

Woraman Chalermwat 2014: A Numerical Simulation of Fire and Evacuation on Offshore Oil and Gas Processing Platform. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Faculty of Engineering. Thesis Advisor: Assistant Professor Nathasak Boonmee, Ph.D. 117 pages.

This thesis presents a numerical simulation of a fire evacuation at Offshore Oil and Gas Processing Platform by using computer program named FDS+EVAC (Fire Dynamic Simulator and Evacuation). The simulation occupants were stipulated to 45 POB (Personnel On Board) during normal operation with reference to the capacity of TEMPSC (Totally Enclosed Motor Propelled Survival Craft) installed on the platform and 150 POB during plant shutdown for annual preventive maintenance. The platform consists of 5 decks where the dimension of 77 meters wide, 94 meters long, and 45 meters high (above sea level). The simulation occupants were performed for 5 cases, namely, 1) 45 POB for comparing the result with annual emergency exercise; 2) and 3) 45 POB (male) during normal operation without and with fire presented respectively; 4) and 5) 150 POB (male) during plant shutdown without and with fire presented respectively. The heat-release-rate of 1000 kW/m^2 was used for case 3 and 5. The muster point for case 1 was located at the TEMPSC while the other cases were located at the linked bridge to the next processing platform.

The simulation results showed the evacuation time for case 1 was 3 minutes, annual emergency exercise was 5 minutes, case 2 was 4 minutes, case 3 was 4.5 minutes, case 4 and case 5 were 4.7 and 4.6 minutes respectively, all of which comply with the regulations of the Ministry of Labour which stipulates that the employee must be evacuated to a safe location within five minutes.

Student's signature

Thesis Advisor's signature