Transportation Safety Board of Canada
Bureau de la sécurité des transports du Canada

MARINE TRANSPORTATION SAFETY INVESTIGATION REPORT M20A0434

SINKING WITH LOSS OF LIFE

Fishing vessel *Chief William Saulis*
12 nautical miles NNE of Digby, Nova Scotia
15 December 2020

Canada

ABOUT THIS INVESTIGATION REPORT

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Summary

On 15 December 2020, the fishing vessel *Chief William Saulis* was returning from scallop fishing when the Joint Rescue Coordination Centre in Halifax, Nova Scotia, received a signal from its emergency position-indicating radio beacon (EPIRB), 12 nautical miles NNE of Digby, Nova Scotia. Search and rescue efforts were initiated after the vessel could not be reached via very high frequency (VHF) radio or phone. The body of 1 crew member was recovered; as of December 2022, the other 5 crew members remained missing. On 16 January 2021, the vessel was located close to where the EPIRB activated, in 66 m of water.

1.0 FACTUAL INFORMATION

1.1 Particulars of the vessel

Name of vessel	*Chief William Saulis*
Transport Canada official number	828228
Fisheries and Oceans Canada vessel registration number	10661
Port of registry	Grand Manan, NB
Flag	Canada
Type	Fishing
Gross tonnage	56.22
Registered length	14.98 m
Built	2004, Belliveau Shipyard Limited, NS
Propulsion	1 diesel engine (448 kW) driving a single propeller
Crew	6
Registered owner and authorized representative	Yarmouth Sea Products Limited

1.2 Description of the vessel

The *Chief William Saulis* was a fishing vessel of the Cape Island design, built in 2004 from moulded, glass-reinforced plastic, and designed for lobster and scallop fishing (Figure 1).

Figure 1: The fishing vessel Chief William Saulis, showing the A-frame for the scallop drag, the freeing ports and covers, and a shucking house (Source: Third party, with TSB annotations)

The wheelhouse was located forward of amidships. It was equipped with a very high frequency digital selective calling (VHF-DSC) radiotelephone, an autopilot, 2 global positioning systems, 2 radars, a Fisheries and Oceans Canada (DFO) vessel monitoring system (VMS), a bridge navigational watch alarm system, and a camera used for monitoring the working deck. One fixed Class 1 Canadian-registered emergency position-indicating radio beacon (EPIRB), fitted with a hydrostatic release unit (HRU), was attached to the top

of the wheelhouse. There were also two 6-person life rafts[1] with HRUs fixed to the top of the wheelhouse. The vessel had 2 shucking houses aft of the wheelhouse: 1 on the port side and 1 on the starboard side. The shucking houses were accessed from the wheelhouse through hinged doors opening outward (Figure 2). The engine room was situated below the main deck and accessed through 2 covered hatches within the wheelhouse.

The accommodation space was below the forward deck and contained 6 bunks, as well as 1 refrigerator and 1 refrigerator-freezer, both secured for rough weather. Access to the accommodation space was through an opening in the forward port side of the wheelhouse and there was an emergency escape hatch, approximately 0.6 m by 0.6 m, above the bunks.

The working deck, which extended aft of amidships, had bulwarks on the port and starboard sides. Each side had 5 freeing ports: 3 on the open working deck and 2 within each shucking house. The working deck also had 5 flush watertight hatches: 1 to the lazarette, 2 to the fish hold, and 2 to live tanks. Two watertight bulkheads below the main deck separated the forecastle, engine room, and fish hold.

The vessel was fitted with a large A-frame, a single-drum deck winch, and a scallop drag for fishing operations. A plate was attached across the entire stern to protect the vessel's hull from the scallop drag.

1.2.1 Emergency escape routes

The *Fishing Vessel Safety Regulations* (FVSR) require at least 2 means of escape from each crew space.[2] On the *Chief William Saulis*, the principal crew spaces were the accommodation space and the wheelhouse (Figure 2). Like many fishing vessels of a size similar to the *Chief William Saulis,* the accommodation space was in the bow below the forward deck of the vessel and was accessed via a short ladder from the wheelhouse.

From the accommodation space, the 2 means of escape were either up a ladder into the wheelhouse or through the emergency escape hatch out onto the forward deck. From the wheelhouse, the 2 means of escape were through doors into the shucking houses. From each shucking house, the 2 means of escape were through sliding doors onto the working deck, 1 door aft and 1 door inboard. The aft doors slid toward the centreline to close, and the inboard doors slid forward to close (Figure 2).

The vessel was also required to have a permanent or portable light to illuminate the life raft launching area.[3] A 2018 condition and valuation survey report showed that the vessel carried a portable emergency flashlight.

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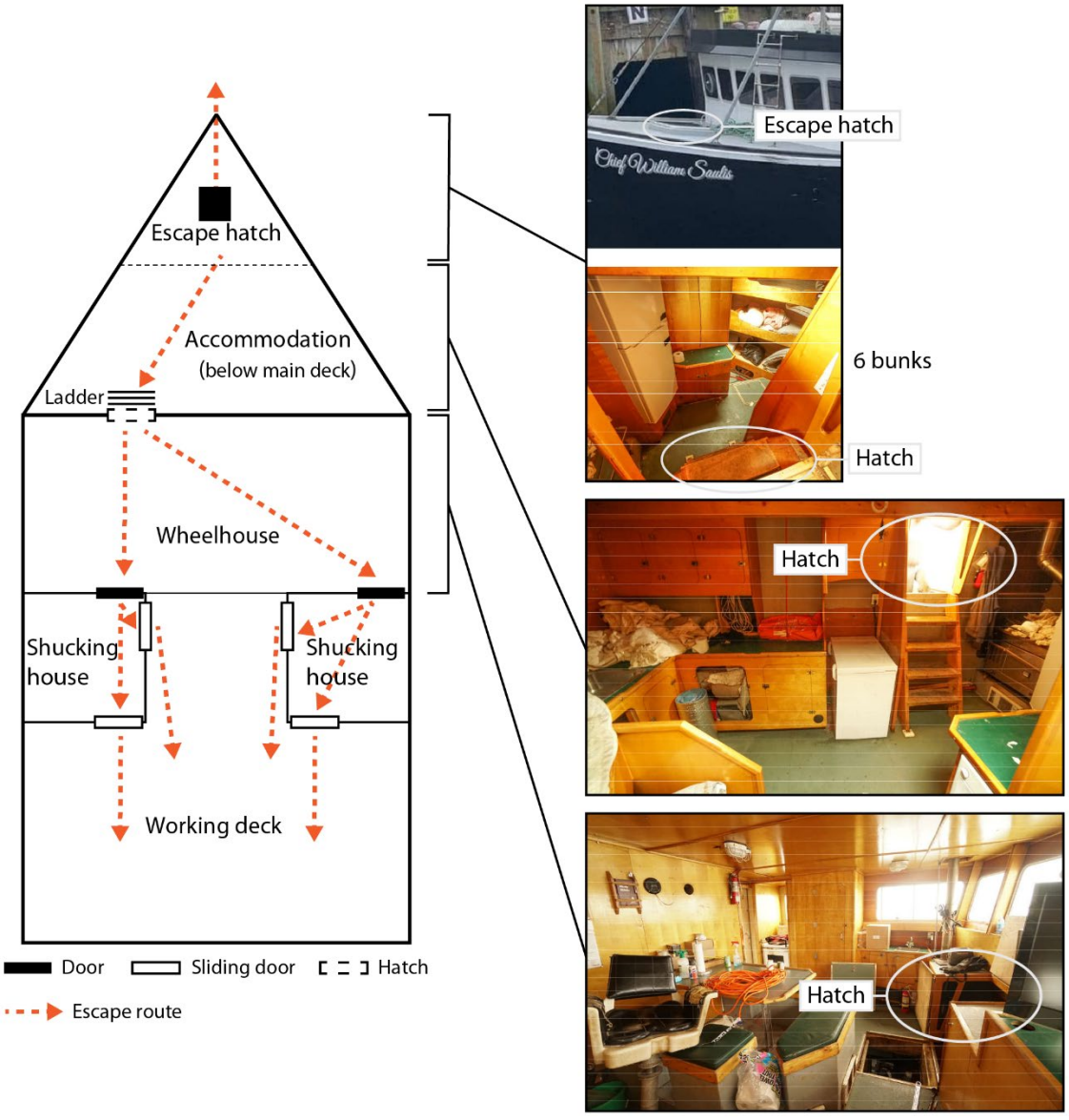
1 Although the safe manning document required only 2 people in the crew, the vessel usually carried 6 to 8 people for fishing operations, and so 2 life rafts were needed.

2 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 06 October 2020), subsection 26.4(1).

3 Ibid., subsection 43.1(1).

Figure 2. Diagram of the vessel and inset photos illustrating the main emergency escape route from the accommodation space to the deck, which required moving through the wheelhouse and a shucking house. The routes from the wheelhouse to the deck required moving through a shucking house. (Source of diagram: TSB, based on survey report by Jameson Theriault Marine Surveys. Source of escape hatch inset photo: Third party, with TSB annotations. Source of other inset photos: Jameson Theriault Marine Surveys, with TSB annotations)



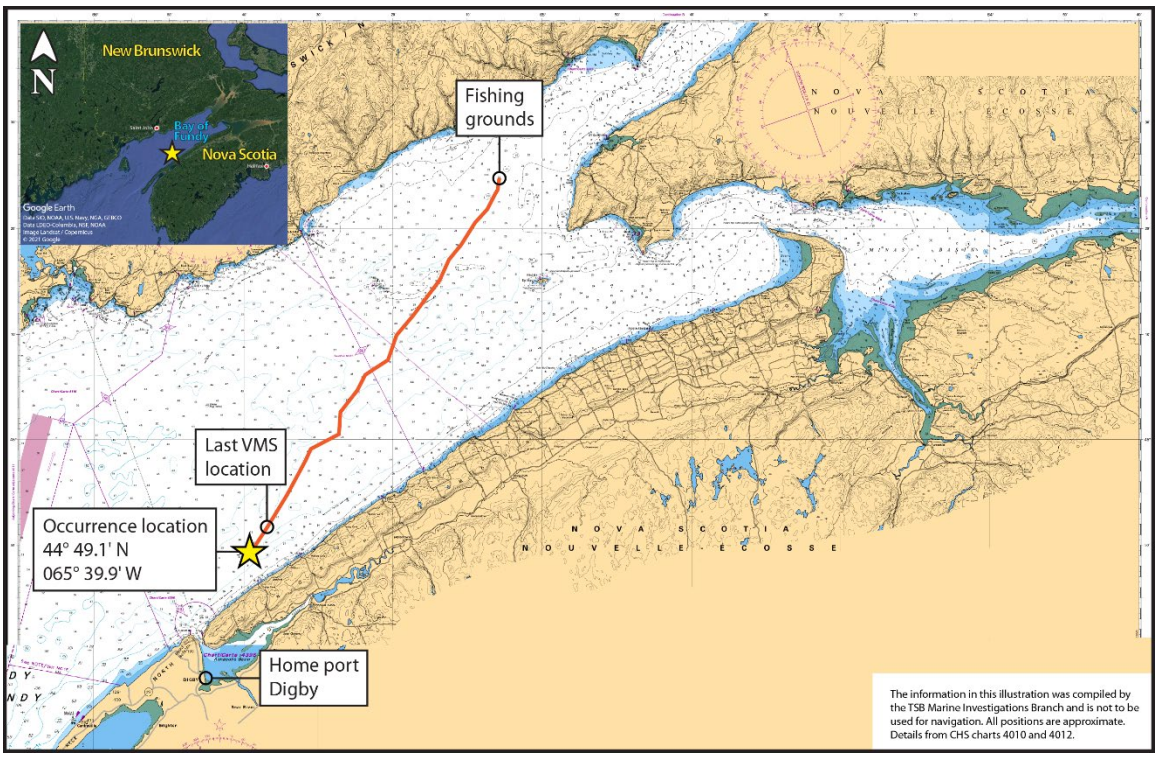
1.3 History of the voyage

On 09 December 2020, at approximately 1300,[4] the *Chief William Saulis* departed Digby, Nova Scotia, for the 6-hour trip to Chignecto Bay, New Brunswick, to fish scallops. The crew fished at the mouth of Chignecto Bay (the fishing grounds indicated in Figure 3) until 11 December, when they returned to Digby to have a new electric clutch installed for the

[4] All times are in Atlantic Standard Time (Coordinated Universal Time minus 4 hours).

power take-off for the winch. While in harbour, they reported 463 kg of scallops,[5] but did not offload them. Later that evening, the vessel returned to Chignecto Bay, arriving early on 12 December. The crew continued to fish until 15 December.

