

## Dangers of power-operated watertight doors

### Background

Over the years Gard has seen several accidents related to power-operated watertight doors on board ships. Such doors are fitted in watertight bulkheads of ships like cruise vessels, ro-ro passenger vessels, ferries, large supply ships, special purpose ships, etc., and are electrically or hydraulically operated. On the lowermost decks doors are often hydraulically operated, closing with a force of two tons. People have been killed or severely maimed by such doors. There is often an element of fault by the affected person in such accidents, as the strict procedure for passing through these doors may not have been followed. Other issues which may affect their operation are lack of proper maintenance, the crew has not been properly trained nor received specific instructions on how to operate the doors, and SOLAS regulations and guidance are not followed.



The purpose of this circular is to stress the importance of the correct operation of watertight doors in order to maintain the vessel's survivability during emergencies involving water ingress, but also to foster awareness of the risk to crew passing through these doors during their everyday operation of the vessel.

### Operational requirements for watertight doors

The bulkheads in which such doors are fitted are required to be watertight in order to save the vessel should water enter the hull, following a collision or grounding. Regulations for the subdivision of ships are found in SOLAS, and so are the regulations concerning power-operated watertight doors.

SOLAS requires as few watertight doors as possible in subdivision bulkheads, regarding them as a certain risk, but it has become relatively easy, depending on the policy of the flag state, to obtain a relaxation, so it is not uncommon for ships to have 30, 40, 50 or more watertight doors. If a ship is at risk of being flooded, these doors must be closed. Doors can be closed from the bridge or they can be opened and closed on location. When the ship is at sea, in principle all such doors must be in a closed position. Under certain circumstances, however, some doors may be allowed to be opened at sea. Although the regulations are quite strict, the practice on board is often found to be more relaxed, and we have seen ships with a number of doors open during voyage, a bad habit.

The bridge may need to close all watertight doors in an emergency, but must also be assured that no one is trapped within a compartment. Doors can therefore always be opened locally and, if the vessel suffers a blackout, there must be stored energy within the door for three movements. In addition, it is possible to pump the door open with a manual pump.

The current SOLAS regulations apply to vessels built after 1 February 1992. The regulations demand that a number of safety measures be built into the operational system of the doors. There must be a diagram on the bridge showing the location of each door, with indicator lamps for open and closed doors: red for open and green for closed. The logic is that an open door represents a danger to the ship, thus a red light. There must also be a master mode switch, which has two positions: "Local control" and "Doors closed". That switch must always be in "Local control" mode, unless there is an emergency or the system is being tested.

### Gard's experience

We have noted that people often pass through watertight doors before they are fully opened, a dangerous habit in itself and which can easily result in a casualty if the master mode switch is placed in "Doors closed". The door will then immediately start to close when the local operating handle is released. A door will also go to closed position if there is a fault, as the system will give priority to the safety of the ship.

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We have noted that some vessels built before the current SOLAS regulations entered in force do not have a master mode switch on the bridge, but only push buttons for opening and for closing the doors. There may be red and green indicator lamps for the door positions, but often no definition of what the colours mean. Older vessels therefore run the risk of having doors opened in error instead of closing from the bridge in an emergency.

Doors have a flow valve in the hydraulic system to regulate the speed of their movements. The SOLAS regulations require the doors to close in a minimum of 20 seconds and a maximum of 40 seconds when operated locally. Reports from accidents often reveal that the flow valve has been set for the door to close much faster, obviously by crewmembers finding that doors take too long to open and close. Such tampering is of course very dangerous and contrary to regulations. Unfortunately the flow valve is not always well protected but it should be.

### Recommendations

SOLAS regulations for “Subdivision and stability” and for doors in watertight bulkheads are found in Chapter II. Part B-4, Regulation 22 requires all doors to be kept closed at sea, but makes some exceptions. For passenger ships the IMO Circular MSC.1/Circ.1380 “*Guidance for watertight doors on passenger ships which may be opened during navigation*” contains a useful checklist for determining if a door may be open during navigation.

In summary, ship management and crew members should bear in mind the following concerning watertight doors:

- Be aware of the risks posed by steel doors closing with a power of 2 tons.
- Know the regulations for such doors, read the instructions and follow them.
- For older vessels, bring the bridge control panel in line with current SOLAS regulations. A red indicator lamp should mean an open door, and doors should not be able to be opened from the bridge.
- Be aware of the dangers to local users if the master mode switch is set to “Doors closed”.
- Do not walk through a door in motion. If items are to be carried or pulled through a watertight door, ask for assistance.
- Do not tamper with alarm bells, operating levers and speed controls of doors.
- Maintain doors in good condition, they are there to save the ship in an emergency. Have regular servicing carried out by the door manufacturer.
- Keep doors closed at sea.

Gard News 207 contains four articles addressing the problems and risks associated with power-operated watertight doors. A number of incidents are referred to in the articles and contain useful learning points for ship operators. The Gard News articles are available on [gard.no](http://gard.no) [here](#).

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