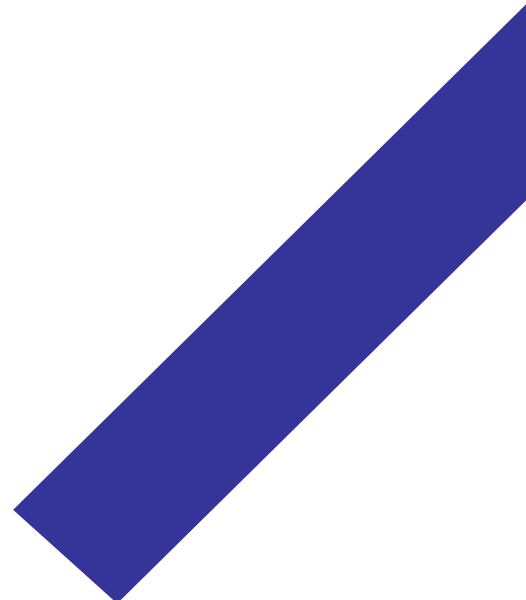


***Canadian Coast
Guard
Auxiliary***
(Central and Arctic Region)



SAR Operations
Manual
2004



Canadian Coast Guard Auxiliary
(Central and Arctic Region)

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

Introduction

The background for this manual extends to the early 1980's. At that time:

Ted Philips (CPS) (CCGA)
Captain John Hanbidge (CCGA - deceased)
John Goodman (CCG)
Lawrence Swift (CCG)

were the contributing authors. Much of the original work is still evident in this and the accompanying SAR Training Manual.

A CCGA *ad hoc* Training Committee developed new editions of the SAR 1 and 2 manuals in the late 1990's. The members of the committee included, at various times:

Murray Miner (CCGA Director of Training – Ret'd)
Theo. (Ted) Cook (CCGA – deceased)
Richard (Butch) Dompierre (CCGA)
Peter Graham (CCGA)
Gerry Reed (CCGA – Ret'd)
Jim P. Gram (CCGA)
Don Limoges (Director of Training)
Scott Miller (CCG – JRCC Trenton)
Dan Coultis (CCG – JRCC Trenton)
Mark Gagnon (CCG SAR Training Officer)

In late 2002, CCG mandated a change in the way we conduct our training and initiated a standard training program for all CCGA members involved with SAR activities. The original training material contained in the SAR 1 and 2 courses was divided into two general areas consisting of what might be considered theory content and operational content. This division now created the basis for a SAR Training course and a second training process based on the Operational Checklist. The material in this manual offers CCGA members an insight into “how to” get the job done – operational guidelines. This material provides the Operational knowledge expected of Search & Rescue crews.

More recent contributors include Fergus Reid (PARA), Kevin Roy (Owen Sound Fire Service), Wayne McCrae, Dave Elit, (JRCC) and Duff Dwyer (CCGA).

Table of Contents

<u>Module 1: Abbreviations</u> -----	Page 05
Glossary	
General Information	
SAR Readiness	
Statistics	
<u>Module 2: Man Overboard</u> -----	Page 23
PIW Recovery	
<u>Module 3: Fire Situations</u> -----	Page 33
SRU Fire	
Abandon the SRU	
Distress Vessel Fire	
Marina Fire	
<u>Module 4: Guidelines for dealing with Distress Situations.</u> -----	Page 49
Vessel: sunk – capsized – swamped – taking on water	
Trapped survivors	
Medical assistance	
Recovery of vessels	
Abandoned vessels	
Disoriented	
Groundings	
<u>Module 5: Towing</u> -----	Page 67
When to tow	
When not to tow	
Waivers	
<u>Module 6: Disaster Scene Management</u> -----	Page 81
Incident Command Structure	
<u>ANNEX: Forms</u> -----	Page 95

Module 1

Introduction

Abbreviations & Glossary

General

Information

Canadian Coast Guard Auxiliary
(Central and Arctic Region)



Cove Island Imperial Tower Light House

ABBREVIATIONS AND GLOSSARY

Alphabetical Order by Abbreviation

AOR	Area of Responsibility
C	Coverage Factor
CASARA	Civil Air Search and Rescue Association
CCG	Canadian Coast Guard
CCGA	Canadian Coast Guard Auxiliary
CCGC	Canadian Coast Guard Cutter
CFB	Canadian Forces Base
CGRS	Coast Guard Radio Station (also known as MCTS)
CHS	Canadian Hydrographic Service
CMCC	Canadian Mission Control Centre
CRP	Casualty Reception Point
CSA	Canada Shipping Act
CSP	Commence Search Point
CSS	Coordinator Surface Search
DFO	Department of Fisheries & Oceans
DMB	Datum Marker Buoy
DND	Department of National Defense
DR	Dead Reckoning
DSC	Digital Selective Calling
DTG	Date Time Group
EPIRB	Emergency Position Indicating Radio Beacon
GEOSAR	Geostationary Search & Rescue Satellite
GMDSS	Global Maritime Distress and Safety System
GPIRB	Global Position Indicating Radio Beacon
HF	High Frequency
ICAO	International Civil Aviation Organization
ICS	Incident Command Structure
IMO	International Maritime Organization
IAMSAR	International Aeronautical and Maritime Search & Rescue
IRB	Inshore Rescue Boats
JRCC	Joint Rescue Coordination Centre
KTS	Knots

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

LF	Low Frequency
LKP	Last Known Position
LOP	Line of Position
MARB	Marine Assistance Request Broadcast
MAJAID	Major Air Disaster
MCTS	Marine Communications and Traffic Services (a.k.a. CGRS)
MF	Medium Frequency
MMSI#	Maritime Mobile Service Identity Number (DSC)
MRSC	Marine Rescue Sub-Centre
NM	Nautical Miles
NDHQ	National Defense Headquarters
NSP	National SAR Program
NWPA	Navigable Waters Protection Act
OSC	On-scene Coordinator
PIW	People in Water
POB	People on Board
RCMP	Royal Canadian Mounted Police
RTB	Return to Base
S	Track Spacing
SAR	Search and Rescue
SART	Search & Rescue Transponder
SLDMB	Self Locating Datum Marker Buoy
SITREP	Situation Report
SM	Search Master
SOG	Standard Operating Guideline
SOLAS	International Convention for Safety of Life at Sea
SOP	Standard Operating Procedure
SRR	Search & Rescue Region
SRU	Search and Rescue Unit
TC	Transport Canada
UTC	Coordinated Universal Time
VHF	Very High Frequency
W	Corrected Sweep Width
Wu	Uncorrected Sweep Width

General Glossary

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

AERONAUTICAL INCIDENT

All SAR incidents involving aircraft.

AERONAUTICAL COORDINATOR

A person at JRCC responsible for planning, coordinating and controlling the response to a SAR incident.

CAPTAIN

A generic term applied to the master of a ship, pilot in command of an aircraft, commanding officer of a warship or the operator of any other craft.

CASUALTY RECEPTION POINT (CRP)

An intermediate forward location where a large number of survivors can be treated prior to evacuation to appropriate medical facilities.

COORDINATED SAR SYSTEM

The facilities, equipment and procedures established in each SRR to coordinate the response to SAR incidents

COORDINATOR SURFACE SEARCH

When more than one vessel or aircraft has been tasked to an incident JRCC may designate one unit to coordinate the on scene operation. If the unit is a primary SAR vessel or aircraft it is known as the On Scene Commander. If it is a vessel other than a primary SAR vessel it is known as the Coordinator Surface Search.

COXSWAIN

The master of a search & rescue unit.

DATUM

The most probable location of a search object or person, corrected for total drift at a specific time.

DISABLED

A situation wherein a vessel or aircraft afloat and not in distress or potential of distress has lost all means of propulsion or steering control to such a degree as to be incapable of proceeding to safety without assistance.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

DISTRESS

A SAR incident wherein there is a reasonable certainty that one or more individuals are threatened by grave and imminent danger and require immediate assistance.

DITCHING

The forced landing of an aircraft on water.

EMERGENCY LOCATOR TRANSMITTER (ELT)

An emergency radio beacon designated for use by aircraft.

EMERGENCY POSITION INDICATING RADIO BEACON (EPIRB)

An emergency radio beacon designated for use by vessels.

GLOBAL POSITION INDICATING RADIO BEACON (GPIRB)

An emergency radio beacon designated for use by vessels which transmits its actual location.

HUMANITARIAN ASSISTANCE

An incident not directly related to an air or marine incident which requires the provision of assistance by SAR resources to save life or relieve human suffering, including the provision of a medevac, transportation of human organs, relief or medical supplies.

INMARSAT

International Mobile Satellite Organization operates 8 geostationary satellites providing worldwide coverage. Extensive marine interests.

JOINT RESCUE COORDINATION CENTRE (Also known as JRCC)

A unit responsible for providing efficient organization of search and rescue resources for coordinating the conduct of search and rescue operations within a SAR region.

MAJOR AIR DISASTER (MAJAD)

An aircraft accident occurring in Canada which because of the size of the accident requires augmentation of established SAR resources.

MAJOR MARITIME DISASTER

A marine incident which because of the number of people involved requires augmentation of established SAR resources.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

MARITIME COORDINATOR

A person at JRCC responsible for planning, coordinating and controlling the response to a SAR incident.

MARITIME INCIDENT

A SAR incident involving a vessel or a person, including a Medical Evacuation of a person (s) from a vessel.

MARITIME RESCUE SUB-CENTRE (MRSC)

A subordinate unit to a Rescue Coordination Centre (JRCC) established to complement the JRCC within a specific portion of a search and rescue region.

MEDEVAC

The evacuation of injured or stranded persons from isolated areas or the recovery of sick or critically injured persons from vessels at sea.

OFFICE OF BOATING SAFETY (OBS)

A group of CCG employees responsible for providing SAR prevention logistics and organization.

ON SCENE COMMANDER (OSC)

When more than one vessel or aircraft has been tasked to an incident JRCC may designate one unit to coordinate the on scene operation. If the unit is a primary or secondary SAR vessel or aircraft it is known as the on scene commander. If it is a vessel other than a primary SAR vessel or aircraft it is known as the Coordinator Surface Search.

OTHER SAR RESOURCES

Resources other than primary or secondary which from time to time participate in SAR activities when required. This includes municipal and provincial resources, civil volunteers and partially funded federal government resources such as the CCGA or CASARA.

PRIMARY SAR RESOURCES

Aircraft, vessels or formations established and equipped specifically for SAR and staffed with trained SAR crews. Primary SAR resources are under the direct operational control of the SRR commander for SAR tasking.

RESCUE COORDINATION

The integration of efforts of SAR facilities and resources

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

to achieve concerted and harmonized resolution of SAR incidents in an effective and efficient manner.

RESCUE SPECIALIST

Specially trained rescue personnel who are a key part of a primary SAR vessel. The military equivalent carried on board SAR aircraft are known as SAR TECH's.

SEARCH AND RESCUE REGION (SRR)

A specified geographical area in which SAR operations are coordinated and controlled by a designated Rescue Coordination Centre.

SAR INCIDENT

A reported air, maritime or humanitarian incident which requires a response by the SAR system.

SAR MISSION

The task assigned to a SAR resource by a JRCC in response to a SAR incident. A SAR mission starts with formal tasking by JRCC and is normally defined in scope and time.

SAR OPERATIONS

When the response to a distress incident requires the utilization of more than one resource and/or numerous SAR missions are anticipated during the resolution of the incident, it is considered a SAR operation.

SAR RESOURCE

A resource capable of responding to a search and rescue incident.

SAR UNIT

A unit specializing in the provision of search and rescue services.

SECONDARY SAR RESOURCES

Federal aircraft or vessels established and equipped for other than SAR, but which can be expected to respond (when available) to SAR tasking. They include multi-tasked government resources.

SELF LOCATING DATUM MARKER BUOY

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

A datum marker buoy launched by either an aircraft or SRU vessel and used to measure the rate of drift of either a POB or a life-raft. The buoy transmits a signal to a satellite, which in turn transmits the data to the appropriate JRCC.

SRR COMMANDER / RESCUE COORDINATOR

The military commander designated by NDHQ as being responsible for SAR operations within a search and rescue region.

SPOTTERS

Personnel aboard a SAR aircraft or vessel to assist in the conduct of a visual search.

STAND / STOOD DOWN

The order originating from the master of the vessel in distress or JRCC which releases the resource from the incident.

SAR Readiness

Responding to Search and Rescue Incidents:

Auxiliary vessels should be in a state of readiness at all times.

- * Full load of fuel
- * Emergency rations
- * Ancillary Equipment serviceable
- * Logs up to date

Note: When a vessel is not available for tasking, the JRCC must be notified either by telephone (land line) or through an MCTS station. Use the **Status Report** format.

Similarly, the Rescue Centre should be notified when the unit returns to service. Using the MCTS facilities is probably the preferred method to communicate with JRCC.

Response Times.

Emergency Response Times (ERT) vary significantly depending on:

- * Time of day
- * Travel distance
- * Crew availability

There is no defined expectation as to how quickly a unit should be able to “scramble”.

Typically, Community based units that maintain an “on duty” crew will have an almost immediate response to a SAR tasking. That same unit, without a duty crew, may take a good deal more time to respond depending on travel distances, weather and driving conditions.

Privately owned units in smaller communities can often leave the dock within twenty minutes of a tasking. However, these units may also experience delays in response.

It would be difficult to reconcile a unit stopping for fuel before proceeding on a call.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Tasking Authorization:-

Any unit responding to a SAR incident must have a tasking authorization by JRCC. An incident number is assigned when final report is phoned in.

Similarly, any unit involved in an “on water” training exercise must have a tasking number (TSK) issued by CCG Sarnia.

The Contribution Agreement between the Auxiliary and CCG states that only authorized activities fall under the terms of the Agreement. Consequently, all activities must be authorized.

Canadian Coast Guard and Auxiliary vessels are **not self tasking**. That is, as a general rule, vessels respond to a call only when JRCC tasks that vessel.

Owners and coxswains should understand that if an incident of a serious nature is occurring in their immediate area, they should proceed and contact JRCC through the MCTS as soon as is practical – preferably while en - route.

Auxiliary units should realize that failure to connect with the Rescue Centre as soon as possible may well result in a tasking number being declined for the incident in question.

Incident Follow-up:

To ensure that the incident record is maintained and accurate, the unit coxswain / owner must contact the JRCC immediately following the completion of an incident. **(See Mission Report Form in Annex)**

Most important are the critical times surrounding the incident. That is:

Time:

1. tasked
2. departed
3. on scene
4. incident ended
5. secure at base

**Maintain your
deck log
when on a tasking!**

Search and Rescue Exercises:

From time to time, search and rescue exercises are scheduled in various locations across the region.

In most instances, the units will know well in advance when an exercise is scheduled in their area and they are expected to participate. Units must take part in an exercise at least once every five (5) years. In instances where SAR operations are infrequent, units should try to take part in exercises as often as possible.

Coast Guard vessels, either SAR cutters or fleet vessels normally assist in organizing the events. Exercises also include other agencies, such as Parks Canada, O.P.P. and Regional Police Services.

Marine SAR and the 911 System:

The 911 system was originally created to satisfy an urban need to improve emergency responses involving police, fire and / or ambulance services. Over the years, the system has expanded to include non-urban areas and now involves emergency responses from resources other than the three primary elements mentioned above. In particular, Coast Guard and Auxiliary resources. In recent years, water based communities such as the Thousand Islands area and most island communities along the east shore of Georgian Bay have adopted the 911 system.

The 911 Municipal Address system is not compatible with the marine environment.

The address does not provide a latitude / longitude location, but rather a number or sets of numbers. An island is simply numbered. With the enhanced 911 system, a caller would be identified by that number. The responding resource (Fire / Police / EMS) would locate the address using a 911 Address Map.

It would be helpful then that marine resources (CCG / CCGA) operating in a MARITIME 911 area be in possession of the area 911 Address Book. Otherwise, the 911 operator would have to provide a cross referenced geographical location. As well, the co-ordinator at JRCC who is tasking the resource would provide the information.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

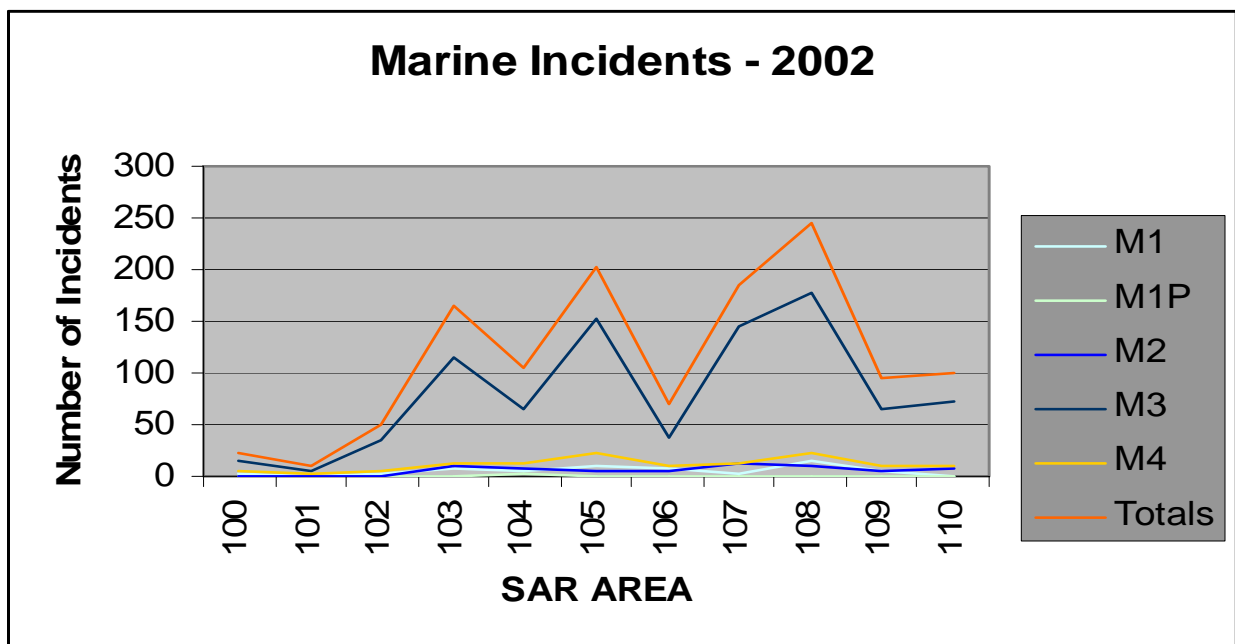
Although it is an unlikely possibility, it is conceivable that an Auxiliary unit could be contacted directly by Police or Fire services responding to a 911 call. The best approach in dealing with such an eventuality is to have the caller contact the JRCC directly. If appropriate, JRCC will then contact and task the Auxiliary unit.

