

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

| | | |
|--|---------------------------------|---------------------------------|
| REPORT NO.: 99900743/82-01 | INSPECTION DATE(S) 10/6&7/82 | INSPECTION ON-SITE HOURS: 16 |
| <p>CORRESPONDENCE ADDRESS: Brown Boveri Electric, Incorporated Distribution Apparatus Division ATTN: Mr. D. D. Duvall, Vice President-Operations, BBEL Norristown Road & Route 309 Spring House, PA 19477</p> <p>ORGANIZATIONAL CONTACT: Mr. R. R. Conrad, Manager - Quality Assurance TELEPHONE NUMBER: 215/674-5990</p> | | |
| <p>PRINCIPAL PRODUCT: Protective Relays</p> <p>NUCLEAR INDUSTRY ACTIVITY: Details were not obtained during this inspection; however, supplying spares and reworking delivered hardware are ongoing.</p> | | |
| <p>ASSIGNED INSPECTOR: <u>W. E. Foster</u> <u>11/23/82</u> W. E. Foster, Reactive & Component Program Date Section (R&CPS)</p> <p>OTHER INSPECTOR(S):</p> <p>APPROVED BY: <u>I. Barnes</u> <u>11/23/82</u> I. Barnes, Chief, R&CPS Date</p> | | |
| <p>INSPECTION BASES AND SCOPE:</p> <p>A. <u>BASES</u>: Appendix B of 10 CFR Part 50.</p> <p>B. <u>SCOPE</u>: This inspection was made as the result of the issuance of two 10 CFR Part 50.55(e) reports and one reportable occurrence report by the Tennessee Valley Authority. The reports pertained to deficient over and/or undervoltage relays that had been furnished to Bellefonte, Units 1 and 2, and Browns Ferry, Unit 1.</p> <p style="text-align: right;">DESIGNATED ORIGINAL</p> | | |
| <p>PLANT SITE APPLICABILITY: <u>Certified By Rheanne Clark</u></p> <p>Docket Nos.: 50-313,368; 50-293; 50-261; 50-400/401; 50-324/325; 50-440/441; 50-373/374; 50-255; 50-329/330; 50-341; 50-155; 50-334,412; 50-331; 50-335,389; (cont. on next page)</p> | | |

8212270213 821202
PDR GA999 EMVBB
99900743 PDR

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

REPORT

NO.: 99900743/82-01

INSPECTION

RESULTS:

PAGE 2 of 6

PLANT SITE APPLICABILITY: (Cont.) 50-250,251; 50-458,459; 50-219; 50-289; 50-344; 50-220,410; 50-263; 50-546/547; 50-395; 50-327/328; 50-312; 50-445/446; 50-259; 50-500; 50-266,301; 50-460,513; 50-413/414; 50-438/439; 50-269/270; 50-244; 50-498/499; and 50-369.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 2.4 and 3.1 of Test Procedure No. RC-3047, Revision 8, dated August 23, 1978, and attendant data sheets of completed units:
 - a. Data had not been entered in the data sheets, dated March 27, 1982, to indicate the change to 48Vdc control power, for the following completed units: (1) Catalog No. 211B4175D, Serial Nos. 2128 and 2173; and (2) Catalog No. 211B6175D, Serial Nos. 2397, 2473, and 3001.
 - b. The voltage value recorded in the data sheet, dated March 27, 1982, for Catalog No. 211B6175D, Serial No. 3001, did not satisfy the minimum requirement of 115 volts as evidenced by the recording of "1" in the data sheet.
2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraphs 3.1, 3.2, and 3.3 of Quality Assurance Procedure (QAP) No. 3.4H, Revision 0, dated December 20, 1978, regarding engineering drawings that had been released to accomplish modification tasks (of customer returned hardware) by the manufacturing department:
 - a. Release forms had not been filled out to indicate what was being released and what actions were required.
 - b. The drawings had not been approved by the Engineering Manager or his representative, as evidenced by the signature of the Quality Assurance Manager in the approval block of the drawings.

