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## Fishing Vessels: The Risk of Flooding

Notice to Owners, Builders, Employers, Skippers and Crews of Fishing Vessels.

This Notice replaces Marine Guidance Note No. MGN 49 (F).

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### *Summary*

This notice:

1. provides guidance on bilge systems, during construction and operation, to help reduce the number of vessels and lives lost as a result of flooding; and
2. recommends owners and skippers to consider using additional or alternative equipment, such as salvage pumps, propeller shaft-mounted pumps and secondary bilge alarms, to reduce the risk of catastrophic flooding.

### 1. INTRODUCTION

MAIB investigations into fishing vessel losses continue to show flooding as the primary cause. In 1999, 18 (out of a total of 33) vessels were lost for this reason.

Flooding is preventable, but if not prevented, in most cases can be controlled. If discovered early, leaking pipes can be isolated and the flooding controlled by pumping out the affected space. Flooding can be rapid and late discovery leaves no time to treat the cause. An efficient bilge alarm can be critical in providing early warning of flooding.

No alarm or pumping system, however efficient, is fully reliable on its own. Good practice requires regular checks and function tests of bilge alarms and pumps, together with regular checks of hull and pipework to prevent potential leaks or failures developing.

### 2. ARE THE PUMPS ON YOUR VESSEL ADEQUATE?

Statutory requirements provide for a minimum capacity for pumping bilges. There is no guarantee that the statutory minimum is adequate for dealing with serious hull or pipework failure. Alternative supplementary means of pumping bilges are available, such as salvage pumps and propeller-shaft mounted pumps. Use of such equipment is highly recommended.

### 3. CONSIDER CARRYING MORE EQUIPMENT THAN THE REGULATIONS REQUIRE

A range of bilge pumps and alarms are available. To help reduce the consequences of flooding, in addition to statutory requirements, consider one or more of the following options:-

- Install an efficient bilge alarm in the fish hold and any other compartment below the waterline.
- Fit secondary bilge alarms, positioned at a higher level to the main bilge alarm. This will reinforce the main alarm.
- Fit secondary bilge alarms, fed from a separate supply, that incorporate an alarm visible from outside the vessel (e.g. an orange “strobe” light).
- When available, fit electronic bilge level monitoring systems in addition to conventional “float switch” alarms.
- Fit “circuit healthy” indicators on bilge alarm circuits to ensure that the alarm system is working correctly (similar idea to navigation light failure alarms).
- Fit a propeller-shaft mounted pump; this type of pump runs continuously on the main propeller shaft and automatically attempts to pump out the engine room space in the event of flooding.
- Install “submersible” pumps, which continue to operate whilst submerged in water.
- Where practical, fit remotely operated clutches to engage engine driven bilge pumps.
- Carry a portable salvage pump. Extremely positive feedback has been received from Skippers who have sailed with this type of pump, which may “double-up” as a fire-fighting pump in a “dead ship” situation. However, a recent investigation attributed the death of one crew member to such a salvage pump. Unfortunately, he received fatal carbon monoxide poisoning whilst operating the pump inside the engine room.

Such pumps should be:-

- i) Used in a well-ventilated space, preferably on deck, where the exhaust fumes will be released to outside the vessel.
- ii) Permanently rigged, or readily available, with direct attachment to permanent suction lines (to prevent the need for hoses to be fed through open hatches/doors).

- iii) Given due consideration concerning the storage of fuel, particularly petrol driven versions (i.e. adequate ventilation provided, fit for purpose storage canisters and away from sources of ignition).

#### 4. PREVENTATIVE MEASURES – DURING CONSTRUCTION AND REFITS

##### **Bulkheads/Openings**

- Ensure that the main bulkheads are as watertight as practicable, to prevent (or at least delay) a flood from spreading to other compartments.
- DO NOT make additional penetrations through main bulkheads unless absolutely necessary.
- Clearly label (“TO BE KEPT CLOSED AT SEA”) all doors which contribute to the watertight integrity of the vessel.

