bolting (Visual Inspection)

The inspectors made a visual examination of selected connections for appropriate fastener material type, size, traceability, and material.

No violations or deviations were found in this area.

d. Review of Quality Records

The inspectors reviewed the documentation packages for the 1A-SA-1B-SB and 2A-SA-2B-SB R-2 HVAC air cleaning units to determine conformance with procurement, storage, and fabrication specifications, and regulatory requirements. The review revealed the following conditions:

(1) Records for the liquid penetrant examination performed by Bahnson on July 16, 1982, and partially reexamined as described in paragraph c, above revealed the following statement:

> "Item 2 to housing, Typ. area, 100%, reject
> RW July 16, 1982, Repair Accept July 16, 1982."

It should be noted that there are two number 2 items installed in each R2 unit and there are welds on both the upstream and downstream sides of each item 2, attaching them (Item 2) to the unit housing, that require liquid penetrant examination, as specified by CTIN drawing 32735-A Section C C. At the time of this inspection, it could not be determined whether the above statement meant that all of the welds attaching all of the Item 2s to the

housing of the 2A-SA-2B-SB R-2 unit had been repaired or just some of them. The licensee indicated that they would investigate the above matter and make a determination as to the number of welds repaired. Pending NRC review of the licensee's investigation, this matter will be identified as unresolved item 400/84-05-01: "HVAC Weld Repairs."

(2) The 2A-SA-2B-SB R2 unit was subjected to a vigorous receipt inspection by CP&L which resulted in the issuance of DDR-1053. DDR-1053 accepted "as-is" all weld defects including two cracks, on the 2A-SA-2B-SB R2 unit. At the time of this inspection the licensee could not provide a justification for leaving the two cracks uncorrected in the unit. Pending resolution of the above issue this matter will be identified as unresolved item 400/84-05-02: "Cracks in R2 HVAC Unit."

(3) The "Preventative Measures" block of the Corrective Action Report for DDR-1053 was marked "NA", Not Applicable, with an accompanying note which stated that preventative measures were not applicable because the Air Cleaning Unit inspected and rejected was the last unit in production. No reinspection of previously received units of Bahnson equipment was initiated. The inspectors informed CP&L management that failure to perform adequate corrective action is contrary to 10 CFR 50, Appendix B, Criterion XVI, as implemented by CP&L PSAR section 1.8.5.16. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 2.

6. Heating, Ventilating, and Air Conditioning (HVAC) Air Handling Units

The inspectors performed detailed inspections of 17 of the 47 safety related HVAC Air Handling Units manufactured by The Bahnson Company for CP&L's Shearon Harris Project. The inspections were conducted using criteria established in the applicable Ebasco Specification (CAR-SH-BE-08), Bahnson Drawings (drawing only available for four units), and Seismic Qualification Reports to determine whether the fabrication, receiving inspection, handling and storage were consistent with applicable drawings, procedures, specifications and regulatory requirements. All the Air Handling Units inspected had been accepted by CP&L.

a. Welding (Visual Inspection)

The inspectors made a visual examination of accessible welds on the below listed units relative to the following: location, length, size, and shape; weld surface finish and appearance; weld reinforcement-height and appearance; joint configuration of permanent attachments and structural supports; arc strikes and weld splatter; finish grinding or machining of weld surface - surface finish and absence of wall thinning; surface defects - cracks, laps, lack of penetration, lack of fusion, porosity, slag and undercut exceeding prescribed limits. During the inspection the following conditions were observed:

