



Maritime &
Coastguard
Agency

MARINE GUIDANCE NOTE

MGN165 Amendment 2 (F)

FISHING VESSELS: Risk of Flooding

Notice to all Designers, Builders, Certifying Authorities, Classification Societies, Agents, Brokers, Owners, Employers, Skippers and Crew of Fishing Vessels.

This notice should be read with the Fishing Vessel (Code of Practice) Regulations 2017 No. 943, MSN1871 (F) The Code of Practice for the Safety of Fishing Vessels of less than 15m Length Overall, MSN1872 (F) The Code of Safe Working Practice for the construction and use of Fishing Vessels of 15m Length Overall to less than 24m Registered Length, MGN570 Fishing Vessels: Emergency Drills and MGN571 Fishing Vessels – Prevention of Man Overboard.

Summary

This notice:

- provides guidance on bilge systems, during construction and operation, to help reduce the number of vessels and lives lost as a result of flooding;
- preventative maintenance around all aspects of the vessel integrity and pumping arrangements is critical against the risk of flooding;
- recommends owners and skippers 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;
- provides guidance on the actions to take in the event of flooding;
- provides guidance on preventing and dealing with flooding in shelter decks;
- reminds owners that vessels must be maintained in accordance with accepted / recognised construction standards and ensure modifications comply with these standards.

1. INTRODUCTION

- 1.1 MAIB investigations into fishing vessel losses continue to show flooding as the primary cause. Between 2016 and 2024, 86 vessels were involved in flooding or foundering incidents. Of these, 29 vessels were lost.
- 1.2 In addition to the risks of water causing the vessel to sink as it loses buoyancy, if water gets into a vessel and cannot escape, this can cause free surface effect. The water will move from one side to the other and cause the vessel to heel and eventually capsize, which can occur very rapidly. Water may also raise the centre of gravity. In addition, it will reduce the freeboard and increase the chances of more water getting on deck, leading to a situation that may get out of control.
- 1.3 Downflooding is also a key cause of vessel losses and make it unlikely the vessel can be saved. To prevent this watertight doors, hatches and windows, and other closing devices must be maintained in good working order and you must ensure all watertight and weathertight doors are closed when not in use.
- 1.4 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.
- 1.5 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. REDUCING THE RISK – DURING CONSTRUCTION AND REFITS

2.1 General

- A vessel shall always be maintained to the standard it was built to comply with and any modifications to a vessel shall meet the relevant Construction and Outfit Standards or the Standards of a Recognised Organisation appropriate to the length of the vessel.
- Based on vessel age and survey type a more invasive survey regime for Fishing Vessels will be conducted. For example:
 - satisfactory visual external examination and a functional test at working pressure at annual surveys for over 24 metre vessels and intermediate inspection of under 24 metre vessels;

- additional internal examination of a sample of pipes selected at intermediate surveys for over 24 metre vessels; and
- Internal examination and pressure testing, or thickness measurement at Renewal surveys for vessels over 10 years unless proven that pipes have been renewed in the last five years.

2.2 Bulkheads/Opening

- Ensure that the main bulkheads are as watertight as practicable, to prevent (or at least delay) flooding in one area from spreading to other compartments;
- If the vessel is leaning to one side, for example whilst bringing catch on board, ensure that any coamings, hatches, or unprotected openings are not underwater at that angle of heel;
- Be aware of compartments which may be at risk of water spreading to them;
- DO NOT make additional penetrations through main bulkheads unless absolutely necessary, any penetrations must meet the requirements of the relevant Code of Practice and be notified to MCA in advance as modifications;
- Clearly label (“TO BE KEPT CLOSED AT SEA”) all doors and hatches which contribute to the watertight integrity of the vessel.

