

INSPECTION REPORT

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF INSPECTION AND SUPPORT PROGRAMS

ORGANIZATION: ABB Service Inc.
Fenton, Missouri

REPORT NO.: 99901321/97-01

ORGANIZATIONAL CONTACT: Mr. D. P. Polizzi, Manager, Regional Service
314 343 0232

NUCLEAR INDUSTRY ACTIVITY: ABB Service Inc. services switchgear
manufactured by I.T.E.

INSPECTION CONDUCTED: May 15, 1997

INSPECTORS: Kamalakar R. Naidu, NRR
Virgil L. Beaston, NRR

APPROVED BY: Gregory C. Cwalina, Chief
Vendor Inspection Section
Special Inspection Branch
Division of Inspection and Support Programs
Office of Nuclear Reactor Regulation

1 INSPECTION SUMMARY

ABB Service Inc., located in Fenton, Missouri, performs switchgear overhauling services for commercial and nuclear customers. Recently it performed services on 480 volt metal-clad circuit breakers installed at Illinois Power Company's (IPC) Clinton Power Station (Clinton). The circuit breakers were originally designed and manufactured by I.T.E Imperial Company (ITE). The ownership subsequently changed and the company became known as I.T.E.- Gould, Gould-Brown Boveri, Brown Boveri Electric and finally ASEA Brown Boveri (ABB). ABB manufactures low-voltage metal-clad circuit breakers, and medium-voltage circuit breakers at Florence, South Carolina. ABB at Sanford, Florida, assembles complete switchgear installations. ABB has established service centers at several locations in the U.S. The service center at Fenton currently services the circuit breakers installed in Clinton. Recently, ABB decided to service its nuclear customers from four locations, Columbia, Maryland; Cleveland, Ohio; Charlotte, North Carolina; and Houston, Texas. In the future, breakers which need service will be shipped to ABB Services, Houston, Texas.

The inspectors reviewed the documentation on selected metal-clad K-line circuit breakers that IPC's Clinton sent for refurbishment.

The inspection bases were:

- Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50)
- 10 CFR Part 21, "Reporting of Defects and Noncompliance"

During this inspection, the NRC found no instance where ABB failed to meet NRC requirements. However, the inspectors identified one unresolved item regarding the availability of breaker specific drawings (Section 3.1).

2 STATUS OF PREVIOUS INSPECTION FINDINGS

This is the first inspection at ABB Service Inc., Fenton, Missouri.

3 INSPECTION DETAILS

3.1 Breaker Refurbishment

a. Scope

On May 15, 1997, the inspectors reviewed the records documenting the refurbishment performed on Clinton breakers and reviewed the refurbishment activities with the personnel who performed the work at the Fenton shop. The inspectors also reviewed the purchase order (PO) that IPC issued to ABB for the refurbishing services including selected revisions to the PO to determine if the work performed on selected Clinton breakers met the quality requirements.

b. Observations and Findings

IPC issued PO 554794 to ABB Sanford, Florida, to rework/refurbish a circuit breaker with serial number 51752A-9-02616 with SS-13 type solid state trip device in compliance with ABB Procedure MS 3.1.1.9-2D, "Maintenance and Surveillance, Low Voltage Switchgear Equipment." In subsequent revisions to the PO, Clinton added additional breakers to be refurbished.

IPC attached to the PO a copy of its "Supplier Quality Assurance Program Requirements," QAP-407-02F02, Revision 2, which invoked 10 CFR Part 50 Appendix B, and 10 CFR Part 21. IPC required ABB to obtain its approval for all nonconformance reports initiated by ABB during the refurbishment where ABB would recommend "use as is" or "repair." IPC required ABB to issue a Certificate of Rework or Repair certifying that the item was reworked using original equipment parts by a qualified technician, and that the item will function in accordance with the original design specification.

Revision 02 to the PO, dated June 23, 1995, required the replacement of all EQ sensitive (organic) items with less than 40-year qualified life. As a minimum, Agastat time delay relays, Gould auxiliary relays (J13PA4312), and control and power Shawmut type fuses were to be replaced.

Revision 09 to the PO, dated November 29, 1995, required ABB to test the breakers for "as-found" conditions. ABB was also to rework/refurbish and lubricate the breakers, and test the trip devices to verify the time/current curve.

Revision 12 to the PO, dated March 12, 1996, added the refurbishment of breaker Serial Number (S/N) 51752E-9-02616. ABB was to (1) reconfigure the breaker and update documentation as appropriate, (2) replace the electrically operated mechanism with a manually operated mechanism, (3) replace the lower molding and CT assembly with 600-A variety, (4) change the solid state trip device to 600-A (SS 14), (5) add an alarm switch, and other minor accessories as required to conform with Drawing 708 663, Revision 0.

The records on work performed on breakers with S/Ns 51752AB-109-201054, 51752B-9-11456, 51752E-9-02616, 51752B-9-01456, 51752F-11-02616, and 51752F-9-01616, indicate that ABB personnel had operated the Clinton breakers, disconnected the breaker mechanisms, and inspected the main roller and carrier and other major pins and moving components in the breakers. Records indicated that the operating mechanisms were dirty and had to be disassembled, cleaned, lubricated and reassembled. On receipt of the breakers from ABB, Clinton personnel performed receipt inspections and documented adverse findings (discussed below) in Condition Reports (CRs). The inspectors discussed the adverse findings in these CRs with the ABB personnel and reviewed the refurbishment records.

During receipt inspections, Clinton identified a deficiency related to incorrect wiring of leads 11 and 12 on the alarm switch in four breakers. Clinton corrected this error by switching the leads, and informed ABB during a meeting at the Clinton plant. The inspectors interviewed the ABB personnel

who worked on the breakers, and determined that the technician who wired the switch had made an error. ABB personnel stated that they could not verify the correct wiring of the alarm switch because Clinton did not send them the drawings for the individual breakers. At the time of the inspection, ABB personnel stated that this condition had not been documented in a nonconformance report because the technician who made the error had been away working on a job in Maine, and returned to the shop only the previous week. ABB personnel subsequently documented this in a nonconformance report.

Clinton also identified a problem related to the configuration of the 8-point auxiliary switch which is mounted on the "C" phase side below the Power Shield unit. The switch is connected through a right-hand link assembly to the jack shaft of the breaker. The contacts in the auxiliary switch change state when the breaker operates. Clinton personnel had documented that, when the breakers were receipt inspected, the contact configuration did not meet the breaker drawing requirement. ABB personnel stated that different breakers have different contact configurations. A 90-degree rotation of the operating lever will change the contact configuration. ABB personnel informed the inspectors that Clinton did not provide them with the drawings for the individual breakers. Therefore, ABB could not verify the correct contact configuration. Further, ABB did not identify the need for the drawings to perform safety-related refurbishments.

c. Conclusion

Initially, Clinton did not provide individual breaker drawings to ABB, and ABB did not request them. The inspectors considered this to be an indication of inadequate Licensee - Vendor interface. Adequate technical information exchange (e.g., circuit breaker drawings) between personnel at Clinton and ABB could have reduced the number of problems that were identified in the condition reports. Since the service center at Fenton will no longer refurbish safety-related breakers, this concern is being identified as an unresolved item and will be followed up at a future inspection of the ABB Service Center at Houston, where ABB proposes to refurbish the Clinton breakers in future. (Unresolved item 99901321/97-01-01)

4. PERSONS CONTACTED

ABB Service Company

D. P. Polizzi, Manager, Regional Service
R. Clostermann, Service Engineer
J. O. Webb, Director of Quality

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

99901321/97-01-01 URI unavailability of breaker drawings