



## CANADIAN CADET ORGANIZATIONS

# SMALL CRAFT OPERATOR PROGRAM (SCOP) MODULE 1 – BOATING SAFETY – STUDENT WORKBOOK

(ENGLISH)

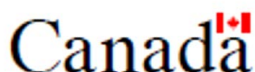
(Cette publication est disponible en français sous le numéro A-CR-CCP-921/PW-002)

**Issued on Authority of the Chief of the Defence Staff**

***This boating safety course manual has been approved by Transport Canada strictly on the basis that it meets the minimum requirements of basic boating safety knowledge set out in Transport Canada's Boating Safety Course and Test Syllabus. (TP14932E)***

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<b>Page No.</b>	<b>Change No.</b>	<b>Page No.</b>	<b>Change No.</b>
Cover page .....	0	3-2-1 to 3-2-2 .....	0
Title .....	0	3-3-1 to 3-3-10 .....	0
A .....	0	3-4-1 to 3-4-12 .....	0
i to vi .....	0	4-1-1 to 4-1-8 .....	0
1-1-1 to 1-1-2 .....	0	4-2-1 to 4-2-8 .....	0
1-2-1 to 1-2-10 .....	0	4-3-1 to 4-3-8 .....	0
2-1-1 to 2-1-8 .....	0	4-4-1 to 4-4-4 .....	0
2-2-1 to 2-2-6 .....	0	5-1-1 to 5-1-2 .....	0
2-3-1 to 2-3-2 .....	0	5-2-1 to 5-2-6 .....	0
2-4-1 to 2-4-2 .....	0	5-3-1 to 5-3-4 .....	0
2-5-1 to 2-5-4 .....	0	5-4-1 to 5-4-6 .....	0
3-1-1 to 3-1-6 .....	0		

## **FOREWORD AND PREFACE**

1. **Issuing Authority.** This document was developed under the authority of the Commander, National Cadet and Junior Canadian Rangers Support Group (Comd Natl CJCR Sp Gp) and is issued on the authority of the Chief of Defence Staff.
2. **Development.** Development of this workbook was in accordance with the *Boating Safety Course and Test Syllabus (TP 14932)* as issued by Transport Canada Marine Safety. This workbook also adheres to the principles of the Canadian Forces Individual Training and Education System A-P9-050 Series, *Manual of Individual Training and Education*, with modifications to meet the needs of the Canadian Cadet Organizations (CCO).
3. **Suggested Changes.** Suggested changes to this document can be forwarded to [cadettraining@forces.gc.ca](mailto:cadettraining@forces.gc.ca).

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## TABLE OF CONTENTS

		PAGE
CHAPTER 1	ACTS, CODES AND REGULATIONS	1-1-1
SECTION 1	NAUTICAL TERMINOLOGY	1-1-1
SECTION 2	ACTS, REGULATIONS AND CODES THAT GOVERN BOATING SAFETY	1-2-1
CHAPTER 2	PERSONAL SAFETY	2-1-1
SECTION 1	LIFEJACKETS AND PFDs	2-1-1
SECTION 2	COLD-WATER IMMERSION	2-2-1
SECTION 3	HEAT EXHAUSTION AND HEAT STROKE	2-3-1
SECTION 4	SEASICKNESS	2-4-1
SECTION 5	CARBON MONOXIDE	2-5-1
CHAPTER 3	VESSEL RESTRICTIONS AND REQUIREMENTS	3-1-1
SECTION 1	VESSEL COMPLIANCE, LICENSING AND REGISTRATION	3-1-1
SECTION 2	VESSEL COMPLIANCE, LICENSING AND REGISTRATION	3-2-1
SECTION 3	USE AND MAINTENANCE OF PLEASURE CRAFT SAFETY EQUIPMENT	3-3-1
SECTION 4	MINIMUM REQUIRED SAFETY EQUIPMENT	3-4-1
CHAPTER 4	NAVIGATION SAFETY	4-1-1
SECTION 1	SAFE BOATING PRACTICES	4-1-1
SECTION 2	VISUAL AND SOUND SIGNALS	4-2-1
SECTION 3	CANADIAN AIDS TO NAVIGATION	4-3-1
SECTION 4	NAVIGATIONAL RESOURCES	4-4-1

**TABLE OF CONTENTS (Cont)**

	<b>PAGE</b>
<b>CHAPTER 5      SAFE VESSEL OPERATIONS</b>	<b>5-1-1</b>
<b>SECTION 1      SAFE FUELLING PROCEDURE</b>	<b>5-1-1</b>
<b>SECTION 2      EMERGENCY SITUATION PREVENTION</b>	<b>5-2-1</b>
<b>SECTION 3      PLANNING AND PREPARATION</b>	<b>5-3-1</b>
<b>SECTION 4      RESPONSE TO EMERGENCIES</b>	<b>5-4-1</b>



## LIST OF FIGURES

FIGURE	TITLE	PAGE
1	PCOC.....	1-2-2
2	Nautical Terminology Crossword.....	1-2-6
3	Nautical Terminology Crossword Questions.....	1-2-7
4	Nautical Terminology Crossword Answer Key .....	1-2-8
1	Example of a SOLAS Lifejacket.....	2-1-2
2	Example of a Standard Lifejacket.....	2-1-2
3	Example of a Small Vessel Lifejacket .....	2-1-3
4	Example of a Typical-style PFD .....	2-1-4
5	Example of a Paddling-style PFD .....	2-1-4
6	Example of a Angler-style PFD .....	2-1-4
7	Example of a Vest-type Inflatable PFD .....	2-1-4
8	Example of a Pouch-type Inflatable PFD .....	2-1-4
1	HELP .....	2-2-4
2	Huddle Position .....	2-2-4
3	1-10-1 Principle .....	2-2-5
1	Compliance Notice for an inboard or stern-drive powered vessel of not more than 6 m .....	3-1-2
2	Compliance Notice for an inboard or stern-drive powered vessel of not more than 6 m .....	3-1-2
3	Compliance Notice for Pleasure Craft of more than 6 m .....	3-1-3
1	Examples of Restriction Signs.....	3-2-2
1	Overtaking Vessel .....	4-1-3
2	Alter Course to Starboard .....	4-1-4
3	Alter to Avoid a Vessel to Starboard .....	4-1-4
4	Alter to Avoid Vessels Engaged in Fishing .....	4-1-5
5	International Code of Signals Flag A .....	4-1-5
6	Private Buoy Regulations Diver Flag.....	4-1-5
1	Arc of Visibility.....	4-2-1
2	Trawling Vessel .....	4-2-3
3	Fishing Vessel .....	4-2-3
4	Towing Vessel .....	4-2-4
5	Signals of Distress.....	4-2-6
1	Lateral Buoys Marking the Channel.....	4-3-1
2	Starboard Lateral Buoy.....	4-3-2
3	Port Lateral Buoy.....	4-3-2
4	Fairway Buoy.....	4-3-3
5	Bifurcation Buoys.....	4-3-3
6	Isolated Danger Buoy.....	4-3-3
7	Navigating the Lateral Buoys.....	4-3-4

**LIST OF FIGURES (Cont)**

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
8	Standard Daybeacons.....	4-3-5
9	Cardinal Buoys.....	4-3-5
10	Special Buoys.....	4-3-7
1	Marine Weather Forecast.....	5-2-3
1	Sample Trip Plan.....	5-3-3
2	Pre-Departure Checklist.....	5-3-4
1	Anchor Scope.....	5-4-3
2	Recovering a POB .....	5-4-4

**CHAPTER 1**  
**ACTS, CODES AND REGULATIONS**  
**SECTION 1**  
**NAUTICAL TERMINOLOGY**

**DEFINITIONS**

**Bow.** The forward part of the vessel.

**Stern.** The after part of the vessel.

**Port.** The left side of the vessel, facing forward.

**Starboard.** The right side of the vessel, facing forward.

**Hull.** The body or shell, of the vessel.

**Draught (Draft).** The distance from the lowest point of the vessel in the water to the surface.

**Freeboard.** The distance from the waterline to the deck of a pleasure craft.

**Waterline (Design).** The waterline at the recommended maximum gross load capacity.

**Recommended maximum gross load capacity.** The maximum number of persons or safe limits of engine power of a pleasure craft, means calculated in accordance with the applicable formula set out in the *Construction Standards*.

**Lifejacket.** A small vessel lifejacket, a standard lifejacket or a Safety of Life at Sea (SOLAS) type lifejacket.

**Personal flotation device (PFD).** A buoyant life-saving apparatus other than a lifejacket that is intended to be worn by a person and that is approved by Transport Canada.

**Vessel.** A boat, ship or craft designed, used or capable of being used solely or partly for navigation in, on, through or immediately above water, without regard to method or lack of propulsion, and includes such a vessel that is under construction. It does not include a floating object of a prescribed class.

**Pleasure craft.** A vessel that is used for pleasure and does not carry passengers.

**Power driven vessel.** A vessel that is propelled by machinery, the hull of which is designed by means of transom cut-outs, V-sterns or engine wells so that the vessel can be propelled by machinery or that is otherwise designed to be propelled by machinery.

**Sailing vessel.** A vessel under sail that is not using propelling machinery.

**Operate.** The action of controlling the speed and course of a pleasure craft.

**Give-way vessel.** A vessel that is required by the *Collision Regulations* to keep out of the way of another vessel.

**Stand-on vessel.** The vessel which has the right of way.

**Strong wind warning.** A warning issued by Environment Canada for expected wind speeds of 20–33 knots (37–61 km / h).

**Restricted visibility.** Any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms or any other similar causes. Vessels shall be deemed to be in sight of one another only when one can be observed visually from the other.

**Wake.** The disturbed column of water around and behind a moving pleasure craft which is set into motion by the passage of a pleasure craft.

**Wash.** The turbulent water caused by a propeller or water jet.

## SECTION 2

### ACTS, REGULATIONS AND CODES THAT GOVERN BOATING SAFETY

Pleasure craft operators have the obligation to comply with several acts, regulations and codes that govern boating safety. The following are the acts, regulations and codes:

- the *Criminal Code of Canada*,
- the *Contraventions Act*, and
- the *Canada Shipping Act 2001*:

### THE CRIMINAL CODE OF CANADA

The *Criminal Code* of Canada is a federal statute enacted by Parliament which provides the federal government exclusive jurisdiction to legislate criminal offences in Canada. The *Criminal Code* contains most of the criminal offences that have been created by Parliament. The *Criminal Code* establishes the type and degree of punishment that may be imposed when an individual is convicted of an offence and the procedures to be followed throughout the conviction process.

Offences that fall under the *Criminal Code* of Canada can result in fines and / or criminal charges with convictions resulting in imprisonment and probation. The *Criminal Code* of Canada states the following with regards to boating safety:

1. A vessel must be operated in a safe manner so that it is not dangerous to the public (Section 249[1]).
2. Alcohol, drugs and controlled substances could impair a person's ability to operate a vessel. It is illegal to operate a vessel while impaired (Section 253).
3. The operator of a pleasure craft shall stop the vessel when requested to do by a representative of the Minister of Oceans and Fisheries, Minister of Transportation or by a designate of the Attorney General (Section 254[5] and Section 255).
4. When reasonable, the operator of a pleasure craft shall provide samples of bodily fluids when requested to do so by a designate of the Attorney General for the purposes of investigating pleasure craft operator impairment (Section 254).
5. A spotter must keep watch on a person being towed and a person cannot be towed after dark (Section 250[1] & [2]).
6. The operator of a pleasure craft has an obligation to stop and offer assistance when the operator is involved in an accident (Section 252[1]).
7. Sending a false message is a criminal offence (Section 372).
8. The operator of a pleasure craft should watch for signals that indicate distress and need of assistance. The operator of a pleasure craft, in so far as he / she can do so without serious danger to his / her own craft and the persons on board, shall render assistance to every person who is found at sea and in danger of being lost (Section 451).
9. Unseaworthy vessels cannot knowingly be operated. Doing so is an indictable offence punishable by up to five years imprisonment (Section 251[1]).
10. A vessel cannot interfere with a marine signal by:
  - a. making fast the craft to a signal, buoy or other sea-mark that is used for the purposes of navigation (Section 439[1]); and

- b. willfully altering, removing or concealing a signal, buoy or other sea-mark that is used for purposes of navigation (Section 439[2]).

11. An individual may not operate a pleasure craft while disqualified / prohibited from operating a motor vehicle due to an alcohol, drugs or controlled substances, impairment related offence (Section 259).

### THE CONTRAVENTIONS ACT

The *Contraventions Act* was passed in October 1992 to provide a procedure for less-serious federal offences to be prosecuted in a regulatory manner. These offences, or contraventions, could then be prosecuted by means of a fine instead of being prosecuted under criminal law. An example would be a fine for speeding.

### THE CANADA SHIPPING ACT 2001

The *Canada Shipping Act 2001* establishes a framework of rules and regulations and incorporates international conventions that shape the behaviour of mariners. The five regulations under the *Canada Shipping Act 2001* that apply to pleasure craft are:

- *Competency of Operators of Pleasure Craft Regulations,*
- *Vessel Operation Restriction Regulations,*
- *Small Vessel Regulations,*
- *Collisions Regulations, and*
- *Charts and Nautical Publications Regulations.*

### COMPETENCY OF OPERATORS OF PLEASURE CRAFT REGULATIONS (COPCR)

**Proof of Competency.** As of September 15, 2009, the *COPCR Regulations* requires operators of pleasure craft fitted with a motor to have proof of competency on board at all times (with the exception of Northwest Territories and Nunavut). Proof of competency is not required for pleasure craft without motors. Proof of competency can take one of three forms:

- An original Pleasure Craft Operator Card (PCOC);
- Proof, such as a course certificate, that you have successfully completed a boating safety course in Canada before April 1, 1999; or
- A completed rental boat safety checklist.



Note: Created by Director Cadets 3, 2009,  
Ottawa, ON: Department of National Defence.

Figure 1 PCOC

**Marine Safety Certificates.** In addition to the normal proof of competency listed above, there are a number of marine safety certificates that have been approved as meeting the proof of competency requirements. If you hold one of these certificates, you need only carry a copy of your certification on board with you. A list of approved marine safety certificates can be found at [www.boatingsafety.gc.ca](http://www.boatingsafety.gc.ca).

**Non-Residents of Canada.** Non-residents of Canada, who are operating their pleasure craft in Canadian waters for less than 45 consecutive days, are not required to have proof of competency.

## **VESSEL OPERATION RESTRICTION REGULATIONS (VORR)**

The *Vessel Operation Restriction Regulations* impose such restrictions as vessel types, speed limits (both posted and un-posted), shoreline speed zones, maximum engine power limits, and other operating restrictions on specified waterways. VORR are covered in more detail in chapter 3.

## **SMALL VESSEL REGULATIONS (SVR)**

The SVR outlines the minimum mandatory safety equipment required to be carried on a pleasure craft (determined by size), safety precautions to follow before and while on the water, and construction standards such as the requirement for every boat operating within five nautical miles (9.26 km) of shore equipped with an engine to be equipped with a muffler (excluding stock / unmodified outboard engines and vessels built before 1960). Many of the requirements of the SVR are covered in details throughout this workbook.

## **COLLISION REGULATIONS**

The *Collision Regulations* are a published set of rules to aid mariners in the prevention of collisions at sea. The rules provide clear directions as to what actions shall be taken for any situation that may arise on the water. *Collision Regulations* are covered in more detail in chapter 4.

## **CHART AND NAUTICAL PUBLICATIONS REGULATIONS**

The *Charts and Nautical Publications Regulations* outline the requirements for the carriage of charts, tide tables and other nautical publications for the safe operation of a vessel at sea. Pleasure craft that are propelled by oars or paddles are not required to carry charts and nautical publications.

## **REGULATIONS FOR THE PREVENTION OF POLLUTION THAT APPLY TO PLEASURE CRAFT**

**Sewage.** The *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* address major risks to the health of our waterways and shorelines such as oil, untreated sewage in inland waters, garbage and hydrocarbons.



**Sewage.** Human or animal body waste, drainage and other waste from toilets.

To prevent the discharge of sewage into Canadian waters the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* prohibit the use of freestanding portable toilets. Boats fitted with toilets must be equipped with either a holding tank or a marine sanitation device. Any boat built before May 3, 2007, must comply with these regulations by May 3, 2012. Boats built on or after May 3, 2007, must comply immediately.

Marine sanitation devices are most commonly installed on small vessels that are equipped with a toilet. The devices are used to store and treat sewage before it is pumped into the water. Holding tanks are used to store all sewage until it can be pumped into a land based pumping station. Holding tanks are the most environmental friendly method for boaters to deal with sewage but because of their size and weight are often impractical for use on small vessels.

**Pollution From Bilges.** A bilge is the lowest point in a vessel and is where rain water and spray collect. Unfortunately it is also where a variety of pollutants collect, such as oil, fuel, anti-freeze and transmission fluids. Many vessels are equipped with automatic bilge pumps which engage when the bilge become full, this can also result in the accidental discharge of harmful pollutants into the environment. Bilges should be equipped with bilge cleaners which help reduce the concentration of petroleum products. To prevent pollutants from being pumped overboard, bilge water should be cleaned with absorbent bilge cloths prior to engaging the bilge pump. Absorbent bilge cloths are designed to absorb petroleum products and repel water. Any spill incidents must be reported to a pollution prevention officer.



Additional information about environmentally friendly boating practices can be found in the *Safe Boating Guide*.

## INVASIVE SPECIES

Invasive species are animals have accidentally been introduced to an area and are having a negative impact on the local marine environment (eg, zebra mussels and green crab). Invasive species are most commonly transported into an area in the bilge or attached to the hull of a vessel. When preparing to enter a lake or river system it is important to remove the boat from the water to clean the bilge and hull to remove spores and other invasive organisms. Some communities require this as part of local bylaws.

## FINES AND PENALTIES FOR NON-COMPLIANCE WITH ACTS, CODES AND REGULATIONS

The Royal Canadian Mounted Police (RCMP), provincial and municipals police forces and other local designates have the authority to enforce the acts, codes and regulations that apply to safe boating. Enforcement Officers have the right to board a vessel, ask for identification and proof of competency, as well as any other questions pertinent to the enforcement of acts, codes and regulations. Vessel operators are obligated to comply with the demands of an Enforcement Officer.

The most commonly enforced pleasure craft related offenses pertain to missing safety equipment, operating a pleasure craft while impaired, operating a pleasure craft in a reckless manner and failure to produce a Pleasure Craft Operator Card. Under the *Contraventions Act*, authorities can ticket offenders on the spot for offences instead of requiring them to appear in court.

Examples of fines for common boating offences (excluding administrative charges):

- Operating a vessel in a careless manner—\$200.
- Speeding—\$100.
- Underage operation of a personal watercraft—\$100.
- Operating a power-driven pleasure craft without the required Pleasure Craft Operator Card—\$250.
- Insufficient number of approved, appropriately sized floatation devices—\$200 for each absent device.



The fines listed above were current as of April 2010. Refer to <http://www.boatingsafety.gc.ca> for a complete list of boating-related offences under the *Contraventions Act* and their associated fines.

## NON-RESIDENTS OPERATING IN CANADIAN WATERS

All pleasure craft and commercial operators (both residents and visitors) on Canadian waters are required to follow Canadian acts, regulations and codes and are subject to the corresponding penalties and fines for failure to conform. The following are exceptions for non-residents operating in Canadian waters:

- Foreign boats (boats that are licensed or registered in a country other than Canada), need to comply with the equipment requirements of the country in which the boat is usually kept. Non-residents operating a boat that is licensed or registered in Canada must conform to Canadian safety equipment requirements.
- PFDs that meet the requirements of the non-resident's home country may be worn in lieu of a PFD approved by Transport Canada.





## ***TEST YOUR KNOWLEDGE!***



1. What are the three acts with which pleasure craft operators must comply?
2. What is the purpose of the *Contraventions Act*?
3. What are the five regulations under the *Canada Shipping Act 2001* that apply to pleasure craft?
4. Which regulation states that pleasure craft that are propelled by oars or paddles are not required to carry charts and nautical publications??
5. What is the fine for operating a vessel in a careless manner?
6. What are the most commonly enforced pleasure craft related offenses?
7. Who has the authority to enforce the acts, codes and regulations that apply to safe boating?
8. Zebra mussels and green crabs are examples of what type of species?
9. Why should a boat's bilge and hull be cleaned before entering a lake or river system?

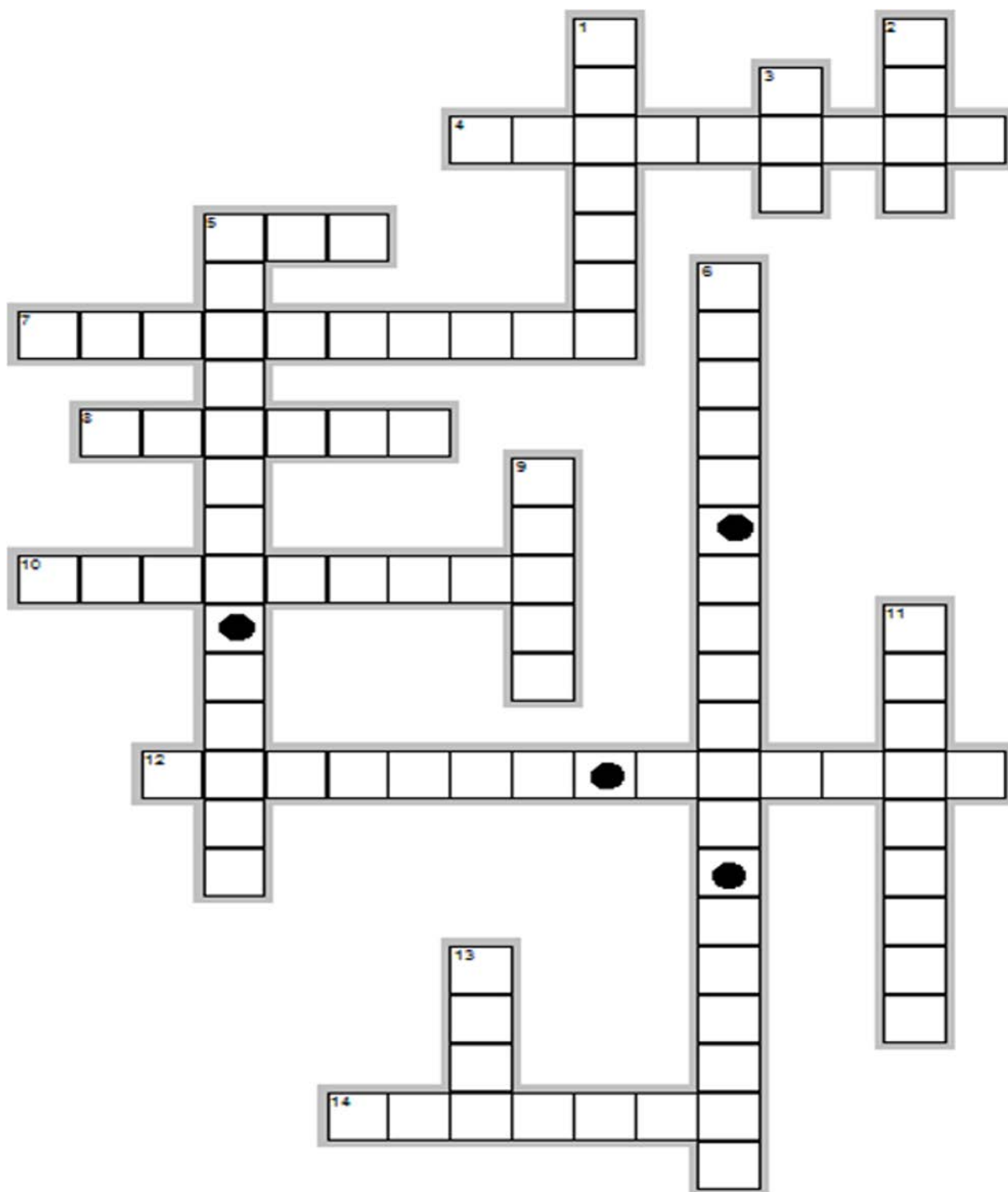


Figure 2 Nautical Terminology Crossword

ACROSS		DOWN	
4.	The right side of the vessel, facing forward.	1.	The distance from the lowest point of the vessel in the water to the surface.
5.	A buoyant life-saving apparatus that provides enough floatation to keep a person afloat at the surface, but does not have the self-righting ability of a lifejacket.	2.	The left side of the vessel, facing forward.
7.	A device that will keep a person afloat with their head well out of the water and has the ability to turn a person onto their back with their face out of the water if they are unconscious.	3.	The forward part of the vessel.
8.	A boat, ship or craft designed, used or capable of being used solely or partly for navigation in, on, through or immediately above water, without regard to method or lack of propulsion, and includes such a vessel that is under construction. It does not include a floating object of a prescribed class.	5.	A vessel that does not carry passengers.
10.	Where the surface of the water meets the hull.	6.	A vessel that is propelled by machinery.
12.	A vessel under sail that is not using propelling machinery.	9.	The after part of the vessel.
14.	The action of controlling the speed and course of a pleasure craft.	11.	The distance from the waterline to the deck of a pleasure craft.
		13.	The disturbed column of water around and behind a moving pleasure craft which is set into motion by the passage of a pleasure craft.

