Annex A

MGN 492 (M+F) Health and Safety at Work: Protecting those not employed by the ship owner

Maritime & Coastguard Agency

MARINE GUIDANCE NOTE

MGN 492 (M+F)

Health and Safety at Work : Protecting those not employed by the ship owner

Notice to all ship owners and fishing vessel owners, employers, masters and seafarers

This notice should be read with the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 and MGN 20

Summary

- It is not only the employer who has a duty of care towards their workers under the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 (referred to in this notice as "the General Duties Regulations").
- Each employer has a duty of care both to workers and to others on board who are affected by their business.
- The Company has a duty to coordinate health and safety for all workers and others on board, by working with and sharing information with other employers, including contractors temporarily on board ship.
- Workers should take care for, and report any concerns about, the safety of contractors operations in the same way as they would for ship's crew.

1. Introduction

1.1 Ships can be complex working environments with a number of employers, contractors and other people all working or carrying out activities alongside each other.

1.2 This notice explains how the Company's and the employer's duties under health and safety law should work in cooperation to ensure the health and safety of anyone on board.

1.3 For the purposes of the General Duties Regulations, "the Company" means the owner of the ship or any other organisation or person such as the manager, or bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner. These regulations apply to all ships on which workers are employed.

2. "The person in control of the matter"

2.1 The General Duties Regulations set the principles for ensuring health and safety at work on board ships and fishing vessels. Marine Guidance Note MGN 20(M+F) gives more information on those principles and "general duties".

2.2 Regulation 4 says that where an individual employer does not have control of the operation of the ship, the duty of care resides with the person who has "control of that matter". The Company has overall control of the operation of the ship, and therefore has a duty to assess the risks to others on board ship in so far as they are affected by the operation of the ship.

3. Workers and "other persons"

3.1 Under Regulation 5 of the General Duties Regulations, each employer has a duty to ensure the health and safety of workers and other persons, so far as is reasonably practicable. Both the underpinning principles for health and safety in Regulation 5(1) and the general duties set out in regulation 5(2) apply equally to the protection of workers and other persons. Regulation 5 is reproduced in the Annex to this MGN for ease of reference.

3.2 "Other persons" may include passengers, those undertaking adventure activities such as trainees on a sail training vessel, those on work experience, independent researchers, self-employed contractors and share fishermen working alongside employed fishermen. This is not an exhaustive list.

3.3 The regulations make no distinction between the duty of care towards workers and that towards other persons on board. If there is a relevant risk to other persons, the employer conducting the undertaking must take reasonably practicable steps to avoid that risk. This is in respect of all risks including those covered in detail in separate health and safety regulations, such as those on chemical agents, work at height and noise at work. So, once the likelihood and potential severity of harm are identified, the employer must do what is reasonable to address that risk. What it is reasonable for the employer to do may be different depending on whether the person at risk or posing the risk is employed, (who can be trained, given and required to take account of information and to follow instruction as contractual requirements), or on the vessel for other reasons, (who may or may not be available to be trained, given information and to follow instruction).

4. Co-ordination

4.1 Regulation 13 of the General Duties Regulations requires the Company (as defined for the purposes of the ISM Code) to co-ordinate health and safety measures for all those working on board. Regulation 13 is reproduced in the Annex for ease of reference.

4.2 Employment relationships on board ship can be complex with several different employers as well as, or other than, the Company each employing workers on board.

4.3 As well as carrying out risk assessments and taking appropriate measures for their own employees, regulation 13 requires the Company also to co-ordinate the control measures identified in the risk assessments of all other relevant employers on board, as appropriate. To a large extent this should be covered by the safety management system on board, but it may also mean ensuring that contractors and sub-contractors have conducted adequate risk assessments, consulting them about the risks they have identified and whether these may affect the health and safety of other people on board; informing them of any significant risks to the contracted staff arising from the ship as a workplace, or from the activities of other workers on board, and of the measures put in place for their protection.

4.4 As workers themselves, the master and the crew also have a responsibility under Regulation 21, to report any safety concerns, and they should be encouraged to do so where such concerns arise from the activities of contractors or sub-contractors in the same way as they would report any deficiencies of on-board equipment or procedures relating to their own duties.

4.5 Contractors or charterers placing their staff on board ship are also subject to the duties of employers under these regulations, and accordingly should co-operate with the Company on health and safety issues. Similarly, contractors' or charterers' staff while on board are subject to the duties of workers under Regulation 21.

5. Shore-based health and safety legislation

5.1 This guidance relates to the Merchant Shipping legislation. Shore-based health and safety legislation[1], which applies to certain operations when the ship is in port in the UK or when a ship is in dry dock, contains similar duties for co-operation and co-ordination between employers on health and safety matters, and similar duties for employees.

More Information

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telephone numbers are correct at time of publishing

Safer Lives, Safer Ships, Cleaner Seas

1. The Management of Health and Safety at Work regulations 1999 (S.I. 1999/3242) as amended, and the Management of Health and Safety at Work (Northern Ireland) Regulations 2000 (S.I. 2000/348) as amended.

‘Industry Advisory Note’ on potting safety, Seafish

SEAFISH
the authority on seafood

Industry Advisory Note

January 2011

Potting Safety

The Marine Accident Investigation Branch (MAIB) report *Analysis of UK Fishing Vessel Safety 1992 to 2006*[1] found that a higher than average man overboard fatality rate was attributed to parts of the potting sector. The report recommended Seafish research potting methods and procedures.

This advisory note summarises the available information on potting related incidents and provides guidance on safe practices.

Fatalities in the Potting Sector

MAIB has been recording accident data since 1991. During the period 1st Jan 1991 – 31st Dec 2009, the deaths of 54 fishermen from the potting sector were recorded. This represents an average of 2.8 fatalities a year during this 19 year period.

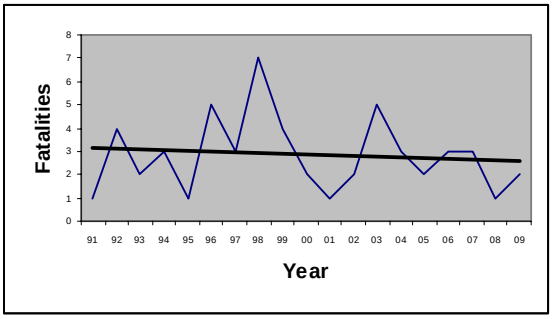


Figure 1: UK Potting Fatalities 1991 - 2009

The figure above shows that the fatality rate has remained consistent with no significant improvements being achieved. Further improvements in safety practices are needed to reduce the loss of lives within the sector.

It is estimated that the number of UK full- and part–time fishermen engaged in potting is 4,600[2]. This equates to an average fatality rate of one per 1,618 fishermen each year.

Clearly too many lives are being lost and this warrants a closer re-examination at available data to try and ascertain why accidents are occurring in the sector and what actions may be employed to reduce the accident rate.

It can be seen from the table below that nearly half (46%) of deaths in this sector are due to fishermen going overboard. This is much higher than for the catching sector overall for which a third of all fatalities between 1992 and 2006 resulted from fishermen going overboard[1].

Table 1: Summary of Fatalities on Potting Vessels reported to MAIB References:

Incident Type	Fatalities Rate 1991 -2009	% of Fatalities 1991 -2009
Person Overboard	25	46.3
Flooding/Foundering	12	22.2
Capsize/Listing	10	18.5
Missing Vessel	4	7.4
Accident to Person	1	1.9
Collision	1	1.9
Grounding	1	1.9
Total	***54***	**100**

1. http://www.maib.gov.uk/cms_resources.cfm?file=/FishingVesselSafetyStudy.pdf
2. Calculated from 2,599 vessels actively engaged in potting in 2008 using average crew numbers recorded in England and Wales for each category.

Size Category	Av. Crew	Vessels	Totals
10m & under	1.6	2,285	3656
10 – 15m	2.5	264	660
Over 15m	5.7	50	285

Pot fishing hazards

The main potting hazards that may result in a fatality or serious injury include:

- **Snagged in rope when shooting**

A loop or bite of rope caught around a limb during shooting will result in serious injury or death. The limb is likely to be severed or the person will be dragged overboard and, even if wearing a lifejacket, likely to be pulled down by the weight of pots attached to the rope. Accidents have also occurred due to a loop of rope snagging a pot and carrying it overboard, striking a crewman on its passage.

- **Pots out of sequence**

Stacking pots in a rigid sequence is essential where pots remain attached to the back rope and all involved in the shooting operation need to be totally certain of the sequence. Problems can occur if a pot is stacked out of sequence to enable it to be repaired prior to shooting, or if the vessel motion causes stacked pots to fall. Should an incorrect pot be selected, the correct pot will be pulled from the stack as the back rope tightens and 'fly' across the deck, quite likely striking the man holding the incorrect pot at the rail.

- **Trips and falls**

The most common accident in any workplace, but on a fishing vessel it can be fatal if the person falls overboard and in potting, a simple trip and fall could be disastrous during the shooting operation.

- **Vessel overloading**

The overloading of a fishing vessel with pots, either by having too many on a string or when moving strings to new fishing grounds, can put the vessel at risk of capsize and foundering, and her crew at risk of drowning.

- **Struck by pot or anchor at the davit block**

Failure to stop the hauler can result in a pot, or perhaps an anchor, hitting the davit block and possibly swinging over the top to strike the crewman.

- **Fatigue**

Not a potting specific hazard but fatigue is a common hazard in the catching sector. Working in a physically demanding job for long hours ultimately leads to fatigue, and this increases the risk of an incident occurring. Anecdotal evidence from industry suggestions many more pots are being worked than 10-15 years ago and in many cases have doubled. This will undoubtedly increase levels of fatigue within the sector.

- **Crew competence**

Owing to reduced or static levels of income in the sector it may be more difficult to attract and retain experienced and competent crew. Inexperienced crew are more likely to be involved in an accident.

- **Operating single-handed**

Problems with recruitment and low returns force more fishermen into working single-handed. This practice may increase the risk of accidents and certainly reduces the chances of rescue should an accident occur.

These hazards do occur and injuries and deaths can be the result.

Hazard reduction methods

Some suggestions for reducing the risk of hazards and accidents occurring are detailed below:

1. Detachable Pots - Toggle System

This system, originally devised by Trevor Bartlett (Devon) for use on his 18m potter *Euroclydon* and now in use on most of the larger potting vessels, is a major advance in pot fishing safety. The key to the system is a toggle clip which connects into a loop to join together the two-piece leg rope at a point quite close to the pot.

By slipping the toggle clip out of the loop, the pot can be detached from the back rope, enabling it to be stored anywhere and without worrying about sequence. On hauling, the pots are lifted on board as normal, but once on board, the toggle is disconnected and the loop, which it fits into, is slipped over a vertical steel pole.

Figure 1: Detaching the pot from the main ground rope onboard 16m Dartmouth based vessel *Excel*

The size of the eye splice is critical to this shooting system. If the opening of the eye splice is too loose the pots may become unattached when hauling or shooting and be lost. If it is too tight it will be a struggle to unattach when hauling and attach the strop to the toggle when shooting.

Figure 2: Placing the eye splice on the pole ready for shooting.

Putting each eye splice on the pole ensures each of the strops is kept in the correct sequence for shooting back.

