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Vulnerability Analysis for Risk Zones Boundary Definition to Support a Decision Making Process at CBRNE Operations

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Abstract : An effective emergency response to accidents with chemical, biological, radiological, nuclear, or explosive materials (CBRNE) that represent highly dynamic situations needs immediate actions within limited time, information and resources. The aim of the study is to provide the foundation for division of unsafe area into risk zones according to the impact of hazardous parameters (heat radiation, thermal dose, overpressure, chemical concentrations). A decision on the boundary values for three risk zones is based on the vulnerability analysis that covered a variety of accident scenarios containing the release of a toxic or flammable substance which either evaporates, ignites and/or explodes. Critical values are selected for the boundary definition of the Red, Orange and Yellow risk zones upon the examination of harmful effects that are likely to cause injuries of varying severity to people and different levels of damage to structures. The obtained results provide the basis for creating a comprehensive real-time risk map for a decision support at CBRNE operations.

Keywords : boundary values, CBRNE threats, decision making process, hazardous effects, vulnerability analysis, risk zones
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