2.3 Sea Valves/Pipework

- Try to keep the number of sea inlet valves to a minimum;
- Valves and fittings should be manufactured from a suitable¹ material to resist corrosion. Ensure mild steel pipework is removed;
- Avoid unnecessary bends in sea water pipework, pipes with bends of a radius of less than 3 diameters should be checked for erosion;
- Galvanised pipe shall be examined and rust spots investigated with a screw driver;
- Pipework thicknesses should be checked by a competent/trained person;

¹ * “Suitable” means a ductile and corrosion resistant material e.g. bronze, gunmetal, stainless steel, alphasbrasses (containing 70% copper or more and effectively inhibited from de-zincification).

- Check for corrosion on stainless steel pipes at “crevices” e.g. flange connections;
- Many corrosion problems in seawater systems occur in valves. Often such problems are due to the use of steel or cast iron valves with non-ferrous piping. The life of such valves in a steel or cast iron pipe system is short - typically two to three years. However, when fitted in an alloy system, it may be less than a year due to the galvanic effects from the piping;
- Coating on valve bodies depends on maintaining it's integrity, as manufactured, after installation and in service. Any break in a coating can result in intense corrosion and perforation of the valve body;
- Check valve seats for erosion;
- Check valves are secured by nuts which are not corroded;
- 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;
- Ensure everyone onboard knows the locations of all sea valves and their means of closure;
- Develop an at least monthly regime to function test and grease all overboard valves;
- Fit clear labels to identify sea valves and their means of closure if remote/extended;
- Display engine room diagrams showing the location of sea inlet valves outside the entrances;
- Maintain a piping system diagram, which includes materials pipework valves and coolers are made of and record if pipework has been galvanised/coated;
- 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). Pipework adjoining flexible sections shall be supported as closely as possible to the flexible section;
- The use of hose clamps and similar types of end attachments is not acceptable for flexible hoses in sea water piping systems where failure of the end attachment may result in flooding. For sea water

systems, where flooding can be prevented by the installation of a readily accessible shutoff valve immediately upstream of the hose without out relying solely on the ship side valve, double clamps at each end connection may be accepted;

- Pipes with bandage repairs, welded patches and inserts are not acceptable;
- Maintain a record of when each section of pipework was last replaced;
- Check pipework is secure and supported without being strained. Failure of a welded joint may indicate a local vibration and the need for extra pipe supports or a flexible connection;
- If the vessel has had long periods of inactivity remove sections of pipe for internal examination. Check internal surface for formation of oxide layer. If the piping system has been inactive whilst the vessel has been laid up for more than one year, remove sections of pipe for internal examination. At survey, the surveyor may also request this at their discretion.

2.4 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.

2.5 Bilge Valves/Strainers

- Fit bilge valves so they can easily be reached in an emergency;
- Fit clear labels to identify bilge valves and their means of closure if remote/extended;
- 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.

2.6 Bilge Lines

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

2.7 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.

3. REDUCING THE RISK – TRAINING

3.1 Ensure crew members undergo induction training when joining a vessel and that this training is continually refreshed. This will ensure the crew are aware of:

- the actions to take to reduce the risks of flooding whilst the vessel is at sea;
- the checks to be made when an alarm is raised regarding flooding;
- how to identify where water may be entering the vessel and how to stop or slow water ingress, for example, everyone onboard knows the locations of all sea valves and their means of closure;
- how to respond dependent on the extent of flooding and risk to the vessel.

3.2 Induction training will:

- increase the likelihood of the vessel surviving the flooding incident;
- increase the time available to receive equipment to prevent vessel loss;
- increase the time available for potential rescue.

4. REDUCING THE RISK - DURING OPERATION

- Always investigate immediately the cause of high level bilge alarms;
- Watertight doors, hatches and windows, and other closing devices must be maintained in good working order;
- Ensure all watertight and weathertight doors are closed when not in use;

- Vents and air intakes should be as high and near the centreline of the vessel as possible, to minimise the possibility of water getting in through them;
- 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;
- Keep freeing ports [and tonnage valves] clear of blockages and obstructions;
- Check sea valves (including tonnage valves and overboard non-return valves) whenever the vessel is slipped.