Under no circumstances should an Auxiliary unit consider accepting a tasking from any authority other than JRCC.

Statistics and SAR Areas

The maps on the following pages illustrate SAR Areas as defined by JRCC. The areas are used to generate statistics, some of which can be found in this module.

Statistics are presented in this module to illustrate the type and frequency of incidents in the various SAR areas.



M1 = Distress

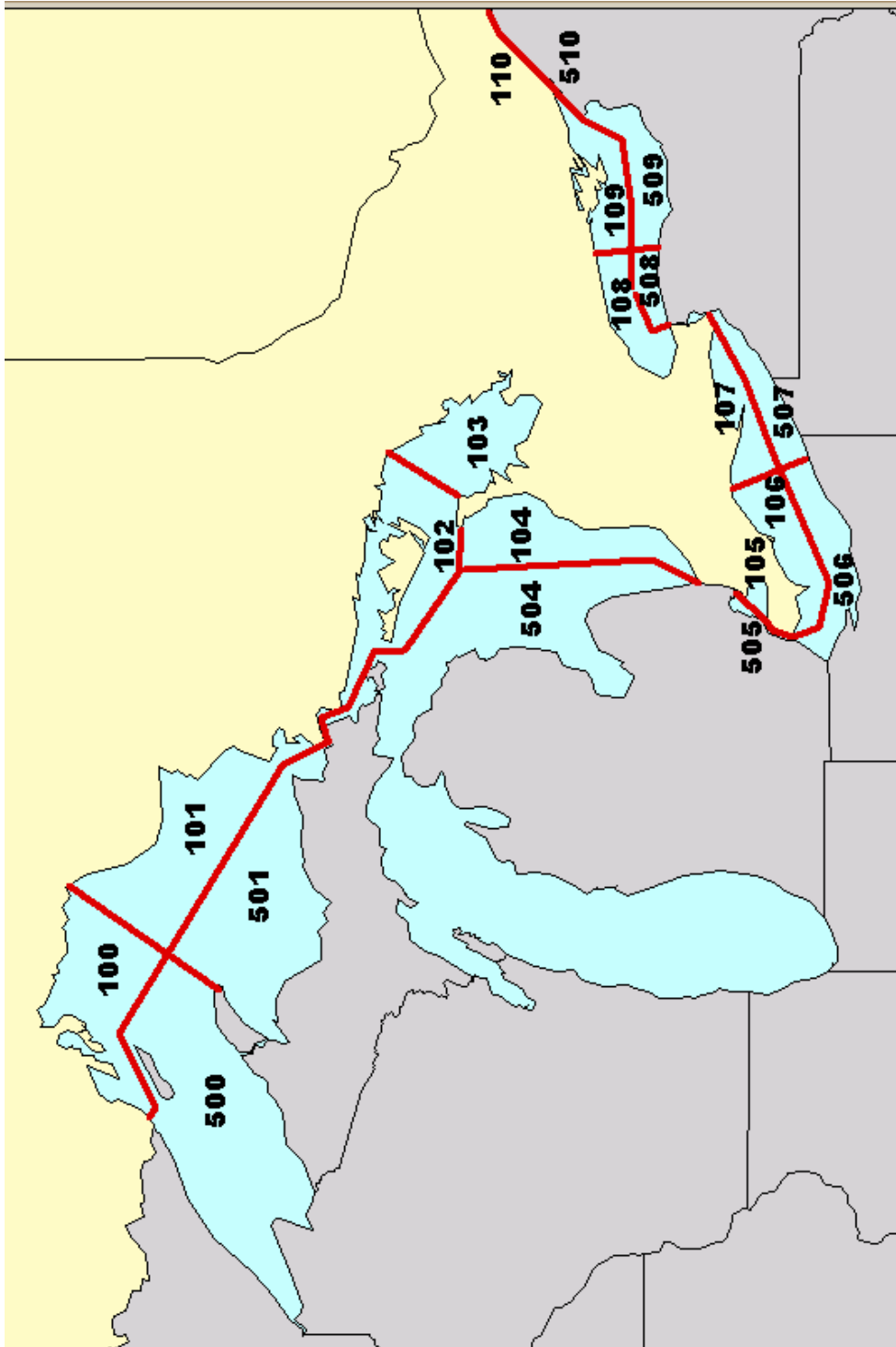
M1 P = Previously unreported M1 incident

M2 = Potential Distress

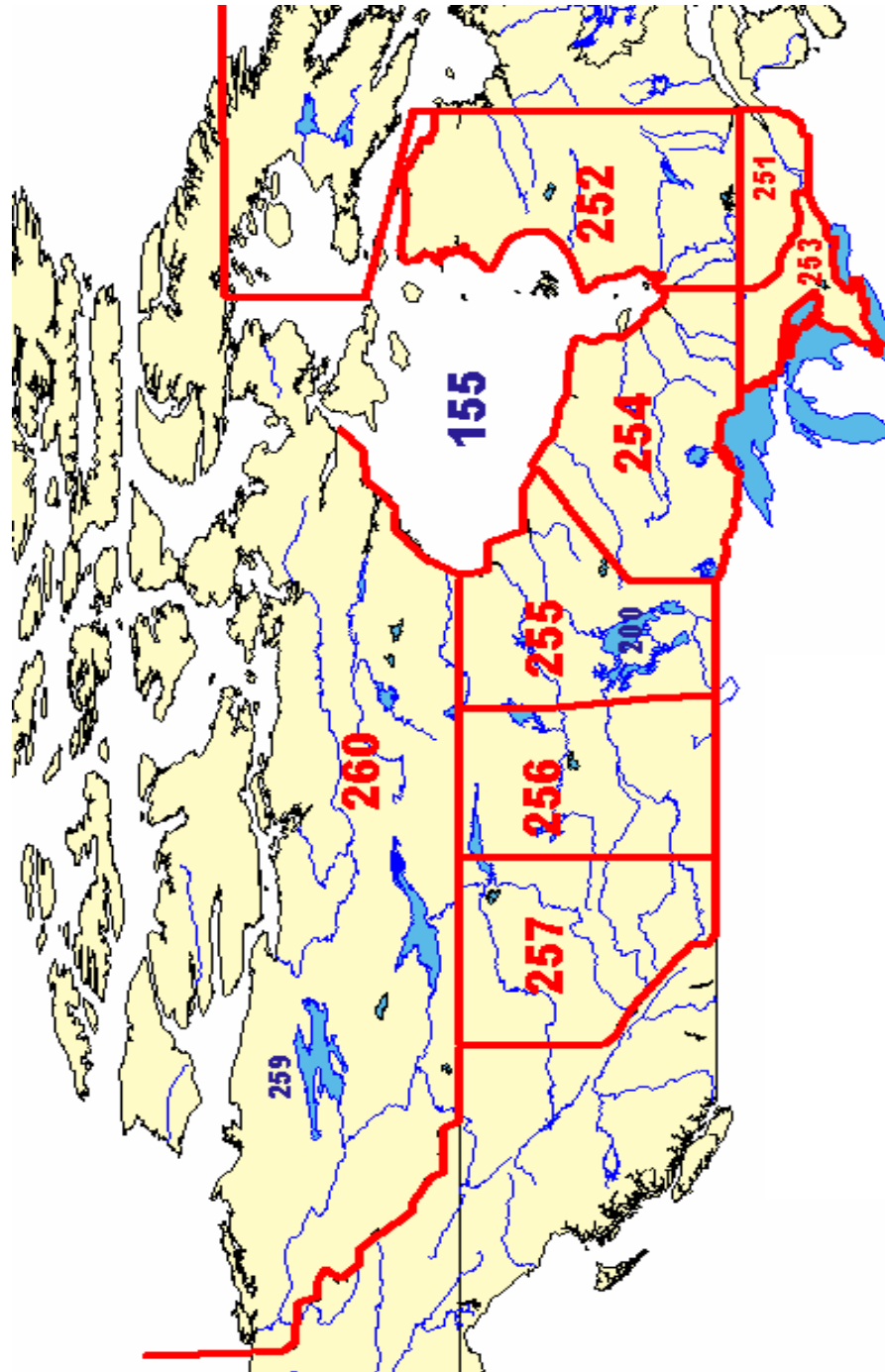
M3 = Situation resolved in the Uncertainty Phase

M 4 = False Distress or Hoax

SAR AREAS, GREAT LAKES



SAR Areas beyond the Great Lakes



Canadian Coast Guard Auxiliary
(Central and Arctic Region)

NEW SAR AREAS (in red)

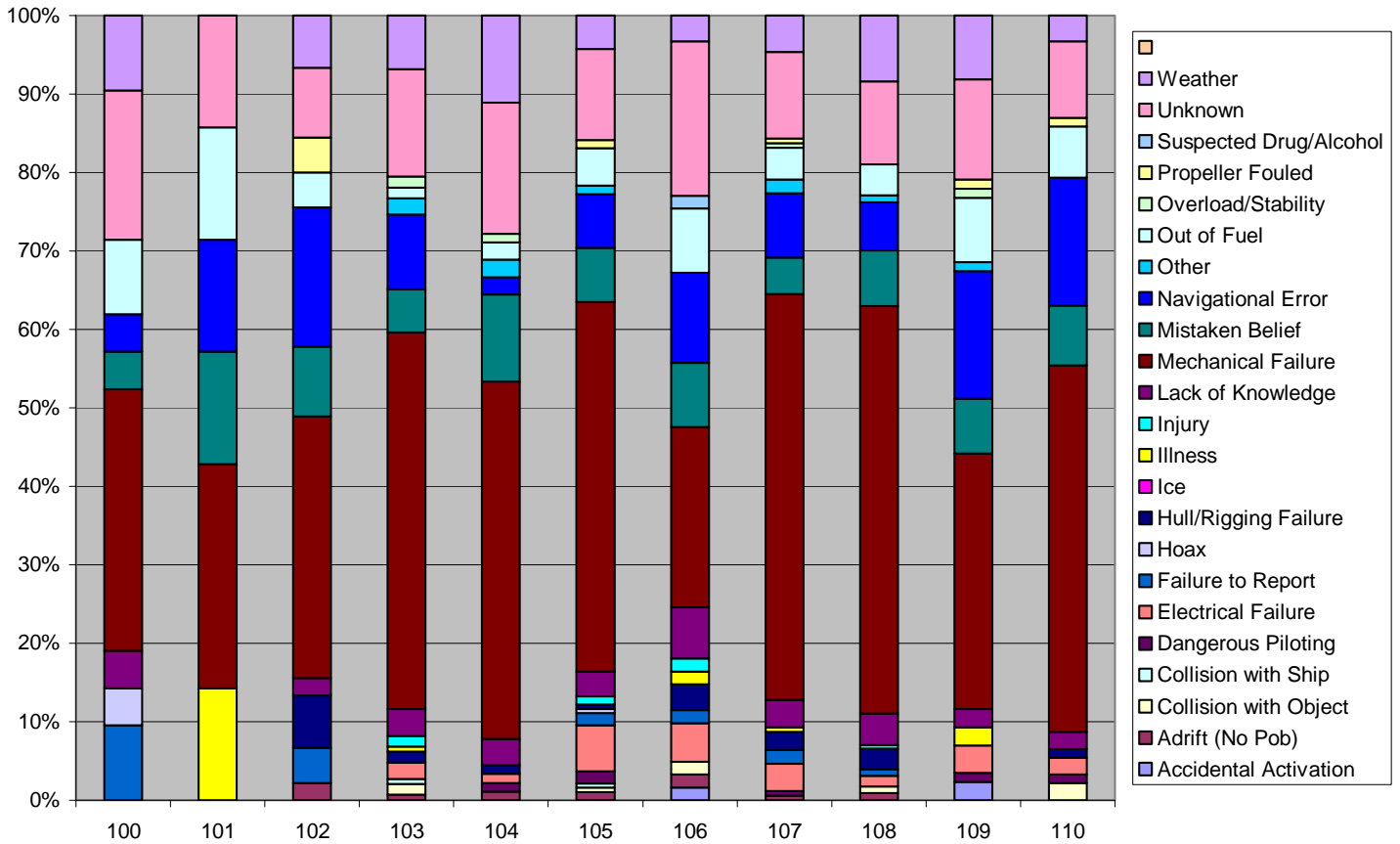
SAR AREA	GEOGRAPHIC AREA	SAR AREA	GEOGRAPHIC AREA
251	Quebec South of the 48 th parallel	100's	See Great Lakes Map
252	Quebec North of the 48 th parallel	155	Hudson Bay, James Bay, Foxe Basin
253	Ontario South of the 48 th parallel	160	Lake Simcoe
254	Ontario North of the 48 th parallel	200	Lake Winnipeg
255	Manitoba	259	Great Slave Lake and Mackenzie River
256	Saskatchewan	Maritime incidents in area 160, 200, and 259 are classified as Humanitarian "H" incidents .	
257	Alberta		
260	Northwest Territory		
		Maritime incidents in the Mackenzie Delta (Tidal area) and the Arctic are classified as Maritime "M" incident cases in area 260.	

The statistical data on the following page is provided to illustrate the:

- (a) most common causes of incidents
- (b) importance of supplying accurate information when completing the SAR Mission Report.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Incident Causes by Area



Although mechanical failure is shown as the single largest cause of marine incidents, you should not conclude that the failures were only the result of poor maintenance. Running over a shoal could also cause a mechanical failure.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)



Imperial Tower at Chantry Island

Every rescue means you assume some risk!

Before acting, weigh the risk involved with the safety of your vessel and crew in mind.



Routine does not equal low risk!

MODULE 2

Man Overboard

And

PIW Recovery

Man overboard from the SRU

The paramount concern is the safe retrieval of the lost crew member overboard.

Identify the Latitude and Longitude of the man overboard (“man overboard” button on the Loran or GPS ?, marker buoy ?, life ring?)

The crew member on the helm will initiate a turn that meets the weather conditions. (see below for a description of some turns)

Initiate a PAN PAN call on Ch 16 for man overboard. Details should include:

Name of vessel
Latitude and Longitude
Nature of distress

This module will deal with:

1. Man overboard procedures
2. Turning maneuvers
3. PIW approach
4. PIW recovery

The vessel will make an approach to the PIW in the water that best meets the needs of the situation.

Crew members may be required to:

- 1) Set up retrieval equipment
- 2) Man the sides of the vessel
- 3) Make the first aid kit available
- 4) Spotter must keep eye on PIW at all times.

Retrieve the victim.

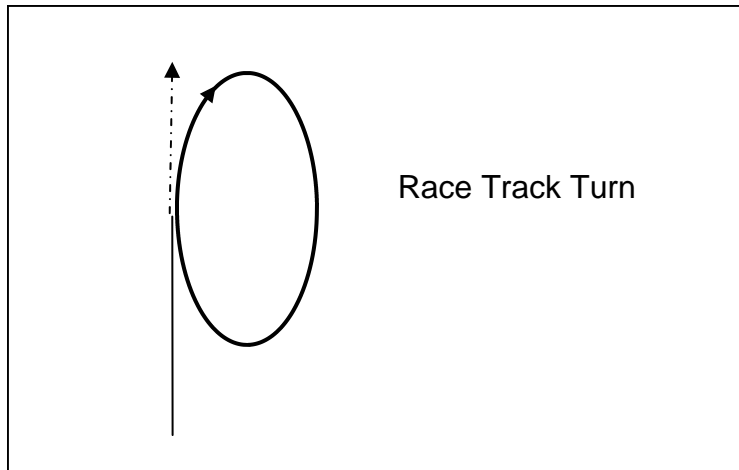
Cancel the PAN PAN.

Provide the necessary First Aid for the casualty (possible Hypothermia).

Turns

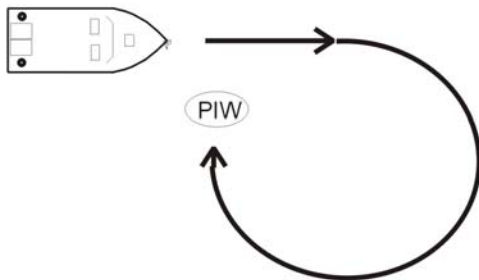
The object of any turn is to get the vessel into the retrieval position as quickly as possible.

In most cases, a single screw will only allow a longer flatter oval which some call the Race Track Turn because of its resemblance to a horse racing track. With a single screw, a turn like the Anderson (following illustration) is not possible. If you see the victim, just turn the boat around using the Anderson or Race Track Turns.



Anderson Turn

The fastest turn method, but requires twin engines.



1. Rudder full over in direction the person fell overboard. Full throttle on outboard engine, three quarter throttle on inboard.
2. Two thirds of the way around, back inboard engine throttle to 1/3.
3. Idle engines when PIW is 15° off bow.
4. Ease rudder, back engines for pickup position - engines off.

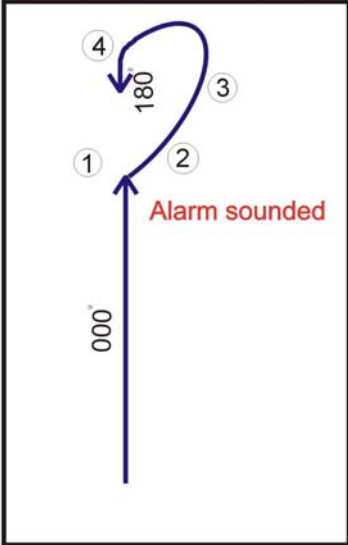
The Williamson Turn is much more complicated. It is not just a "turn the boat around" manoeuvre.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

The Williamson Turn is designed to get you on a reciprocal course to begin a search for a PIW who went over unnoticed in daytime or at night. It is therefore the first step in beginning a **search** for the missing person.

The search pattern is basically a Track Crawl Pattern, as you expect to find the PIW on, or close to the course (track) your vessel recently travelled.

Williamson Turn



1. Mark original course. Launch ring buoy, strobe or other floating object.
2. Alter course 60° either to port or starboard.
3. Calculate reciprocal of original heading. (In example - 000° changes to 180°)
When compass reads 60° turn back to original course.
4. Run reciprocal course and begin search.

The 60° compass heading applies only to a starboard turn.