Figure 3. Area of the occurrence, showing the fishing grounds and the position of the last VMS signal (Source of main image: Canadian Hydrographic Service charts 4010 and 4012, with TSB annotations. Source of inset image: Google Earth, with TSB annotations)



On 15 December, just after midnight, the *Chief William Saulis* departed the fishing grounds. They were near the end of a typical trip,[6] and the last weather forecast at 2000 indicated a gale warning and winds increasing from 10 to 15 knots up to 35 knots by early morning.[7] They proceeded on a southwesterly course to return to Digby, finish shucking, and offload the scallops. Another scallop fishing vessel, the *Brier Endeavor,* had departed the fishing grounds just before the *Chief William Saulis*. The *Brier Endeavor* slowed down on the trip home because of the environmental conditions. At 0300, the *Chief William Saulis*'s VMS showed it had reduced speed to 6.5 knots from 8.6 knots.

At 0500, when the last VMS position was received,[8] the vessel's heading was 195° magnetic and the speed had been further reduced to 5.4 knots. At 0551, the vessel's EPIRB activated approximately 3.4 NM south-southwest from the last VMS position. In response, search and rescue coordinators at the Joint Rescue Coordination Centre (JRCC) in Halifax retrieved the

5 According to the monitoring requirements for the scallop fishery, catch must be reported ("hailed in") any time a vessel enters a harbour, whether or not the catch is offloaded.

6 Typical trips last 5 to 7 days, depending on catch and weather.

7 Environment Canada Weather Bulletin FQCN13 CWHX 142350.

8 VMS data for the *Chief William Saulis* were available at hourly intervals.

vessel information, contacted the general manager of Yarmouth Sea Products Limited (YSP), and attempted to contact the vessel by the master's cellphone and by VHF radio. When no response was received, search and rescue efforts began. Three Canadian Armed Forces aircraft, 3 Canadian Coast Guard (CCG) vessels, and numerous private vessels were deployed in the search. At 0740, search and rescue coordinators requested information from YSP, including the total number of people, on-board safety equipment, a crew list and medical conditions of the crew. Two inflated life rafts, a fully opened immersion suit, a lifejacket, and miscellaneous debris were recovered after being initially discovered at 0830.

At 1630, 1 body was recovered, partially dressed in work clothes and with no flotation aid. On 16 December at 0742, the final list of crew members on board the *Chief William Saulis* was confirmed. At 1700, search and rescue efforts were halted and the search was transferred to the RCMP as a missing persons case.

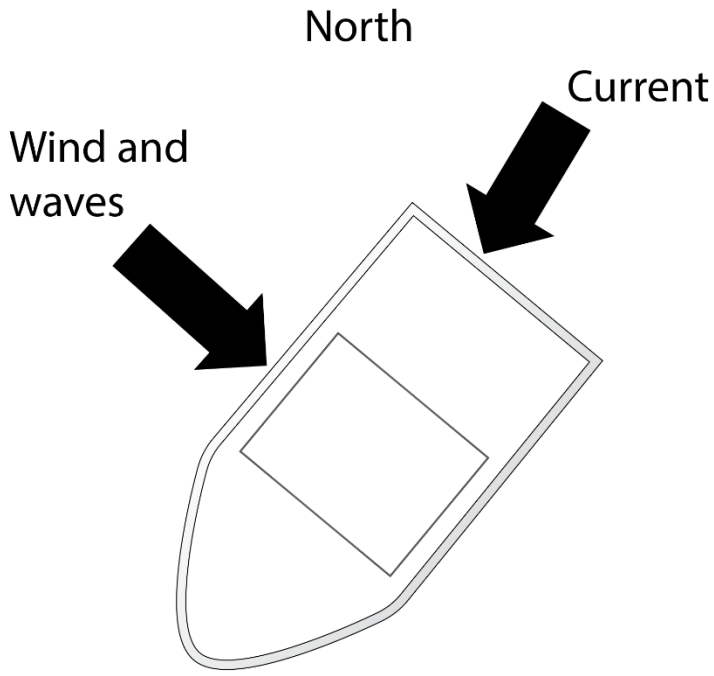
On 16 January 2021, the vessel was located by CCG and RCMP using side scan sonar and a remotely operated vehicle , 2 NM NNW of Delaps Cove, Nova Scotia, in 66 m of water. Visibility and manoeuverability were limited because of the tide, and the remotely operated vehicle was not able to determine the disposition of the vessel or access the interior. The vessel has not been recovered. As of December 2022, the 5 missing crew members had not been found.

1.4 Environmental conditions

At the time of the occurrence, Environment and Climate Change Canada reported 10 NM visibility. The air temperature was 1.6 °C, and the sea temperature was 9.2 °C. At 0550, the tidal current had changed from ebb at 212° (in the same direction as the *Chief William Saulis* was travelling) to flood at 032° and would have been near its weakest around the time of the occurrence.

The Western Bay of Fundy wave buoy, 31.7 NM away from where the EPIRB activated, recorded a wind direction of 305°, wind speeds of 25.1 knots gusting to 31.1 knots, and peak wave heights of 2.66 m. Given the wind and current directions at the time of the occurrence, the vessel was travelling in a beam sea (Figure 4). The waves in the area of the occurrence were reported to be much higher than the forecast.

Figure 4: Diagram illustrating the effect of wind, waves, and current on the Chief William Saulis travelling in a beam sea (Source: TSB)



1.5 Personnel certification and experience

The master held a Fishing Master, Fourth Class certificate of competency[9] issued in 1990. He held a General Operator Certificate[10] and had completed a Marine Emergency Duties (MED) A2 course. He had more than 30 years of fishing experience as a master and had sailed as master on the *Chief William Saulis* intermittently since October 2017.

The mate held a Fishing Master, Fourth Class certificate of competency issued in 2015 and renewed in 2020. He had completed MED A1, B2, and Advanced First Aid courses in 2004. He had more than 10 years of fishing experience and had started working on the *Chief William Saulis* in September 2020.

The 4 deckhands had varying levels of fishing experience, ranging from 10 to 39 years. No training records were available for any of the deckhands.

1.6 Vessel certification

The *Chief William Saulis* was required to undergo a periodic Transport Canada (TC) inspection for certification every 4 years. It had last been inspected by TC on 12 April 2017

9 The master had completed the fishing master training before 2007, when a stability component was added to the curriculum.

10 The General Operator Certificate is Canada's highest level of radio operator certificate for operators of the Global Maritime Distress and Safety System.

and had been issued an inspection certificate for Near Coastal, Class 1, Limited Home Trade 2 voyages that stipulated that the vessel was to remain within 120 NM from shore. The certificate was supplemented by a record of safety equipment[11] and a safe manning document.[12]

1.7 Harvesting scallops

Since the *Chief William Saulis* was purchased by YSP in 2013, it had been used for harvesting lobster as well as scallops. At the time of this occurrence, the *Chief William Saulis* was harvesting scallops.

Scallops are harvested with a drag that is designed to collect them off the seabed. The scallops are then sorted immediately and stowed in loose piles or in uncovered totes and baskets on the working deck. Unshucked scallops are often kept on deck to make cleaning up the shells easier and to save the effort of moving them in and out of the hold. Shucked scallops (scallop meats) are bagged, moved to the hold, and stored on ice. Scallops are brought ashore within 7 days.

It is common practice to shuck scallops all day, stopping only periodically to haul back the drag. When the weather is good, the crew will continue to shuck scallops on the return trip. However, shucking is difficult in rough weather and so the crew usually rests and finishes shucking when they are back in the shelter of a port.

For the inshore scallop fishery in the Bay of Fundy,[13] DFO requires fish harvesters to report interim catch estimates whenever they return to harbour, even when not offloading. Final scallop catches must be reported to DFO before returning to harbour, and reported as estimated weights of shucked scallops after unloading. DFO also requires vessels to transmit a VMS signal hourly.

When harvesting scallops, the *Chief William Saulis* would typically make a multi-day trip. The *Chief William Saulis* had begun fishing out of Digby in September 2020, and had made 8 earlier trips, landing an average of 1600 kg of shucked scallops per trip. At the time of the occurrence, the *Chief William Saulis* was carrying an estimated load of 1600 kg of shucked scallops, 230 kg of which was stowed on deck. The unshucked scallops, approximately 2700 kg, were piled up to approximately 5 ft high on deck and in totes and baskets.[14] An

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11 The record of safety equipment stated that the *Chief William Saulis* was equipped in accordance with the requirements of the *Life Saving Equipment Regulations* (C.R.C, c. 1436).

12 The safe manning document for the *Chief William Saulis* specified a minimum crew of 2 and that when the vessel could not remain in port overnight, a second certified person was required to perform watchkeeping and radio watch duties. This information was recorded in the safe manning document in accordance with 2020, paragraph 202(3)(b). of the *Marine Personnel Regulations*.

13 Fisheries and Oceans Canada, *Inshore Scallop – Maritimes Region,* Integrated Fisheries Management Plan, at dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/scallop-petoncle/scallop-petoncle2015-toc-eng.html (last accessed on 23 January 2023).

14 The estimate of catch and layout on the deck is based on a final load equal to the average trip and video images that show the catch on deck just before they left the fishing grounds.

unshucked scallop can measure 7.5 cm to 15 cm long. When loose on deck they can pile against freeing ports, reducing the ports' ability to shed water. The total weight of scallops on board was approximately 4300 kg.

1.8 Vessel stability

The stability of a vessel is its ability to return to an upright position when displaced by forces such as wind, waves, and fishing operations, or affected by shifting loads. Understanding how different factors affect stability is important for estimating risks. For example, how the weather and seas affect the vessel's stability depends on the directions of the wind, current, and waves relative to the heading of the vessel. How the weight of loads on a vessel affects stability depends on the location and magnitude of the weight; the lower and closer to the centreline the weight is placed, the better for the stability of the vessel.

All vessels are required to have adequate stability to safely carry out their intended operations.[15] Fish harvesters often determine the stability of a vessel based only on experiencing its movements in a variety of operating conditions. However, this determination of stability is not reliable.[16] Stability assessments examine a vessel's ability to right itself and its watertight integrity. These assessments help crews determine safe operating limits, such as minimum freeboard and maximum cargo loads, as well as safe sequences for loading and stowing cargo and gear, for managing consumables, and for minimizing free surface effects.

Before the FVSR came into force on 13 July 2017, the requirement for a stability assessment was based on whether a vessel possessed certain risk factors. These risk factors and the process for their review are described in Ship Safety Bulletin (SSB) 04/2006.[17] Since 13 July 2017, the FVSR require new or modified fishing vessels over 9 m in length, fishing vessels of more than 15 GT that harvest capelin or herring, or vessels fitted with anti-roll tanks to have stability assessments.[18]

The *Chief William Saulis* was required by the FVSR to have adequate stability to safely carry out its intended operations. To help operators determine what constitutes adequate stability, TC provided SSB 04/2006 and TP 15393, *Adequate Stability and Safety Guidelines for Fishing Vessels*. A number of risk factors described in these documents were noted on the *Chief William Saulis*. For example, the vessel carried substantial top-side weight from the protective stern plate, the A-frame for the scallop drag, the second shucking house, and the

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15 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 06 October 2020), section 3.45 and subsection 3.46(2).

16 TSB Marine Investigation Report M09Z0001, Safety Issues Investigation into Fishing Safety in Canada.

17 Transport Canada, Ship Safety Bulletin 04/2006: Safety of Small Fishing Vessels: Information to Owners/Masters about Stability Booklets (17 March 2006), at tc.canada.ca/en/marine-transportation/marine-safety/ship-safety-bulletins/bulletin-no-04-2006 (last accessed on 23 January 2023).

