CROWCON
Detecting Gas Saving Lives

Case Study

Gas-Pro TK: Saving lives in a Southeast Asian refinery

One of Southeast Asia's largest refineries now specifies Gas-Pro TK detectors to check for combustible gases before workers enter potentially hazardous confined spaces.

The Background

Refineries are home to a range of large tanks that are used to store combustible products. During maintenance, empty tanks are typically flushed with inert nitrogen gas to prevent any residual vapour from presenting a risk of explosion. This flushing takes place prior to any work being done inside storage tanks, after which the tank is ventilated so that workers can safely enter the space.

Checks are routinely made by a safety supervisor to ensure that the atmosphere within the storage tank is not explosive before workers enter. However, some sensor technologies need the presence of oxygen to register the presence of a flammable gas, so cannot work properly during the flushing stage.

They can also be damaged when exposed to levels of combustible gas above 100% of the lower explosive limit (LEL). All this makes it vital to choose the correct monitoring technology when a nitrogen 'blanket' has been used.

The Requirement

Crowcon's customer operates one of the biggest refineries in Southeast Asia, distilling more than 500,000 barrels per day of crude oil. The site also includes an ethylene cracker complex with a capacity of 1 million tonnes per year and a butadiene extraction unit producing 155,000 tonnes per annum.

This size of site naturally includes a lot of large storage tanks. When maintenance is required, the tanks are usually emptied and flushed with nitrogen to prevent an explosive atmosphere from forming as a result of any residual vapour.

A safety supervisor checks the level of gases in the tank before the tank is ventilated and workers can enter the space, ensuring that the concentration remains well below the LEL. This often involves monitoring the volume concentration of combustible gases and observing them as they fall away to safe levels.

However, gas detectors based on popular pellistor or catalytic bead technologies rely on the presence of oxygen to safely burn a tiny sample of the gas, so there is a risk that an inert nitrogen atmosphere will interfere and give misleading results. They can also be damaged by gas concentrations exceeding 100% of the LEL.

The customer therefore needed a versatile, multi-gas detector using a technology that does not suffer from the same issues.

The Approach

The company's Standard Operating Procedure (SOP) now specifies that Crowcon's Gas-Pro TK detector with dual infrared (IR) sensor is used for such confined space testing in an inert gas environment.

The ability to monitor gas levels in terms %vol and %LEL allow users to accurately determine the level of flammable gas present.

These versatile detectors are unaffected by nitrogen and can be used to monitor up to five gases, including the common combustible gases methane, propane and butane. They can be safely used to measure gas levels in excess of 100% LEL.

As well as using versatile dual IR detection technology, several other features make the Gas-Pro TK detectors ideal for tank safety applications.

For example, tanks can be sampled quickly from their top, middle or base, thanks to an integrated pump that draws samples through a line up to 30m long. A pump test is carried out automatically upon start-up and the detector is ready to use within 20 seconds.

The compact and rugged Gas-Pro TK also features an easy-to-read top mount display and weighs just 340g, which combines with a rechargeable battery to make it effortlessly portable.

A powerful 95dB audible alarm, flashing LEDs and a vibrating alert all work together to ensure that personnel are alerted immediately to a potential risk.

Naturally, the client has already been monitoring gas levels in its tanks before now and had previously been using Crowcon detectors. The Gas-Pro TK offers the same, simple, one-button operation as the prior models, making it familiar and easy-to-use for safety personnel.

The Outcome

The refinery now specifies the Gas-Pro TK in its safety procedures as the detector required to check confined spaces before maintenance personnel enter tanks. Approximately half of the detectors have been upgraded so far, with the balance scheduled for early 2020.

The project successfully supports ongoing efforts by the owner of the refinery to achieve zero health and safety incidents and zero leaks across the site.

In summary, a combination of sensor expertise and a successful ongoing relationship enabled Crowcon to provide the safest and most versatile solution for the client.

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