"MIHAJLO PUPIN" TECHNICAL FACULTY

"Exposure to hazmat road accidents - Toxic release simulation and GIS-based assessment method"

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Industrial demand has intensified production, utilization, and transport of hazardous materials (hazmat). As the production and use of hazardous materials are frequently carried out at different locations, accidents during the transport of hazmats constantly occur. The most critical points on the hazmat routs within inhabited urban or rural areas are centres where the population with increased vulnerability reside. This study aims to assess the exposure of people with disabilities to the impact of hazmat road accidents, in order to provide evidence-based knowledge necessary for the establishment of competent disaster preparedness procedures. A case study was developed for ammonia release from a tanker truck in the vicinity of the Institution for Children and Youth with Disabilities in Veternik, a suburban settlement of Novi Sad, Serbia. An integrated methodology for the risk assessment of the identified problem was proposed focusing on environmental and human-induced variables with a significant impact on the hazard magnitude. The simulation conducted with ALOHA (Areal Locations of Hazardous Atmospheres) confirmed assumption that the combination of high temperature and low wind speed can cause the worst-case scenario i.e. to expose a larger surface area to the influence of released ammonia. In addition, hazard maps were developed by importing the simulated area of ammonia spread into Quantum GIS (QGIS) software.