SEA SAFETY
INFORMATION BULLETIN

Number 4 - February 2008

All you want to know about marine radios ... and other things

It has been longer than a year since the last issue of the *Sea Safety Information Bulletin* (SIG Bulletin #3) was printed and distributed. Many of you have undoubtedly been waiting patiently for news of sea safety in the Pacific. We are also waiting … for contributions from you, the readers. In that last issue the editor, Hugh Walton, urged "group" members and readers to "sharpen their pencils or sit down at their keyboards and send in safety-related stories and articles". Unfortunately, not much material was sent to Mr Walton's desk. And just who are the group members that he was referring to? As it turns out, we are way too few. The group consists largely of the editor and a few contributors, including the staff of SPC's Coastal Fisheries Programme, the very ones who produce the *Sea Safety Bulletin*.

The wish of having sea-safety-related news and stories pouring in from around the Pacific and elsewhere never came to fruition. Even so, we are producing the fourth issue of the bulletin – with new aspirations and a new approach. The staff of SPC's Nearshore Fisheries Development and Training Section will take over editorial functions and will also remain the root of the sea safety awareness group and continue to be the main contributors, at least for now. For the most part the reports on SPC activities, safety features, training activities, technology and safety, resource materials, and accident and incident reports will come from our small group. We will still rely on others for news from other places and reader contributions. Since we are in a sense reviving the bulletin after a brief hiatus we ask you to be patient when examining our efforts, just as we have been patient waiting for your stories – and we still urge you to sharpen your pencils…

Among my other duties as Fisheries Development Officer for the Nearshore Fisheries Development and Training Section, I will be editing at least the next two *Sea Safety Information Bulletin*s, numbers 4 and 5. For the current issue I have had to rely mostly on two sources for content – myself and the Internet. I ask you to bear with me while I present my own ramblings – one a story on sea safety in the Cook Islands, and the other an article on tricks of the trade. I make no apologies, however, for relying on the Internet and have included under the "Resource Materials" section a report called "Surfing the Net for sea safety information" that has links to many interesting sites. I urge you to click on as many of these as you can and to do your own searches as well. I found Maritime New Zealand on the Internet and they have kindly allowed us to use some of their materials in this issue. You will find excerpts from their *Radio Handbook for Coastal Vessels*, tips about boating safety, and a simple guide to making radio distress calls. My thanks go to Maritime New Zealand for sharing this vital information in the interest of safety at sea for all.

Steve Beverly (steveb@spc.int)

In this issue ...

SECRETARIAT OF THE PACIFIC COMMUNITY
Prepared by the Fisheries Information Section of the Marine Resources Division
and printed with financial assistance from France

Radio handbook for coastal vessels

Adapted from: A guide to maritime communications - MARITIME NEW ZEALAND

How radio works

Radio waves

Radio transmitters work by supplying a rapidly changing electrical current to an aerial (antenna) to create a changing electromagnetic field. The speed with which these currents change controls the speed that the electromagnetic field around the aerial changes. This is measured in Hertz (Hz).

1 Hz	1 hertz	1 cycle per second
1 kHz	1 kilohertz	1 thousand cycles per second
1 mHz	1 megahertz	1 million cycles per second
1 gHz	1 gigahertz	1 billion cycles per second

Like dropping a pebble into a pond, the pebble represents the transmitter while the radiating ripples represent the fluctuating electromagnetic fields. These radiating electromagnetic fields are called radio waves. These radio waves radiate out from the aerial at the speed of light. Marine VHF operates at a frequency of approximately 156 mHz. MF / HF (also called SSB) radios operate at frequencies from about 2 mHz to 22 mHz.

Frequency characteristics

The different frequencies have different characteristics for specific purposes and are subdivided into different "bands". These bands are listed below.

