

General Information or Other (PAR)

Event # 35862

Rep Org: ABB COMBUSTION ENGINEERING Supplier: ABB COMBUSTION ENGINEERING	Notification Date / Time: 06/25/1999 16:34 (EDT) Event Date / Time: 06/25/1999 (EDT) Last Modification: 07/20/2000
Region: 1 City: WINDSOR County: State: CT	Docket #: Agreement State: No License #:
NRC Notified by: IAN RICKARD HQ Ops Officer: BOB STRANSKY Emergency Class: NON EMERGENCY 10 CFR Section: 21.21 UNSPECIFIED PARAGRAPH	Notifications: GLENN MEYER R1 VERN HODGE (via fax) NRR

10CFR PART 21 REPORT REGARDING ABB COMBUSTION ENGINEERING 4KV VACUUM BREAKERS

The following text is excerpted from a facsimile received in the NRC Operations Center:

"The defect concerns ABB 1200A 4KV Vacuum Breakers delivered to Baltimore Gas and Electric Company's (BG&E's) Calvert Cliffs Nuclear Power Plant (CCNPP). Specifically, the defect concerns the breaker performing a trip free operation when a close signal is received by the breaker. This defect results in the breaker failing to remain in the closed position. The defect could lead to non-conservative failure of not starting certain plant equipment upon demand such as an Emergency Core Cooling Pump."

*** UPDATE AT 1613 ON 06/30/99 BY VIRGIL PAGGEN TO JOLLIFFE ***

The above 10CFR Part 21 Report was submitted to the NRC via ABB Combustion Engineering Letter #LD-99-035, dated 06/25/99. The following is an update to the above 10CFR Part 21 Report via ABB Combustion Engineering Letter #LD-99-039, dated 06/30/99, Same Subject.

The activity for which this report is being filed is the use of ABB 1200A 4KV Vacuum Breakers in an application where the breaker is normally open and must close on demand. This defect applies only to BG&E's CCNPP.

The defect identified is associated with the use of the ABB 1200A 4KV Vacuum Breaker only in applications where the breaker must close on demand. The defect was detected during site testing of the breaker during installation into CCNPP. During this test, a close signal was applied to the breaker and the breaker tripped free (i.e., failed to remain in the closed position).

These breakers are intended for both normally open and normally closed operation. In some applications, the breaker must close upon demand. This may be for electrical distribution applications or component control applications (e.g., start an Emergency Core Cooling pump). Demands can be automated (e.g., by ESFAS) or based on manual operator demands. If the breaker does not remain closed when demanded (i.e., trips free), the safety function cannot be performed. This breaker is intended for use in multiple redundant safety divisions. Multiple redundant divisions could be affected by this defect.

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The defect applies only to ABB 1200A 4KV Vacuum Breakers delivered to CCNPP. Thirty-seven (37) of these breakers were delivered to CCNPP. ABB Combustion Engineering understands that several of these breakers have been installed at CCNPP, however, none are installed in any application that requires a close on demand function.

The NRC Operations Officer notified the R1DO Larry Doerflein and NRR Vern Hodge (via fax).

*** UPDATE AT 1740 ON 7/20/00, BY PAGGEN VIA FAX RECEIVED BY WEAVER ***
An additional defect has been discovered.

The defect concerns ABB 1200A 4KV Vacuum Breakers delivered to the Calvert Cliffs Nuclear Power Plant. Specifically, the defect reported herein concerns the potential for breaker stalling due to interference between an adjustment nut on the auxiliary switch extension rod and the mechanism top cover plate. Such interference could result in failure of the auxiliary switch contacts to fully change state, which could prevent the breaker from being remotely opened on demand and could lead to failure of certain plant equipment to start on demand. This defect could also potentially provide incorrect information to operators regarding the status of the breaker.

The Operations Center notified the R1DO (Cranston) and NRR (Hodge) via fax.

CE Nuclear Power LLC
Nuclear Licensing Group
Windsor, Connecticut



To: NRC Operations Center
U.S. Nuclear Regulatory Commission
Fax No: 301-816-5151
Subject: Report of Defect in Auxilliary Contact Mechanism
of ABB 4KV Vacuum Breakers

From: Virgil Paggen
(virgil.a.paggen@us.westinghouse.com)
Date: 20 July 2000
Fax No: 860-285-4189, Phone: 860-285-4700
This is Page 1 with 3 pages to follow.

Dear Sir:

The attached letter (LD-2000-044) reports a defect pursuant to 10 CFR 21 concerning the Auxiliary Contact Mechanism of ABB 4KV Vacuum Breakers. These breakers have only been provided to Calvert Cliffs Nuclear Power Plants.

A handwritten signature in cursive script that reads "Virgil Paggen".