The pot, now separate from the back rope is emptied, baited and stacked. The back rope, as normal, is allowed to pile up on deck and the loop, of each disconnected leg rope, is dropped over the pole in sequence. Thus at the end of the haul, the back rope is in a pile on the deck with each leg rope leading to the pole. The pots are stacked securely out of harms way, wherever is convenient, as there is no need to keep them in sequence.

During the shooting operation, the pot is stood on a shooting table and the first leg rope loop removed from the pole. The toggle is slipped into the loop, thus connecting the pot which is pulled into the sea when the back rope tightens. The next pot is placed in position and connected to the next leg rope from the pole. Shooting proceeds with one

man connecting the toggles and one or two men bringing the pots to the shooting table.

Figures 3: Attaching the pots to the ground rope whilst shooting.

Aside from the ability to stack the pots out of sequence, the system gives more compact storage of the back rope with all the leg ropes leading to the pole. Because the leg ropes are constrained to a narrow area it is easy to build a division to separate the rope from the deck area where the crew handle the pots. In addition, should a problem occur with the shoot, the leg ropes can simply be slipped off the pole as required to enable back rope to be paid away.

It is appreciated that deck space and crew numbers are limiting factors for many small boat operators to adopt this method. However, vessel operators are urged to consider the adoption of this system as the hazard of pots being dragged wildly across the deck is totally removed. If the limiting factor is deck space consider working shorter strings. See Figure 4.

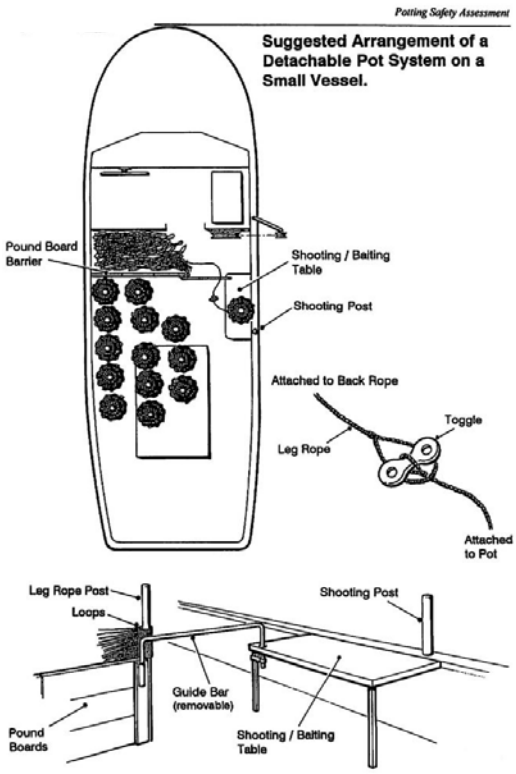


Figure 4: Suggested arrangement or a detachable pot system on a small vessel.

2. Rope Pounds or Divisions

Separating the crew from the back rope will resolve one of the most dangerous hazards; that of becoming snagged in the rope when shooting. The design of the barrier will depend on the layout of the vessel and the stacking of the pots but should endeavour to provide protection to all involved in the shooting operation. A sketch of a separation system devised by an Orkney skipper who introduced the system after the loss of one of his crewmen who became snagged in the rope is shown below in Figure 5.

This system as shown in Figure 5 uses a 600mm (2 ft) high pound board barrier to form a trough between the pound boards and the bulwark to contain all the 'tails' or leg ropes. A high wire mesh screen is set at the end of the pound boards to provide protection for the man who sets each pot in turn on the shooting table. Although the illustration shows a vessel with aft stowage of the pots, the concept can be applied to other layouts in order to keep the ropes clear of crewmembers.

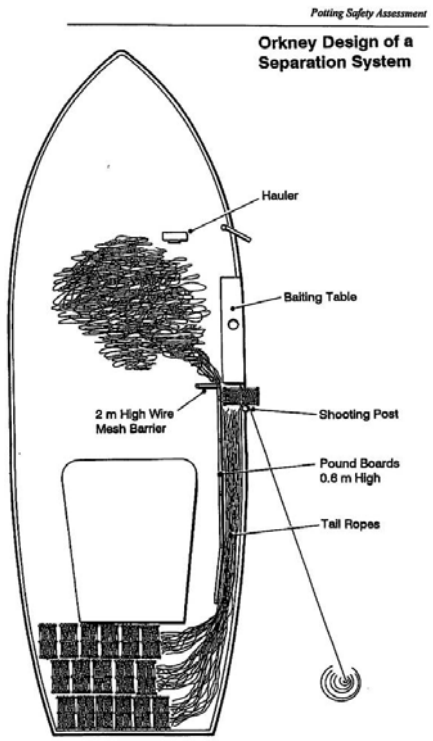


Figure 5: Orkney design of a separation system

3. Self Shooting Systems

There has been a number of varying self shooting systems developed to suit individual vessel layout and skipper preferences. The main difference between self shooting systems and the toggle system is that the pots remain attached to the back rope and as such great care needs to be taken to ensure pots are stacked in a precise pattern, and in a manner, that will not cause pots to be shot out of sequence. The main benefit of this system is reduced manual handling which in turn may reduce fatigue levels and the risk of accidents associated with fatigue.

Many self shooting systems shoot the pots through an opening cut into the transom. Figure 6 below shows pots being stacked during the hauling operation in preparation for shooting through the stern opening. This 12m vessel has a forward wheelhouse and the opening in the transom is permanent with a rail fixed across the top to help prevent crew from falling through the gap.

Figure 6: Stacking pots ready for shooting onboard the 14m Bridlington based vessel *Hollie J*

Figure 7 below shows the pots being shot away with minimal contact from the crew. A crew member can just be seen standing safely clear of the shooting area, watching to ensure the pots are shot correctly and ready to alert the skipper if there is a problem.

Figure 7: Self shooting through the stern opening

Similar systems to above have been developed on vessels with aft or mid-ship wheelhouses where the pots are stacked forward of the wheelhouse and shot through an opening in the transom via a 'funnel' alongside the wheelhouse. Some openings in the stern have a gate that can be closed when not shooting for additional safety.

Figure 8 shows an example of a self shooting system on a smaller vessel. When working with 2 crew the deck hand can stand in safety behind the open door during shooting operations.

Figure 8: Salcombe based 19' vessel *Amelia Grace.*

As shown in Fig 9, the door should be closed when not shooting pots for additional safety.

Figure 9: Shooting door open and closed

This system has been designed to enable single handed operation. This system was developed by owner Dean Login utilising a quick release clip (see Figure 10 below) suspended from the aft gantry that can operated from the wheelhouse.

In preparation for shooting the first end weight is suspended below the water line (well clear of the prop) over the stern from the quick release clip. Once the first buoy rope has been shot away the skipper then retreats to the safety of the wheelhouse to steer the vessel. Once the vessel is in the desired position the skipper releases the first end weight from the wheelhouse by pulling a cord attached to the quick release clip which releases the weight suspended from it.

Figure 10: End weight quick release system

The combined weight of the first end and forward motion of the boat initiates the shooting process of the pots. The last end weight shoots automatically over the stern in the same manner as the pots do. Once the last end weight has been shot away all that

remains is the end buoy line and buoy that also exits the vessel through the shooting door cut into the transom without intervention.

After shooting away the first buoy rope the skipper enters the wheelhouse and is not required to step back onto the deck, and into the shooting area, for the remainder of the shooting operation. This is a 19' vessel shooting strings of 20 pots.

Where it is not possible to shoot over the stern, systems have been developed to allow self shooting from mid-ships.

Figure 11: Self shooting ramp mid-ships onboard the Bridlington based vessel *Nordstjerne*

Figure 11 above shows a system using a ramp to allow an adaptation of self shooting from mid-ships. During shooting operations a crew member rolls or places each pot in position at the foot of the ramp to ensure it is shot away without incident. Although this method requires some human intervention the effort required is minimal.

The self shooting systems shown here have been developed specifically for each vessel layout and to the individual skippers' requirements. Therefore these are examples only and any system adopted must be designed and developed to fit vessel and skipper requirements.

4. Automatic hauler stop

The concept is to have the hauler stop automatically when a pot or anchor comes up to the davit block. Various methods could be used to achieve an automatic stop:

- **Mechanical**

A spring loaded lever arm mounted on the davit block, such that, the pot or anchor would make contact with it as it neared the block. The lever arm would activate a cut-out valve to stop the hauler. The design of a mechanical stop would have to allow the free passage of the leg rope over the open side of the davit block.

- **Optical**

An optical sensor would be utilised to detect the approaching pot or anchor. This has the advantage that there will be no possibility of the leg rope fouling but, the reliability of an optical system with all the spray from the rope would have to be proven.

- **Proximity**

The robustness and reliability of a proximity probe switch could be exploited, not to detect the actual pot or anchor, but to detect a marker attached to the back line or leg rope. Stainless steel bands crimped around the rope would act as markers to be detected by the proximity switch mounted so that the rope passed close by. The switch may well be mounted on the hauler and the distance of the marker from the pot calculated accordingly.

- **Combined**

Perhaps the most advantageous method would be to combine the control possibilities with optical or proximity detection to offer a

fail safe mechanical stop. Such a combination would enable the pot hauler to be automated (stopping automatically whenever a pot arrived level with the rail.) Indeed, if it is possible that a system could be designed to haul the pots and place each one on a table or conveyor totally automatically. Such a system would greatly improve the efficiency of potting, as it would enable the crew to concentrate totally on emptying, re-baiting and stacking pots.

Whether the development of such an auto stop system could be justified on purely safety grounds is questionable. Only a few incidents occur from persons being struck by a pot or anchor at the hauler, and some fishermen report that if they are late stopping the hauler, the pot simply jams against the davit block with the rope slipping in the hauler vee wheels.

Perhaps the biggest justification for an automated hauler stop would be on the grounds of efficiency, as it could enable attention to be concentrated on the cleaning, baiting and stacking of pots. On those vessels where the hauler operator is also cleaning pots, and has developed the timing to know exactly when to be at the hauler control, there would be little advantage, other than being able to finish clearing the pot before restarting the hauler. However, in situations where a man is solely operating the hauler it would be a major advance.

An automated hauler stop does offer a further benefit. Extending the automation further, to include lifting the pot on board onto a table, would be very desirable. Such automation, although certainly possible, would require considerable research and development to achieve a suitable and reliable system able to cope with the marine environment and vessel motion. An essential factor, with any automation, would be how cost effective the system would be to the fisherman.

5. Potting Roller

Traditionally, a davit-mounted hanging block has been used to haul pots or creels over the vessel's rail, but a wide roller mounted on the rail is now being used with good results by several vessels. The idea was pioneered by Jersey fisherman Peter Gay on board his vessel *Loup de Mer* and has become popular on several under 10m vessels in Scotland. Seafish has worked with Joe Masson to improve the roller installation on his under 10m vessel *Goodway* operating from Fraserburgh.

- **Layout**

The general layout on the vessel is shown below. Ideally, to enable the vessel to be easily controlled the roller needs to be mounted well forward on the vessel's rail and in a reasonably horizontal position.