Figure 3 Nautical Terminology Crossword Questions

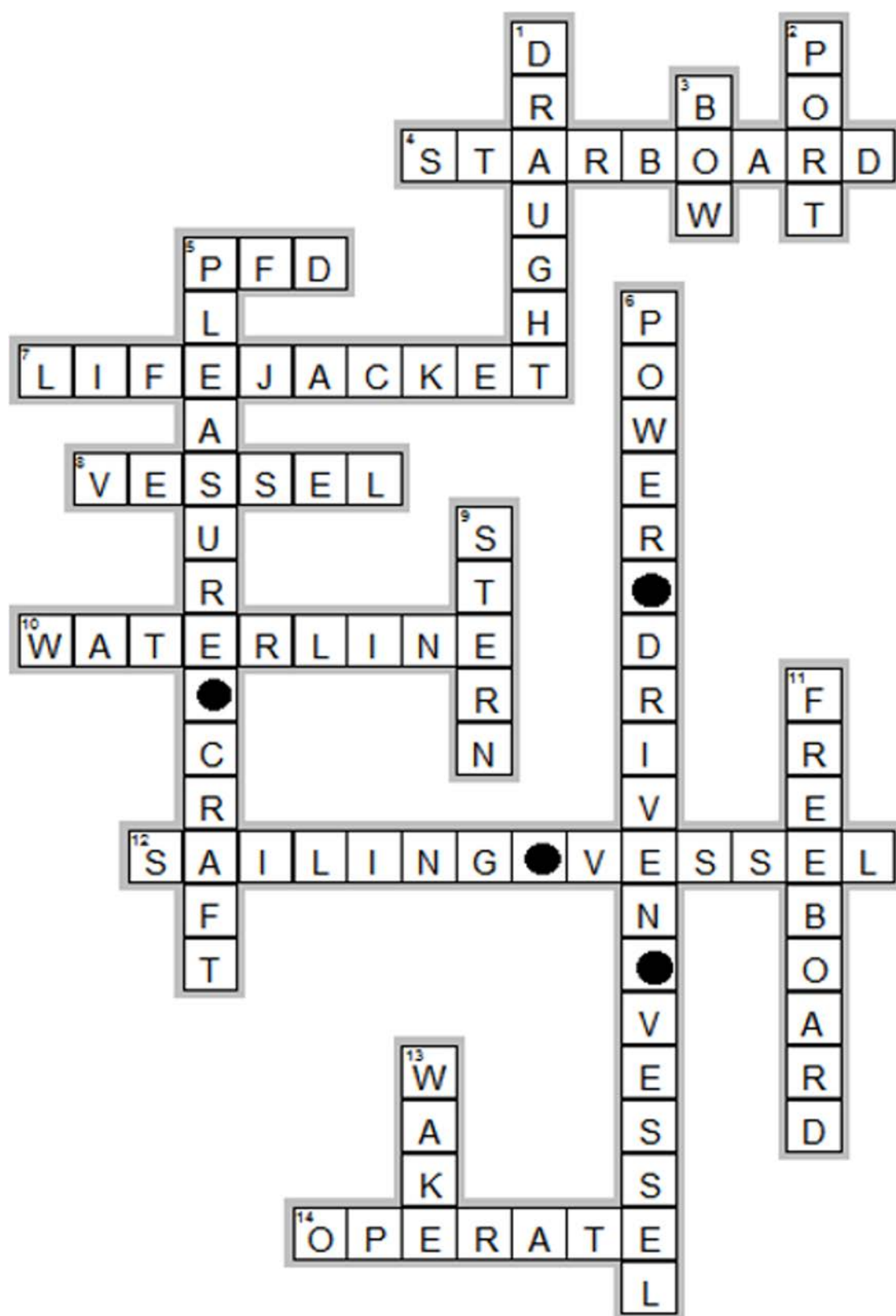


Figure 4 Nautical Terminology Crossword Answer Key

## REFERENCES

C1-098 0-662-42286-4 Office of Boating Safety (2010). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen of Right of Canada, as represented by Transport Canada

C1-156 Department of Justice. *Criminal Code*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/en/C-46/>

C1-156 Department of Justice. *Contraventions Act*. (2010). Retrieved April 03, 2008, from <http://laws.justice.gc.ca/en/C-38.7/>

C1-156 Department of Justice. *Canada Shipping Act*. (2010). Retrieved January 24, 2010, from <http://www.tc.gc.ca/eng/acts-regulations/acts-2001c26.htm>

C1-156 Department of Justice. *Vessel Operation Restrictions Regulations*. (2010). Retrieved January 24, 2010, from <http://laws.justice.gc.ca/eng/SOR-2008-120/>

C1-156 Department of Justice. *Small Vessel Regulations*. (2010). Retrieved January 24, 2010, from <http://laws.justice.gc.ca/eng/SOR-2010-91/>

C1-156 Department of Justice. *Collision Regulations*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/eng/C.R.C.-C.1416/index.html>

C1-156 Department of Justice. *Charts and Nautical Publications Regulations*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/eng/SOR-95-149/>

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## CHAPTER 2

### PERSONAL SAFETY

#### SECTION 1

#### LIFEJACKETS AND PFDs

In accordance with *Small Vessel Regulations*, the operator of a pleasure craft is required to ensure there is a minimum of one Canadian-approved lifejacket or personal flotation device (PFD) of appropriate size for each person onboard. Especially when onboard a small pleasure craft, all persons should always wear lifejackets or PFDs to prevent drowning.



#### **Lifejacket / PFD Approval**

Canadian-approved means approved by Transport Canada (Department of Transportation [DOT]), or Department of Fisheries and Oceans (Canadian Coast Guard [CCG]) and clearly labelled to that effect.



The *Small Vessel Regulations* state that there must be a Canadian-approved lifejacket or PFD of appropriate size for each person on board, however, IAW A-CR-CCP-030/PT-001 *Water Safety Orders*, a PFD must be worn at all times by cadets.

The terms lifejacket and PFD are often used inter-changeably. However, there are important differences between a lifejacket and a PFD and the floatation support each provides. In simple terms a lifejacket is a device that keeps a person afloat with their head well out of the water and has the ability to turn a person onto their back with their face out of the water should they be unconscious. A PFD provides enough floatation to keep a person afloat at the surface, but does not have the self-righting ability of a lifejacket.

#### **LIFEJACKETS**

Lifejackets were originally designed for professional mariners in the event of emergencies at sea and continue to be used more by those on commercial vessels versus recreational boating. In an emergency situation on a commercial ship, crew members and / or passengers may face extreme wave conditions, they may be injured or even unconscious, and rescue at sea may take some time. Therefore, lifejackets were designed to have the capability to not only keep a person afloat, but also turn the wearer onto their back, with the head supported and face out of the water in order to protect the airway. In order to achieve this, lifejackets are designed with the buoyant material placed predominately in the chest area with an additional buoyant cell (or collar) to support the head.

There are three general types of lifejackets approved for use in Canada: SOLAS, Standard and Small Vessel, each with differing capabilities and uses. All three types of lifejackets are available in only three approved colours to improve visibility in a rescue situation: red, yellow, and orange.

#### **SOLAS Lifejackets**



The current version of the International Convention for the Safety of Life at Sea (SOLAS) was adopted by the International Maritime Organization (IMO) in 1974. The convention establishes international safety standards for the shipping industry.



*From "Lake Fish", 2011, SOLAS Lifejacket.  
Retrieved January 31, 2011, from [http://www.lakefish.net/images/prod\\_mustang\\_17.jpg](http://www.lakefish.net/images/prod_mustang_17.jpg)*

Figure 1 Example of a SOLAS Lifejacket

SOLAS Lifejackets meet very high performance standards and are approved for use on any type of vessel. They are the most buoyant of the three types of lifejackets and turns a person on their back in seconds to keep their face out of the water, even if they are unconscious.

SOLAS Lifejackets are keyhole-type with adjustable straps (or ties) that wrap around the torso and an additional tie under the chin to prevent the head from slipping back through the hole. They are also equipped with retro-reflective tape and a whistle.

Available in two sizes (by weight of person):

- Over 32 kg (70 lbs), or
- Less than 32 kg (70 lbs).

### Standard Lifejackets

Standard Lifejackets are approved for all vessels, except those vessels that fall under the provisions of the SOLAS convention. They are more buoyant than a Small Vessel Lifejacket or PFD and will turn a person on their back to keep their face out of the water, even if they are unconscious.

Standard Lifejackets are keyhole-type with adjustable straps (or ties) that wrap around the torso and an additional tie under the chin to prevent the head from slipping back through the hole. They are also equipped with retro-reflective tape and a whistle.

Available in two sizes (by weight of person):

- Over 40 kg (88 lbs), or
- Less than 40 kg (88 lbs).



*From "IMP Marine", 2010, PFD.  
Retrieved April 20, 2010, from <http://www.impmarine.com/en/home/products.aspx>*

Figure 2 Example of a Standard Lifejacket



## Small Vessel Lifejackets



*From "Mustang Survival", 2010, Small Vessel Lifejacket. Retrieved April 20, 2010, <http://www.mustangs survival.com/products/product.php?id=416>*

Figure 3 Example of a Small Vessel Lifejacket

Small Vessel Lifejackets are designed and approved for use on small vessels only. They are less buoyant than a Standard Lifejacket, but still turns a person on their back to keep their face out of the water, even if they are unconscious, however they may do so more slowly and harsh sea states can also impede their self-righting ability.

Small Vessel Lifejackets are available in keyhole and vest-type models. Depending on the model, Small Vessel Lifejackets have a fastening system similar to a Standard Lifejacket or a combination of zipper and adjustable torso straps as seen in [Figure 3](#). Small Vessel Lifejackets may or may not be equipped with retro-reflective tape and a whistle.

Available in three sizes (by weight of person):

- Over 41 kg (90 lbs),
- 18 kg (40 lbs) to 41 kg (90 lbs), or
- Less than 18 kg (40 lbs).

## PERSONAL FLOTATION DEVICES (PFD)

The main differences between lifejackets and PFDs are that PFDs are less buoyant and have limited turning capability compared to lifejackets. However, since recreational boaters typically boat in more congested waters, close to shore or to help, the fact that they are less buoyant and are less effective at turning an unconscious person is not as much of a concern.

PFDs are only approved for use on pleasure craft and are designed specifically for recreational boating, and are generally smaller, less bulky, and more comfortable than lifejackets. Also, some PFDs provide additional thermal protection against hypothermia. PFDs are available in a wide variety of colours and styles allowing the boater to choose (and WEAR) a device suited to the type of activity providing both comfort and manoeuvrability.

While there are many styles of PFDs available, there are two general types of PFDs: inherently buoyant and inflatable.

### Inherently Buoyant PFDs

Inherently buoyant PFDs are buoyant due to their construction using approved inherently buoyant materials. They come in many different styles and sizes. The fastening system used on these PFDs can vary depending on the style. Some have adjustable straps that wrap around the torso and buckle in the front, as seen in [Figure 4](#). While others have a combination of a zipper and adjustable side straps that can be tightened for a snug fit. Some styles also have adjustable shoulder and waist straps to keep the vest centred on the torso, such as the paddling-style PFD shown in [Figure 5](#). When selecting a PFD, it should be: snug-fitting; appropriate to the size of the person eg, "adult sizing" for adults and "children sizing" for children; and appropriate for the type of activity.



From "IMP Marine", 2010, Helly Hanson PFD. Retrieved April 20, 2010, from <http://www.impmarine.com/en/home/products.aspx>

Figure 4 Example of a Typical-style PFD



From "The Binnacle", 2011, Salus Kiwi Performance Vest. Retrieved January 31, 2011, [http://ca.binnacle.com/Safety-Lifejackets-PFDs/c39\\_107/p694/SALUS-KIWI-PFD-VEST-WOMEN/product\\_info.html](http://ca.binnacle.com/Safety-Lifejackets-PFDs/c39_107/p694/SALUS-KIWI-PFD-VEST-WOMEN/product_info.html)

Figure 5 Example of a Paddling-style PFD



From "Kayak Exchange", 2010, Salus Angler PFD. Retrieved April 20, 2011, from <http://www.kayakexchange.ca/proddetail.asp?prod=AG-770>

Figure 6 Example of an Angler-style PFD

## Inflatable PFDs

An inflatable PFD is another option for recreational boaters. However, as they are not made of inherently buoyant materials, but instead contain inflation devices, it is very important to read and understand the manufacturer's instructions on operation and maintenance. There are two basic types of inflatable PFDs: vest and pouch, shown in Figures 7 and 8. Both types are equipped with two methods of inflation:

1. Manual inflation, which uses a CO<sub>2</sub> inflation cartridge engaged by manually pulling a toggle cord; and
2. Oral inflation by blowing into an inflation tube.

Vest-type inflatables are also available with an automatic inflation system that contains a small cardboard element that disintegrates when wet, and this leads to a chain reaction of events that causes a CO<sub>2</sub> inflation cartridge to inflate the device.



From "Nautilus by Protexion", 2011, Deluxe Manual Inflation. Retrieved January 31, 2011, from <http://www.nautilusbyprotexion.com/products.cfm?FamilyName=Odyssey&ID=57>

Figure 7 Example of a Vest-type Inflatable PFD



From "Mustang Survival", 2011, Inflatable Belt Pack PFD. Retrieved January 31, 2011, <http://www.mustangsurvival.com/products/product.php?id=197>

Figure 8 Example of a Pouch-type Inflatable PFD

A vest-type inflatable is worn over the shoulders with an adjustable waist strap and buckle. A pouch-type inflatable is worn around the waist with an adjustable strap and must be pulled over the head similar to a keyhole lifejacket once inflated.

If inflatable is the floatation device of choice, there are some additional restrictions that apply in accordance with *Small Vessel Regulation*:

- With regard to the requirement to have onboard one lifejacket or PFD for each person onboard, the following additional requirements apply in the case of inflatables:
  - on open boats - must be worn at all times;
  - on vessels equipped with a cabin - must be worn at all times while on deck or in the cockpit area;
- Inflatables are not approved for persons under 16 years of age or weighing less than 36.3 kg (80 lbs); and
- Inflatables are not approved for use on Personal Watercraft (PWC) or white water paddling.



While the inflation time for inflatable PFDs is relatively short (usually less than five seconds), they are not appropriate for those who are weak swimmers, since even if an automatic inflatable PFD is used, in the event of a failure in the inflation mechanism, the wearer would have to use the back up (oral) inflation system to inflate the PFD while staying afloat.

### Lifejacket / PFD Care

Keep in mind the following tips when it comes to caring for your floatation device:

- Ensure that straps, buckles and zippers are clean and in good working order;
- Tug on straps to ensure they are well attached and there is no sign of wear;
- Dry the device in open air and avoid direct heat sources;
- Store it in a dry, well-ventilated, easily accessible place; and
- Do not dry clean. Use mild soap and running water to clean.
- Replace if it is ripped or in poor condition



Never use a lifejacket / PFD as a cushion or fender. The approved status of a lifejacket / PFD becomes void if it has been damaged or altered.



**Remember! When it comes to inflatable PFDs it is very important to follow the manufacturer's instructions on maintenance to ensure that it will work when you need it!**

### Lifejacket / PFD Testing

When testing a lifejacket / PFD the following steps should be followed:

1. don the lifejacket / PFD,
2. walk into chest deep water,
3. bend the knees and float on the back, and
4. ensure that it keeps the chin above the water so that it is easy to breathe.

If there are signs of wear or damage, or if it doesn't pass the float test, it's time to replace it!



Lifejackets / PFDs should be tested yearly to ensure they have not lost their buoyancy. In addition to a buoyancy test, lifejackets should be tested to ensure they keep a person's face out of the water.

### **Donning a Lifejacket / PFD in the Water**

The following are steps to be followed if a Lifejacket / PFD must be donned in the water:

1. spread the device open with the inside facing up out of the water,
2. rotate the device so as to look at the neck opening,
3. place arms through arm holes and extend both arms over the head,
4. position the device around the upper body, and
5. fasten the device to fit snugly.



To don a keyhole-type lifejacket while in the water, place head through the keyhole, lay back and secure the straps as per normal.



Never under-estimate the protection that a floatation device can provide. It is called lifesaving equipment for a reason.



### **Always Be Prepared!**

When it comes to safety equipment, the middle of an emergency situation is not the time to be trying to figure out how to use a piece of equipment. Safety equipment must always be easily accessible and in good working order. Always read the manufacturer's instructions and test equipment on a regular basis.

Operators have an obligation to inform their passengers of the location and use of safety equipment. This includes how to properly don and adjust to fit a lifejacket / PFD.

**Activate Your Brain:**

What are the major differences between a PDF and a lifejacket?

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Who approves PFDs?

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How should Lifejackets /PFDs be cared for?

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What must be considered when selecting a PFD?

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## SECTION 2

### COLD-WATER IMMERSION

You don't need to be in cold North Atlantic waters to experience what happens in cold-water. Most lakes in Canada are dangerously cold for at least part of the year, and many for the entire year. As a result, boaters in Canada are aware of the condition known as hypothermia. Which is when the core body temperature drops abnormally low and eventually the heart stops.

However, hypothermia is the final stage the body reaches when immersed in cold water. Many people die in the first few minutes of immersion in cold water and they are not hypothermic, they simply drown due to the immediate and sometimes deadly effects of cold-water. Statistically speaking, nearly 99% of drownings in Canada occur in water that is colder than 20 degrees Celsius. That doesn't seem very cold, but it's cold enough and the numbers don't lie. When the water drops to 15 degrees Celsius or colder that is when the real problems start to occur.

So, what happens to the body if a person accidentally tumbles into cold-water? The physiological effects of being immersed in cold-water happen in three stages:

1. Cold-Water Shock,
2. Cold-Water Incapacitation, and
3. Hypothermia.

### COLD-WATER SHOCK

Sudden exposure to cold water causes sudden-immersion reflex, resulting in involuntary gasping. If a person's face is under water, a single gasp can fill the lungs with about a litre of water. Wearing a PFD or lifejacket will help ensure that the first gasp happens with the face out of the water and keep a person afloat as the effects of cold shock set in. Over the next minute the following can occur:

- hyperventilation (as much as 600-1000% greater than normal breathing),
- dizziness,
- muscle spasms,
- significant rise in heart rate and blood pressure, and
- an increased risk of heart attack or stroke.

The effects of cold-water shock normally subside after about one minute. During this time it is important to concentrate on the following:

- avoiding panic;
- keeping the airway clear (face out of the water); and
- controlling breathing.

### COLD-WATER INCAPACITATION

As long as a person is safely floating with a PFD or lifejacket, after the first minute or so, their breathing will settle down. Depending on the water temperature, over the next ten minutes or so Cold Incapacitation will set in. As the body struggles to preserve its core temperature a person will lose the effective use of their fingers, arms and legs for any meaningful movement and their ability to self-rescue or even simply continue to swim will become impaired. In cold-water, without a PFD or lifejacket, a person will sink.

If a person is wearing a PFD or lifejacket and has not been able to rescue them self, even in the coldest water, a person can expect to be conscious for about an hour and it will still be some time before they succumb to hypothermia. This gives rescuers additional time to find and rescue them.

## HYPOTHERMIA

Hypothermia is a drop in body temperature below the normal level. When participating in water sports or leisure, hypothermia typically develops from exposure to abnormally low temperatures such as:

- immersion in cold water,
- exposure to cool air in water-soaked clothing, or
- prolonged exposure to low environmental temperatures.



Even on warm summer days, it is likely to be cool out on the water. Always dress warmly, especially when the air / water temperature is below 20 degrees Celsius. Generally, it is better to overdress as you can always remove layers if you get too warm.

## Stages of Hypothermia

There are three stages of hypothermia:

- mild,
- moderate, and
- severe.

## Signs and Symptoms of Hypothermia

Signs / Symptoms	Mild Hypothermia	Moderate Hypothermia	Severe Hypothermia
<b>Pulse</b>	• normal	• weak	• weak, irregular or absent
<b>Breathing</b>	• normal	• slow and shallow breathing	• slow or absent
<b>Appearance</b>	• shivering • slurring speech	• shivering violently • clumsy • stumbling • pupils becoming dilated • skin becoming bluish	• shivering has stopped
<b>Mental State</b>	• conscious but withdrawn or disinterested	• confused • sleepy • irrational	• unconscious

## Treatment of Hypothermia

If it is suspected that someone is suffering from mild hypothermia due to immersion, the following treatment is recommended:



1. remove the individual from the source of cold exposure;
2. provide dry shelter;
3. if possible, prevent further decrease in body temperature and warm the person's body gradually by:
  - a. replacing wet clothing with dry clothing,
  - b. wrapping the person in blankets,
  - c. placing dry coverings over the person,
  - d. covering the person's head and neck,
  - e. covering the person with an insulating device and vapour barrier, and
  - f. applying warm, dry objects (40 to 45 degrees);
4. if asked for, offer warm liquids but do not give alcohol or hot stimulants to the person;
5. do not rub or massage the surface of the person's body or extremities; and
6. use or exhibit signals to indicate distress and seek out the assistance of emergency medical services, if necessary.



Always handle the individual very gently and keep them as horizontal as possible.

### Methods of Prevention

The following are measures to be taken to prevent hypothermia:

- **Dressing warmly.** Dressing for the weather plays a key role in preventing hypothermia. The air temperature on the water is often much colder than on land, therefore wearing extra clothing is recommended.
- **Staying dry.** When the air and water temperatures are cold it is recommended to stay out of the water and stay dry.



Immersion hypothermia is caused by being in cold water. A person loses body heat 25 times faster in water than in air of the same temperature.

- **Wear a waterproof layer.** It is possible to become wet without falling overboard. A waterproof jacket or rain gear may be worn to keep clothes from becoming wet.
- **Wear equipment designed for protection against hypothermia.** Wear equipment that provides additional protection against hypothermia on days where the water is very cold. The equipment comes in a variety of styles and names including:
  - floater or survival suits: a full nose-to-toe PFD,
  - anti-exposure work suits: a PFD with a thermal rating,
  - dry suits: to be used with a PFD and a thermal layer,
  - wet suits: to be used with a PFD, traps and heats water against the body, and,
  - immersion suits: to be used in extreme conditions when abandoning a vessel.

- **Adopt the Heat Escape Lessening Position (HELP).** Adopting the HELP when in the water alone decreases the amount of body heat lost by half. The HELP is adopted by holding the knees up to the chest (as illustrated in [Figure 1](#)).
- The HELP covers the following major areas of heat loss:
  - head,
  - neck,
  - armpits,
  - chest,
  - groin, and
  - back of the knees.



*From "Transport Canada", 2010, Hypothermia. Retrieved April 20, 2010, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-88-emerg-hypothermia-585.htm>*

Figure 1 HELP


- **Get out of the water.** If possible, climb onto a nearby object to get as much of the body out of the water as possible.
- **Adopting the huddle position.** The huddle position should be adopted when in the water with a group. The huddle position covers the same areas of major heat loss as the HELP position and provides more insulation to the sides of the body. The huddle position is formed by forming a tight circle, placing the left arm around the shoulder of the swimmer to the left and placing the right arm under the arm and around the back of the swimmer to the right (as illustrated in [Figure 2](#)).