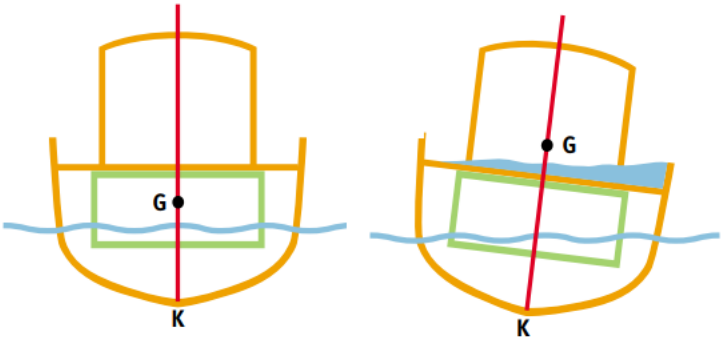
18 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 06 October 2020), subsection 3.48(1).

practice of stowing scallops on deck. As well, the vessel had freeing port covers reducing the freeing port area when in use. When freeing port covers are in place, they effectively turn the working deck into a closed space the full width of the vessel, which can hold water and which therefore introduces a substantial risk of free surface effects. Under SSB 04/2006, which was in force at the time of the *Chief William Saulis*'s last 3 TC inspections, these risk factors would have required a stability assessment. No stability assessment had been conducted and as such there was no stability booklet available to the crew.

1.8.1 Free surface effect

When cargo, gear, and water in tanks or on deck are able to move freely with the motion of the vessel they shift the centre of gravity, where their weight is acting, and so change the stability of the vessel (Figure 5). This effect, called the free surface effect, results from the changes in the centre of gravity as the materials move. The severity of a free surface effect increases with the weight of the material and the distance moved. The free surface effect becomes particularly severe when the materials, such as water trapped on deck, are able to shift along the entire width of the vessel.

Figure 5. Diagram illustrating the free surface effect on a vessel. When water or other materials, like scallops on deck, are able to move with the motion of the vessel, the vessel's centre of gravity (G) changes, and this affects the stability of the vessel (Source: Fish Safe BC, Fishing Vessel Stability: Make It Your Business: The Stability Handbook, Effect of Free Surface on Deck, p. 34)



1.8.2 Freeing ports

Freeing ports (also known as scuppers) are openings in or near the bottom of a vessel's bulwark that are used to prevent the accumulation of water on the deck of a vessel. Accumulated water on the deck of a vessel adds weight high on the vessel and creates the potential for a free surface effect. This water can accumulate from large waves coming over the bulwark, especially in a beam sea, or from water coming on board with the catch, rain, and sea spray.

The FVSR define a minimum area for freeing ports on any vessel on which the bulwarks form a well where water can collect. This minimum area is to ensure that the vessel is capable of rapidly draining any water from the deck. The required minimum freeing port

area for the *Chief William Saulis* was calculated by the TSB to be 0.93 m^2.[19] The investigation estimated that the *Chief William Saulis*'s total freeing port area was 0.62 m^2, including the freeing ports within the shucking houses, approximately two thirds of the required freeing port area.

The *Chief William Saulis* was equipped with freeing port covers in the form of aluminum plates on rails which could be slid down to cover the freeing ports. Freeing port covers were installed to prevent smaller waves washing through the freeing ports onto the deck, but as a result, water could accumulate on the deck from larger waves, catch, rain, and sea spray. The *Chief William Saulis* had these covers installed on the forward 4 of the 5 freeing ports on each side. With the freeing port covers in place, the freeing port area was 0.12 m^2, just about one eighth of the required freeing port area.

1.8.3 Beam sea conditions

Vessels travelling in a beam sea encounter waves at approximately 90° relative to their heading. These conditions create large roll angles and increase the amount of water shipped on deck, increasing the risk of the vessel capsizing.

At the time of the occurrence, the *Chief William Saulis* was returning from the fishing grounds in a beam sea, with a large amount of unshucked scallops on deck, and likely with freeing port covers in use.

1.9 Commercial fishing safety

Regulation and oversight of safety in commercial fishing operations is a responsibility shared by individual masters and authorized representatives (ARs) and governed at the federal and provincial levels. At the federal level, the *Canada Shipping Act, 2001* (CSA 2001) requires the master of a vessel to take all reasonable steps to ensure the safety of the vessel and of persons who are on board.[20] The CSA 2001 also defines the role of the AR, who is by default the vessel owner, or is a person named by the vessel owner.[21] The CSA 2001 requires the AR to act with respect to all matters related to a vessel that are not otherwise assigned to any other person. Specifically, a vessel's AR is responsible for ensuring that the vessel and its machinery and equipment meet all applicable regulations; for developing procedures to safely operate the vessel and to deal with emergencies; and for ensuring that crew members receive safety training.[22]

The workplace safety of crews while they are engaged in the business of fishing is primarily under provincial jurisdiction. The provincial department responsible for occupational health and safety has a role in establishing and clarifying the responsibilities of the owner

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19 Ibid., subsection 29.1(1).

20 Government of Canada, *Canada Shipping Act, 2001* (as amended 30 July 2019), subsection 109(1).

21 Ibid., section 14.

22 Ibid., subsection 106(1).

and employees, supporting them in carrying out their responsibilities, and intervening appropriately when those responsibilities are not carried out.

1.9.1 Requirements for safety procedures

Procedures for the safe operation of a vessel and for dealing with emergencies are required by the CSA 2001.[23] For Canadian fishing vessels of not more than 24.4 m in length and of not more than 150 GT, such as the *Chief William Saulis*, the FVSR also apply. Under the FVSR, the master and AR are both responsible for ensuring that the regulations are followed.[24] The FVSR require certain written safety procedures for vessel operations and itemize the specific safety procedures which must be established and implemented to familiarize persons on board with various operational and emergency activities. The safety procedures must cover

> (a) the location and use of all safety equipment;
>
> (b) all the measures that must be taken to protect persons on board, in particular measures to prevent persons from falling overboard, measures to retrieve persons who have fallen overboard, measures to protect limbs from rotating equipment, and measures to avoid ropes, docking lines, nets and other fishing equipment that may pose a safety hazard to persons on board;
>
> (c) in the case of beam trawling and purse seining operations, the quick release of loads that can be activated in an emergency;
>
> (d) all the measures that must be taken to prevent fires and explosions on the vessel;
>
> (e) if the vessel has a deck or deck structure, all the measures that must be taken to maintain watertightness and weathertightness and to prevent flooding of the interior spaces of the hull or, if the vessel has no deck or deck structure, all the measures that must be taken to prevent swamping of the vessel;
>
> (f) all the measures that must be taken to ensure safe loading, stowage and unloading of fish catches, baits and consumables; and
>
> (g) the operation of towing and lifting equipment and the measures that must be taken to prevent overloading of the vessel.[25]

When the FVSR came into force, TC prepared templates to help meet the requirements for written safety procedures. TC states that

> [y]ou do not have to submit your safe operating procedures to Transport Canada for approval. However, during an inspection, you must be able to show that you have met the requirements for developing and using them.[26]

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23 Ibid., paragraph 106(1)b.

24 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 06 October 2020), section 3.02.

25 Ibid., section 3.16.

26 Transport Canada, "Templates for small fishing vessel procedures," at tc.canada.ca/en/marine-transportation/marine-safety/templates-small-fishing-vessel-procedures (last accessed on 23 January 2023).

The TC list of templates does not cover all safety procedures and information that should be documented. For example, there are no templates for the following areas:

- preventing fire and taking on water
- protecting limbs from rotating equipment, and the measures needed to avoid ropes, docking lines, nets and other fishing equipment which may pose a safety hazard
- loading, stowing, and unloading catch, bait, and consumables, and the measures needed to prevent overloading

The FVSR also specify that drills on the safety procedures shall be held to ensure crew members are proficient in carrying out the procedures, and that a record of each drill held shall be kept for 7 years.[27]

In 2018, TC published *Guidelines for Fishing Vessel Major Modifications or a Change in Activity* (TP 15392)[28] and *Adequate Stability Guidelines for Fishing Vessels* (TP 15393).[29] These documents, in particular TP 15393, provide guidance on best practices for small fishing vessels related to loading and stability. The documents were published to address TSB Recommendation M03-07, which stated that:

> the Department of Transport, in collaboration with the fishing community, reduce unsafe practices by means of a code of best practices for small fishing vessels, including loading and stability, and that its adoption be encouraged through effective education and awareness programs.
>
> **TSB Recommendation M03-07**

The publication of these documents along with progress made by the fishing community in enhancing fishing safety led the Board to reassess the response to Recommendation M03-07 as **Fully Satisfactory** in 2019. However, given that commercial fishing safety remains on the TSB Watchlist, the Board continues to monitor changes in the attitude and behaviour among fish harvesters and the development of safe work practices.[30]

1.9.2 Transport Canada oversight

TC's primary oversight mechanism to ensure compliance with legal and regulatory requirements for small fishing vessels of more than 15 GT but of less than 24.4 m and 150 GT, is through vessel certification, which includes inspections every 4 years. One part of these inspections is to verify the presence of written safety procedures and verify that there are records of their implementation, such as drill and familiarization records and records of

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27 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations*, (as amended 06 October 2020), subsections 3.16(2) and 3.17(1).

28 Transport Canada, TP 15392, *Guidelines for Fishing Vessel Major Modifications or a Change in Activity* (13 July 2018).

29 Transport Canada, TP 15393, *Adequate Stability and Safety: Guidelines for Fishing Vessels* (13 July 2018).

30 TSB Recommendation M03-07: Promoting safe practices on board small fishing vessels, at tsb.gc.ca/eng/recommandations-recommendations/marine/2003/rec-m0307.html (last accessed on 23 January 2023)

vessel maintenance. Although inspectors must verify the presence of safety procedures, they are not required to assess and approve them: "Written safety procedures do not need to be approved by Transport Canada marine safety inspectors. Inspectors should ask to see copies."[31]

Between the introduction of the FVSR in 2017 and the date of the occurrence, 25 YSP vessels had been inspected 84 times by TC. These inspections flagged 13 deficiencies in 3 of the vessels, but did not flag any gaps in the written safety procedures or in drill and familiarization records.

TC conducts concentrated inspection campaigns (CICs) that involve checking specific areas of safety on selected vessels. CICs focus on areas in which marine safety inspectors or surveyors have observed a high number of deficiencies, or in which new regulatory or convention requirements have recently come into effect. TC's most recent 2021/2022 CIC focused on compliance with the FVSR. A summary of the findings was presented at the Spring 2022 meeting of CMAC (the Canadian Marine Advisory Council).[32] The campaign involved 101 vessels from all TC regions. Of the 101 vessels, 83% were inspected vessels and 62% were issued safety deficiencies. The campaign also noted that

- the largest number of deficiencies were recorded under the CIC sections about ensuring the safety of vessel and crew, which includes the completeness (30%) and accessibility (31%) of safety procedures, and whether related drills were conducted and recorded (41%);
- 28% of fishing vessel crews could not demonstrate their knowledge of procedures;
- 79% of the vessels did not have up-to-date certificates; and
- 80% of the vessels had overdue deficiency notices from previous inspections.

During each inspection under the CIC, the question about procedures was broken down into 3 parts (did procedures exist, were they accessible, and could the crew demonstrate knowledge of the procedures). Responses to these questions were available for only 82 of the 101 vessels. The responses were similar across regions, except for those from the TC Prairie and Northern Region. In this region, crews of 10 of the 15 vessels inspected could not demonstrate their knowledge of procedures.

1.9.3 Nova Scotia occupational health and safety

In Nova Scotia, the *Occupational Health and Safety Act* states that employees and owners share the responsibility for the health and safety of persons at the workplace.[33] The Act is enforced by the Nova Scotia Department of Labour, Skills and Immigration's Occupational Health and Safety Division (NS OHS).

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31 Transport Canada, "Fishing Vessel Safety Regulations, Inspector Training Module," *Vessel Inspection Course: Marine Safety Inspectors*.

32 Transport Canada Marine Safety and Security, *2021/22 Concentrated Inspection Campaign Summary of Findings,* presented at the Canadian Marine Advisory Council spring meeting (May 2022).

33 Government of Nova Scotia, *An Act Respecting Occupational Health and Safety* (12 June 2017), section 2.

In 2017, as part of the response to a 2015 incident on board a YSP vessel, NS OHS required YSP to develop an occupational health and safety program to satisfy the requirements of the *Occupational Health and Safety Act*.[34] Specifically, YSP created the YSP Health, Safety, and Environment (HSE) manual, established a health and safety committee, and appointed a safety officer. The safety officer is responsible for maintaining the HSE manual and running the health and safety committee.

