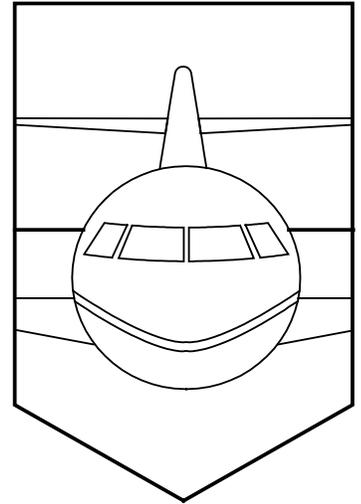
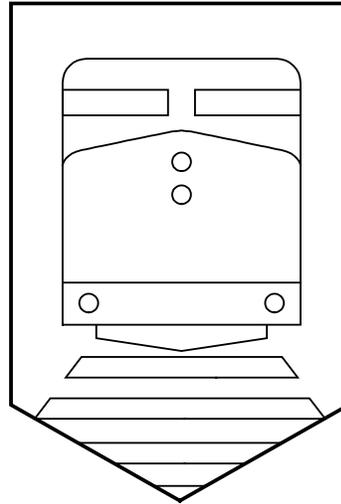
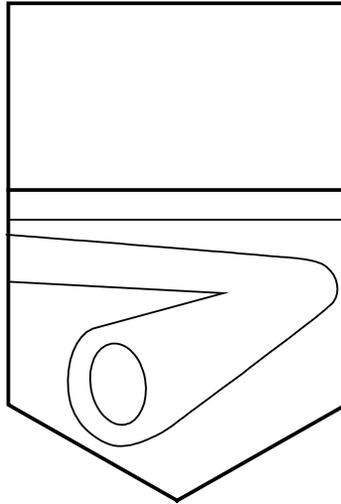
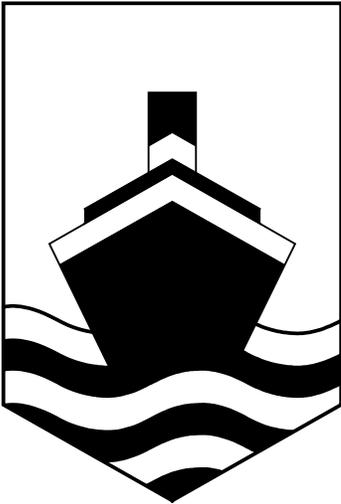




Transportation Safety Board  
of Canada

Bureau de la sécurité des transports  
du Canada



**MARINE OCCURRENCE REPORT**

**SWAMPING AND CAPSIZING**

**OPEN BOAT CFV # 087578  
NORTHEAST ARM  
HARBOUR BRETON, NEWFOUNDLAND  
10 MAY 1996**

**REPORT NUMBER M96N0047**

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**Canada**

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## MANDATE OF THE TSB

The *Canadian Transportation Accident Investigation and Safety Board Act* provides the legal framework governing the TSB's activities.

The TSB has a mandate to advance safety in the marine, pipeline, rail, and aviation modes of transportation by:

- conducting independent investigations and, if necessary, public inquiries into transportation occurrences in order to make findings as to their causes and contributing factors;
- reporting publicly on its investigations and public inquiries and on the related findings;
- identifying safety deficiencies as evidenced by transportation occurrences;
- making recommendations designed to eliminate or reduce any such safety deficiencies; and
- conducting special studies and special investigations on transportation safety matters.

It is not the function of the Board to assign fault or determine civil or criminal liability.

## INDEPENDENCE

To encourage public confidence in transportation accident investigation, the investigating agency must be, and be seen to be, objective, independent and free from any conflicts of interest. The key feature of the TSB is its independence. It reports to Parliament through the President of the Queen's Privy Council for Canada and is separate from other government agencies and departments. Its independence enables it to be fully objective in arriving at its conclusions and recommendations. Its continuing independence rests on its competence, openness, and integrity, together with the fairness of its processes.