*From "Transport Canada", 2010, Hypothermia. Retrieved April 20, 2010, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-88-emerg-hypothermia-585.htm>*

Figure 2 Huddle Position

When it comes to cold-water immersion, remember the 1-10-1 Principle.




**1-10-1 Principle**

1-10-1 is a simple way to remember the first three phases of cold water immersion and the approximate time each phase takes.

**1 Minute - Cold Shock:**

An initial deep and sudden Gasp followed by hyperventilation that can be as much as 600-1000% greater than normal breathing. You must keep your airway clear or run the risk of drowning. Cold Shock will pass in about 1 minute. During that time concentrate on avoiding panic and getting control of your breathing. Wearing a lifejacket during this phase is critically important to keep you afloat and breathing.



**10 Minutes - Cold Incapacitation:**

Over approximately the next 10 minutes you will lose the effective use of your fingers, arms and legs for any meaningful movement. Concentrate on self rescue initially, and if that isn't possible, prepare to have a way to keep your airway clear to wait for self rescue. Swim failure will occur within these critical minutes and if you are in the water without a lifejacket, drowning will likely occur.

**1 Hour - HYPOTHERMIA:**

Even in ice water it could take approximately 1 hour before becoming unconscious due to Hypothermia. If you understand the aspects of hypothermia, techniques of how to delay it, self rescue and calling for help, your chances of survival and rescue will be dramatically increased.

**“It’s a fight for your life!”**

*From "Smart Boater", 2011, 1-10-1 Principle. Retrieved January 28, 2011, from [http://www.smartboater.ca/education/cold\\_water/tools/1-10-1\\_Principle](http://www.smartboater.ca/education/cold_water/tools/1-10-1_Principle)*

Figure 3 1-10-1 Principle



### Post-Rescue Collapse

About one fifth of all cold-water immersion victims die because of a drop in body temperature after they have been rescued. Cold blood begins to flow to the body core, cooling it even more. The heart finds it more difficult to pump cold blood and slows down. The risk of heart failure can still be present up to several hours after rescue.



**Activate Your Brain:**

What is the second stage of cold-water immersion?

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What device should be worn to reduce the risk of cold-water shock?

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What are three possible causes of hypothermia?

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## SECTION 3

### HEAT EXHAUSTION AND HEAT STROKE

Heat exhaustion and heat stroke are caused by prolonged exposure to the sun, humidity or extended periods of physical exertion. The body regulates its temperature by sweating. Sweat is released through pores in the skin and when it evaporates the skin is cooled. High humidity can slow and sometime prevent the evaporation of sweat which reduces the body's ability to regulate heat. Sweating for extended periods of time can dehydrate the body, reduce salt levels and cause the skin to heat resulting in heat exhaustion. Heat exhaustion is a warning that the body is becoming too hot, sustained physical activity and exposure to heat can result in heat stroke. Heat stroke occurs when the body's organs overheat and in severe cases, stop working which results in death.

#### Signs and Symptoms

The sensation of thirst and dark coloured, odorous urine are signs that the body is dehydrated and may be overheating. When preparing for physical exertion or extended periods of exposure to heat, it is important to hydrate in advance.

Heat-Related Illness	Symptoms
<b>Heat Exhaustion</b>	<ul style="list-style-type: none"> <li>• Normal, low, or slightly elevated body temperature.</li> <li>• Cool, clammy, pale skin.</li> <li>• Sweating.</li> <li>• Dry mouth and thirst.</li> <li>• Fatigue and weakness.</li> <li>• Dizziness.</li> <li>• Headache.</li> <li>• Nausea.</li> <li>• Vomiting.</li> <li>• Muscle cramps.</li> <li>• Weak or rapid pulse.</li> </ul>
<b>Heat Stroke</b>	<ul style="list-style-type: none"> <li>• High body temperature (40 degrees Celsius [104 degrees Fahrenheit]).</li> <li>• Hot dry red skin.</li> <li>• No longer sweating.</li> <li>• Deep breathing and fast pulse, followed by shallow breathing and weak pulse.</li> <li>• Confusion and hallucinations.</li> <li>• Convulsions.</li> <li>• Loss of consciousness.</li> </ul>



Heat exhaustion can quickly escalate to heat stroke. At the first sign of heat exhaustion, the individual should force themselves to consume water and should be monitored for signs of heat stroke.

## Treatment

If it is suspected that someone is suffering from heat exhaustion, the following treatments are recommended:

1. move the person to a cool place, such as indoors or under a shady tree;
2. provide dry shelter;
3. move the individual to a cool place indoors or in the shade;
4. loosen tight clothing;
5. have the individual consume as much water as desired;
6. have the individual consume small amounts of salty food; and
7. massage and stretch cramped muscles.

If it is suspected that someone is suffering from heat stroke, the following treatment is recommended:

1. move the person to a cool place, such as indoors or under a shady tree;
2. reduce the risk of shock by having the individual flat on their back and elevate their feet;
3. remove the hot clothing and cover the individual in wetted sheets or towels;
4. slowly sponge cold water over the individual's head;
5. fan the individual;
6. place ice packs or cold compresses on the individual's neck, under the arm pits and groin; and
7. once the individual's body temperature has been lowered to 38 degrees Celsius (101 degrees Fahrenheit), place the individual in the recovery position.



### **Activate Your Brain:**

How does sweating regulate body temperature?

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What occurs during the onset of heat stroke?

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If it is suspected that someone is suffering from heat stroke, what are the treatments?

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## SECTION 4

### SEASICKNESS

Seasickness is an often-used term for common motion sickness. Seasickness is caused by the rise and fall of a vessel while at sea. The brain monitors our surroundings by the deep tissues of the body (proprioceptors) which sense movement, the eyes which see the surroundings and the inner ear (labyrinth) which senses motion, acceleration and gravity. When the body is subjected to constant movement, the inner ear sends constant signals to the brain; these inputs can overwhelm the brain resulting in nausea (motion sickness). The effects of motion on the brain can be worsened when in an enclosed space such as below decks on cruise ships and other large vessels. When above decks, the eyes can use the horizon as a reference point to confirm the rise and fall of the vessel and help the brain confirm the signals being sent by the inner ear. When below decks and there is no view of the horizon, the objects in a cabin (eg, paintings or a television) appear static or not moving. This results in the eyes signalling to the brain that there is no movement, whereas the inner ear is signalling that there is constant movement. These contradictory messages confuse the brain and increase the likelihood of developing and the severity of seasickness.

#### Symptoms

The severity of seasickness varies depending on an individual's tolerance for motion and on the degree of a vessel's motion. Unfortunately for individuals who have previously experienced motion sickness, seasickness is often triggered and worsened by anxiety. The following are symptoms of seasickness:

- nausea,
- paleness of the skin and cold sweats,
- vomiting,
- dizziness,
- headache,
- increased salivation, and
- fatigue.

#### Treatment

There are two primary treatments for seasickness: medication and stimulation. A wide variety of over-the-counter and prescription drugs are available which can reduce the feelings of nausea.

The best treatment for seasickness is to prevent its onset. The following preventative measures can be taken to reduce the risk of developing seasickness by reducing the signals sent to the brain from the inner ear, other medications can also be taken to reduce the feelings of nausea and vomiting. Most medications require 30 minutes to take effect and should be consumed before a trip begins.

Because seasickness can also be caused by anxiety, stimulation can also be used to reduce the risk of developing seasickness. Pressure bands (sea bands) are worn around the wrist or ankle. The bands have small plastic points which press against the skin and distract the individual from the motion of the vessel. Although pressure bands are merely placebos, they are often used by seamen and fishermen to avoid the drowsiness caused by motion sickness medication.

Like most ailments, the best treatment of seasickness is prevention. The following steps can be taken to prevent the onset of seasickness:

1. **Eat smart.** Avoid eating large meals and heavy, spicy or fatty foods feel heavy in the stomach after consumption. Beverages such as alcohol and caffeinated drink should also be avoided as they can also lead to an upset stomach.

2. **Hydrate.** If seasickness occurs, dehydration is a potential risk if the vomiting becomes severe. Prior to the start of a trip, consume a lot of water and drinks high in electrolytes. This gives more comfort while seasick and results in faster recovery once vomiting has subsided.
3. **Avoid strong odours.** Strong odours such as diesel fuel, food and sea growth can cause nausea and increase the likelihood of developing seasickness.
4. **Choose where you sit.** The ability to use the horizon as a visual reference point can greatly reduce the likelihood of developing seasickness. Select a seat that faces the bow so that the eyes can see the rise and fall of the vessel. If possible, sit near the middle of the vessel, where the motion of the vessel is less noticeable.
5. **Do not read.** Focusing on a television, book, magazine or newspaper forces the eyes to concentrate on a static object. This results in the eyes sending contradictory signals to the brain of that sent by the inner ear and increases the likelihood of developing seasickness.
6. **Breathe fresh air.** Sit next to a vent or window to ensure a constant supply of fresh air.
7. **Isolate yourself.** If other passengers are prone to seasickness or are already ill, remove yourself from the area. The sights and sounds of others who are ill can increase anxiety and increases the likelihood of developing seasickness.
8. **Pre-medicate.** Motion sickness medication is only effective when taken before a trip. If prone to developing seasickness or, if anticipating rough seas, it is important to consume the medication before becoming ill.

For most individuals, seasickness is a temporary ailment, which subsides after 2 to 3 days at sea, once the inner ear and brain have adapted to the motion of the vessel. Many mariners who spend extended periods of time at sea can develop land sickness once ashore. This occurs when the inner ear has become so accustomed to a vessel's motion that being on solid ground is disorienting and requires several days to readjust.



**Activate Your Brain:**

What is seasickness?

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What are the symptoms of seasickness?

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What are the two primary treatment types for seasickness?

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## SECTION 5

### CARBON MONOXIDE

#### CARBON MONOXIDE POISONING

Carbon monoxide (CO) is a colourless, odourless gas that is produced by burning fuels such as gasoline, oil, kerosene, propane or butane. Because it is undetectable to the human nose, CO poisoning can occur in a short amount of time without the victim's awareness that they are in any danger at all. Most stoves and other fuel burning appliances have an internal fan which removes most CO from the air by blowing it outdoors through an exhaust pipe. CO poisoning occurs most often when the fuel burning appliance has a defect caused by misuse or poor maintenance.

#### Symptoms

CO poisoning symptoms vary depending on an individual's tolerance for CO and on the amount of CO present. CO poisoning symptoms are similar to the common flu resulting in nausea, dizziness, headaches, confusion and deterioration of dexterity and motor skills.



**Danger!** The symptoms of CO poisoning can be easily mistaken for those of less dangerous ailments such as seasickness. Don't take a chance! If even the slightest possibility exists that it is CO poisoning, take action accordingly.

CO Exposure Level	Symptoms
<b>Low</b>	<ul style="list-style-type: none"> <li>• Shortness of breath.</li> <li>• Mild nausea.</li> <li>• Mild headaches.</li> </ul>
<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Nausea.</li> <li>• Vomiting.</li> <li>• Moderate to severe headache.</li> <li>• Vision and hearing impairment.</li> <li>• Dizziness.</li> <li>• Light-headedness.</li> <li>• Mental confusion.</li> <li>• Weakness and loss of muscle control.</li> </ul>
<b>High</b>	<ul style="list-style-type: none"> <li>• Unconsciousness.</li> <li>• Brain damage.</li> <li>• Fatal, causing death within minutes.</li> </ul>

#### Treatment

The best treatment for CO poisoning is to reduce the risk of exposure by ensuring proper use and maintenance of fuel burning appliances. To further reduce the risk of CO exposure, spaces that contain a fuel burning appliance should also contain a carbon monoxide detector. Similar to common smoke detectors, carbon monoxide detectors monitor CO levels and sound an alarm when CO levels become too high.

When an individual has been exposed to low levels of CO, they can be treated by removing them from the area and into fresh air. Treatment of moderate and high exposure must be conducted at a medical facility. Victims are given high-dosage oxygen through a facemask and in severe cases, a hyperbaric chamber. Individuals who have been exposed to moderate to high levels of CO often continue to experience nausea, dizziness, headaches and weakness for several months (and sometimes years) after their exposure.



### **Activate Your Brain:**

What is the most common cause of CO poisoning?

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What are the symptoms of moderate exposure to CO?

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What is the first aid treatment for an individual who has been exposed to low levels of CO?

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## **REFERENCES**

0-662-42286-4 Office of Boating Safety (2010). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen of Right of Canada, as represented by Transport Canada

C1-098 Office of Boating Safety. *Emergencies*. (2010). Retrieved March 30, 2010, from [http://www.tc.gc.ca/eng/marinesafety/debs-obs-operation-emergencies-menu-2295.htm#surviving\\_in\\_cold\\_water](http://www.tc.gc.ca/eng/marinesafety/debs-obs-operation-emergencies-menu-2295.htm#surviving_in_cold_water)

C1-278 *Cold-Water Shock, The Peril of Sudden Death*. (2004). Retrieved March 30, 2010, from [http://www.chronicbackpainclinic.com/pdf/cold\\_water\\_shock.pdf](http://www.chronicbackpainclinic.com/pdf/cold_water_shock.pdf)

C1-279 Healthy.net. *First Aid for Heat Exhaustion & Heat Stroke*. (2010). Retrieved March 30, 2010, from <http://www.healthy.net/scr/article.aspx?Id=1291>

C1-280 Medicine Net.com. *Motion Sickness*. (2010). Retrieved March 30, 2010, from [http://www.medicinenet.com/motion\\_sickness/article.htm](http://www.medicinenet.com/motion_sickness/article.htm)

C1-281 University of Maryland Medical Centre. *Motion Sickness* (2010). Retrieved March 30, 2010, from <http://www.umm.edu/altmed/articles/motion-sickness-000110.htm>

C1-282 *A Guide to prevent carbon monoxide poisoning*. (2010). Retrieved March 30, 2010, from <http://www.carbon-monoxide-poisoning.com>

C1-283 eMedicineHealth. *Carbon Monoxide Poisoning*. (2010). Retrieved March 30, 2010, from [http://www.emedicinehealth.com/carbon\\_monoxide\\_poisoning/article\\_em.htm](http://www.emedicinehealth.com/carbon_monoxide_poisoning/article_em.htm)

C1-284 Union Gas Limited. *Carbon Monoxide*. (2010). Retrieved March 30, 2010, from <http://www.uniongas.com/safety/carbon.asp>

C1-300 Smart Boater. *Beware of Cold Water Risks (The 1-10-1 Principle)*. (2011). Retrieved January 38, 2011, from [http://www.smartboater.ca/education/cold\\_water/tools/1-10-1\\_Principle.html](http://www.smartboater.ca/education/cold_water/tools/1-10-1_Principle.html)

C1-301 Coming Back Alive. *Cold Water Kills*. (2011). Retrieved January 31, 2011, from <http://www.comingbackalive.com/coldwater.html>

C1-302 Transport Canada. *Lifejackets and PFDs*. (2011). Retrieved January 31, 2011, from <http://www.tc.gc.ca/eng/marinesafety/debs-obs-equipment-lifejackets-information-1324.htm#lj1>

DVD Video. *Beyond Cold Water Boot Camp*. Copyright 2011. Canadian Safe Boating Council.

DVD Video. *Weather to Boat*. Canadian Safe Boating Council.

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## CHAPTER 3

### VESSEL RESTRICTIONS AND REQUIREMENTS

#### SECTION 1

#### VESSEL COMPLIANCE, LICENSING AND REGISTRATION

##### HULL SERIAL NUMBER (HIN)

All pleasure craft made in, or imported into Canada after August 1, 1981 require a HIN. A HIN is a 12-digit number that is permanently marked (in characters no less than 6 mm in height and width) on the upper right hand corner on the outside of the transom (eg, ABC2AB41G203). A HIN is used to help identify lost or stolen vessels and is required to be put in place by the boat builder before it can be sold.

##### COMPLIANCE NOTICES

Compliance Notices are the manufacturer's or importer's attestation that the vessel is built in accordance with the construction requirements of the *Small Vessel Regulations* and *Construction Standards for Small Vessels*.

The *Small Vessel Regulations* require, with a few exceptions, all pleasure craft under 24 m that are or can be fitted with engine(s) to have a Compliance Notice affixed to them in a conspicuous position plainly visible from the helm.

There are three types of Compliance Notices:

- For vessels of not more than 6 m (same for both pleasure and non-pleasure craft),
- For pleasure craft of more than 6 m, and
- For non-pleasure craft of more than 6 m.

For vessels of not more than 6 m, the Compliance Notice contains a statement of compliance with the construction requirements at the time the vessel was built or imported (the latest of the two). The notice must also indicate the recommended safe limits for gross load capacity in fair weather conditions and if the vessel is designed to be fitted with an outboard motor, the maximum power of the engine.



Gross Load Capacity refers to the total weight of persons, equipment, stores, fuel, motor assembly and steering controls.

For vessels above 6 m, the Compliance Notice must contain a statement of compliance indicating if the vessel was built to the pleasure craft construction requirements or to the non-pleasure craft construction requirements. A Compliance Notice for non-pleasure craft also contains a statement that the vessel may be used as a pleasure craft.



While the Compliance Notice gives recommended safe limits for the vessel, the operator must take into account the weather and water conditions and make adjustments accordingly.






Owners of pleasure craft may obtain their individual compliance notices from the original manufacturer.

CANADIAN COMPLIANCE NOTICE AVIS DE CONFORMITÉ CANADIEN		
MAXIMUM RECOMMENDED SAFE LIMITS LIMITES MAXIMALES DE SÉCURITÉ RECOMMANDÉES		
	<b>4</b>	<b>300 kg 660 lbs/lb</b>
 +  + 		<b>578 kg 1273 lbs/lb</b>
	<b>37 kW 50 HP</b>	<b>228 kg 502 lbs/lb</b>
<p>THE MAXIMUM RECOMMENDED SAFE LIMITS MIGHT HAVE TO BE REDUCED IN ADVERSE SEA AND WEATHER CONDITIONS. LES LIMITES MAXIMALES DE SÉCURITÉ RECOMMANDÉES PEUVENT DEVOIR ÊTRE RÉDUITES DANS LES CONDITIONS DE MER ET DES CONDITIONS MÉTÉOROLOGIQUES DIFFICILES.</p>		
<p><b>SAFEBOAT COMPANY INC. (MIC)</b> CITY, PROVINCE, COUNTRY</p>		
<p><b>MODEL / MODÈLE:      RUNABOUT 555X</b></p>		
<p>THE MANUFACTURER DECLARES THAT THIS PRODUCT COMPLIES WITH THE CONSTRUCTION REQUIREMENTS OF THE SMALL VESSEL REGULATIONS AS THEY READ ON THE DAY ON WHICH THE CONSTRUCTION OF THE VESSEL WAS STARTED OR ON THE DAY ON WHICH THE VESSEL WAS IMPORTED. LE FABRICANT ATTESTE QUE CE PRODUIT EST CONFORME AUX EXIGENCES DE CONSTRUCTION DU RÉGLEMENT SUR LES PETITS BÂTIMENTS EN VIGUEUR À LA DATE DU DÉBUT DE SA CONSTRUCTION OU DE SON IMPORTATION.</p>		

From "Transport Canada", 2011, Compliance Notices. Retrieved March 25, 2011, from [http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork\\_notices-120.htm](http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork_notices-120.htm)

Figure 1 Compliance Notice for an inboard or stern-drive powered vessel of not more than 6 m

CANADIAN COMPLIANCE NOTICE AVIS DE CONFORMITÉ CANADIEN		
MAXIMUM RECOMMENDED SAFE LIMITS LIMITES DE SÉCURITÉ MAXIMALES RECOMMANDÉES		
	<b>6</b>	<b>450 kg 991 lbs</b>
 + 		<b>525 kg 1156 lbs</b>
<p>THE RECOMMENDED SAFE LIMITS MAY HAVE TO BE REDUCED IN ADVERSE SEA AND WEATHER CONDITIONS. LES LIMITES MAXIMALES DE SÉCURITÉ RECOMMANDÉES PEUVENT DEVOIR ÊTRE RÉDUITES DANS LES CONDITIONS DE MER ET LES CONDITIONS MÉTÉOROLOGIQUES DIFFICILES.</p>		
<p><b>SAFEBOAT COMPANY INC. (MIC)</b> CITY, PROVINCE, COUNTRY</p>		
<p><b>MODEL / MODÈLE:      RUNABOUT 555X</b></p>		
<p>THE MANUFACTURER DECLARES THAT THIS PRODUCT COMPLIES WITH THE CONSTRUCTION REQUIREMENTS OF THE SMALL VESSEL REGULATIONS AS THEY READ ON THE DAY ON WHICH THE CONSTRUCTION OF THE VESSEL WAS STARTED OR ON THE DAY ON WHICH THE VESSEL WAS IMPORTED. LE FABRICANT ATTESTE QUE CE PRODUIT EST CONFORME AUX EXIGENCES DE CONSTRUCTION DU RÉGLEMENT SUR LES PETITS BÂTIMENTS EN VIGUEUR À LA DATE DU DÉBUT DE SA CONSTRUCTION OU DE SON IMPORTATION.</p>		

From "Transport Canada", 2011, Compliance Notices. Retrieved March 25, 2011, from [http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork\\_notices-120.htm](http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork_notices-120.htm)

Figure 2 Compliance Notice for an inboard or stern-drive powered vessel of not more than 6 m



From "Transport Canada", 2011, Compliance Notices. Retrieved March 25, 2011, from [http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork\\_notices-120.htm](http://www.tc.gc.ca/eng/marinesafety/debs-obs-paperwork-paperwork_notices-120.htm)

Figure 3 Compliance Notice for Pleasure Craft of more than 6 m

## VESSEL LICENSING

Pleasure craft powered by an engine of 10 hp (7.5 kW) or more must be licensed, and the vessel owner's information (including name and address) kept up-to-date regardless of where they operate in Canada.

By law, a pleasure craft's licence (or copy of) must be carried on-board and the licence number must be displayed above the waterline on both sides of the bow, as far forward as practical and where it can easily be seen. The numbers must be in block letters, 7.5 cm (3 inches) in height and must contrast with the colour of the pleasure craft's bow. Pleasure craft owners that do not legally require vessel licensing may choose to voluntarily licence their vessel with Transport Canada so that in the event of an emergency, Search and Rescue can access the vessel's information from the *Pleasure Craft Licensing System*.

A pleasure craft licence is free-of-charge, valid for ten years beginning on the day which it is issued, transferred or renewed and can be obtained from Service Canada. To learn more about obtaining or transferring a pleasure craft licence, visit [www.servicecanada.gc.ca](http://www.servicecanada.gc.ca).



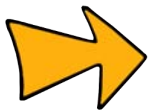
Vessels that are registered do not require a pleasure craft licence.

## VESSEL REGISTRATION

Although it is not a required to register a pleasure craft, owners can still choose to do so. There is a cost associated with registering a vessel but it can provide some important benefits that a vessel licence does not, such as:

- proof of ownership (legal title),
- the right to fly the Canadian flag,
- a unique name and official number, and
- the right to use the boat as security for a marine mortgage.

To learn more about vessel registration, visit Transport Canada's Vessel Registration Office online at [www.tc.gc.ca](http://www.tc.gc.ca).



Owners of vessels operated in Canada for commercial use are required to register their vessel with Transport Canada.

## BUYING A PLEASURE CRAFT

When buying a pleasure craft that is going to be owned and operated in Canadian waters, the vessel purchaser (new owner) is required to ensure the vessel is constructed in accordance with Transport Canada's *Construction Standards for Small Vessels* and ensure the vessel licence is transferred to their name.

When buying a pleasure craft, it is a good idea to hire a professional marine surveyor to inspect the vessel and ensure the vessel is in compliance with Transport Canada's *Construction Standards for Small Vessels*. Construction standards for vessels fabricated in other countries may differ from Canadian standards, therefore special attention must be made if making a foreign purchase.

Similar to the Proof of Ownership certificates used by most provinces, pleasure craft licences have a Pleasure Craft Transfer Form printed on the reverse side of the licence. Before a vessel can legally be operated by its new owner, the pleasure craft's licence must be transferred to their name. The seller of the vessel (previous owner) is required to sign and date the transfer form so the vessel purchaser can apply to Service Canada for a new licence. The transfer of the vessel licence must take place within 90 days.