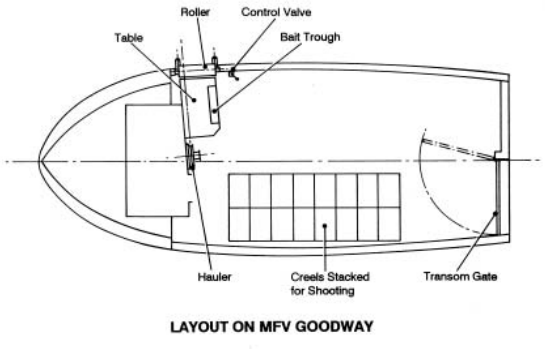


Figure 12: Roller layout on MFV Goodway

- **Roller Details**

The roller has a large diameter, necessary to smooth the passage of the pots over it and a length to accommodate the pots being used. On the *Goodway* the creels worked are 710mm x 460mm x 460mm (28 x 18 x 18inches) and the roller installed to haul these over is 273mm diameter by 850mm long. The width between the side rollers is 800mm, which gives a large clearance on the 460mm, (18inch) width of the creels.

Most pots/creels can be hauled over this size of roller, including 'inkwell' type pots, the critical factor being that there is clearance between the side rollers for the maximum dimension of the pot. Figure 13 shows the Seafish roller design with removable side rollers to avoid damage when mooring the vessel.

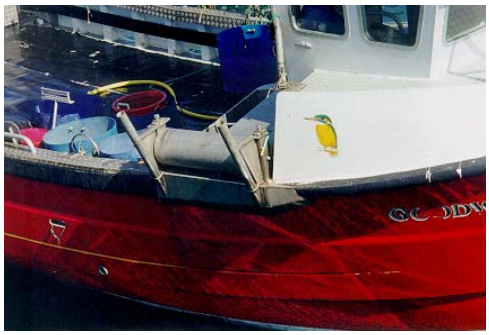


Figure 13: Seafish roller design

- **Hauler Control**

The pots/creels can be hauled over the roller at a modest speed, but it is essential that the hauler is slowed from high speed as each pot arrives at the roller. To achieve rapid smooth control a quarter turn rotary control valve is recommended. This should be mounted adjacent to the roller, readily accessible to the person standing at the roller but with the handle protected such that it cannot be accidentally caught by a rope or clothing.

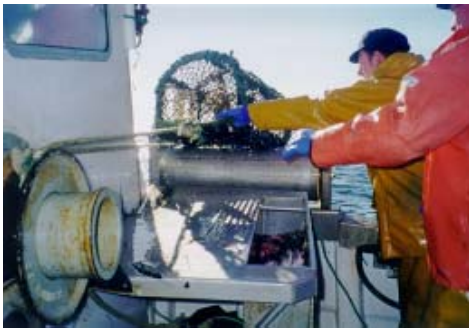


Figure 14: Hauling pots with roller

- **Safety**

The roller has the advantage over the davit block in that the manual effort of lifting the pots/creels inboard has been eliminated and therefore levels of fatigue reduced. The pots/creels pass over the roller directly onto the table and only have to be lifted once for stacking ready for shooting.

6. Other considerations

- **Stability Issues**

When loading, consideration should be given to the size and capabilities of the vessel and the weather conditions. The load should then be adapted as necessary. This may mean moving pots around the vessel to even out the weight of the load, reducing the number of pots on a string, or making additional trips to move a load.

- **Fatigue**

Fatigue is often a major factor in marine incidents. Fishing vessel owners and operators are urged to review the issues of fatigue on their vessels. They are also urged to take remedial measures to prevent fatigue such as:

- ✓ Scheduling watches
- ✓ Avoiding under-manning
- ✓ Not letting other activities intrude on rest and sleep
- ✓ Ensuring adequate meals are provided
- ✓ Using a team approach where possible to prevent a single person's fatigue from impeding safety

- **Crew Competence**

Fishing Vessel (Safety Training) Regulations require fishermen to undertake basic safety training. In addition to these courses, fishermen are also recommended to undertake the following Seafish courses that comprise the Under 16.5 m Skipper's Certificate.

1. Navigation/Bridge Watchkeeping
2. Engineering/Engine Watchkeeping
3. Intermediate Stability Awareness
4. GMDSS Short Range Certificate

Skills and knowledge learned on these courses will make a big contribution towards improving and maintaining safety levels on board. Vessel operators must also ensure crew receive adequate training and induction regarding use of machinery and systems particular to the vessel. Operational systems should be regularly reviewed and risk assessments carried out involving all crew members.

- **Risk Assessments**

Regular risk assessments are an essential tool for identifying potential hazards and dangers onboard a vessel. They focus attention on what actions and measures can be taken to reduce the likelihood of an incident occurring. Involving all crew members in this process will significantly enhance the benefits.

- **Drills**

Regular drills are the best way to ensure that all crew members are prepared to deal effectively with incidents (such as man overboard) when/if they occur. All crew should participate to ensure they are competent and confident in dealing with different incident scenarios.

Life saving appliances

Epirbs and life rafts are currently not mandatory on smaller vessels. As such only eight of the ten vessels that capsized or were missing during the period 1998-2008 were carrying life rafts and none were carrying Epirbs (see Table 2). If they had been, the crew's chances of survival would have been improved. Not all of these capsizes could be attributed to potting practices, but that they resulted in loss of life is sufficient justification to include them in this report.

Small vessel operators should consider carrying these items and installing man overboard (MOB) systems as they will greatly improve the chances of survival and aid swift recovery in a capsize scenario. Additionally handheld radios and PLBs (Personal Locator Beacons) should also be considered.

Of the nineteen fatalities in the same period resulting from MOB incidents, seventeen were known not be wearing lifejackets and two are believed not to have. Had these fishermen been wearing correctly fitted lifejackets or Personal Flotation Devices PFDs) their chances of survival would have undoubtedly been improved.

Table 2: UK Potting Vessel Fatalities 1998-2008: Safety equipment employed

Incident Type	No of Incidents	Fatalities	Lifejacket worn			Liferaft		Epirb	
			Yes	No	Not known	Yes	No	Yes	No
MOB	19	19	0	17	2	n/a	n/a	n/a	n/a
Capsize/Missing	10	14	0	12	2	2	8	0	10
Grounding/Collision	2	2	0	2	0	2	0	2	0
Totals	**31**	**35**	**0**	**31**	**4**	**4**	**8**	**2**	**10**

Of these nineteen MOB incidents it is known that eight were caused by entanglement in the ropes, the causes of seven were unknown as the fishermen were operating single handed or the bodies were not recovered. The remainder were caused by bad weather. The incident involving collision was due to inadequate watchkeeping.

Lifejackets are still not worn by many fishermen on deck. It is often claimed they are a potential hazard and/or cumbersome to wear. However some fishermen do wear them and wearing a lifejacket will undoubtedly increase a fisherman's chances of survival in an MOB situation. The design of constant-wear lifejackets is always improving.

During 2005 and 2006, the RNLI and Seafish conducted evaluation research into PFDs for their suitability in a commercial fishing environment. Trials found that a number of lifejackets readily available in the marketplace were appropriate for use in potting operations.

Conclusions

The fatal accident rate for UK fishermen for the decade 1996-2005 was 115 times higher than that of the general workforce, 81 times higher than in manufacturing and 24 times higher than the construction industry which is often considered the most hazardous occupation in the UK. While the fatal accident rate for almost all other UK occupations had fallen sharply over the last 30 years, there has been no discernable reduction in the fishing industry[3].

The continued high rate of accidents resulting in fatalities within the potting sector is a cause for concern. Fishing, and indeed potting, remains a highly dangerous occupation and it is unrealistic to imagine all hazards can be eliminated. However, by considering and adopting some or all of the suggestions listed it may be possible to reduce the likelihood of accidents occurring, and by providing non-mandatory life saving appliances, increase the chance of survival when unfortunately they do occur.

Vessel operators looking to modernise their vessels to improve safety, improve working conditions and purchase non-mandatory safety equipment may be eligible for grant aid towards the cost. See over for details.

[3] MCA Research Project 578, see: www.mcga.gov.uk

Further information

- **Toggle systems, rope separation pounds and automatic hauler**

For more detailed information regarding toggle systems, rope separation pounds and automatic hauler stops see Seafish Report No. SR524: *Potting Safety Assessment*. A copy of this report can be obtained from http://www.seafish.org/resources/publications.asp. Enter 'potting' in keyword search. *Please note that fatality data included in this report was later found to be under estimated.*

- **Potting roller**

For more detailed Information see Seafish Technical Information Sheet N0: 2001/02/ms *Potting Roller*. A copy of this report can be obtained from the Seafish website http://www.seafish.org/resources/publications.asp. Enter 'potting' in keyword search.

- **Seafish courses**

Those interested in these courses should discuss course and grant availability with their local Seafish Approved Training Provider. A list of training providers can be found on the Seafish website: http://www.seafish.org/sea/training.asp?p=ef154 or call Seafish Training on 01472 252302.

- **Risk assessment**

A standard risk assessment form for potting can be found on the Marine Services section of the Seafish website: http://www.seafishmarineservices.com/Safety.htm

- **Man Overboard Systems**

For information on MOB systems: http://www.rnli.org.uk/what_we_do/sea_and_beach_safety/fishing_safety/mob/moredetails http://www.seamarshall.com/

- **Life jacket research**

The results of this research can be viewed on RNLI and Seafish websites: www.rnli.org.uk/fishingsafety and http://www.seafish.org/resources/publications.asp. Enter 'lifejacket' in keyword search.

- **Grant aid**

Grants toward the cost of safety improvements/equipment may be available. For the latest information contact Seafish or your Fishermen's Federation or click on the links below to the UK Fisheries Departments.

England
http://www.marinemanagement.org.uk/fisheries/grants/index.htm
Scotland
http://www.scotland.gov.uk/Topics/Fisheries/grants-subsidies
Northern Ireland
http://www.dardni.gov.uk/index/grants-and-funding/fisheries-grants.htm
Wales
http://wales.gov.uk/topics/environmentcountryside/foodandfisheries/fisheries/europeanfundforfisheries/?lang=en

For further information contact:
T: 01472 252301
E: training@seafish.co.uk

Origin Way, Europarc, Grimsby DN37 9TZ

t: 01472 252302 f: 01472 268792
e: training@seafish.co.uk w: www.seafish.org SIN: http://sin.seafish.org

Extracts from the Fishermen's Safety Guide, MCA

Maritime &
Coastguard
Agency

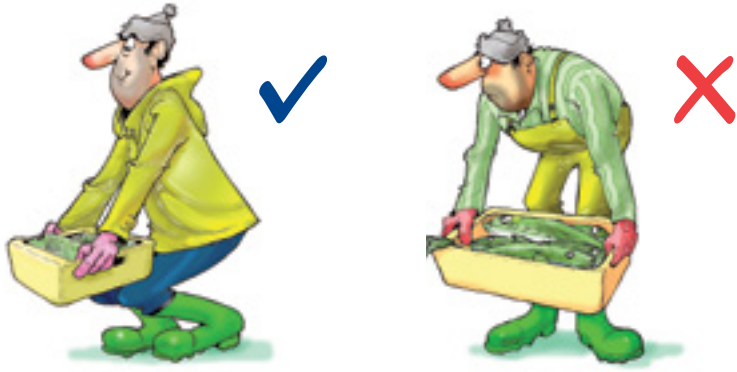
FISHERMEN'S SAFETY GUIDE

A guide to safe working practices and emergency procedures for fishermen

Manual handling

Lifting baskets, boxes of fish and other heavy or awkward items can easily result in injuries unless great care is taken and correct techniques are used.

Never bend your back over the load when lifting heavy weights. Stand with your feet a little apart, and keep your back straight.