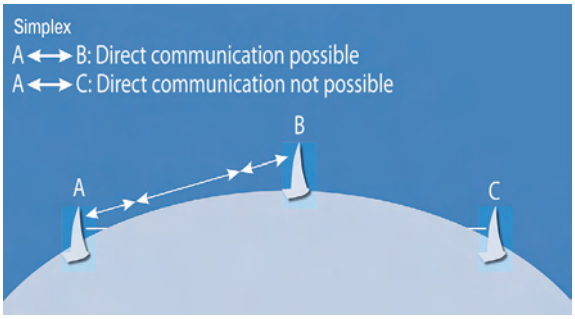
Frequency range	Band classification	Band abbreviation
10–30 kHz	Very low frequency	VLF
30–300 kHz	Low frequency	LF
300–3000 kHz (3 mHz)	Medium frequency	MF
3–30 mHz	High frequency	HF
30–300 mHz	Very high frequency	VHF
300–3000 mHz (3 gHz)	Ultra high frequency	UHF
3 gHz–30 gHz	Super high frequency	SHF

VHF radio waves travel in a straight line and won't bend over hills, headlands or the horizon to any great extent. VHF radio is used for local transmissions but aerials must be in sight of each other (line of sight). MF radio waves have a greater tendency to follow the earth's curvature, so lend themselves to medium-range navigation aids, regional broadcasting and medium-range communications because they can curve around obstructions and over the horizon. HF radio waves do not bend over the horizon, but utilise a layer of the earth's atmosphere known as the "ionosphere" to reflect the radio waves back to earth. The ionosphere varies throughout the day but is most stable shortly after sunset. This is a particularly good time for SSB communications in the HF band. During the daytime, SSB transmissions are not as reliable due to the effect of the sun on the ionosphere. In general, higher frequencies such as 12 mHz or 16 mHz bands achieve better communications while lower frequencies such as 4 mHz or 6mHz work better at night. The distance between stations is also a factor, with higher frequencies such as 8mHz and above providing better results at longer ranges.

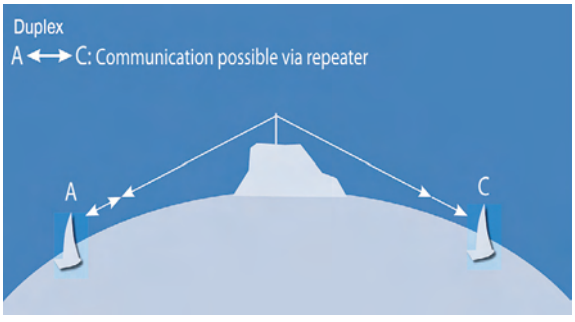
Simplex and duplex – VHF radio

Simplex means both stations use the same frequency for transmitting and receiving. Duplex is where there is a third station, a repeater station, normally on a high mountain or similar. It receives the incoming signal and simultaneously retransmits it on a different frequency. So duplex uses two frequencies, one to transmit and another to receive.

Simplex: One frequency only is used for transmitting and receiving. All channel 16 transmissions are simplex.



Duplex: As VHF signals will not pass through hills or islands, a repeater is often placed on a hilltop so stations on different sides of the hill can communicate with each other. By placing the repeater station on top of a high mountain, vessels up to about 70 miles apart can communicate, where line of sight between the vessels may be under 10 miles. Duplex operation requires repeater channels to operate on two separate frequencies, one to transmit and one to receive.



Aerials
The approximate distance in miles from an aerial to the horizon is: Distance = 1.2√ aerial height (metres) x 3. (Note: Aerial height is the height above sea level.) Two aerials will be in range of each other when their distances overlap. Not all aerials radiate power equally in all directions and a single "whip" aerial mounted vertically should provide the best 360˚ coverage in all directions from the vessel.

Shielding
Aerials should be placed to avoid shielding from superstructures, masts and similar structures because these could interfere with the radio waves as they radiate outwards from the aerial.

Distress calls

Channel 16 is the international VHF maritime distress channel.

Distress, urgency and safety calls

Note: The wearing of lifejackets is a legal requirement in all emergencies.

Special calls are used in cases of distress, urgency and safety and must be properly understood and correctly used.