If purchasing a pleasure craft from another country, contact the Canada Border Services Agency (CBSA) to determine what documentation is required and tariff (import) fees may apply.



Many small pleasure craft purchases also involve the purchase of a boat trailer. The trailer should be inspected to ensure it is in proper working condition and is the appropriate size and type for the vessel. Because trailers are considered motor vehicles, the licence and ownership of the trailer must also be transferred to the new owner at the point of purchase.

## ENFORCEMENT

In accordance with the *Canada Shipping Act* and *Small Vessel Regulations*, a marine safety inspector acting on behalf of the Minister of Transport or other agency authorized by the Minister of Transport to conduct marine inspections may board and inspect a vessel in Canadian waters. The inspection seeks to ensure the compliance of:

- HIN,
- compliance notice,
- vessel licensing or registration,
- construction standards,
- safe loading,
- minimum required safety equipment, and
- navigation equipment.

The failure to comply with *Canada Shipping Act* and *Small Vessel Regulations* may result in fines, the seizure of the vessel or imprisonment. During the recreational boating season, Transport Canada works with the Canadian Coast Guard Auxiliary, the Canadian Power and Sail Squadrons and other safe boating organizations to offer



free courtesy compliance checks for pleasure craft. At the request of a pleasure craft owner, a boating safety volunteer can board and carry out a courtesy check of the vessel and provide feedback and recommendations to the owner. Because courtesy compliance checks are intended to promote safe boating practices, any violations are brought to the attention of the boat owner, but do not result in fines or other penalties.

**Activate Your Brain:**

What is the purpose of a hull serial number (HIN)?

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What information regarding recommended safe limits is displayed on a capacity label?

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Who has the authority to board and conduct a compliance inspection of a vessel in Canadian waters?

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## SECTION 2

### VESSEL COMPLIANCE, LICENSING AND REGISTRATION

The *Vessel Operation Restriction Regulations (VORR)* outlines the various restrictions placed on vessels operating in Canadian waters such as, signage, anchorage locations, engine type and horsepower limitations and age / horsepower restrictions. Restrictions such as engine type and horsepower limitations vary depending on the body of water and are usually clearly identified by posted signage on the water and at public boat launches.

Operators of pleasure craft have a legal obligation to refer to, and comply, with the restrictions imposed under *VORR*. Operators must be familiar with the waterways in which they boat and any related restrictions. Some of the general restrictions found in the *VORR* are described in this section. To refer to the complete *VORR*, visit the Acts and Regulations page of the Transport Canada website at [www.tc.gc.ca](http://www.tc.gc.ca).

#### SPEED LIMITS

Unless otherwise posted, there is a maximum speed limit of 15 km/h along shorelines. Most provinces have adopted a shoreline speed zone policy imposing a maximum speed of 10 km/h within 30 m of shore. This limit applies to all waterways in the provinces of Ontario, Manitoba, Saskatchewan and Alberta, and the inland waters of Nova Scotia and British Columbia.

Pleasure craft operators have must adhere to speed limits even if they are not posted. Therefore, refer to the *VORR* and be aware of any speed limits in effect in the area.

#### AGE / HORSEPOWER RESTRICTIONS

*Vessel Operation Restriction Regulations* age / horsepower restrictions apply to all applicable operators. Restrictions are placed on operators under the age of 12 and operators from the age of 12 to 16 regarding supervision, horsepower restrictions and the use of personal watercraft (PWC).

Age	Restrictions
Under 12 years of age with no direct supervision.	May operate a boat with up to 10 hp (7.5 kW).
Ages 12 to 16 with no direct supervision.	May operate a boat with up to 40 hp (30 kw).
16 years of age or older.	No horsepower restrictions.
Under 16 years of age, regardless of supervision.	May not operate a PWC.



**Supervisor.** An individual who is 16 years of age or older and is present in the vessel being operated by the youth.

#### OTHER RESTRICTIONS AND SIGNAGE

Many waterways in Canada, especially those with higher volume of recreational boating activities have areas where boats are either prohibited or where specific restrictions and / or special conditions apply. These areas are identified using signs placed on buoys, on docks, along the shoreline or some other location easily seen from the water.

There are five types of shapes for the restriction signs. The frame colour is orange with the type of restriction shown in the middle. Green bordered areas indicate that a special condition applies to the restriction (for example, the day / time an activity is allowed). If the sign is arrow-shaped, the restriction applies in the direction pointed by the arrow. It is important to be able to recognize these signs, know what they mean and follow them.

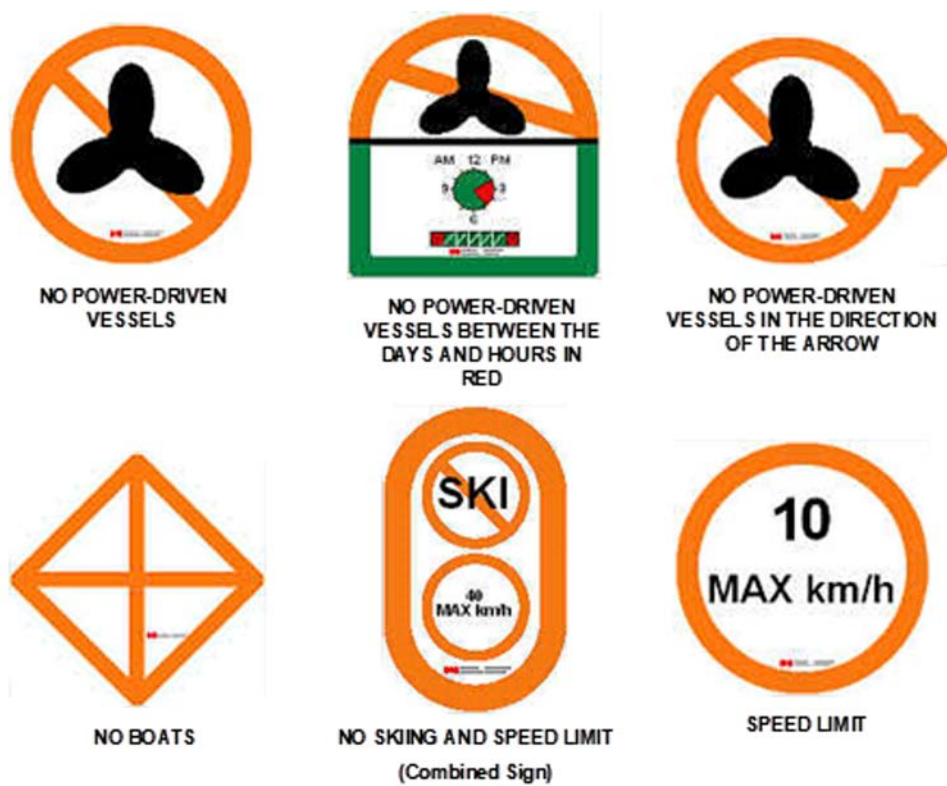


Figure 1 Examples of Restriction Signs

## SECTION 3

### USE AND MAINTENANCE OF PLEASURE CRAFT SAFETY EQUIPMENT

*Small Vessel Regulations* stipulate the minimum requirements for the safety equipment that must be carried onboard a pleasure craft. The specific equipment varies based on the length and type of vessel. The specific carriage requirements will be covered later in Section 4. The tables that follow in this section provide the basic description, intended use and some general maintenance information about the various types of safety equipment.







#### Always Be Prepared!

When it comes to safety equipment, the middle of an emergency is not the time to be trying to figure out how to use a piece of equipment. Safety equipment must always be easily accessible and in good working order. Always read and follow the manufacturer's instructions on operation and maintenance and test equipment on a regular basis.



Operators have an obligation to inform their passengers of the location and use of safety equipment and what they should do in case of an emergency.

#### Personal Life-Saving Appliances

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Lifejacket or PFD</b></p>	<p>As previously mentioned, the operator of a pleasure craft, is required to ensure there is a minimum of one Canadian-approved lifejacket or PFD of appropriate size for each person on board.</p> <p><b>Note:</b> The description, use and maintenance of lifejackets and PFDs have been covered in chapter 2</p>
 <p><b>Buoyant Heaving Line</b></p>	<p><b>Use:</b> A heaving line must be kept in a place that can be quickly accessed and only used in emergencies to assist a person in the water. It is recommended that a person practice throwing the heaving line to develop accuracy.</p> <p><b>Description:</b> A rope made of buoyant material of not less than 15 or 30 m in length depending on the size of the vessel. It is also recommended that a ball or other buoyant object be attached to one end to assist in throwing accuracy.</p> <p><b>Maintenance:</b> Check regularly for fraying or other signs of wear and coil neatly to prevent tangling.</p>


EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Lifebuoy</b></p>	<p><b>Use:</b> The lifebuoy must be kept in a place that can be quickly accessed and is used in emergencies to assist a person in the water. Assist in keeping a person afloat as well retrieving the person overboard.</p> <p><b>Description:</b> A buoyant ring attached to a buoyant line. There are currently two types lifebuoys approved for use in Canada:</p> <ul style="list-style-type: none"> <li>• Small Vessel Lifebuoy (610 mm) – Approval authority is Transport Canada; and</li> <li>• SOLAS Lifebuoy (762 mm) – Approval authority is SOLAS.</li> </ul> <p><b>Maintenance:</b> Check regularly for holes or tears, fraying of grab lines or other signs of wear.</p>
 <p><b>Re-boarding Device</b></p>	<p><b>Use:</b> Used to assist a person to board the vessel from the water.</p> <p><b>Description:</b> The device must be appropriate to the size of the vessel and cannot be part of the propulsion unit (eg, the engine shaft). Examples include: metal, plastic or rope ladder, swimming platform or hoisting device with harness.</p> <p><b>Maintenance:</b> Check regularly for signs of wear and ensure it is in working order.</p>




### Life-Saving Equipment – Visual Signals

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Watertight Flashlight</b></p>	<p><b>Use:</b> In addition to the obvious benefits of having a flashlight in the dark, it can also be used as a distress signal by flashing it at regular intervals of 50 to 70 per minute.</p> <p><b>Note:</b> A watertight flashlight also qualifies as navigation lights on sailboats less than 7 m and other non-powered pleasure craft.</p> <p><b>Description:</b> A flashlight with watertight seal that operates even after being submerged in water.</p> <p><b>Maintenance:</b> Regularly test and change batteries as required and ensure the watertight seal is intact.</p>
 <p><b>Pyrotechnic Distress Signals (Flares)</b></p>	<p><b>Use:</b> Used to indicate distress. Should only be used in times of real emergency. With a high wind velocity, lower the angle to a maximum of 45 degrees.</p> <p><b>Description:</b> There are four types of distress flares approved by Transport Canada, each is described below.</p> <p><b>Maintenance:</b> Store flares vertically in a cool, dry, accessible location (such as a watertight container). Pyrotechnics are valid only for four years from the date of manufacture, stamped on each flare. To dispose of your outdated flares, seek advice from your local fire department, law enforcement agency or Transport Canada Centre.</p>


EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
Pyrotechnic Distress Signals (Flares) (Cont)	<p><b>Rocket Parachute Flare</b></p> <ul style="list-style-type: none"> <li>creates a single red star;</li> <li>reaches a height of 300 m and descends slowly with a parachute;</li> <li>is easily seen from the ground and air from a long distance, day or night; and</li> <li>burns for at least 40 seconds.</li> </ul> <p><b>Multi-Star Flare</b></p> <ul style="list-style-type: none"> <li>creates two or more red stars;</li> <li>reaches a height of 100 m and each burns for 4–5 seconds; and</li> <li>is easily seen from the ground and air, day or night, but has less visual range than a rocket parachute flare.</li> </ul> <p><b>Hand Flare</b></p> <ul style="list-style-type: none"> <li>is a hand-held red flame torch;</li> <li>can be seen day or night but has limited visibility from the ground due to obstructions in line of sight;</li> <li>normally used to signal to a passing aircraft; and</li> <li>burns for at least one minute.</li> </ul> <p><b>Buoyant or Hand-Held Smoke Signal</b></p> <ul style="list-style-type: none"> <li>creates a dense orange smoke for three minutes,</li> <li>is only effective in daylight and can have limited visibility from the ground due to obstructions in line of sight, and</li> <li>can be packaged for pleasure craft with three signals that last one minute each.</li> </ul>

### Vessel Safety Equipment



EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Manual Propelling Device</b></p>	<p><b>Use:</b> Used to propel the vessel in the event of mechanical breakdown.</p> <p><b>Description:</b> A manual propelling device may consist of: a paddle; a set of oars; or anything that can be operated by hand or foot to propel the vessel (eg, the rudder on a dinghy sailboat).</p> <p><b>Maintenance:</b> Check regularly for signs of wear and ensure it is in working order.</p>



EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Anchor</b></p>	<p><b>Use:</b> Anchor your vessel, whether it is just to stop and rest for the night or in an emergency situation where you must take safe harbour from the weather or keep your vessel from drifting into danger in the event of a mechanical breakdown.</p> <p><b>Note:</b> When anchoring in adverse conditions (eg, strong wind and large waves) a larger anchor should be used and the scope (ratio of length of anchor line to depth of water) increased to create more holding power.</p> <p><b>Description:</b> An anchor with the appropriate length of line (rope, cable, chain or combination thereof) for the length of the vessel and water depth (the recommended normal scope is 7:1). There are minimum required lengths for anchor lines based on the size of the vessel which are covered in the next section.</p> <p>There are a number of different types and sizes of anchors depending on the type of bottom its intended (mud, sand, rocky, etc) for and the holding power based on the size of the vessel. When selecting an anchor be sure to refer to the manufacturer's instructions for intended use and holding power.</p> <p><b>Maintenance:</b> If the anchor is attached with a locking device, ensure the shackle pin is properly secured. The anchor is attached to the vessel by the (anchor) rode, which is made of a chain, cable, rope or a combination of the three. The rode should be inspected regularly for chaffing and other signs of wear and its components replaced as required.</p> <p>And don't forget to secure the other end of the anchor line to the bow of your boat!</p>
 <p><b>Bailer</b></p>	<p><b>Use:</b> Removes water from the boat.</p> <p><b>Description:</b> Bailers must be at least 750 ml with the opening a minimum of 65 cm<sup>2</sup> (10 in<sup>2</sup>), and made of plastic or metal.</p> <p><b>Maintenance:</b> Replace as necessary.</p>
 <p><b>Manual Bilge Pump</b></p>	<p><b>Use:</b> Used to remove water from the boat.</p> <p><b>Description:</b> Many pleasure craft are equipped with electric bilge pumps and permanently fixed manual pumps. Electric pumps are connected to the battery, and can be equipped with a float, which activated the pump when water levels rise, and automatically shuts off when water levels drop—this can result in the accidental discharge of engine lubricants that have leaked into the bilge.</p> <p>Many pleasure craft are equipped with electric bilge pumps and permanently fixed manual pumps. Electric pumps are connected to the battery, and can be equipped with a float, which activates the pump when water levels rise, and automatically shuts off when water levels drop—this can result in the accidental discharge of engine lubricants that have leaked into the bilge.</p>




EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
<b>Manual Bilge Pump (Cont)</b>	<p>Permanently fixed manual bilge pumps are equipped with longer hoses than portable manual pumps; this allows for the pump level to be installed in convenient areas like the cockpit for ease of use.</p> <p><b>Maintenance:</b> Check regularly for signs of wear and ensure it is in working order.</p>
 <b>Electric Bilge Systems</b>	<p><b>Use:</b> Used to remove water from the boat.</p> <p><b>Description:</b> Many pleasure craft are equipped with electric bilge pumps and permanently fixed manual pumps. Electric pumps are connected to the battery, and can be equipped with a float, which activated the pump when water levels rise, and automatically shuts off when water levels drop—this can result in the accidental discharge of engine lubricants that have leaked into the bilge.</p> <p>Permanently fixed manual bilge pumps are equipped with longer hoses than portable manual pumps; this allows for the pump level to be installed in convenient areas like the cockpit for ease of use.</p>



### Navigation Equipment

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <b>Sound-Signalling Appliance</b>	<p><b>Use:</b> Sound-signalling appliances are required for vessels over 12 m in length and used to attract attention and communicate intended manoeuvres such as turning to port / starboard, moving astern, etc. They are also used to make a vessel's presence known to others during periods of restricted visibility. Specific sound signals and their meaning are covered in Chapter 4.</p> <p><b>Description:</b> A permanently fitted whistle or bell as defined by <i>Collision Regulations</i>. Depending on the length of the vessel one or both types may be required.</p> <p><b>Maintenance:</b> Must be regularly tested and kept in good working order.</p>
 <b>Sound-Signalling Device</b>	<p><b>Use:</b> Sound-signalling devices are required for vessels under 12 m in length that are not fitted with a sound-signalling appliance. Their intended use is the same as a sound-signalling appliance.</p> <p><b>Description:</b> A pealess whistle or a compressed gas or electric horn.</p> <p><b>Maintenance:</b> In accordance with manufacturer's instructions.</p>


EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Navigation Lights</b></p>	<p><b>Use:</b> Navigation lights are used to indicate the type of vessel and its course after sunset and before sunrise or in periods of restricted visibility to assist in the avoidance of collisions.</p> <p><b>Description:</b> Navigation lights are red, green and white lights with specific configurations, range and arc of visibility requirements based on the type and size of a vessel. These specifications are covered later in Chapter 4.</p> <p><b>Maintenance:</b> Navigation lights should be regularly inspected to ensure they are in working order and light bulbs changed as required.</p>
 <p><b>Magnetic Compass</b></p>	<p><b>Use:</b> Magnetic compasses are used to measure a boat's heading.</p> <p><b>Description:</b> Dependent on manufacturer.</p> <p><b>Maintenance:</b> Dependent on manufacturer.</p>




### Firefighting Equipment

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Portable Fire Extinguisher</b></p>	<p><b>Use / Description:</b> Different types of fires require different types of extinguishers. The letters on a fire extinguisher identify what types of fires it is designed to extinguish. Fires are classified as follows:</p> <ul style="list-style-type: none"> <li>• <b>Class A.</b> Materials that burn, such as wood, cloth, paper, rubber and plastic.</li> <li>• <b>Class B.</b> Liquids that burn, such as gasoline, oil and grease.</li> <li>• <b>Class C.</b> Electrical equipment.</li> <li>• <b>Class D.</b> Combustible metals such as magnesium and titanium.</li> </ul> <p><b>Water or APW (air-pressurized water) Fire Extinguishers.</b> Water Fire Extinguishers are suitable for Class A fires only. Never use a water extinguisher on grease fires, electrical fires or Class D fires - the flames spread and make the fire bigger! Water extinguishers are filled with water and are typically pressurized with air. Again - water extinguishers can be very dangerous in the wrong type of situation. Only fight the fire if you're certain it contains ordinary combustible materials only.</p> <p><b>CO<sub>2</sub> Fire Extinguishers.</b> CO<sub>2</sub> fire extinguishers eject CO<sub>2</sub>, which, when directed at the base of a fire, cuts off the fire's supply of oxygen. The duration for the 6.8-kg (15-lb) extinguisher is 45 seconds. The extinguisher consists of a single steel cylinder that holds CO<sub>2</sub> in a liquid state. When operated, the pressure forces the liquid out the suction tube and into the discharge horn where it quickly changes back to a gas state. CO<sub>2</sub> is most effective in fighting Class "C" fires, but it is effective as a smothering agent for Class "B" fires and can also be used to control Class "A" fires by extinguishing surface flames.</p>

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
<p><b>Portable Fire Extinguisher (Cont)</b></p>	<p><b>Dry Chemical Fire Extinguishers.</b> Dry chemical fire extinguishers come in a variety of types and are suitable for a combination of Class A, B and C fires. These are filled with foam or powder and pressurized with nitrogen</p> <ul style="list-style-type: none"> <li>• <b>BC</b> - This is the regular type of dry chemical extinguisher. It is filled with sodium bicarbonate or potassium bicarbonate. The BC variety leaves a mildly corrosive residue which must be cleaned immediately to prevent any damage to materials.</li> <li>• <b>ABC</b> - This is the multipurpose dry chemical extinguisher. The ABC type is filled with monoammonium phosphate, a yellow powder that leaves a sticky residue that may be damaging to electrical appliances such as a computer. Dry chemical extinguishers have an advantage over CO<sub>2</sub> extinguishers since they leave a non-flammable substance on the extinguished material, reducing the likelihood of re-ignition.</li> <li>• Dry chemical fire extinguishers differ from other types of fire extinguishers because their contents are dry. To keep the chemicals active, once a month, dry chemical fire extinguishers need to be removed from their storage bracket, turned upside down and given several hard shakes.</li> </ul> <p>The number before the letters on the extinguisher identifies the size of a fire it will extinguish compared to other extinguishers. For example, a 10BC device puts out a larger fire than a 5BC device.</p> <p>Portable fire extinguisher must be certified and labelled by the Underwriters' Laboratories of Canada (ULC), the British Department of Trade and Industry for marine use or the US Coast Guard (for marine use).</p> <p>All persons onboard should make themselves familiar with the use of the fire extinguisher by reading the manufacturer's instructions.</p> <p><b>Maintenance:</b> Must be kept fully charged, stored in a readily accessible location in areas where fire is most likely to occur and maintained according to the manufacturer's instructions.</p>
 <p><b>Axe</b></p>	<p><b>Use:</b> An axe is used primarily as tool to assist in gaining access to the fire source to extinguish it. It can also be used to cut a towline in an emergency.</p> <p><b>Description:</b> Any type of axe is acceptable, but a spiked axe (as pictured) is recommended.</p> <p><b>Maintenance:</b> The axe must be stored in a location that is readily accessible but not exposed to the elements.</p>
 <p><b>Bucket</b></p>	<p><b>Use:</b> A bucket is used to assist in the extinguishing of a fire by collecting water from over the side of the vessel.</p> <p><b>Description:</b> A bucket with a recommended capacity of 10 L or more, made of metal and attached to a line of sufficient length to reach the water from the location it is stored.</p>

## Other Safety Equipment

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p data-bbox="170 1192 349 1224"><b>Marine Radio</b></p>	<p data-bbox="461 294 1399 525"><b>Use:</b> A marine VHF radio is the most effective and reliable means of emergency communications because it alerts emergency services and other boaters in the area who may be able to render assistance.. Operators should keep their VHF radio tuned to Channel 16 and listen for distress, urgency and safety calls. VHF radio is considered the best way to call because it alerts other boaters in the area at the same time and they may be able to render assistance.</p> <ul data-bbox="461 550 1399 1333" style="list-style-type: none"> <li>• <b>Distress Call.</b> A distress call is the highest priority. It is used when, and only when, a vessel or person onboard is in <b>grave and imminent danger</b> and requires immediate assistance (ie, a life-threatening situation). To make a distress call use channel 16 and say the word “MAYDAY” repeated three times followed by a message including the name and description of the vessel, its position, the nature of the emergency and the type of assistance needed.</li> <li>• <b>Urgency Call.</b> An urgency call has priority over all other communications except a distress call. It is used to transmit an urgent message regarding the safety of a vessel or persons onboard (ie, a vessel adrift and unable to make it to shore, but not in imminent danger). To make an urgency call use channel 16 and say the word “<b>PAN-PAN</b>” repeated three times followed by a message including the name and description of the vessel, its position, the nature of the emergency and the type of assistance needed.</li> <li>• <b>Safety Call.</b> A safety call is third inline of priority. It is used to communicate a navigational or meteorological warning to vessels operating in a particular area. To make a safety call, initiate the call on channel 16 by saying the word “<b>SÉCURITÉ</b>” repeated three times then indicate the area of concern and the channel (other than channels 16 or 70) that the warning will be communicated on. All those concerned then switch to the channel indicated to send / receive the specific details of the warning.</li> </ul> <p data-bbox="461 1354 1399 1453"><b>Note:</b> Channel 16 is only to be used for emergency communications or to initiate a call, after which the parties involved switch to a working channel to continue their communication.</p> <p data-bbox="461 1470 1399 1696"><b>Description:</b> Marine VHF radios are available in many different models in both base station and hand-held form. Newer radios are now equipped with a feature known as Digital Selective Calling (DSC) which operates on VHF Channel 70. DSC equipped radios have a number of automated features the most valuable of which is the ability to send a digital Distress Call at the touch of a single button. To learn more about DSC and its advantages, visit the Industry Canada website, at <a href="http://www.ic.gc.ca">www.ic.gc.ca</a>.</p> <p data-bbox="461 1717 1399 1785"><b>Usage:</b> All VHF marine radio operators must carry a Restricted Operator Certificate (Maritime)—ROC(M).</p> <p data-bbox="461 1806 1399 1904"><b>Maintenance:</b> In accordance with manufacturer’s instructions. Ensure the battery is charged (if applicable) and / or have a means of recharging onboard.</p>

EQUIPMENT	USE / DESCRIPTION / MAINTENANCE
 <p><b>Cellular Telephone</b></p>	<p><b>Use:</b> Cellular phones can also be used to communicate an emergency by calling the 1-800 number for the rescue coordination centre or by dialling *16.</p> <p><b>Note:</b> Not all cellular providers offer the *16 service. Contact your wireless provider to be sure.</p> <p>However, a cell phone is not a reliable substitute for a marine radio and not the best means of issuing a distress call, as it does not alert other vessels in the area of the situation. Cell phones can also lose reception or get wet and damaged.</p> <p><b>Maintenance:</b> Ensure the battery is charged / or have a means of recharging onboard.</p>
 <p><b>Global Positioning System (GPS) Receiver</b></p>	<p><b>Use / Description:</b> The GPS is a worldwide radio-navigation system consisting of a network of satellites and monitoring stations. A GPS receiver can calculate a vessel's position, anywhere on the planet, to within 30 metres. Connecting a GPS receiver to a DSC marine radio ensures that when a distress call is transmitted, the precise location is automatically sent to rescuers. GPS receivers are available for many different models in both base station and hand-held form.</p> <p><b>Maintenance:</b> In accordance with manufacturer's instructions. Ensure the battery is charged (if applicable) and / or have a means of recharging onboard.</p>
 <p><b>Passive Radar Reflector</b></p>	<p><b>Use:</b> Radar reflectors are required* for vessels less than 20 m in length or that are constructed of primarily non-metallic materials. These devices allow the smaller vessel to be seen on the radar screen of larger, less manoeuvrable ships. They should be placed above any equipment (eg, wheelhouse, etc.) and at least 4 m above the waterline (if possible).</p> <p><b>Description:</b> A passive radar reflector is a metallic device usually sphere, diamond or cylinder shaped that can either be permanently mounted or hoisted on a halyard.</p> <p><b>Maintenance:</b> Prior to departure, inspect halyard fittings to ensure the reflector can be hoisted if required.</p> <p>*Not required if operating in limited traffic conditions, daylight and favourable weather conditions or if the small size of the vessel or operation away from radar navigation makes compliance impracticable.</p>



To help make navigation safer, the following must be carried onboard:

- the latest edition of the largest scale chart (when available), and
- the latest edition of related documents and publications including *Notice to Mariners*, *Sailing Directions*, tide and current tables, and the *List of Lights, Buoys and Fog Signals*.

