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TRANSPORT PHENOMENA & FLUID MECHANICS

液化石油气储罐在喷射火焰作用下的热响应模型

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摘要 Abstract This paper describes a mathematical model developed to study the behavior of liquefied petroleum gas (LPG) tanks when subjected to jet fire. The model consists of a number of field and zone sub-models which are used to simulate the various physical phenomena taking place during the tank engulfm ent period. The model can be used to predict the pressure and temperature of the LPG in the tank, the temperature of the wall of tank, and the time of tank explosion. The comparisons between the model predicted results and the test data show good agreement. The results show that the jet fire partially i mpinging on tank wall led to higher wall temperature and the time to failure was shorter than that in engulfing pool fire. And the exposure of the upper wall in the vapor zone to the fire is more dangerous than that of the LPG contacted wall.

关键词 液化石油气储罐 喷射火焰 热响应 LPG

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The Model of Thermal Response of Liquefied Petroleum Gas Tanks Partially Exposed to Jet Fire

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Key words mass transfer; heat transfer; thermal response; liquefied petroleum gas; tank; jet fire; simulation

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