5. SPECIAL CONSIDERATIONS FOR SHELTER DECKS

- 5.1 In addition to the measures set out elsewhere in this MGN, special consideration should be given to shelter decks where deck wash is used.
- 5.2 Loose water on deck can cause a significant loss of stability due to its ability for transverse movement. The deck shall be maintained clear of water. It is imperative that vessels of 15m Length Overall to less than 24m Registered Length built before 23 November 2002 with weathertight compartments such as shelter decks for the protection of the crew, especially if they are spaces for processing or have wash water introduced, have scuppers/ tonnage valves or other means fitted to rapidly drain water and are recommended to have an independent means of pumping away wash water with a pumping capacity at least 1.5 times the wash water supply. Where pumping arrangements are

intended to cater for solid waste, discharge shall be arranged via local sumps with pumps suitable for pumping fish waste products. In the event of a build up of water occurring in the processing spaces, the water supply should be stopped immediately until the deck has been cleared.

- 5.3 Where tonnage non-return valves would be immersed at an angle of heel of 10° or less in any loading condition, powered drainage pumps, discharging from a point high in the side of the shelter, must be used; and the non-return valves removed and their openings sealed.
- 5.4 If the vessel does not have independent pumping capability in 5.2 above, it shall have additional measures in place to adequately address the risk of water accumulation on weathertight shelter decks due to blocked, seized, or shut tonnage valves or other water freeing arrangements.
- 5.5 Crew shall be aware of the potential output of wash water from deck wash pumps and the capacity of the bilge pumps to remove the water.
- 5.6 Deck wash pumps should never be left running unattended.
- 5.7 Deck wash pumps shall have controls with readily accessible remote stops.
- 5.8 Regularly check tonnage valves and scuppers for blockages and that they function as intended and are not seized.
- 5.9 Decks kept clear of loose gear, canisters etc that could be washed into and block freeing ports and tonnage valves.
- 5.10 Ensure safeguards are in place, for example, bilge alarms fitted within the shelterdeck space, conduct a risk assessment of flooding in the shelter deck area, have clear signage on measures to ensure preventative measures are adhered to and put in place operational procedures.

6. MANDATORY REQUIREMENTS

- 6.1 The requirements for bilge pumps and alarms are contained in Chapter 4 of the following Codes:
 - MSN1871 (F) The Code of Practice for the Safety of Fishing Vessels of less than 15m Length Overall;
 - MSN1872 (F) The Code of Safe Working Practice for the Construction and Use of Fishing Vessels of 15m Length Overall to less than 24m Registered Length;
 - MSN1873 (F) The Code of Practice for the Construction and Safe Operation of Fishing Vessels of 24m Registered Length and Over.

7. ARE THE PUMPS ON YOUR VESSEL ADEQUATE?

- 7.1 These Codes set out the 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.

8. CONSIDER CARRYING MORE EQUIPMENT THAN THE REGULATIONS REQUIRE

- 8.1 A range of bilge pumps and alarms are available. To help reduce the consequences of flooding, in addition to mandatory requirements, consider one or more of the following options, if the Code applicable to your vessel does not already require:-

- install an efficient bilge alarm in the fish hold and any other compartment below the waterline; sensors shall also be fitted in any compartment which has a bilge suction if the level of bilge water cannot be readily checked visually without entering the compartment;
- 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” alarm;
- 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 power pump driven by main machinery provided that the propeller shafting can be readily disconnected or provided that a controllable pitch propeller is fitted;
- consider installing CCTV in positions throughout the vessel where ingress of water can easily be seen;
- 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. This can “double-up” as a firefighting pump in a “dead ship” situation. However, [MGN 659 \(M+F\) Amendment 2 The Merchant Shipping and Fishing Vessels \(Entry into Enclosed Spaces\) Regulations 2022](#) should be read as operating this pump in an enclosed space can lead to fatal carbon monoxide poisoning;
- auto pumps are not to be fitted in spaces with oil.
- **Portable Salvage Pumps should therefore 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).

