ABSTRACT

Layer of Protection Analysis (LOPA) is widely used within the process industries as a simplified method to address risks and determine the sufficiency of protection layers. LOPA brings a consistent approach with added objectivity and a greater degree of understanding of the scenarios and risks as compared to purely qualitative studies such as Process Hazard Analyses. LOPA can be used to address a wide range of risk issues and serves as a highly effective aid to decision making. Incorporation of human performance within LOPA is recognized as an important, though often challenging, aspect of the analysis. The human role in potential initiating events or within human independent protection layers is important throughout the process industries, and becomes even more critical for batch processing facilities and in non-routine operations. The human role is key to process safety and the control of risks, necessitating the inclusion and quantification of human actions in independent protection layers for most companies. Human activities as potential initiating events and human performance within independent protection layers are reviewed and methods for quantification outlined. An extension into Human Reliability Analysis (HRA) is provided, including methods to develop Human Error Probabilities specific to the process safety culture and operations at a given plant site.