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10 CFR 21.21

Palo Verde Nuclear
Generating Station

John H. Hesser
Vice President
Nuclear Engineering

Tel. 623-393-5553
Fax 623-393-6077

Mail Station 7605
P. O. Box 52034
Phoenix, Arizona 85072-2034

102-06335-JHH/DCE
March 23, 2011

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket No. STN 50-528, STN 50-529, and STN 50-530
License No. NPF 41, NPF 51, and NPF 74
ABB K600S 480 VAC Class 1E Breaker Defect - Bell Alarm Switch
Bracket Misalignment**

Enclosed please find a written notification of a defect discovered on Asea Brown Boveri (ABB) K600S 480 VAC Class 1E breakers. This report is being submitted pursuant to 10 CFR 21.21(d)(1).

In accordance with 10 CFR 50.4, copies of this notification are being forwarded to the NRC Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Marianne Webb, Section Leader, Regulatory Affairs, at (623) 393-5730.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,

DCM/RAB/TNW/MNW/DCE/gat

Enclosure

cc: E. E. Collins Jr. NRC Region IV Regional Administrator
L. K. Gibson NRC NRR Project Manager for PVNGS (send electronic and paper)
J. R. Hall NRC NRR Project Manager (send electronic and paper)
M. A. Brown NRC Senior Resident Inspector for PVNGS

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NRR

Enclosure

**ABB K600S 480 VAC Class 1E Breaker Defect
Bell Alarm Switch Bracket Misalignment**

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ABB K600S 480 VAC Class 1E Breaker Defect
Bell Alarm Switch Bracket Misalignment

On February 15, 2011, Palo Verde Nuclear Generating Station (PVNGS) completed an evaluation of prior deviations related to the alignment of bell alarm switches installed in Asea Brown Boveri (ABB) K-600S 480 VAC Class 1E circuit breakers. If the breakers had been placed into service as received, the misaligned bell alarm switch brackets could have prevented the automatic or remote closure of the breakers installed in safety-related applications.

The listed reporting officer received the information related to the completed defect evaluation on February 22, 2011. The NRC Headquarters Operations Officer was notified on February 24, 2011, via Event Notification #46639.

Pursuant to 10 CFR 21.21(d)(1), the following information is provided related to the identified defect, as required by 10 CFR 21.21(d)(4):

- (i) Name and address of the individual or individuals informing the Commission.

John H. Hesser, Vice President, Nuclear Engineering
Palo Verde Nuclear Generating Station
Mail Station 7605
PO Box 52034
Phoenix, AZ 85072-2034

- (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.

ABB/ITE K600S Class 1E 480 VAC Circuit Breaker
Manufacturer Part Number: KLS6E90176

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

ABB POWER T & D COMPANY
PO Box 100524
Florence, SC 29501-0524

- (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 ABB K-600S breakers contain a protective indication feature related to the overcurrent trip. An overcurrent trip actuates the reset indicator which moves an armature roller away from the bell alarm switch (ABB part number 706747-T07/BBC) to open the alarm switch contact. The alignment of the bell alarm switch bracket affects the range of contact between the bell alarm switch and the reset indicator armature. This alignment is critical because the vibration of breaker closure can cause the switch and the armature to lose contact momentarily to create an unintended 86 lock-out and trip the breaker open during the closure sequence. The breaker will not be able to be re-closed until the 86 lock-out and the bell alarm switch have been manually reset. This defeats the safety function of the breaker to provide power to the supported component.

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The 86 lock-out feature is a protective circuit installed in the breaker enclosure and is not part of the purchased component. The 86 lock-out uses the bell alarm indication of a faulted trip to prevent re-closure of the breaker until the lock-out is reset. The 86 lock-out circuit also trips the breaker open.

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

Two instances were identified in which new or refurbished ABB K600S breakers failed pre-service testing due to the misalignment of the bell alarm switch brackets. In each case, the bell alarm switch bracket was manually re-aligned to ensure that contact between the reset indicator and bell alarm switch remained intact during breaker closure.

The first instance occurred on a refurbished breaker that failed testing on November 5, 2009. The quality control receipt inspection was completed on the breaker on October 2, 2009.

The second instance occurred on a new breaker that failed testing on October 21, 2010. The quality control receipt inspection was completed on the breaker on June 3, 2010.

The untimely evaluation and defect reporting have been entered into PVNGS's corrective action program. PVNGS completed an operability assessment for uses of the ABB K600S breakers that support components impacting Technical Specifications and concluded affected systems were OPERABLE.

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

At PVNGS, each unit uses 34 ABB K600S circuit breakers in safety-related applications. The station has not provided any of these breakers from its own stock to any other licensee.

- (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.

ABB provided PVNGS written instructions regarding adjustment of the bell alarm switch bracket, including tolerances to ensure the bell alarm switch and the reset indicator remain in contact during breaker closure. These were incorporated into the station's ABB K600S vendor manual on January 27, 2011.

ABB is preparing a response to Vendor Corrective Action Report generated by PVNGS, issued to ABB on February 3, 2011. The intended response date was March 3, 2011. The response from ABB is pending.

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- (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.

Licensees who use ABB K600S 480 VAC breakers in safety-related applications should review whether the bell alarm indication is also used to actuate a protective feature and evaluate vulnerability to this defect. Questions regarding the details of PVNGS design related to use of K600S breakers may be forwarded to Karl Bright, Electrical System Engineer, at Karl.Bright@aps.com.

- (ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not applicable.