Westinghouse Electric Company
CE Nuclear Power LLC

2000 Day Hill Road
Windsor, CT 06095

July 20, 2000
LD-2000-0044

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: Report of a Defect Pursuant to 10 CFR 21 Concerning the Auxillary Contact Mechanism of ABB 4KV Vacuum Breakers

Reference: Letter LD-99-039, I. Rickard (ABB) to NRC, *Report of a Defect Pursuant to 10 CFR 21 Concerning ABB 1200A 4KV Vacuum Breakers*, 6/25/99

The Reference letter notified the NRC of a defect as defined in 10 CFR 21, *Reporting of Defects and Noncompliance*, concerning trip-free operation of ABB 4KV breakers. This letter reports the identification of a further defect associated with the auxiliary contact mechanism of the subject breakers.

The defect concerns ABB 1200A 4KV Vacuum Breakers delivered to the Calvert Cliffs Nuclear Power Plant. Specifically, the defect reported herein concerns the potential for breaker stalling due to interference between an adjustment nut on the auxiliary switch extension rod and the mechanism top cover plate. Such interference could result in failure of the auxiliary switch contacts to fully change state, which could prevent the breaker from being remotely opened on demand and could lead to failure of certain plant equipment to start on demand. This defect could also potentially provide incorrect information to operators regarding the status of the breaker.

The Enclosure summarizes the evaluation and corrective actions performed by CE Nuclear Power. Please feel free to contact Virgil Paggen of my staff at 860-265-4700 or me if you have any questions.

Sincerely,
CE Nuclear Power LLC

Ian G. Rickard, Director
Nuclear Licensing

Enclosure: As stated

**Westinghouse Electric Company LLC
CE Nuclear Power LLC
10 CFR 21 Report of a Defect or Failure to Comply**

The following information is provided pursuant to the requirements set forth in 10 CFR 21.21:

(i) Name and address of the individuals informing the Commission:

Ian C. Rickard, Director
Nuclear Licensing
CE Nuclear Power LLC
2000 Day Hill Road
Windsor, CT 06095-0500

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States, which fails to comply or contains a defect:

The activity for which this report is being filed is the use of ABB 4KV Vacuum Breaker in applications where the breaker is normally open and must close on demand. In addition, should the breaker's primary contacts be closed, the defect could prevent the breaker from being opened remotely, although local manual operation could still be achieved. This defect applies only to ABB 4KV breakers supplied to the Calvert Cliffs Nuclear Power Plant (CCNPP).

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect:

CE Nuclear Power LLC (formerly, ABB C-E Nuclear Power, Inc.)
2000 Day Hill Road
Windsor, CT 06095-0500

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply:

The defect identified is associated with the use of the ABB 4KV Vacuum Breaker only in applications where the breaker is normally open and must close on demand, or where the breaker is closed and may be prevented from opening and re-closing on demand. This defect, detected during testing of a breaker at CCNPP, was identified when an attempt was made to close the breaker and, although the primary contacts closed, the auxiliary switch contacts failed to change state.

These breakers are intended for use in safety and non-safety applications, and for both normally open and normally closed operation. In the normally open application, the breaker closes upon demand. This may be for electrical distribution applications or component control applications. Demands can be automated (e.g., by Emergency Diesel Generator load shedding and sequencing) or based on operator action. If the breaker's auxiliary switch contacts fail to change state, the ability to open and re-close the breaker may be impaired such that the safety function cannot be performed. Multiple electrical divisions could potentially be affected by this defect.

- (v) *The date on which the information of such defect or failure to comply was obtained:*

CE Nuclear Power became aware of this issue on May 25, 2000 by notification from CCNPP. A defect was determined to exist in these breakers on July 14, 2000.

- (vi) *In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part:*

The defect applies only to ABB 4KV Vacuum Breakers delivered to CCNPP. Nine (9) of the sixty-five (65) delivered breakers have been installed, seven (7) in safety-related applications and two (2) in non-safety applications. Only two of the seven safety-related breakers could be impacted by this problem; the remaining five breakers are installed on electrical load center feeders that remain normally closed.

- (vii) *The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action:*

Two installed safety-related breakers are affected by the defect, one provides power to auxiliary feedwater pump #23 and has successfully undergone periodic surveillance testing since installation in December 1999. The second breaker was installed in May 2000 and provides power to service water pump #23; this breaker experienced stalling during testing.

CE Nuclear Power and CCNPP performed an evaluation of the problem, with exigent actions being adjustment of the service water pump breaker by a service representative to eliminate binding. Breakers remaining in the warehouse have been "Hold" tagged and will not be installed until the binding problem is resolved. Corrective actions include expedited efforts to qualify and install replacement mechanism top cover plates that are designed to eliminate any potential for interference with the auxiliary switch extension rod. A seismic analysis of the replacement plate has been performed and the results indicate that the replacement plates will not impact the seismic qualification of the breakers.

- (viii) *Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees:*

ABB 4KV breakers of this design have only been provided to CCNPP; no other nuclear power plants are affected.