

Relative ranking of fire and explosion in a petrochemical industry by fire and explosion index

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*Abstract

Background: Fire and explosion hazards are considered as the first and second major hazards in process industries.

Objective: The aim of this study was to quantitatively assess the fire and explosion hazards as well as relative classification of such hazards in a petrochemical industry.

Methods: This was a quantitative study in which the process units were selected based on parameters affecting the risk of fire and explosion. Later, these parameters were analyzed using DOW's fire and explosion index (F&EI). Technical data to determine the index were obtained through process documents and reports as well as the fire and explosion guideline. Following calculating the DOW's index, the high and low risk process units were determined.

Findings: The stripper column with a rank of 226 and the naphtha tank with a rank of 64 were determined as the most and least disastrous process units. The level of hazard was determined as severe for columns ($F\&EI > 158$), heavy for magna-former reactor and gasoline furnace ($127 < F\&EI \leq 158$), and moderate for hydrodealkylation reactor and naphtha tank ($61 < F\&EI \leq 96$). The radius of exposure was calculated at 57 meters for stripper column.

Conclusion: The fire and explosion index is a suitable measure to determine the high and low risk areas of an industry. The stripper column as the most disastrous process unit needs more sensitive methods for hazard assessment.

Keywords: Fire and Explosion Index, Process Unit, Hazard, Loss

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