1.9.4 Search and rescue operations

Search and rescue (SAR) operations are the last line of defence against hazards at sea. When a vessel is reported as missing, maritime search and rescue coordinators collect information about the vessel and crew to help focus search efforts and therefore increase the crew's chances of survival. This information includes the location of the vessel (for example, from an EPIRB or other alerting devices; from VMS, phone, or radio data; or from reports from other vessels), characteristics of the vessel (for example, from registration information), safety equipment on board the vessel, and information about the crew members, including the number of crew and any medical conditions. In this occurrence, EPIRB data notified search and rescue coordinators at the JRCC and narrowed the search area, but information about the crew was not known until 26 hours after the occurrence.

Finding: Other

YSP did not have an up-to-date crew list for the *Chief William Saulis* before the vessel departed for the fishing grounds. YSP was unable to provide the JRCC with the total number of persons on board until 26 hours after the occurrence.

1.10 Managing fishing operations

Fish harvesters must interact with various federal and provincial government departments: with TC as ARs and as vessel owners, with DFO as licensed fish harvesters, and with workplace safety and compensation boards as employers responsible for a workplace (Figure 6). For example, fish harvesters and vessel owners must manage fishing licenses, reporting, and regulatory compliance. Masters must hire crew; familiarize them with the vessel, gear, and equipment; conduct drills; operate the vessel; and supervise the fishing operations. A vessel's AR is responsible for ensuring that the vessel and its machinery and equipment meet the regulations; for developing procedures to safely operate the vessel and to deal with emergencies; and for ensuring that crew members receive safety training.[35] The number of different organizations, separate regulatory requirements, and operational duties creates numerous responsibilities for the AR, making it difficult to fully understand the details of the requirements, much less their execution. This difficulty increases with the number of vessels.

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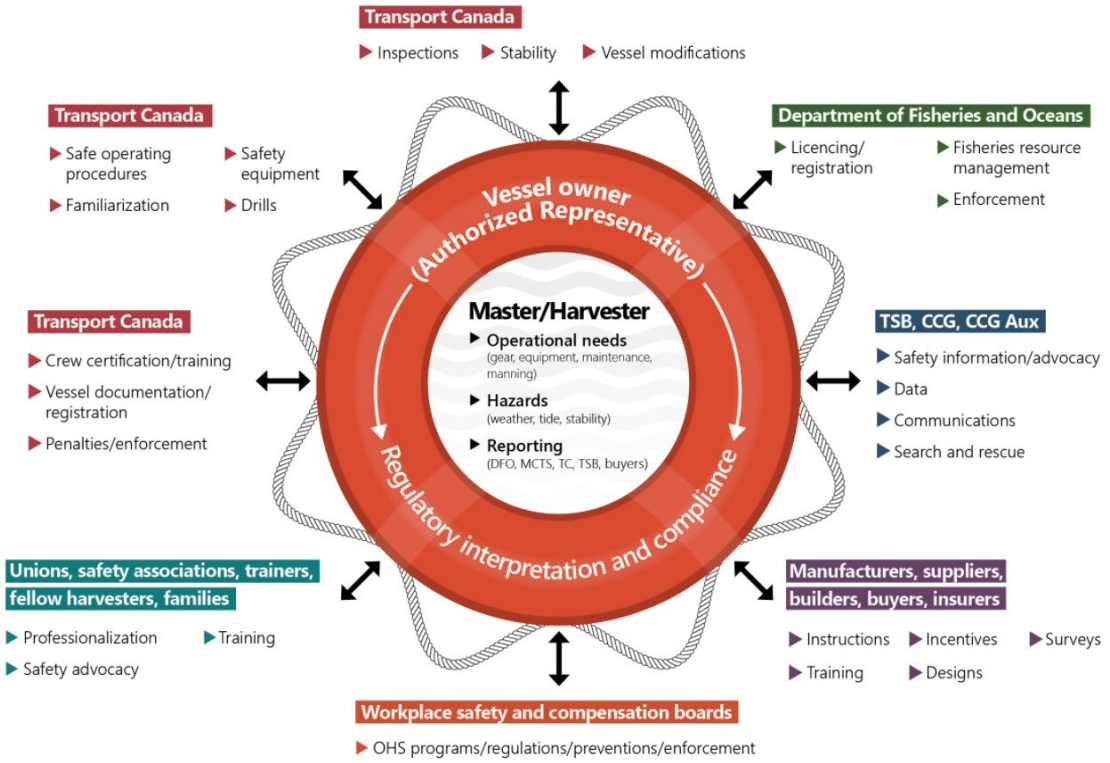
34 Ibid., section 28.

35 Government of Canada, *Canada Shipping Act, 2001* (as amended 30 July 2019), subsection 106(1).

Figure 6. The master and vessel owner interact with numerous federal and provincial departments and organizations to satisfy all regulatory requirements and operate safely (Source: TSB)



1.11 Safety management systems

The International Safety Management (ISM) Code is an international standard for the safe management of ships and the prevention of pollution for ships engaged on international voyages. Chapter IX of the *International Convention for the Safety of Life at Sea, 1974* (the SOLAS Convention) requires certain vessel operators to comply with the ISM Code and develop a safety management system (SMS).

YSP does not have an SMS, nor is it required to have one, but it has a safety program intended to satisfy the requirements of Nova Scotia's *Occupational Health and Safety Act* and TC's regulatory requirements under the *Canada Shipping Act, 2001*. The principles defined in the ISM code are universal for safety management and include

- clearly defined responsibilities, obligations, and authorities for an organization and its vessel operators;
- operating procedures for the vessel and the use of checklists;
- documentation and record-keeping procedures;
- procedures for identifying hazards and managing risks;
- drills, training, and familiarization for vessel crews; and
- a system for self-assessment and improvement.

1.12 Yarmouth Sea Products Limited management of safety

Masters are responsible for safety on board a vessel during operations, but a large part of safety management for a vessel takes place outside of fishing operations. As well as operational maintenance, shore safety management includes preventive maintenance. It must also include developing procedures for and tracking of crew familiarization, training and drills, and regulatory compliance. These shore-based activities create a framework for the masters to operate in.

At YSP, the masters are hired by the company and have an arrangement to use the company vessels to harvest scallops. Masters are responsible for crewing the vessels. They are also responsible for training, familiarization, and drills with the crew on board their vessels in preparation for safe fishing and for identifying operational maintenance needs. Some masters are part of the company's OHS safety committee.

Responsibility for safety management at YSP is shared by the owner, the company's safety officer, and one additional staff member. The owner is involved in larger decisions such as decisions about expensive vessel repairs. The safety officer role was set up to comply with provincial requirements, but the role includes additional responsibilities with no formal, written job description. The safety officer and the additional staff member both deal with maintenance items and support for the vessels. The safety officer performs internal inspections, and the additional staff member organizes TC inspections.

The owner of the vessels, and therefore the AR, is YSP. The investigation determined that shore staff were unaware of what an AR was and there was no consensus as to who was the AR for the company. The safety officer and the additional staff member were performing most of the duties that are defined as part of the AR's responsibilities.

The safety officer has been in his current role since November 2018 and maintains YSP's HSE manual, which is generic and distributed to each of YSP's 25 fishing vessels. The safety officer also has responsibilities besides managing safety, such as managing the boat yard and fabrication shop also owned by the owner of YSP.

1.12.1 Yarmouth Sea Products Limited health, safety, and environment manual

YSP's HSE manual was originally created in 2017 to comply with provincial requirements after a provincial accident investigation. After the safety officer started in his role in late 2018, he reworked the HSE manual to simplify it for the masters and crew and to meet TC regulatory requirements. In July 2020, with the approval of the owner, the safety officer added a new fatigue policy to the manual.

The YSP HSE manual contains various policies, procedures, and forms covering parts of the vessel operations. The manual contains the following forms:

- Boats Familiarization Form (a familiarization checklist; see Appendix A)
- Record of personal [*sic*: personnel] on-Board Form
- Personal Information of Crew Members Form
- Emergency Drill Form

- Maintenance Record Form
- Crew Members Certifications Record
- Incident Report Form

The manual contains the following policies:

- Occupational Health & Safety Policy
- Hard Hat Policy
- Personal Floatation Device (PFD)
- Accident Scene Policy
- Inspection Wire Rope Policy
- Fatigue Policy

The manual contains the following procedures:

- Abandon Ship Procedure
- Fire Fighting Aboard Vessel Procedure
- Person Overboard Procedure
- Pollution Response Procedure
- Taking on Water Procedure
- Ammonia Evacuation Plan
- Ammonia Evacuation Plan for Maintenance Personal [*sic*]

YSP created the Boats Familiarization Form, the Maintenance Record Form, the Crew Members Certifications Record, the Incident Report Form, all of the policies, and the ammonia evacuation plans; the rest of the manual consisted of copies or adaptations of templates prepared as guidance when the FVSR were introduced.

The FVSR require procedures related to preventing fire and taking on water; to protection from fishing equipment that may pose a safety hazard; and to loading, stowing, and unloading. These procedures were not in the HSE manual.

The safety officer ensured that all vessels had copies of the HSE manual, as well as copies of TC's *Small Fishing Vessel Safety Manual*.[36] He collected completed forms from the safety manuals annually, at the beginning of the year. He saved some of the safety manuals from previous years. However, none of the safety manuals from the *Chief William Saulis* were available.

The investigation examined HSE manuals from 3 other YSP vessels containing records from 2017 to 2020. The following documents were included:

- Maintenance Checklist (5)

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36 Transport Canada, TP 10038, *Small Fishing Vessel Safety Manual* (2003), at tc.canada.ca/en/marine-transportation/marine-safety/small-fishing-vessel-safety-manual-tp-10038-e-2003 (last accessed 23 January 2023).

- Emergency Drill Form (4)
- Personal Information of Crew Members Form (10)
- Record of Personnel (15)
- Crew Member Certification Record (2)
- Boats Familiarization Form (3)

During the year, the safety officer asked the masters to send photos of any completed forms or drill records. However, none were available from the *Chief William Saulis*.

1.12.2 Internal vessel inspections

As part of the YSP safety program, the safety officer aims to inspect each of the YSP vessels annually, focusing on safety equipment. However, he does not see every vessel every year. He records the results of inspections using a boat inspection checklist with 59 items (Appendix B). The last inspection on board the *Chief William Saulis* took place on 08 June 2020 and identified 22 deficiencies. Some of the deficiencies and comments were:

- Expired life raft (One expired May 2020, the other was due to expire September 2020)
- Insufficient number of PFDs (for a crew of 8)
- Expired portable fire extinguishers (expired 06 September 2017)
- No manual bilge pump
- 4 survival suits past inspection expiry, 4 survival suits with inspections due to expire in September and October 2020
- General clutter

After an inspection is completed, the completed boat inspection checklist is provided to the master. It is informally understood that the master will resolve the deficiencies. The safety officer returns to the vessel to talk with the master about the issues that have been resolved. There is no formal checkpoint or sign-off at this stage to confirm that all issues have been resolved, and no records of corrected deficiencies are kept.

Expiry dates on the recovered life rafts showed that the life rafts from the June 2020 inspection had been replaced with life rafts expiring in November 2020 and June 2021.

1.13 Developing, documenting, and reviewing safety procedures

Procedures contribute to safety when they are specific to the operations that they apply to, take into account both activities and operating conditions, and are used by their intended audience. Procedures should be reviewed regularly to ensure that they still reflect the activities they describe and that they are being used effectively.

Developing procedures requires an understanding of and experience with the context, goals, risks, and activities of the operations. For fishing operations, this includes a complete understanding of all aspects of the fishery (such as area fished, common weather conditions, and catch and landing requirements) and of the vessel and its limitations. An

understanding of all the factors that might affect the vessel's stability is especially important because many of the risks of fishing operations are related to stability: for example, how equipment such as drags and freeing port covers affects the stability of the vessel; what weight of equipment, ice, and catch are expected; and where that weight is placed on the vessel.