Take a firm grip and keep the load as close to your body as possible.

Lift smoothly and don't twist your body. If you need to turn to one side, move your feet.

Do not reach and lift; slide the load towards you before lifting.

Get help with heavy or awkward items; do not be tempted to lift too much.

Potting and creeling

Check equipment and machinery

Have you made sure that the equipment operates smoothly and safely?

Is the hauling winch properly set up and maintained?

Are the controls in good working order and easily reached by the operator? Is there any risk of the rope snagging the control? Is there an emergency stop for the hauler that can be quickly reached by other crew members?

Are the sheaves in good condition and is the rope ejector knife correctly in place? Is the angle of wrap sufficient to ensure that the rope will not pull out?

Is the davit block/roller in good condition and does it enable the pots to be hauled in board with minimum manual effort and with safety for the crew? Does it effectively retain the rope even when the vessel is rolling heavily?

Think about the layout of the vessel

Does the layout on your vessel allow the safe working of pots/creels? Are there any possible snag points that the rope or pots may snag on when shooting? Could you modify the vessel to enable the pots to be shot directly off the deck via a transom gate or a shooting ramp?

Is it possible to improve safety by installing a barrier to separate the rope from the area where the crew handle the pots?

Can the pots be securely stacked in sequence ready for shooting? Have you a system of clearly marking any out of sequence pot? Are they away from freeing ports and safety equipment?

Is the number of pots in a 'string (fleet)' limited to the number that can be easily and safely worked in the deck space available on the vessel? Are you satisfied that the number per string is safe or would safety be significantly improved by reducing the number per string?

Are you confident in the number of 'strings' you can safely carry on the vessel? Have you considered the effect on stability of carrying pots stacked high on the vessel? You should consider all aspects of the loading on the vessel, the weight of pots and rope, the catch on deck, the pull of the hauler and the effects of wind and tide. Is your vessel overloaded?

If the catch is stowed on deck are you confident that it will not shift in bad weather, block the freeing ports, or the boxes fill with water and overload the vessel?

Keep unnecessary gear away from the shooting and hauling area.

Avoid shooting in fairways and harbour approaches.

Have a sharp knife handy.

Beware: familiar and repetitive tasks may cause lapses in concentration that can result in serious accidents.

Ropes and lines, etc.

Ropes, cables, lines and chains when in use can be dangerous: they can snap, suddenly become taut, trap you, etc., so try not to step over a rope or net or a moving warp. It could pull tight and injure you, or pull you into a winch, or into the sea. Do not put your foot on one to steady it or to judge its tension.

To lessen the danger of crew members being entangled in ropes, is it possible to install a barrier to keep the rope clear of the area where the crew are handling fishing gear?

Before working always inspect the rope you will be using; whether it is a lifeline, gantline, or stage rope. Check for damage, and make sure it is right for the job. Your life may depend on it. Know the safe working load of the rope, and do not exceed the limit.

If you are not involved, stay well clear of a rope or cable, etc. which is moving, especially if it is under strain.

Synthetic ropes are stronger and last longer than natural fibre ropes. However they are not suitable for some jobs. Synthetic ropes should never be discarded over the side, and should be used with caution on a winch drum.

Synthetic ropes, in particular, stretch and give no audible warning when approaching their breaking point. They recover their length almost instantly when tension is released, and recoil violently when a break occurs. Most mooring ropes are synthetic; so keep them in a protected position during any mooring or towing operation.

Do not expose rope to oil, petrol, paint or other chemicals. These can cause severe damage, especially to natural fibre rope.

Do not allow ropes to remain excessively soiled or dirty. Wash in clean water and always dry natural fibres before storage.

Stability

Capsizing due to insufficient stability is a major cause of fatalities for boats under 24m length, especially those under 15m. The causes relate to two main factors:

- the centre-of-gravity is too high, making the vessel top heavy, and
- there is insufficient freeboard due to overloading

EVERY VESSEL WILL CAPSIZE IF THE CENTRE OF GRAVITY IS TOO HIGH!

Man overboard (MOB)

Wearing a PFD or lifejacket at all times on deck will significantly increase your chances of survival if you go overboard.

When a man overboard situation occurs, it is essential that the right actions are taken quickly as the cold temperature of the water will rapidly reduce the person's ability to survive. Raise the alarm by shouting "Man Overboard!" or press the MOB alarm if fitted, to alert all on board.

Immediately throw the lifebuoy, together with its smoke float/light unit, overboard. Although the person in the water may not be able to reach the lifebuoy it will mark his approximate position.

Ensure that the helmsman is aware of the situation. He should mark the vessel's position – most Navaids have a MOB function. It may prove vital if contact is lost with the person in the water.

Act as lookout (or ensure that somebody else does) and watch the person in the water and point at them continuously, in view of the helmsman so he knows where the man in the water is.

If it is safe and depending on how the fishing gear is deployed, the helmsman should start to turn as quickly as possible to avoid losing sight of the person in the water.

In most circumstances and weather conditions, recovery of a person from the water should be carried out from the 'weather side' of your vessel. This prevents the vessel from drifting down on top of them and reduces the risk of ropes and heaving lines (being used for the recovery) from fouling the propeller.

Deploy a scrambling net or ladder if possible. Have a heaving line ready to throw to the person in the water in case it is difficult to manoeuvre alongside them.

A boat hook can assist in getting the person back alongside.

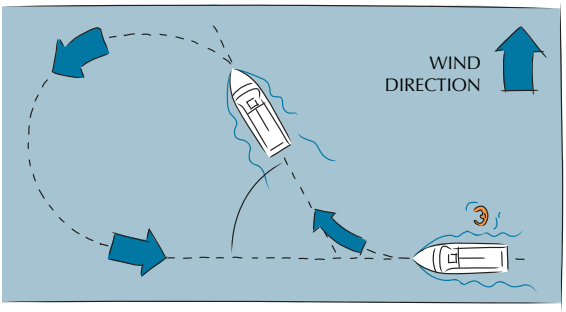
In poor visibility or when the weather and sea state are heavy the 'Williamson Turn' is a good way for the helmsman to get back on to a reciprocal course which will take you back down the track.

Put the helm hard over to the side that the man has fallen over until you are 60° from your initial course.

Once the new heading has been reached put the helm hard over the other way (i.e. away from the side the man has fallen over) until the reciprocal course has been reached.

Steer this course and the casualty should be ahead of you.

In heavy weather the reciprocal course may bring the sea astern or on the quarter. In this case a short initial 'head to sea' course may be necessary.



Williamson Turn

During the hours of darkness a white parachute flare, which will pick up the retro reflective tape on clothing/buoys, can be used to illuminate the area. Remember your night vision will be impaired if you look at the flare.

Additional follow up action

The following additional actions should also be considered depending upon the circumstances:

- Sound an alarm of three long blasts if there are other vessels in the vicinity.
- Initiate a Pan broadcast or an equivalent DSC 'urgency' message.
- Advise the Coastguard of the situation.
- Consider starting an appropriate search pattern if the person in the water is still missing.

In the water

If you fall or are washed overboard the actions mentioned below will assist you to survive until you can be rescued:

- Don't panic – it is essential to conserve as much energy as possible; you will need it to assist with your recovery from the water.
- Tighten up the wrist, ankle and neck fastenings of your protective clothing to reduce heat loss and delay the onset of hypothermia and subsequently death. Do not attempt to swim back to the vessel, for the same reasons.
- In rough conditions turn your back to the waves to keep your mouth and nose clear of spray.
- Look for the lifebuoy which may be close by. If you can reach it, invert it over an upraised arm thence over your head and shoulders. Remain

calm, keep your legs close together and restrict your movements so that the cold water will not be flushed into your clothing.

- Remember to activate the light on your lifejacket at night. Use the whistle to assist those persons searching for you. You can increase your buoyancy with some types of lifejacket by additional oral inflation; in cold water you may need to do this.
- Whatever your situation conserve your body heat because the greatest threat to your survival is from the cold. In UK waters during the winter your ability to assist in your rescue will be greatly diminished after ten to fifteen minutes.
- The Heat Escape Lessening Position (HELP) protects these critical body areas and slows down the loss of heat. Try to keep in this position.

Recovery

Recovering a person from the water can be very difficult and fishermen have drowned alongside the vessel because their colleagues were unable to recover them.

Every vessel should have an action plan for recovery of a person from the water. Make sure that you know the necessary equipment and what to do.

Crew members effecting the rescue of a person from the water should wear a lifejacket, complete with harness and lifeline, to ensure that they do not get pulled into the water as well. This is vital if a crew member goes over the side to assist in a rescue.

A rescuer should only enter the water as a last resort. Do not compromise the rescuer's safety and do not leave your vessel dangerously undermanned.

After recovery

When the person is back on board and fully conscious, take off their clothes (even if they are shivering a lot), wrap them in blankets, enclose their body in a large plastic bag or sheet and lay them down. A good

method for warming them up at a sensible rate is for one or two people to huddle up to them.

Do not rub the surface of the body. Do not put them in a shower.

The person must not be heated up quickly, so do not give them hot drinks or a hot water bottle. If they are able to swallow, give them sugar, glucose or condensed milk, or a warm sweet drink. Do not give them alcohol in any form.

If the person seems semiconscious or unconscious, check their breathing and heart rate. If these have stopped then take action as indicated in **Breathing**, **Stopped** or **Heart Stopped** below. Otherwise disturb them as little as you can. Do not remove their wet clothes, but wrap them in blankets and, if possible, in a Thermal Protective Aid (TPA), large plastic bag or sheet. Put the person in the recovery position. When they are able to talk to you fairly well, give them warm sweet drinks, sugar, glucose or condensed milk.

Do not leave the person on their own, especially if they are still cold. The person should be kept under constant supervision in case they become unconscious; if they do then place them in the recovery position.

Handle hypothermia victims as gently as you can because jolting them could damage the heart. Do not lift the casualty by arms or legs as elevating the limbs could cause a heart attack.

Breathing stopped

If a person's breathing appears to have stopped, lay them on their back on a hard surface. Remove from their mouth any food, vomit, false teeth, etc. Tilt the head as far back as possible and push the lower jaw open. Listen for breathing. If their breathing has stopped, keep their head and jaw in the tilted position; hold the forehead back, pinch the nose and keep the mouth open.

Take a deep breath, seal your mouth around the casualty's and blow into it hard but steadily, whilst watching their chest. If the chest does not rise, check again that their throat is not blocked, and, if possible, tilt the head further back and blow into their mouth again. You can also close the mouth and blow through the nose. Take care not to blow too hard, as this may cause the stomach contents to blow into the casualty's mouth.

Blow into the person's lungs at a rate of about 10 inflations a minute, with each inflation lasting two seconds, until the casualty starts breathing by themselves. Keep checking to see if the lungs are inflating and check from

time to time if they can breathe on their own. If they can, stop blowing into the lungs, but watch in case they stop breathing again.

Heart stopped

If the casualty's heart has stopped, their breathing will also stop. Listen to the chest for heart sounds.

Make certain that they are lying on a hard surface. If you are sure that their heart has stopped, place the heel of your hand on the lower half of the breast bone, with your second hand over your first. Keep your arms straight, and press the breast bone down 3½ to 5cms, for half a second. Maintain a rate of about 100 times a minute and after every 30th compression; blow into the lungs two times as indicated in the 'Breathing Stopped' section.

