

JX Nippon Oil & Energy Corporation Builds Safety Standards-compliant Emergency Shutdown System

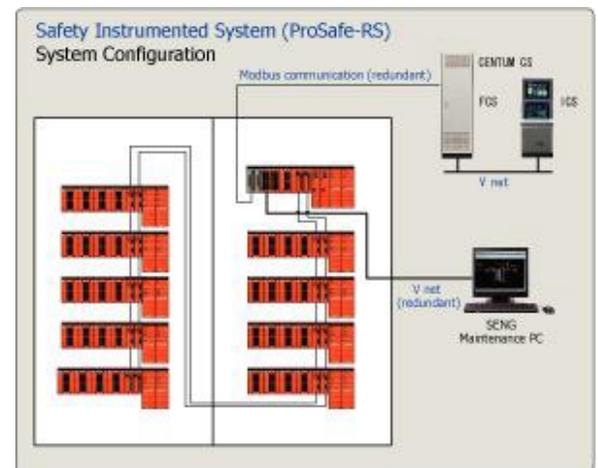
JX Nippon Oil & Energy Corporation

Location: Ukishima Plant, Kawasaki Operation Center, Japan
Industry: Petrochemical

Projects Background

Although conventional standards have required safety system to use Hardware relay interlocks, the Ukishima plant decided to employ the ProSafe-RS safety instrumented system (SIS) in order to:

- Achieve safer and more stable operation for their safety interlock, which is comprised of many components
- Improve maintainability for the emergency shutdown system
- Reduce the emergency shutdown system's footprint



The Challenges and the Solutions

To increase high-purity propylene production capacity, the Ukishima plant enhanced the existing CENTUM CS control system and emergency shutdown system, the latter of which achieved:

- A certified emergency shutdown system Contrary to conventional relay-based systems that cannot obtain certification to meet IEC 61508/JIS C 0508 functional safety standards, the Prosafe-RS SIS enabled the construction of an emergency shutdown system that could be certified by a registered certification body.
- Substantial reduction in maintenance work ProSafe-RS is not the first SIS for JX Nippon Oil & Energy Corporation and the company had been already convinced that the new system would require a lot fewer man-hours for maintenance than relay-based systems.
- System configuration with reduced footprint The new emergency shutdown system had to be installed in a limited space next to the existing instrument panel, and the compact ProSafe-RS was a perfect solution.
- System scalability The new system is designed to flexibly accommodate future improvements and extensions

Customer Satisfaction

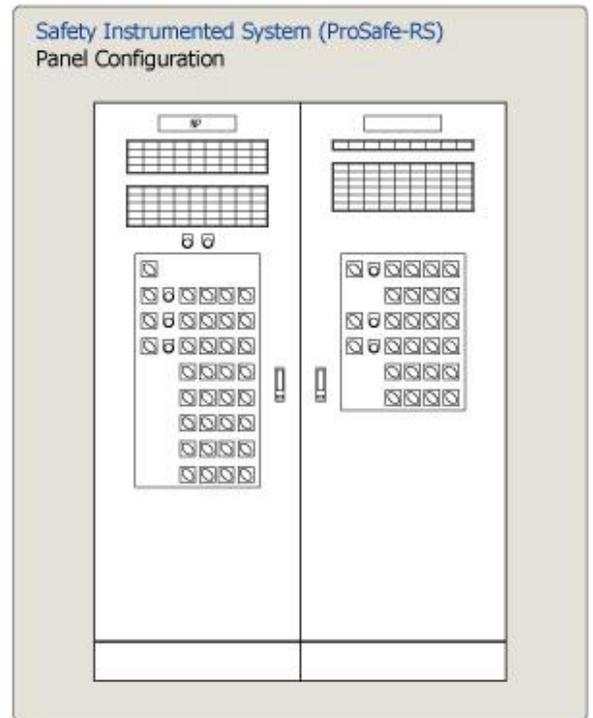
JX Nippon Oil & Energy Corporation commented:

“We began test runs of the system in December 2005 and it’s been fully operational since March 2006. Conventional interlocks use hardware relays. However, we employed the ProSafe-RS, because it is compliant with the IEC 61508/JIS C 0508 functional safety standards.

As SIS ensure safety more reliably and are more scalable than general relay-based systems, they will be increasingly employed for emergency shutdown systems in the future. SIS can directly deal with contact inputs/ outputs as well as 4-20mA DC and other analog signals from transmitters. This can eliminate the need for alarm configurators and reduce necessary man-hours for periodic maintenance work.

Our ProSafe-RS system has improved reliability by incorporating redundant CPU and I/O modules to avoid unnecessary trips triggered by system abnormalities, not by true safety concerns. Modbus communications with the CENTUM CS for data monitoring are also redundant.

We feel that SIS is becoming essential in emergency shutdown systems in Japan and in other countries, and that we must add cooperate value by further strengthening plant safety.”



Yokogawa Electric Corporation

YOKOGAWA ELECTRIC CORPORATION

World Headquarters

9-32 Nakagyo 2-chome, Musashino-shi, Tokyo 180-8750, Japan

<http://www.yokogawa.com/>

Subject to change without notice

All Rights Reserved, Copyright © 2022, by Yokogawa Electric Corporation