Distress: The radiotelephone distress signal MAYDAY is used to indicate that a ship or aircraft or person is threatened by grave and imminent danger and requires IMMEDIATE assistance.

Urgency: The radiotelephone urgency signal PAN PAN is used to indicate that a ship has a very urgent message to transmit concerning its safety, e.g. loss of steering.

Safety: The radiotelephone safety signal SÉCURITÉ (pronounced SAY-CUR-E-TAY) is used to indicate that the calling station has an important navigational or meteorological warning to transmit.

Distress
A station in distress may use any means at its disposal to attract attention, make known its position and obtain help. The radiotelephone distress signal is MAYDAY and its use is prohibited except in the case of distress. The distress call has absolute priority over all other transmissions. All ships and coastal stations hearing it must immediately cease any transmissions capable of interfering with the distress communications, and must continue to listen on the frequency being used. Distress calls and distress messages may be sent only on the authority of the master or person responsible for the station. Stations involved in distress communications should exercise great care not to interfere with the transmissions of the station in distress or with other assisting stations. When MAYDAY is not warranted but urgency is required for the safety of the ship or person, the urgency signal PAN PAN should be used.

IMPORTANT – *DISTRESS and URGENCY calls and messages must be cancelled if it is subsequently found that help is no longer required or when the incident is finished.*

Distress procedure
The distress procedure is:
- the alarm signal (if available), followed by
- the distress call, followed by
- the distress message.

Alarm signal
The radiotelephone alarm signal is only used on SSB transmissions. (Not all SSB radios are fitted with an alarm signal generator.) It consists of two different audio frequency tones transmitted alternately, giving a distinctive warbling sound. The alarm signal is only used on 2182 kHz, 4125 kHz or 6215 kHz. The purpose of this signal is to attract the attention of the person on watch or to activate an automatic receiver alarm (if fitted). The alarm signal should be sent continuously for a period of at least 30 seconds, but not exceeding one minute. It shall be used only:
- to announce that a distress call or message is about to follow
- by an authorised coastal station transmitting an urgent cyclone warning – the warning shall be preceded by the safety signal
- to announce the loss of someone overboard when the assistance of other ships is required and cannot be obtained by using the urgency signal only. In this case the alarm signal shall not be repeated by other stations. The message shall be preceded by the urgency signal.

Any radiotelephone alarm signal transmitted by a coastal station is followed by a single tone for 10 seconds.

Distress call
The radiotelephone distress call is the distress signal MAYDAY (spoken three times), the words THIS IS and the name and callsign of the ship in distress (spoken three times). VHF radio distress calls are transmitted on VHF channel 16. SSB distress calls are transmitted on 2182 kHz, 4125 kHz, 6215 kHz, 8291 kHz, 12290 kHz or 16420 kHz. These frequencies are dedicated to distress, safety and calling.

Distress message
The distress call should be followed immediately by the distress message. This message consists of:
- the distress signal MAYDAY
- the name and callsign of the ship in distress
- the ship's position (either in terms of latitude and longitude, or as a true bearing and distance from a known geographical point)
- the nature of the distress
- the type of assistance required
- the number of people on board
- any other information that may help the rescue, such as the sea conditions and description of the ship.

EXAMPLE

- Switch to VHF channel 16 or SSB 2182 kHz, 4125 kHz, 6215 kHz
- On SSB – send alarm signal if available
- MAYDAY; MAYDAY; MAYDAY
- THIS IS
- ALBATROSS ZM1726; ALBATROSS ZM1726; ALBATROSS ZM1726 MAYDAY ALBATROSS ZM1726 – 5 nautical miles west of Kapiti Island – holed and listing heavily, engine room flooded – require immediate assistance – three people on board – seas rough – OVER.

IMPORTANT – Listen on the same frequency for an acknowledgement.