Documenting existing or newly developed procedures in a usable and maintainable written form also requires skill in creating effective written procedures. Fish harvesters have operational knowledge but not all may have an understanding of the associated risks or the skills for creating procedures. Different forms of support are suitable for different kinds of procedures. Support for creating procedures can be in the form of templates that give a general structure and leave operation-specific details to be filled in, such as those provided by TC for some of the FVSR requirements. Support can also be a guided process of some form, such as described in Fish Safe NS's step-by-step guide to completing a job hazard assessment and accompanying safe work procedure.[37] Finally, support can be in the form of examples from similar operations to show the level of detail in the procedures, the kinds of advice and warnings that are included, and formats used. Fish Safe NS also provides some examples of completed safe work procedures, such as lifting traps.[38]

Best practices from industry ensure that common risks across operations are considered during risk assessments. In general, fish harvesters tend to underestimate risk, which may lead to unsafe practices and compromise the safety of a vessel.

Developing safety procedures for fishing operations should involve all members of the crew and include a risk assessment of the operations, supported by industry best practices, to ensure all risks are captured.

1.14 Survival factors

When at sea, crew members risk exposure to the hazards associated with water immersion, which are primarily water ingestion (drowning), and cold water effects, especially in waters 15 °C or colder. Cold water effects include

- initial cold shock, which increases the likelihood of water ingestion and reduces the ability to hold one's breath;
- cold incapacitation, which reduces dexterity, speed, and strength; hinders the ability to perform any tasks; and may lead to drowning if no flotation aid is worn and the person is unable to keep their head above water; and
- hypothermia, which can occur quickly depending on water temperature and can lead to drowning if no flotation aid or thermal protection is used or worn.

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37 Fish Safe NS, *Completing a Job Hazard Assessment and Connecting Safe Work Procedure*, at fisheriessafety.ca/_files/ugd/7a1cbf_e15f6f651a484784a85a364a395ddc62.pdf (last accessed 23 January 2023).

38 Fish Safe NS, "Safe Work Procedures," at fisheriessafety.ca/safe-work-procedures (last accessed on 23 January 2023).

Some other factors that affect survivability in water are sea state, water ingress rate,[39] activity levels, body position, and stress response, which often results in survivors experiencing a sudden onset of psychological stress, anxiety, confusion, disorientation, and/or distraction. These factors increase the probability of water ingestion, increase the rate of heat loss, and reduce overall survivability.

The investigation determined that most of the crew members had little to no swimming ability, which would have affected their ability to survive in water.

1.14.1 Fatigue

Disruptions to sleep or sleeping patterns have been shown to cause fatigue, which can slow reaction time and reduce the ability to solve complex problems.[40] The time of day has a particular effect on an individual's alertness and performance as the human body experiences circadian highs and lows. For example, a circadian rhythm trough, or overall low period of human performance, occurs between approximately 2230 and 0430,[41] though it varies slightly depending on each individual. Overall performance and cognitive functioning are at their worst during the circadian rhythm trough.[42] Further, if a person is suddenly awoken from sleep, they may experience sleep inertia, which is characterized by confusion, disorientation, low arousal, and deficits in various types of cognitive and motor performance skills.[43]

For sleep to be restorative, it should occur at night in a period of 7 to 9 continuous hours[44,45] so that all 5 stages of sleep[46] occur during each nightly sleep period.

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39 Even if the sea state is calm, gushing water, for example from a vessel door or hatch, will significantly increase the risk of drowning. Not only will the water continuously cover the face and mouth and potentially fill the survivable space, it will significantly hinder the ability to swim and escape to the surface.

40 T. Maddox, B. D. Glass, S. M. Wolosin et al., "The Effects of Sleep Deprivation on Information-Integration Categorization Performance," *Sleep*, Vol. 32, Issue 11 (2009), pp. 1439–1448).

41 J. F. Duffy, D. J. Dijk, E. B. Klerman and C. A. Czeisler, "Later endogenous circadian temperature nadir relative to an earlier wake time in older people," *American Journal of Physiology*, Vol. 275, Issue 5 (1998), pp. R1478–R1487.

42 See for example A. Reinberg, M. H. Smolensky, M. Riedel, et al., "Chronobiologic perspectives of black time—Accident risk is greatest at night: An opinion paper," *Chronobiology International*, Vol. 32, Issue 7 (2015), pp. 1005–1018.

43 M. Ferrara and L. De Gennaro, "The sleep inertia phenomenon during the sleep-wake transition: Theoretical operational issues," *Aviation, Space and Environmental Medicine*, Vol. 71, Issue 8, pp. 843–848.

44 M. Hirshkowitz, K. Whiton, S. M. Albert, et al., "National Sleep Foundation's Sleep Time Duration Recommendations: Methodology and Results Summary," *Sleep Health: Journal of the National Sleep Foundation*, Vol. 1, Issue 1 (March 2015), pp. 40–43.

45 Fatigue-management programs, such as the United States Coast Guard's Crew Endurance Management System, have shown that at least 7 to 8 continuous hours of sleep is preferable.

46 The 5 stages of sleep consist of 4 to 6 repeating cycles of approximately 90 minutes each, with each cycle occurring as follows: stage 1, stage 2, stage 3, stage 4, stage 3, stage 2, REM sleep.

If a person's sleep is repeatedly disrupted during the first half of the normal sleep period, total deep-stage sleep will be decreased, increasing the risk of fatigue and disrupted physiological functioning. If a person's sleep is disrupted in the second half of the sleep period, REM sleep will be restricted, leading to impairments in cognitive functioning as well as increased fatigue.

The YSP Occupational Health and Safety Policy contains a fatigue policy, which discusses the risks of fatigue, the signs and symptoms of fatigue, the potential performance impairments, and employee responsibility to manage or mitigate fatigue and report it where appropriate. It also identifies that individuals need between 7.5 to 8.5 hours of sleep per day.

The work shifts on the *Chief William Saulis* typically followed a pattern of 8 hours on / 4 hours off throughout a 24-hour period. Although it was not possible to determine the exact sleep patterns of the crew, the following was noted:

- The crew's work schedule of 8 hours on / 4 hours off would not have permitted them restorative sleep during the days leading up to the occurrence.
- It is likely the crew had some disruptions to their normal sleeping patterns in the days prior to the occurrence, even if this was just the natural disruption of working sporadic hours and trying to sleep in conditions that are typically not conducive for sleep.
- The emergency took place at around 0550, which is a time the crew would normally require restful sleep and near a period of circadian low.
- Because it was typical for crews to rest on the return trip in rough sea conditions, and because the vessel was returning at night, it is probable that some crew members were awoken from sleep when the emergency occurred.

1.15 Active TSB recommendations

1.15.1 Recommendation relating to stability assessments and adequate stability information for small fishing vessels

Following an occurrence on 05 September 2015, in which the large fishing vessel *Caledonian* suddenly capsized 20 NM west of Nootka Sound, British Columbia, and 3 crew members died,[47] the Board recommended that

> the Department of Transport require that all small fishing vessels undergo a stability assessment and establish standards to ensure that the stability information is adequate and readily available to the crew.
>
> **TSB Recommendation M16-03**

Stability assessments provide guidance to masters in ensuring operations fall within the safe stability limits of their vessels. TC requires an assessment of certain risk factors and modifications that are likely to adversely impact the stability of a vessel, to ensure that the

47 TSB Marine Investigation Report M15P0286.

remaining stability is sufficient. The *Chief William Saulis* was equipped with freeing port covers that, when used, adversely impacted the stability of the vessel. Additionally, scallops were carried on deck, which could block open freeing ports. The vessel also carried substantial topside weight. However, no stability assessment was conducted.

Since the release of Recommendation M16-03, the TSB has followed up annually with TC on action to address the recommendation. TC has provided responses to indicate any action taken, and the TSB has assessed those responses. At February 2023, TC's response to the recommendation was assessed as **Unsatisfactory**. The history of these responses is available on the TSB website.[48]

1.15.2 Recommendations relating to the risk of fatigue in the marine industry

On 13 October 2016, the articulated tug-barge composed of the tug *Nathan E. Stewart* and the tank barge DBL 55 went aground approximately 10 NM west of Bella Bella, British Columbia.[49]

Following this occurrence, the Board concluded its investigation and released report M16P0378 on 31 May 2018. The investigation found that although fatigue is widely accepted as an unavoidable condition within the marine industry and is recognized as a contributing factor in many marine accidents, there is a general lack of awareness of the factors that cause fatigue. If watchkeepers understand those factors and the practical actions that can be taken to minimize their effects, it may significantly reduce the number of fatigue-related occurrences. The Board therefore recommended that

> the Department of Transport require that watchkeepers whose work and rest periods are regulated by the *Marine Personnel Regulations* receive practical fatigue education and awareness training in order to help identify and prevent the risks of fatigue.
>
> **TSB Recommendation M18-01**

The investigation also found that implementing effective fatigue education and awareness for watchkeepers is just one step that will help the marine industry go beyond the regulations to mitigate the risk of fatigue. Implementing comprehensive fatigue management plans within the marine industry will bring it in line with approaches to fatigue management adopted by the rail and air transportation modes. The Board therefore also recommended that

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48 TSB Recommendation M16-03: Stability assessments and adequate stability information for all small fishing vessels, at tsb.gc.ca/eng/recommandations-recommendations/marine/2016/rec-m1603.html (last accessed on 23 January 2023).

49 TSB Marine Investigation Report M16P0378.

> the Department of Transport require vessel owners whose watchkeepers' work and rest periods are regulated by the *Marine Personnel Regulations* to implement a comprehensive fatigue management plan tailored specifically for their operation, to reduce the risk of fatigue.
>
> **TSB Recommendation M18-02**

Education and awareness training on fatigue are critical to ensuring crew are aware and able to identify and prevent the risks. This training is also required to ensure that materials developed, such as the YSP fatigue policy, are structured in a way that prevent work schedules that create fatigue.

Since the release of recommendations M18-01 and M18-02, the TSB has followed up annually with TC on action to address them. TC has provided responses to indicate any action taken, and the TSB has assessed those responses. At February 2023, TC's response to Recommendation M18-01 was assessed as having **Satisfactory Intent**, and its response to Recommendation M18-02 was assessed as **Unsatisfactory**. The history of these responses is available on the TSB website.[50,51]

1.16 Previous TSB occurrences

1.16.1 Fishing vessel occurrences related to stability

Since 2007, a number of fishing vessels have capsized from combinations of shifting loads, free surface effect, and sea conditions with subsequent loss of life. The following occurrences had factors affecting stability similar to those of this occurrence.

- **M07N0117** – The 10.64 m small fishing vessel *Sea Urchin*, with 3 people on board, capsized and sank due to the combined effects of wind gusts, quartering seas, shifting fishing gear and subsequent water ingress resulting in 1 fatality.
- **M07M0088** – The 10.7 m lobster trap vessel *Big Sister*, with 4 people on board, capsized while laden with traps, resulting in 1 fatality. There were choppy seas and the wind was blowing on the vessel's port beam.
- **M09L0074** - The 14 m crab trap vessel *Le Marsouin I*, with 3 people on board, capsized while navigating in slight to moderate quartering seas, resulting in 2 fatalities.
- **M14P0121** – The 8.69 m small fishing vessel *Five Star*, with 3 people on board, capsized while navigating in following seas and against the tide, resulting in 2 fatalities.

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50 TSB Recommendation M18-01: Fatigue education and awareness training for watchkeepers, at tsb.gc.ca/eng/recommandations-recommendations/marine/2018/rec-m1801.html (last accessed on 23 January 2023).

51 TSB Recommendation M18-02: Fatigue management plans on vessels, at tsb.gc.ca/eng/recommandations-recommendations/marine/2018/rec-m1802.html (last accessed on 23 January 2023).

- **M18A0303** – The 11.5 m fishing vessel *Kyla Anne*, with 3 people on board, capsized after being struck broadside by a large breaking wave, shifting cargo, and subsequently being struck by 2 more large waves, resulting in 2 fatalities.

In addition**,** the 10.64 metre fishing vessel *Sarah Anne* (M20A0160), with 4 people on board, went missing and likely capsized while fishing. The vessel had no formal stability assessment.