If operating a vessel under 100 gross tons, these documents and publications are not required provided you know:

- the location and type of charted shipping routes, lights, buoys, marks and boating hazards, and
- the area's usual boating conditions such as tides, currents, ice and weather patterns.

## SECTION 4

### MINIMUM REQUIRED SAFETY EQUIPMENT

The *Small Vessel Regulations* identify the minimum equipment required onboard a pleasure craft according to vessel length. The following tables outline the minimum safety equipment requirements for different types and sizes of pleasure craft.

#### Pleasure Craft Not More Than 6 m in Length:

(Other than Human-Powered)

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>A re-boarding device (if the freeboard of the vessel is greater than 0.5 m); and</li> <li>A buoyant heaving line no less than 15 m in length.</li> </ul>
Life-Saving Appliances—Visual Signals (if fitted with an engine)	<ul style="list-style-type: none"> <li>A watertight flashlight; <b>or</b></li> <li>3 pyrotechnic distress signals (flares) other than smoke signals</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>A manual propelling device or an anchor with no less than 15 m of cable and / or chain in any combination;</li> <li>A bailer or manual bilge pump;</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>A sound-signalling appliance or sound-signalling device;</li> <li>Navigation lights appropriate to the vessel type (if operating from sunset to sunrise or during periods of restricted visibility); and</li> <li>A magnetic compass.</li> </ul>
Firefighting Equipment	<ul style="list-style-type: none"> <li>A 5B:C portable fire extinguisher (if the vessel has an inboard engine, fixed fuel tank or fuel-burning appliances).</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li><b>Visual Signals.</b> If not fitted with an engine, visual signal requirements do not apply;</li> <li><b>Visual Signals.</b> Pyrotechnic distress signals are not required on rivers, canals or lakes where at no time the vessel will be less than one nautical mile from shore; or if the vessel has no sleeping arrangements and is engaged in an official competition or in final preparation for an official competition.</li> <li><b>Vessel Safety Equipment.</b> A bailer or manual bilge pump is not required for a boat that cannot hold enough water to make it capsize or a boat that has watertight compartments that are sealed and not readily accessible (eg, pontoon boat).</li> <li><b>Navigation Equipment.</b> A compass is not required if operating within sight of navigational aids (seamarks).</li> <li><b>Racing Pleasure Craft</b> (other than canoes, kayaks and rowing shells). When engaged in formal training, in an official competition or in final preparation for an official competition and is operated under conditions of clear visibility and attended by a safety craft only need to carry the safety equipment that is required under the rules of the applicable governing body.</li> </ul>	

**Pleasure Craft More Than 6 m but Not More Than 9 m in Length:***(Other than Human-Powered)*

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>• A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>• A re-boarding device (if the freeboard of the vessel is greater than 0.5 m); and</li> <li>• A buoyant heaving line no less than 15 m in length <b>or</b> a lifebuoy attached to buoyant heaving line no less than 15 m.</li> </ul>
Life-Saving Appliances– Visual Signals	<ul style="list-style-type: none"> <li>• A watertight flashlight; and</li> <li>• 6 pyrotechnic distress signals (flares) not more than two of which is a smoke signal.</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>• 1 manual propelling device <b>or</b> 1 anchor with no less than 15 m of cable and / or chain in any combination;</li> <li>• A bailer <b>or</b> manual bilge pump.</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>• A sound-signalling appliance <b>or</b> sound-signalling device;</li> <li>• Navigation lights appropriate to the vessel type (if operating from sunset to sunrise or during periods of restricted visibility); and</li> <li>• A magnetic compass.</li> </ul>
Firefighting Equipment	<ul style="list-style-type: none"> <li>• A 5B:C portable fire extinguisher (if the vessel is power-driven); and</li> <li>• A 5B:C portable fire extinguisher (if the vessel has fuel-burning appliances).</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li>• <b>Vessel Safety Equipment.</b> A bailer or bilge pump is not required if the vessel is of a design that will not retain enough water to cause it to capsize.</li> <li>• <b>Navigation Equipment.</b> A compass is not required on a vessel not more than 8 m if operating within sight of navigational aids (seamarks).</li> <li>• <b>Racing Pleasure Craft</b> (other than canoes, kayaks and rowing shells). When engaged in formal training, in an official competition or in final preparation for an official competition and is operated under conditions of clear visibility and attended by a safety craft may carry, instead of the equipment prescribed above, the safety equipment that is required under the rules of the applicable governing body.</li> <li>• <b>Life-Saving Appliances – Visual Signals.</b> The number of flares can be reduced to at least 3 pyrotechnic distress signals (flares), not more than 1 of which is a smoke signal if the vessel is equipped with two-way electronic communication devices (eg, cell phone, satellite phone, VHF radio with digital selective calling, 406 MHz personal locator beacons or 406 MHz emergency position radio-indicating beacons).</li> </ul>	



**Pleasure Craft More Than 9 m but Not More Than 12 m in Length:***(Other than Human-Powered)*

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>• A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>• A re-boarding device (if the freeboard of the vessel is greater than 0.5 m);</li> <li>• A buoyant heaving line no less than 15 m in length; <b>and</b></li> <li>• A lifebuoy attached to buoyant line no less than 15 m.</li> </ul>
Life-Saving Appliances– Visual Signals	<ul style="list-style-type: none"> <li>• A watertight flashlight; <b>and</b></li> <li>• 12 pyrotechnic distress signals (flares), of which not more than 6 are smoke signals.</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>• A anchor with no less than 30 m of cable and / or chain in any combination; and</li> <li>• 1 manual bilge pump or bilge pumping arrangements.</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>• A sound-signalling appliance <b>or</b> sound-signalling device;</li> <li>• Navigation lights appropriate to the vessel type; and</li> <li>• A magnetic compass.</li> </ul>
Firefighting Equipment	<ul style="list-style-type: none"> <li>• A 10B:C portable fire extinguisher (if the vessel is power-driven); and</li> <li>• A 10B:C portable fire extinguisher (if the vessel has fuel-burning appliances).</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li>• <b>Vessel Safety Equipment.</b> A bailer or bilge pump is not required if the vessel is of a design that will not retain enough water to cause it to capsize.</li> <li>• <b>Racing Pleasure Craft</b> (other than canoes, kayaks and rowing shells). When engaged in formal training, in an official competition or in final preparation for an official competition and is operated under conditions of clear visibility and attended by a safety craft may carry, instead of the equipment prescribed above, the safety equipment that is required under the rules of the applicable governing body.</li> <li>• <b>Life-Saving Appliances – Visual Signals.</b> The number of flares can be reduced to at least 6 pyrotechnic distress signals (flares), not more than 3 of which is a smoke signal if the vessel is equipped with two-way electronic communication devices (eg, cell phone, satellite phone, VHF radio with digital selective calling, 406 MHz personal locator beacons or 406 MHz emergency position radio-indicating beacons).</li> </ul>	

**Pleasure Craft More Than 12 m but Not More Than 24 m in Length:***(Other than Human-Powered)*

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>• A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>• A re-boarding device (if the freeboard of the vessel is greater than 0.5 m);</li> <li>• A buoyant heaving line no less than 15 m in length; <b>and</b></li> <li>• A lifebuoy equipped with a self-igniting light <b>or</b> attached to buoyant line no less than 15 m.</li> </ul>
Life-Saving Appliances—Visual Signals	<ul style="list-style-type: none"> <li>• A watertight flashlight; <b>and</b></li> <li>• 12 pyrotechnic distress signals (flares), of which not more than 6 are smoke signals.</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>• A anchor with no less than 50 m of cable and / or chain in any combination; and</li> <li>• 1 manual bilge pump or bilge pumping arrangements.</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>• A sound-signalling appliance;</li> <li>• Navigation lights appropriate to the vessel type; and</li> <li>• A magnetic compass (must meet the requirements of <i>Navigation Safety Regulations</i>).</li> </ul>
Firefighting Equipment	<ul style="list-style-type: none"> <li>• A 10B:C portable fire extinguisher at each of the following locations: <ul style="list-style-type: none"> <li>◦ at the access to any space fitted with fuel-burning appliances;</li> <li>◦ at the entrance to any accommodations space; and</li> <li>◦ at the entrance to any machinery space;</li> </ul> </li> <li>• One axe; and</li> <li>• Two buckets.</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li>• <b>Sound-Signalling Appliance.</b> Vessels 12-20 m must be fitted with a whistle. Vessels over 20 m must be fitted with whistle and bell.</li> <li>• <b>Vessel Safety Equipment.</b> A bailer or bilge pump is not required if the vessel is of a design that will not retain enough water to cause it to capsize.</li> <li>• <b>Racing Pleasure Craft</b> (other than canoes, kayaks and rowing shells). When engaged in formal training, in an official competition or in final preparation for an official competition and is operated under conditions of clear visibility and attended by a safety craft may carry, instead of the equipment prescribed above, the safety equipment that is required under the rules of the applicable governing body.</li> </ul>	

**Pleasure Craft Over 24 m in Length:***(Other than Human-Powered)*

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>• A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>• A re-boarding device (if the freeboard of the vessel is greater than 0.5 m); and</li> <li>• A buoyant heaving line no less than 30 m in length;</li> <li>• 2 SOLAS lifebuoys (one attached to a buoyant line no less than 30 m and the other equipped with a self-igniting light); and</li> <li>• A lifting harness with appropriate rigging.</li> </ul>
Life-Saving Appliances–Visual Signals	<ul style="list-style-type: none"> <li>• A watertight flashlight; <b>and</b></li> <li>• 12 pyrotechnic distress signals (flares), of which not more than 6 are smoke signals.</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>• An anchor with no less than 50 m of cable and / or chain in any combination; and</li> <li>• 1 manual bilge pump or bilge pumping arrangements.</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>• A sound-signalling appliances (fitted whistle and bell);</li> <li>• Navigation lights appropriate to the vessel type; and</li> <li>• A magnetic compass (must meet the requirements of <i>Navigation Safety Regulations</i>).</li> </ul>
Firefighting Equipment	<ul style="list-style-type: none"> <li>• A 10B:C portable fire extinguisher at each of the following locations: <ul style="list-style-type: none"> <li>◦ at the access to any space fitted with fuel-burning appliances;</li> <li>◦ at the entrance to any accommodations space; and</li> <li>◦ at the entrance to any machinery space;</li> </ul> </li> <li>• Two axes;</li> <li>• Four buckets; and</li> <li>• A power-driven fire pump, fitted with a fire hose and nozzle.</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li>• <b>Vessel Safety Equipment.</b> A bailer or bilge pump is not required if the vessel is of a design that will not retain enough water to cause it to capsize.</li> <li>• <b>Racing Pleasure Craft</b> (other than canoes, kayaks and rowing shells). When engaged in formal training, in an official competition or in final preparation for an official competition and is operated under conditions of clear visibility and attended by a safety craft may carry, instead of the equipment prescribed above, the safety equipment that is required under the rules of the applicable governing body.</li> </ul>	

### **Additional Exceptions for Personal Watercraft**

If every person onboard a personal watercraft is wearing a personal flotation device or lifejacket of an appropriate size, the personal watercraft is required to carry onboard only the following safety equipment:

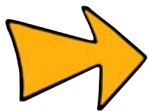
- a sound-signaling device,
- a watertight flashlight or three pyrotechnic distress signals other than smoke signals,
- a magnetic compass, if the personal watercraft is navigated out of sight of seamarks, and
- navigation lights (if the personal watercraft is operated after sunset or before sunrise or in periods of restricted visibility).

### **Additional Exceptions for Sailboards and Kiteboards**

If the operator of a sailboard or kiteboard is wearing a personal flotation device of an appropriate size, the sailboard or kiteboard is required to carry on board only the following safety equipment:

- a sound-signaling device, and
- a watertight flashlight (if operated after sunset or before sunrise or in periods of restricted visibility).

A sailboard or kiteboard is not required to carry on board the safety equipment if it is engaged in an official competition at which a safety craft is in attendance and carrying on board a lifejacket or PFD for the operator of the sailboard or kiteboard that can be donned in the water.



A pleasure craft is not required to carry a personal flotation device or lifejacket of appropriate size for any infant that weighs less than 9 kg or person whose chest size exceeds 140 cm.

**Human-Powered Pleasure Craft**

CATEGORY	EQUIPMENT
Personal Life-Saving Appliances	<ul style="list-style-type: none"> <li>• A Canadian-approved lifejacket or PFD of appropriate size for each person onboard;</li> <li>• A re-boarding device (if the freeboard of the vessel is greater than 0.5 m); and</li> <li>• A buoyant heaving line no less than 15 m in length;</li> </ul>
Life-Saving Appliances– Visual Signals  <b>Note:</b> Applies to vessels over 6 m only.	<ul style="list-style-type: none"> <li>• A watertight flashlight; <b>and</b></li> <li>• 6 pyrotechnic distress signals (flares) not more than two of which is a smoke signal.</li> </ul>
Vessel Safety Equipment	<ul style="list-style-type: none"> <li>• A bailer, manual bilge pump <b>or</b> bilge pumping arrangements.</li> </ul>
Navigation Equipment	<ul style="list-style-type: none"> <li>• A sound-signalling appliance <b>or</b> sound-signalling device;</li> <li>• Navigation lights appropriate to the vessel type (if operating from sunset to sunrise or during periods of restricted visibility); and</li> <li>• A magnetic compass.</li> </ul>
EXCEPTIONS	
<ul style="list-style-type: none"> <li>• <b>Lifejacket or PFD.</b> Must be inherently buoyant (not inflatable) if operating in white-water.</li> <li>• <b>Paddleboats, Watercycles, Stand-Up Paddleboards and Sealed-Hull, Sit-on-Top Kayaks.</b> If every person on board paddleboat, watercycle, paddleboard or kayak is wearing a pfd or lifejacket of an appropriate size, the paddleboat, watercycle is required to carry on board only the following safety equipment:             <ul style="list-style-type: none"> <li>◦ a sound-signaling device, and</li> <li>◦ a watertight flashlight, if the paddleboat, watercycle, paddleboard or kayak is operated after sunset or before sunrise or in periods of restricted visibility.</li> </ul> </li> <li>• <b>Racing Canoes, Kayaks and Rowing Shells.</b> A number of different exceptions apply to these types of human-powered pleasure craft when engaged in formal training, in an official competition or in final preparation for an official competition. For specific detail refer to <i>Small Vessel Regulations</i>, Part 2, Subpart 5.</li> <li>• <b>Life-Saving Appliances – Visual Signals.</b> The number of flares can be reduced to at least 3 pyrotechnic distress signals (flares), not more than 1 of which is a smoke signal if the vessel is equipped with two-way electronic communication devices (eg, cell phone, satellite phone, VHF radio with digital selective calling, 406 MHz personal locator beacons or 406 MHz emergency position radio-indicating beacons).</li> </ul>	



Radar reflectors are required for all vessels less than 20 m in length, or that are built of mostly non-metallic materials. A radar reflector is not required if:

1. the vessel operates in limited traffic conditions, daylight and favourable environmental conditions, and where having a radar reflector is not essential to the vessel's safety; or
2. the small size of the vessel or its operation away from radar navigation makes having a radar reflector impractical.



**Activate Your Brain:**

In what circumstance(s) is a radar reflector not required?

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**True or False?:** A vessel greater than 12 m, but not greater than 24 m in length is not required to carry distress flares.

List the safety equipment required in a pleasure craft of not more than 6 m in length.

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**MINIMUM SAFETY EQUIPMENT TO BE CARRIED ONBOARD A PLEASURE CRAFT (OTHER THAN HUMAN-POWERED)**

	Vessel not more than 6 m	Vessel more than 6 m, but not more than 9 m	Vessel more than 9 m, but not more than 12 m	Vessel more than 12 m, but not more than 24 m	Vessel over 24 m
<b>Personal Life-Saving Appliances</b>  One DOT- or CCG-approved PFD of lifejacket of appropriate size for each person on board	√	√	√	√	√
A reboarding device if the freeboard of the vessel is greater than 0.5 m	√	√	√	√	√
<b>Additional Personal Life-Saving Appliances</b>  A – a buoyant heaving line of not less than 15 m in length.  B – a lifebuoy attached to a buoyant line of not less than 15 m in length.  C – A lifebuoy equipped with a self-igniting light or attached to buoyant line of not less than 15 m in length.  D – A buoyant heaving line no less than 30 m in length; 2 SOLAS lifebuoys (one attached to a buoyant line of not less than 30 m and the other equipped with a self-igniting light); and a lifting harness with appropriate rigging.	A	A or B	A and B	A and C	D
<b>Visual Signals</b>  A – Watertight flashlight.  B – 3 Canadian approved flares.  C – 6 Canadian approved flares of Type A, B or C.  D – 12 Canadian approved flares of Type A, B, C or D, not more than six which are of Type D.  <b>Note.</b> Exempt from carrying if operating in a river, canal or lake in which at no time more than one nautical mile from shore; or engaged in an official competition or in final preparation for an official competition and has no sleeping arrangements.	A or B *(see note)	A or C *(see note)	A and D *(see note)	A And D	A And D

	Vessel not more than 6 m	Vessel more than 6 m, but not more than 9 m	Vessel more than 9 m, but not more than 12 m	Vessel more than 12 m, but not more than 24 m	Vessel over 24 m
<b>Vessel Safety Equipment</b>  A – A manual propelling device (eg, paddle, oar) or an anchor with not less than 15 m of cable, rope or chain in any combination.  B – An anchor with not less than 30 m of cable, rope or chain in any combination.  C – An anchor with not less than 50 m of cable, rope or chain in any combination.	A	A	B	C	C
A – A bailer, unless vessel cannot capsize.  B – A manual bilge pump or bilge-pumping arrangements, unless vessel cannot capsize.  C – Bilge-pumping arrangements.	A or B	A or B	B	C	C
<b>Navigation Equipment</b>  A – sound signalling device or  B – sound signalling appliance - Vessels 12-20 m must be fitted with a whistle. Vessels over 20 m must be fitted with whistle and bell.	A	A or B	B	B	B
<b>Magnetic Compass</b>  Note #1: Not required if operating within sight of navigational aids.  Note #2: Not required on a vessel not more than 8 m if operating within sight of navigational aids.	√ * (see note #1)	√ * (see note #1)	√	√	√
A - Navigation lights that meet the requirements of Collision Regulations, appropriate to the vessel type (if operating after sunset and before sunrise or in periods of restricted visibility).  B – Navigation lights appropriate to the vessel type.	A	A	B	B	B
<b>Firefighting Equipment</b>  A. – 5B:C portable fire extinguisher (if the vessel has an inboard engine, fixed fuel tank or fuel-burning appliances).	A	A	B	C	D



	Vessel not more than 6 m	Vessel more than 6 m, but not more than 9 m	Vessel more than 9 m, but not more than 12 m	Vessel more than 12 m, but not more than 24 m	Vessel over 24 m
<p>B. – 10B:C portable fire extinguisher (if the vessel is power-driven); and has fuel-burning appliances).</p> <p>C – A 10B:C portable fire extinguisher at each of the following locations at the access to any space fitted with fuel-burning appliances; at the entrance to any accommodations space; and at the entrance to any machinery space, 1 axe; and 2 buckets.</p> <p>D – As per C, plus a power-driven fire pump, fitted with a fire hose and nozzle and 2 axes and 4 buckets.</p>					

## REFERENCES

A1-004 B-GN-181-105/FP-E00 Chief of the Maritime Staff. (2000). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

A1-070 C-23-045-000/AG-001 Director Maritime Requirement Sea 3-6. (2009). *Shipboard damage control* (Vol. 1). Ottawa, ON: Department of National Defence.

C1-098 0-662-42286-4 Office of Boating Safety (2009). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen of Right of Canada, as represented by Transport Canada

C1-156 Department of Justice. *Canada Shipping Act*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/en/S-9/index.html>

C1-156 Department of Justice. *Canada Shipping Act*. (2010). Retrieved January 24, 2010, from <http://www.tc.gc.ca/eng/acts-regulations/acts-2001c26.htm>

C1-156 Department of Justice. *Small Vessel Regulations*. (2010). Retrieved January 24, 2010, from <http://laws.justice.gc.ca/eng/SOR-2010-91/>

C1-156 Department of Justice. *Collision Regulations*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/eng/C.R.C.-C.1416/index.html>

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## CHAPTER 4

### NAVIGATION SAFETY

#### SECTION 1

#### SAFE BOATING PRACTICES

#### SHARING WATERWAYS

While operating a pleasure craft an operator must be aware of the impact of their wake and wash on other water activities, property and commercial traffic. While operating a pleasure craft in the presence of other persons or properties, the operator shall take the following actions:

- stay well clear of swimmers and properties;
- be aware of, and reduce engine noise;
- avoid motor / propeller strikes;
- adjust the speed of the craft so that the wake does not cause injury, damage to property or erode the shoreline;
- follow the *Collision Regulations*; and
- use courtesy and common sense so as not to create a hazard, threat, stress or be an irritant to themselves, others, the environment or wildlife.

The speed of a pleasure craft can greatly influence an operator's ability to react to different situations. A craft travelling at high speeds requires increased stopping distance. It also requires the operator to be more attentive because the operator has less time to react to changing conditions.

Small boats, particularly small sailing boats can be difficult to navigate around because of their requirement to tack back and forth through the wind. Whenever possible, small vessels should travel as a group or fleet especially when operating in or near a shipping lane. This makes tracking individual boats easier and the fleet easier to identify and avoid.

