How safe is your site?
COMAH 2015 and its implications

Endress+Hauser
People for Process Automation

Overfill prevention
Safety of your plant and personnel

COMAH and you
The introduction of latest COMAH regulations in 2015 has once again brought the issue of overfill prevention to the fore. Many smaller firms affected by the rules for the first time and larger companies who are now subject to more comprehensive requirements are taking the opportunity to improve their existing plant.

The Control of Major Accident Hazards (COMAH) 2015 regulations have superseded the legislation that had been in force since 1999. More companies are now required to inform the authorities about the dangerous substances they hold or those that could be generated in the event of an accident. Sites are divided into two categories: top-tier sites (those that hold a greater quantity of dangerous chemicals) and lower-tier sites.

The top-tier sites are dominated by chemical and oil & gas facilities but also include distilleries due to the amount of flammable spirit being held. Overfilling in the distillation process is not only very costly but also dangerous. As such, systems must be put in place to prevent overfilling the tank.

In recent years, industry has moved away from float switches to more reliable devices based on the tuning fork principle, for example the Liquiphant. In its simplest form this device monitors its own condition continually and warns of failure before the level reaches the switch. This self-monitoring has resulted in Liquiphant systems being created to comply with IEC 61508 and to be compatible with SIL systems. The majority of Liquiphant devices conform to SIL2 (the most common level of SIL required).

In the distilling industry the Liquiphant is usually used in conjunction with a Nivotester mounted in the safe area panel. The Nivotester provides easy-to-use relays that can be hard wired in the panel, a safe power supply to the Liquiphant in the tank, continuous monitoring of the loop and a convenient place to carry out a proof test. Pressing a button on the Nivotester acts as a system test to prove the reliability of the Liquiphant in preventing overfill.

Both top-tier and lower-tier operators need to provide public information electronically and keep it up to date.

SIL3 in a single device
Some installations, though, are much higher risk and as such require higher integrity systems to SIL3. The solution to this in the past has been to use two devices in a redundancy system to reduce the probability of an unsafe condition going unnoticed. However, this has the disadvantage of requiring two process connections and increases the risk of false alarms.

Now the Liquiphant FTL80 series offers SIL3 levels of protection with a single device and installation point. The system also includes a Nivotester for easy panel work and proof tests. The device is built to the highest integrity standards with redundant components and continuous self-checking and loop-monitoring capabilities. This results in a system that is reliable and easy to proof test, although it offers such reliability that a proof test is not required within its normal working life.

Reliability decreases with age
IEC 61508 and 61511 define an instrument's normal working life as 8 to 12 years. Sites with overfill warning systems older than this should be looking for a replacement to avoid unpredictable performance. Endress+Hauser's Liquiphant systems provide easy retrofit solutions - in some cases they can even be provided with process connections to replace old float switches. Of course maintenance of your new system is just as important as its correct installation to ensure continued reliable performance and compliance with regulations, including COMAH.

Endress+Hauser offers a range of support throughout your system's life cycle, from commissioning to regular maintenance and record-keeping, to ensure your instrumentation remains both safe and accurate.

Free site survey!

To fully ensure the safety of your site, we'd like to offer a complimentary visual site survey to establish any limitations of the existing systems. During this visit, one of our level experts will attend at a convenient time to carry out an accompanied tour of the plant - assessing all relevant equipment and discussing any concerns you may have. Post visit, we'll provide a written report to advise on future strategies to help you maintain the required safety integrity levels.

To arrange a complimentary site visit, contact us on 0161 286 5050 or visit www.uk.endress.com/comah and complete the online form.

Liquiphant FailSafe
For the maximum in site safety

Liquiphant FTL81

Liquiphant FTL85

Nivotester FTL825

Liquiphant FTL80

- For high degree of failure safety: Safety Integrity Level up to SIL3 according to IEC 61508/IEC 61511 with only one instrument (internal redundancy).
- Safe function due to permanent self-monitoring SFF (Safe Failure Fraction) > 99%.
- Proof test interval may be extended to up to 12 years, independent of sensor covered (pump protection) or uncovered (overfill prevention).
- Significantly simplified proof test according to WHG guidelines (Water Resource Law) or IEC 61508/IEC 61511 functional safety requirements.
- 4...20mA output according to NAMUR NE06/NE43 for easy integration with Nivotester FTL825 or directly to a (safety) PLC.
- Additional, dynamic LIVE signal.

Liquiphant: level switches that perform

Maximum peformance
A decisive advantage of the vibronic measuring principle is its safe and universal operation in any kind of liquid. Point level detection is not affected by the physical properties of the medium and commissioning does not require any calibration in relation to the medium. These unique performance characteristics qualify the instruments of the Liquiphant family for all process engineering industries.