Identification	Defect Description
AH-5 (1A-SA)	Missing floor to frame welds, missing weld on cooling coil frame
AH-5 (1B-SB)	Lack of fusion, burn through on side panel frames
AH-6 (1A-SA)	None
AH-7 (1A-SA)	Crack in skin to frame weld; weld craters, lack of fusion, burn through, overlap in skin to frame welds and side panel frames
AH-15 (2A-SA)	No weld symbol on drawing for skin to cooling coil frame channel stitch weld
AH-17 (1-4A-SA)	Stitch fillet weld on fan housing did not extend to end of joint, end weld less than 2" long, lack of fusion, insufficient weld reinforcement, unconsumed weld rod protruding from weld joint, tack welds not removed or incorporated into final weld in panel frame welds and skin to frame welds
AH-17 (1-4B-SB)	In addition to nonconformances noted under AH-17 (1-4A-5A), floor panel joints were mismatched, roof skin to cooling coil frame welds were corroded, one fan housing anchor bolt missing, and 7 cooling coil mounting bolts were an incorrect material
AH-19 (1A-SA)	Missing nut on coiling coil mounting bolt, missing cooling coil mounting bolt
AH-19 (1B-SB)	Missing welds on side panel framing
AH-20 (1A-SA)	None
AH-20 (1B-SB)	None
AH-25 (1X-SB)	Missing welds on cooling coil frame and side panel frames, undercut and lack of fusion on skin to frame welds, missing side panel frame welds, missing cooling coil mounting bolts
AH-28 (1A-SA)	Lack of fusion, weld craters in side panel frames and skin to frame welds, pitch on stitch weld more than 10" center to center
AH-28 (1B-SB)	Missing 2 welds on cooling coil channel
AH-29	Missing side panel frame welds, missing cooling coil mounting bolts, skin to frame welds less than 2" long

Identification	Defect Description
AH-85 (1A-SA)	None

(1) The Bahnson Company considers their drawings proprietary information and therefore CP&L did not have copies of the drawings. CP&L did request that The Bahnson Company supply drawings for three units selected by the NRC inspectors, units AH-15, AH-28, and AH-85. The remaining units were inspected for weld location and joint design based on typical weld details contained on the drawings for units AH-15, AH-28, and AH-85. At the time of this inspection, it could not be determined, except for units AH-15, AH-28, and AH-85, with 100% confidence that the welds listed as missing in the remaining units were required by the drawings for the specific unit. However, the welds listed as missing on side panel frames were typically required to be welded all the way around and were actually only welded on two or three sides. The licensee indicated that they would investigate the above matter and make a determination as to the number and location of missing welds. Pending NRC review of the licensee's investigation, this matter will be identified as unresolved item 400/84-05-03: "Missing HVAC Welds", except for those welds found missing on Unit AH-28 (1B-SB) [see para. 6.a.(3)].

(2) Inspection of weld quality was based on Ebasco Specification CAR-SH-BE-05, Addendum A, "Quality Assurance Requirements for Nuclear Safety Related HVAC Equipment", which invokes AWS D1.1 and specifically prohibits cracks, craters, lack of fusion, and undercut which exceeds 1/64". As noted in the listing above there were seven Air Handling Units which did not meet the acceptance criteria for welds.

(3) The inspectors reviewed the documentation packages for the Air Handling Units to determine whether or not the missing welds in Unit 28 (1B-SB) and the weld quality nonconformance in the other units had been documented and evaluated. There was no documentation to indicate the nonconformances had ever been detected. The inspectors informed CP&L management that failure to identify and evaluate nonconforming welds in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

b. Bolting (Visual Examination)

(1) The inspectors made a visual examination of selected connections for appropriate fastener material type, size, and material traceability. One instance of substituting carbon steel bolts for stainless steel bolts and four

instances of missing fastener hardware were discovered by the inspectors.

(2) The inspectors informed CP&L management that failure to identify nonconforming bolted connections and fastener materials in purchased equipment is contrary to 10 CFR 50, Appendix B, Criterion VII as implemented by CP&L PSAR section 1.8.5.7. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which lead to Potential Enforcement Action 1.

c. Review of Quality Records

(1) The inspectors reviewed the Ebasco procurement specification, Bahnson general arrangement drawing and Bill of Material (BOM) for unit AH-17 (1-4A-SA) to establish material requirements. The Certified Material Test Reports (CMTR) or Certificates of Compliance (COC) supplied with the documentation package for the unit were then compared with the material requirements. The review revealed the following conditions:

(a) The BOM and procurement specification were inconsistent on material requirements in the following areas:

- Interior Casing (Fan and Coil Sections) Specification required 20ga ASTM A240, Type 304. The BOM specified 20ga 304 stainless steel with no ASTM designation.

- Floor (Coil and Fan Sections) Specification required 20ga ASTM A240, Type 304. The BOM specified 10 ga 304 stainless steel with no ASTM designation.

