

Part 21 (PAR)

Event # 47818

<b>Rep Org:</b> ABB INC	<b>Notification Date / Time:</b> 04/09/2012 17:06 (EDT)		
<b>Supplier:</b> ABB INC	<b>Event Date / Time:</b> 04/09/2012 (EDT)		
	<b>Last Modification:</b> 04/27/2012		
<b>Region:</b> 1	<b>Docket #:</b>		
<b>City:</b> FLORENCE	<b>Agreement State:</b>	Yes	
<b>County:</b>	<b>License #:</b>		
<b>State:</b> SC			
<b>NRC Notified by:</b> DAVID BROWN	<b>Notifications:</b>	BLAKE WELLING	R1DO
<b>HQ Ops Officer:</b> CHARLES TEAL		GERALD MCCOY	R2DO
<b>Emergency Class:</b> NON EMERGENCY		DAVID HILLS	R3DO
<b>10 CFR Section:</b>		VINCENT GADDY	R4DO
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE		PART 21 GROUP	EMAIL

PART 21 REPORT - HK CIRCUIT BREAKER STUDS FAILED TO MEET SPECIFICATION

"This letter is submitted in accordance with 10 C.F.R. 21.21(d)(3)(ii) with respect to a failure to comply with the specifications associated with two studs P/N 163392A00 and 192247A00 used in medium voltage HK circuit breakers that may be subject to failure due to hydrogen embrittlement due to incorrect processing during plating. These studs were manufactured at the ABB Medium Voltage Service facility in Florence, SC from steel rod, heat treated in-house, and then sent to Surtronics for zinc plating with chromate treatment, including hydrogen embrittlement relief baking immediately following plating. A total of 51 pieces of P/N 163392A00 and 104 pieces of P/N 192247A00 were plated by Surtronics."

\*\*\* UPDATE FROM DAVID BROWN VIA FAX AT 1309 EDT on 4/27/12 \*\*\*

The vendor has notified the affected licensees, removed all remaining studs from inventory and will be auditing Surtronics established process during the next finishing production run.

The licensees affected include EFH/Luminant, Progress Energy and TVA.

Notified R1DO (Jackson), R2DO (Musser), R3DO (Lara) and R4DO (Proulx).

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IEIG  
NIRR

2300 Mechanicsville Road  
Florence, South Carolina 29501  
(843) 413-4700  
(843) 413-4853



# Fax

**To:** NRC Operations Center      **From:** David Brown

**Fax:** (301) 816-5151      **Pages:** 3

**Phone:** (301) 816-5100      **Date:** 27 April 2012

**Re:** \_\_\_\_\_      **cc:** \_\_\_\_\_

- Urgent**     **For Review**     **Please Comment**     **Please Reply**     **Please Recycle**

● **Comments:**

Amendment to 10 CFR Part 21 Notification of 9 April 2012

- Corrective actions complete

Thank you,

David C. Brown



April 27, 2012

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
FAX 301-816-5151

Subject: Amended Report 10CFR Part 21 Notification of Deviation re. Legacy Breaker Studs

This amended report is submitted to provide the list of affected utilities who may have received a suspect component and to update status of corrective actions detailed in the original notification.

1. Notifying individual: Jay Lavrinc, Vice President & General Manager, ABB (Medium Voltage Service), 2300 Mechanicsville Road, Florence, SC 29501.
2. Identification of the Subject component: ABB P/N 163392A00 stud and 192247A00 stud. These studs are used in truck assemblies for large frame (7.5 and 15) HK circuit breakers and in TVA refurbishment kits. The 163392A00 and 192247A00 studs are use to hold the puffer piston pivot bracket in place.
3. Nature of the deviation: Two of five refurbished HK circuit breakers provided to TVA incurred damage to 163392A00 studs during the receiving inspection. TVA provided notice of this damage to ABB March 22, 2012. The damaged studs were provided to a material analysis lab (Element Material Technology) for failure analysis on April 2, 2012. On April 4, 2012 Element Material Technology provided a report of failure to ABB and ABB reviewed the same on April 4, 2012. The failure of the breaker studs appears to have been caused by hydrogen embrittlement, and therefore it is believed that there was a failure to comply with the baking portion of the specification which sets forth certain baking parameters in order to protect the studs from hydrogen embrittlement. Extent of condition testing performed internally by ABB indicated that P/N 192247A00 may also be subject to hydrogen embrittlement suspect due to being finished in conjunction with the same production run.
4. The function of these studs is to hold the puffer piston pivot bracket in place and allow proper air flow direction. The safety related function of the puffer assembly is the creation of an airflow through the puffer nozzle when the circuit breaker is opened. The air flow is directed between the arcing contact and the stationary contact so as to propel the arc up into the arc chute assembly. Failure to provide proper air flow could cause damage to the arcing contact assembly. The failure of a proper airflow could cause damage to the contacts due to prolonged arcing and subsequent high resistance in the contact assembly, however the breaker will still operate. ABB's recommendation is to review the suspected parts during the next planned service interval.

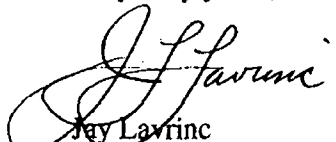
**ABB Inc.**



5. Corrective actions include:
- a. Notification of the potential existence of this deviation to affected customers. (Action complete)
    - EFH/Luminant - PO S07133166S2
    - Progress Energy - PO's 00571411, 00591629
    - TVA - PO's 290492, 336501
  - b. Review historical procurement and inspection records associated with the subject parts. Objective evidence from ABB inspections indicates all characteristics confirmed including hardness and dimensions, including verification of vendor finishing and E1 bake times. (Action complete)
  - c. Removed all 163392A00 studs (quantity of 7) from inventory. Four of 7 provided to Element Materials Technology for material analysis and destructive testing. Their report indicated satisfactory material, hardness, tensile strength and grain structure. (Action complete)
  - d. Confirmed that no inventory amount of 192247A00 was available for testing. (Action complete)
  - e. Notified Surtronics of discrepancy and established process audit to be completed by ABB during next finishing production run for replacement parts 163392A00 and 192247A00. (Action complete)

Because of the large variety of usages of the affected circuit breakers, ABB (Medium Voltage Service) cannot determine if the potential for a substantial safety hazard exists at any licensee's facility if premature failure of these studs occurs. Licensees are requested to evaluate the history of circuit breaker operating cycles to determine if the circuit breaker studs should be replaced immediately, or to perform the replacement at the next convenient maintenance opportunity.

Very truly yours,

  
Jay Lavrinc  
VP & GM ABB MVS

**ABB Inc.**

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