Evaluating Safety Instrumented System Needs Using Process Hazard Analysis Data

Kenneth H. Harrington and Kelli M. McEldowney
Battelle - Integrated Risk Management
505 King Avenue, 11-10-114
Columbus, Ohio 43201-2693
(614)424-7485
mceldowneyk@battelle.org

ABSTRACT

Determining Safety Instrumented Systems (SIS) needs is the first step of a long process of complying and maintaining compliance with national and international standards. How a company goes about determining SIS needs can have a significant impact, not only on process safety, but also on process economics. Much of the process analysis used to evaluate the need for SIS, based on Safety Integrity Levels (SIL), is already included in process hazards analyses. Using existing analyses will allow you to minimize "re-analysis" and help focus SIS and recommended actions on plant economics.

Hazard analysis data can help determine if existing equipment and instrumentation are adequate to ensure a safe shutdown of the plant. In instances where the existing safeguards are not sufficient, companies can look to good engineering practices, such as ISA S84.01, and determine if an SIS is necessary.

In addition to identifying the need for SIS, companies can use Importance Measures, used to relatively rank equipment based on their influence to the overall risk, to help prioritize SIS selection. By prioritizing SIS selection, the minimum number of SIS can be identified while still addressing all the hazards of the process. This paper present processes and results from using process hazards analysis for SIL determination and action item/maintenance prioritization.