Continue pushing and blowing, listening every so often to see if the heart has restarted. If a pulse is found then carry on, as indicated in the 'Breathing Stopped' section, until the casualty is breathing by themselves. Check the heart regularly because it may stop again.

Abandon ship

On joining your vessel make sure that you know how to release and operate the life raft. It should be stowed securely where it cannot be easily damaged, but it can be launched quickly.

The life raft must be capable of being automatically released and activated from a sinking vessel. Such float free arrangements are achieved by securing the life raft's painter to a Hydrostatic Release Unit (HRU). Do not put anything on top of the life raft or other emergency gear and make sure the liferaft can float free on release and has not been tied down to the boat via anything other than an HRU arrangement. Find where the lifejackets, portable emergency radio and flares, etc. are kept and how they work.

Do not abandon the ship unless the skipper orders you to do so. Often you are safer in a stricken vessel than you would be in the life raft. If you abandon ship put on as much warm clothing as time and circumstances allow. Then put on your lifejacket, and fasten it properly. If you are working below deck, keep warm outer clothing close at hand for use in an emergency. If you have time, take the vessel's EPIRB with you and stream it behind the life raft. If possible also take Hand held VHF Radios, SARTs, flares etc.

Manually launching the life raft

Before launching ensure that the painter is untied from the HRU and made fast to a strong point. Make sure that the water in the launching area is clear of people or obstructions.

Potting Safety Message, MAIB

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

Potting Safety Message

Over recent years, MAIB has investigated a number of fatal accidents that occurred when vessels were moving pots/creels between their summer and winter grounds. Two types of accidents stand out:

- Overloading due to carrying too many strings of pots at one time, leading to capsize/foundering; and,
- Man overboard or injury due to the cluttered nature of the working deck when attempting to shoot these additional creels

As you set about retrieving gear displaced or damaged by the recent storms, please carefully think about the lessons learned from such accidents. When moving or recovering pots, resist the temptation to take on board more strings than normal unless you can be absolutely confident that this can be done without compromising the stability of your boat.

When shooting, ensure you and your crew are standing in a safe area, to avoid the chance that someone could be taken overboard by running gear.

Plan for the worst outcome: make sure there are knives placed around the working area so that lines can be quickly cut should this be necessary. Always wear a personal flotation device when working on the open deck and make sure you have a plan (and have drilled your crew) on how you would recover someone from the water.

You owe it to your loved ones and family to come home safely from every fishing trip.

More information on accidents that have occurred on potters and other fishing vessels can obtained from the MAIB's website: www.maib.gov.uk.

Steve Clinch.

Steve Clinch
Chief Inspector of Marine Accidents

Lifejackets: a review, MAIB

REVIEW

Lifejackets: a review

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

NOVEMBER 2016

All MAIB publications can be found on our website: www.gov.uk/maib

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CONTENTS

TABLES

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BIM - Bord Iascaigh Mhara (Irish Sea Fisheries board)

CWPFD - Constant wear Personal Flotation Device

EFF - European Fisheries Fund

FISG - Fishing Industry Safety Group

ISO - International Organisation for Standardisation

MCA - Maritime and Coastguard Agency

MGN - Marine Guidance Note

MOB - Man overboard

MSN - Merchant Shipping Notice

NFFO - National Federation of Fishermen's Organisations

PFD - Personal Flotation Device

RNLI - Royal National Lifeboat Institution

Seafish - Sea Fish Industry Authority

SFF - Scottish Fishermen's Federation

SUMMARY

MAIB statistics between 2000 and 2014 show no downward trend in the rate of commercial fishermen who have drowned. Also, 67% of those who drowned[1] were not wearing a Personal Flotation Device (PFD) at the time they entered the water.

In 2013, following a number of recommendations from the MAIB, the Fishing Industry Safety Group (FISG) commenced an intensive education campaign aimed at persuading commercial fishermen to wear PFDs while working on deck. This campaign included the provision of grant-funded lifejackets. The same year, the Maritime and Coastguard Agency (MCA) accepted a recommendation[2] from the MAIB to specify the improvement in safety culture / behavioural change that it is seeking with respect to the voluntary wearing of personal flotation devices and to make arrangements to rapidly introduce the compulsory wearing of personal flotation devices on the working decks of fishing vessels should the sought after improvements not be achieved. Despite agreeing to complete an assessment of the campaign's effectiveness by 31 December 2014, and to mandate PFD wear if non-regulatory steps were failing, at the time of this report the MCA had not agreed the metrics for measuring success and no data had been collected.

Evidence from MAIB statistics and 35 MAIB investigations into accidents involving commercial fishing vessels since 2013 shows that the campaign has not been successful in reducing the fatality rate, and that there has been minimal change in the safety behaviour of fishermen.

A review of evidence from other nations shows that education campaigns are generally ineffective at changing behaviour with respect to the wearing of PFDs unless backed by relevant legislation.

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1 The term 'drown' is used in this Annex to mean death due to inhalation of water, or due to cardiac arrest leading to an inability to swim or stay afloat.

2 MAIB Recommendation 2013/108

SCOPE

The purpose of this document is to evaluate the success of initiatives aimed at encouraging commercial fishermen to wear PFDs on the working decks of fishing vessels while at sea. The casualty data from the MAIB, MCA and several international organisations has been reviewed to validate the lifesaving potential of constant wear PFDs when worn on the exposed decks of fishing vessels. All the relevant recommendations made by the MAIB since its inception, and the implementation or otherwise of these recommendations, are also reviewed.

This document also reviews the campaigns carried out by various industry groups in the UK and Ireland, and also examines mandatory regulations the EU and other countries have introduced to ensure that PFDs are being used in the fishing sector. A review of the relevant literature studying the effect of mandating the wear of PFDs is also included.

CASUALTY STATISTICS

MAIB STATISTICS

The MAIB database on marine accidents held 380 cases of persons in the water from UK fishing vessels, between 2000 and 2015. 139 were recorded as fatal drowning accidents. Of these, 93 of the casualties were not wearing PFDs and 17 were wearing them. In the remaining 29 cases it was unknown whether PFDs were worn at the time of the accident (**Table 1, Figure 1)**. The statistics show that the likelihood of surviving a man overboard incident is five times greater if a PFD is worn.

Fatal drowning accidents		
PFD not worn	**PFD worn**	**Unknown**
93	17	29

Table 1: PFD usage statistics from MAIB database (2000-2015)

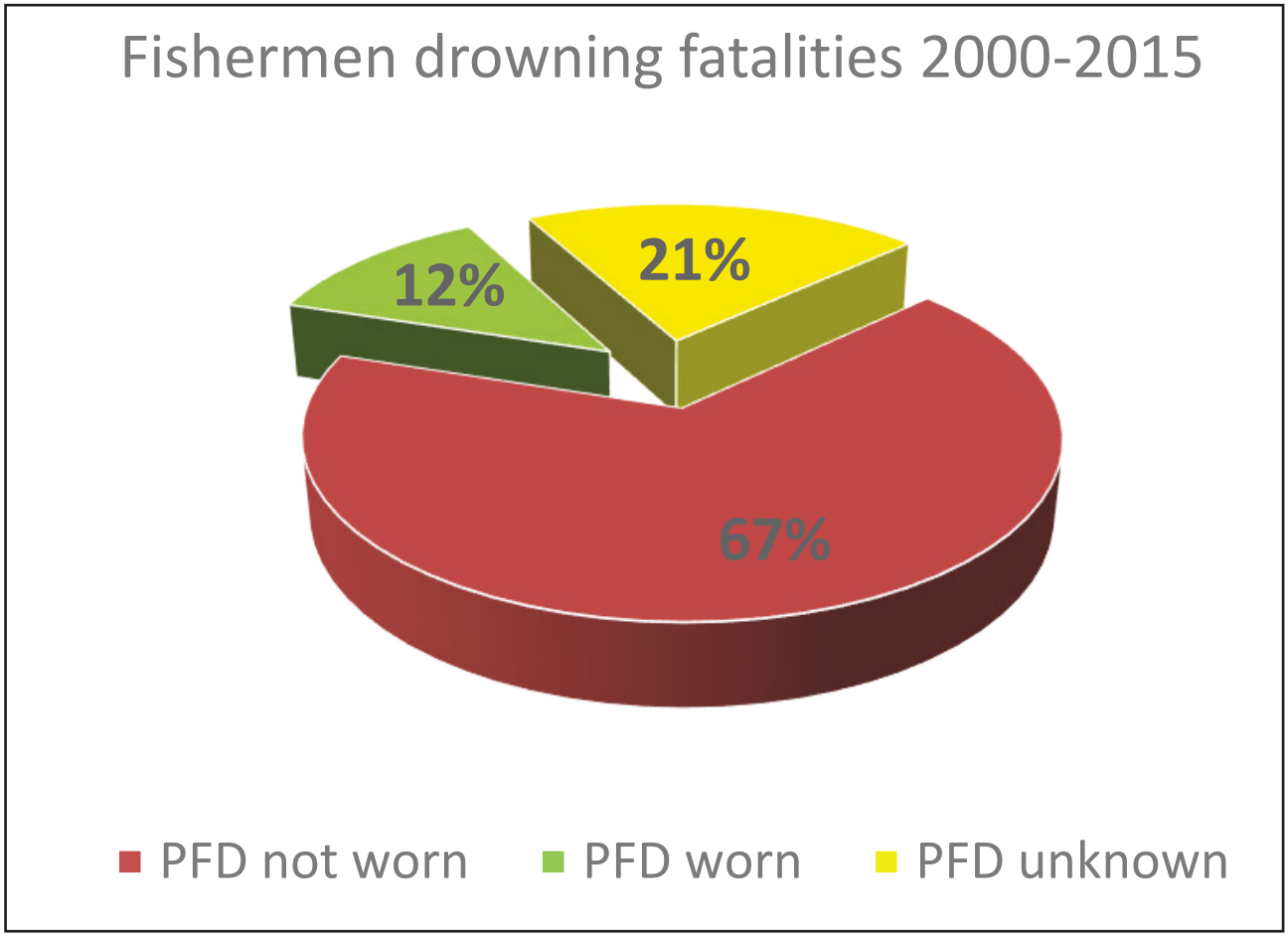

Figure 1: Fatality statistics from MAIB database (2000-2015 as indicated in **Table 1**)

The number of commercial fishermen has varied considerably over this period. So as to enable the number of fatalities from drowning to be compared as a proportion of the population at risk year on year, the number of commercial fishermen in the UK between 2000 and 2014[3] was used to produce the annual drowning fatalities per 100,000 **(Figure 2)**.

