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化工园区火灾爆炸风险网格矩阵叠加分析

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Superposition analysis of explosion risks in chemicalindustrial parks based on grid matrix method

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全文: PDF (813 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 为了研究化工园区火灾爆炸事故的个人风险和社会风险问题, 首先, 基于网格划分技术将评价区域划分成网格矩阵; 然后, 采用蒸气云爆炸模型(VCE)模型和沸腾液体扩展蒸气爆炸(BLEVE)模型公式分析事故后果严重程度; 第三, 运用风险叠加原理, 构建化工园区初始火灾爆炸引发连锁事故的死亡概率模型; 最后, 绘制基于风险概率叠加效应的个人风险概率图和社会风险概率图. 结果表明: 个人风险主要取决于危险源的物化特质、地理位置、事故概率等. 区域社会风险除取决于个人风险外, 还取决于人口数量. 基于网格划分及风险叠加耦合技术的化工园区火灾爆炸风险分析, 对有效采取防控措施, 阻断连锁途径起到重要作用.

关键词: 化工园区 火灾爆炸 网格矩阵 风险概率叠加

Abstract: In order to analyze the individual risk and the social risk of the fire explosion accidents in chemical industry park. Firstly, basing on the meshing technology, the assessment areas are subdivided into some grid matrixes. Secondly, the accidents severity results are analyzed according to the vapor cloud explosion (VCE) model and the boiling liquid expanding vapor explosion (BLEVE) model. Thirdly, the probability of dying models which cause of the initial fire explosion chain accidents in the chemical industrial park are set up. At last, the personal risk probability diagram and the society risk probability diagram are drawn based on the risk probabilities superposition effects. The result shows that the personal risk of the park mainly depends on the chemical and physical properties of the hazard installations, the geographic locations and the accidents probability. The regional social risks mainly depend on the individual risk as well as the number of the population density in this location. All in all, basing on the technology of the grid generation and the risk superposition, the analysis of the fire explosion risk can help us taking effective measures to intercept domino function in chemical industrial park.

Key words: chemical industrial park fire explosion grid matrix risk probability superposition

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