The foregoing pertains to the following drawings, which are examples:
(1) 211-001, Revision 0, dated April 14, 1981; (2) 211-002, Revision 0, dated April 4, 1981; (3) 211-004, Revision 1, dated October 13, 1981; (4) 211-005, Revision 2, dated June 26, 1981; and (5) 211-007, Revision 1, dated April 14, 1981.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

| | | |
|-------------------------------|------------------------|-------------|
| REPORT NO.: 99900743/82-01 | INSPECTION RESULTS: | PAGE 3 of 6 |
|-------------------------------|------------------------|-------------|

3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.4 of QAP No. 10.9H, Revision 0, dated January 2, 1979, wave solder and subassembly inspections had not been documented as evidenced by the lack of records to indicate accomplishment of these activities.

4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.4 of QAP No. 10.1H, Revision 0, dated December 19, 1978, reinspection of affected characteristics (component removal/replacement and hand soldering) had not been performed on hardware returned by the Tennessee Valley Authority for modification as evidenced by the lack of inspection records to confirm accomplishment.

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph 3.1 of QAP No. 5.1H, Revision 0, dated January 4, 1980, management and supervisory personnel had not assured that all activities affecting quality had been prescribed in a documented form, as evidenced by the noninitiation of the following QAP's which appeared in the indices of various sections of the QAP Manual (Nos. 10.9.2, "Subassembly Inspection," 9.2.4, "Component Mounting Methods," 6.2H, "Control of Inspection and Test Procedures," and 15.3H, "Repair and Modifications").

With the exception of QAP 6.2H, the indices reflected revision levels and dates for the aforementioned documents.

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

(Closed) Nonconformance (81-02): The organization chart incorporated into the Quality Assurance Manual and Quality Assurance Procedure, dated June 1981, did not agree with the chart submitted with the corrective action response letter dated April 8, 1981.

The NRC inspector verified by interview (of the QA Manager) that the three persons responsible for responding to the NRC had been reminded to inform the NRC of revisions to commitments.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

| | | |
|-------------------------------|------------------------|-----------|
| REPORT NO.: 99900743/82-01 | INSPECTION RESULTS: | P. 1 of 6 |
|-------------------------------|------------------------|-----------|

E. OTHER FINDINGS OR COMMENTS:

Followup on Regional Requests

1. The Tennessee Valley Authority (TVA) filed a 10 CFR Part 50.55(e) report, dated February 2, 1981, with the Nuclear Regulatory Commission, Region II (NRC, RII); the final report is dated August 5, 1982. The report pertained to deficient solid-state alternating current relays used in the 6.9 kilovolt switchgear at the Bellefonte Nuclear Station. The deficiency became apparent with the loss and restoration of direct current control power which would allow the auxiliary relay to "become energized long enough to initiate the supply feeder breaker trip sequence" upon a false undervoltage indication.

This condition affects 35 nuclear plants with only 6 having identified the problem. Brown Boveri Electric, Incorporated (BBEL) had not informed the other 29 affected nuclear plants or the NRC. BBEL maintains that the deficient condition is an application problem; however, the available information does not support that position. Records indicate that Mr. W. Laudan of the NRC contacted Mr. C. Downs of BBEL on September 20, 1982, requesting identification of all nuclear plants that use the ITE-27 relays susceptible to the direct current control power loss.

Corrective actions and preventive measures entail: (1) modifying the hardware; and (2) a modified design. Modification of the relays has been completed for the following nuclear power plants: (1) Catawba; (2) Ginna; (3) McGuire; and (4) Oconee. Modification of the relays from Bellefonte is underway while the items at South Texas are under discussion. Corrective actions and preventive measures appear adequate.

2. TVA filed a reportable occurrence report dated February 12, 1982, with the NRC, RII. The report pertained to under/overvoltage relays with trip set points below the allowable minimum. These devices are located on the 4.0 kilovolt shutdown boards at the Browns Ferry Nuclear Plant.

