

On the safe side at Shell Clyde

The Shell oil refinery at Clyde – nestled among the mangroves on the banks of the Parramatta River – is a well-known Sydney landmark. With encroaching suburbia and the surrounding fragile ecology of the Parramatta River on its doorstep, the refinery is committed to maintaining maximum safety and high environmental standards.

The Shell oil company has an excellent safety and environmental record throughout the world, so with the safety systems at Clyde due for an upgrade, it wanted to maximise the safety and operational requirements.

After a prolonged study of safety instrumented systems and an expression of interest process, Shell chose the Yokogawa ProSafe-RS safety instrumented system (SIS) as the nucleus of a new Fire and Gas System and Plant Safety Shutdown System. The contract with Yokogawa Australia includes the supply of the SIS, system engineering, installation and commissioning support.

When asked why the Yokogawa ProSafe-RS was chosen, John McGuire, Special Projects Manager for Shell Clyde was quick to respond. “This system is the first line of defence to stop small operational problems turning into critical plant or equipment failures, so we have to get it right. The ProSafe system, which has been installed by other Shell sites overseas, has a proven track record for reliability and stability. The reports we have received from our colleagues indicated that they are very pleased with the system. That response and Yokogawa’s mix of technical quality and cost, along with its solid reputation and service record in Australia, were the decider.”

The TUV-certified ProSafe-RS SIS meets IEC 61508 and IEC61511 safety standards and is designed for integrated use with process automation applications. It has earned SIL3 certification under international standards – one of the first safety systems integrated with a process control system to do so. The system constantly monitors the status of process-oriented plants and ensures safety by responding in a predictable manner whenever an unsafe condition is detected.

Industrial safety under international standards is organised into a series of protection protocols, which include basic plant design, process control systems, work procedures, alarm systems and mechanical protection systems. At the top of the protection protocol is the safety shutdown and fire and gas control systems.

The safety shutdown system takes automatic and independent action to prevent a hazardous incident from occurring, to protect personnel and the plant equipment against potentially serious harm. The fire and gas system is tasked with taking action to reduce the consequences of a fire or gas leak event after it has occurred.

Yokogawa's ProSafe-RS system is being specifically engineered for Shell Clyde to prevent potentially serious incidents from developing. "The system not only reacts to potentially dangerous situations, but actually monitors the whole process and prevents dangerous situations from occurring," said John McGuire. "Stopping incidents from happening is of paramount importance. With the ProSafe system, if something does go wrong, it maximises control of the situation and minimises the potential for damage. That could involve simply slowing down a single process or shutting down the entire plant."

The Esso Longford gas plant fire in 1998, which severely disrupted Victoria's gas supply for nearly two weeks, is a stark reminder of what can happen in a major hazard facility when something goes wrong.

"That disaster was an eye-opener. We all studied and learned from that: new laws and new protocols were put in place for the whole petrochemical industry and we've all tried even harder to lock in the best safety standards possible in our refineries. Here at Shell, we are determined to not only reach our safety requirements but to surpass them," John added.

The ProSafe-RS system is presently being configured to suit Shell's requirements. John summed up the new installation: "The ProSafe-RS system more than satisfies all the governing and safety bodies' requirements, as well as community and environment groups concerns and most importantly it will ensure a safe working environment here at Shell."

Australia has nine petroleum refineries and Shell Clyde is one of only four of these refineries involved in the manufacture of petrochemicals. This new safety and production upgrade will ensure its safety and operation well into the future.