1.16.2 Occurrences related to procedures and documentation for vessels

Since 2007 the TSB has made findings as to cause and contributing factors as well as findings as to risk relating to an absence of procedures for vessels in a number of investigations:

- **M09N0031** – The small fishing vessel *Sea Gypsy Enterprises*, with 5 people on board, capsized and sank due to downflooding from an unsecured hatch, resulting in 1 fatality and 1 missing crew member. The vessel did not have procedures for the securing of watertight hatches, maintaining equipment, or conducting safety drills.
- **M10C0043** – The passenger vessel *River Rouge*, with 71 passengers and crew on board, ran aground after steering off the recommended course. The vessel did not have written procedures concerning emergency situations and training nor was this gap identified during TC inspections.
- **M13L0067** – The passenger vessel *Louis Jolliet*, with 78 passengers and crew on board, ran aground after the vessel proceeded off course. The vessel did not have procedures regarding the navigational watch, voyage planning or familiarization of crew.
- **M15P0037** – The tug *Syringa,* with 2 crew on board, sank due to water ingress and progressive downflooding. The vessel did not have procedures for the safe operation of the vessel or for dealing with emergencies.
- **M16P0162** – The tug *C.T. Titan* collided with the tug *Albern* causing it to capsize and sink. The *C.T. Titan* did not have procedures for common aspects of the vessel's operation or all emergency procedures such as collision, striking and grounding.
- **M17C0232** – The third officer on the general cargo vessel *Amazoneborg*, which had 14 crew members on board, fell overboard while completing draft readings and drowned,. The vessel did not have any procedures for taking draft measurements.
- **M17P0052** – The small fishing vessel *Miss Cory*, with 5 people on board, capsized and sank from progressive downflooding after the vessel heeled due to an increased load on its boom. The vessel did not have any procedures for the safe operation of the vessel or for dealing with emergencies.

1.17 TSB Watchlist

The TSB Watchlist identifies the key safety issues that need to be addressed to make Canada's transportation system even safer.

Commercial fishing safety is a Watchlist 2022 issue. The Board placed commercial fishing safety on the Watchlist in 2010. Every year, the same safety deficiencies on board fishing vessels continue to put at risk the lives of thousands of Canadian fish harvesters and the livelihoods of their families and communities. From 01 July 2020 to 30 June 2022,[52] there were 19 fatalities related to commercial fishing in Canada. The number of fish harvesters that lose their lives annually has not decreased, and continues to average about 11 per year, despite a slight reduction in the number of fish harvesters and active fishing vessels over the same period, making harvesting marine resources one of the most hazardous occupations in the country. This occurrence demonstrates the continued need for regulatory oversight of commercial fishing to support ARs and masters in ensuring that they follow and document safe work practices.

ACTIONS REQUIRED

Commercial fishing safety will remain on the Watchlist until there are sufficient indications that a sound safety culture has taken root throughout the industry and in fishing communities across the country, namely:

- TC and DFO work together to ensure that fish harvesters meet all requirements before they operate commercially.
- Federal and provincial authorities coordinate regulatory oversight of commercial fisheries.
- TC, provincial workplace safety authorities, and fish harvester associations promote existing user-friendly guidelines on vessel stability designed to reduce unsafe practices.
- Spurred by the leadership of industry and safety advocates, there is marked and widespread evidence that harvesters are taking ownership of safety, specifically with respect to the use of stability guidelines, PFDs, immersion suits, emergency signaling devices, and safe work practices.

Fatigue management is a Watchlist 2022 issue. As this occurrence demonstrates, fatigue can impact the survivability of crew in an emergency situation. Given that fishing operations are not conducive to obtaining proper restorative sleep, fish harvesters need a greater awareness of the risks associated with fatigue and effective strategies to mitigate its risks. This occurrence further demonstrates the continued need for fatigue education and awareness training to ensure fatigue management plans mitigate all aspects of fatigue.

ACTIONS REQUIRED

Fatigue management in marine transportation will remain on the Watchlist until

- TC requires that watchkeepers whose work and rest periods are regulated by the *Marine Personnel Regulations* receive practical fatigue education and awareness training to help identify and prevent the risks of fatigue.

52 To facilitate Watchlist preparation, the time period used for statistical purposes is a 2-year period beginning on 01 July 2020 and ending on 30 June 2022.

- Vessel owners are required to implement fatigue management plans, including education on the detrimental effects of fatigue and support to mariners in reporting, managing and mitigating fatigue; and
- TC reviews the domestic hours of work and rest provisions in the *Marine Personnel Regulations* in light of the most recent knowledge from fatigue science and, at a minimum, ensures consistency with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

Regulatory oversight is a Watchlist 2022 issue. As this occurrence demonstrates, there is a continued need for effective TC surveillance and monitoring to ensure compliance with regulatory requirements particularly in respect to written safety procedures. Given the gaps identified in the YSP HSE manual and the number of inspections carried out on vessels operating under this manual, there is a need for additional oversight of the commercial vessel inspection process.

ACTIONS REQUIRED

Regulatory surveillance will remain on the Watchlist for the marine transportation sector until TC provides more oversight of the commercial vessel inspection process by demonstrating that its surveillance and monitoring are effective in ensuring that ARs and recognized organizations are ensuring vessel compliance with regulatory requirements. Additionally, TC demonstrates an increase in proactive surveillance.

Safety management is a Watchlist 2022 issue. Fishing vessels are exempt from regulations regarding safety management. However, under subsection 3.16 of the FVSR, fishing vessels are required to have written safety procedures. The investigation determined that although a safety program had been developed and implemented by YSP, it did not address all required procedures, particularly regarding the safe operation of the vessel, and there is no mechanism to ensure that the program is effective at identifying and mitigating hazards.

ACTIONS REQUIRED

Safety management will remain on the Watchlist for the air and marine transportation sectors until

- TC implements regulations requiring all commercial operators to have formal safety management processes; and
- operators that do have an SMS demonstrate to TC that it is working—that hazards are being identified and effective risk-mitigation measures are being implemented.

2.0 ANALYSIS

The analysis will look at the factors affecting the stability of the vessel and the conditions at the time of the occurrence; the loss of life, safety management and safety procedures in commercial fishing vessels; and Transport Canada (TC) guidance and oversight.

2.1 Factors that affected stability

All fishing vessels must have adequate stability to undertake their intended operations, and TC may request that the authorized representative (AR) demonstrate the adequacy of a vessel's stability. Although many fish harvesters use the feel of their vessel and past experience to determine stability limits, this is not reliable: stability should be measured through a formal stability assessment and connected to the safe operating limits and practices of the vessel.

Existing vessels such as the *Chief William Saulis* that are more than 9 m long are not required to have such an assessment unless certain stability risk factors are present or they have had a major modification that is likely to adversely impact stability. Yarmouth Sea Products Limited (YSP) believed that the *Chief William Saulis* did not require such an assessment, nor was one ever requested by TC as a result of its inspections. However, risk factors that are likely to adversely impact stability, like the use of freeing port covers, the practice of stowing scallops on deck, and the substantial topside weight from the A-frame and second shucking house, require a stability assessment to ensure the vessel's stability remains adequate.

In most cases, a vessel loses stability when multiple factors combine to make the vessel exceed safe operating limits, even if these factors have only a moderate impact on stability if they were present individually. In this occurrence, the environmental conditions, stowage of cargo, and free surface effects combined to significantly impact the stability of the *Chief William Saulis*:

- The environmental conditions increased the risk of losing stability. Wave heights were greater than 2 m and the current and wind were acting from 212° magnetic and 305° magnetic respectively, creating a beam sea condition that greatly increased roll motions and the risk of capsizing.
- The weather was too rough for shucking on the return trip, so the *Chief William Saulis* was carrying approximately 4300 kg of scallops, close to 3 times the reportable catch, due to the additional weight of the scallop shells. As well, the unshucked scallops were normally stowed unsecured on deck in piles surrounded by totes and baskets. When stowed this way, the scallops may have blocked any remaining open freeing ports and were free to move the full width of the vessel as the vessel rolled in the sea conditions.
- Given the typical use of the freeing port covers, at least 4 of 5 freeing ports on each side were likely covered at the time of the occurrence. Because the vessel was travelling in conditions where the waves were larger than the vessel's freeboard and so likely to be breaking over the bulwark, water would have begun to accumulate.

Water on the deck adds to the load, but more significantly, it shifts with the movement of the vessel and amplifies the shifting of the catch, creating a large free surface effect. The dangers of water collecting on deck and importance of freeing ports are mentioned in TP 10038,[53] which the YSP safety officer included with the Health, Safety, and Environment (HSE) manual. However, freeing ports were not included in the YSP vessel inspection checklist.

Overall, the vertical centre of gravity of the vessel would have been raised by the amount and location of the catch and water, and there would have been a sizeable free surface effect from their movement across the width of the deck in the rough weather.

Finding as to causes and contributing factors

Without a formal stability assessment, the crew made operating decisions that likely affected the vessel's stability without sufficient knowledge of the vessel's safe operating limits.

Finding as to causes and contributing factors

The vessel departed the fishing grounds with unshucked scallops on deck, and the freeing ports were likely covered either mechanically or by scallops so that water from the heavy beam sea also accumulated on deck. The resulting free surface effect from shifting scallops and water and the rolling motion from the heavy beam sea likely caused the vessel to capsize and sink.

2.2 Loss of life

The exact location on the vessel of the crew at the time of the occurrence is unknown. However, given that they were making the return voyage at night in weather too rough to continue shucking, it is likely that crew members were either in the wheelhouse or resting in the accommodation space.

When the emergency occurred, crew members who were in the accommodation space would have needed to recover from any sudden, large movement of the vessel and make their way to an escape route. The escape routes from the accommodation space were through the emergency escape hatch or through the wheelhouse. However, the emergency escape hatch was not part of the crew familiarization checklist or part of the abandon ship procedure. As well, the crew would have had to deal with any unsecured or loosened obstacles and possible injuries that may have resulted.

Crew members who started in or reached the wheelhouse needed to go through one of the shucking houses, through either the inboard or aft sliding doors. The aft doors closed

53 Transport Canada, TP 10038, *Small Fishing Vessel Safety Manual* (2003), section 2: Stability, subsection 3: Loose Water or Fish on Deck, at tc.canada.ca/en/marine-transportation/marine-safety/loose-water-fish-deck (last accessed on 23 January 2023).

toward the centre of the vessel and could have been difficult to shift if the angle of list was large or if the vessel had capsized.

Crew members would have been attempting to escape in the dark and quite likely with the vessel at an unusual angle, making the escape routes more difficult to access. They would have needed either to reach the deck before water began to enter the wheelhouse and accommodation space or to swim out when the water ingress rate had slowed. This second option would have been very difficult given the water temperature and the difficulty of navigating the flooded accommodation space. The water was cold (9.2 °C), which would have caused an initial cold shock response, cold incapacitation, and a stress response, reducing their ability to respond to the emergency. The crew member whose body was recovered was not wearing lifesaving equipment, and it is unlikely that any of the crew members would have been able to retrieve and don lifesaving equipment.

As well, crew members were likely fatigued from the effects of the work schedule, from the lack of restorative sleep over the course of the voyage, and by the timing of the emergency early in the morning, near a period of circadian low. This fatigue would have reduced cognitive functioning and the ability to respond to the emergency situation.

Findings as to causes and contributing factors

The ingress rate and cold temperature of the water, fatigue, being woken from sleep, darkness, stress response, and the difficult-to-access escape routes combined to significantly affect the crew's chances of survival.

2.3 Safety management

Safety management requires an organization to be cognizant of the hazards involved in its operations and to manage the resulting risks. A safety management system can help ensure that members at all levels of an organization have the knowledge and the tools to manage risk effectively, as well as the necessary information to make sound decisions in all operating conditions, both routine and emergency. Safety management remains a TSB Watchlist issue; the TSB has identified that even when formal processes are present, they are often not effective.

In 2017, YSP created a safety program to comply with provincial requirements following an accident investigation by the Nova Scotia Department of Labour, Skills and Immigration's Occupational Health and Safety Division. The program was updated in 2018 to meet TC requirements and again in 2020 to include a fatigue policy.

The investigation assessed the YSP safety program using the principles defined in the International Safety Management Code with respect to the definition of responsibilities; operating procedures for vessels; documentation and record-keeping; procedures for identifying hazards and managing risks; drills, training, and familiarization for vessel crews; and a system for self-assessment and improvement.

