Integrated Fire and Evacuation Simulations for Shipboard Fire Scenarios

Camille Azzi
Ship Stability Research Centre (SSRC)
Naval Architecture & Marine Engineering
University of Strathclyde
Henry Dyer Building, 100 Montrose Street
Glasgow G4 0LZ, Scotland UK

Abstract

Fire accidents onboard ships are considered among the greatest hazards that encounter ships at sea. Several marine disasters were caused due to fires beside collision, grounding and structural failures. The fast development in ship design and the increasing trend towards innovation especially in passenger ships, where luxury and comfort are vital for the business, obscure the trouble-free accomplishment of safety standards by simply abiding by the rules. Therefore, new arrangements relying on the specific design performance were introduced by marine authorities. This brought in the inevitability in using state-of-the-art simulation tools in order to measure safety performance. Fire and evacuation modelling is essential to assess the hazards associated to detailed fire scenarios. This is made rather feasible due to the current advances in field models in the civil sector and continuous improvements on evacuation and human behaviour modelling. The integration of both fire and evacuation models allow a more realistic assessment approach through considering the health consequences of fire effects on human evacuees onboard. This paper makes use of the integrated fire simulations and evacuation modelling to assess the safety performance of critical fire scenarios onboard passenger ships.