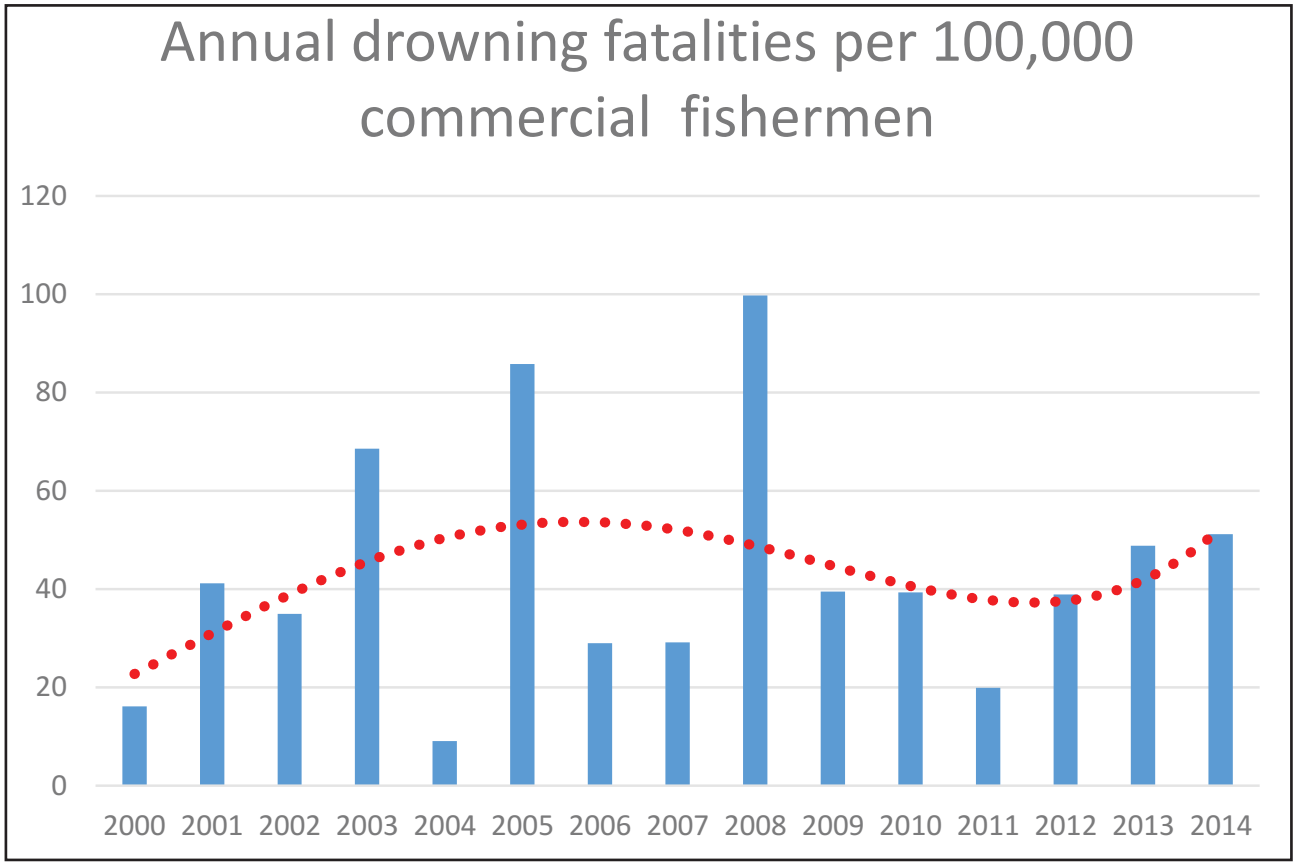

Figure 2: Drowning fatalities from 2000-2014 per 100,000 commercial fishermen

The graph shows no downward trend in the rate of commercial fishermen who have drowned; in fact, there appears to be a slight upward trend in recent years.

OTHER SOURCES

The Casualty Review Panel[4] led by the MCA carried out a study on marine fatality data from 2007 to 2013 **(Ref 1)**. The panel concluded that 148 lives, including 29 commercial fishermen, could have been saved had lifejackets or other buoyancy aids been used.

Statistics published by the US Coastguard for 2012 stated that, of the 459 cases of drowning from recreational vessels, 82% of the casualties had not been wearing lifejackets **(Ref 2)**.

[3] Data available from the Marine Management Organisation (MMO), 2015 data not available: https://www.gov.uk/government/organisations/marine-management-organisation

[4] Casualty Review Panel comprises the Angling Trust, RNLI, Royal Yachting Association, MAIB, MCA, National Water Safety Forum, British Canoe Union, the lifejacket industry, Scottish Fishermen's Federation and University of Portsmouth

The research project entitled *Will it Float? Mandatory PFD Wear Legislation in Canada* **(Ref 3)**, was commissioned by the Canadian Safe Boating Council to *examine the advisability of advocating for legislation concerning mandatory PFD use for recreational boaters in small craft*. This report quoted 10 years of statistics provided by the Canadian Red Cross, which showed that lifejackets had not been worn by around 89% of those who had drowned. Similarly high figures are quoted for other countries studied in the report.

Presence / Absence of a PFD on Drowning Victim	1999	1991-1995	1996-2000
Victim was (properly) wearing PFD	11%	12%	11%
Victim was not wearing PFD / wearing PFD improperly / unknown	89%	88%	89%

Table 2: Statistical data on drowning fatalities presented in **Ref 3**
(source of data attributed to The Canadian Red Cross)

SUMMARY

The casualty statistics show that an MOB incident is between five and eight times more likely to result in a fatality when the casualty is not wearing a PFD. This is further corroborated by the findings of the MCA-led Casualty Review Panel establishing that 148 lives could have been saved in a 7-year period had the casualties used some form of buoyancy aid.

MAIB FISHING VESSEL INVESTIGATIONS SINCE 2013

Since 2013, the National Federation of Fishermen's Organisations (NFFO), Scottish Fishermen's Federation (SFF), Fishermen's Mission and Sea Fish Industry Authority (Seafish) have been distributing heavily subsidised or free constant wear lifejackets to fishermen in the UK. To assess the need to mandate the wearing of PFDs, the MCA had intended to review the effectiveness of this campaign by 31 December 2014. However, no metrics were set and no data was collected to enable such an assessment to take place. The MCA has now concluded, in conjunction with the FISG, that MAIB data on fishing vessel casualties will be used to assess the effectiveness of the campaigns.

The MAIB has started 35 investigations into accidents involving commercial fishing vessels since January 2013. The availability, use and relevance to the outcome of the accident of constant wear PFDs (CWPFD) in these investigations is shown in **Table 3**.

Vessel name(s)	Accident Type	CWPFD relevant to the accident	CWPFD available on board	CWPFD worn at the time of the accident	Comment
King Challenger	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Our Sarah Jane	Man overboard	No	Yes	No	One fatality. Deceased entered the water to clear the propeller.
Harvester	Man overboard	Yes	No	No	One fatality and one missing. Vessel foundered having run aground unmanned.

Vessel name(s)	Accident Type	CWPFD relevant to the accident	CWPFD available on board	CWPFD worn at the time of the accident	Comment
Apollo	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Louisa	Flooding and foundering	No	Yes	N/A[5]	Two fatalities and one missing. Vessel was at anchor and crew were in bed at the time of the accident.
Majestic	Flooding and foundering	Yes	Yes	No	No loss of life. Crew abandoned to liferaft.
Annie T	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Aquarius	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Karen	Submarine contact	Yes	Yes	No	No loss of life. Vessel started to submerge by the stern but broke free before foundering.
JMT	Capsize and sinking	Yes	Unknown	No	Two crew lost with vessel. One body recovered without PFD.
Karinya	Fire and sinking	Yes	Yes	No	No loss of life. Six crew survived having donned CWPFDs.
St Christophe 1	Capsize alongside	No	Unknown	N/A	No loss of life, vessel moored alongside at the time of the accident.
Enterprise	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Good Intent / Silver Dee	Collision, and sinking	No	Yes	N/A	No loss of life, crew were in bed at the time of the accident but had time to don lifejackets.
Kairos	Capsize and sinking	Yes	Yes	Yes	No loss of life. Crew who were not already wearing CWPFDs donned lifejackets.
Stella Maris	Capsize and sinking	Yes	Yes	No	No loss of life. CWPFDs carried but not worn. Liferaft deployed and boarded.

[5] N/A = Not applicable, i.e. it was not appropriate for the crew to be wearing a CWPFD at the time.

Vessel name(s)	Accident Type	CWPFD relevant to the accident	CWPFD available on board	CWPFD worn at the time of the accident	Comment
Beryl	Man overboard	Yes	Yes	Yes	One fatality. Crewman lost overboard from the working deck, recovered on board after 49 minutes in cold water but did not survive.
Ocean Way	Capsize and sinking	No	Unknown	N/A	Three fatalities, two survived. Crew in accommodation and did not have time to don lifejackets during abandonment.
Orakai / Margriet	Collision	No	Unknown	N/A	No loss of life. Crew in accommodation at the time of the collision.
Ronan Orla	Occupational accident	No	Yes	No	One fatality. Single handed skipper became trapped in deck equipment. CWPFD on board was unused.
Wanderer II	Occupational accident	No	Yes	Yes	No loss of life. CWPFDs were used when working on deck.
Diamond	Grounding and sinking	Yes	Yes	Yes	One fatality, crewman had no PFD and died. Skipper was wearing a flotation suit and survived.
Water-rail	Navigational error	No	No	No	No loss of life. CWPFDs had been supplied but left at home.
Barnacle III	Man overboard	Yes	Yes	No	One fatality. Crewman lost overboard from the working deck.
Shalimar	Contact with quay, resulting in vessel foundering	No	Yes	No	No loss of life. CWPFDs available on board but not worn while manoeuvring in port.
Karen / Sapphire Stone	Collision resulting in loss of Karen	Yes	No	No	No loss of life. Lifejackets could not be reached. Liferaft deployed and boarded.
Eshcol	Carbon monoxide poisoning	No	Yes	N/A	Two fatalities in the accommodation while vessel was alongside.
New Dawn / Horizon II	Man overboard	No	Yes	No	One fatality. Skipper fell into the water while boarding a vessel moored alongside.

Vessel name(s)	Accident Type	CWPFD relevant to the accident	CWPFD available on board	CWPFD worn at the time of the accident	Comment
Sally Jane	Capsize and sinking	Yes	Yes	No	No loss of life. Crew were not on deck when the accident occurred. Liferaft deployed and boarded.
Prospect	Grounding and sinking	Yes	No	No	No loss of life. Only one of four crew donned a lifejacket. Crew transferred to lifeboat.
Speedwell	Flooding and sinking	Yes	Yes	No	One fatality. CWPFD available but not worn on single-handed vessel.
Achieve	Flooding and sinking	Yes	No	No	One fatality. Casualty donned lifejacket but died of hypothermia following rescue.
JCK	Foundering in heavy weather	Yes	Yes	No	One fatality. CWPFD carried but not worn on single-handed vessel.
Vidar	Man overboard	Yes	Yes	No	One fatality. CWPFDs carried but never used.
Amy Harris III	Engine room fire	No	Yes	Unknown	No loss of life. Crew airlifted off the vessel following a fire.

Table 3: Commercial fishing vessel accidents investigated by the MAIB since 2013

SUMMARY

- Of the 22 cases where CWPFDs were relevant to the outcome of the accident, they were available on board in 17 cases and worn in 3 cases.

- 14 lives could have been saved had the casualties been wearing CWPFDs while working on deck and CWPFDs were available on board in 9 of these cases.

- In some cases, the subsidised/free PFDs supplied to fishermen had never been removed from their packaging, and in one case these had been left at home.

MAIB RECOMMENDATIONS ON PFDS

The MAIB has made eight recommendations concerning the wearing of PFDs by fishermen. These are listed below in **Table 4**. On three separate occasions these addressed the question of mandating their usage.