2.3.1 Clearly defined responsibilities, obligations, and authorities

At YSP, the owner of the vessels, and therefore the AR, was the company itself. The investigation determined that shore staff were unaware of what an AR was, and there was no consensus as to who was designated to carry out the AR's responsibilities.

Responsibility for safety was shared between the YSP safety officer, the shore staff member, and the masters of the 25 YSP vessels. YSP did not have written job descriptions, and the divisions of responsibility for safety were informal. Such an informal distribution of responsibilities has been identified by the TSB in other investigations,[54] and leads to gaps in the safety system.

2.3.2 Operating procedures for the vessel

The procedures related to vessels in YSP's Health, Safety, and Environment (HSE) manual were copied from templates provided by TC. These templates provide a starting point only and must be adapted to the specific operations of the organization based on input from people experienced in those operations. This input must be structured using a guided process, such as the job hazard assessment provided by Fish Safe NS, and supported by best practices from industry. Otherwise, the procedures may not be developed to effectively ensure safe work practices.

The HSE manual contained policies as well as procedures, including one for fatigue. However, the version of the fatigue policy that was examined did not include restorative sleep, an important aspect of fatigue management. Policies that do not fully address hazards will inadvertently expose masters and crew to risk. For example, in the case of insufficient restorative sleep, risks are related to impairments in cognitive functioning and increased fatigue.

2.3.3 Documentation and record-keeping

For documentation and record-keeping at YSP, the masters completed forms in the HSE manual and the safety officer collected the forms or photos sent by masters. The responsibility for completing these forms was therefore placed on the masters of the individual vessels. However, there was no follow-up to ensure that documentation was being completed.

The investigation determined that the most common form filled out was the record of personnel: across 3 vessels and 3 years, 15 records of personnel were filled out. In contrast, 5 maintenance record forms, 3 familiarization checklists, 4 emergency drill forms, and 2 crew member certification records were completed for these vessels. No documented records were available for the *Chief William Saulis*.

Without consistent documentation and follow-up, there is no way to ensure masters are preparing crew members effectively for the risks associated with operations.

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54 For example, TSB Marine Transportation Safety Investigation Report M20P0229.

2.3.4 Procedures for identifying hazards and managing risks

YSP uses internal vessel inspections to identify hazards and risks on board vessels. The inspections are based on a checklist and cover various systems and pieces of safety equipment on board the vessel. This process is not formally documented, and the roles of the master and safety officer are not clearly defined. In practice, the safety officer completes the inspections and the deficiencies are informally left to the master to resolve. The safety officer then talks with the master later. However, there is no checkpoint or documentation to ensure that all deficiencies have been resolved appropriately. Without this step, there is no way to confirm that the hazards resulting from the deficiencies are being adequately addressed.

2.3.5 Drills, training, and familiarization

To ensure that masters and crew members are prepared for emergencies, drills and familiarization must be conducted. Although YSP had drill procedures, they were not tailored to specific vessels and operations. Additionally, YSP did not require vessels to complete drills or familiarization. All records obtained from 3 YSP vessels show only 3 familiarization checklists and 4 drill records across 3 years. No records of drills or familiarization were available for the *Chief William Saulis*.

2.3.6 Self-assessment and improvement for effective safety management

To ensure that the management of safety continues to be effective, a company should have a process for self-assessment and improvement. At YSP, the responsibility for the HSE manual and for internal inspections fell on the safety officer. The owner reviewed changes proposed by the safety officer. However, the addition of new material was largely driven by the safety officer. As structured, no internal oversight of the execution of the safety system was in place. Without processes for self-assessment and improvement, YSP cannot ensure that its program is managing safety effectively.

Finally, safety management should help ensure that organizations remain compliant with the regulations. Multiple procedures were required by the *Fishing Vessel Safety Regulations* (FVSR) but were not included in the HSE manual. Most importantly for this occurrence, there were no procedures for fishing operations, such as loading, unloading, and stowage, and other operations. Such procedures are important for evaluating risks to stability and ensuring that masters have guidance to complete operations in accordance with safe work practices.

Finding as to risk

If a company does not identify hazards specific to the context and nature of operations and assess their risks using a guided process, then fish harvesters will be left without appropriate guidance and safe work practices for mitigating hazards effectively.

2.4 Transport Canada guidance and oversight

Developing and documenting safety procedures is a detailed process that requires guidance to ensure the procedures are complete and effective. The safety officer for YSP used most of the templates provided by TC when he rewrote the YSP HSE manual in 2019, believing he was meeting TC regulatory requirements. However, these templates do not cover all required procedures, and to be effective they must be modified to match the operation of each vessel. For example, there are procedures for fighting a fire and what to do if a vessel takes on water, but not for preventing fire or taking on water.[55] There is no disclaimer to inform readers that the list is not exhaustive and that additional work is required to create useful material.

Finding as to risk

If guidance provided by TC for written safety procedures required by the FVSR, including templates, only partially covers regulatory requirements for effective safety procedures, there is a risk that organizations will not develop complete written safety procedures.

In TSB Recommendation M03-07, the Board recommended that TC reduce unsafe practices by means of a code of best practices for small fishing vessels, including best practices related to loading and stability. In response to this recommendation, TC published *Guidelines for Fishing Vessel Major Modifications or a Change in Activity* (TP 15392) and *Adequate Stability and Safety Guidelines for Fishing Vessels* (TP 15393). These documents provide best practices related to loading and stability of vessels. Loading and unloading procedures are among the most important operational procedures required in the FVSR, and these were not included in the YSP HSE manual.

Although the implementation of these best practices has been mainly left to the fishing associations, part of a TC certification inspection is to look at written safety procedures and records of implementation. The oversight of these items is not always effective. Inspectors are required to verify that safety procedures are on board, that familiarization procedures and drills are carried out, and that records of familiarization and drills are kept. However, training instructions for TC marine safety inspectors state that written safety procedures do not need to be approved. That is, inspectors are not required to assess the completeness or quality of safety procedures. However, this approach to verification and feedback of the policies and procedures that are required by regulation during the certification process is a missed opportunity to promote the continuous improvement of safe work practices, particularly those related to loading and stability.

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55 Transport Canada, "Templates for small fishing vessel procedures," at tc.canada.ca/en/marine-transportation/marine-safety/templates-small-fishing-vessel-procedures (last accessed on 23 January 2023).

In this occurrence, TC inspection records do not show any deficiencies related to drill records or safety procedures in any of the 84 inspections of 25 YSP vessels between 13 July 2017 and 15 December 2020. Furthermore, TC's 2021/2022 concentrated inspection campaign of 101 vessels across Canada found deficiencies related to drills and drill records (41%), the completeness and accessibility of safety procedures (30%), and the crews' knowledge of safety procedures (28%).

Regulatory surveillance and commercial fishing safety remain on the TSB Watchlist as key safety issues to be addressed. As shown in this occurrence, TC surveillance is not always effective, and TC's reliance on ARs is not achieving the intended results.

Finding as to risk

If the vessel certification process does not identify gaps in safety procedures and provide education, there is a risk that masters, owners, and others filling the role of AR will allow vessels to operate without effective safe work practices.

3.0 FINDINGS

3.1 Findings as to causes and contributing factors

These are conditions, acts or safety deficiencies that were found to have caused or contributed to this occurrence.

1. Without a formal stability assessment, the crew made operating decisions that likely affected the vessel's stability without sufficient knowledge of the vessel's safe operating limits.

2. The vessel departed the fishing grounds with unshucked scallops on deck and the freeing ports were likely covered either mechanically or by scallops so that water from the heavy beam sea also accumulated on deck. The resulting free surface effect from shifting scallops and water and the rolling motion from the heavy beam sea likely caused the vessel to capsize and sink.

3. The ingress rate and cold temperature of the water, fatigue, being woken from sleep, darkness, stress response, and the difficult-to-access escape routes combined to significantly affect survivability.

3.2 Findings as to risk

These are conditions, unsafe acts or safety deficiencies that were found not to be a factor in this occurrence but could have adverse consequences in future occurrences.

1. If a company does not identify hazards specific to the context and nature of operations and assess their risks using a guided process, then fish harvesters will be left without appropriate guidance and safe work practices for mitigating hazards effectively.

2. If guidance provided by Transport Canada for written safety procedures required by the *Fishing Vessel Safety Regulations*, including templates, only partially covers regulatory requirements for effective safety procedures, there is a risk that organizations will not develop complete written safety procedures.

3. If the vessel certification process does not identify gaps in safety procedures and provide education, there is a risk that masters, owners, and others filling the role of AR will allow vessels to operate without effective safe work practices.

3.3 Other findings

These items could enhance safety, resolve an issue of controversy, or provide a data point for future safety studies.

1. Yarmouth Sea Products Limited did not have an up-to-date crew list for the *Chief William Saulis* before the vessel departed for the fishing grounds. Yarmouth Sea

Products Limited was unable to provide the Joint Rescue Coordination Centre with the total number of persons on board until 26 hours after the occurrence.

4.0 SAFETY ACTION

4.1 Safety action taken

4.1.1 Yarmouth Sea Products Limited

Following the occurrence, Yarmouth Sea Products Limited required vessel masters to leave crew lists with the safety officer before departure.

4.2 Safety action required

4.2.1 Regulatory oversight of written safety procedures for fishing vessels

On 15 December 2020, the fishing vessel *Chief William Saulis* was returning from scallop fishing when the Joint Rescue Coordination Centre in Halifax, Nova Scotia, received a signal from its emergency position-indicating radio beacon (EPIRB), 12 nautical miles NNE of Digby, Nova Scotia. Search and rescue efforts were initiated after the vessel could not be reached via very high frequency (VHF) radio or phone. The body of 1 crew member was recovered; as of December 2022, the other crew members remained missing.

The investigation determined that the vessel departed the fishing grounds with unshucked scallops on deck, and the freeing ports were likely covered either mechanically or by scallops, so that water from the heavy beam sea also accumulated on deck. The resulting free surface effect from shifting scallops and water and the rolling motion from the heavy beam sea likely caused the vessel to capsize and sink.

Both the *Canada Shipping Act, 2001* and the *Fishing Vessel Safety Regulations* (FVSR) require a vessel's authorized representative (AR) to provide written safety procedures that familiarize persons on board with various operational and emergency activities. Yarmouth Sea Products Limited (YSP), the AR for the *Chief William Saulis*, had provided the *Chief William Saulis* and the other 24 vessels in the YSP fleet with a manual for vessel operations. Most of the safety procedures in the manual were based on templates provided by Transport Canada (TC). However, these templates do not cover all required procedures, and the manual did not include all procedures required by regulation. In particular, the manual did not have any written procedures to guide the use of the freeing ports, or for how scallops should be stowed on deck, 2 elements critical for the stability of the *Chief William Saulis*. The investigation determined that, if guidance provided by TC for written safety procedures required by the *Fishing Vessel Safety Regulations*, including templates, only partially covers regulatory requirements for effective safety procedures, there is a risk that organizations will not develop complete written safety procedures.

For fishing vessels such as the *Chief William Saulis*, TC's certification program is the primary oversight mechanism to ensure compliance with regulations. Although written safety procedures are required by regulation, TC does not require them to be approved, does not verify their content during inspections, and does not determine if the crew are knowledgeable about the procedures.

TC inspection records indicate that from July 2017 to December 2020, 84 separate inspections were conducted on the 25 vessels operated by YSP. None of the records indicated any deficiencies relating to the vessels' safety procedures. The investigation found that, if the vessel certification process does not identify gaps in safety procedures and provide education, there is a risk that masters, owners, and others filling the role of AR will allow vessels to operate without effective safe work practices.

Concentrated Inspection Campaigns (CICs) are one form of TC oversight that is independent of the regular certification program. In these campaigns, TC focuses on a specific area of safety concern for Canadian vessels. In 2021/2022, TC conducted a CIC that focused on fishing vessels and especially on compliance with the FVSR, including regulatory requirements for effective safety procedures. The CIC found deficiencies that had not been identified through TC's certification program and issued deficiency notices to 62% of the 101 vessels inspected. The largest number of deficiencies were related to ensuring the safety of vessel and crew: vessels had deficiencies related to drills and drill records (41%), the completeness and accessibility of safety procedures (30%), and the crews' knowledge of safety procedures (28%).