9. 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.

10. WHAT TO DO IN AN EMERGENCY

10.1 [The Fishermen’s Safety Guide](#), published by the Maritime and Coastguard Agency (MCA) provided guidance to help crews develop flood action plans, and [Marine Guidance Notice \(MGN\) 570 Amendment No.1 \(F\): Fishing Vessels: Emergency Drills](#) provided drill scenarios to practice such plans.

10.2 The following provides guidance on the actions required. These actions are generic and may vary from vessel to vessel and it is recommended that you identify the requirements particular to your vessel through practice drills.

Primary Action	Secondary Action	Vessel Dependent Action	Skipper should be aware of
Inform Coastguard via DSC Immediately	• Send DSC Alert and follow up with VHF call		• Be aware of correct procedure

Prepare for Emergency	• Don Warm clothing and lifejacket		• Understand most suitable place to store lifejacket • Access lifejacket quickly • Know how to don lifejacket • Be aware of suitable clothing • Deal with flooding first. Do not recover gear before dealing with flooding.
Make Contingency Plans	• Ensure crew are aware of any contingency plans should situation change and vessel cannot be saved		• Abandon ship drills • How to prepare LSA
Check for Water ingress	• Check all potential locations and amount of water ingress when first aware of emergency. • Maintain regular checks of compartments for water ingress during emergency • Shut the right sea valve. <u>If in doubt, close all sea valves until the flooding stops.</u> • Take tank soundings, it might be a fore peak tank breach rather than a hold	• Start Bilge pumps • Monitor bilge pumps and alarms	• Be aware of how to check alarms • Be aware of methods for stopping water ingress • Be aware how to take tank soundings • Be aware that misidentifying the source of the water ingress will mean that the vessel remains at risk. • Be aware of locations where it is not possible to prevent water reaching other compartments
Inform Coastguard of ongoing situation	• Maintain regular contact with Coastguard and inform of any changes to the vessels situation		• Be aware of correct procedure
Prepare to fight flooding	• Collect damage control kit • Check bilge pumps are discharging on a regular basis to ensure water is being removed from vessel	• Consider if bailer/ bucket will remove water • Consider if pumps will cope • Consider if additional pumps will help • Request portable pumps	• Be aware of bilge pump capabilities • Be aware how to operate bilge pumps • Be aware how to use damage control kit • Be aware of how to clear blockages in bilge pumps

Prepare LSA		- Secure liferaft in safe area - Provide safe means of boarding	Know how to release and deploy liferaft
Consider Abandon Ship	- Close oil and fuel vents - Consider stability of vessel - Deploy EPIRB/PLB		

10.3 Drills should be carried out at least monthly. The drill will refresh basic safety training and add an element of reality of working as part of a team on board the vessel. To ensure a safe and effective drill, it is important that as many of the regular crew are present as possible.

10.4 Drills cannot replace the written risk assessment but are a vital part of the necessary control measures within that risk assessment.

10.5 It is essential that all crew members undertake drills and play their part in the safe day to day running of the vessel.

10.6 In addition to ensuring as many of the crew attend, it is important that they are engaged and involved in the drill scenarios.

10.7 A debrief session should take place after each drill to identify weaknesses, areas for improvement as well as what went well.

10.8 Use drills as an additional opportunity to inspect emergency gear and test equipment.

10.9 Ensure lifejackets and immersion suits provided on a vessel are suitable storage locations.

11. FLOODING 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;

- Take care during unloading operations due to the reduction in stability and heightened risk of sudden heeling when crane is in use when hatches and doors are open;
- Deck wash hoses should be shut off when unattended.

More information

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Please note that all addresses and telephone numbers are correct at time of publishing.

Published: July 2026

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