



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

Reference: Final Notification of Potential Defect regarding AMETEK Power Supply, series 85-RPXXX

Product: AMETEK Power Supply, series 85-RPXXX

Ametek Solidstate Controls is submitting the following Report of a Potential Defect in accordance with the requirements of 10CFR21.

The attached document provides details on the potential problem, the evaluation results, and actions recommended. Please contact us at the phone number or email provided above if there are any questions.

For questions or clarifications, please contact me at 1-614-410-6293.

Sincerely,

Ethan Salsbury
Quality Director
Ametek Solidstate Controls



SUMMARY

AMETEK Solidstate Controls discovered a concern with the structural integrity of the 85-RP2675-01 Rack Mounted Power supply. While qualifying a replacement part for an obsolete breaker, the left panel of the power supply came loose after the hardware sheared during the seismic simulation testing of the qualification. The loss of structural integrity of the power supply led to internal shorting and a premature stoppage of the simulation testing.

After investigation, AMETEK concluded that this could have been a result of tolerance stack up in the sheet metal components or undersized hardware to support the bottom of the power supply frame for 85-RPXX series power supplies. Additional evaluation was performed by seismically testing two new specimens – one would have larger bolts and the other would use the same size hardware. Both configurations contained a nut on the hardware to avoid any lateral movement.

The follow up testing was completed late September of 2020. No failures were observed during the testing of either unit.

PROBLEM YOU COULD SEE

During a seismic event, a structural failure of the power supply enclosure resulting in a loss of output could occur. AMETEK suspects that the failure is related to a variation in the components that increased strain on the power supply enclosure, and it is indeterminate if there is a widespread deviation. It is also possible that the cause of the failure is attributed to inadequately sized hardware that supports the bottom panel of the power supply. In the previous designs, there are three (3) #10-32 machine screws through each of the side panels that fasten to the bottom panel to support the transformer.

AMETEK is unable to identify the actual structural support of power supplies in the field. In the recent testing performed, no support was provided under the power supply during the testing. If there is support in the end application from the bottom of the power supply, there may not be a structural concern as the connection screws would not be exposed to the same forces.

ACTION RECOMMENDED

AMETEK does not consider this to be a likely failure based on these test results. Additionally, AMETEK is unable to determine the criticality of the applications the power supplies are installed in and if the safety function is required to be maintained during a seismic event, which will determine the need to take corrective actions. The following enhancements can be applied to power supplies in operation:

- Add a #10-32 nut to each of the six (6) mounting screws to avoid any lateral movement of the sheet metal parts that would lead to potential elongation or striping of the fastener.
- Add support to the bottom of the transformer to prevent horizontal forces on the support screws

Although recent testing did not result in a similar failure, AMETEK is taking actions to enhance the design of the power supply. On new power supplies, the mounting hardware will use 1/4" bolts that connect the side panels to the bottom panel through 5/16" through holes with a nut and washers. In combination, these changes will increase the force required to shear the hardware reduce the force on the bolt itself by allowing some movement to dampen the forces during a seismic event.