It appears that the problem results because the: (1) devices are being used at the extreme limit of their capability; and (2) calibration methodology at site is somewhat less than required. TVA has revised the specification and BBEL has developed a relay that complies with the revised specification in an attempt to resolve the problem.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

| | | | |
|----------------|----------------|------------------------|-------------|
| REPORT NO.: | 99900743/82-01 | INSPECTION RESULTS: | PAGE 5 of 6 |
|----------------|----------------|------------------------|-------------|

This item will be evaluated during future inspections to determine the adequacy of the corrective actions and preventive measures.

3. TVA filed a 10 CFR Part 50.55(e) report dated June 28, 1982, with NRC, RII. The report pertained to two each undervoltage and overvoltage relays which "failed to function during construction testing." The relays are installed in the 6.9 kilovolt switchgear at Bellefonte Nuclear Plant, Unit 2.

BBEL was not aware of this condition at the time it was brought up by the NRC inspector. They were able to obtain some information prior to the close of the inspection; however, its receipt coupled with their not having the failed hardware to conduct an analysis prevented an evaluation by the NRC inspector. This evaluation will occur during a future inspection.

4. During the course of the inspection, the Quality Assurance Manager of the Horsham facility had comments regarding the following nonconformances:

a. B.1.b - It is his contention that only a checkmark is required for the 115V indication because it is under the "Functional" heading of the data sheet; however, this position does not agree with the procedure or practice. Paragraph 3.1 (under heading of "Procedure") of Test Procedure No. RC-3047, Revision 8, dated August 23, 1978, requires that the input volts be varied to determine pickup point "and record on data sheet (115V min)." Also, the NRC inspector reviewed a minimum of 24 additional data sheets of completed hardware and observed that values in excess of 115 volts had been recorded.

b. B.2 - He maintains that these were special drawings initiated to perform modifications to hardware which had been returned by the purchaser. As such, the quality assurance program contained no provisions. He also stated that he was given the responsibility for coordinating the task between engineering, manufacturing, and quality assurance. In response to query, he indicated that he was not approving the drawings as the Engineering Manager's representative.

ORGANIZATION: BROWN BOVERI ELECTRIC, INC.
DISTRIBUTION APPARATUS DIVISION
HORSHAM, PENNSYLVANIA

| | | |
|--|------------------------|-------------|
| REPORT NO.: 99900743/82-01 | INSPECTION RESULTS: | PAGE 6 of 6 |
| <p>c. B.3.4 - The Quality Assurance Manager maintains that: (1) inspections and reinspections are performed; and (2) defects are identified and corrected during these inspections and reinspections. It is simply that no records of these activities are initiated. The NRC inspector informed the Quality Assurance Manager that this indicated non-compliance with Appendix B to 10 CFR Part 50.</p> <p>5. This inspection was accomplished by evaluating the following documents for requirements and/or implementation of requirements: (1) nine each, letters and quality assurance procedures; (2) quality assurance manual; (3) three test procedures; (4) eight drawings; and (5) numerous documents identified as: test data sheets, nonconformance report, failure evaluation, special requirements, criteria for under/overvoltage relays, returned goods authority, and certificates of conformance. This activity resulted in the identification of five nonconformances detailed in paragraph B.</p> | | |

BROWN BOVERI ELECTRIC, INC.