Special point of interest:

Now that GPS units are readily available and found on most vessels, locating “a man overboard” could be somewhat facilitated.

If the captain is immediately aware of an MOB, the GPS can be used to identify the position with the push of a button.

As long as the GPS is on, the unit will generate a track plot which the captain can use to follow his reciprocal course.

PIW Recovery

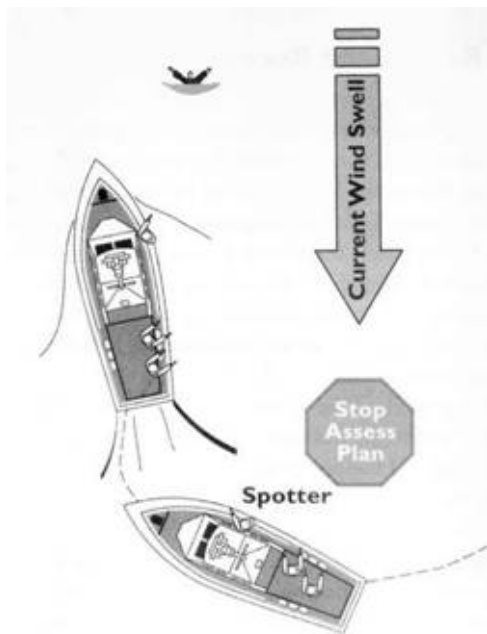
Whether recovering a PIW from an SRU (an unlikely scenario) or the end of a fruitful search for PIW's from another vessel, the critical moments occur when a PIW must be recovered.

Recovering someone from the water is a potentially dangerous maneuver for the PIW. The best way to prevent an incident is to practice the approach and recovery using a dummy. Getting a person aboard is much more difficult than many expect!

If the crew takes their time to plan and prepare, then the chances for a successful recovery improve significantly.

The recovery team should consider:

- * the direction of the wind and sea
- * their vessel's configuration
- * the recovery method they will use
- * PIW's with and without PFD's



Approach (illustration courtesy CCGA(P))

Steps to a Recovery

- Assign a crew member to keep PIW in sight.
- Keep bow into the wind with PIW in front of your vessel.
- Assess and Plan when you are 2 – 3 boat lengths away.
- Establish communication with PIW.
- Approach victim slowly.
- Throttles in neutral when PIW is along side.
- Shut down engine(s).
- Use a re-boarding device if possible.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

Remember

**Persons in cold water
quickly lose
muscle strength and
may be incapable of
helping themselves.**

With the person alongside:

Make use of:

- * Boarding ladders
- * Swim platforms
- * Lines as foot stirrups
- * Any other means
(see following pages)

When retrieving a PIW in the vicinity of a sunken or capsized vessel be cautious of debris and lines.

Extrication techniques

Move hypothermia victims gently. Rough handling can lead to cardiac arrest.

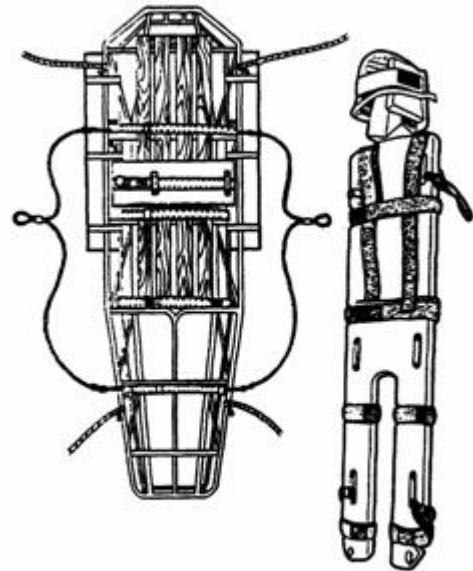
Always support the victim's head.

Talk to the person and reassure.

Keep victim on upwind side of the SRU. If the victim is on the downwind side, the feet are pushed under the hull which increases the effort required to lift.

Once on board treat for hypothermia and administer first aid as required.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)



Stokes Litter and Miller Board

Other devices.

Safety harnesses usually have a ring which can be used for hoisting.

Some ocean-type floater jackets also have a ring as part of the jacket.

Stirrups formed of heavy line can be prepared ahead of time. These can be as simple as a series of bowlines tied on the bight.

Larger loops in which a victim can be seated are also useful.

Crew should be proficient in tying a recovery line (e.g. using a bowline) around themselves for their own recovery.

They should also, by feel alone, be able to tie a recovery line around another person from the back of the other person.

All these devices, and others prepared by local ingenuity, have the potential to be effective. But none are of any use if the equipment is unfamiliar and if the skills are not practiced.

Non-boom Vessels

The majority of small vessels have no boom. However, there are a number of ways available to recover a victim from the water.

First, **all** of the devices discussed above can be used without a boom. In using them without mechanical assistance, brute strength and power is not the only factor. Technique and practice are equally important. Crew members need to **feel** the dead weight of a PIW or a dummy and work out how to use their legs, bracing against the gunwale, and working together to hoist the PIW. However, there are some devices and techniques which will help.



Recovering the Person in the Water at the Surface of the Water

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

a) **Corkscrew.** Two crew members.

1. Position the victim facing away from the boat with his arms crossed in front.
2. The crew member on the victim's left side grasps the right wrist of the victim with his left hand.
3. The crew member on the victim's right side grasps the left wrist of the victim with his right hand.
4. On command, they lift the victim straight up and out of the water in a corkscrew motion.

(b) **Corkscrew.** Single crew member.

1. Position the victim facing away from the boat with arms uplifted.
2. The crew member cross his own arms and grasps the arms of the PIW in a wrist-to-wrist fashion.
3. The crew member lifts the victim straight up and out of the water in a corkscrew fashion.

NOTE: Both methods bring the victim into the vessel face to the gunwale. This allows a "two-stage" lift as the first part of the hoist can drape the person over the gunwale. Some situations may require a "back to the gunwale" procedure. Note also that since PIW weigh less when immersed, their full weight is not felt initially. This means that a strong, quick, confident hoist right from the start can often raise a substantial weight, at least to the gunwale. The 'corkscrew' motion tends to straighten the victim's legs which often float under the vessel and make a straight lift difficult.

(c) **Stirrups and ladders.** Stirrups are formed by making loops in lengths of line and can be secured over the side to provide hand and foot holds to a PIW. Ladders may be either solid or the rope type. Ladders usually need to be adjusted so they do not tilt inward from gunwale to waterline making them almost impossible to climb. Even if a good ladder is available, crews should practice for situations where the PIW does not have the strength to climb aboard on their own.

(d) Many crews rely on **the swim platform** to both stand on for recovery and as a first-stage platform when bringing a PIW aboard. However, extreme care needs to be taken. First, the boat propeller is close and even if the gear box is in neutral, the propeller may still turn creating a hazard. Second, the swim platform itself can act as a giant flyswatter to the PIW in choppy conditions. Using the swim platform as a recovery platform is an extremely hazardous operation.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

(e) **Dinghies and Rafts.** If a vessel either carries or tows an inflatable or dinghy, PIW recovery is often made easier. The lift into a dinghy or raft is shorter, usually safer, and less damaging to all concerned. The subsequent transfer to the rescue vessel is made easier because crews can assist the transfer from outside the vessel. Crews in a small inflatable or dinghy should wear proper exposure and floatation gear. For PIW recovery, it is preferable to tether these little craft and switch off to avoid the danger of turning propellers.



***Do not allow crew members
to enter the water
to assist in the
recovery of PIW's***

**Never leave the scene until you are positive
there are no other survivors**

***If the SRU Coxswain assumes a casualty is deceased,
JRCC should be contacted immediately.***

Module 3

Fire

Situations

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

The following guidelines revolve around two basic scenarios:

- a) If fire on the SRU should happen and
- b) when the SRU is involved in dealing with fire in other venues.

Recent insurance studies have indicated that, by far, the majority of fires on board a vessel are the result of DC electrical problems. (Source – Boat US -) If it is at all possible, in the event of an on board fire, the electrical power should be shut off. Only the VHF radio should be connected directly to the battery.

Generally, marine fires aboard pleasure craft spread very quickly and the opportunity for rescue units to even attempt to control these fires is rare. Fire aboard larger vessels is a possibility and this will be discussed. Auxiliary members should remember that, for the most part, we are not trained as fire fighters but we could find ourselves supporting trained crews.



Fire aboard the SRU

In this situation it is important for the Coxswain to determine as quickly as possible the cause of the fire and the strength of the fire. A rapid decision is required to determine if the fire can be fought successfully.

1. At the alarm of fire aboard call MAYDAY on Ch 16 VHF. Details should include:
 - Name of vessel
 - Location / Latitude and Longitude
 - Nature of distress
 - Number of POB
2. Detail a crew member the job of preparing abandon ship details.
3. Turn boat to keep fire downwind.
4. Identify the location of the fire.
5. Identify cause of fire.
6. Shut off fire fuel supply.
7. Disconnect all sources of electrical power.
8. Initiate fire fighting if:
 - (i) you catch it early enough such that it is small and confined, and
 - (ii) you have a way out and can fight the fire with your back to the exit.
9. **If the fire is not readily extinguishable or if fibreglass is burning, abandon ship!**
(Fibreglass burns very hot and gives off noxious fumes)

Chemistry of Fire

Fuel can be found in any of the three states of matter: solid, liquid or gas. The burning of a solid or liquid fuel requires their conversion into a gaseous state by heating. Gaseous fuels can be the most dangerous because they are already in the natural state for ignition. (see section on LPG)

Liquid fuels also have the physical properties that *increase* the difficulty of extinguishment (e.g. gasoline floating on water that has been ignited) and increases the hazard for anyone attempting to extinguish a fire involving the fuel. Large quantities of flammable vapours can be extremely dangerous because they may be easily ignited. That is why it is so important to ensure proper use of bilge blowers.

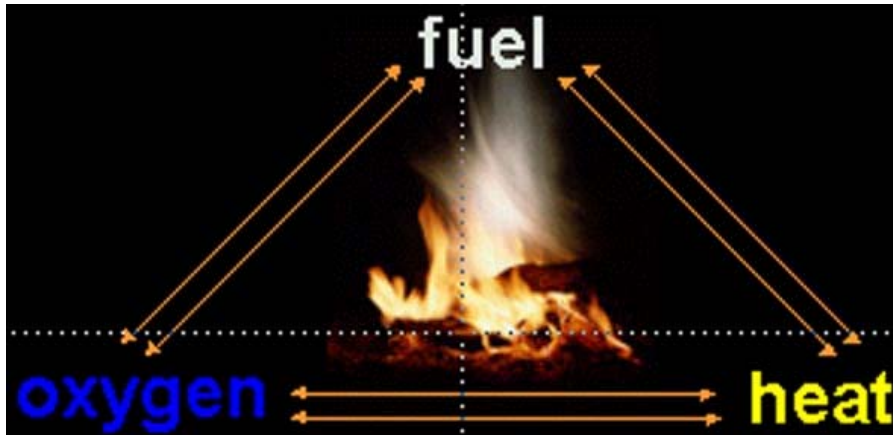
Once fuel has been converted to a gaseous state, it must be mixed with the air in correct proportions and exposed to a source of ignition in order to burn.

Examples of Flammable Ranges (% of vapour in air)

	<u>Lower Limit (%)</u>	<u>Upper Limit (%)</u>
Gasoline Vapour	1.4	7.6
Propane	2.2	9.5
Natural Gas	5.0	15.0

The Fire Triangle:

For some time, a three-sided figure called the Fire Triangle was used as a combustion and extinguishing theory. The idea was that oxygen, heat, and fuel, in proper proportions, are required for combustion. Removing any of the three would extinguish the fire.



A more complete theory requires four elements: fuel, oxygen, heat, and a chemical chain reaction. The theory is illustrated by using a four sided figure called a tetrahedron. A chemical chain reaction is now a necessary component for burning. Once again, the removal of any one component will extinguish a fire.



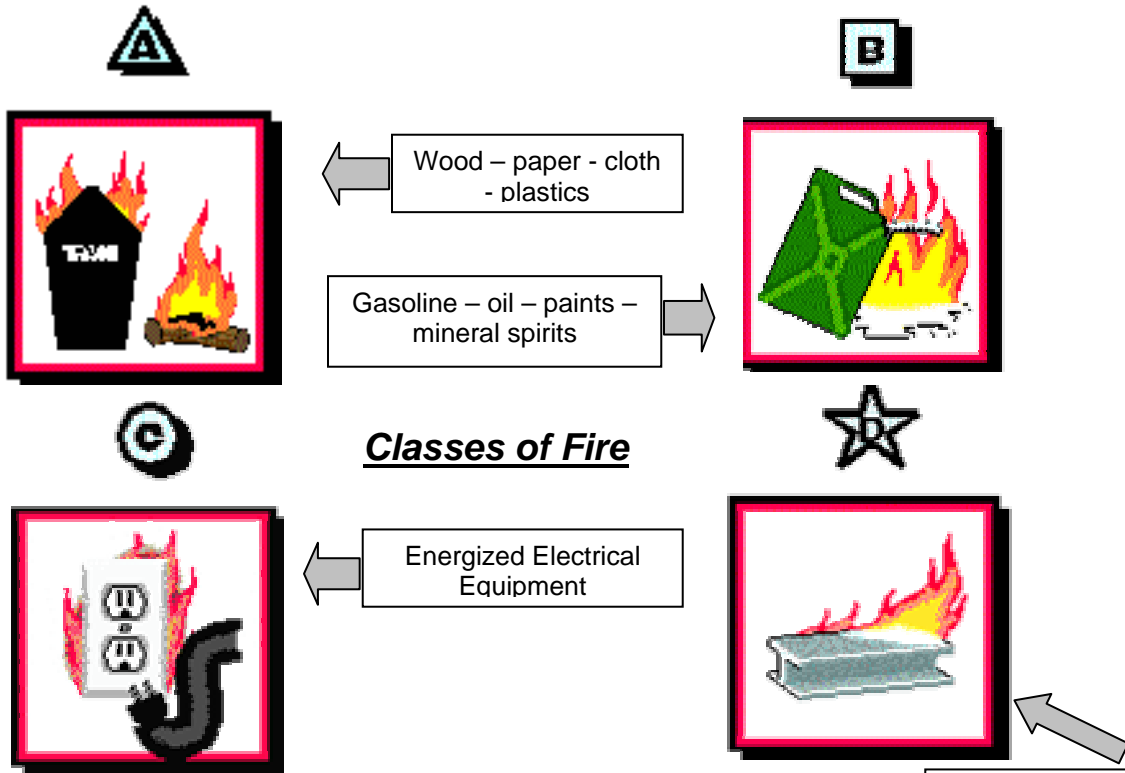
The Fire Tetrahedron

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

NOTE: Many local Fire Departments will offer a short seminar on the proper use of fire extinguishers if requested. Coxswains should also ensure all crew know the location of fire extinguishers aboard and know what to do about fire on board by holding an occasional "Fire Drill".

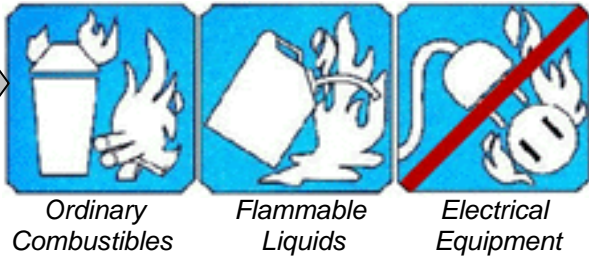
**Most damage to a vessel can be controlled well enough to keep you wholly or partly afloat...
Except, a serious fire.**

In many instances, an apparent fire is in fact, steam from an overheated engine!



Classes of Fire

At right is the latest method of identifying fire extinguisher applications. In this example, the device is not suitable for electrical fires.



Class D fires involve active metals such as sodium, calcium & magnesium. These are not commonly available and require special fire fighting techniques and equipment.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)



Class ABC (Ammonium Phosphate)



Class BC
(Sodium or Potassium Bicarbonate)



Class BC (CO₂)

Fire extinguishers are also rated using a number system:

5BC, 10BC, 10ABC, 5A-40 BC etc.

A 5BC extinguisher would be the small 2.5 pound type. They last no more than 10 seconds.

According to manufacturers, a 10BC would be twice as effective as a 5BC.

If space allows, the best option is a 5A – 40BC.

Use of Fire Extinguishers:

- Aim nozzle toward the fire. Some hose assemblies are clipped to the body of the extinguisher. Release the hose. Remove locking pin.
- Squeeze the handle above the carrying handle to release the agent. Before going up to the fire, try a very short test burst to ensure proper functioning.
- Sweep the nozzle back and forth at the base of the flames to disperse the extinguishing agent. Then make sure the fire is out!

Abandoning the SRU Vessel

If the Coxswain deems it necessary to abandon ship because the vessel is no longer seaworthy or stable, then the paramount concern is for crew safety.

1. The Coxswain is to determine that abandon ship is the only alternative.
2. The Coxswain will be the only one to issue the abandon ship order.
3. The Coxswain will assign crew to prepare either the daughter boat or life-raft if equipped. (*assign responsibilities ahead of time through drills*).
4. The Coxswain will arrange for possibly a second MAYDAY call on Ch. 16 VHF to be broadcast. The broadcast will provide:
 - The name of the vessel.
 - The location (Latitude and Longitude)
 - The nature of the distress.
 - The number of people abandoning ship.
 - The specifics of abandoning.
5. If equipped, the Coxswain will arrange for the EPIRB / GPIRB to be activated.

If taking to the water, ensure that all crew remain in a group for easier rescue.

Just as you carry a “Damage Control Kit”, a “Tool Kit”, and so on, you should prepare and carry an “Abandon Ship Kit”. A small zippered waterproof bag might contain, flares, smoke flares, light sticks, a flashlight, lines to rope off survivors, bottled water, signal mirror, snacks, whistles, and so on. A couple of surplus PFD’s could be lashed to the bag.

Distress vessel on fire

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

When attending a fire at sea your first priority is to extricate, stabilize, and where necessary, evacuate any victims.

Fires should only be fought

1. To save lives; i.e. victims trapped inside a burning vessel.
2. To prevent danger to third persons in situations such as vessels on fire at fuel docks and marinas. (Caution. See discussion in a later section.)
3. To prevent major property loss.