Heavy fog, rain and wind can greatly reduce visibility while on the water. The reduction of speed in bad weather will help to maintain control of the pleasure craft and decrease the risk of injury or loss of life to persons on board.

A responsible boater has an obligation to respect and share waterways with wildlife, swimmers, divers and other boaters. As stated in *Small Vessel Regulations* “No person shall operate a vessel in a careless manner, without due care and attention or without reasonable consideration for other persons”... it's the law!

#### RULES OF THE ROAD

***Collision Regulations.*** The *Collision Regulations* are a published set of rules to aid mariners in the prevention of collisions at sea. The rules provide clear directions as to what actions shall be taken for any situation that may arise on the water.

#### General Rules, Vessel Hierarchy and Common Courtesy

The *Collision Regulations* state the following general rules:

1. The operator of a pleasure craft shall make every effort and take any action to avoid collisions.



*In other words... Always do everything possible to avoid a collision, regardless of who has right-of-way.*

2. The operator of a pleasure craft shall at all times maintain a proper lookout by sight and hearing, gather as much information as possible from as many sources as available and practicable to determine a risk of collision. If there is any doubt, such risk shall be deemed to exist and appropriate action taken.



*In other words... Always pay close attention to what is happening around you when operating your pleasure craft and ask those with you to do the same. When in doubt, refer to paragraph 1.*

3. A pleasure craft shall at all times proceed at a safe speed so that proper and effective action could be taken to avoid collision. Pleasure craft operators shall take the following factors into account in determining safe speed:

- a. state of visibility,
- b. traffic density including the concentrations of fishing vessels and / or other vessels,
- c. state of wind,
- d. sea state and current, and
- e. proximity to navigational hazards.



*In other words... Slow down to account for the conditions so that you maintain good control and are able to react to changing circumstances.*

4. A pleasure craft shall at all times proceed with caution at a speed such that wake and wash will not adversely affect:

- a. other vessels, such as anchored vessels, grounded vessels, wrecks, dredges, tows, rowboats or canoes,
- b. shoreline, docks, floats or wetlands,
- c. other waterway users such as swimmers,
- d. area of bathing beaches,
- e. area where divers are working, or
- f. area of anchorage.



*In other words... The wake and wash generated by your boat can have negative and sometimes dangerous affects on the people and things around you. Pay attention and adjust your speed appropriately to avoid this.*

5. The operator of a pleasure craft of less than 20 m in length or a pleasure sailing craft shall not impede the safe passage of a larger vessel within a narrow channel.



*In other words... Large vessels in narrow channels have very little room to manoeuvre safely, so stay out of the way! In order to avoid a potentially dangerous situation, pleasure craft are to stay as close to the starboard side of the channel as possible.*

6. The operator of a pleasure craft of less than 20 m in length or a pleasure sailing craft shall not impede the safe passage of a power driven vessel following a traffic or shipping lane.



*In other words... Harbours and other passageways that have regular large vessel traffic (commercial or otherwise) have traffic lanes indicated on the nautical chart of the area. It is important to note that large commercial ships transiting traffic lanes are likely unable to see smaller craft operating in front of them from the bridge! Pleasure craft shall keep clear of vessels using these lanes.*



### **When encountering large vessels always give them plenty of room!**

This common sense rule applies to large vessel such as ferries (docked or in transit), tugs and their tow, cruise ships, etc. or vessels not under command. Their manoeuvrability, even in open water, can be quite limited so you should give them lots of room. Additionally, always be aware of cable ferries and that the cable that normally lies on the bottom rises close to the surface when they are in transit. Listen for ships sounding one prolonged blast of their horn, indicating they are leaving the dock. And, never pass between a tug and its tow, even if it looks like the tug has disconnected, that may not be the case as the towline may merely be submerged and out of sight.

When operating in or near a shipping lane small recreational boat should stay in groups if possible.

7. The operator of a pleasure craft not in sight of other vessels in or near an area of restricted visibility shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility.



*In other words... Even if you know the area, if visibility is poor, slow down! You never know what might pop out of the fog.*

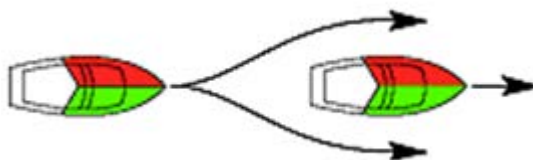
## **Right-of-Way Rules**

The *Collision Regulations* state the following right-of-way rules:

1. The operator of a pleasure craft shall take early and substantial action to keep well clear of vessels being overtaken.



*In other words... Stay well clear when approaching and passing from behind.*



From "Safe Boating Guide", 2011, Reference Material. Retrieved January 23, 2013, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp511-reference-material-83.htm#Rules>

Figure 1 Overtaking Vessel

2. The operator of a pleasure craft that meets on reciprocal courses to other power-driven vessels, so as to involve a risk of collision, shall alter course to starboard so that they should pass on the port side of the others.



*In other words... When approaching another powerboat head-on, move to the right.*



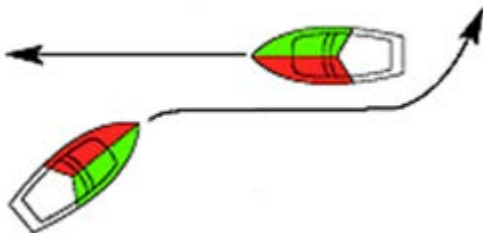
*From "Safe Boating Guide", 2011, Reference Material. Retrieved January 23, 2013, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp511-reference-material-83.htm#Rules>*

Figure 2 Alter Course to Starboard

3. The operator of a pleasure craft that has other powered vessels on the starboard side and must cross them so as to avoid a risk of collision, shall take early and substantial action to keep well clear and, if necessary, avoid crossing ahead of the other vessels.



*In other words... If approaching another powerboat and you are looking at their port (left) side you must avoid them. When navigation lights are visible; red avoid, green proceed.*



*From "Safe Boating Guide", 2011, Reference Material. Retrieved January 23, 2013, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp511-reference-material-83.htm#Rules>*

Figure 3 Alter to Avoid a Vessel to Starboard

4. The operator of a pleasure craft that does not have to take early and substantial action to keep well clear of other vessels shall maintain course and speed.



*In other words... If you have the right-of-way, maintain your course until the other boat passes. This is referred to as being the "Stand-on Vessel". The vessel that must alter their course is known as the "Give-way Vessel".*

5. The operator of a power-driven pleasure craft shall take early and substantial action to keep well clear of a pleasure sailing craft.

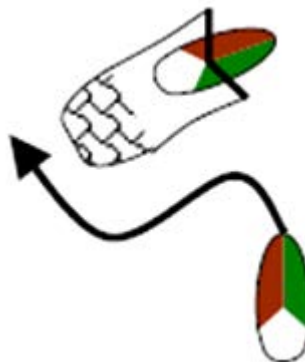


*In other words... Sailboats have right-of-way over powerboats.*

6. The operator of a power-driven pleasure craft or a pleasure sailing craft shall take early and substantial action to keep well clear of a vessel engaged in fishing.



*In other words... Avoid fishing boats.*



*From "Safe Boating Guide", 2011, Reference Material. Retrieved January 23, 2013, from <http://www.tc.gc.ca/eng/marinesafety/tp-tp511-reference-material-83.htm#Rules>*

Figure 4 Alter to Avoid Vessels Engaged in Fishing

7. The meaning of the following flags when exhibited:
- from the *International Code of Signals*, flag ALFA (A) (as illustrated in Figure 5), indicates "I have a diver down, keep well clear at slow speed", and
  - from the *Private Buoy Regulations*, flag "red and white" marks area where diving is in progress.
8. The operator of a pleasure craft shall take early and substantial action to keep well clear of vessels engaged in diving operations that exhibit the International Code flag "A" (Rules 18 & 27).



*In other words... If you see either of these flags being displayed, give plenty of room.*



*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 5 *International Code of Signals* Flag A



*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

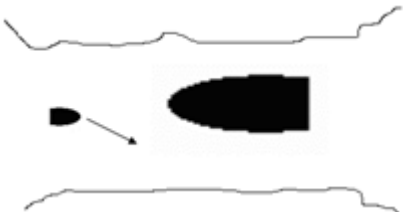
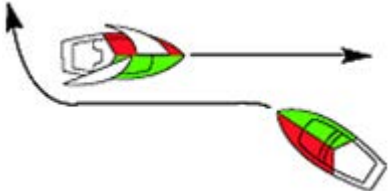


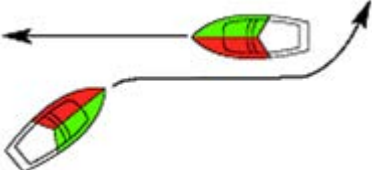
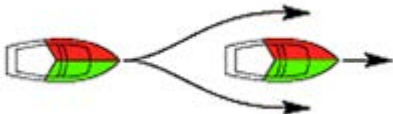

Figure 6 *Private Buoy Regulations* Diver Flag

9. A pleasure craft boat meeting a ferry in in transit or a vessel in tow should keep clear of the ferry or towing vessel.
10. An operator should never pass between a tug and its tow.



### RULES OF THE ROAD EXERCISE

Instructions: Match the diagram with the statement.

Statement	Answer	Diagram
1. Both sail and power vessels must give way to a vessel actively engaged in fishing exercises.	(       )	A 
2. Both vessels must alter course to starboard and pass port on port.	(       )	B 
3. Overtaking vessel must keep clear.	(       )	C 
4. A power vessel must keep clear of a sailing vessel under sail.	(       )	D 
5. The vessel on the others starboard side has right of way.	(       )	E 
6. "I have a diver down. Keep well clear."	(       )	F 
7. "The operator of a pleasure craft of less than 20 m in length shall not impede the safe passage of a larger vessel within a narrow channel."	(       )	G 

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## SECTION 2

### VISUAL AND SOUND SIGNALS

#### NAVIGATION LIGHTS

In accordance with *Collision Regulations*, vessels operating from sunset to sunrise or during periods of restricted visibility such as a foggy day are required to display navigation lights. There are different types of lights and the combination of lights that must be displayed differs based on the type of vessel and type of activity the vessel is engaged in.

The *Collision Regulations* define the following types of navigation lights:

**Masthead (forward) light.** A white light placed over the fore-and-aft centerline of a vessel, showing an unbroken light over an arc of the horizon of 225 degrees and so fixed as to show the light from right ahead to 22.5 degrees abaft the beam on either side of the vessel.

**Sidelights.** A green light on the starboard side and a red light on the port side, each showing an unbroken light (not flashing) over an arc of the horizon of 112.5 degrees and so fixed as to show the light from right ahead to 22.5 degrees abaft the beam on either side of the vessel.

**Sternlight.** A white light placed as nearly as practical at the stern showing an unbroken light over an arc of the horizon of 135 degrees and so fixed as to show the light 67.5 degrees from right aft on each side of the vessel.

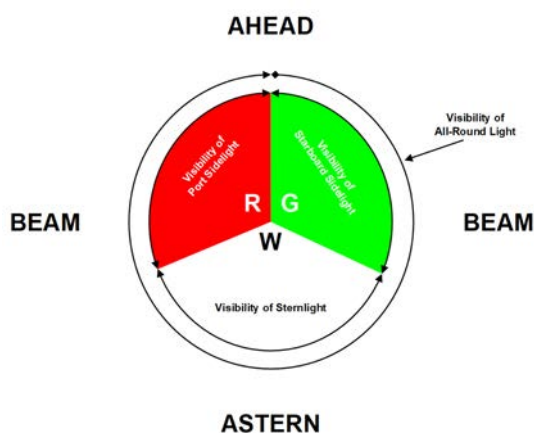
**All-round light.** A white light showing an unbroken light over an arc of the horizon of 360 degrees.

**Towing light.** A yellow light with the same visibility characteristics as a sternlight.

**All-round flashing light.** An all-round light flashing at regular intervals at a frequency of 120 flashes or more per minute.

**Special flashing light.** A yellow light flashing at regular intervals at a frequency of 50–70 flashes per minute, placed as far forward and as nearly as practicable on the fore and aft centreline of a vessel and showing an unbroken light over an arc of the horizon of not less than 180 degrees nor more than 225 degrees and so fixed as to show the light from right ahead to abeam and not more than 22.5 degrees abaft the beam on either side of the vessel. This light is placed at the forward end of a towing vessel or a vessel being pushed.

**Blue flashing light.** A blue all-round light flashing at regular intervals at a frequency of 50–70 flashes per minute. This light is used by Government vessels operated by harbour, county, police or CCG — Canadian Coast Guard personnel.



*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 1 Arc of Visibility

## Visual Range Requirements of Navigation Lights

	Visual Range				
	Masthead Light	Sidelights	Sternlight	Towing Light	All-Round Light
<b>Vessels less than 12 m</b>	3.22 km (2 miles)	1.6 km (1 miles)	3.22 km (2 miles)	3.22 km (2 miles)	3.22 km (2 miles)
<b>Vessels 12 m or more but less than 20 m</b>	4.83 km (3 miles)	3.22 km (2 miles)	3.22 km (2 miles)	3.22 km (2 miles)	3.22 km (2 miles)
<b>Vessels 20 m or more but less than 50 m</b>	8.05 Km (5 miles)	3.22 km (2 miles)	3.22 km (2 miles)	3.22 km (2 miles)	3.22 km (2 miles)
<b>Vessels 50 m or more</b>	9.66 km (6 miles)	4.83 km (3 miles)	4.83 km (3 miles)	4.83 km (3 miles)	4.83 km (3 miles)

The visual range requirement for a special flashing light or blue flashing light is 3.22 km (2 miles), regardless of vessel size.

The *Collision Regulations* state the following rules pertaining to lights:

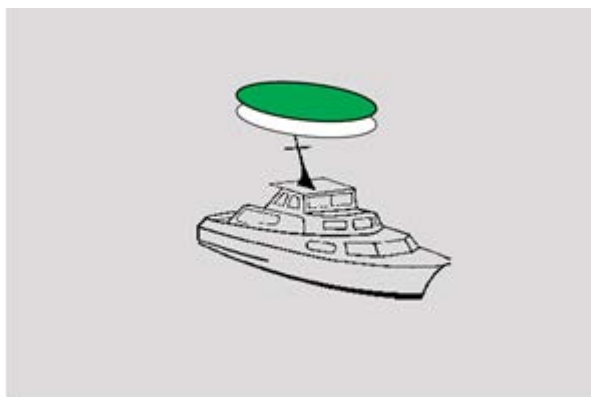
1. **Power vessel.** The operator of a power vessel underway shall, from sunset to sunrise, exhibit a masthead light forward, sidelights and a sternlight.
2. **Power vessel of less than 12 m.** The operator of a power vessel of less than 12 m in length underway may exhibit, from sunset to sunrise, in lieu of a masthead light forward, sidelights and a sternlight, an all-round white light and sidelights.
3. **Sailing vessel.** The operator of a sailing vessel underway shall, from sunset to sunrise, exhibit sidelights and a sternlight. The vessel may also exhibit 2 all-round lights in a vertical line, the upper being red and the lower green.
4. **Sailing vessel of less than 20 m.** The operator of a sailing vessel of less than 20 m in length underway may exhibit, from sunset to sunrise, in lieu of sidelights and a sternlight, a combined sidelights and sternlight in one lantern carried at or near the top of the mast.



**Sailing Vessel Under Power.** The operator of a sailing vessel under power shall, from sunset to sunrise, exhibit the same combination of lights required for power vessels of similar size.

5. **Sailing vessel of less than 7 m.** The operator of a sailing vessel of less than 7 m in length underway shall exhibit from sunset to sunrise, if practical, sidelights and a sternlight, but if the operator cannot, they shall have ready at hand an electric torch (flashlight) or lighted lantern showing a white light which shall be exhibited in sufficient time to prevent collision.
6. **Hand-Powered vessel.** The operator of a hand-powered vessel such as a rowboat canoe or kayak, shall exhibit from sunset to sunrise, sidelights and a sternlight, but if the operator cannot, they shall have ready at hand an electric torch (flashlight) or lighted lantern showing a white light which shall be exhibited in sufficient time to prevent collision.
7. **Vessel at anchor.** The operator of a vessel of less than 50 m in length at anchor shall exhibit, from sunset to sunrise, in the fore part an all-round white light and a black ball from sunrise to sunset.
8. **Fishing Vessels.** The navigation lights required by fishing vessels depend on the type of fishing activities underway. The following are the navigation lighting requirements for fishing vessels:

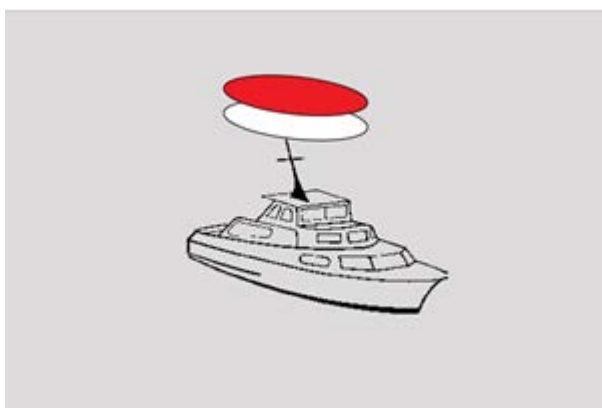
- a. The operator of a vessel engaged in trawling (eg, dragging through the water a dredge net or other apparatus used as a fishing appliance) shall, from sunset to sunrise, exhibit:
- (1) two all-round lights in a vertical line, the upper being green and the lower white, or a shape consisting of two cones with their apexes together in a vertical line, one above the other,
  - (2) a masthead light abaft (behind) and higher than the all-round green light; a vessel of less than 50 m in length shall not be obliged to exhibit such a light but may do so, and
  - (3) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a sternlight.



*From "Hella Marine", 2010, Navigation Lighting. Retrieved April 7, 2010, from [http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special\\_OE/Navigation\\_Lighting.pdf](http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special_OE/Navigation_Lighting.pdf)*

Figure 2 Trawling Vessel

- b. The operator of a vessel engaged in fishing, other than trawling, shall, from sunset to sunrise, exhibit:
- (1) two all-round lights in a vertical line, the upper being red and the lower white, or a shape consisting of two cones with apexes together in a vertical line one above the other;
  - (2) when there is outlying gear extending more than 150 m horizontally from the vessel, an all-round white light or a cone apex upwards in the direction of the gear; and
  - (3) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a sternlight.



*From "Hella Marine", 2010, Navigation Lighting. Retrieved April 7, 2010, from [http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special\\_OE/Navigation\\_Lighting.pdf](http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special_OE/Navigation_Lighting.pdf)*

Figure 3 Fishing Vessel

9. **Vessel engaged in towing.** The operator of a vessel engaged in towing, in addition to sidelights and a sternlight, from sunset to sunrise, shall display a special flashing light, a towing light and two masthead lights forward in a vertical line.



*From "Hella Marine", 2010, Navigation Lighting. Retrieved April 7, 2010, from [http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special\\_OE/Navigation\\_Lighting.pdf](http://www.hella.com/produktion/HellaResources/WebSite/HellaResources/HellaAU/Special_OE/Navigation_Lighting.pdf)*

Figure 4 Towing Vessel



In the case where a pleasure craft that would not normally be engaged in towing, but is doing so to assist another vessel in distress, the towing vessel shall make every effort to indicate that they are towing the vessel behind. Since pleasure craft would not normally be fitted with all the navigation lights required for towing, the towing vessel should at a minimum illuminate the towline between the two vessels.

10. **Vessel being towed.** A vessel being towed shall, from sunset to sunrise, exhibit sidelights at the forward end and a sternlight.

11. **Vessel engaged in pushing.** The operator of a vessel engaged in pushing ahead or towing from alongside shall exhibit, in addition to sidelights and a sternlight, from sunset to sunrise, two masthead lights forward in a vertical line.

12. **Vessel being pushed.** A vessel being pushed ahead (but not as a composite unit) shall, from sunset to sunrise, exhibit sidelights and a special flashing light at the forward end. A vessel being towed from alongside pushed ahead (but not as a composite unit) shall, from sunset to sunrise, exhibit sidelights at the forward end and a sternlight.

13. **Law enforcement vessel.** The operator of a vessel used for law enforcement may exhibit a flashing all-round blue light.

## SOUND SIGNALS

The *Collision Regulations* define the following:

**Short blast.** A blast of about one second duration.

**Prolonged blast.** A blast four to six second duration.













The *Collision Regulations* state the following rules pertaining to sound signals:

1. The operator of a vessel of less than 12 m in length shall carry sound signalling appliances or some other means of making an efficient sound signal.

2. When vessels underway are in sight of, and headed toward each other, there are some general sound signals used to communicate their intentions for manoeuvring to avoid the other. These signals are as follows:
  - a. One short blast – “I am altering my course to starboard” or “I intend to leave you on my port side”;
  - b. Two short blasts – “I am altering my course to port” or “I intend to leave you on my starboard side”;
  - c. Three short blasts – “I am operating astern propulsion” (in other words “I’m backing up”);
  - d. Five or more short blasts – This signal is used to communicate that the intentions of the other vessel are unclear or that the action being taken is insufficient (eg, “you’re still too close”).
3. The operator of a vessel in or near an area of restricted visibility, whether by day or night, shall sound the following signals using a whistle or sound-signalling device to indicate presence:
  - a. A power vessel underway shall sound, at intervals of not more than two minutes, one prolonged blast.
  - b. A power vessel underway but making no way through the water (stopped but not anchored or moored) shall sound, at intervals of not more than two minutes, two prolonged blasts in succession with an interval of about two seconds between them.
  - c. A vessel at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds. A vessel at anchor may, in addition, sound three blasts in succession, namely one short, one prolonged and one short blast, to give warning of their position and of the possibility of collision to an approaching vessel.

## SIGNALS TO INDICATE DISTRESS

The *Collision Regulations* state that an operator of a pleasure craft shall recognize, use or exhibit the following signals to indicate distress and need of assistance.

	Signal		Signal
	<b>Gun or other explosive signal.</b> Fired at intervals of approximately one minute.		<b>Distress Flare.</b> A Transport Canada approved distress flare, such as a rocket parachute flare, multi-star flare, hand-held flare or smoke signal.
	<b>Horn or sound-signalling device.</b> Continuous sounding.		<b>Flags "N" and "C".</b> International Code of Signals message that indicates distress.
	<b>Radiotelephony.</b> Spoken word MAYDAY sent by radiotelephony.		<b>An orange background with a black square and black circle.</b> Viewed from the air.
	<b>Emergency position-indicating radio beacon (EPIRB).</b> A transmitted signal.		<b>Square flag and ball.</b> Square flag above or below a ball or anything resembling a ball.
	<b>High-intensity, flashing white light.</b> Flashing at regular intervals of 50 to 70 times per minute.		<b>Square shape</b> or anything resembling a square shape.
	<b>Waving arms.</b> Slowly and repeatedly raising and lowering arms outstretched to each side.		<b>Dye marker</b> in the water.



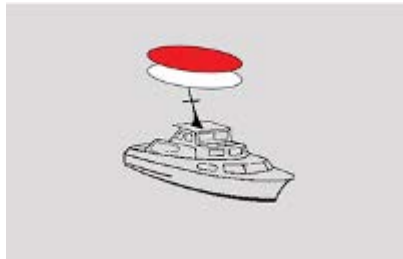


Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 5 Signals of Distress



### VISUAL AND SOUND SIGNAL EXERCISE

Instructions: Match the signal with the meaning.