Dates 10/6, 7

Inspector W. E. Foster

Page 1 of 5[illegible]

DOCUMENTS EXAMINED

| 1 | 2 | TITLE/SUBJECT | 3 | 4 |
|----|---|--|----------|---|
| 1 | 7 | TVA to BBE - Bellefonte Nuc Pft 13.8 & 6.9 kV Switchgear, Cont. 75KS-95583 | 1/5/81 | |
| 2 | | BBE to TVA - ~ ~ ~ ~ ~ | 4/13/81 | |
| 3 | | G-BB to TVA - ~ ~ ~ ~ ~ | 11/12/80 | |
| 4 | | TVA to G-BB - ~ ~ ~ ~ ~ | 12/24/80 | |
| 5 | | BBE to TVA - TVA Cont. 75KS-95583, BBE S. O. 33-51014, RGA 34102 | 9/10/81 | |
| 6 | | TVA to BBE - Bellefonte Nuc Pft 13.8 & 6.9 kV Switchgear, Cont. 75KS-95583 | 9/4/81 | |
| 7 | | Duke Pwr(?) to G-BB - Catawba Nuc Sta Modification of Undervoltage Relays | 12/11/80 | |
| 8 | | BBE to TVA - TVA Cont. 75KS-95583, S. O. 33-51014 | 4/13/81 | |
| 9 | | TVA to BBE - Browns Ferry Nuc Pft, Addition to 4160-volt Shutdown Boarding | 4/1/82 | |
| 10 | 7 | ~ ~ ~ ~ ~ | 5/27/82 | |
| 11 | 6 | To: B. J. Capriotti, From: Chet Wood - TVA Browns Ferry NP, I-T-E 27/59 Relays | 3/17/82 | |
| 12 | | To: C. Wood, From: Cliff Downs - TVA Browns Ferry / I-T-E 27/59H Relays | 2/15/82 | |
| 13 | | To: B. J. Capriotti, From: Chet Wood - TVA, Browns Ferry Nuclear Plant I-T-E 27/59 Relay | 4/2/82 | |
| 14 | | To: Blair Capriotti, ~ ~ ~ - Browns Ferry Nuclear Plant, Addition to 4160 Volt | 6/1/82 | |
| 15 | | To: C. Wood, From: B. J. Capriotti: ~ ~ ~ ~ ~, TVA Contract 81PS-928864 | 6/13/82 | |
| 16 | 6 | TVA - To: Thom Lister, From: E. W. Chandler - Browns Ferry Nuclear Plant Units 1 and 2 | 3/5/82 | |

Document Types:

- | | |
|------------------|---------------------------------|
| 1. Drawing | 5. Purchase Order |
| 2. Specification | 6. Internal Memo |
| 3. Procedure | 7. Letter |
| 4. QA Manual | 8. Other (Specify-if necessary) |

Columns:

- | |
|-----------------------------|
| 1. Sequential Item Number |
| 2. Type of Document |
| 3. Date of Document |
| 4. Revision (If applicable) |

DOCUMENTS EXAMINED

| 1 | 2 | TITLE/SUBJECT | 3 | 4 |
|----|---|--|-------------|---|
| 17 | 8 | TVA Nonconformance Report No. BFNEEB 8201 | 3/5/82 | |
| 18 | 8 | ~ Failure Evaluation for NCR No. BFNEEB 8201 | 2/12/82 | |
| 19 | 8 | ~ Criteria for I.T.E 27/59H Under-Overvoltage Relays - Browne Ferry 4kV... | 3/16/82 | |
| 20 | 8 | ~ Special Requirements for Cont. No. 828864 | | |
| 21 | 6 | To: E. Rhonda From: C. Wood - TVA, Bellefonte Nuc. Pkt - TVA R.O. 75k - 85583 | 1/11/82 | |
| 22 | 8 | G-BB Returned Goods Authority ^(REG) No. 34102 | 5/22/81 | |
| 23 | 1 | TVA Shipping Ticket No. G191500 | 7/7/81 | |
| 24 | | Certificates of Conformance, 11/10/81, 5/2/82, 2/2/81, 3/12/81 | 1 | |
| 25 | | RGA No. 39147 | 12/9/80 | |
| 26 | 8 | ~ - 26965 | 2/2/81 | |
| 27 | 6 | TVA-To: A. L. Rice, From: W. R. Dahnke - Bellefonte Nuc. Pkt - Cont. 75k - 85583... | 8/25/81 | |
| 28 | 1 | 211-009 (Sht 1, Rev 2 8/22/81; Sht 2 Rev 1 8/22/81; Sht 3 Rev 1 2/16/82); 211-002 Rev 1 4/19/81; 211-001 Rev 1 4/14/81; 211-006 Rev 1 4/14/81; 211-007 Rev 1 4/14/81 (Sht 1 & 2, Sht 3 is Rev 1 8/22/81); 211-003 (Sht 1 Rev 1 8/22/81, Sht 2 Rev 1 8/22/81); 211-004 Rev 1 4/12/81; 211-005 Rev 2 6/26/81. | | |
| 29 | 8 | Completed Test Data Shts - Cont. No. 211B1175D, S/N 5873, 3/22/82; Cont. No. 211B4175D, S/N 2128, 3/22/82 | 28, 3/22/82 | |