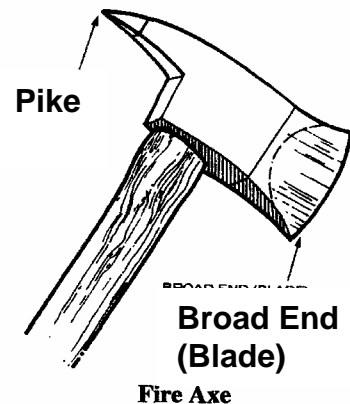
CAUTION: Most fires aboard small vessels result in a total loss within minutes. Where such fires do not endanger other persons or facilities, they are best left untouched.

If you spot or are advised of a fire at sea you should

1. Contact JRCC.
2. Make preparations to extricate and stabilize survivors.
3. Remove from the deck area any readily flammable materials such as portable / spare fuel tanks, convertible tops and tarps.
4. Prepare your fire fighting equipment such as extinguisher, pumps, and fire axe.

When approaching the scene of a fire

1. Reduce speed.
2. Take a position upwind.
3. If there appears to be no possibility of survivors remaining onboard, then you should stop, shut down engines and listen for survivors. If survivors are not immediately located, begin a suitable search pattern bearing in mind that if there is any significant wind, survivors will generally be found upwind of the burning vessel.



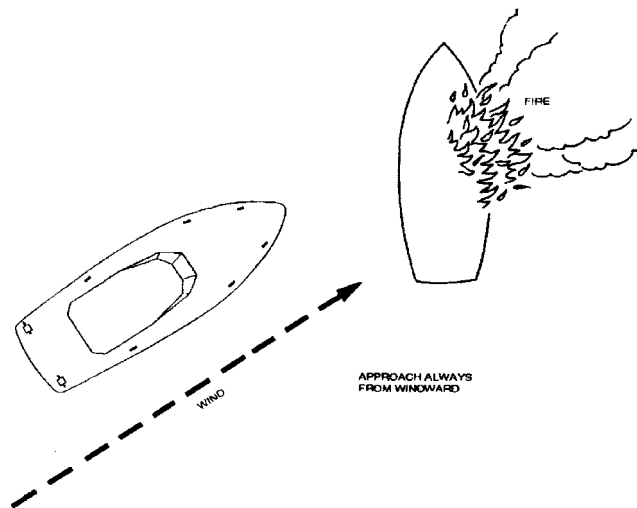
Although putting people aboard a vessel afire is not recommended, an occasion may arise where an incapacitated person, or a very young person may require assistance. This is a life and death situation that requires a personal decision.

If there is no life at risk, DON'T RISK YOURS!

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

If a burning vessel must be approached:

- a) Best approach is bow to bow. (Touch and Go)
- b) **Do not attach any lines**



Approaching a Boat on Fire

When all survivors have been recovered, transport the survivors to shore. If available, another rescue unit should remain on scene to keep other vessels away from the blaze.

NOTE: Do NOT attempt to tow burning vessels if they do not present a HAZARD.

Vessel on fire at a marina or dock

This type of situation is NOT part of the CCGA's mandate. It is the responsibility of the local fire department. However, units may find themselves acting in a support capacity and should be aware of the following.

Even though a fire could spread to many boats in a marina, cause explosions, and result in thousands of dollars of damage, ***the preservation of life comes before property.***



Fire at a Colonial Beach Marina (Virginia)

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

A towed burning vessel can act as a torch to ignite other vessels and property. If you are unsure whether you can tow it away safely or not, then leave it alone.



Marina Fire at Colonial Beach VA

What you may do if around a marina at the time of a fire is to:

- * Call Fire Service
- * Take care of life safety issues
- * Evacuate all boaters and guests
- * Move adjacent boats away
- * Have electrical power shut off
- * Have fuel dock shut down
- * Secure the burning boat
- * Crowd control
- * Other activities may depend on ETA of Fire Service
- * Serve as "on water" support for fire crews – firefighters don't swim well when wearing bunker suits.

Liquefied Petroleum Gas (LPG)—Propane

The popularity of deck and rail mounted propane barbeques is ever increasing. Fire on board vessels involving gas barbeques will present additional risks and hazards to the rescuer.

Properties

Propane is a “liquefied” petroleum gas (LPG) that is colourless, flammable and has a distinct odour. Propane is heavier than air. Should a leak occur, gas could accumulate in low areas such as the bilge or cabin spaces. Although not toxic in nature, high concentrations may cause suffocation due to oxygen deficiency. Within its flammable range, small sparks from an electrical appliance could cause an LPG-air mixture to ignite.

Cylinders

The most common portable propane cylinder sizes range from 1 pound to 95 pounds. The 1 pound, disposable type cylinders are commonly used for torches, gas lanterns and small out-door cook stoves and grills. The 20 and 30 pound models are widely used for barbecue grills.

The 20-pound class cylinder is usually of two or three-piece welded steel construction. There is generally one fitting which is welded in the service end of the cylinder. A combination screw valve (KV) and pressure relief valve is installed in the fitting. This type of valve is mainly for use in households, recreational vehicles or boats. It is recognizable by the O-ring on the outlet connection.

Rescue Response Considerations

The release of LPG, when being mixed with air and ignited, may cause an explosion. If a fire from another source (example: engine fire) impinges on the propane cylinder, a B.L.E.V.E. (Boiling Liquid Expanding Vapour Explosion) may occur. This is a violent rupture of the cylinder and explosion. Signs indicating potential B.L.E.V.E. include:

- * Loud whistling sound coming from the cylinder experiencing flame impingement
- * Very dark areas developing on the cylinder being impinged upon.
- * High heat and flame involvement surrounding the cylinder.

Whenever possible, the following procedure should be followed for fires involving LPG:

1. Notify the local fire service.
2. Evacuate the area.
3. Extreme caution should be exercised when approaching a vessel with suspected LPG cylinder involvement.

Other Hazardous Situations

Leaking Cylinder—no fire

- Avoid contact with gas flow
- Do not smoke or use electrical appliance
- Close the gas shutoff valve on the cylinder
- If the valve can't be closed, the leaking cylinder should be moved into the open air away from all ignition sources.
- Allow all pressure to be discharged; evacuate the area and vicinity
- Call local fire service

LPG cylinder with valve burning

- Call local fire service.
- Evacuate area.
- Close cylinder valve if possible using a steady stream of water to cool the cylinder without extinguishing the fire.
- **If valve can't be closed, do not extinguish fire.**
- Allow fire to burn itself out and if possible use water to cool the cylinder and nearby equipment or exposures.
- It's better for the product to burn off safely than it is to leak into a bilge or over to another vessel and then ignite or explode.

Environmental Concerns

Large vessel fires often lead to pollutants in the water. Although the Contribution Agreement does not include responses to oil spills or other contaminants, Auxiliarists should report such occurrences to the Regional Operations Centre through their MCTS station.

Incident Management System

This system is similar in purpose to the Incident Command structure outlined later in this manual.

The Incident Management System is used by Fire Services. An Incident Commander is appointed and is held accountable for anyone connected to the incident whether on land or water. CCGA members arriving on a fire scene involving Fire Services should immediately contact the Incident Commander.

Use of Dewatering Pumps

Most SRU's carry dewatering pumps, and although we are advised not to get involved in fire fighting, the pump can be an extremely valuable tool. In particular, you could use the pump to generate a protective water shield in assisting victims escaping threatening situations or to cool hull structures.

The pump could also be used to protect the SRU in performing rescue operations as mentioned in an earlier part of this module.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

MODULE 4

Guidelines for SAR Crews

in dealing with Miscellaneous

Distress Situations

Retrieving POB

Vessel foundered / sunk

Vessel Overturned

Vessel Swamped

Vessel Taking on Water

Trapped Survivors

Recovery of Vessels

Vessel Righting

Abandoned Vessels

Overdue Vessels

Disoriented Vessels

Groundings

Retrieving POB From Distress Vessels

Evacuation of POB From a Distress Vessel

If people are on board the distress vessel, assess the relative safety of leaving them aboard their own craft against the hazards of transferring them to the rescue craft. Unless there is a calm sea and ideal conditions, the probability of bodily injury increases during transfer.

A person suffering illness or injury may require fast transport to shore. In such a situation, the availability of an air MEDEVAC should be discussed with JRCC.

If it is necessary to transfer people to the rescue craft, these guidelines should be followed:

(1) Preparation

Persons on both vessels must wear PFD's or lifejackets.

Explain intended procedure to crew and to people on board the distressed craft.

Rig fenders on both craft.

Designate one (1) person to communicate with people aboard the distressed vessel and caution others to refrain from causing confusion by calling other instructions.

In very severe conditions, it is sometimes possible to get a line to a distress vessel, get to windward of it, "hold" position, and "hand-line" the distress against the wind and waves up to the rescue vessel in a controlled way.

(2) Approach

It is preferable to approach by heading upwind. The hull of a larger vessel may provide a lee for the transfer. In any case, you will have greater control of your vessel with an upwind approach. If the distress vessel is on fire, an approach from windward is recommended. Beware of trailing lines in the water or flotsam in the wake of a sinking craft drifting to leeward.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

If possible, get the distressed vessel to anchor as this simplifies your approach. If the distressed vessel is seaworthy, it may be possible to raft up to the other vessel to facilitate transfer. However, in rafting up, use boat hooks and tended lines. Do not tie off in case of sudden changes in sea conditions or the distress vessel's seaworthiness.

Distress vessel foundered or sunk

It is important to immediately contact JRCC as well as accurately mark your position. Ascertain if there are survivors. Question survivors carefully to find out if there are others trapped or who may have drifted away.

If there are POB trapped in the vessel, note the water depth and request diving assistance immediately. If survivors have drifted away, commence a suitable search pattern (Expanding Square or Sector Search).

**Do not attempt to enter sunken wreckage
yourself.**

Overtuned or capsized vessel

The first consideration, as always, is to determine if there are survivors. In this situation, there is always the possibility that survivors are located in an air pocket in the capsized vessel. Approach the vessel slowly to eliminate wave action that might break a sealed air pocket

Attempt to find out if anyone is trapped inside the vessel, and if so, their probable location by tapping on the hull and shouting. If found, reassure them, try to keep them calm to conserve air, have them remain out of the water as much as possible. Advise them of what is being done to assist.

If there are trapped survivors, advise JRCC of all the particulars and request immediate assistance and divers. In addition, notify other vessels that an emergency is in progress and they must either avoid the area or reduce speed and wake as they pass.

Survivors trapped in an enclosed compartment

In addition to the guidelines above, these procedures should also be followed for survivors trapped in an enclosed compartment.

Send for divers and, if possible, someone familiar with the internal structure of the craft.

To prevent sinking, stabilise the hull with emergency floatation bags (EFG's), other boats tied alongside, or with heavy shipboard lifting tackle. Place vessels on either side and carefully pass a line under the capsized vessel.

Do not attempt to right the vessel at this stage

If available, inject air, (preferably clean air from diving tanks or a diving compressor) under the vessel so that it bubbles. This will help keep the boat afloat and may provide more breathing air.

If towing, always tow the craft very slowly to prevent breaking the air seal.

Never make any attempt to cut through the hull while the vessel is still afloat.

WARNING

If the SRU is tied off to the distress vessel, a quick release knot must be used and personnel should be close at hand to disconnect.

Swamped Vessel

Assess the situation:

People onboard: Determine if there are people on board the swamped vessel. If no one is aboard, keep clear. If people are aboard, determine if it is possible to take them off the swamped vessel. **Ensure POB's are wearing life jackets or PFD's.**

Do not board: The stability of a swamped vessel is compromised. Try to remove the people from the swamped vessel without boarding.

Mark location: Record the location of the vessel and set out a buoy or some other marker.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Advise authorities: Advise the MCTS of the situation and ensure that JRCC is informed. JRCC will advise appropriate authorities and a safety communication will be made. If the swamped vessel founders in a navigation channel it may be a hazard to vessel traffic and a notice to mariners may be in order.



Swamped vessel & damaged salvage vessel behind.

Vessel Taking On Water

When an incident involves a vessel taking on water, ensure POB's are wearing life jackets or PFD's.

You may be able to assist by placing a de-watering pump onboard the distressed vessel or you may provide guidance on methods of damage control.

Any damage control work which is carried out on the vessel **MUST** be done by the disabled vessel's crew.

Provide an escort to the nearest safe haven, remembering that the safety of life and not property is your main concern. (Always be aware that due to loss of stability the vessel may capsize, roll over or sink).

Consideration may also be given to removing passengers.

Remember that a vessel may be taking on water because of a broken engine cooling hose and stopping the engine stops the water inflow.



Southern Star



Unknown

Medical Assistance

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

When encountering a situation where medical assistance is required advise JRCC of the current status. Information given to JRCC may see the controller request that medical assistance be made available. This may result in the tasking of a Canadian Forces Helicopter that will evacuate victims or in the tasking of other Coast Guard resources.

If a rescue vessel is transporting an injured party, an ambulance should be requested at the location at which the rescue vessel intends to land. Ambulances can be requested through Coast Guard Radio Station.

Do not take on any more responsibility or liability by carrying the injured party in your personal vehicle.

Recovery of Vessels

Swamped or Overturned Canoe or Small Vessel

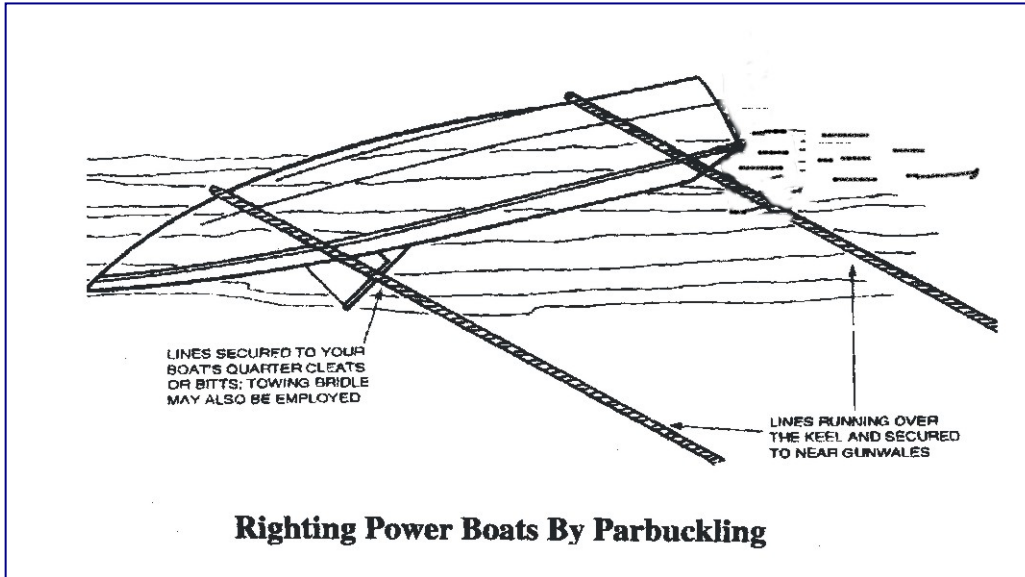
1. Exercise caution and avoid PIW's when approaching swamped rowboats or capsized canoes, especially in rough water.
2. Make a lee with your vessel. Stop engines and pass a line secured to a floatation device to the occupants. Recover them from the water and apply the appropriate treatment. Make sure all survivors are accounted for.
3. Lift the canoe by the bow or stern, bottom side up, breaking the air pocket, and slide it aboard, gunwales down.
4. Right the canoe, then slide it carefully back into the water.
5. Pump or bail rowboats according to their size. (see also optional topics)

Note:

A SAR vessel master does not have to follow directions which might endanger his vessel or crew. JRCC must be notified of such a decision.

Righting a Small Power Boat

We are not in the business of salvaging vessels. However, the following may be useful for your own daughter boat or another rare situation.



1. Secure at least two lines (towline, etc.) to the **nearest** gunwales of the capsized boat.
2. Run the lines **under** the capsized vessel, **over** the keel and to the rescue vessel. Make sure lines are outboard of all stanchions, rails, etc. on the capsized vessel. With some patience this can usually be accomplished without putting crew in the water. This maneuver is designed to turn the vessel while still under water. This minimizes strain and possible damage to the hull and fittings.
3. Stand off far enough that the righted vessel will have room to be righted.
4. Take up the lines by hand or with towing with sufficient pressure that the capsized vessel comes upright. It will still be filled with water (swamped).
5. Bring the swamped vessel alongside and de-water.

Small Sail Boat Righting

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

Capsized centre-board sailboats normally remain afloat, but may turn "turtle", (upside down). Any sailboat in this condition presents a hazard to approaching power vessels because of lines and sails in the water. Most lines on sailing vessels are led aft to the cockpit leaving a chance that the bow is relatively clear. Approach the bow of an overturned boat, giving it a wide berth to avoid your ship's screws becoming tangled in the rigging. Remember that your propellers turn slowly even when in neutral.

At no time should crew members be put in the water to assist.

1. Retrieve any injured or fatigued persons from the water and provide treatment.
2. Uninjured crewmembers may stay in the water and assist in righting. If the crew members elect to stay in the water they should be watched carefully for signs of hypothermia.
3. The usual method for righting a small sailing vessel is:
 - Move the capsized vessel head to wind.
 - Lower the sails if possible and secure them.
 - To right, stand on the centre-board, slowly leaning weight outward.
 - When righted, climb aboard and secure lines, sails, and boom.
4. When the boat is righted and partially de-watered, remove any remaining water by bailing or by a manual bilge pump.
5. Before taking the vessel in tow, raise the centre-board and secure the rudder. Recover any persons in the water.

NOTE: Raising the centre-board may make the vessel significantly less stable. Even in light to moderate seas this could result in POB being thrown into the water and the boat swamped or turn over.

6. Consult the owner or skipper when choosing the best place to secure a towline.

* **Do not tow capsized vessels.**
* **Cut lines, not sails.**
* **We are under no obligation to right vessels.**

Abandoned vessels

Various possibilities exist in this circumstance:

- A) The vessel has broken away or been cut free from its moorings and is simply

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

adrift.

B) The operator (and other occupants) have fallen overboard.

C) There has been foul play, an insurance scam, used for contraband, etc.

To assist in establishing (A) or (B) or (C), the SRU crew must carefully assess the condition and equipment on board the vessel. Possibilities include:

- Lifejackets / PFD's ?
- Other equipment – fuel tanks – fishing gear – food – mooring lines – anchor – paddles – i.e. does the vessel appear to have been in use? Engine in or out of gear? Ignition key? Engine warm / cold? Lines in or out of water? Cut lines?

**Always advise JRCC of the position and circumstances
of an abandoned vessel.**

If any doubt exists about POB, begin an Expanding Square or Sector Search. Use the vessel as datum and continue searching until JRCC advises further action.