Meaning		Signal
1. "I'm in distress"	(      )	A 
2. "I'm in distress"	(      )	B Flashing all-round blue light
3. Vessel at anchor (during daylight hours)	(      )	C One prolonged sound blast at intervals of not more than two minutes
4. Law enforcement vessel	(      )	D 
5. A power vessel underway in restricted visibility	(      )	E 
6. Fishing vessel	(      )	F 
7. Towing vessel	(      )	G 

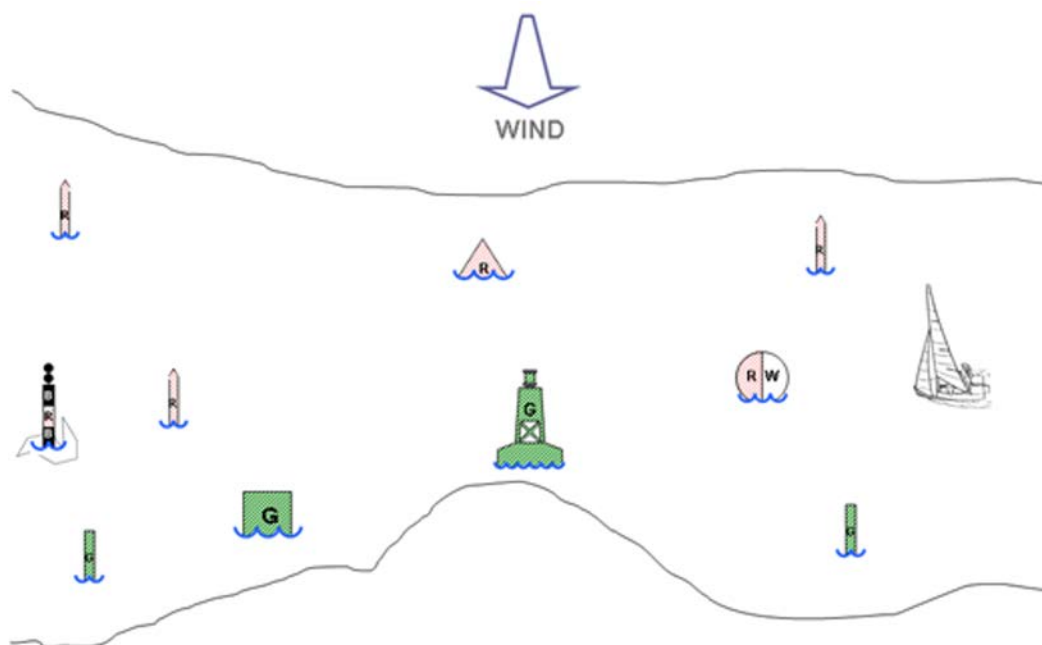
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### SECTION 3

#### CANADIAN AIDS TO NAVIGATION

Aids to navigation are devices or systems external to a vessel that help determine position or course, warn of dangers and obstructions and identify a preferred route. Lateral buoys are buoys that mark channels. They come in various shapes and sizes.

Vessels may encounter several lateral buoys while on the water (as illustrated in [Figure 1](#)). Correct navigation of lateral buoys ensures that the vessel does not get damaged by hazards to navigation.



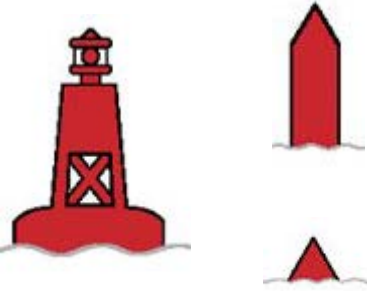
*Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.*

Figure 1 Lateral Buoys Marking the Channel

The following terms are used when describing lateral buoys:

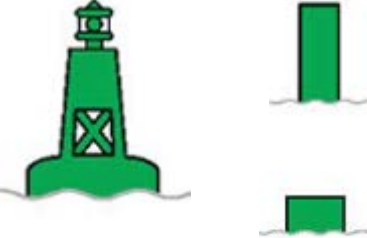
- **Headwaters.** The source of a river system. Typically, this is a lake or series of lakes that drain into a river and flows in the direction toward the ocean.
- **Flood tide.** The incoming tide when the sea water level rises along a shoreline.
- **Upstream.** The direction away from the ocean, toward the headwaters of a river, into a bay or harbour or with a flood tide.
- **Topmark.** A shape or shapes on the top of a buoy. In Canada, topmarks are only used on isolated danger buoys in an ice-free area, as they are susceptible to damage.

## LATERAL BUOYS

Starboard Lateral Buoy	
	<p><b>Use.</b> Marks the starboard (right) side of a channel or the location of a danger and must be kept on the starboard side of a pleasure craft when proceeding in the upstream direction.</p> <p><b>Identification.</b> Displays identification letter(s) and even numbers.</p> <p><b>Colour.</b> Red.</p> <p><b>Light.</b> Red.</p> <p><b>Top.</b> Pointed (if no light carried).</p> <p><b>Topmarks.</b> Single red cone (if carried).</p>

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 2 Starboard Lateral Buoy


Port Lateral Buoy	
	<p><b>Use.</b> Marks the port (left) side of a channel or the location of a danger and must be kept on the port side of a pleasure craft when proceeding in the upstream direction.</p> <p><b>Identification.</b> Displays identification letter(s) and odd numbers.</p> <p><b>Colour.</b> Green.</p> <p><b>Light.</b> Green.</p> <p><b>Top.</b> Flat (if no light carried).</p> <p><b>Topmarks.</b> Single green cylinder (if carried).</p>

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 3 Port Lateral Buoy

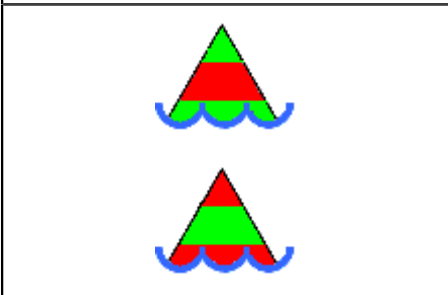


A simple trick to remember which lateral buoy is on which side is the phrase, "Red right returning". The red marks (starboard lateral buoys) are kept on the right (starboard) side of the boat when returning home to a bay, harbour or the source of a river.

Fairway (Mid-Channel) Buoy	
	<p><b>Use.</b> Indicates safe water and is used to mark channel entrances and channel centres.</p> <p><b>Colour.</b> Red and white.</p> <p><b>Top.</b> Round.</p> <p><b>Light Colour.</b> White.</p> <p><b>Topmarks.</b> None.</p>

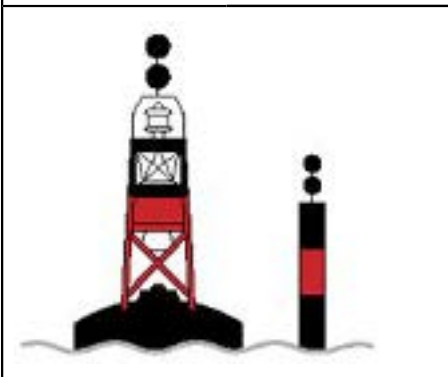
*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 4 Fairway Buoy

Bifurcation Buoys	
	<p><b>Use.</b> Used where a channel divides into two safe channels. This buoy may be passed on either side; however, the preferred channel is indicated by the colour of the top band.</p> <p><b>Colour.</b> Red and green. Topmost colour band indicates main or preferred channel.</p> <p><b>Topmarks.</b> None.</p>

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

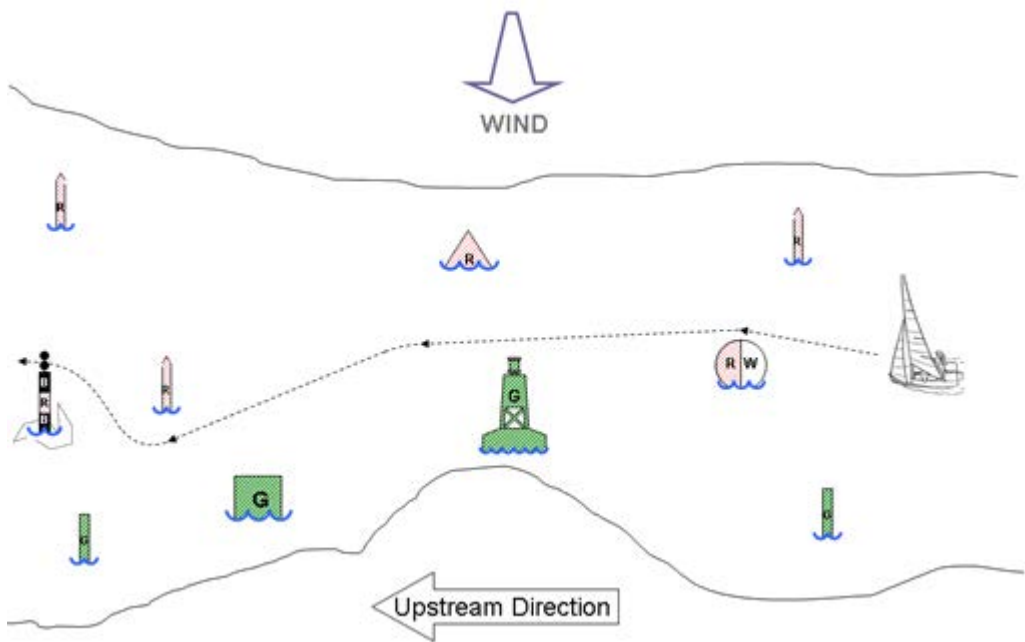
Figure 5 Bifurcation Buoys

Isolated Danger Buoy	
	<p><b>Use.</b> Marks an isolated danger that has safe water all around it and may be passed on either side.</p> <p><b>Colour.</b> Black and red.</p> <p><b>Top.</b> Flat.</p> <p><b>Light.</b> White.</p> <p><b>Topmarks.</b> Two vertical spheres.</p>

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 6 Isolated Danger Buoy

Understanding how to use the lateral buoys allows a boat to navigate a channel safely (as illustrated in [Figure 7](#)).







*Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.*

Figure 7 Navigating the Lateral Buoys

**STANDARD DAYBEACONS**

Daybeacons can be used in the place of lateral buoys during daylight hours in areas where a buoy is impractical. Daybeacons are usually affixed to a solid surface such as a bridge support or shore location.

Port Daybeacon		Starboard Daybeacon	
	<p><b>Use.</b> Marks the port side of a channel when proceeding upstream.</p> <p><b>Colour.</b> Outer green square with a black (or green) square inside on a white background.</p>		<p><b>Use.</b> Marks the starboard side of a channel when proceeding upstream.</p> <p><b>Colour.</b> Outer red triangle with a red triangle inside on a white background.</p>


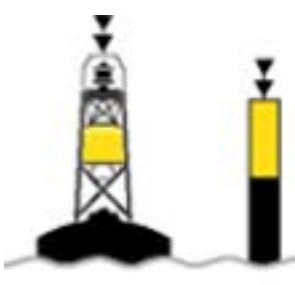


Junction Daybeacon			
	<b>Use.</b> Indicates the main or preferred channel is to the right when proceeding upstream.		<b>Use.</b> Indicates the main or preferred channel is to the left when proceeding upstream.
	<b>Colour.</b> Outer red diamond with a green square inside on a white background.		<b>Colour.</b> Outer red diamond with a red triangle inside on a white background.

*Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.*

Figure 8 Standard Daybeacons

## CARDINAL BUOYS

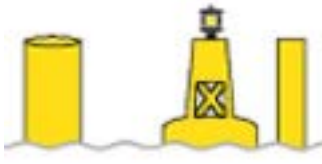





The cardinal buoys are used to mark the direction of safe water using the cardinal points of a compass. The buoys are marked with a unique combination of yellow and black bands.

North Cardinal Buoy		South Cardinal Buoy	
	<b>Use.</b> Indicates the direction of safe water is to the north.		<b>Use.</b> Indicates the direction of safe water is to the south.
	<b>Colour.</b> Black and yellow. <b>Light.</b> White. <b>Topmarks.</b> Two cones, apex pointing up.		<b>Colour.</b> Black and Yellow. <b>Light.</b> White. <b>Topmarks.</b> Two cones, apex pointing down.
West Cardinal Buoy		East Cardinal Buoy	
	<b>Use.</b> Indicates the direction of safe water is to the west.		<b>Use.</b> Indicates the direction of safe water is to the east.
	<b>Colour.</b> Yellow with a broad black band. <b>Light.</b> White. <b>Topmarks.</b> Two cones, apex pointing at each other.		<b>Colour.</b> Black and yellow. <b>Light.</b> White. <b>Topmarks.</b> Two cones, apex pointing away from each other.




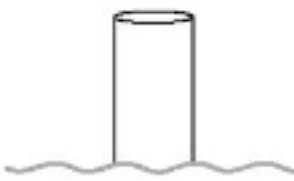
*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 9 Cardinal Buoys

## SPECIAL BUOYS

Cautionary Buoy		Anchorage Buoy	
	<p><b>Use.</b> Marks dangers such as firing ranges, underwater pipelines, seaplane bases and areas where no through channel exists.</p> <p><b>Identification.</b> Displays letter(s).</p> <p><b>Colour.</b> Yellow.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> May display a yellow "X".</p>		<p><b>Use.</b> Marks the perimeter of a designated anchorage.</p> <p><b>Colour.</b> Yellow.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> May display a yellow "X".</p>
Mooring Buoy		Information Buoy	
	<p><b>Use.</b> For mooring or securing a vessel.</p> <p><b>Colour.</b> White with an orange band at the top.</p> <p><b>Topmarks.</b> None.</p>		<p><b>Use.</b> By means of words or symbols displays information regarding locality, marina, campsite, etc.</p> <p><b>Colour.</b> White with an orange square between two orange bands.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>
Hazard Buoy		Control Buoy	
	<p><b>Use.</b> Marks random hazards such as shoals and rocks.</p> <p><b>Colour.</b> White with an orange diamond between two orange bands.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>		<p><b>Use.</b> Indicates speed limits, wash restrictions, etc.</p> <p><b>Colour.</b> White with an orange circle between two orange bands.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>



Keep Out Buoy		Scientific Buoy (ODAS)	
	<p><b>Use.</b> Marks an area in which boats are prohibited.</p> <p><b>Colour.</b> White with an orange cross inside an orange diamond between two orange bands.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>		<p><b>Use.</b> Ocean Data Acquisition System (ODAS). Collects meteorological and other scientific data.</p> <p><b>Colour.</b> Yellow.</p> <p><b>Light.</b> May display a yellow "X".</p> <p><b>Topmarks.</b> May be any shape.</p>
Diving Buoy		Swimming Buoy	
	<p><b>Use.</b> Marks an area where scuba or other such diving activity is in progress.</p> <p><b>Colour.</b> White buoy flying a red flag with a diagonal white line on it.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>		<p><b>Use.</b> Marks the perimeter of a swimming area.</p> <p><b>Colour.</b> White.</p> <p><b>Light.</b> Yellow.</p> <p><b>Topmarks.</b> None.</p>

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 10 Special Buoys








## RESTRICTION AND WARNING SIGNS

Restriction and warning signs may be posted to warn of local hazards or post special instructions for vessels operating in the area. The colour of the frame is international orange. When part of a sign has a green border, a special condition applies to the restriction. The symbol tells you the type of restriction that applies. If the sign is arrow-shaped, the restriction applies in the direction of the arrow. The signs may include such information as:

- no wake,
- no anchorage area,
- speed limit zone,
- low head dam hazard,
- no skiing, or
- power limits.

## AIDS TO NAVIGATION EXERCISE

Instructions: Match the description/diagram with the meaning.

Meaning	Answer	Signal
1. Marks the starboard side of a channel when proceeding upstream.	( )	A 
2. Marks an area where scuba or other such diving activity is in progress.	( )	B 
3. For mooring or securing a vessel.	( )	C 
4. Marks an isolated danger that has safe water all around it and may be passed on either side.	( )	D 
5. Marks the port side of a channel or the location of a danger and must be kept on the port side of a pleasure craft when proceeding in the upstream direction.	( )	E 
6. Marks random hazards such as shoals and rocks.	( )	F 
7. Marks the perimeter of a designated anchorage.	( )	G 

## **SECTION 4**

### **NAVIGATIONAL RESOURCES**

#### **NAVIGATIONAL RESOURCES**

Canadian aids to navigation such as lateral buoys and cardinal buoys provide assistance to mariners and boaters. These aids are however limited to the line of sight of the vessel. Charts, topographical maps and compasses provide mariners and boaters with the opportunity to plan their trip prior to getting underway.

##### **Charts**

Charts are published by the Canadian Hydrographic Service (CHS), Department of Fisheries and Oceans (DFO). The charts are intended for use by mariners to assist navigation, by providing graphic representations of water areas, to include:

- water depth,
- underwater hazards,
- traffic routes,
- aids to navigation, and
- nearby coastal areas.

##### **Topographical Maps**

Topographical maps are published by Natural Resources of Canada and some provincial authorities. The maps are intended for use by the general public on the land, and provide information about natural and artificial features of the land to include:

- elevation contours,
- shoreline,
- rocks,
- land features above water, and
- cultural features.

Topographical maps can be used by mariners when no charts are available however they do not depict the following:

- underwater hazards,
- marine aids to navigation,
- channels, and
- anchorage areas.

##### **Compasses**

Mariners have used compasses to navigate safely for centuries. Modern navigational resources such as Global Positioning Systems (GPS) may have become more fashionable but basic navigation using a compass is a valuable skill that every boater should possess. A heading (direction the bow is pointed) can be determined by positioning a steering or handheld compass close to the centreline in the cockpit; within the line of sight of the operator. While navigating, operators should be aware that compasses are influenced by the proximity of metallic objects, which could provide false information.

### **Charts and Nautical Publication Regulations**

The operator of a vessel not propelled by oars (or paddles) is required to carry on board the most recent edition of the following publications, as described in the *Charts and Nautical Publication Regulations*:

1. the largest scale charts available, authorized by the CHS, for the immediate areas to be operated,
2. the reference catalogue of available charts,
3. the annual edition of the *Notice to Mariners*, published by the DFO,
4. *Sailing Directions*, published by the CHS,
5. *Canadian Tides and Current Tables*, published by CHS,
6. *List of Lights, Buoys and Fog Signals*, published by the DFO, and
7. *Radio Aids to Marine Navigation*, published by the DFO, where the vessel is required to be fitted with radio equipment.

The operator of a vessel shall be aware of changes to routes, buoys and water depth by ensuring that the charts, documents and publications required are, before being used for navigation, correct and up-to-date, based on information that is contained in the *Notice to Mariners*.



#### **Activate Your Brain:**

What is the difference between a chart and a topographical map?

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What regulations describe the publications that are required to be carried on board?

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What must an operator of a vessel ensure before using any charts, documents or publications for navigation?

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### **REFERENCES**

C1-098 0-662-42286-4 Office of Boating Safety. (2009). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen of Right of Canada, as represented by Transport Canada.

C1-103 Transport Canada. *Collision Regulations*. (2001). Retrieved April 03, 2008, from <http://www.tc.gc.ca/acts-regulations/GENERAL/C/csa/regulations/010/csa014/csa14.html>

C1-103 Transport Canada. *TP14352 Rules of the Road*. (2007). Retrieved April 18, 2008, from <http://www.tc.gc.ca/Publications/bil/TP14352/PDF/HR/TP14352EF.pdf>

C1-103 Transport Canada. *TP14541 Lateral Buoys and Standard Daybeacons*. (2007). Retrieved April 18, 2008, from <http://www.tc.gc.ca/Publications/bil/TP14351/PDF/HR/TP14541EF.pdf>

C1-103 Transport Canada. *TP14542 Cardinal Buoys and Special Buoys*. (2007). Retrieved April 18, 2008, from <http://www.tc.gc.ca/Publications/bil/TP14352/PDF/HR/TP14542EF.pdf>

C1-103 Transport Canada. *Charts and Nautical Publications Regulations*. (2001). Retrieved April 03, 2008, from <http://www.tc.gc.ca/acts-regulations/GENERAL/C/csa/regulations/010/csa011/csa11.html>

C1-156 Department of Justice. *Collision Regulations*. (2010). Retrieved April 05, 2010, from <http://laws.justice.gc.ca/eng/C.R.C.-C.1416/index.html>

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**CHAPTER 5**  
**SAFE VESSEL OPERATIONS**  
**SECTION 1**  
**SAFE FUELLING PROCEDURE**

Fuel is extremely harmful to the marine environment and its vapours create a fire hazard. Any enclosed space that contains fuel-burning engines or appliances should be well ventilated. Operators should ensure that fuel-burning engines or appliances are designed for marine use and are maintained to prevent oil and fuel from leaking into the water. Not wearing a pfd / lifejacket is the number one contributing factor to recreational boating deaths in Canada.

By law the fuelling procedure that must be followed includes these steps:

1. Moor the vessel securely to prevent spillage.
2. Shut off all engines.
3. Send all persons ashore.
4. Extinguish all open flames.
5. Do not smoke.
6. Turn off electrical switches and avoid using electrical devices such as portable radios.
7. Close all windows, portholes, hatches and cabin doors.
8. Remove portable tanks from the vessel.
9. Ground the nozzle against the filler pipe.
10. Know the capacity of the fuel tank and do not overfill it.
11. Clean up spillage and properly dispose of the cloth or towel used.
12. Turn on the engine compartment blower for at least four minutes immediately before starting a gasoline engine.
13. Check for fuel vapour odours from the engine compartment before starting up the engine.



**Engine Compartment Blower.** An electric fan mounted through the aft section of the engine compartment to help regulate temperature and remove engine-related vapours.

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## **SECTION 2**

### **EMERGENCY SITUATION PREVENTION**

The Canadian Red Cross and the Canadian Life Saving Society maintain statistics on swimming and boating related incidents, injuries and fatalities. The following are the four most common causes of on-water incidents, injuries and fatalities:

1. Not wearing a personal flotation device (PFD) / lifejacket.
2. Person overboard.
3. Capsizing, sinking, swamping, grounding and collisions.
4. Alcohol and drug-related operation—which accounts for approximately 40% of recreational deaths in Canada.

Wearing a PFD at all times while on the water and refraining from alcohol and drugs while operating a pleasure craft are simple and very effective way to prevent emergencies on the water. The prevention of on-water incidents such as capsizing or swamping requires a competent operator and trained crew who are familiar with emergency procedures.

### **VESSEL AND OPERATOR LIMITATIONS**

The majority of emergency situations are preventable. Emergency situations are often a result of operator error, equipment malfunction, mechanical breakdown or weather related. With adequate training, equipment and vessel maintenance and planning, emergency situations can be prevented by identifying and correcting deficiencies and potential hazards.

#### **Vessel Limitations**

Pleasure craft come in a variety of shapes and sizes and include design features that are intended for specific uses and in a range of “normal” weather conditions. For example, a 20 m power vessel with a powerful engine and a high bow is intended for deep sea sport fishing in large waves, whereas a pontoon boat with a small engine and low freeboard is intended for use on a lake in small waves. Consider the following when determining if a vessel is appropriate for the forecasted conditions:

1. What is the forecasted weather?
2. What is the forecasted wave height?
3. How strong is the current?
4. What is the water depth?
5. What are the vessel characteristics, such as:
  - a. vessel length, width and draught,
  - b. vessel displacement,
  - c. hull type / shape (eg, deep-v or flat bottom),
  - d. open or closed cockpit,
  - e. engine size / hp (if applicable), and
  - f. types of sails, total sail area and reefing ability (if applicable).
6. What navigation equipment is on board?

7. What communication equipment is on board?
8. What safety equipment is on board?
9. Are the vessel, engine / sail, and equipment in good repair? If not, what tools are available to repair deficiencies?

There are no clearly defined rules or regulations which dictate what type and size vessels can operate in the wide range of weather conditions that can occur in the various rivers, lakes and coastal regions of Canadian waters. Therefore it is up to the vessel operator to determine if their vessel is seaworthy for the prevailing conditions. Most seasoned boaters are able to use previous experience to identify their vessel's limitations and determine if it is safe to operate in the forecasted conditions. Prior to departure, novice boaters and boaters with limited local knowledge of the area should consult local boat owners to determine if the conditions are safe.

### **Operator Limitations**

Operator limitations are a commonly overlooked aspect of pleasure craft operations and are often the root cause of an on-water incident. Novice boaters and operators who are tired have a tendency to overestimate their ability to operate their vessel in challenging conditions (such as weather, current or in a crowded passage), leading to preventable on-water emergencies. The following factors can affect an operator's ability to safely operate a vessel:

1. knowledge of the limitations of the vessel being operated,
2. experience operating the type and size of the vessel,
3. experience operating in the area,
4. experience operating in the prevailing conditions (eg, wind, waves, current, fog, etc),
5. experience operating around other craft,
6. experience operating at night (if applicable),
7. time the operator has spent at the helm (operator fatigue), and
8. mental state of the operator (ability of focus on the task at hand).