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The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

## Marine Occurrence Report

### Swamping and Capsizing

Open Boat CFV #087578

Northeast Arm

Harbour Breton, Newfoundland

10 May 1996

Report Number M96N0047

### *Synopsis*

On 10 May 1996, in the Northeast Arm, Harbour Breton, Newfoundland, the open fishing boat CFV #087578 swamped and capsized as the crew was returning to Harbour Breton after hauling herring from a bar seine in Bill Skinners Cove. Two of the crew of four succeeded in swimming ashore; the other two lost their lives.

The Board determined that the open boat capsized after being swamped by a wave which partially filled the boat and caused the cargo of herring to shift.

*Ce rapport est également disponible en français.*

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<b>1.0</b>	<b><i>Factual Information</i></b>	
<b>1.1</b>	<b><i>Particulars of the Vessel</i></b>	

<b>CFV Number</b>	087578
<b>Home Port</b>	Harbour Breton, Nfld.
<b>Flag</b>	Canada
<b>Type</b>	Fibreglass open fishing boat
<b>Gross Tons</b>	+/- 1
<b>Length OA</b>	5.87 m
<b>Breadth</b>	2.08 m
<b>Depth</b>	0.91 m
<b>Built</b>	1986, Kings Point, Nfld.

Appendix A for sketch of the area of the occurrence.

Units of measurement in this report conform to International Maritime Organization (IMO) standards or, where there is no such standard, are expressed in the International System (SI) of units.

<b>CFV Number</b>	087578
<b>Propulsion</b>	22 kW and 30 kW Yamaha outboard motors
<b>Owner</b>	Calvin Piercy, Sr. Harbour Breton, Nfld.

### 1.1.1 *Description of the Vessel*

CFV # 087578 is one of many open boats built from the same mould that operate around the Newfoundland coast. Permanent flotation is built into the thwarts and forward end.

## 1.2 *History of the Voyage*

On the morning of the accident, the owner/operator of CFV # 087578 and his crew had hauled approximately 1,900 kg of herring from their bar seine and successfully transported and discharged it at the fish plant in Harbour Breton.

During the latter part of the morning, the weather began to deteriorate. The owner/operator decided to make a second, but smaller, haul of approximately 1,450 kg from the bar seine.

During the return trip, the boat was headed gradually toward the small amount of lee offered on the western side of the Northeast Arm. The precise courses and speeds of the boat are unknown. When the boat was approximately 6 km from Harbour Breton and 460 m from shore, the bow was struck by a large wave which partially filled the boat, causing the herring in the fish wells to shift and the boat to swamp and capsize.

The four crew members either were washed overboard or abandoned the boat which was capsizing. All were wearing lifejackets or personal flotation devices (PFDs). Not all could swim.

The owner/operator reportedly assisted the three other crew members onto the bottom of the capsized boat, but it proved difficult for four persons to remain on the upturned hull. One, who was wearing a floater suit, returned to the water and hung on to a line attached to the boat.

Some time thereafter, the person in the water decided to attempt to swim ashore, go to the bar seine where the boat's motorized skiff was moored and return with it to rescue the three others.

The remaining three crew members decided to attempt to reach the shore some time later. Tragically, only one of them succeeded.

The first crew member ashore, despite losing his boots and despite the rough terrain, managed to return to the bar seine. He retrieved the skiff and rescued the other crew member who had reached the shore. They proceeded together to a cabin in Baldens Cove where one remained. The other headed cross-country to the highway where he was given a ride back to Harbour Breton.

At approximately 1600, he arrived at the detachment of the Royal Canadian Mounted Police (RCMP) in Harbour Breton and a search was initiated for the two missing crew members of CFV # 087578. Local speed boats, Canadian Marine Rescue Auxiliary (CMRA) vessels and a search and rescue (SAR) helicopter took part in the search.

<sup>3</sup> See Glossary at Appendix D for all abbreviations and acronyms.

<sup>3</sup> See Appendix B for sketch of the boat.

<sup>4</sup> All times are NDT (Coordinated Universal Time (UTC) minus two and a half hours) unless otherwise stated.

### 1.3 *Injuries to Persons*

As a result of this occurrence, two of the crew of four lost their lives. Autopsies revealed that the cause of death for both crew members was drowning.

### 1.4 *Vessel Certification*

The boat was not required to be inspected by Transport Canada (TC) Marine Safety, and had not been so inspected.