Dismasting

This can be the result of heavy winds or the sudden stop of running aground. In most cases the captain would have cut away the rigging and broken mast to stabilize the vessel. This requires bolt cutters (stainless steel cables). Not all sailors are ready for this eventuality. If a SRU frequently rescues sailboats, bolt cutters may be a useful addition to its equipment.

The rescue vessel must take great care when approaching a dismasted vessel. Lines and rigging in the water can easily foul the screw of the rescuer. When the broken mast, the lines and rigging, have been cleared, the rest of the rescue can proceed.

Aircraft Crash (Ditching)

If you arrive on scene of an aircraft that has ditched into the sea you should:

1. Advise JRCC.
2. Commence a search pattern if the aircraft has sunk.
3. Attempt to extract survivors if the plane is still afloat.
4. Deploy your life raft, dinghy and/or any other objects survivors can cling to.
5. If you recover victims, question them as to the possibility of other persons being trapped in the wreckage. If there is such a possibility request divers immediately.
6. Arrange for evacuation of injured victims.

Overdue Vessel

1. If requested, contact marinas in the area to see if the vessel has docked somewhere else. Boaters often change plans without notifying others.
2. Check every vessel carefully for license number, description, and name. REMEMBER that there is no time limit on a search. It is not a race, and the watchword is thoroughness.
3. The vessel description may not always be accurate. Check each boat closely. There have been cases where the search has been for a power boat, and the boat turned out to be a sailing vessel or a fishing boat.
4. Check the parking lot for the missing person's vehicle. If the vehicle is still there, the person may not have returned yet. If the vehicle is not there, then the person may have returned and not told anyone. Relay this information to JRCC through the CGRS by radio or via landline.
5. Check all over the marina and docks. The missing party may have returned and tied up at a different spot. If there are other people around on the docks, tell them who you are and what you are doing. You may receive unexpected information concerning the whereabouts of the missing vessel.
6. Always do a thorough check of the area that the vessel departed from. People have been reported overdue only to discover that they had not yet departed.
7. Do not assume you have the correct information from, e.g. officials operating a canal at the first call. There have been cases where only a **third** phone call revealed that the overdue had passed through the locks.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Disoriented

When a disoriented vessel requests assistance from JRCC (through a CGRS), the controller will evaluate the degree of emergency and take such action as deemed appropriate.

The coordinator may request the CGRS to attempt to locate the vessel using direction finding equipment, and/or task an available SAR resource to locate the disoriented vessel.

If you are involved in assisting a disoriented vessel, usually by VHF radio:

DO NOT

- Give sailing directions by radio.
- Tell vessel to anchor unless authorized to do so by JRCC.

DO

- Advise to “heave to” or maintain minimum steerage.
- Obtain LKP and destination.
- Determine what can be seen or heard.
- Water depth and colour.
- Advise JRCC through CGRS.

Grounded Vessels:

Minor

When arriving on the scene of a vessel aground, offer assistance to the persons aboard and ask them if they wish to transfer to the safety of your vessel, or to another safe location. Advise JRCC about the welfare of the POB.

Before doing anything about the grounding, determine the integrity of the keel, hull, steering and propulsion apparatus.

Take care that any action may either worsen the damage or cause the vessel to sink when it reaches deeper water. If the vessel master agrees, one can often lighten the boat by removing people, reduce the draft, and pull the vessel free. If this is not possible, then it should be considered a major grounding and commercial help may be required.

If you attempt to pull the vessel free, obtain the owner's authorization waiving liability. If the vessel is a small sailboat, suggest the POB move to one side of the boat in order to heel the vessel over, reduce the draft, and allow the vessel to come off in the same direction that it went aground.

If an attempt is made to pull the grounded vessel free, the type of bottom is an important element. Pulling vessels off rocks almost always results in some damage, even if only minor scratches. Mud and sand may be more forgiving. In most cases, an attempt to release the vessel on the track she went aground is the reasonable strategy. This is usually a draw on the bow or on the stern.

Major

A major grounding usually involves a larger vessel, a "hard aground" situation, difficulty in getting close to the grounding, a lee shore, high waves, or some other difficult situation. In a major grounding you should:

1. Advise JRCC.
2. Assess your ability to extricate the crew of the grounded vessel.
3. If you cannot extricate the crew, advise JRCC who may in turn request air support.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

4. Where air support is not forthcoming you can attempt to float a dinghy or life raft at the end of a towline to the grounded vessel.

Do not take your vessel into the surf line.

In most cases, a major grounding requires a salvage or commercial towing vessel.

However, rare situations may arise where it is best to try to get the grounded vessel off even if further damage may occur. This must be with the permission of the master of the grounded vessel. Your vessel may have the power to haul a vessel off by brute force. If you do so, be prepared to act quickly to recover any POB as the vessel may swamp or sink.

By sailing west, the vessel and the sun move in the same direction; the sun overtakes the vessel; the vessel's day is therefore lengthened...by one hour for every 15° of longitude made.
By sailing east, the sun advances to meet the vessel; and the day is shortened by one hour for every 15° of longitude made.

**Use area chart to help establish
best approach and
towing direction.**

LARGER SAILBOAT GROUNDINGS

BEAM RECOVERY

To simply hook on a grounded sailing vessel and pull from the beam may break off the keel and/or cause other hull damage leading to the loss of the vessel. Any beam recovery should only be attempted with the full cooperation and consent of the vessel's owner and an experienced SRU crew.



CONSIDERATIONS BEFORE ATTEMPTING A BEAM TOW

- Direction of the tow must be into deeper water with no shoals between grounding point and deeper water
- Direction of tow, when possible, should be 180° to the direction of travel at grounding
- Vessel must be heeled towards the direction of tow. Never attempt to pull a grounded sailing vessel from its high heeled side (see picture)
- Full consideration must be given to the type of keel
 - Full keel – vessel may, in fact, be lying on her sides rather than just on her keel
 - Fin keel – vessel may, or may not have pivoted on her keel away from the course of grounding due to wave and wind action. Keel is not well suited to withstand lateral force.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

Wing keel – even when heel is increased, wings may drag on bottom causing lateral strain on the keel. Care must be taken that the vessel is, in fact, free of grounding.

- SRU must be able to establish a firm anchor in deep water or maintain station.

PREPARING FOR TOW

- **Grounded vessel must be closed up and crew wearing PFD's**
- Clear communications must be possible between SRU and the grounded vessel throughout the process
- Both crews must understand and review the intended course of action

RIGGING FOR TOW

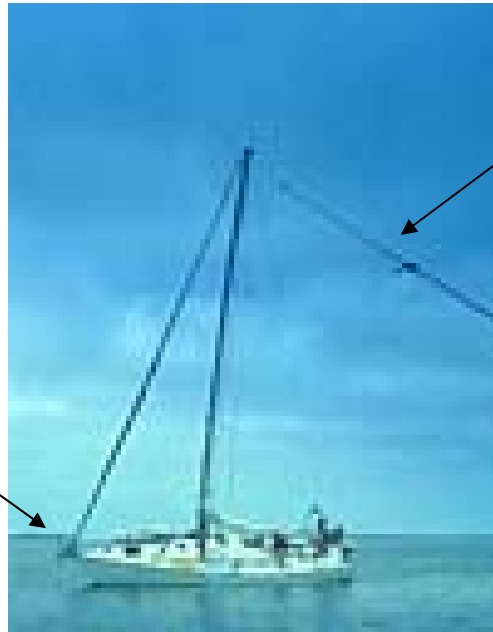
- Pass towing line to vessel for attachment to the toe rail at vessel's beam. A bridle attached at two points on the toe rail would be an even better option. (See Note 1 below)
- Have the vessel's crew detach the main halyard from the head of the mainsail and pass it to SRU. If necessary, SRU crew should attach additional line to the main halyard to ensure that it remains slack as SRU moves to anchor.
- Anchor SRU in deep water and take up slack on towline. Secure halyard.
- Vessel's crew, using main halyard winch, takes up the slack on the main halyard until the vessel heels sufficiently to free from grounding. If need be, this can be done by SRU crew taking in the slack from their boat.
- SRU then moves forward on anchor lines or power until grounded vessel is in deep water.
- The grounded vessel may assist by using its own engine.
- Ease the main halyard until the vessel is floating upright.
- Ensure the vessel is under control, then release the towline. If the vessel is unable to continue, establish a bow tow.

Be very careful not to tie lines to pulpits, stanchions, lifelines or gates. They are not built for the strain.

A waiver is mandatory here. Also, take only actions that the distress skipper approves. He / she knows the vessel.

Note 1: In many instances, a tow line to the SRU may not be necessary. Pulling on the main halyard will heel the vessel and she may be able to clear the grounding under her own power.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)



This vessel is heeled to port and therefore the beam recovery is carried out on the port side.

Main halyard is attached to the tug. In this instance, no additional tow lines are being used.



In the illustration above, the crew is attempting to heel the boat over by adding body weight to the boom which is at right angles to the vessel's heading. This may force the vessel to heel over enough to free her.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Another method frequently attempted is to use the vessel's dingy.

With a line attached to the main halyard, the dingy, if outboard powered, may be successful in heeling the sailboat and freeing her from the grounding. The dingy may also be used to set an anchor some distance from the grounded vessel. The anchor rode is attached to the main sheet and the winch is used to heel the vessel.

This is another form of the beam recovery.

Further considerations:

At the outset of this section, considerable emphasis was placed on keel configurations. SRU crews should also be aware that certain shorelines have many large submerged boulders. There have been instances where keels have become wedged. Such situations would best be left for commercial salvage operators. Any attempt at a beam recovery would be disastrous. Even towing the vessel backwards could cause serious damage.

Module 5

Towing

Principles

Towing Procedures

SAR units may provide towing assistance in accordance with the National SAR Objective, provided it can be done without imperiling the assisting vessel, or towed vessel or the persons on board.

To Tow or Not To Tow

If in the judgment of the JRCC or the Coxswain on-scene, the conditions for a distress or potential distress are not present, and if suitable commercial assistance is readily available, then the provisions of tow by the SAR unit will be denied.

It must be understood, that the SAR units are not in the business of salvage nor are they in competition with commercial salvage or tugs.

In many instances, towing a disabled vessel may be the most expeditious or safe means of saving life. The following factors should be considered in determining if a tow should be executed:

MARINE ASSISTANCE REQUEST BROADCAST (M.A.R.B.)

A M.A.R.B. is a broadcast by a CGRS, on the authority of JRCC, identifying a vessel in difficulty and requesting assistance in a **non distress** situation. Normally the vessel is disabled as a result of mechanical problems or out of fuel. Depending on location, the M.A.R.B. may be answered by a commercial salvage vessel or any other vessel. If there is no response, a SRU may be tasked to render assistance.

Occasionally you may be tasked by JRCC to investigate a possible distress situation, only to discover when arriving "on scene" that the vessel is not in "grave and imminent danger". In such instances, in consultation with JRCC, a M.A.R.B. may be initiated.

A MARB is **not** issued if the disabled vessel is not radio equipped.

The M.A.R.B. system exists partially because CCG and CCGA vessels are not in competition with commercial operations. As well, a SRU engaged in towing may not be readily available to respond to more urgent calls.

QUICK FACTS

When -to-Tow

- *if sea conditions render it hazardous to transfer persons on board;*
- *vessel is rolling beam on to heavy seas in danger of damage by waves or capsize;*
- *vessel is drifting towards danger*
- *non-transferable injuries or medical problems;*
- *no commercial tug immediately available, or estimated time of arrival would cause unacceptably long wait;*
- *to leave adrift may cause unnecessary discomfort or hardship; and*
- *For humanitarian reasons or public goodwill when tow can be safely executed without interfering with higher priorities.*
- *No response from M.A.R.B.*
- *JRCC authorizes*

A vessel is to be taken in tow only when authorized by JRCC.

Most recreational type craft will have great difficulty in towing a vessel more than 1 1/2 times her own displacement.

When the decision is not to tow, the rescuer's duty is to:

- Stand by as long as circumstances or conditions permit;
- Remove people on board if practicable; and Notify JRCC.

QUICK FACTS

When-Not-to-Tow

- *when suitable commercial assistance is available*
- *it is dangerous to life or limb;*
- *the Distress Vessel is hard aground and to attempt to tow may cause further damage in the course of re-floating;*
- *it is beyond the capability of the Rescue Vessel, due to weather, sea, or size of disabled craft, fuel limitations, etc;*
- *A higher priority for saving life is presented at another location.*
- *Notify JRCC.*

When you first come alongside a disabled vessel:

(A) Determine if all passengers are OK, and

(B) ensure everyone is wearing a PFD

Waiver of Claims

When the decision is to tow, first obtain a waiver of claims. This can be done by either a written signature or by verbal agreement. If it is to be done by signature, ensure that the master of the distress vessel signs a standard waiver form (see example).

If the waiver is to be agreed to verbally, it can be done on VHF or simply by voice. If VHF is used request that the CGRS monitor the exchange. A simple hail can be made after ensuring rescue crew members are ready to listen and prepared to later attest to wording (see example).

In this situation log the exchange of verbal communication, both question and reply, then have the crew members sign the log book entry as witnesses to its accuracy.

If answers are negative, do not attempt to tow, but stand by and call JRCC for instructions.

If only a verbal waiver has been obtained at commencement then a signed waiver form should be sought from the master of the disabled vessel once rescue is accomplished. This will confirm the verbal answer.

QUICK FACTS

DECISION TO TOW:

- ***OBTAIN WAIVER***

DECISION NOT TO TOW:

- ***STAND BY DISABLED VESSEL***

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

EXAMPLE OF VERBAL WAIVER:

VERBAL WAIVER OF CLAIMS AND IDEMNIFICATION - To be used when hailing or by radio:

Do you want us to tow?

If we agree to do so, will you hold us harmless and waive all claims for any death, injury or damage which may result, or which may result from the need to abandon or transfer the tow.

(print and place on board near radio telephone to be read to distress vessel's master)

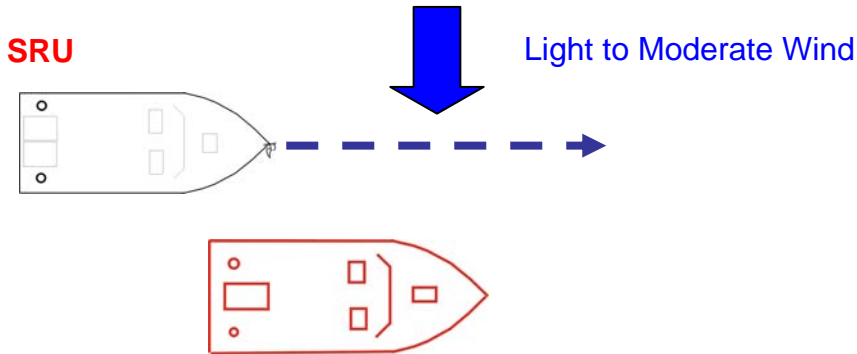
It is customary for the rescuer to set the towing procedure, however, the **master of the disabled vessel has the authority** to overrule the rescuer's decision. In case of an impasse, the rescuer's duty is to stand by in safety and refer the situation to JRCC.

Each Search and Rescue Unit will have its own method of conducting a tow, depending on the characteristics of the rescue. It is strongly recommended that the **towing boat use its own lines for towing as the strength, length and condition are known.**

Approaching a Disabled Vessel

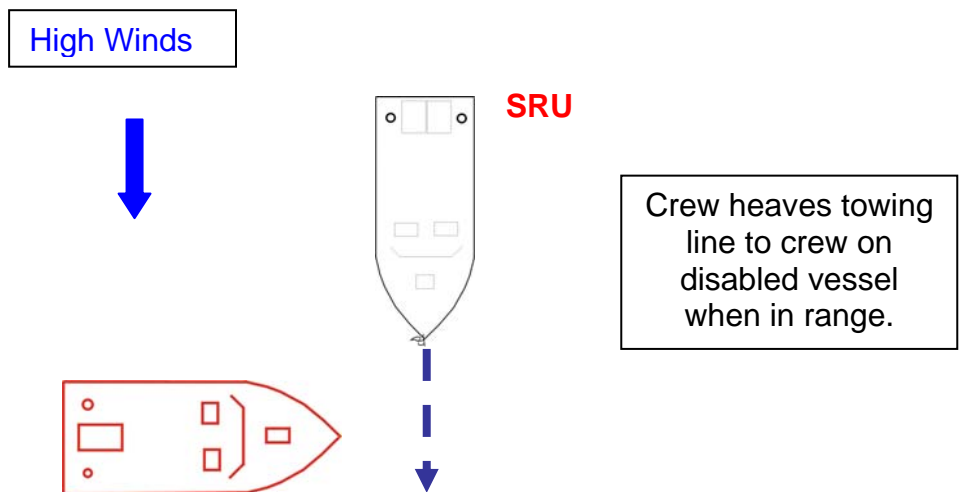
(1) Alongside Approach

In light to moderate seas, the SRU may approach a disabled vessel fairly safely. The helmsman should approach with the other vessel on the starboard side. This offers better depth of vision and reduces the risk of a broadside collision.



(2) Cross the "T"

In heavy weather when an alongside approach is too dangerous and the SRU crew want to take the disabled vessel in tow, a "Cross the 'T'" approach is often the best choice. As illustrated below, the helmsman is best advised to keep the disabled vessel on his/her starboard side.



Securing a Towline

To a vessel in need of assistance: Many recreational type power vessels have inadequate means of securing a towline on their fore deck. The small cleats that are lightly secured to the deck are usually inadequate for towing. A towline should be attached to the strongest point available. On trailored recreational power and sailing vessels, the strongest point may be the "C" bow ring.

Caution: Attaching a line to the "C" bow ring should not be attempted in rough water as this is dangerous with the bow of the distress vessel pitching (kicker hook below will help). In calm water this may be carried out by passing the bight through the ring and leading both ends back to the rescue vessel. The tow can then be easily slipped by releasing one end of the line. This method also avoids using both hands while endeavoring to tie a knot at the ring

To the towing/rescue vessel: Light fittings will not stand the strain of towing. Auxiliary rescue craft may expect to carry out more towing than most other non-purpose built vessels. Consequently, they should plan in advance by examining and selecting the strongest securing points or specially strengthening selected cleats. Without a towing post, the next best option is to set up a towing bridle and attach the two ends of this bridle to two cleats on opposite sides of the stern of the vessel.