To reduce operator fatigue when on long voyages, it is recommended that a watch system be established so that helming responsibilities are shared by the qualified persons on board the vessel.

Similar to vessel limitations, there are no clearly defined rules or regulations which determine operator limitations (except for the requirement to provide proof of competency and to operate while unimpaired by alcohol or drugs). When determining if conditions are safe, pleasure craft operators should take into consideration all vessel, equipment, weather and personal experience factors.

### **WEATHER AND WATER CONDITIONS**

Before departing, an operator should obtain a current weather forecast for the area in which they will be operating. This forecast gives an indication as to the weather patterns expected and any potential dangers to a pleasure craft on the water.

Current weather forecasts can be obtained from the following sources:

- personal observations,
- newspapers,

- radios,
- television weather channel,
- radiotelephones, or
- Environment Canada website.



To obtain a current marine weather forecasts (as illustrated in [Figure 1](#)), visit the Environment Canada website at [http://www.weatheroffice.gc.ca/marine/index\\_e.html](http://www.weatheroffice.gc.ca/marine/index_e.html)

<b>Environment Canada Weather Forecast</b>	
<b>Marine Forecast issued for Juan de Fuca strait.</b>	
<b>Issued:</b> 4 PM PDT Monday 14 April 2008 for the period ending 4 PM Tuesday with an outlook for the following 24 hours.	
<p><b>Synopsis:</b></p> <p>A weak ridge of high pressure over northern Vancouver Island this evening will drift southeastward through the south coast tonight.</p> <p>Meanwhile a weak front well offshore will reach the north coast overnight and will slowly move inland on Tuesday.</p> <p>Moderate westerlies will back to moderate to strong south or southeast in advance of the warm front over most areas from northern Vancouver Island northward. Winds will veer to moderate to strong westerly behind the front. In the far south moderate to strong west or northwest winds will prevail tonight with gales forecast through Juan de Fuca strait. Winds will ease to light to moderate by Tuesday morning.</p>	
<p><b>Forecast:</b></p> <p><b>Gale warning continued.</b></p> <p>Winds westerly 25 to gales 35 knots easing to 15 to 25 overnight.</p> <p>Partly cloudy. Chance of showers.</p> <p>Outlook. Moderate to strong westerlies.</p>	
<p>Copyright © 2008 Environment Canada</p> <p>All Rights Reserved</p>	

*Note. From Marine Weather by Environment Canada, 2008, Juan de Fuca Straits. Retrieved April 14, 2008, from [http://www.weatheroffice.gc.ca/marine/marine\\_e.html?c-jfs](http://www.weatheroffice.gc.ca/marine/marine_e.html?c-jfs). Copyright 2008 by Environment Canada*

Figure 1 Marine Weather Forecast

When high wind speeds are expected, Environment Canada will issue a wind warning in the marine forecast:

- **Strong Wind Warning.** 20–33 knots (37–61 km/h),
- **Gale Warning.** 34–47 knots (62–87 km/h),
- **Storm Warning.** 48–63 knots (88–117 km/h), and

- **\*Hurricane Force Wind Warning.** 64 knots or more (118 km/h or more).

*\*This warning refers to wind speed and does not mean that a hurricane is expected or is taking place.*



One knot is one nautical mile per hour or 1.852 km/h.

Prior to departure, local nautical charts should be reviewed to gain knowledge about the local area. Examine the chart to become familiar with the topography and identify local hazards such as shoals and other navigational hazards. Because of wave height and frequency increases in shallow water, it is recommended that shallow water be identified, and a route be planned navigating through the deepest (practical) areas.

Based on the planned route, identify small coves, inlets and other places to seek shelter if the weather conditions suddenly change. Securing to a mooring or dock and setting an anchor is significantly more difficult when operating in high winds and waves. Predetermining places to seek shelter can save time if the weather changes and increase the likelihood that the vessel can be safely secured before conditions become too severe.

## **BRIEF PASSENGERS**

Regardless of the size or type of vessel, a pleasure craft operator is legally responsible for all persons on board. Prior to departure all passengers should know where the lifejackets on board are stowed (if they are not wearing them already) and where they should muster (gather) in the case of an emergency. Passengers should be briefed on the location of all safety equipment and how to use it in the case of an emergency. Passengers should also be briefed on procedure in the case of an emergency and assign individual responsibilities.

## **ENSURE SAFE LOADING PRACTICES**

In accordance with Transport Canada's *Construction Standards for Small Vessels*, vessels are required to be fitted with a compliance notice which displays the following information regarding recommended safe limits while operating in fair weather:

- safe motors size (hp),
- number of occupants, and
- maximum weight or load.

When a load (occupants and equipment) is placed in a vessel, the vessel sinks lower into the water. By sinking into the water, the amount of freeboard decreases which changes the way the vessel interacts with waves. When travelling into the waves, a fully loaded vessel has a tendency for its bow to punch through the waves instead of gliding over top. When too much weight is added to a vessel, when the bow punches through the wave, the bow can submerge, causing the vessel to fill with water (swamp). When travelling across waves (perpendicular) vessels have a tendency to roll from side to side. Because fully loaded vessels have a lower freeboard, the angle / degree a vessel can roll is smaller. When too much weight is added to a vessel, when the vessel rolls with the waves, one of the gunwales can submerge causing the vessel to swamp and capsize. Seat passengers and store gear evenly throughout the boat. Gear should also be stored as low as possible.



Compliance notices indicates the maximum load for operation in fair weather. To ensure safe operation, operators should reduce the vessel's load (occupants and equipment) when planning to operate in foul weather.

Always maintain an even weight distribution (passengers and load) in the vessel to reduce the risk of swamping or capsize.



All required safety equipment must be stowed such that it is readily accessible in an emergency.

## ADHERE TO SAFE FUEL HANDLING PROCEDURES

Gasoline and other petroleum based fuels are among the most dangerous aspects of boating. Most fires that occur on board a vessel are a direct result of the mishandling of petroleum or from the misuse or poor maintenance of fuel-burning appliances.



**Fuel-burning Appliances.** Gas vapour and propane and butane gas are heavier than air and quickly and easily build up in the lower compartments of your boat. These gases are extremely explosive and can pose great risk if not handled properly. Always store tanks in a well ventilated area and ensure appliances are installed and used according to the manufacturer's instructions.

Recreational boating activities occur in or near environmentally sensitive areas such as rivers, lakes and coastal areas. The potential risks of using petroleum are not limited to a vessel or its occupants. Even small petroleum spills can have devastating impact on local birds, fish, marine plants and local habitat.

To reduce the risk of an on-water fuel-based emergency, safe fuelling practices should be adhered to at all times. To prevent a spill, an accidental fire or explosion and to prevent dangerous fumes from filling the cabin, all individuals should be made familiar with fuelling procedures before fuelling begins.



**Avoid stockpiling.** Storing any petroleum-based product on board a vessel increases the risk for an incident. To reduce risk, only the minimum practical amount of petroleum should be stored on board. For example, if the vessel is equipped with a propane burning stove, store one propane tank on board at a time and replace the tank as required as opposed to storing multiple tanks on board that will not be used for several weeks.

## AVOID AND DETECT CARBON MONOXIDE

Carbon monoxide (CO) is an inflammable, colourless, odourless and tasteless toxic gas produced during the incomplete combustion of fuel. When oxygen is replaced with carbon monoxide in our blood, our bodies poison themselves by cutting off the needed oxygen to our organs, resulting in unconsciousness or death. Cooking, heating or even leaving a motor idling for too long, particularly where there are enclosed or partially enclosed spaces, can result in a dangerous build-up of CO.

If the vessel has accommodations and is fitted with an inboard engine, generator or fuel-burning appliance, a CO detector must be installed close to where people will be sleeping.

Reduce the risks of CO poisoning by:

- Idle the engine only in well-ventilated areas. A tail wind can easily carry CO back on board.
- Only heat the cabin or cook when proper ventilation is in place.
- Ensure cabin extensions and areas fitted with canvas tops are well ventilated.
- Use only fuel-burning engines or appliances that are certified or designed for marine use and ensure they are only used in well-ventilated areas.
- Use a marine-grade CO detector and check its batteries before every trip.

- Be aware that CO can build up when:
  - two vessels are tied to each other,
  - docked alongside a seawall,
  - the vessel's load causes the bow to ride high, or
  - a fuel-burning appliance or engine is running while the vessel is not moving.



**Houseboats and Pontoon Boats.** Many people do not realize that CO gas can easily build up between the pontoons of these types of boats and swimming between them can put you at risk.



***Activate Your Brain:***

What are the most common causes for boating related incidents, injuries and fatalities?

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What factors can affect an operator's ability to safely operate a vessel?

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Why should small coves and inlets along the planned route be identified prior to departure?

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## SECTION 3

### PLANNING AND PREPARATION

An operator of a pleasure craft must prepare for any situations that may take place while they are out on the water. First and foremost you must make sure your vessel is in good working order. In addition to thorough pre- and post-season inspections, it is important to do a quick inspection before each trip to ensure the vessel and all equipment are in good repair and any required servicing is done. If well planned, the trip is safer and more enjoyable.

#### Check the Weather Forecast

Weather systems near coastal regions and lakes can be very unpredictable and subject to constant change. Most boaters check the weather forecast in the morning when determining if it is a "nice day to go boating". In some cases, several hours can pass between the time the decision was made to go boating and the actual time of departure. As part of pre-departure preparations, it is important to check the weather forecast to ensure there have been no changes and it is still safe to operate a pleasure craft in the area.



Local factors such as topography can affect weather resulting in unexpected conditions. If unfamiliar with the area, consult with boaters from the area for some "local knowledge" prior to departure.

#### Identify Local Hazards

When planning a trip on the water, research the area for local hazards that may impede the operation of a pleasure craft and increase the risk of injuries or loss of life to persons on board. Knowing where these hazards are located aids in making decisions in case of an emergency.

- Local hazards may include:
- low-head dams,
- rapids,
- sudden winds,
- tides,
- currents,
- white water,
- overhead cables,
- underwater cables,
- bridges, or
- rapid build-up of high wave conditions.

Information on local hazards can be obtained from sources such as knowledgeable local residents, marine charts of the area, current tide tables and other nautical publications. Rapids have strong turbulent currents that can conceal rocks just below the surface. They can easily swamp a vessel and cause it to overturn or can overpower a vessel causing a loss of control. They can also cause injury or death to persons in the water.

#### Navigational References

It is important to refer to navigational references and become familiar with the area you will be boating in order to avoid hazardous areas to identify safe places to take shelter in the event of foul weather. There are a

great number of references published by, or available through the Canadian Hydrographic Services (CHS) that provide detailed information regarding many Canadian waterways. These include;

- tide and current tables,
- navigational charts,
- Sailing Directions, and
- Cruising Guides.

For more information, visit the CHS website at [www.charts.gc.ca](http://www.charts.gc.ca).



*Sailing Directions* and *Cruising Guides* are publications that provide information on general navigation, meteorology, ports, buoyage, currents, regulations and detailed advice on passage in each local area.



If you plan to cross into US waters, obtain the most recent Homeland Security requirements.

## Fuel

Ensure there is sufficient fuel for the trip. Use the fuel rule of thirds—1/3 reserve, 1/3 trip out and 1/3 trip back.

## Prepare a Trip Plan

Before heading out on the water, an operator of a pleasure craft should complete a trip plan (as illustrated at attachment F), with the necessary details to assist in initiating a call for search and rescue in case of an emergency. File the plan with a responsible person that is familiar with the instructions to follow in case of an emergency and update the plan during the trip if there are any changes and inform the person when you return home.

The trip plan should contain the following information:

- the name and number of the vessel,
- whether the vessel is a sailing or power-driven vessel,
- the name, address and phone number of the owner,
- the number of persons on board,
- the size, type and colour, type of engine, and any distinguishing features of the vessel,
- the type of radiotelephone carried, if any, and the channel monitored,
- any safety equipment carried including flares, lifejackets and life rafts,
- a description of the trip, time of departure, time of return and proposed route, and
- any instructions to follow in case of emergency.



Trip plans may also be referred to as sail or float plans.



## TRIP PLAN

Owner's Name & Address:		Telephone Number:	
Vessel Name & License Number:		<b>Sail</b> <input type="checkbox"/>	<b>Power</b> <input type="checkbox"/>
Size & Type:			
Colour:	Hull:	Deck:	Cabin:
Type of Engine:		Other Distinguishing Features:	
<b>Radio Channels Monitored:</b>	<b>HF</b>	<b>VHF</b>	<b>MF</b>
<b>Safety Equipment Onboard:</b>			
Life Rafts:		Dinghy or Small Boat (Include colour):	
Flares (Include number & type):		Lifejackets or PFDs (Include number):	
Other Equipment:			
<b>Search &amp; Rescue Telephone Numbers:</b>			
Rescue Co-ordination Centre Victoria		1-800-567-5111 or Channel 16 (156.8 MHz)	
Rescue Co-ordination Centre Trenton		1-800-267-7270 or Channel 16 (156.8 MHz)	
Rescue Co-ordination Centre Quebec		1-800-463-4393 or Channel 16 (156.8 MHz)	
Rescue Co-ordination Centre Halifax		1-800-565-1582 or Channel 16 (156.8 MHz)	
Marine Rescue Sub-Centre St John's		1-800-563-2444 or Channel 16 (156.8 MHz)	
<b>Trip Details (Include these details for every trip):</b>			
Date of Departure:		Time of Departure:	
Leaving From:		Heading To:	
Proposed Route:		Estimated Date & Time of Arrival:	
Stop Over Point:		Number of Persons On Board:	
Stop Over Point:			

*Note. Created by Director Cadets 3, 2010, Ottawa, ON: Department of National Defence.*

Figure 1 Sample Trip Plan

### Use a Pre-Departure Checklist

The operation of a pleasure craft should be fun, safe and hassle-free. To ensure the pleasure craft is in good working order and to avoid situations which could lead to emergencies, a pre-departure checklist should be followed before heading out on the water. A Pre-Departure Checklist ensures that all necessary safety equipment is onboard.

PRE-DEPARTURE CHECKLIST	
√	Pre trip vessel inspection complete.
√	Fuel / Oil tanks full.
√	Is all gear on board and secure.
√	Bilge pump working.
√	Tools and spares on board.
√	Lights and spot lights working.
√	Steering checked.
√	Sail plan filed.
√	VHF radio check and portables charged.
√	Cell phone and extra batteries checked.
√	VHF ROC(M) certificate on board.
√	PCOC on board.
√	PFDs on board.
√	Crew briefed.
√	Start-up procedure followed.

*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 2 Pre-Departure Checklist

## SECTION 4

### RESPONSE TO EMERGENCIES

The events that are most likely to cause an emergency are a breakdown, fire, collision with an object or deterioration in the weather. Preparing for these events before heading out on the water could prevent them from becoming worse and could possibly save lives.

#### Breakdown

The following actions should be taken in response to a breakdown:

1. alter the speed of the vessel as appropriate to the prevailing circumstances;
2. anchor the vessel as appropriate to the prevailing circumstances;
3. investigate the problem;
4. correct the problem if possible; and
5. use or exhibit signals to indicate distress and need of assistance, if necessary.

The owner of a pleasure craft should maintain the vessel and its equipment on a regular basis and ensure that everything onboard the vessel is functioning properly to reduce the probability of breakdowns.

#### Fire

A fire is the most dangerous emergency that can be faced by occupants of a small craft. The following actions should be taken in response to a fire:

1. shut off all engines and fuel-burning appliances;
2. if possible / safe, disconnect and secure portable fuel tanks and fuel lines;
3. muster all vessel occupants on deck;
4. don PFDs / lifejackets;



The *Small Vessel Regulations* state that there must be a Canadian-approved PFD or lifejacket of appropriate size for each person on board, however, IAW A-CR-CCP-030/PT-001 *Water Safety Orders*, a PFD must be worn at all times by students.

5. close all accessible windows, portholes, hatches and cabin door;
6. extinguish all open flames; and
7. use or exhibit signals to indicate distress and need of assistance, if necessary.



**Ignition Protection.** Every boat that has a gasoline engine or uses propane devices must have ignition-protected electrical devices. These parts are designed and made so that, under normal conditions, they do not ignite gasoline, propane fumes or vapours. This protection prevents sparks from escaping during use. Only use electrical components that are clearly labelled as ignition protected and certified for marine use.

## Hull Leaks or Flooding

The following actions should be taken in response to a hull leak or flooding:

1. don PFDs / lifejackets;
2. locate the source of the hull leak or flooding;
3. stop the leak or the source of flooding if possible;
4. remove the accumulation of water in the hold or other compartments of the vessel using either handheld bailers, manual pumps or bilge pumping systems appropriate for the circumstances and the vessel; and
5. use or exhibit signals to indicate distress and need of assistance, if necessary.

The operator of a pleasure craft should carry tools and material onboard at all times to temporarily stop hull leaks or flooding.

## Capsizing, Swamping, Sinking, Grounding or Collision

The following actions should be taken in response to a capsizing, swamping, sinking, grounding, or collision:

1. don PFDs / lifejackets;
2. stay with the vessel when appropriate;
3. account for all persons; and
4. radio, use or exhibit signals to indicate distress and need of assistance, if necessary.

## Deterioration in the Weather

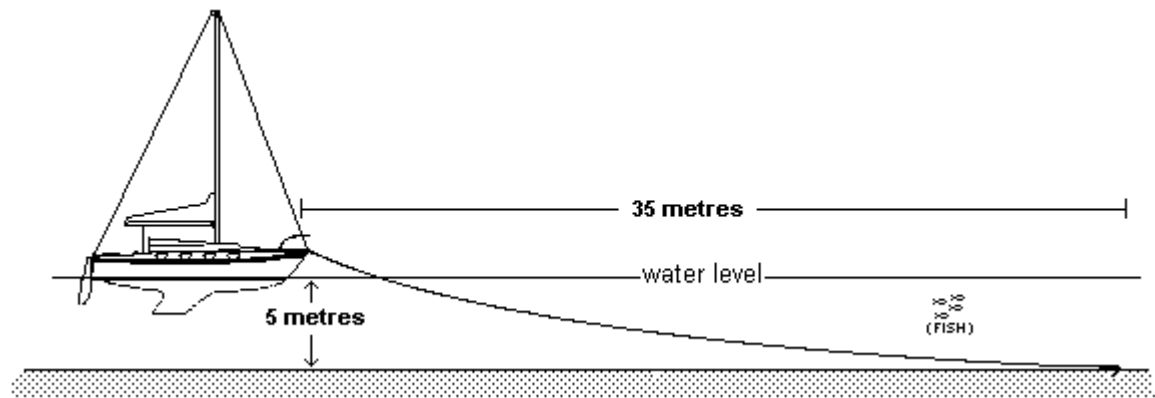
Summer thunderstorms and squall lines can strike quickly and without warning. While on the water it is important to monitor VHF weather transmissions and observe local weather conditions by taking note of changing cloud formations and sudden changes in wind speed and direction. If it starts to look dark and cloudy, and conditions are changing quickly, head for shore / shelter.

When the weather deteriorates and there are no moorings or dock space available in the immediate area, it may be necessary to seek shelter in a nearby cove or inlet and anchor until the weather subsides.



**Veer.** To let out anchor cable.

When anchoring, it is important to fasten the inboard end of the anchor line to a secure point on the pleasure craft and to securely fasten the outboard end of the anchor line to the anchor. For an anchor to dig into the bottom, it must have the correct amount of cable veered. This is known as the scope of the cable. For a short stay or "lunch hook", veer out a scope of 3:1 (cable length of three times the depth of water). For a longer stay, a scope of 5:1 is recommended. A scope of 7:1 is recommended for an overnight anchorage.



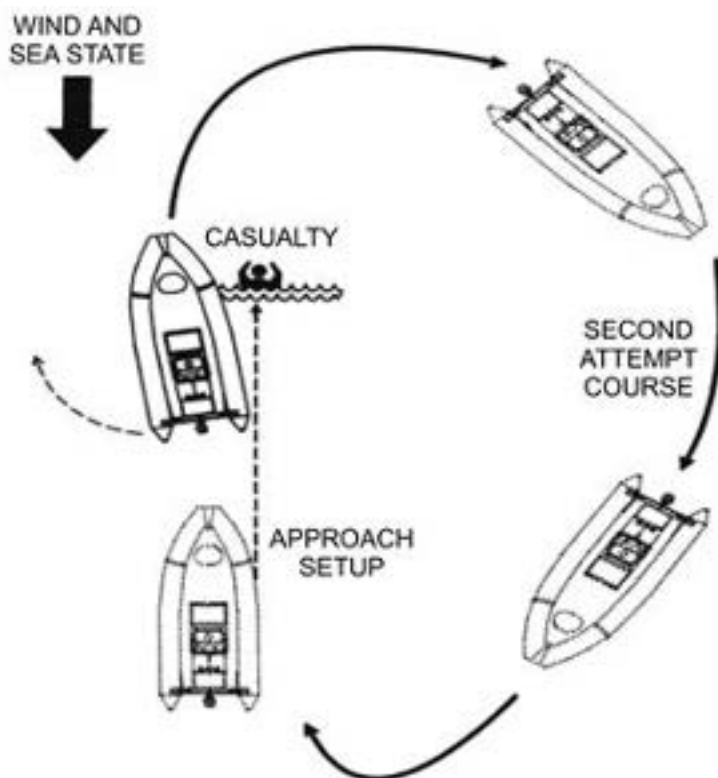
*Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.*

Figure 1 Anchor Scope

### **PERSON OVERBOARD (POB)**

The procedure to recover a person overboard is as follows:

1. Slow down gradually and turn back into the boat's own wake.
2. Position the boat directly downwind of the POB.
3. Manoeuvre the boat slowly toward the POB on the starboard side.
4. Once alongside the POB, stop the engines and have the crew recover the POB.
5. If the POB is missed on the first approach, circle around again keeping the POB on the inside of the circle and keeping the propeller away from the POB (as illustrated in [Figure 2](#)).



From Canadian Forces CFCD 105, *Seamanship Rigging and Procedures Manual* (p. 11-18), by Chief of Maritime Staff, 1997, Ottawa, ON: Department of National Defence. Copyright 1995 by HMSO Publications.

Figure 2 Recovering a POB

### Offering Assistance

In accordance with the *Criminal Code* of Canada and the *Canada Shipping Act*, the operator of a pleasure craft should watch for signals that indicate distress and need of assistance. The operator of a pleasure craft, in so far as he / she can do so without serious danger to his / her own craft and the persons on board, shall render assistance to every person who is found at sea and in danger of being lost.

If vessels collide, the operator of each vessel shall, if and in so far as they can to do so without endangering their vessel, crew or passengers:

1. render to the other vessel, its master, crew and passengers the assistance that may be necessary to save them from any danger caused by the collision, and to stay by the other vessel until the master or person has determined that it has no need of further assistance; and
2. give the name of their vessel, if any, the name and address of its authorized representative, if any, and any other prescribed information to the master or person in charge of the other vessel.

While proceeding to offer assistance, the operator can, through observation, determine:

- the level of assistance required by the vessel,
- the number of visible crew,
- the status / condition of the vessel's crew, and
- any potential dangers in the area.

Once on scene a pleasure craft operator should offer any assistance possible to ensure the safety of the vessel in distress and all persons on board. In cases where a vessel is aground, care should be taken to ensure the safety of the assisting vessel. If wave current and wind conditions are too severe, the assisting vessel runs the risk of also being pushed around and becoming in a situation of distress themselves.

If offering assistance to a vessel in distress may pose danger to the assisting craft, the pleasure craft operator should contact local Coast Guard services and refrain from endangering their own vessel. During the summer months, the Canadian Coast Guard operates the Inshore Rescue Boat Service, which is able to provide quick response rescue capabilities in many popular swimming and boating locations. If the Coast Guard has been contacted, the assisting vessel should remain on location until further directed by the response team.



### **Activate Your Brain:**

What events are most likely to cause an emergency?

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How should you remove the water accumulation in the vessel after stopping a leak?

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What actions should be taken in response to capsizing, swamping, sinking, grounding, or collision?

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### **REFERENCES**

A1-004 B-GN-181-105/FP-E00 Chief of the Maritime Staff. (2000). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

C1-098 0-662-42286-4 Office of Boating Safety. (2009). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen of Right of Canada, as represented by Transport Canada.

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