- Drain Pan Liner Specification required 10ga ASTM A240, Type 304. The BOM specified 20ga stainless steel with no ASTM designation.

(b) The following questions or inconsistencies resulted from reviewing the data package:

- An Edcomb Metals COC was for 18-8 Type 304 stainless steel with no ASTM designator.

- No material CMTR's or COC's were provided for the fan housing which was supplied by Westinghouse and required to be ASTM A283.

- COC's or CMTR's for the following materials, specified in the BOM could not be found;

Unit Casing Exterior - 14ga ASTM A366

Interior Casing in fan and coil sections - 20ga Type 304 stainless steel

Drain Pan Liner - 20ga Type 304 stainless steel

- The Ebasco release for shipment report was signed and stated that there were no special conditions and deviat from purchase contract; however, there was an open DDR (No. 80-0070) and attached correspondence permitting shipment with open documentation and without fan motors.

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, this matter will be identified as unresolved item 400/84-05-04: "Material Substitutions".

(2) CP&L instituted a 100% receipt inspection at the Shearon Harris Plant site in approximately September 1982. Bahnson supplied air handling units AH-85, AH-86, AH-92, and AH-93 were received after the institution of the 100% receipt inspection program. The inspectors reviewed the CP&L receipt inspection reports and accompanying deficiency documentation reports. CP&L had rejected all the units for a combination of nonconforming weld quality, weld joint configuration, and missing welds. At the time of the inspection, Units AH-85, AH-86, and AH-93 had already been repaired and accepted by CP&L. However, CP&L had not performed any kind of reinspection on air handling units received prior to instituting the 100% receipt inspection.

The inspectors informed CP&L management that failure to perform adequate corrective action is contrary to 10 CFR 50, Appendix B, Criterion XVI, as implemented by CP&L PSAR section 1.8.5.16. 10 CFR 50.55(f)(1) requires CP&L to implement the QA program documented in the PSAR. This is an example of the findings which led to Potential Enforcement Action 2.

(3) The inspectors reviewed reports of Ebasco facility evaluations and Bahnson commitment to corrective actions to cited deficiencies for 1977, 1978, 1980, and 1983. The review revealed the following conditions:

The corrective actions committed to by Bahnson indicated a lack of adequate measures to prevent recurrence of the problems; however, most commitments were never questioned by Ebasco and there was no evidence that Ebasco performed followup to review implementation of corrective action until the next facility evaluation was performed. The following areas of Bahnson's QA program were repetitively cited by Ebasco and reflects a lack of adequate corrective action by Bahnson and a lack of vendor control by Ebasco:

- Failure to maintain adequate vendor program control for nuclear suppliers

- Failure to maintain adequate controls of procedures and personnel relating to performance of the quality function including NDE.

This is an example of the findings which led to Potential Enforcement Action 2.

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. Ebasco specification CAR-SH-BE-08
2. Addendum A to CAR-SH-BE-08
3. Ebasco specification CAR-SH-BE-31
4. Addendum A to CAR-SH-BE-31
5. Seismic Qualification Report 9Q-BE-08-20-S1
6. Seismic Qualification Report 9Q-BE-08-20-S1B1
7. Seismic Qualification Report 9Q-BE-08-20-S1B2
8. Documentation Package for AH-5 (1A-SA) and (1B-SB)
9. Documentation Package for AH-15 (2A-SA)
10. Documentation Package for AH-17 (1-4A-SA) and (1-4B-SB)
11. Documentation Package for AH-85 (1A-SA)
12. Documentation Package for AH-93
13. Documentation Package for R2 (1A-SA-1B-SB)
14. Documentation Package for R2 (2A-SA-2B-SB)
15. CTIN Drawing 32735A
16. CTIN Drawing 32629
17. Bahnson Drawings for AH-15, AH-28, and AH-85
18. Bahnson WPS GMI-1/2/3
19. Bahnson WPS GM8-1/2
20. Bahnson WPS GT 1-1
21. Bahnson WPS GT 8-4
22. Bahnson WPS SMI-6/7/8
23. Reports for Ebasco Facility Evaluation at Bahnson for years 1977, 1978, 1980, and 1983
24. Drawing 2728-1-7 (Air Handling Unit AH-17)