



Case Study: LNG Tank Leak Detection



ONE SERIES
FIELD SAFETY SYSTEM

CHALLENGE:

Thermocouple sensors were used to detect LNG leaks in wells and spillways within the dike containment area at a National Grid LNG bulk storage facility.

It was critical that LNG be detected before it could enter the sump pit and potentially be pumped outside the containment area, causing a hazardous condition.

During colder weather months, these thermocouples were prone to failure due to snow and ice buildup.

Additionally, National Grid was implementing safety loops and looking at SIL certified devices as an upgrade to many of their measurement and safety devices.

SOLUTION:

The One Series Safety Transmitter with Safety Relay Output (SRO) was chosen to replace the thermocouples.

Consisting of an accurate and reliable cryogenic temperature RTD, transmitter, safety relay and logic solver integrated into a single device, it represented a significant cost-effective upgrade and reduction in complexity within the fire and gas system protecting the containment area, while minimizing sensor failures.

When there is a LNG leak, the change in temperature detected by the One Series Safety Transmitter with SRO 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. By acting directly to shut down pumps, National Grid achieved greater risk reduction and faster system response times. A voting mechanism of these safety devices could be employed to maximize availability.



Cost effective
upgrade



Risk reduction with
emergency shutdown



Protection for
employees and assets