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AMS Talking Points for February 17, 2021 Discussion with NRC on AMS Topical Report AMS-TR-0720R1

1. Common Mode Drift. This is not a problem with nuclear grade pressure transmitters as substantiated with the information provided in the AMS topical report and its references. Like RTDs, the drift behavior of nuclear grade pressure transmitters is random. That is, redundant pressure transmitters do not all drift at the same time in the same direction. Therefore, a transmitter calibration is warranted when OLM identifies it as drifting beyond its limits. As for new transmitters to be included in the OLM program, the -A version of the topical report will include a statement to point out that a similarity analysis with transmitters already evaluated in this topical report should be performed.

   During the audit of understanding, NRC indicated that it may consider a "Backstop" calibration schedule to defend against any possibility of common mode drift. AMS will work with the NRC to establish a Backstop Schedule if needed. As discussed during the audit, the British Nuclear Regulatory Authorities approved a backstop of 8 years for Sizewell B in 2006 when there was no experience with OLM implementation. Today, with nearly 16 years of successful OLM implementation at Sizewell B with no common mode drift experienced, a longer backstop should be allowed; for example 16 years.

2. Transmitter Span Coverage. OLM data taken at start up, shut down and normal operations periods can be analyzed to check for drift over much of a transmitter's span. For those transmitters with their set points above OLM coverage, an analysis may be required to address drift at unobserved setpoints for normal operational and/or accident conditions. During the audit, it was mentioned that if the high setpoint was within about 10 percent of the observed operating point as at Sizewell B, then this may be acceptable. Guidance to help establish the criteria for the allowance between the operating point and the high setpoint will be provided in the -A version of the topical report.

   As for transmitters that normally operate in the low end of their span such as containment pressure transmitters, OLM may not be used.

3. Sensing Line Blockage. As a result of the audit discussions, AMS has a better understanding of the NRC reluctance to strongly link the noise analysis to the sense line blockage failure mode. That is, we understand and appreciate that the NRC is reluctant to expand its regulatory scope that is not currently addressed without a compelling new safety case (i.e., backfit rule). AMS did not intend in its topical report to ask for an extension of the regulatory scope on this issue. This issue was included in the topical report in order to be proactive because AMS has detected sensing line blockages in nuclear power plants with good success using the noise analysis technique. It was also included as another way to assess failure modes associated with sensor sluggish behavior. In essence, noise analysis is a part of the OLM tool suite that one would use to determine if calibration is needed. We think that provides the NRC with a solution to its regulatory concerns and offers the nuclear industry a useful tool to provide a comprehensive assessment of performance of a pressure sensing system. These points will be clarified in the -A version of the topical report.

4. Transmitter Response Time. The elimination of response time testing requirements was predicated upon performance of routine calibrations which was assumed to also reveal response time failure modes. With implementation of OLM, routine calibrations are not performed unless indicated by OLM and the response time testing requirements must therefore be addressed. The OLM methodology to detect drift can also detect sensor failure modes that can affect response time. With high frequency OLM data (i.e., with the noise analysis technique), utilities can address the response time issue without performing time intensive and intrusive hydraulic ramp testing. This also will address the concern about sluggish or stuck transmitters. For services such as containment pressure with no process noise, these can be tested by injecting noise, traditional hydraulic ramp testing, or they can be excluded from the OLM program.

   As described in Section 3 of the current version of the topical report, some failures are not detectable by OLM as shown in the table below. These failure modes are detectable by noise analysis.

From AMS-TR-0720R1 Table 3.1 Summary of FMEA for Nuclear Grade Pressure Transmitters

Number	Sensor Type	Failure Mode	Response Time Detectable	OLM Detectable
1	Force Balance Pressure Transmitters	Increased fill fluid viscosity	Yes	No
2	Strain Gage Pressure Transmitters	Increased fill fluid viscosity	Yes	No
3	Generic Capacitance Pressure Transmitters	Increased fill fluid viscosity	Yes	No
4		Ceramic insert partial blockage	Yes	No

No: Not detectable, Yes: Detectable

5. Appendix A. This appendix was included in the AMS topical report in response to NRC's request in a pre-submission on why the previous TR was not implemented by the industry. During the audit, it was concluded that AMS can remove this appendix in the -A version as it does not relate to AMS methodology.

6. Appendix C. This appendix was included in the AMS topical report as an example of changes that licensees may make in their Technical Specification to allow themselves to use OLM and/or traditional calibrations. AMS is not asking for approval of the material in this appendix. The appendix was included as a courtesy to the industry and in response to NRC's request in a pre-submission meeting to show an example that can help with consistency of LARs that NRC may receive for OLM implementation. We are open to feedback from the NRC on the content we have proposed for the OLM program description example. We wrote it to be at the same kind of level of detail as TSTF-425 and we think it would be useful to all the stakeholders if the NRC provided some feedback on whether that is sufficient.