Implementation of Safety System Programming Changes at an Operating Facility

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Abstract

This paper reviews the development and implementation of safety system programming changes for a large refinery as part of a multi-unit upgrade project.

PLC based safety systems can offer the option of making online programming changes so that operations can continue without having to shut a unit down. However, making changes to an operating safety system means that the entire unit covered by that system is placed at risk before and after the change is made. The resulting consequence can potentially be much more severe than shutting down the unit or plant. Therefore, meticulous planning in development and implementation is required to ensure that changes are made correctly and safely.

At an operating facility in Sakhalin Island Russia a large expansion project required that safety systems in several units have changes made to the operating programming. The automation contractor took a copy of the installed programs to his facility in Calgary Canada and over the course of several months made the required changes to the programs. Then he performed a software test at his facility to demonstrate the correct implementation of the changes. As a safeguard, the newly added programming was temporarily “inhibited from operation” by addition of inhibiting logic blocks. After the new programming was installed at the plant and the new logic was verified as operating correctly with new hardware, the inhibiting logic blocks were removed and the new programming put into operational service.

This paper will review the structure of the safety system programming, discuss the scope of the changes to the programming and how those programming changes were implemented, and then illustrate how the programming change were accomplished at the site.