Abstract

Liquid fuels (hydrocarbon and peroxide) are flammable and there is a risk of pool fires during their storage and transportation. In order to measure and develop effective methods for protection and considering safety distances, experimental studies and CFD simulations of pool fire of two hydrocarbon fuels (i.e., gasoline and kerosene) and peroxide (TBPB (tert-butyl per oxybenzoate)) were performed. Experiments revealed that the pool fires of liquid organic peroxide show fundamentally very different characteristics e.g., generally much higher mass burning rate, larger flame length as well as higher temperature and subsequently higher irradiance in comparison to liquid hydrocarbon pool fires. The three well-known flame zones of pool fires is well captured by CFD simulations and the predicted axial flame temperature profiles. The safety distances accurately predicted by CFD simulations when predicted time averaged maximum flame temperature is used instead to the experimentally measured values in calculations performed in this work.

**Index Terms**

Computer Science

Control Systems

**Keywords**

CFD simulation pool fire temperature irradiance