



How To Pick a SIL - BBBB (Buy)

Safety Integrity Level Selection: Systematic Methods Including Layer of Protection Analysis by Ed Marszal and Eric Scharpf

Reviewed by Nick Sands

One of the critical steps in the safety lifecycle is the allocation of safety layers. Marszal and Scharpf show various methods for this process in *Safety Integrity Level Selection*. Marszal has almost 15 years of experience, including time with UOP, Exida, and Kenexis, where he is company president. Marszal has a BS ChE from Ohio State, a PE license, and is a Certified Functional Safety Expert. He is involved in SP18, SP84 and is currently director of ISA's Safety Division. Dr. Scharpf has a BS ChE from the University of Delaware and a PhD ChE from Princeton. He has 15 years of experience including Air Products and Exida. He teaches at the University of Otago in New Zealand. Scharpf is a CFSE and a MIPENZ.

The first half of the book provides an introduction to the subject; both a purpose and a connection to the safety lifecycle. A key to a quantitative assessment process is setting a limit for tolerable risk, where risk is a function of consequence severity and event frequency. This may be set As Low As Reasonably Practicable (ALARP) which may vary from country to country or from company to company. Based on the design, PHA and risk analysis, the correct Safety Integrity Level (SIL) can be selected for each Safety Instrumented Function (SIF). Because many of the techniques are based on probability theory, there is a chapter to explain the assumptions, calculations and symbology.

The second half of the book covers various methods for the allocation of safety layers and SIL selection, starting with determination of consequences. Event tree analysis, reliability block diagrams, fault tree analysis, and Layer of Protections Analysis (LOPA) are different methods. Event tree analysis is covered in more detail. LOPA, a simplified version of event tree analysis is also covered in detail. The final chapter show how qualitative and risk chart methods can be applied to SIL selection.

Marszal and Scharpf summarize several approaches to SIL selection. Their book is a helpful reference. Likely there will be a second edition in a year or so to catch up with the new safety standards. The first edition is still worth buying (BBBB) at ISA for \$72 (member price). It won the Thomas Fisher award as the best seller from ISA the year it was published.