Quantitative Risk Assessment for Refinery Industry

Adam S. Markowski
Technical University of Lodz
90-924 Lodz
ul. Wolczanska 213
Poland
markows@wipos.p.lodz.pl

ABSTRACT

A quantitative risk assessment is widely accepted methods for safety assurance in process industry. The methods is continuously improving by introduction of new approaches both to hazards identification and risk evaluation.

This paper addresses two important aspects:

1. Selection of creditable incidents after qualitative hazards identification which subsequently are used in individual and group risk evaluation

2. "Domino effects" understood as a subsequent chain of accidents after single hazard event.

The first aspect is developed by the application of multilayer risk matrix where each layer represents risk reduction level according to typical prevention, protection and response layers met in a particular refinery installation. The second aspect is presented by guidelines on a particular chain of events occurring for the most often refinery types of the equipment (storage tanks, loading and unloading areas, reactors, pipe networks and other types of process equipment). The above aspects are illustrated by the case study of a HF Alkylatian Plant.