



Rosemount Nuclear Instruments, Inc.
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26 February 2020

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

Re: Notification under 10 CFR Part 21 for Rosemount Model 1153, 1154, and 3150 Series Pressure Transmitters

Pursuant to 10 CFR Part 21, section 21.21(a)(2), Rosemount Nuclear Instruments, Inc. (RNII) is writing to provide a final report related to the treatment of temperature rise due to electronics self-heating in qualified life thermal aging calculations for select pressure transmitters as outlined in this notification.

This report is an update to interim 10 CFR Part 21 report issued 5 December 2019 subject "*Interim notification under 10 CFR Part 21 for Rosemount Model 1153 and 1154 Pressure Transmitters*".

1.0 Name and address of the individual providing the information:

Mr. Gerard Hanson
Vice President & General Manager
Rosemount Nuclear Instruments, Inc.
8200 Market Blvd
Chanhassen, MN 55317

2.0 Identification of items supplied:

Rosemount 1153 and 1154 pressure transmitters
(inclusive of 1153 Series B, 1153 Series D, 1153 Series F, 1154, and 1154 Series H)

Rosemount 3150 Series pressure transmitters
(inclusive of 3152N, 3153N, 3154N, and 3155N)

3.0 Identification of firm supplying the item:

Rosemount Nuclear Instruments, Inc.
8200 Market Blvd
Chanhassen, MN 55317

4.0 Nature of the failure and potential safety hazard:

As outlined in "*Interim notification under 10 CFR Part 21 for Rosemount Model 1153 and 1154 Pressure Transmitters*" dated 5 December 2019 ("*Interim Notification*"), RNII has completed an analysis related to the treatment of temperature rise due to electronics self-heating in qualified life thermal aging calculations on Rosemount 1150 series pressure transmitters (inclusive of 1153 Series B, 1153 Series D, 1153 Series F, 1154, and 1154 Series H). Qualification programs for Rosemount 1150 series models did not account for electronics temperature rise in original Arrhenius qualified life calculations.

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As also discussed in the Interim Notification, the analysis reflected in this notification was extended to include the more recently qualified 3150 series pressure transmitters (including 3152N, 3153N, 3154N, and 3155N). Although 3150 series qualification programs did account for temperature rise in Arrhenius qualified life calculations, the temperature rise assumptions used in the original qualification have been evaluated for conservatism.

RNII's analysis of both 1150 series and 3150 series included electronics thermal imaging to characterize the thermal distribution on electronic assemblies, as well as direct in situ temperature measurements of qualified life limiting components. Specifically, temperature measurements were taken on limiting components to quantify actual temperature rise for both the original qualification accelerated aging conditions as well as for normal operating conditions. These temperature measurements were then used, along with the relevant component activation energies, in updated Arrhenius calculations to more accurately evaluate the impact of temperature rise on qualified life thermal aging calculations. The general methodology used in the analysis was reviewed with a US Nuclear Regulatory Commission Inspection team during a site inspection December 9-12 of 2019 to obtain NRC insight and feedback into the methodology.

The analysis demonstrates that temperature rise due to electronics self-heating on limiting components is application dependent. As a result, the calculated qualified life will be application dependent. Important application specific factors contributing to the magnitude of temperature rise include power supply voltage, loop load resistance, and operating output current. In many application conditions, the originally established qualified life calculations will remain conservative with respect to the updated calculations (i.e. the updated qualified life will be longer than the originally established qualified life). In applications where the originally established qualified life calculations may not be conservative (i.e. the updated qualified life will be shorter than the originally established qualified life), RNII believes there is no impact to the safety function of either the 1150 series or 3150 series pressure transmitters due to any differences in calculated qualified life because long term aging information obtained from the limiting component supplier, supported by RNII independent internal testing, demonstrates insignificant change over time in the electrical parameters of the limiting components for the temperatures and operating conditions in question.

5.0 The corrective action which has been taken; the name of the individual or organization responsible for that action; and the length of time taken to complete that action:

To provide a more accurate model to account for electronics temperature rise in Arrhenius calculations, RNII is revising our temperature inputs into the Arrhenius accelerated aging calculation methodology for both 1150 series and 3150 series pressure transmitters. This revised methodology will be provided separately to end users.

6.0 Any advice related to the potential failure of the item:

RNII does not believe this issue presents a risk to the safety function of the 1150 and 3150 series pressure transmitters. Nevertheless, RNII recommends end users evaluate the significance of this notice to their specific pressure transmitter applications.

Rosemount Nuclear Instruments, Inc. is committed to the nuclear industry and we assure you that we are dedicated to the supply of high-quality products and services to our customers. If there are any questions, please contact our Technical Support Engineers at 952-949-5200 (RNII.info@emerson.com) or Nathan Schukei at 952-949-5213.

Sincerely,

A handwritten signature in cursive script that reads "Gerard Hanson".

Gerard Hanson
Vice President & General Manager
Rosemount Nuclear Instruments, Inc.