

NRC-Approved Technology to Extend Calibration Intervals of Pressure, Level, and Flow Transmitters

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Overview

In August 2021, the NRC approved a Topical Report (TR) written by Analysis and Measurement Services Corporation (AMS) to use online monitoring (OLM) technology to extend the calibration intervals of nuclear plant pressure, level, and flow transmitters.¹ As shown in Figure 1, transmitter data stored in the plant computer is retrieved and analyzed to identify transmitters whose calibration must be checked (Bad), and those that can be left alone (Good). Basically, the output of transmitters during startup, normal operation, and shutdown is statistically analyzed to verify the calibration of transmitters over much of their range. There is no need for any plant modifications or installation of any new equipment to implement OLM. All that is needed for OLM is already available from the plant computer. This is the same data mechanism that TVA employees currently utilize to monitor equipment remotely – even at home.

To facilitate outage preparation and planning, preliminary data analysis would be provided to the site mid-cycle with formal results submitted within a couple of days after the shutdown of the plant. Additionally, the methodology is constructed to utilize existing instrument uncertainties without the need for expensive safety setpoint and accident analysis changes.

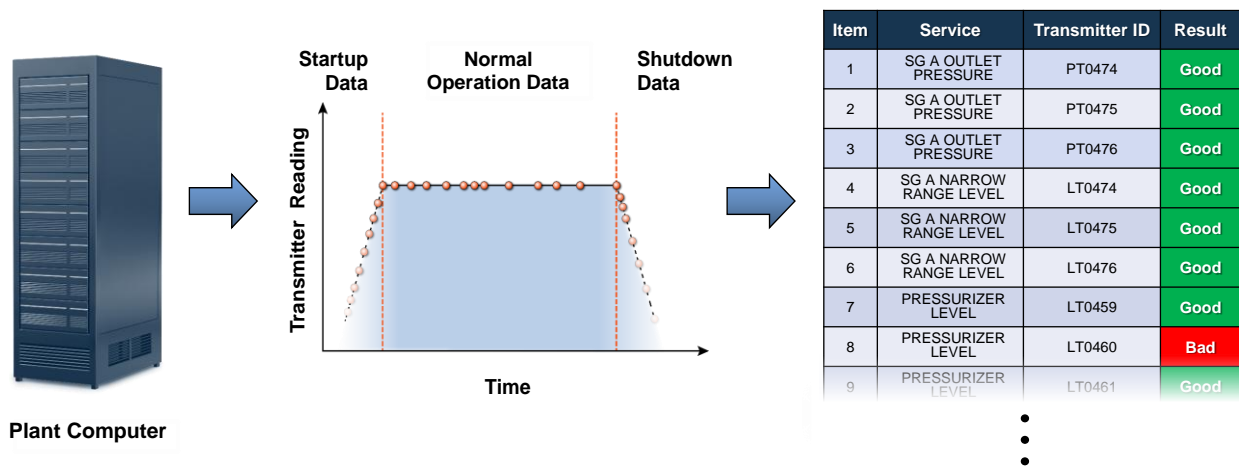


Figure 1. OLM Implementation Process

¹ AMS Corporation, "Online Monitoring Technology to Extend Calibration Intervals of Nuclear Plant Pressure Transmitters", AMS-TR-0720R2-A, NRC ADAMS Accession No. ML21235A493, August 2021.

Benefits

In a typical 4-Loop PWR, OLM implementation will allow for approximately **100 pressure transmitters per plant unit** to be spared from unnecessary calibrations each cycle.

Additional direct and indirect cost savings include:

1. Reduced Labor Cost and Dose (ALARA)
2. Ability to Reallocate I&C Resources for Non-calibration Outage Activities
3. Reduced Maintenance-Induced Errors (up to 5% of calibrations per industry data)
4. Reduced Calibration-Induced Wear and Tear of Transmitters
5. Reduced Need for Expensive EQ Qualified Gaskets, O-rings and Lugs
6. Reduced Instrument Line Valve Rework/Replacement
7. Elimination of Calibration-Induced Plant Trips
8. Reduced Start-Up Delays and Outage Duration
9. Reduced at Power Re-calibrations of Transmitters

In contrast to other methods of extending transmitter calibration intervals like the Surveillance Frequency Control Program (SFCP), the OLM methodology does not require Probabilistic Risk Assessment (PRA) or extensive transmitter drift evaluations and can extend calibration intervals **for up to 12 cycles** as opposed to the current 36-month extension limitation for the SFCP.

Getting Started

OLM implementation requires a license amendment request (LAR) for each plant. AMS is currently working with Southern Nuclear to obtain the first plant-specific LAR. This will facilitate the work for the remainder of the industry.

For more information on how to get started with implementing OLM at your facilities, please contact Ryan O'Hagan at AMS (ryan@ams-corp.com).