

Application Success Story

Industry: Liquefied Natural Gas (LNG)

Product: One Series Field Safety System (Transmitter+Logic Solver+Safety Relay all-in-one)

Application: LNG storage tank leak detection in dike containment areas

Process: Liquefied Natural Gas Storage and Distribution

Company: National Grid



Customer Information

National Grid operates LNG bulk storage facilities that perform re-gasification of LNG stored in thermally-insulated tanks at -260°F. These operations provide peak demand distribution to residential and commercial customers. When exposed to atmospheric temperatures, LNG absorbs warm air, beginning the regasification process and returns to a natural gas. NFPA 59A and 49 CFR part 193 provide regulations for storing and safeguarding these LNG operations.

Challenges

LNG can escape as a fluid from the tank or during loading, unloading and regasification processes, creating a hazardous condition. Impounding dikes that surround the tank and transport vehicles provide spill containment, and sump pump systems that are permanently installed to remove rainwater. To mitigate the danger of leaking LNG in these containment areas, it is essential to detect the presence of LNG before it enters the sump pit and is pumped outside of the dike containment system, exacerbating the hazardous condition. A previous method of LNG leak detection involved very long (200') bi-metallic thermocouple sensors that often failed due to wear and the buildup of snow and ice.

Solution

UE's One Series certified Safety System consisting of a temperature transmitter, logic solver and safety relay in a single explosion proof enclosure represented a significant cost-effective upgrade of the fire & gas system. This Class I, Div. 1 device uses a cryogenic temperature RTD to monitor for the presence of LNG in wells and spillways in the dike containment area. When LNG is detected, the One Series Safety System initiates a direct emergency shutdown of the sump pump while simultaneously signaling the DCS to fill the dike containment area with foam to prevent the ignition of fugitive natural gas. Often a voting mechanism of these safety systems will be employed to maximize availability.

Results

By combining sensor, logic solver and relay into a self-contained, SIL certified field mounted safety system, operators have reduced complexity, lowered installed cost and gained the confidence to standardize on the One Series Safety System. By acting directly to shut down pumps, National Grid gains more achieved risk reduction and faster system response times.



Contact Information

For additional information please contact our application experts at +1 617-923-6977 or visit our website www.ueonline.com.