



SOLIDSTATE CONTROLS

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

Attention: Document Control Desk
Subject: Notification of Potential Defect - 10CFR Part 21

Product: Vishay/ International Rectifier Clamp, Diodes 300V, 250A, forward and reverse bias, Ametek part numbers 07-600250-00 and 07-600251-00.

Ametek Solidstate Controls is submitting the following Interim Report of a Potential Defect in accordance with the requirements of 10CFR21. This notification is currently applicable to equipment model number 85-VC0250-41 provided to Tennessee Valley Authority at Watts Bar Power Station.

TVA has experienced multiple failures of diodes in two specific pieces of equipment, serial numbers C84733-0211 and C84733-0511. The failures have occurred over the last four years and evaluation of the failures and root cause is ongoing.

The attached document provides details on the problem experienced, potential causes, effects, and the ongoing evaluation. Please contact me with any further questions or comments.

Sincerely,

Ethan Salsbury
Director of Quality
AMETEK Solidstate Controls



COMPONENT DESCRIPTION:

300V, 250 A clamp diodes with Vishay/International Rectifier part numbers IN3737 and IN3737R and Ametek part numbers 07-600250-00 and 07-600251-00, respectively.

Diode failures occurred in 20kVA Inverters, Ametek part number 85-VC0200-41 with serial numbers C84733-0211 and C84733-0511. Two failed diodes returned for evaluation were manufactured in India in 2004.

PROBLEM EXPERIENCED:

TVA has experienced 5 diode failures since November of 2017. The diode failures experienced at TVA resulted in alarms for abnormal conditions and equipment alarms for fan failure, inverter fuse blown, and inverter failure. The equipment will transfer to bypass when a diode fails.

POTENTIAL CAUSE

Diodes installed in the TVA equipment were shorted in most cases and degraded in one instance. Only two of the shorted diodes were sent to AMETEK SCI for evaluation.

While the precise cause of this failure is unknown, diode failures are generally attributed to transient voltage spikes and overheating. TVA did indicate there have not been any transient events on the DC bus that could have caused this failure.

The inverters at TVA are loaded below 50%. This could contribute to increased heat and stress on the diodes due to increased current draw. However, test data from the original testing of the equipment at no load did not show elevated temperatures on the diodes.

EFFECT ON SYSTEM PERFORMANCE

Failures described above could result in loss of output voltage and transfer of the static switch to the bypass source which could result in potential loss of load.

EVALUATION OF THE POTENTIAL DEFECT

AMETEK is sending the parts to the original manufacturer for further evaluation with the intent to obtain more insight on the interior condition of the diodes. The targeted completion date for this evaluation of the two diodes returned is June 1, 2021.