ABSTRACT

There are many examples in industry where incidents have occurred because of failures of process safeguards. The objective of this research is to determine a sufficient safety integrity level and to find the best way to reduce process risk. This objective requires a detailed analysis of the overall system, including process and equipment, human factors and other factors.

Fault Tree Analysis can be used to conduct quantitative risk assessments for a process, relating local cause and effect contributing to the top event. Computerized modeling and analysis of industrial processes are dependent quite significantly on the availability of failure rate data. This analysis helps to determine which events contribute most to the possibility of overall process failure. Thus, quantitative risk assessment is an important risk management tool for both managers and practitioners. This paper provides examples for the use of failure rate data and fault trees for conducting quantitative risk assessments of chemical processes. The drawbacks of the approach, namely the dearth of failure rate data, limitations on the development of computerized fault trees and cut-sets, and current software limitations are also discussed in detail.