As a registered commercial fishing vessel, the boat was required to, and did, comply with the provisions of the Small Fishing Vessel Inspection Regulations (SFVIR) that pertain to life-saving and fire-fighting equipment.

### 1.5 *Crew Certification and Experience*

Two of the four persons on board were professional, experienced fishermen. Although no certificate is required to operate a boat of this size, one of the crew members held a Certificate of Competency as Chief Engineer, Motor-driven Fishing Vessel and a Fourth Class Motor Certificate with STCW endorsement.

### 1.6 *Weather*

Weather conditions at the time of the occurrence, as reported by Environment Canada, were sunny with good visibility, winds from the south-west at 15 knots increasing to 20 to 25 knots. Air temperature was between 7 °C and 9 °C. Waves of under one metre were predicted. The sea water temperature was between 2 °C and 3 °C.

### 1.7 *Safety Equipment and Survival Aspects*

The vessel was not fitted, nor required by regulation to be fitted, with either a radio or an Emergency Position Indicating Radio Beacon (EPIRB).

Appendix C shows the predicted survival time of average adults wearing a standard lifejacket and light clothing in water of different temperatures.

Additional clothing extends the expected

survival times. The crew members were reportedly warmly dressed in consideration of the expected weather and of the time of year.

### 1.8 *Vessel Construction and Stability*

When CFV # 087578 was built, production of small open fishing vessel glass-reinforced plastic (G.R.P.) hulls was largely unregulated. The hulls were usually adaptations from standard production moulds and their design and construction were generally in accordance with normal small vessel practice, which followed the requirements of the *Construction Standards for Small Vessels*, 1978 (TP 1332).

Design and construction requirements specifically addressing open G.R.P. fishing vessels, "Recommended Guidelines for the Construction of Open Fibreglass Fishing Boats from 5.0 m to 7.0 m in Length", were introduced in February 1996, and are applicable to all small open commercial fishing boats built in Newfoundland after that date.

TP 1332 and the 1996 Guidelines both include requirements regarding the provision of sufficient built-in reserve buoyancy to prevent sinking in the event of swamping, and also the incorporation of outboard motor wells, the inboard faces of which maintain effective freeboard up to gunwale level.

Reportedly, production from the basic hull mould of CFV # 087578 has been discontinued for some time and, although the builders' records are incomplete, it is known that a significant number of hulls was produced. Some of the basic hulls were outfitted with additional deck mouldings and used as pleasure craft, while others (including the occurrence vessel) were employed as open boats in various commercial fishing activities.

The hull and flotation compartments were undamaged during the occurrence; the built-in buoyancy kept the boat afloat when swamped. While the fibreglass hull remained afloat after the boat capsized, it did not have bilge keels, built-in handholds or similar support for persons in the water.

No detailed stability data or booklet was prepared for this small open boat, nor is either required by regulation.

## *1.9 The Herring Fishery*

The 1996 commercial herring fishery allowed for a maximum catch of 3,225 tonnes, of which 200 tonnes is allocated for bar seines. The quota for bar seines in the Fortune Bay/Harbour Breton area during the spring season (1 April to 31 May) was 50 tonnes. Of this quota, 25 tonnes had been allocated to the owner/operator of CFV # 087578.

In 1995, a total of 2,084 fishermen were licensed to use fixed gear (gillnets, traps, and bar seines) with a further 1,400 herring bait permits issued.

Bar seines and other fixed gear are generally fished using open boats.

## *2.0 Analysis*

### *2.1 Introduction*

It is well known and documented throughout the fishing industry that herring in bulk must be carefully stowed aboard a vessel in order to prevent it shifting and initiating stability problems.

### *2.2 Effect of the Topography on the Sea State*

Although waves of under one metre were predicted, the high ground surrounding the Northeast Arm funnelled the wind and made worsening sea conditions very likely. The effect of the steep-to beach in the area of the occurrence would also cause sudden steep and confused seas. In view of the increasing wind and the choppy sea experienced in the Northeast Arm, the owner/operator decided to load less herring for the second trip to the fish plant.

As had been anticipated, the sea state worsened, and during the return trip, the wind was blowing up the Northeast Arm. Because there was some lee offered on the western side of the Arm, the boat was headed gradually toward that side.