Document Types:

- | | |
|------------------|---------------------------------|
| 1. Drawing | 5. Purchase Order |
| 2. Specification | 6. Internal Memo |
| 3. Procedure | 7. Letter |
| 4. QA Manual | 8. Other (Specify-if necessary) |

Columns:

- | |
|-----------------------------|
| 1. Sequential Item Number |
| 2. Type of Document |
| 3. Date of Document |
| 4. Revision (If applicable) |

Inspector U. E. FosterDocket No. 99900743
Report No. 82-01
Page 4 of 5Scope/Module Follow up on Regional RequestsDOCUMENTS EXAMINED

| 1 | 2 | TITLE/SUBJECT | 3 | 4 |
|-----------|---|--|----------|---|
| 29 cont'd | 8 | ^{S/N 2473} ^{S/N 2397} Cat. No. 211A6175D, ^{S/N 3001} 3/27/80; Cat. No. 211A9275D, S/N 3420, 3/27/82; Cat. No. 211A1175D, S/N 2118 3/27/80; Cat. No. 211A4175D, S/N 2173 3/27/82; Cat. No. 211A9275D S/N 3426 11/10/81; 211A0175D, S/N 3491 11/10/81; Cat. No. 211A0175, S/N 3402 11/10/81; Cat. No. 211A6175D, S/N 2063, 2074, 2557 11/10/81 | | |
| 30 | 3 | No. RC-3029-F, Voltage Relays, Final Test Procedure | 2/12/81 | |
| 31 | 3 | No. RC-3047 | 8/23/78 | 8 |
| 32 | 3 | No. RC-3046 ... 27H ... Undervoltage Relay | | 8 |
| 33 | 4 | Protective Relay Operation QA | 6/17/81 | |
| 34 | 3 | 5.1H - Instructions, Procedures and Drawings | 1/4/80 | 8 |
| 35 | | 6.3H - Engineering Release Processing | 5/12/81 | |
| 36 | | 8.1H - Identification and Control of Material | 1/17/79 | 8 |
| 37 | | 9.2H - Controlled Processes | 1/5/79 | 8 |
| 38 | | 10.1H - Inspection Policy and Requirements | 12/19/78 | 8 |
| 39 | | 12.1H - Retention and Storage of QA Records | 4/16/80 | 1 |
| 40 | | 9.2.2H - Hand Soldering | 1/4/80 | 8 |
| 41 | | 10.9.1H - Wave Solder Inspection | 2/16/75 | 1 |
| 42 | | 10.9H - In-Process Inspections | 1/2/79 | 8 |

Document Types:

- | | |
|------------------|---------------------------------|
| 1. Drawing | 5. Purchase Order |
| 2. Specification | 6. Internal Memo |
| 3. Procedure | 7. Letter |
| 4. QA Manual | 8. Other (Specify-if necessary) |

Columns:

- | |
|-----------------------------|
| 1. Sequential Item Number |
| 2. Type of Document |
| 3. Date of Document |
| 4. Revision (If applicable) |

[illegible]

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual

Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)