

DEMYSTIFYING THE USE OF API 682 4TH EDITION FROM AN INSTRUMENTATION PERSPECTIVE

The 4th edition of API 682 changed the instrumentation from switches to transmitters. Since this change is not mandatory, users should understand its intent and decide if appropriate for the organization.

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Summary

The 4th edition of API 682 significantly changed instrumentation used in the monitoring and control of seal support systems. The new standard clearly states the preference for pressure, temperature, and level transmitters over the switches deployed in the 3rd edition. As the 4th is not a mandatory requirement, which standard, 3rd or 4th edition, should you deploy? Here are a few things to consider before you decide.

Issues

After years of delays the API 682 4th edition was finally released this past May, signifying a change to transmitters instead of switches for monitoring seal support systems. The preferred monitoring technology has been switches since the first iteration of the standard written in the 1990's.

As a supplier of both switches and transmitters and with fewer biases than a switch-only supplier, this article was developed as objectively as possible. The following are practical guidelines for users to help them make informed decisions regarding the changes from switches to transmitters based on the unique attributes of their organizations.

Primary Instrumentation Changes to the Standard:

- Pressure, Temperature, and level indicating transmitters instead of switches, as depicted in the piping plans
- HART communication protocol is not required, only 4-20 ma output
- New API Plans 65A, 65B, 66A, 66B identify excessive leakage from the seal, requires level indicating transmitter
- Hydrostatic (pressure) level transmitter detection for Plans 52, 53A
- Revised temperature limit for instrumentation to 100 deg c
- Temperature measurement of gas bubble for Plan 53B

Objective of Instrumentation Changes

This article discusses the change from switches to transmitters. By transitioning to transmitters with proportional in lieu of switch outputs, end users in the API Task Force hoped to use measurement trending to infer seal and instrumentation health. Knowing when the seal or measurement device is about to fail allows maintenance to proactively schedule a convenient resolution before a catastrophic failure and prevent unplanned shutdowns that can cost millions in lost revenue.

Reality

The use of transmitters for predictive maintenance is an excellent idea that has been deployed in process measurements for over a decade. The reality is that there are a number of factors conspiring to limit its success in API 682 piping plans, as it has in process applications, particularly in brownfield applications:

- Wiring racks are at capacity with no real estate to add additional wiring.
 - Before opting for 4th edition and transmitters, ensure that the wiring infrastructure can support connecting the additional devices.
- With the expansion of smart instrumentation networks and the loss of expertise from the retiring workforce, workers are drowning in data.
 - Before opting for the 4th edition,

be sure that the workforce has the bandwidth to use the data or the investment will be all for naught.

- The cost of process transmitters can be more than five-times that of electromechanical switches and more than three-times that of electronic switches with 4-20-ma transmitter outputs.
 - Consider the higher initial purchase price and cost of changing to transmitters (IO, Wiring, Programming, and Software) and compare the benefits before deciding.
- Typical culture in many plants deploys inspection rounds in lieu of using asset management software data to create work orders.
 - Make sure that the culture and processes can be changed to act on the information.

Recommendations

- In a brownfield upgrade to API 682 4th Edition, the potential ROI envisioned by the API 682 Task Force may not materialize due to the prohibitive cost of changing to transmitters. Specify the 3rd Edition.
- Greenfield applications could be more attractive as the cost of changing is not a factor with just the initial cost of hardware to consider. Specify the 4th Edition after ensuring that the organization will invest in process and culture changes necessary to benefit from trending information.
- If the organization has older legacy 3rd edition seal support systems and expansions using the new 4th edition, consider deploying a multi-functional product like the UE One Series Transmitter Switch that works on both old and new systems to reduce inventory and workforce training.
- Choose suppliers with expertise in products, application knowledge, and seal support systems to select appropri-

ate products for your organization.

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