EXPANDING THE APPLICABILITY OF ISA TR84.02 IN THE FIELD

Dr. Lawrence Beckman
HIMA-Americas, Inc.
10801 Hammerly, Suite 130
Houston, TX 77043
(713) 464-3277
hima.americas@pdq.net

Abstract

The ANSI/ISA S84.01 standard was released in 1996. The companion Technical Report TR84.02 is in the process of being completed. The latter document is intended to provide the methodology to implement the safety performance requirements of the standard for the safety system. In this document three (3) techniques are presented; these being Simplified Equations, Fault Tree Analysis and Markov Modeling. Of the three, only the Simplified Equations approach would reasonably be utilized in the field by plant personnel.

The Simplified Equations provided in Part 2 of ISA TR84.02 comprehend common cause failures, systematic failures, and second failure prior to repair scenarios. They do not however comprehend the use of redundant field devices which are dissimilar, and as such have different failure rates. This situation is quite common in practice, and simple to manage using enhanced equations for the computation of PFD_{avg}. A set of these equations for typical redundant architectures in the field, and several examples of their applications in safety loop analysis are derived and presented in this paper.