The best arrangement is a towing post with cruciform, situated well forward on the centre line secured through the deck to the keel. With this rig, it is necessary to keep the post as low as possible whilst clearing any obstructions abaft the post. The following illustrate the two methods of securing a towline on the towing vessel.

Note: Towlines, in normal circumstances, must be made of a floating material, such as polypropylene.

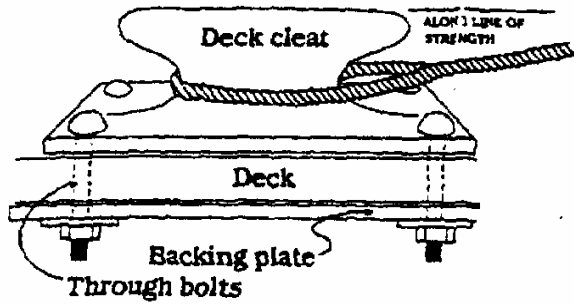


Kicker hook attached to boat hook.

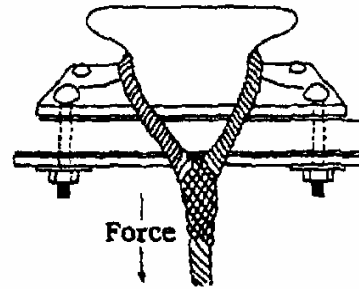


Clasp closed and released.

CORRECT



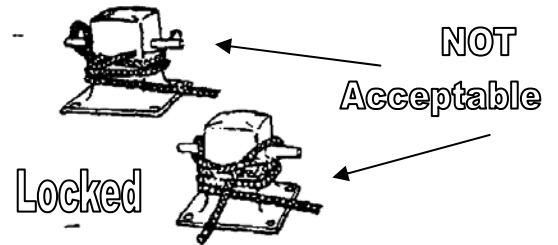
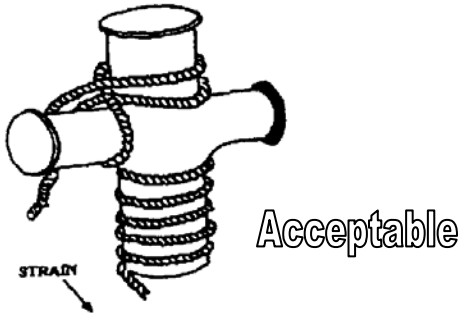
INCORRECT



Force at right angles to the cleat will break cleat

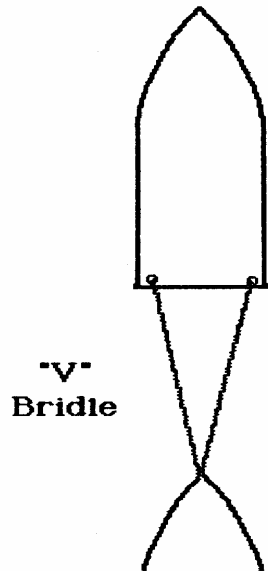
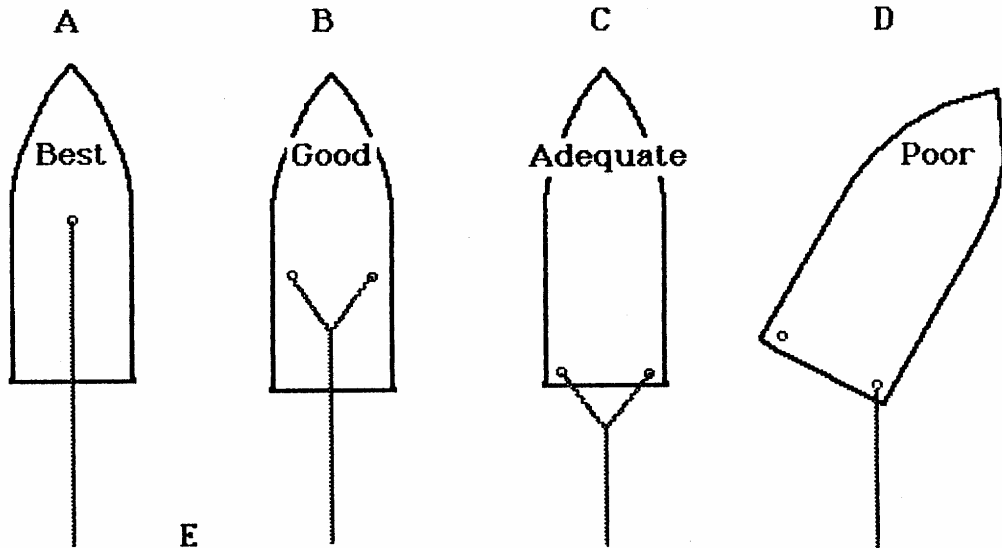
Securing a tow line to a cleat

SECURING A TOWLINE TO A BITT



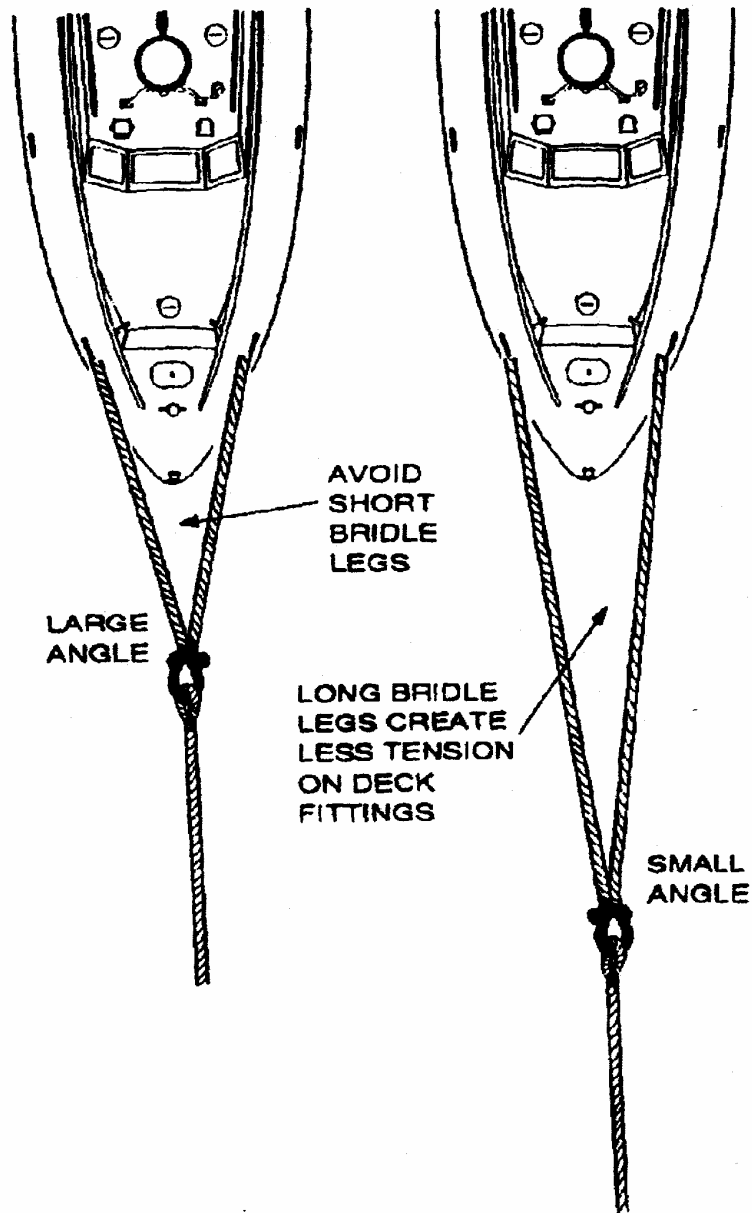
When securing a towline to a tow post, commence with four or five turns around the post below the cruciform, followed by one or two figures of eight around the cruciform for the purpose of holding the round turns below.

Methods of Towing



Diameter	Nylon	Dacron	Polypropylene	Manila
1/2"	7100	6100	5300	2650
1"	24 500	20 000	16 500	9 000
1 1/2"	55 000	36 000	31 500	18 500

Nominal strength of types of line in pounds



Towline Connection Showing Bridle Angle

Safe Towing Speeds

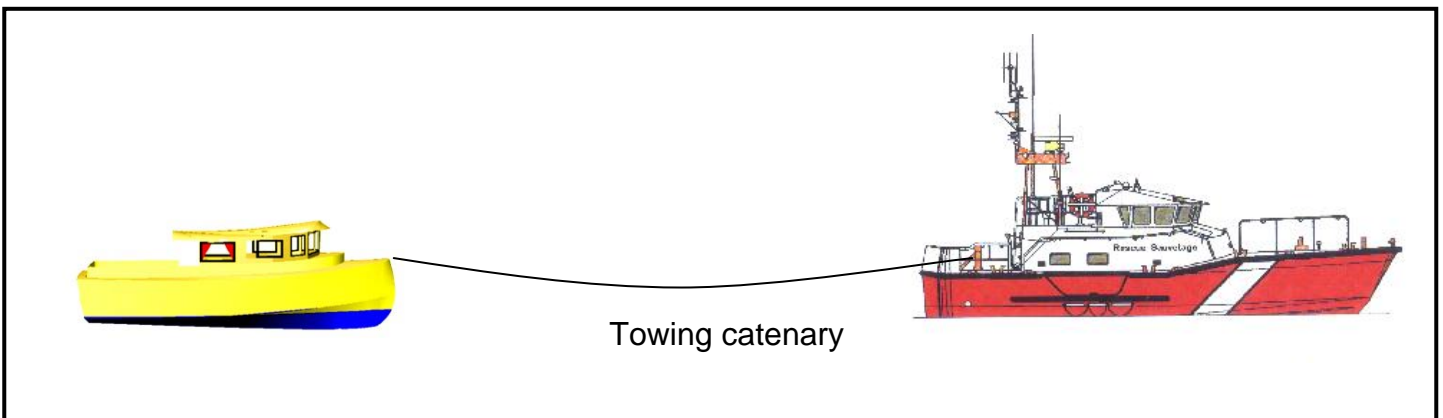
Damage, sinking and loss of life have occurred as a direct result of towing too fast. Maximum safe towing speed is based on the vessel's waterline length and hull shape, but wind and sea conditions could dictate a much slower speed.

Never tow a hull faster than the hull design speed.

Above hull speed, the vessel will try to ride up on its bow wave, becoming unstable and, in extreme cases, could capsize. Also, wave drag (even one large wake) could slow the hull to displacement speed and cause a severe shock-load in the tow rig as the towing force tries to pull the towed vessel back on plane. In response to this shock-load, the towed vessel could plough its bow into another wave and swamp or capsize.

Generally, a tug with a tow should not tow faster than 6 – 8 knots.

Moderately powerful SRU's could easily tow smaller open runabouts (16' -18') on plane. This practice would be considered as unsafe operation of a vessel. Should the tow suddenly "dig in" at speed, disaster would surely follow.

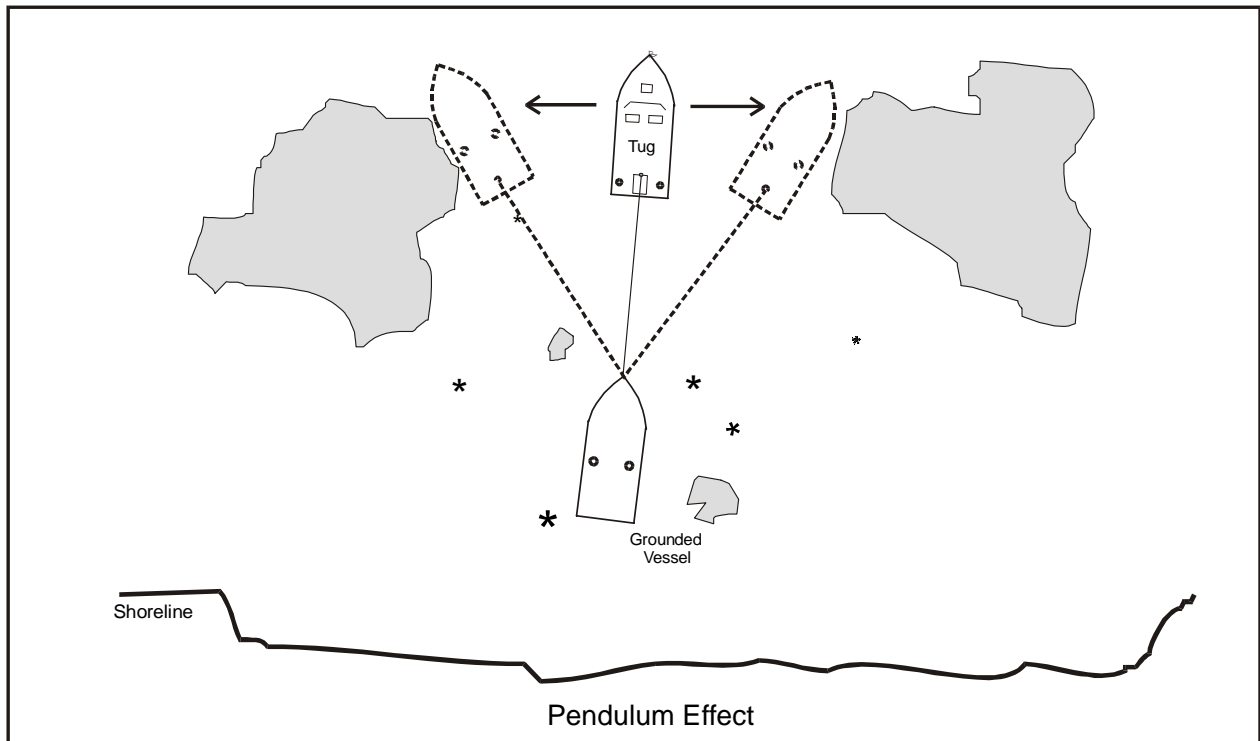


A catenary is the curve formed by a flexible cable of uniform density hanging from two points under its own weight. Other common examples include power lines and an anchor rode. The catenary acts as a damping curve and is a desirable feature when towing.

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Pendulum effect: When towing a grounded vessel off, the SAR unit must be very cautious of the pendulum effect of wind or current upon the tug lest she be helplessly swept upon the same shoal.

If possible, the towing vessel should set its ground tackle to limit pendulum effect.



Draw down or Squatting

This possibly unexpected action takes place in a situation similar to that described above. When power is applied to dislodge a grounded vessel, the stern of the tug will tend to squat down (or dig in), significantly increasing the vessel's draft.

In shallow waters this could result in serious propeller damage.

Vessel operators should exercise added caution when first initiating a tow under these circumstances.

Towing in FOG:

Sound signal

**1 long blast
&
2 short blasts
every 2 minutes (CSA – 35C)**

**The vessel in tow responds immediately
with
1 long blast and 3 short blasts (CSA – 35E)**

Towing at NIGHT:

- Ensure towline is illuminated
- Maintain proper lookout
- If possible ensure proper navigation lights are displayed

***Be extra cautious when towing.
Vessels have been known to attempt to cross
between the tug and the tow – even in clear, fair
weather.***

Module 6

Disaster Scene Management

MARINE DISASTER SCENE

DEFINITION:

Any event that causes a number of persons to require medical attention in numbers beyond the capacity of the agencies normally involved in providing adequate care.

RESPONSIBLE AGENCIES FOR THE SRU

JOINT RESCUE CO-ORDINATION CENTRE

The Joint Rescue Co-ordination Centre or JRCC, is a military operation staffed by Canadian Armed Forces and Coast Guard personnel. The JRCC receives reports of an emergency situation and tasks Coast Guard, Coast Guard Auxiliary, and Canadian Forces resources as required. During a search at sea, JRCC provides executive control of the search operation. JRCC also provides an interface with the Emergency Health Services (ambulance and air-ambulance), the RCMP, OPP or municipal police, and any non-aligned resource or service.

CANADIAN COAST GUARD

The Coast Guard **and** the Coast Guard Auxiliary provide the marine element of the search and rescue organization and are controlled by the JRCC.

The role of the Coast Guard in a multi-casualty situation will depend on where it occurs. If the incident is at sea, triage, patient care and possible evacuation to shore for transfer to the ambulance service must be carried out by the Coast Guard. When Coast Guard personnel go ashore to assist civil authorities during a disaster the commanding officer will probably be asked to take direction from the civil authorities.

The Coast Guard Radio Station *or* *CGRS* connects the SAR units with the JRCC either by means of message passing or by direct telephone patch.

CANADIAN ARMED FORCES

In a disaster the Canadian Armed Forces response may include air Transport and Rescue squadrons. How these resources are deployed will depend on the JRCC, based on the advice of the On Scene Commander (OSC). If Search and Rescue Technicians or SAR TECHs are deployed they can provide triage or

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

advanced care at the casualty collecting area, and will accompany patients to the hospital when military aircraft are used for this purpose.

MAJOR MARINE DISASTERS OR MAJOR AIR DISASTERS (MAJAID)

When very large numbers of patients are encountered and existing hospitals are too far away or unable to handle cases, the military has portable hospitals. These can be airlifted together with medical staff into the disaster area. One such unit is located at CFB Trenton.

**ROYAL CANADIAN MOUNTED POLICE, ONTARIO PROVINCIAL POLICE
AND MUNICIPAL POLICE.**

According to jurisdiction, either the RCMP, OPP or municipal police will attend all multi-casualty situations. The role of the police in such cases is to secure the incident scene, provide control of vehicles and the movement of people, gather evidence and conduct the investigation.

KEY PERSONNEL FOR THE SRU

SEARCH MISSION COORDINATOR

The JRCC Search Mission CO - ORDINATOR will usually be either a Coast Guard Officer, in the event of a marine situation or, an Armed Forces Officer if air elements are involved.

The controller initially receives an indication of a problem and assigns appropriate resources. During the incident the controller gives direction to the OSC and provides a communication interface between agencies.

ON SCENE COORDINATOR:

The OSC may be in command of a SAR unit, usually the largest, most stable platform, with the biggest executive structure. Depending on the type of vessel the OSC may delegate the actual running of the vessel to his subordinates in order to be able to concentrate on managing the incident.

As soon as the first reliable personnel are on scene the OSC will try to determine if the scene is STABLE or UNSTABLE, and convey this information to the triage officer and to the personnel who are to board or enter the distress area. As the incident progresses the OSC acts as a clearing house for information to and from JRCC, and all other agencies.