Vessel name or publication	Recommendation No.	Text of the recommendation	Addressee of the recommendation
Heather Anne	2013/103	Specify the improvement in safety culture / behavioural change that it is seeking with respect to the voluntary wearing of personal flotation devices by individuals working on the decks of fishing vessels, and the timescale within which it is to be achieved; and Make arrangements to rapidly **introduce the compulsory** wearing of personal flotation devices on the working decks of fishing vessels should the sought after improvements not be achieved.	MCA
Maggie Ann	2009/158	As part of your efforts to realise improved safety within the fishing industry: Expedite your current work on the use of personal flotation devices and personal locator beacons in the UK fishing industry (MAIB Recommendation 2008/173 refers).	MCA
Analysis of UK Fishing Vessel Safety 1992 to 2006	2008/173	Review international safety initiatives and transfer best practice to the UK fishing industry with particular reference to the use of PFDs and Personal Locator Beacons.	MCA
Donna M	2000/144	FISG to raise an agenda item on **the compulsory** wearing of lifejackets for fishermen when working on deck, and to seek the views of fishermen's representatives on this subject.	FISG
Donna Anne	1999/124	Consider introducing the following requirements when compiling safety proposals for under 12m fishing vessels: … d) owners, skippers and crew should be advised to wear inflatable lifejackets at all times when working on deck when their vessel is at sea.	MCA
Sharona	1996/166	Strongly recommended crew members to wear working buoyancy aids when on deck, in particular any crew members who are unable to swim. This advice is published in the booklet 'Fishermen and Safety', a copy is attached.	Marine Safety Agency

Vessel name or publication	Recommendation No.	Text of the recommendation	Addressee of the recommendation
Kingfisher	1993/153	To pursue their efforts to strongly encourage fishermen and others operating small vessels to wear a buoyancy garment at all times when working on deck.	Marine Directorate, Department of Transport
Majestic	1991/183	All fishing vessel crew members should be advised of the benefits of wearing, at all times when working, personal buoyancy aids with built-in and/or inflatable buoyancy. Further consideration should be given to whether the wearing of such aids should be **a mandatory** requirement.	Marine Directorate, Department of Transport

Table 4: List of recommendations the MAIB has made on the subject of PFDs, including lifejackets

The first recommendation was made in 1991 to the then Marine Directorate. The recommendation – to consider making the wearing of lifejackets mandatory – was made following the investigation into the capsize of the fishing vessel *Majestic*, which resulted in the death of five crew members **(Ref 4)**.

In the *Analysis of UK Fishing Vessel Safety 1992 to 2006* **(Ref 5)**, the MAIB highlighted the high number of fatalities following man overboard incidents, and recommended the MCA to review international practice and implement best practice in the UK. This recommendation was accepted and the MCA committed to conduct a research project with a view to presenting an analysis of international lifejacket initiatives in May 2011. This was to be followed by the implementation of appropriate changes to UK mandatory requirements by 2015. However, the MCA subsequently postponed this to June 2016, a target that has also passed without action. In 2011, during the MAIB investigation into the loss of the skippers from fishing vessels *Breadwinner* and *Discovery* **(Ref 6)**, the MCA reiterated these intentions, stating that it was *committed to creating legislation that would make the wearing of PFDs on commercial fishing vessels compulsory*.

The MAIB investigation report, published in 2013, into the loss of one crewman from the fishing vessel *Heather Anne* **(Ref 8)**, stated: *In 2010 … the MCA concluded that the compulsory wearing of personal flotation devices (PFDs) on the working deck of fishing vessels would have a positive effect on safety and dramatically reduce the number of fatalities. This issue has since been a standing agenda item at the FISG meetings at which the MCA has taken into account fishing industry concerns. Getting fishermen to wear PFDs is now a key part of the MCA's fishing vessel safety project, and its business plan for 2011-2015 included*: *Put arrangements in place to require fishermen to wear Personal Flotation Devices (PFDs) by December 2012*.

Following the foundering in 2013 of the 6.45m fishing vessel *JCK*, with the loss of its skipper **(Ref 7)**, the MAIB investigation report stated: *It has been recognised for some time that many fishermen are reluctant to wear PFDs; indeed it has been the focus of previous MAIB recommendations to the Maritime and Coastguard Agency (MCA) that their wearing should be compulsory on open decks. The MCA is currently monitoring the success of educational campaigns promoting the use and effectiveness of PFDs. If, by the start of 2015, it is found that their use is not more widespread than at present, or MOB survival statistics have not improved, regulation may then be introduced to make the wearing of PFDs mandatory on the open decks of fishing vessels*.

During the investigation into the loss of the crewman from *Annie T*, the MCA reported to the MAIB that December 2020 would be the earliest achievable date for the introduction of legislation mandating the wearing of constant wear PFDs.

SUMMARY

Although the MCA committed to legislating mandatory PFD wear by December 2012, later postponed to 2015 and then June 2016, it has now stated that the earliest this could be achieved would be December 2020.

CAMPAIGNS

A number of organisations have attempted to alter behaviour in the fishing industry by encouraging commercial fishermen to wear PFDs while working on deck. Some of these campaigns are outlined below.

RNLI

In 2005, the RNLI ran the 'Which lifejacket for you?' campaign **(Ref 9)**. This involved 120 fishermen who volunteered to wear a range of lifejackets and buoyancy aids while working at sea and to assess their comfort and durability. The RNLI reported that *the fishermen involved that now wear lifejackets all or most of the time has risen by 900% - a sure sign that they have now found a lifejacket that is suitable for their work.* In 2013, the RNLI also published *PFD guidance for commercial fishing* **(Ref 10)**, which included detailed guidance on PFDs, the importance of wearing them, the types available, the significance of their buoyancy ratings and their maintenance and service requirements.

SEAFISH

The 'Sea You Home Safe' campaign by Seafish was started in 2014 to encourage fishermen to wear PFDs on open decks while at sea. This campaign also supports the lifejacket distribution scheme funded by the EFF. The distribution of subsidised or free lifejackets by NFFO and SFF began in 2013.

MCA

Lifejackets save lives, a brochure published by the MCA, states under the heading *Advice for fishermen*, that the *MCA recommends that commercial fishermen wear a lifejacket or buoyancy aid at all times whilst on deck*. The brochure provides advice on cold water shock, actions to take in the event of falling into the water and comments that *commercial fishing, angling and sailing are the activities where most lives may be saved by buoyancy-wear*.

BORD IASCAIGH MHARA OF IRELAND, IRISH WATER SAFETY AND THE RNLI

In January 2016, Bord Iascaigh Mhara (BIM) of Ireland, Irish Water Safety and the RNLI ran a 4-week lifejacket safety awareness campaign in Ireland. The campaign known as 'Live to Tell the Tale' was intended to encourage more fishermen to complete the mandatory BIM safety survival training and to wear their lifejackets at sea. The wearing of constant wear lifejackets at sea was made mandatory in Ireland in 2002.

SUMMARY

There have been several campaigns to date to encourage commercial fishermen to wear PFDs. The campaigns included the distribution of printed brochures, trials of PFDs by volunteers and the distribution of free lifejackets and training to commercial fishermen.

WORKING GROUPS

FISHING INDUSTRY SAFETY GROUP[6] (FISG)

At a FISG meeting held in September 2010, the MCA proposed that the wearing of PFDs should be made mandatory. In November 2010, during another FISG meeting, a detailed discussion took place regarding PFDs, and a proposal was made that lifelines could be considered in lieu of PFDs[7]. A general concern was also raised at this meeting regarding the enforcement of any regulation that may be introduced to make the wearing of PFDs mandatory.

In April 2011, the FISG met again to discuss the specific issue of the wearing of PFDs on the open decks of fishing vessels at sea, and a working group was formed (with representation from the fishing federations, Seafish, RNLI and MCA) to take this work forward. This working group, known as the PFD Project Group, made several decisions regarding the selection of PFDs, including:

- The inclusion of the maintenance and operation of PFDs in the Sea Survival training course.
- The MCA's role in differentiating PFDs from abandon ship lifejackets.
- The application of risk based selection for the appropriate buoyancy to be afforded by PFDs.
- Public relations initiatives on the PFD scheme, including announcements at suitable industry expositions.

The minutes of the FISG meeting held in March 2013 to discuss the issue of PFDs stated: *Following MAIB's most recent recommendation concerning PFDs, (2013/103), the MCA will be looking at 2015 as a marker for regulatory change if the sought after changes are not delivered*.

In October 2013 the FISG met again, and discussed the initiative to distribute subsidised or free lifejackets to fishermen. It was agreed that a 15-30 minute briefing would be given to each fisherman when the lifejackets were issued. The minutes of the meeting stated: *By doing this there is much higher chance of the PFD being; worn, inspected regularly, and serviced when required*. [sic]

The proposed briefing was to convey the following learning points:

- Heavily subsidised/free PFDs were being handed out in an attempt to address the heavy fatality rate among fishermen due to drowning.
- The operation and features of the PFDs.
- The correct method of wearing the PFDs and an internal examination of the bladder and other components.
- The service requirements of the PFDs.

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[6] FISG comprises representatives from several organisations concerned with the safety of commercial fishing around the UK. Its members include the MCA, Seafish, and representatives from many fishing federations.

[7] Lifelines in lieu of PFDs was subsequently dismissed.

DISTRIBUTION OF FREE OR SUBSIDISED PFDS

In 2012, the PFD Project Group, taking into account the requirements of fishermen and working with Mullion Survival Technology, specified a new lightweight, compact design of PFD. The result was the Mullion Compact 150 PFD, which complied with ISO 12402 and provided 150N of support.

Starting in 2013, the NFFO, SFF, Fishermen's Mission and Seafish started distributing these PFDs to UK fishermen, either free of charge or heavily subsidised. The project was financed by the European Fisheries Fund (EFF) with additional funding from Seafish. The only prerequisite for receipt of a Mullion Compact 150 PFD was that fishermen had to confirm they had completed the four mandatory basic safety training courses. By the end of March 2016, 7880 PFDs had been distributed through this initiative **(Table 5)**.

Country	Number of PFDs distributed	Number of PFDs still to be distributed	Organisation responsible
Scotland	3,100	390	SFF
England	780 2,640	0 1,360	NFFO Seafish
Northern Ireland	220 840	0 0	NFFO Seafish/Fishermen's Mission
Wales	300	200	Seafish
Total	**7880**	**1950**	**-**

Table 5: Distribution of PFDs under the EFF funded PFD Initiative up to March 2016 (data supplied by Seafish)

SUMMARY

FISG formed its PFD Project Group to promote the wearing of PFDs on the open decks of commercial fishing vessels at sea. The PFD Project Group was responsible for engaging with a PFD manufacturer to develop a practical and easy-to-use constant wear PFD. This PFD was subsequently distributed free or heavily subsidised to UK fishermen in an attempt to reduce the number of drowning fatalities. By March 2016 the handing out of subsidised PFDs was approximately 80% complete.

INTERNATIONAL PFD REQUIREMENTS ON FISHING VESSELS

EUROPEAN UNION AND EUROPEAN ECONOMIC ZONE

Within the countries of the European Union and European Economic Zone, the requirement for PFD wear is as follows:

- Ireland enforced the mandatory wearing of PFDs in 2002. Fishermen were required to wear PFDs on exposed decks or at all times on open boats at sea, coming to and from moorings and in harbour. The Irish Fisheries Protection vessels are empowered to enforce these regulations at sea. At the time of writing there was no data to demonstrate whether the introduction of this regulation has increased the usage of PFDs.

