

عنوان مقاله:

Quantitative Evaluation by Protection Layer Analysis (LOPA) for Equipment in Imam Khomeini Petrochemical Aromatic Unit

محل انتشار:

مجله پیشرفت در تحقیقات بهداشت محیط, دوره 11, شماره 2 (سال: 1402)

تعداد صفحات اصل مقاله: 6

نویسندگان:

.Pariya Sarafraz - Department of Environmental Sciences, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

.Katayoon Varshosaz - Department of Environmental Sciences, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

.Neda Orak - Department of Environmental Sciences, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

Nematollah Jaafarzadeh - Department of Environmental Sciences, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

.Ebrahim Aghajari - Department of Electrical Engineering, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

خلاصه مقاله:

Background: In the petrochemical industries, accidents are generally catastrophic which endanger human, environment and economic. In the industries, there is a wide range of flammable and toxic substances that affect health and safety of workers. They have also adverse effects on society. Numerical risk and impact assessment as well as design for protective layers against catastrophic events are necessary for designing process units. Methods: First, the occupational-process and environmental safety hazards were measured by hazard and operability (HAZOP) and environmental failure mode and effects analysis (EFMEA) techniques. Then, the risk was assessed using the layer and operability analysis (LOPA) method. Results: The results showed that a total of ۵۰ safe and health items and ۳۷ environmental risks were identified by HAZOP and EFMEA methods in Imam Khomeini Petrochemical Aromatic Unit. There were ۱۷, ۱۹ and ۱۴ items with low, medium and high level risk, respectively. Conclusion: This study showed that the LOPA method is more comprehensive than hazard identification methods for the analysis of protective layers. The important actions were blockage of the excess gas to the flare and release the H₂S gas. Also, evaluation of the environmental aspects of aromatic unit activities showed that air pollutant production in the power supply unit, waste disposal of reactor tank, waste disposal of condensate tank and reactor fire and explosion were at a high level risk.

کلمات کلیدی:

Risk Assessment, Imam Khomeini Petrochemical, Fuzzy method, LOPA Method, BOWTIE

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