DISASTER SCENE LOGISTICS:

RESCUE SCENE STABILITY:

No specific plan can apply to every multi-patient event and this is even more true of the marine environment. In this environment the logistical structure will depend entirely on the rescue scene stability.

Rescue scene stability relates to the safety of the disaster scene. Rescue scene stability must be assessed quickly and will probably need to be continually re-evaluated as conditions change. Some of the factors influencing rescue scene stability are as follows:

- Vessel taking on water, losing stability
- Ability to stop water intake
- Ability to pump out water or keep water level constant
- Changing sea state that adversely affects vessel stability
- Ice accumulation affecting vessel stability
- Fires that are out of control
- Risk of explosion
- Toxic gases from fire or engine exhaust or some other source
- Wind direction affecting the distribution of toxic gas
- Navigational hazards.

The **individuals** who undertake to assess scene stability should be competent to judge all these factors. If the vessel or situation is complex this person should be a ship's officer, where possible.

Once a judgement of scene stability is made the OSC shall be advised and will direct the rescue effort accordingly.

STABLE SCENE:

Triage, first aid and evacuation can take place with no regard to imminent hazard. **Urgent category patients are evacuated first.**

UNSTABLE SCENE

Possibly a reverse of the aforementioned in that the **uninjured may need to be evacuated before the injured, and the most severely injured, evacuated last.**

You can see that rescue scene stability determines how casualty management will occur. For this reason, scene stability must be determined as early as possible despite the difficulties presented by the variables mentioned.

THE DISASTER SCENE:

The disaster scene is the area or place where casualties have occurred. Although not all casualties may be found in this area (some may have walked, run or swam from the area), this will generally be the area in which urgent and some delayed category cases will be found, and of course, the deceased.

Patients found in the disaster area or scene shall be assessed by the triage officer, tagged with TRIAGE TAGS and removed to the casualty collection area as designated by the TRIAGE TAGS.

THE CASUALTY COLLECTION AREA:

The casualty collection area should be located between the disaster area and the evacuation point from which survivors can be transported to hospital or clearing area. Ideally, the treatment area will be private:

Free of any hazard
Close to the disaster area
Quiet
Dry
Well illuminated.

THE EVACUATION POINT:

The evacuation point will be selected by the OSC and ideally will have the following characteristics:

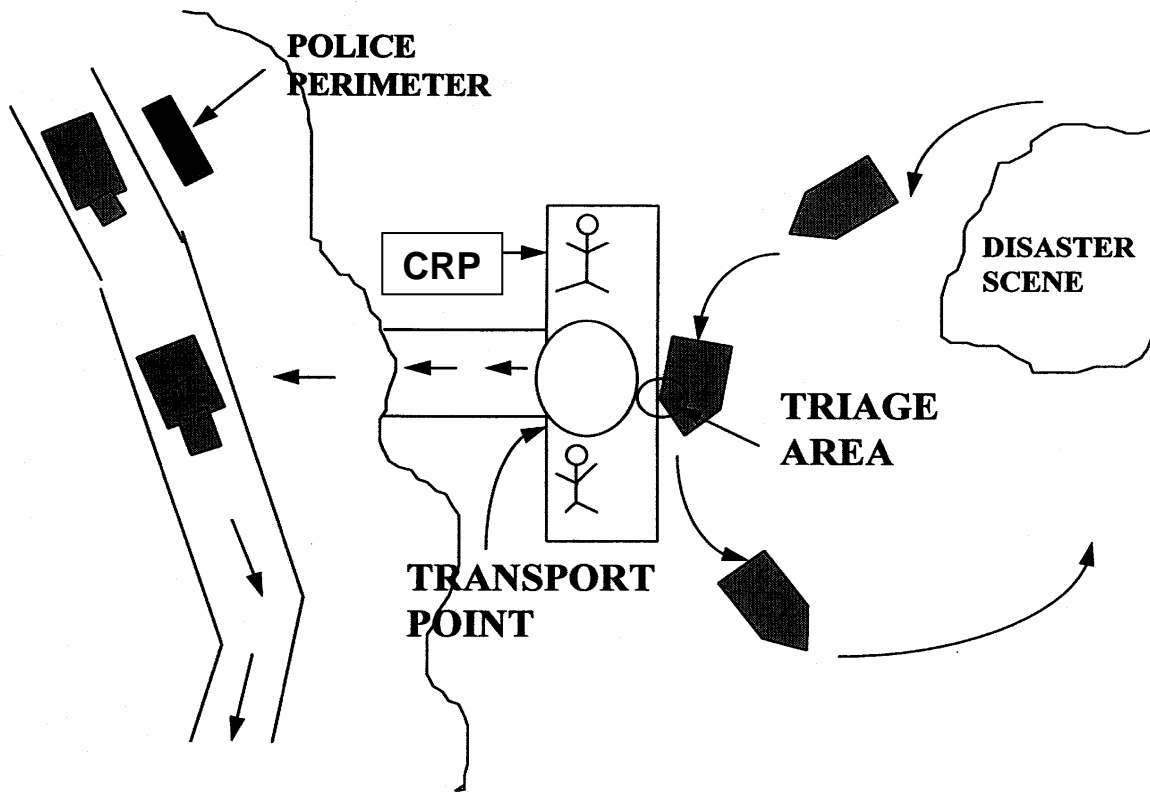
- * Be free of hazard.
- * Provide a one-way or 'circuit' access for vehicles *.
- * Be easily identified by vehicle operators.
- * Be close to the casualty collection area but not so close that patient care is disrupted by rotor wash or vehicle noise.

* Vehicle = Aircraft, ambulance, boat etc.

RESCUE SCENE LAYOUT:

The following illustrations show examples of different site layouts that may be relevant to marine disaster management as well as the 'classical' layout used for a multi-casualty disaster on land.

POSSIBLE LAYOUT: SMALL VESSEL

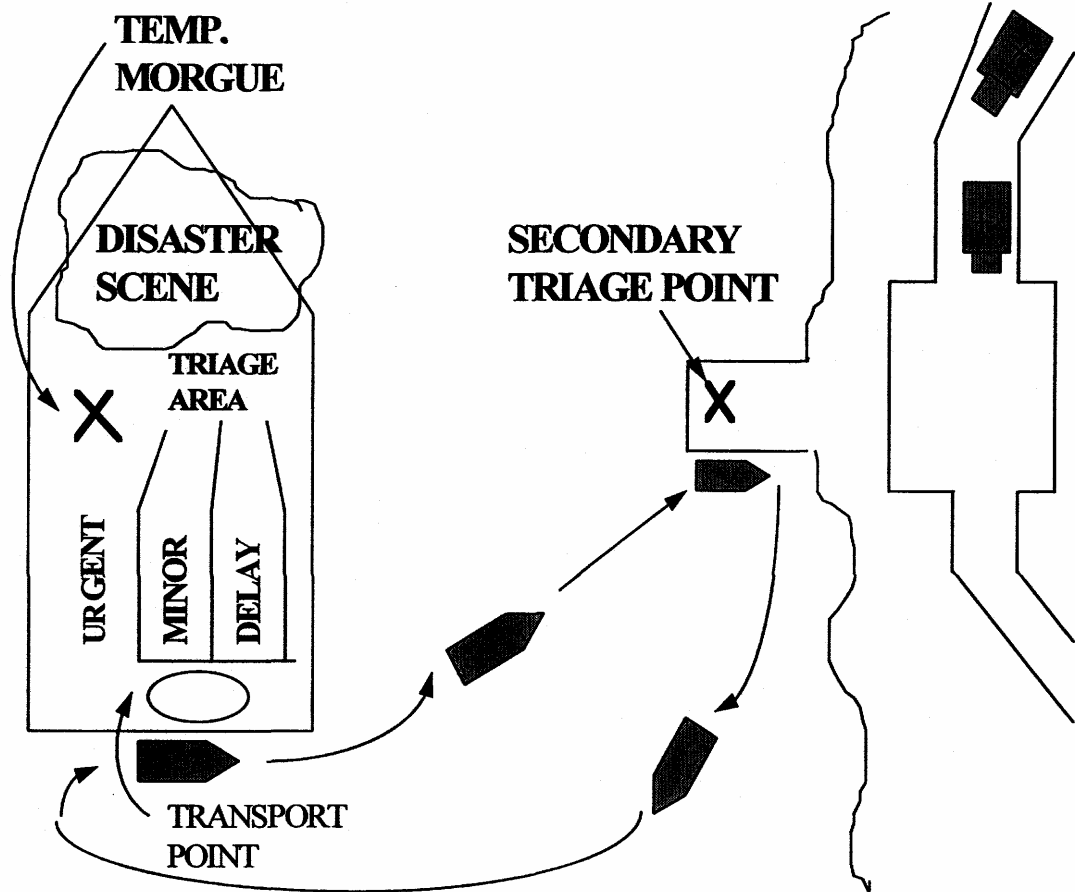


This scene depicts small vessels engaged in rescuing and transporting victims from the disaster scene to a dock where triage can be completed and patients organized for transportation.

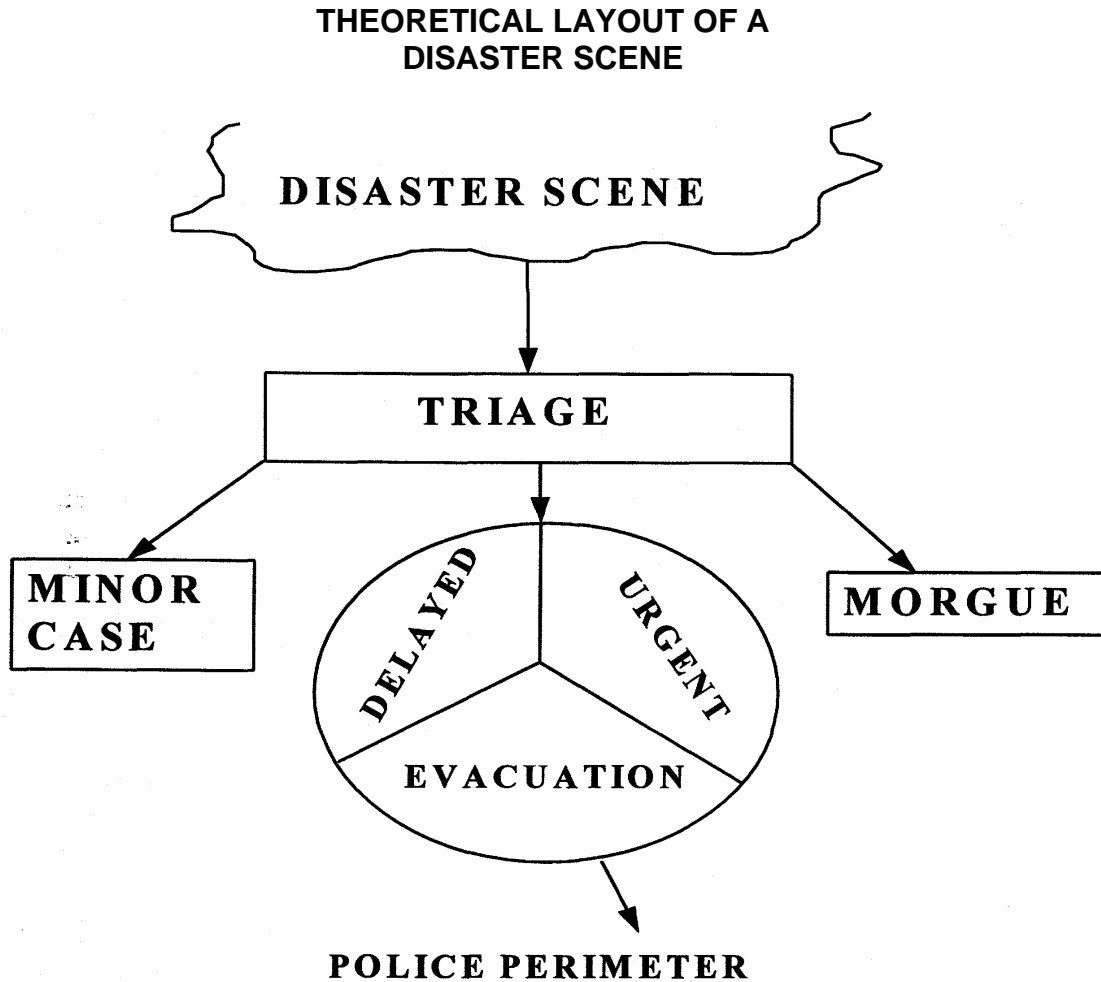
Canadian Coast Guard Auxiliary
(Central and Arctic Region)

This illustration is a large vessel on which some emergency has occurred. The scene is stable. The casualty collection area and transport points are set up on the distressed vessel.

POSSIBLE LAYOUT: LARGE VESSEL



Finally, the classic theoretical set up of a rescue scene on land as would be used in the case of an aircraft crash, or some similar emergency.



HANDLING OF CASUALTIES

The selection of a casualty reception point (CRP) is generally based on the distance to the **location** of the incident and the capability of receiving survivors or the SRU vessel. As a general rule this would be the closest and safest location that the SRU can travel to.

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

-CRPs are more easily chosen when their facilities have been predetermined and the locations pre-selected and recorded at JRCC. Major urban centres have disaster plans which may assist in this selection process.

If there is a large number of casualties a Major Air Disaster (MAJAID) or a Major Marine Disaster (MMD) may be declared.

In this situation existing plans are brought into action. Outside agencies are notified and will make their resources available to help in the resolution of the incident.

HANDLING HUMAN REMAINS

LEGAL ASPECTS:

1. Only a medical doctor may pronounce a person dead.
2. Any layperson may assume death.

The pronouncement of death is a legal act carried out by a physician and it is usually not tied to an operational or logistical requirement to deal with the deceased.

There is a practical requirement for lay persons to be able to set the deceased aside in order to deal with others who are living. The assumption of death should in the context of multi-patient assessment, be made by the triage officer.

When persons are assumed to be deceased they should not be removed from the disaster site until all the living have been evacuated. Persons who are assumed to be deceased are the responsibility of the local coroner or, in his absence, the RCMP or municipal police.

HANDLING THE DECEASED

A cardinal rule of disaster management is: living before the dead.

**Leave the deceased untouched until all living patients
have been cared for and evacuated.**

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

If investigative elements of the coroner's office or other authority are present at the disaster site the deceased may not be moved until preliminary investigation is complete. In the event of a major event on board a ship the investigation may not even begin until the ship is secured at a dock and authorities can go on board.

If representatives of the coroner or investigative authority are not present the OSC may be delegated by the coroner to exercise authority over the handling of the deceased.

If the bodies must be removed from the disaster scene but cannot be transported directly to a morgue, a temporary morgue will need to be established. Ideally, the bodies should be held in the temporary morgue only long enough to arrange transportation from the evacuation point to a proper morgue. The temporary morgue should be located at some point between the disaster scene and transportation point that affords a degree of privacy. The bodies should receive TRIAGE TAGS but at this stage positive identification by relatives would not be appropriate and should not be attempted.

The identification of bodies is the responsibility of the coroner, his delegate, the RCMP or municipal police.

If bodies must be accommodated for an extended period of time, i.e. greater than eight or ten hours, refrigeration is necessary unless the ambient temperature is below freezing.

Refrigerated tractor trailers have been used successfully as an on site temporary morgue and later as a means of transportation to a proper morgue.

If the disaster scene is catastrophic as might be the case of an aircraft accident followed an intense fire, sorting the deceased may become difficult. Try to use one body bag for each body. Count one skull as one body.

SANITATION

As the products of decomposition can be quite toxic the use of thick rubber gloves during the handling of decomposing bodies is strongly recommended. Ideally, disposable smocks or coveralls should also be worn but if these are not available items of uniform issue that become contaminated can either be decontaminated by normal laundry procedures or if you wish be discarded in favour of a replacement issue.

MARINE SAR
INCIDENT
COMMAND STRUCTURE

The simplest incident must be managed with a systematic approach. One SRU is often the sole response to a marine incident, but behind that unit is a system known as the Incident Command Structure, (ICS).

The ICS is designed to control the execution of operations during an incident to the best effect. That is:

- Operating strategies are formulated
- Manpower and technical resources are provided as required
- Operations are conducted effectively
- Information is disseminated constructively to all units involved and the media
- The incident is closed.

The system must have the ability to expand, as any incident becomes more complex or larger in scale. In the simplest of situations key personnel might include:

- JRCC Marine Coordinator
- Coast Guard Radio Station (MCTS)
- SRU Coxswain and crew.

In this situation JRCC will usually provide operating strategies, assign manpower and equipment and maintain communication links. The SRU Coxswain will conduct operations.

In more complex incidents the key personnel may expand to include:

- Marine Coordinator at JRCC
- Coast Guard Radio Station (MCTS)
- On Scene Commander (or Coordinator Surface Search)
- Coxswains of Individual SRU's
- Coxswains of CCGA Units
- Other SAR Units
- Vessels of Opportunity

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

On occasion, a CCGA Coxswain may be asked by JRCC to either formally or informally assume some “on scene” responsibilities. This may be the case when one or more vessels of opportunity are assisting in a search and you are the only SAR vessel with experience. In this case, you could become the **“Coordinator Surface Search”**.

Auxiliary coxswains should understand that in most instances, SAR incidents develop a natural evolution. A single vessel is initially tasked and with negative results, additional resources are deployed. Inevitably, either a CCG vessel and / or DND aircraft arrive “on scene “. One of these units would normally assume the duties of **“On Scene Commander”**.

The decision to appoint an OSC or CSS lies with JRCC.

**Only a PRIMARY SAR Resource can be designated as an
“ On scene Commander”**

The responsibilities of the On Scene Commander or Coordinator Surface Search may vary a little, but the following is expected.

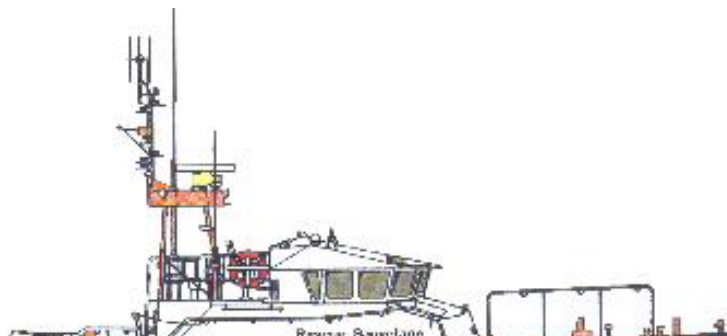
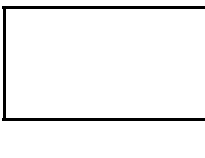
- Assigns Search Areas to Vessels
- Is a Communication link between SAR Vessels and JRCC
 - Plots SAR Vessel Positions
 - Plots Search Patterns
- Monitors Weather, Sea Conditions and Water Temperature
- Ensures Prompt Reporting
- Maintains a Radio Log

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Auxiliary Coxswains who find themselves in such a position of responsibility must keep in mind that the captain of a vessel of opportunity is probably not familiar with search pattern protocol. Assigning such a vessel to do a “sector search” would most likely be interpreted as searching a sector of a chart rather than a search pattern!