TC's oversight is not always effective and so the issue of regulatory oversight remains on the TSB Watchlist 2022.

Without TC oversight to validate that the written procedures required by regulation on board fishing vessels have been developed and that crew are knowledgeable of their content, there is a risk that fishing operations will continue without guidance critical to support the safety of the crew and the vessel. The Board therefore recommends that

> the Department of Transport ensure that each inspection of a commercial fishing vessel verifies that each required written safety procedure is available to the crew and that the crew are knowledgeable of these procedures.
>
> **TSB Recommendation M23-05**

This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. The Board authorized the release of this report on 11 January 2023. It was officially released on 22 March 2023.

APPENDICES

Appendix A: Yarmouth Sea Products Limited familiarization checklist

Figure A1. Blank checklist of the types of equipment on board the Chief William Saulis for which crew members are required to know the location and proper use (Source: Yarmouth Sea Products Limited)

Section 2)

Cheif william saulis

On Board familiarization

All crew members should know the location and proper use of the following:

Vessel Name:	

Life Saving Equipment: (if Applicable or if Carried)	
☐ Life Jacket (keyhole)	☐Personal Floatation device (PFD)
☐Immersion Suit (Survival Suit)	☐Rescue Throwing Device
☐Insulated Work Suit (Floater Suit)	☐Safety Harness/Life Line
☐Life Raft or Life Boat	☐First Aid Kit
☐Life Ring / Life Buoy	☐Personal Safety Gear (Hard Hat / Gloves)
☐Boarding Ladder	☐
Fire Fighting Equipment	
☐Portable Fire Extinguishers	☐Water Pumping Equipment
☐Water Hoses & Nozzles	☐Fire Axe
☐Fixed Fire extinguisher Equipment	☐Fire buckets
Communication Equipment	
☐Flares & other Signaling Devices	☐Emergency or Hand-Held Radiotelephone
☐VHF Radio-telephone	☐EPIRB Transmitter
☐Digital Selective Calling Transmitter (DSC)	☐SART (If applicable)
Emergency System	
☐Fuel Shut- Off Valves	☐Hydraulic Equipment Shut-Off
☐Salt Water In-take Valves	☐Pumping System
☐Emergency Ventilation Closure (E/R)	☐Fixed Bilge Pumping System
All Crew Members Should Know their Responsibilities in Emergency Situations	

Crew Members Signature:

_____ _____ _____

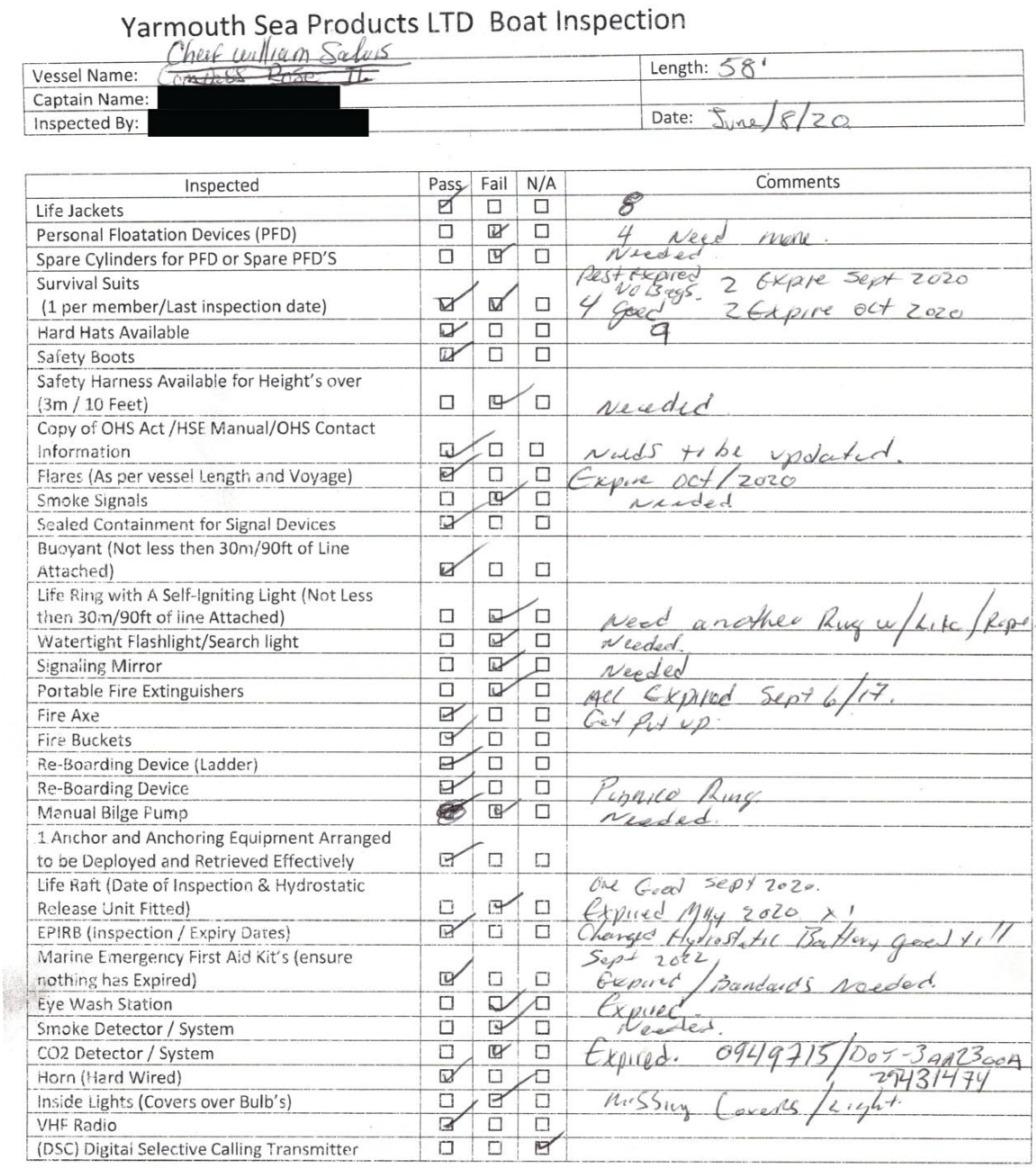
_____ _____ _____

_____ _____ _____

_____ _____ _____

Appendix B: Yarmouth Sea Products Limited inspection checklist

Figure B1. Page 1 of the boat inspection checklist for the Chief William Saulis completed on 08 June 2020 (Source: Yarmouth Sea Products Limited)



Yarmouth Sea Products LTD Boat Inspection

Vessel Name: Chief William Saulis (Formerly Rose Ila)	Length: 58'
Captain Name: [redacted]	
Inspected By: [redacted]	Date: June/8/20

Inspected	Pass	Fail	N/A	Comments
Life Jackets	☑	☐	☐	8
Personal Floatation Devices (PFD)	☐	☑	☐	4 Need more.
Spare Cylinders for PFD or Spare PFD'S	☐	☑	☐	Needed
Survival Suits (1 per member/Last inspection date)	☑	☑	☐	Past Expired No Bags. 2 Expire Sept 2020 4 Good 2 Expire Oct 2020 9
Hard Hats Available	☑	☐	☐	
Safety Boots	☑	☐	☐	
Safety Harness Available for Height's over (3m / 10 Feet)	☐	☑	☐	Needed
Copy of OHS Act /HSE Manual/OHS Contact Information	☑	☐	☐	Needs to be updated.
Flares (As per vessel Length and Voyage)	☑	☐	☐	Expire Oct/2020
Smoke Signals	☐	☑	☐	Needed
Sealed Containment for Signal Devices	☑	☐	☐	
Buoyant (Not less then 30m/90ft of Line Attached)	☑	☐	☐	
Life Ring with A Self-Igniting Light (Not Less then 30m/90ft of line Attached)	☐	☑	☐	Need another Ring w/Lite/Rope.
Watertight Flashlight/Search light	☐	☑	☐	Needed.
Signaling Mirror	☐	☑	☐	Needed
Portable Fire Extinguishers	☐	☑	☐	All Expired Sept 6/17.
Fire Axe	☑	☐	☐	Get put up.
Fire Buckets	☑	☐	☐	
Re-Boarding Device (Ladder)	☑	☐	☐	
Re-Boarding Device	☑	☐	☐	
Manual Bilge Pump	☑	☑	☐	Pigniro Ring Needed.
1 Anchor and Anchoring Equipment Arranged to be Deployed and Retrieved Effectively	☑	☐	☐	
Life Raft (Date of Inspection & Hydrostatic Release Unit Fitted)	☐	☑	☐	One Good Sept 2020. Expired May 2020 x1
EPIRB (inspection / Expiry Dates)	☑	☐	☐	Changes Hydrostatic Battery Good to 11
Marine Emergency First Aid Kit's (ensure nothing has Expired)	☑	☐	☐	Sept 2022 Expired / Bandaids Needed.
Eye Wash Station	☐	☑	☐	Expired.
Smoke Detector / System	☐	☑	☐	Needles.
CO2 Detector / System	☐	☑	☐	Expired. 0949715/DOT-3AA2300A 29431474
Horn (Hard Wired)	☑	☐	☐	
Inside Lights (Covers over Bulb's)	☐	☑	☐	Missing Covers/Light.
VHF Radio	☑	☐	☐	
(DSC) Digital Selective Calling Transmitter	☐	☐	☑	

Figure B2. Page 2 of the boat inspection checklist for the Chief William Saulis completed on 08 June 2020 (Source: Yarmouth Sea Products Limited)

Emergency Hand Held Radio/Telephone	☑	☐	☐	Cell phone
High Water Alarm	☐	☑	☐	Engine Room work / fish hole needs Replac
Steering System / (Manual for Back up)	☐	☑	☐	
Electrical System (12/24/32 VDC Condition of Circuits) (110/220 VAC Circuit Conditions)	☑	☐	☐	Lights
Guards of Moving Equipment (Pulleys & Belts)	☐	☑	☐	has Cover needs installed.
Stove / Furnace (Shut Off Valves if Gas)	☐	☐	☑	
Fuel Shut Off Valves (Functional)	☑	☐	☐	Captain Function Said were good.
Fuel Tanks Grounded	☑	☐	☐	
ESD (Emergency Shut Down) For Hydraulic System	☑	☐	☐	
Main Shut off Valve on Gas/Propane Supply (Functional)	☐	☐	☑	
Means to Secure Hatches (Proper Seal)	☑	☐	☐	
Engine Emergency Ventilation Closure (Functional)	☑	☐	☐	
Cell Booster	☐	☐	☑	
Navigational Lights / Fishing Lights (Functional)	☑	☐	☐	
Deck Hose (Functional/Condition)	☑	☐	☐	
General Condition	☑	☑	☐	
Washroom Facility	☑	☐	☐	
Clutter	☐	☑	☐	Needs to be Cleaned.
Yarmouth Sea Products HSE Manual	☑	☐	☐	need updated.
Condition of Windows	☑	☐	☐	
Compass with Light	☑	☐	☐	
Radar Reflector	☐	☐	☐	needed.
Fishing Shapes & NUC Shapes	☑	☐	☐	
Safety Measures for Open Bow	☐	☐	☑	
Rockets	☑	☐	☐	Expire oct / 2020.
Safety Chains /Hooks	☑	☐	☐	
Shackles (Crosby Shackles is Recommended)	☑	☐	☐	
	☐	☐	☐	
Needed	☐	☐	☐	
more PFD x 4	☐	☐	☐	inside light / Cover Needed
Spare PFD Cylinder x 4	☐	☐	☐	fish hole High water Alarm Fixed
Life Boat Expired	☐	☐	☐	Steering System Needs Back up
Safety harness	☐	☐	☐	guard for pulley need to be install
Smoke Signals	☐	☐	☐	Clean up Clutter.
Life Buoy needed with life Rope	☐	☐	☐	Radar Reflector needed
Manual Bilge Needed	☐	☐	☐	
Flash Light needed	☐	☐	☐	
Signal mirror Needed	☐	☐	☐	
Fire Extinguishers Needed to be Serviced	☑	☐	☐	
Eye wash Station Needed	☐	☐	☐	
CO2 System Expired	☐	☐	☐	
Smoke detector Needed	☐	☐	☐	

[redacted]