- France requires fishermen on all fishing vessels to wear PFDs under certain circumstances, such as working on deck or in bad weather.

- Norway and Belgium require suitable buoyancy aids to be worn by all while working on the exposed decks of fishing vessels.

- Spain enforced the mandatory wearing of PFDs in 2007. Fishermen were required to wear a lifejacket when working on the exposed decks of vessels under 24m in length during bad weather. The Marine Accident and Incident Investigations Standing Commission of Spain has made several recommendations to the Spanish Maritime and Labour Administration to modify these regulations so as to mandate the use of PFDs at all times when working on the exposed decks of all fishing vessels.

- Portugal requires lifejackets to be worn on fishing vessels less than 9m in length.

- Iceland requires fishermen on board all fishing vessels to wear lifejackets while working near open stern gates.

OTHER COUNTRIES

- In 1994 South Africa introduced a mandatory requirement requiring all crew on commercial vessels (regardless of the type) to wear buoyancy aids when working on exposed decks at night, when the risk of being lost overboard has been identified, when operating within 1 nautical mile of the shore and when operating in rough seas or heavy weather. These requirements are reported to have significantly reduced the number of fatalities due to drowning in the South African fishing fleet.

SUMMARY

The introduction of mandatory requirements for fishermen to wear PFDs is widespread throughout Europe. While the effects of these requirements on the fatality rates are not yet clear, none have reported any negative impact in safety resulting from the requirements. The South African Maritime Administration reported a dramatic reduction in fishing vessel fatalities due to drowning, as a result of introducing their legislation in 1994.

LITERATURE REVIEW

MANDATING PFD WEAR AND EDUCATIONAL CAMPAIGNS

A study published in 2014 **(Ref 11)** compared the effectiveness of educational campaigns with mandatory regulations requiring the users of recreational craft to wear lifejackets. Two initiatives, both in the USA, were described: 'Wear It California!', a targeted marketing campaign in the California Delta region, and mandatory wear regulations at four lakes in the state of Mississippi. Before the Californian campaign, the adult PFD wear rate was 8.5%, and this rose to 10.5% during the 3 years of the campaign. In contrast, before the introduction of mandatory regulations, at the four lakes the adult wear rate was 13.7%, increasing to 75.6% during the first year of regulation, before settling at 68.1% in the third year.

A further study of boat users in Washington State in the USA **(Ref 12)** was carried out to assess the relationship between lifejacket use and boating laws. An observational survey of boat users was conducted between August 2010 and September 2010. Age, sex, lifejacket use, boat type, and weather and water conditions were recorded. Of the 5157 users observed, it was found that 30.7% used lifejackets. However, where the state law required that lifejackets be worn under specific circumstances, the compliance was very high: personal watercraft users 96.8%, people being towed (e.g. water-skiers) 95.3% and children under 12 years 81.7%. The authors concluded that efforts to educate boat users fall on deaf ears when not supported by mandatory requirements.

A project sponsored by the Canadian Safe Boating Council **(Ref 3)** concluded that mandatory PFD wear legislation should be introduced. Drawing from the experience of experts in countries such as the USA and Australia, where several states had introduced such legislation, the report commented that the two main barriers to introducing this requirement would be a reluctance on the part of the government to enact new legislation, and the perceived difficulty in enforcing it. Detailed implementation strategies were recommended in the report.

The report entitled MCA Lifejacket Wear – Behavioural Change **(Ref 13)**, published in December 2009, stated: *The objectives of this project were to identify why people do not wear lifejackets, develop an intervention to encourage lifejacket wear and measure the effectiveness of this intervention to inform future lifejacket campaigns*.

The report, based on data collected from recreational boating users, concluded that there could be two major reasons why people do not wear lifejackets: a lack of appreciation of the debilitating effects of cold water shock, and a belief that getting back on board after falling into the water would not be difficult. It recommended educational campaigns as one of the strategies to increase the usage of lifejackets. The report also referred to MCA Research Project No. 586, published in 2007 **(Ref 14)**, a study of the approach taken by other countries in regulating the recreational boating sector. This study concluded: *increasing monitoring and enforcement was the only way to substantially raise lifejacket wear rates*.

In 2006 a safety campaign was launched in Auckland, New Zealand, to combat a spate of drowning incidents associated with fishing from rocky foreshores. Conducted over a 4-year period, the report **(Ref 15)** concluded: *a change of this magnitude in the voluntary wearing of protective gear (31%) may be an important precursor to the successful implementation of safety legislation*.

A study carried out on recreational boat users in Victoria, Australia, subsequent to introducing the mandatory wearing of PFDs in 2005, reported that in the 5-year period before the introduction of the law, there were 59 fatalities; in the following 5-year period there were only 16 **(Ref 16)**.

PFD TRIALS BY COMMERCIAL FISHERMEN

The MAIB's Analysis of UK Fishing Vessel Safety 1992 to 2006 **(Ref 5)** noted that many skippers found it difficult to convince their crews to wear buoyancy aids; some had even resorted to making them sign disclaimers stating that it was their choice not to wear them. Although some static gear[8] fishermen indicated that the PFDs available at the time were unsuitable for their particular work, many fishermen have confirmed that PFDs can be worn as a matter of course without restricting their ability to work.

In 2005 the RNLI conducted the study 'Which lifejacket for you?' **(Ref 9)**, in which 120 fishermen volunteered to wear a range of lifejackets and buoyancy aids to assess their comfort and durability. This was an independent study that demonstrated commercial fishermen could carry out their work unencumbered while wearing a constant wear PFD.

In 2012, a trial conducted in the USA involving 215 fishermen was carried out to evaluate the PFDs best suited to different types of fishing activities **(Ref 17)**. Four types of fishing vessels (crabber, gill netter, longliner and trawler) were included in the trial, and six types of PFDs were tested. The parameters evaluated were: weight, tightness, constriction, chafing, bulkiness, snagging, interference, donning and cleaning. The trial lasted 30 days, and the results (from 165 feedback forms) confirmed the general principle that one or more of the six PFDs tested was fit for constant wear during fishing.

SUMMARY

Research has demonstrated that campaigns succeed in changing entrenched behaviours only when backed by mandatory regulations. The development of light and comfortable PFDs, and their successful endorsement by fishermen around the world, has removed any argument against the use of constant wear PFDs on the exposed decks of fishing vessels at sea.

[8] Static gear is set to allow fish to swim into it, or to attract fish by bait, and consequently become caught in the gear

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Flyer to fishing vessels and small craft, MAIB

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY FLYER TO FISHING VESSELS AND SMALL CRAFT

Annie T (CY 1), fatal man overboard accident, 4 October 2015

Figure 1: Fishing vessel *Annie T*

Narrative

On 4 October 2015, at about 1320, a crewman from the 9.15m long creel fishing vessel *Annie T* **(Figure 1)**, was carried overboard by the fishing gear when his foot became caught in a bight of rope. He was not wearing a lifejacket when he fell through the shooting hatch at the aft of the vessel **(Figure 2)**. At the time of the accident, the vessel was in the sound of Mingulay, at the southern edge of the Western Isles of Scotland.

The skipper was able to manoeuvre *Annie T* back to the crewman in the water and attempted to hoist him on board with the hauler. Unfortunately, the crewman was unable to hold onto the rope and fell back into the water. About 2 minutes later the skipper saw him floating face down in the water some metres away and on this occasion was able to recover him back on board using the hauler. Unfortunately, despite the best efforts of the skipper and the attending lifeboat and helicopter crews, the crewman could not be revived. The postmortem report stated that the crewman might have suffered a cardiac arrest.

The MAIB investigation revealed the following:

- Working practices on board *Annie T* required a crewman to physically lift the end weight on the back rope and carry it aft to the shooting hatch in order to prevent the weight from damaging the vessel during shooting operations.
- The skipper and the crew members of *Annie T* never wore lifejackets.
- Three working lifejackets that had been supplied to *Annie T*'s crew free of charge by the Scottish Fishing Federation were still in their original packaging and had never been used.

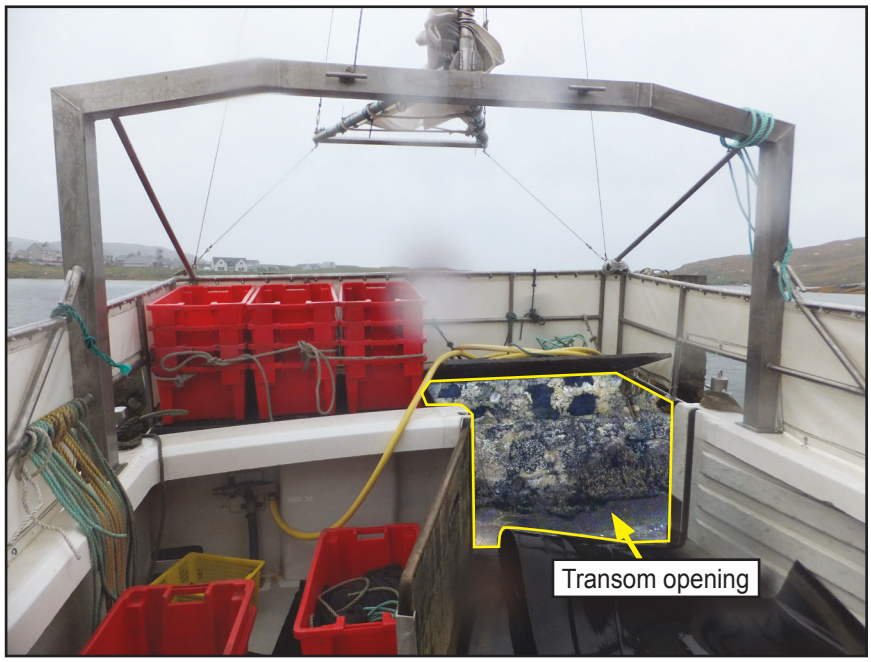

Figure 2: Transom, showing opening for shooting creels

Safety Lessons

1. On small potting vessels space on deck can be very limited, especially when it is stacked with creels, piles of ropes and trays of catch. During shooting, it is not unusual for the gear to become tangled up and move in unexpected ways across the deck. The only way to stay safe is to separate the crew from the running gear during shooting operations.

2. It is extremely difficult to recover a man overboard casualty, and the casualty is unlikely to be able to help themselves. Regular manoverboard drills using a representative dummy will help prepare skippers and crew for dealing with such an emergency.

3. Falling into water below 15ºC will immediately lead to cold water shock. This causes a gasp reflex as the body comes into contact with the water, along with hyperventilation and a dramatic increase in heart rate and blood pressure that can lead to cardiac arrest. This is quickly followed by cold incapacitation with progressive loss of controlled movement of arms and legs. Unless a lifejacket is worn, death by drowning will occur, regardless of the casualty's ability to swim in warmer water. Onset of hypothermia will normally occur after 30 minutes in cold water.

4. Always wear a lifejacket while working on exposed decks. Should you enter the water, it can save your life by:
    - Keeping you afloat and your face clear of the water, allowing you to breathe.
    - Reducing the load on your heart as you won't have to struggle to swim.
    - Assisting those recovering you by providing them with something to grab onto.
    - Increasing your visibility in the water, helping your rescuers find you.
    - Providing additional insulation, helping to keep you warm for longer.

This flyer and the MAIB's investigation report are posted on our website: www.gov.uk/maib

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