Watch for threatening weather



Canadian Coast Guard Auxiliary
(Central and Arctic Region)

47 ' Canadian Coast Guard Cutter



Imperial Tower at Point Clark

ANNEX

SAR Mission Report

Injury and Accident Report

Waiver of Claims

Operational Standards Checklist

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

JRCC TRENTON		SAR OPERATIONS REPORT				Incident #								
CCGA Unit Number			CCGA Unit Name			CCGA VESSEL								
INCIDENT INFORMATION														
Position Located					Distance From Shore			M						
Object Sighted at:		<i>yy/mm/dd</i>	<i>hh:mm</i>	Local	Latitude	<i>(N/S)</i>	<i>MM:mm</i>	N	Longitude	<i>DDD</i>	<i>MM:mm</i>	W		
MARINE INCIDENT TYPE														
MARINE ALERT TYPE														
MAIN ACTION TAKEN		1												
(Select a maximum of 3 actions)		2												
		3												
MARINE INCIDENT CAUSE		1												
(Select a maximum of 3 causes)		2												
		3												
SEARCH OBJECT / UNIT ASSISTED (if more than 1, send addition sheet with incident # & this info)														
NAME					Call Sign									
Make / Model					Registration Number									
Nationality					License Number									
Gross Reg Tonnage					Estimated?		Lloyd's Number							
Length					<i>m</i>	Estimated ?		FVN						
Power					<i>KW</i>	Rental ?		MMSI						
TOTAL POB		Estimated ?		Saved		Lost		Missing		Assisted				
CONTACT INFORMATION (to contact Master/Operator/Owner of Vessel)														
Person Name														
Address						Telephone								
City				Province		Postal Code								
Person State				PFD On ?		Survival Suit On ?								
MARINE ASSISTED TYPE														
MARINE ASSISTED ACTIVITY														
WEATHER														
Conditions														
Winds: Speed		<i>kts</i>		Direction (000-359)		<i>°T</i>		Against Current						
Waves/Swell max Height			<i>m</i>		Tide State									
Visibility		<i>NM</i>		Ceiling		<i>ft</i>		Air Temp		<i>°C</i>				
Clouds				Ice										
OBS Date (yy/mm/dd hh:mm) UTC			UTC		Location									
RESOURCE INFO & TIMES														
Detection Methods				Standby Posture			Sar Tech Used?							
Initial Position				<i>Place name underway or Lat / Long</i>			<i>Times</i>		<i>yyyy/mm/dd</i>		<i>hh:mm</i>		<i>Local</i>	
Distance to incident				NM		<i>hhh:mm</i>		Time Tasked						
Distance Towed				NM		Towing Time		Time Departed						
Distance Escorted				NM		Number of People Rescued		Time On Scene						
Kilometers Driven				KM		← Only if tasked to use vehicle by JRCC		Search Object found						
<i>Note: time departed must be equal to or after time tasked</i>								Operation Ended						
								Return to normal ops						
SIGNIFICANT FACTORS				1										
(maximum of 3)				2										
				3										
COMMENTS						CREWMEMBERS ABOARD THE CCGA UNIT								
						Member		Name		CCGA #				
						Coxswain								
						Crew 1								
						Crew 2								
						Crew 3								
						Crew 4								
						Crew 5								
Crew 6														
Name of Master (print)						Signature of Master								

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**



**JRCC TRENTON VALIDATION LIST
January 2004**



MARINE INCIDENT TYPE				
<input type="checkbox"/> Body Recovery	<input type="checkbox"/> False Alarm	<input type="checkbox"/> Medical	<input type="checkbox"/> PIW	<input type="checkbox"/> Taking On Water
<input type="checkbox"/> Capsized	<input type="checkbox"/> Foundered	<input type="checkbox"/> Missing Person(s)	<input type="checkbox"/> Stranded	
<input type="checkbox"/> Disabled	<input type="checkbox"/> Grounded	<input type="checkbox"/> On Fire	<input type="checkbox"/> Suicide	
<input type="checkbox"/> Disoriented	<input type="checkbox"/> Man Overboard	<input type="checkbox"/> Other	<input type="checkbox"/> Suicide Attempt	
MARINE ALERT TYPE				
<input type="checkbox"/> Cellular Phone	<input type="checkbox"/> FLARE	<input type="checkbox"/> Visual Air Contact	<input type="checkbox"/> SATCOM (NON GMDSS)	<input type="checkbox"/> Other
<input type="checkbox"/> CB	<input type="checkbox"/> Overdue	<input type="checkbox"/> Visual Land Contact	<input type="checkbox"/> VHF/HF/MF RT Marine	
<input type="checkbox"/> ELT/EPIRB/PLB	<input type="checkbox"/> Overdue MCTS	<input type="checkbox"/> Visual Marine Contact	<input type="checkbox"/> VHF/HF/UHF RT Air	
<input type="checkbox"/> ELT/EPIRB/PLB/SARSAT	<input type="checkbox"/> Overdue CGRS Float	<input type="checkbox"/> SATCOM(GMDSS)	<input type="checkbox"/> VHF/MF/HF DSC Marine	
MAIN ACTION TAKEN				
<input type="checkbox"/> Assistance in Ice	<input type="checkbox"/> First Aid	<input type="checkbox"/> Other	<input type="checkbox"/> Search	<input type="checkbox"/> Turn Back WX/BKDN
<input type="checkbox"/> Communication	<input type="checkbox"/> Homing	<input type="checkbox"/> Recovery	<input type="checkbox"/> Tasking Cancelled	<input type="checkbox"/> Towed
<input type="checkbox"/> Escort	<input type="checkbox"/> Investigation	<input type="checkbox"/> Refloated	<input type="checkbox"/> Technical Assistance	
<input type="checkbox"/> Evacuation	<input type="checkbox"/> Monitoring	<input type="checkbox"/> Rescue	<input type="checkbox"/> Transport of Person(s)	
<input type="checkbox"/> Fire Fighting	<input type="checkbox"/> None	<input type="checkbox"/> Resupply	<input type="checkbox"/> Transit Only	
MARINE INCIDENT CAUSE (maximum of 3)				
<input type="checkbox"/> Accidental Activation	<input type="checkbox"/> Dangerous Piloting	<input type="checkbox"/> Ice	<input type="checkbox"/> Mistaken Belief	<input type="checkbox"/> Poor Maintenance
<input type="checkbox"/> Adrift (no POB)	<input type="checkbox"/> Electrical Failure	<input type="checkbox"/> Icing	<input type="checkbox"/> Navigation Error	<input type="checkbox"/> Propeller Fouled
<input type="checkbox"/> Bad Condition / negligence	<input type="checkbox"/> Failure to report	<input type="checkbox"/> Illness	<input type="checkbox"/> Oil Rig Evacuation	<input type="checkbox"/> Suicide or attempt
<input type="checkbox"/> Cargo Shift	<input type="checkbox"/> Fatigue	<input type="checkbox"/> Injury	<input type="checkbox"/> Other	<input type="checkbox"/> Unknown
<input type="checkbox"/> Collision with Object	<input type="checkbox"/> Hoax	<input type="checkbox"/> Lack of Knowledge	<input type="checkbox"/> Out Of Fuel	<input type="checkbox"/> Weather
<input type="checkbox"/> Collision with Ship	<input type="checkbox"/> Hull/Rigging/Failure	<input type="checkbox"/> Mechanical Failure	<input type="checkbox"/> Overload / Stability	
<input type="checkbox"/> Suspected Drug/Alcohol	<input type="checkbox"/> Tides / Currents			
SEARCH OBJECT				
Call Sign	Normally only on larger vessels			
Registration Number	Commercial vessels			
License Number	Pleasure craft ie 28EXXXXX			
Lloyd's Number	Lloyd's Registry of shipping for commercial vessels			
FDN	Fishing vessel number			
MMSI	Maritime Mobile Service Identity code. GMDSS radio identification number			
TOTAL POB	Estimated ?	Yes / No	Saved	Lost
				Missing
				Assisted
CONTACT INFORMATION				
	Captain Owner POB			
Person State	Deceased	injured	missing	saved
			sick	other
				PFD On ?
				Yes / No
				Survival Suit On ?
				Yes / No
MARINE ASSISTED TYPE				
<input type="checkbox"/> Barge	<input type="checkbox"/> Dredge	<input type="checkbox"/> Hovercraft (Pleasure)	<input type="checkbox"/> Other	<input type="checkbox"/> Tanker
<input type="checkbox"/> Bulk Carrier	<input type="checkbox"/> Ferry Boat	<input type="checkbox"/> Kayak	<input type="checkbox"/> PWC	<input type="checkbox"/> Tour Boat
<input type="checkbox"/> Canoe	<input type="checkbox"/> Fishing Boat (open)	<input type="checkbox"/> Motorcraft	<input type="checkbox"/> Roro/Container	<input type="checkbox"/> Tug
<input type="checkbox"/> Cargo Ship	<input type="checkbox"/> Fishing Vessel	<input type="checkbox"/> Nil	<input type="checkbox"/> Sail Craft	<input type="checkbox"/> Unknown
<input type="checkbox"/> Cruise Ship	<input type="checkbox"/> Government Vessel	<input type="checkbox"/> Oil Rig	<input type="checkbox"/> Sail Board	<input type="checkbox"/> War Vessel
<input type="checkbox"/> Derelict	<input type="checkbox"/> Hovercraft (com.)	<input type="checkbox"/> Open Boat	<input type="checkbox"/> Submarine (comm)	<input type="checkbox"/> Work Boat
<input type="checkbox"/> Land Vehicle	<input type="checkbox"/> Person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MARINE ASSISTED ACTIVITY				
<input type="checkbox"/> Commercial Fishing	<input type="checkbox"/> Ground Fishing	<input type="checkbox"/> None/Not Applicable	<input type="checkbox"/> Sport Fishing	<input type="checkbox"/> Unknown
<input type="checkbox"/> Diving	<input type="checkbox"/> Hunting	<input type="checkbox"/> Pleasure	<input type="checkbox"/> Suspicious /Illegal	<input type="checkbox"/> Oil Exploration
<input type="checkbox"/> Government	<input type="checkbox"/> Marine Transport.	<input type="checkbox"/> Racing	<input type="checkbox"/> Swimming	<input type="checkbox"/> Salmon Fishing
WEATHER				
<input type="checkbox"/> Clear Skies	<input type="checkbox"/> Hail	<input type="checkbox"/> Overcast	<input type="checkbox"/> Partly Cloudy	<input type="checkbox"/> Snow
<input type="checkbox"/> Fog / Mist	<input type="checkbox"/> Smog	<input type="checkbox"/> Freezing Rain/Drizzle	<input type="checkbox"/> Rain	<input type="checkbox"/> Squall
<input type="checkbox"/> Unknown	<input type="checkbox"/> Other			
<input type="checkbox"/> Clouds	<input type="checkbox"/> 3/8	<input type="checkbox"/> 7/8 or more but not totally covered		
<input type="checkbox"/> No Cl or Cm clouds present	<input type="checkbox"/> 4/8	<input type="checkbox"/> 8/8 sky totally covered		
<input type="checkbox"/> 1/8 or less, but not zero	<input type="checkbox"/> 5/8	<input type="checkbox"/> Sky obscured by fog and/or other meteorological phenomena		
<input type="checkbox"/> 2/8	<input type="checkbox"/> 6/8	<input type="checkbox"/> Cloud cover indiscernible		
<input type="checkbox"/> ICE	<input type="checkbox"/> 3/10 Very Open Drift	<input type="checkbox"/> 8/10 Close Pack		
<input type="checkbox"/> 0/10 Ice Free	<input type="checkbox"/> 4/10 Open Drift	<input type="checkbox"/> 9/10 Very Close Pack		
<input type="checkbox"/> <1/10 Open Water	<input type="checkbox"/> 5/10 Open Drift	<input type="checkbox"/> 9+10 Very Close Pack		

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

<input type="checkbox"/> 1/10 Very Open Drift	<input type="checkbox"/> 6/10 Open Drift	<input type="checkbox"/> 10/10 Compact/Consolidated Ice
<input type="checkbox"/> 2/10 Very Open Drift	<input type="checkbox"/> 7/10 Close Pack	
DETECTION METHODS		
<input type="checkbox"/> Audio	<input type="checkbox"/> DF (UHF)	<input type="checkbox"/> Night Vision Goggles
<input type="checkbox"/> DF (406)	<input type="checkbox"/> DF (VHF)	<input type="checkbox"/> None
<input type="checkbox"/> DF (CB)	<input type="checkbox"/> Infrared	<input type="checkbox"/> other
<input type="checkbox"/> DF (HF)	<input type="checkbox"/> Night Illumin Flares	
<input type="checkbox"/> Radar	<input type="checkbox"/> Searchlight	
<input type="checkbox"/> Radar (SART)	<input type="checkbox"/> Visual Contact (day)	
<input type="checkbox"/> Radio Contact	<input type="checkbox"/> Visual Contact (nigh	
RESOURCE SIGNIFICANT FACTORS		
<input type="checkbox"/> Collision with Casualty	<input type="checkbox"/> Inadequate Boat	<input type="checkbox"/> Lack of Marine Resources
<input type="checkbox"/> Coordination problems	<input type="checkbox"/> Inadequate Fire Equipment	<input type="checkbox"/> Lack of Procedures
<input type="checkbox"/> Delayed departure	<input type="checkbox"/> Inadequate FRC	<input type="checkbox"/> Lack of Training
<input type="checkbox"/> Exemplary Performance	<input type="checkbox"/> Inadequate Medical Equip	<input type="checkbox"/> Limited Endurance (resource)
<input type="checkbox"/> Fatigue (Resource)	<input type="checkbox"/> Injuries/sickness(resource)	<input type="checkbox"/> Mechanical Problems
<input type="checkbox"/> Icing (resource)	<input type="checkbox"/> Lack of Air Resources	<input type="checkbox"/> Navigation Equipment Problems
<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Resource Grounding	
<input type="checkbox"/> Other	<input type="checkbox"/> Unsuitable Draught	
<input type="checkbox"/> Overwhelmed		
<input type="checkbox"/> Personnel Shortage		
<input type="checkbox"/> Program Limitation		
<input type="checkbox"/> Radio Communication Problems		

**Canadian Coast Guard Auxiliary
(Central and Arctic Region)**

In every instance of a claim for collision, stranding, injury or other casualty, however small, the Auxiliary member is directed to complete the Collision Wreck and Injury Report and telephone the details as soon as reasonably possible to the Regional Headquarters of the Auxiliary (collect) followed by dispatch of the form by mail or fax to the address or number below.

Canadian Coast Guard Auxiliary 201 N Front Street Suite 703 Sarnia Ontario N7T 8B1 Telephone 519 383 1964 Fax 519 464 5137	JRCC Case # _____ OBS EAN _____ Patrol / TRN # _____
---	---

Auxiliary Vessel

Vessel Name _____ Lic / Registration number _____

Owner _____ Master of the CCGA vessel _____

Address _____ Address _____

Phone _____ Phone _____

Other Vessel, Person or Property (if involved)

Vessel Name _____ Lic / Registration number _____

Owner/Master _____ Address _____

Phone _____

Witness

Name _____ Address _____

Name _____ Address _____

Time and Date of incident

Date	Time	Location

Canadian Coast Guard Auxiliary
(Central and Arctic Region)

Damage Description

Damage to CCGA vessel and or personal injury.
Describe details and provide a sketch for additional information as required.

Estimated cost of Repairs \$ _____

Accident Scenario

Indicate North and location of the accident. Describe and sketch factors contributing to the accident (eg other vessels, obstruction etc)

Date	Signature of Claimant

HOLD HARMLESS AND WAIVER OF CLAIMS

I, _____ Master of the vessel _____ request the **CANADIAN COAST GUARD AUXILIARY (CCGA)** to render assistance by towing or other acts. In consideration for which I, for myself and the owners, and all persons on board, and our heirs and executors, **HEREBY AGREE TO HOLD HARMLESS AND WAIVE ALL CLAIMS** against the CCGA, the CCGA vessel, her owners, her master and crew, Her Majesty the Queen, Her Servants and Agents, for personal injury, death or property damage, resulting or arising (either directly or indirectly) from the endeavour to assist, or any abandonment or transfer of the assistance or tow.

Dated this _____ day of _____ 20____.

Signed _____
MASTER OF VESSEL DESIRING ASSISTANCE

Signed _____
WITNESS

Canadian Coast Guard Auxiliary Operational Checklist

<u>Vessel</u>	<u>Coxswain</u>	Exp	<u>Crew 1</u>	Exp	<u>Crew 2</u>	<u>Crew 3</u>	Exp
Name	Name						
Unit #	Member #						
License #	PCOC						
LOA	ROC						
Beam	SAR Trng.						
Power	SAR OPS						
Port	SAR Ex						
District #	First Aid						

SHADED ITEMS ARE MANDATORY



VESEL EQUIPMENT

Personal Safety	Collision Regs.	PFD – Life Jackets	Lines	Survival suits
Piloting	MOB	Fire Extinguisher	Search Light	Compass
Radio Procedures	PIW retrieval	Flashlight	Towing Post	Depth Sounder
Crew Coordination	Capsized Vessel	Flares	Towing Bridle	GPS / Loran
Search Procedures	Righting	Sound signal device	Fume Detector	Radar
Search area	Vessel Aground	Buoyant Line	Fenders	Radio / Cell / Sat.com.
Search Pattern	Swamped Vessel	Buoyant Line & ring	First Aid Equipment	Charts
Waiver	Vessel Fire	Anchor & Rode	Dewatering Pump	Electronic charts
In Line Tow	Helo. Ops.	Re-boarding device	Axe	Personal Strobes
Hip Tow	Sound Signals	Bailer & pump	Tools	Hailer
Knots	MARB	Navigation Lights	Auxiliary Sign	Navigation Tools
Refueling	Distress	Blower	Blue Light	Binoculars / NVG /