The point level switches are ideal for use in the following industries:
- Chemical
- Oil & gas
- Power & energy
- Machine building

The most important properties of the Liquiphant are:
- Materials in contact with the process are made of stainless steel 316L/1.4435 or optionally Alloy C22
- Coatings for aggressive acids
- Different housings of stainless steel, aluminium and plastic material
- International approvals for Ex zones
- Overfill prevention and leakage approval
- Suitable for safety systems according to SIL2/3

Antistatic coating
Different sensor materials are often used in chemical processes or when storing mixed substances. Coating is applied where stainless steel is not sufficient to protect instruments against corrosion. Coating of wetted parts with a conductible surface (PFA) reliably prevents electrostatic charging of the sensor. Therefore, Liquiphant is not subject to any limitations in relation to the operation of systems with plastic coating in Zone 0/1.

Coating materials:
- Plastic PFA material
- Plastic ECTFE material
- Enamel

You can be certain that if there's a problem, our Liquiphant level switch will raise the alarm.

Liquiphant: safety by design

Overfill prevention
Overfilling of storage, process or buffer tanks may cause serious consequences for the health of people and/or the protection of the environment. Plant operators are responsible for safety and also liable in case of an incident. Consequential losses can run into millions of pounds. Storage tanks with liquids hazardous to water require overfill prevention. This is often demanded by law or at least recommended.

As a point level switch, Liquiphant is ideally suited to overfill prevention systems and is also certified.

The operation of overfill prevention systems must be periodically checked. Operators are responsible for the type of annual inspections implemented. Taking the liquid up to the response level of the switch, the so-called 'wet procedure' or the disassembly of the point level sensor and immersion in a comparable liquid is recommended.

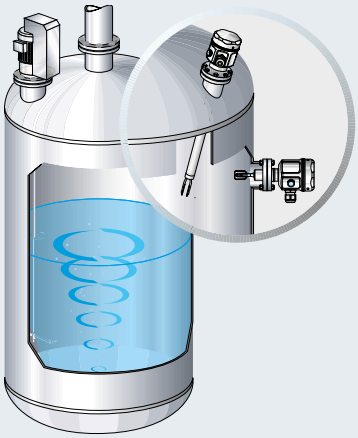
If these procedures are not feasible a substitute test may be performed. Liquiphant, equipped with PFM electronics, can be checked via a test button at the transmitter (Nivotester FTL325P) from the control cabinet. Overfill prevention can thus be checked easily and quickly from the control room. On-site inspection on tanks is superfluous, saving time and money.

Functional safety (SIL)
SIL qualified devices provide an important contribution to the safety of people, the environment and plants in process industries. In most countries, the safety requirements are stated in accordance with the best possible standard. The standard is IEC 61508/IEC61511 (Functional safety of electrical, electronic and programmable systems).

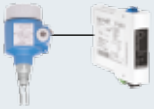
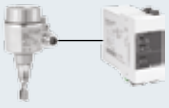
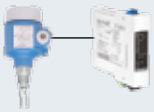
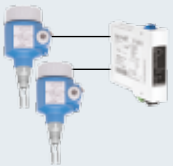
Liquiphant M and Liquiphant S meet these functional safety requirements and are at home in all safety-relevant processes. An individual instrument can be used up to safety level SIL2 or even up to safety level SIL3 in redundant designs.

Liquiphant FailSafe operates on safety level SIL3 as an individual instrument.

Safe and reliable overfill prevention with Liquiphant high level alarms.



Functional safety

SIL2		SIL3
		
FEL51 (2-wire AC) FEL52 (3-wire DC-PNP) FEL54 (AC/DC DPDT) FEL55 (8/16mA) Liquiphant FTL50/51/51C Liquiphant FTL70/71 Recurring tests via operation or disassembly	Liquiphant FTL50/51/51C Liquiphant FTL70/71 Recurring tests via button (test generator)	Liquiphant FailSafe Recurring tests up to 12 years
		
	Liquiphant FTL50/51/51C Liquiphant FTL70/71 Recurring tests via operation or disassembly	Liquiphant FTL50/51/51C Liquiphant FTL70/71 Recurring tests via button (test generator)

Liquiphant level switches are ideal for use in both top-tier and lower-tier sites for safe and reliable point level measurement.

Liquiphant level switches

	Liquiphant M		Liquiphant S	Liquiphant FailSafe
	FTL50/51	FTL51C	FTL70/71	FTL80/81/85
Design	Compact/pipe ext.	Pipe ext.	Compact/pipe ext.	Compact/pipe ext.
Process temperature	-50…+150°C	-50…+150°C	-60…+280°C	-60…+280°C
Process pressure (bar/psi)	-1…64/100 -14.5…930/1450	-1…40 -14.5…580	-1…100 -14.5…1450	-1…100 -14.5…1450
Approvals	WHG overfill, ATEX, CSA, FM, IEC Ex, NEPSI, TIIS, INMETRO			
Functional safety	SIL2/3	SIL2/3	SIL2/3	SIL3
Wetted parts	316L/1.4435, Alloy C22	Coating: ECTFE, PFA, Enamel	316L/1.4435, Alloy C22	316L/1.4435, Alloy C22, Coating: ECTFE, PFA, Enamel

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