### *2.3 Hull and Freeboard Characteristics*

Because the boat was less heavily laden at the start of the second return trip, the effective static freeboard to the gunwale was some 3 inches (75 mm) greater. However, because all small open boats are inherently vulnerable to swamping in rough sea conditions, constant attention must be given to wave height and direction relative to the vessel's course and speed.

While the built-in reserve buoyancy was effective in ensuring that the vessel remained afloat after the swamping, examination of the hull shows that the outboard motor cut-out in the transom and the inboard face of the motor well were some 9 inches (228 mm) below normal gunwale level.

In this instance, the principal quantity of water was reportedly shipped over the intact gunwale; however, the depth of the motor cut-out in the transom and the height of the inboard face of the motor well indicate that boats from the same or similar moulds are vulnerable to swamping by the stern.

### *2.4 Swamping and Capsizing*

As the boat was nearing the steeply shelving shoreline of the western side of the Northeast Arm, the bow buried in the trough of a wave which caused the boat to slow down suddenly. Because of this, the boat was overcome by the seas which flowed over the gunwale, partially filling the hull. Simultaneously, the herring shifted forward and further buried the bow. Subsequent waves completely swamped the hull and caused the boat to capsize.

### *2.5 Crew Survival Aspects*

Because the surface of the upturned fibreglass hull was very smooth, it offered little in the way of handholds for persons in the water.

Due to the lack of bilge keels or grab rails along the turn of the bilge and because of the weight of the outboard motors, one or more persons, whether or not they were accomplished swimmers or wearing PFDs, would find it extremely difficult, if not impossible, to right a capsized boat of this size.

Appendix C illustrates that a person wearing a standard lifejacket and light clothing in water of 2 °C to 3 °C could expect to survive a little over an hour before succumbing to hypothermia. In this case, one of the survivors was in the water for about two hours before he was rescued. It would seem that his clothing slowed the loss of body heat enough to ensure his survival.

## *3.0 Conclusions*

### *3.1 Findings*

1. The open boat was swamped by a wind-induced wave which caused the cargo of herring to shift forward. Subsequent waves filled the boat which then capsized.
2. Some of the crew members were washed overboard by the waves, others abandoned the boat which was capsizing.
3. All members of the crew were wearing lifejackets or personal flotation devices (PFDs).
4. The vessel was not fitted with either a radio or an Emergency Position Indicating Radio Beacon (EPIRB). No Search and Rescue (SAR) operation was initiated until a survivor reached the Royal Canadian Mounted Police (RCMP) detachment at Harbour Breton, overland.
5. The vessel was not fitted with either bilge keels or grab rails at the turn of the bilge. The smooth surface of the capsized boat offered little in the way of handholds for persons in the water.
6. The wearing of heavy clothing/floater suits increased the survivors' ability to withstand the effects of the frigid water.

### *3.2 Causes*

The open boat capsized after being swamped by a wave which partially filled the boat and caused the cargo of herring to shift.



## 4.0 *Safety Action*

The Board has no marine safety recommendations to issue at this time.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoit Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 17 September 1997.*



*Appendix A - Sketch of the Area of the Occurrence*



*Appendix B - Sketch of the Boat*



*Appendix C - Cold Water Survival Chart*



## *Appendix D - Glossary*

°	degree
A.P.	aft perpendicular
C	Celsius
☪	centre line
CFV	Canadian fishing vessel
CMRA	Canadian Marine Rescue Auxiliary
EPIRB	Emergency Position Indicating Radio Beacon
F.P.	forward perpendicular
G.R.P.	glass-reinforced plastic
HP	horse power
IMO	International Maritime Organization
kg	kilogram
km	kilometre
kW	kilowatt
L.O.A.	length overall
m	metre
MLD	moulded (base line, breadth and depth)
mm	millimetre
NDT	Newfoundland daylight time
Nfld	Newfoundland
O.B.	outboard
O.F.	oil fuel
(P)	port
PFD	personal flotation device
RCMP	Royal Canadian Mounted Police
(S)	starboard
SAR	search and rescue
SFVIR	Small Fishing Vessel Inspection Regulations
SI	International System (of units)
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
swamping	the shipping of water over the gunwale of an open boat, which then fills the hull.
TC	Transport Canada
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time