

عنوان مقاله:

Analysis of chlorine gas incident simulation and dispersion within a complex and populated urban area via computational fluid dynamics

محل انتشار:

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خلاصه مقاله:

In some instances, it is inevitable that large amounts of potentially hazardous chemicals like chlorine gas are stored and used in facilities in densely populated areas. In such cases, all safety issues must be carefully considered. To reach this goal, it is important to have accurate information concerning chlorine gas behaviors and how it is dispersed in dense urban areas. Furthermore, maintaining adequate air movement and the ability to purge ambient from potential toxic and dangerous chemicals like chlorine gas could be helpful. These are among the most important actions to be taken toward the improvement of safety in a big metropolis like Tehran. This paper investigates and analyzes chlorine gas leakage scenarios, including its dispersion and natural air ventilation effects on how it might be geographically spread in a city, using computational fluid dynamic (CFD). Simulations of possible hazardous events and solutions for preventing or reducing their probability are presented to gain a better insight into the incidents. These investigations are done by considering hypothetical scenarios which consist of chlorine gas leakages from pipelines or storage tanks under different conditions. These CFD simulation results are used to investigate and analyze chlorine gas behaviors, dispersion, distribution, accumulation, and other possible hazards by means of a simplified CAD model of an urban area near a water-treatment facility. Possible hazards as well as some prevention and post incident solutions are also suggested.

کلمات کلیدی:

Safety.Gas dispersionComputational Fluid DynamicChlorine gas.Hazard simulationWatertreatment facilityUrban area

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