IMO INF PAPER SUMMARY - The SAFEGUARD Enhanced Scenarios and Recommendations to IMO to Update MSC Circ 1238

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This paper details the work undertaken as part of the EU FP7 project SAFEGUARD to develop representative scenarios. It is recommended that the scenarios relating to fire, heel and trim are considered to replace the current secondary cases. A comprehensive list of possible scenarios relevant to the operation of the ship is also considered. Finally it is recommended that the congestion criteria is based on the maximum allowable evacuation time and becomes a pass/fail criterion.

FIRE - The aim was to create a benchmark fire case which modelled the impact of a severe fire without requiring a full fire simulation. To do this the change in evacuation procedures and the reduction in travel speeds of passengers due to smoke obscuration were both tested. Several ways to define the affected (degraded) main vertical zone (MVZ) are discussed.
It is recommended to modify the assembly procedure for the fire case as follows:

1. Identify the MVZ to be degraded. This zone is considered to contain the fire;
2. Agents within the affected MVZ exit the zone horizontally moving to their nearest neighbouring MVZ. If the affected MVZ is an end zone then all agents move horizontally to the nearest neighbouring MVZ.

Examples of the fire scenario were tested on a cruise vessel geometry. The assembly time for the 95th percentile case in the fire benchmark day case was found to increase by 34% (310 s) compared to the standard day case. For the fire benchmark night case, the assembly time for the 95th percentile case is increased by 30% (470 s). For this vessel, the total assembly time for the fire benchmark day and night cases are 20.3 min and 33.5 min respectively, both well within the maximum allowed.

HEEL AND TRIM - Additional scenarios have been developed involving conditions of adverse heel, trim and motions. Three potential scenarios were identified: Scenario (a) static heel of 20° and trim of 10°. (b) Static heel with roll motion superimposed from t = 0, static heel: 15°, roll amplitude: 5° and roll period: 20 s. (c) Time-varying heel with roll motion superimposed from t = 0, heel: linearly varying from 0° at t = 0 to 15° at t = 60 minutes and then held steady, roll amplitude: 5° and roll period: 20 s.
Scenario (a) was tested. The basis assembly times (95%-ile) were estimated to be 25.7min and 16.5min (night and day cases, respectively). In both cases, the impact of the heel and trim conditions was to increase the assembly time. The extent of the increase was shown to be scenario- and ship layout-specific. For the night case, the increase in assembly time was of up to 11% for both heel and trim cases. For the day case, the increase was up to 24% and 13% for heel and trim cases, respectively.

CONGESTION CRITERIA – It is further recommended that the congestion criterion becomes a pass/fail requirement. It is also recommended that the time component is dependent on the maximum assembly time allowed for the ship rather than the predicted assembly time.

SCENARIOS RELEVANT TO THE PURPOSE OF THE SAFE OPERATION OF THE SHIP One of the key observations made by the project team was that the application of pre-defined benchmark scenarios to different designs and classes was not straightforward. A list of further, potential scenarios is outlined that could be tested as part of the evacuation analysis, these include: a hybrid case; public spaces to 100% capacity, emergency disembarkation to shore etc. These additional scenarios are not intended to be compulsory scenarios but are examples of additional scenarios that an Administration could consider to be sufficiently important to be analysed, as is possible within the current Guideline document. The choice of scenario would need to be justified and a minimum from the list required.

SAFEGUARD

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