##### **Sea Valves/Pipework**

- Try to keep the number of sea inlet valves to a minimum.
- Valves and fittings should be manufactured from a suitable\* material.
- Avoid unnecessary bends in sea water pipework.
- Position sea valves where they can be easily and quickly closed. Fit extended spindles if necessary, to ensure that sea intake valves can be closed without having to remove floor plates.
- Fit clear labels to identify sea valves.
- DO NOT fit flexible sections of piping in seawater lines unless designed and fitted to withstand vibration. Such sections should be made from reinforced neoprene rubber and secured with stainless steel clips (at least two at each end). The date of manufacture should be clearly marked to identify renewal dates in accordance with the manufacturers’ instructions (typically every 5 years).

\* “Suitable” means a ductile and corrosion resistant material e.g. bronze, gunmetal, stainless steel, alpha-brasses (containing 70% copper or more and effectively inhibited from de-zincification).

### **Bilge Alarms**

- Position floats or level sensors to bilge alarm systems in accessible positions but where they cannot be damaged and low enough to provide early warning of flooding.

### **Bilge Valves/Strainers**

- Fit bilge valves so they can easily be reached in an emergency.
- Fit clear labels to identify bilge valves.
- Fit and position all bilge strainers (mud boxes) in the engine room, so they can be cleaned easily.
- Fit grids over the fish hold slush well or some other form of coarse strainer.
- Fit a bilge isolating valve in the engine room for the fish hold, to allow cleaning of the strainer even if the hold is flooded.

### **Bilge Lines**

- Avoid unnecessary bends in bilge lines, keeping them straight and direct.

### **Refits**

- Inspect the outer hull closely each time the vessel is slipped, paying close attention to any signs of wastage, damage, caulking and fastenings.
- Inspect sea water pipework closely each time vessel is slipped, paying close attention to bends, “sumps” (e.g. the bottom of sea strainer boxes) and those pipes which are not easily accessible.
- If in doubt about the condition of the sea water pipework, have an ultrasonic inspection carried out and renew those pipes found to be wasted by more than 25-30% of the original wall thickness.

## **5. REDUCING THE RISK – DURING OPERATION**

- Always investigate immediately the cause of high bilge alarms.
- Ensure all watertight and weathertight doors are closed when not in use.

- Regularly (at least weekly) test the bilge pumps and bilge system.
- Test bilge alarms daily.
- Regularly (at least monthly) open and close all bilge and sea water valves, to ensure they don't “seize”.
- Keep sea water valves closed when not in use.
- Permanently repair any leaking sea water pipe as soon as possible. Do not rely on temporary repairs and find out if the other sea water pipes are in a similar condition and require renewal.
- Ensure crew members are familiar with sea water side valves and bilge systems. As a reminder, keep a plan at the engine room entrance, identifying the position of sea inlet valves.
- Regularly (several times a day) check compartments not fitted with bilge alarms.
- Regularly (at least weekly) clean bilge strainers
- Keep the engine room and fish hold free of rubbish, which could choke the bilge system.
- Check sea valves (including overboard non-return valves) whenever the vessel is slipped.

## **6. EFFECTIVE USE OF THE BILGE PUMPING SYSTEM**

- Close the sea suction after any priming of bilge pumps.
- Stop the bilge pump when pumping bilges is finished.
- Close all bilge valves when not in use.

## **7. WHAT TO DO IN AN EMERGENCY**

- Immediately try to find the cause of the flooding and shut the right sea valve. If in doubt, close all sea valves until the flooding stops.
- Start pumping the bilge as soon as possible.
- Do not concentrate on other matters, such as recovering the fishing gear. Deal with the flooding first.

## 8. PREVENTION AT ANCHOR OR IN HARBOUR

- Close all sea suction valves.
- Avoid “squeezing” wooden vessels in harbour, whenever practicable. This can damage the caulking and lead to a sprung plank.

## 9. FURTHER NOTES

1. Statutory requirements for fishing vessels of 12 metres in length and over are detailed in the Fishing Vessels (Safety Provisions) Rules 1975 as amended [currently under review]. New vessels 24 metres in length and over now need to comply with EC Directive 97/70/EC, in accordance with the Torremolinos Protocol.
2. This notice is considered relevant to all types of fishing vessels, regardless of size.

*Enquiries relating to the content of this MGN should be addressed to:-*

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*General enquiries relating to the supply or availability of MSNs, MGNs, MINs or other subjects covered by MCA should be addressed to the Maritime Information Centre at the above address, or*

**Tel: 023 8032 9297**

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