



NTNU

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Update on new standard development on functional safety of valves

Mary Ann Lundteigen

New standard under development

- CEN TC69 WG1 AH3 committee developing a standard titled “**Functional Safety of safety-related automated industrial valves**” (Preliminary Work Item (PWI) 00069217)
 - https://standards.cen.eu/dyn/www/f?p=204:7:0::::FSP_ORG_ID:6052&cs=1DF482A14893E3BCFF660081CC3ACB227
 - https://standards.cen.eu/dyn/www/f?p=204:22:0::::FSP_ORG_ID,FSP_LANG_ID:6052,25&cs=1FF5595C3F27CA48074698E20D347FC8B
- No draft available yet, but I have been in contact with to members of committee:
 - **Paul Reeve** Director & Principal Consultant (SILMETRIC, UK)
 - **Josef Saurer**, Senior Project manager DIN-Valves Standards Committee (NAA), Germany

Current status on progress

- “The draft has undergone a couple of revisions since the ad-hoc committee was formed in 2018.
- The current revision is still considered an early draft and there is a good deal of further work and agreement required around some of the technical details.
- A further revision is expected following the meeting in **Cologne 16th and 17th September 2019**”
- Due to the 36 month limit of such initiatives, and that 12 months have already passed, the draft should be available at least **in 1-2 years...**

Who are involved?

- “There are about 20 participants representing **Germany, UK, Netherlands, Finland, Italy and France**. The participants are mainly from manufacturers, certification bodies and end-users (apart from the secretariat officers from DIN). There have been about 3 meetings so far (by October 2019) of the group drafting the standard. The proportion of the group is Certifier/consultant (37%), Standardization or research body (7%), End user (10%), Manufacturer (27%). Most (70%) of the participants are based in Germany.”
- Note: No one from Norway...

Why this standard?

- “It is recognised that there is a **need for consistency** in the approach used to establish functional safety failure data, systematic measures, qualification criteria, etc, **for mechanical valves and actuators**.
- This is largely because the basic functional safety standard IEC 61508 (7 parts) is aimed at electrical/electronic/programmable-electronic systems (although most safety systems contain at least one mechanical device as the “final element”). “

Scope of this new standard

Preliminary scope:

This standard defines procedures and methods with which all relevant components of automated industrial valve packages can be evaluated according to the rules of IEC 61508-1, -2 and -4 to -7 in order to integrate them into a safety instrumented system (SIS). It provides a method to determine all relevant factors, associated with the product, to be fully taken into account and thereby meet the specific needs of users of the product.

Not in the scope:

- Industrial valves that cannot be integrated in safety instrumented systems according to IEC 61508,
- Automatic safety valves (e.g. pressure relief valves),
- Manually operated valves.
- Components in safety systems or risk-reducing devices that are not designed, assessed and operated according to the principles of functional safety.
- **Electrically actuated valves**

Topics – preliminary list

Basic requirements and classifications of the component

- Intended use
- Demand mode and utilization rate
- Type of final element / component
- Systematic Capability

Safety lifecycle requirements for the development of safety-related automated industrial valves

Assessment of the suitability of a component for use in safety-related systems

- Evaluation of the manufacturer's measures to increase reliability (including Design and Engineering, Qualification testing, Testing during manufacturing, Manufacturing and assembly, General quality assurance measures, Field feedback)
- Qualification tests
- Determination of failure rates

Testing, Maintenance and time restrictions

- On-line diagnostic testing
- Proof test
- Proof Test Coverage (PTC)
- Maintenance
- Useful lifetime
- Storage time

Documentation

- Documentation of the assessment
- Information to be provided to end users and system integrators
- Safety manual in addition to an IOM (Installation, Operation, and Maintenance Manual)

Annexes:

- FMEDA procedure, assumptions and factors affecting failure rates
- Quality assuring measures
- Manufacturing-related measures
- Validation measures