FLUID COMPONENTS INTERNATIONAL LLC

FCI FLT93
Flow Switch

How to Comply with NFPA Code 30 Requirements for Level and Flow Detection

Application Note Case Study ANCS028

National Fire Protection Association (NFPA)® Code 30 defines safeguards to reduce the hazards associated with the storage, handling, and use of flammable and combustible liquids. In the USA, NFPA codes are recognized and enforceable under OSHA and many state and local regulations.

Within Code 30 there are 12 sections which identify and stipulate the use of a level or flow switch. FCI is the world's leading manufacturer of heavy-duty, ultra-reliable thermal dispersion level and flow switches. FCI switches carry agency approvals (FM, FMc, ATEX, IECEx) for installation and application in hazardous gas locations, have MTBF rating of 190 years, and have been independently evaluated to comply with SIL 2.

The table below identifies FCI switch solutions to meet each of the 12 sections identified by Code 30 standard.

FCI Solutions to Comply with NFPA 30: Flammable and Combustible Liquids Code

Application Area	Description	Code 30 Section Number and Excerpt	FCI Solution(s)	FCI Solution SIL Rated?
Ventilation for dispensing areas	Air flow switch for ventilation	**18.6.5.1** The mechanical ventilation system for dispensing areas shall be equipped with an airflow switch or other equally reliable method that is interlocked to sound an audible alarm upon failure of the ventilation system.	**FLT93F** or **FS10i** 	Yes, SIL 2
Vapor recovery and vapor processing systems	High liquid level sensor/alarm	**19.5.5.1** A liquid knock-out vessel used in the vapor collection system shall have means to verify the liquid level and a high liquid level sensor that activates an alarm.	**FLT93S** 	Yes, SIL 2
Operation of storage tanks: operations that receive or transfer class 1 liquids	Independent high level detections (alarm) in above ground tanks Independent high level detection with relay to shut down or divert flow	**21.7.1.1** Facilities with above ground tanks that receive and transfer Class I liquids from mainline pipelines or marine vessels [...] (2) Tanks shall be equipped with a high-level detection device that is either independent of any gauging equipment or incorporates a gauging and alarm system that provides electronic self-checking to indicate when the gauging and alarm system has failed. Alarms shall be located where personnel who are on duty throughout product transfer can arrange for flow stoppage or diversion in accordance with established procedures. (3) Tanks shall be equipped with an independent high-level detection system that will automatically shut down or divert flow in accordance with established procedures.	**FLT93S** 	Yes, SIL 2
Control of spills from above ground tanks	90% of level overfill warning alarm and 95% of level overfill shut-down trip	**22.11.4.5** Means shall be provided to prevent overfilling by sounding an alarm when the liquid level in the tank reaches 90 percent of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity.	**FLT93S** *(Because FLT93S has dual relays, a single FLT93S can be applied. Set relay #1 to trip at 90% (warning) and relay #2 to trip at 95% (shut-down)* 	Yes, SIL 2
Storage tank vault	Liquid level detection alarm (dry to any wet)	**25.15.4** The liquid detection system shall sound an alarm upon detection of any liquid, including water.	**FLT93S** *(Set relay to trip upon dry to wet change)* 	Yes, SIL 2
Annex A				
Gas recovery for auxiliary heating		**A.19.4.4** If stack gas from a heater or vaporizer is recovered to provide auxiliary heat for other equipment (e.g., rotary dryers), suitable dampers, isolation gates, burner control logic, or other means should be provided to ensure that all equipment is properly purged and will operate in a safe manner. The control logic should anticipate all possible operating modes of the individual pieces of equipment, whether operating singly or together, to ensure safe startup and shutdown under normal or upset conditions. Instrumentation and interlocks should be provided to sound an alarm and to automatically shut down the fuel source to the heater or vaporizer when any of the following conditions are detected:		Yes, SIL 2
Heat exchanger	Heat transfer fluid low flow alarm	(1) Low flow of heat transfer fluid through the heat exchange tubes of the heater, as measured at the discharge.	**FLT93S** or **FLT93L** *(Depending on tube diameter)* 	Yes, SIL 2
Expansion tank	Low level in expansion tank	(4) Low fluid level in the expansion tank.	**FLT93S** 	Yes, SIL 2
Vaporizer	Low level in vaporizer	(5) Low liquid level in the vaporizer.		Yes, SIL 2
Sprinklers	Sprinkler system flow detection	(6) Sprinkler system flow in any area containing the heat transfer equipment or piping.		Yes, SIL 2
Knock-out pump	Knock-out vessel low level alarm (to warn of pending pump run dry condition)	**A.19.5.5.1** If the liquid knock-out vessel utilizes a pump for automatic liquid removal, consideration should be given to a low-level alarm and shutdown to avoid running the pump dry, resulting in a potential source of ignition.	**FLT93S** 	Yes, SIL 2