Acknowledgement of a distress message

Any station hearing a distress call and message should write it down. If no response is heard from a shore station, acknowledge the distress call and take all possible steps to attract the attention of other stations that may be able to help. The acknowledgement of a distress message should take the following form:

- the distress signal MAYDAY
- the name and callsign of the ship sending the distress message (three times)
- the words THIS IS
- the name and callsign of the station acknowledging receipt (three times)
- the word RECEIVED
- the distress signal MAYDAY.

EXAMPLE

- MAYDAY
- ALBATROSS ZM1726; ALBATROSS ZM1726; ALBATROSS ZM1726
- THIS IS
- BLUE DUCK ZM1983; BLUE DUCK ZM1983; BLUE DUCK ZM1983
- RECEIVED MAYDAY
- If there is any doubt regarding the vessel's position, repeat the position back to confirm.

Relay of a distress message

A ship or coastal station would in most cases retransmit a distress message to summon further assistance. This message consists of the signal MAYDAY RELAY (spoken three times), the words THIS IS, the name and callsign of the relaying station (three times) – followed by the distress message as broadcast by the ship in distress. When using SSB, use the alarm signal (if available).

EXAMPLE

- MAYDAY RELAY; MAYDAY RELAY; MAYDAY RELAY
- THIS IS
- BLUE DUCK ZM1983; BLUE DUCK ZM1983; BLUE DUCK ZM1983
- MAYDAY ALBATROSS ZM1726 – 5 nautical miles west of Kapiti Island – holed and listing heavily, engine room flooded – require immediate assistance – three people on board – seas rough – OVER.

In cases where the distress message is repeated on a frequency other than that used by the ship in distress, an indication should be given of the frequency used and the time at which the message was received.

EXAMPLE

(Initial procedures as outlined above.)

- Following received on Channel 60 at 0930 – MAYDAY ALBATROSS ZM1726 – 5 nautical miles west of Kapiti Island etc.

Control of distress traffic

The control of distress traffic is the responsibility of the ship in distress or the station relaying a distress message. In most cases these stations will transfer the control to Maritime Radio. While Maritime Radio stations cover local coastal waters, there may be situations where another station has to control the distress traffic. In all cases the controlling station should inform search and rescue authorities. If necessary, the station in distress or the station in control of the distress traffic may impose silence on other stations in the area using the signal SEELONCE MAYDAY, followed by its own name and callsign. Other stations near the ship in distress may, if necessary, impose silence by using the signal SEELONCE DISTRESS, followed by their own name and callsign.

Resumption of restricted working

When complete silence is no longer necessary on a frequency being used for distress traffic, the controlling station will transmit on that frequency a message addressed to ALL STATIONS indicating that restricted working may be resumed with caution.

EXAMPLE

- MAYDAY
- ALL STATIONS; ALL STATIONS; ALL STATIONS
- THIS IS
- TAUPO MARITIME RADIO
- 0930 (the time of the message) ALBATROSS ZM1726
- PRUDONCE

Resumption of normal working

When the distress communications have ceased, the controlling station will transmit a message addressed to ALL STATIONS indicating that normal working may be resumed.

EXAMPLE

- MAYDAY
- ALL STATIONS; ALL STATIONS; ALL STATIONS
- THIS IS
- TAUPO MARITIME RADIO
- 0940 (the time of the message) ALBATROSS ZM1726
- SEELONCE FEENEE

IMPORTANT: The radio watch and contact with the ship in distress should continue until all activity has ended. A distress or urgency call can be cancelled by transmitting a message advising that help is no longer required. When circumstances change, a ship that has sent a MAYDAY may alter the message to a PAN PAN when imminent danger has passed. A PAN PAN can also be upgraded to a MAYDAY if a situation becomes more dangerous.

Urgency signal and message

The radiotelephone urgency signal is PAN PAN (spoken three times) and indicates that the calling station has a very urgent message to transmit concerning the safety of a ship or person. Medical emergencies are normally designated as a PAN PAN message. The urgency signal has priority over all other communications except distress. All stations hearing it must take care not to interfere with the transmission of the message that follows the urgency signal. The urgency message may be addressed either to ALL STATIONS or to a particular station. As soon as the station responsible for the transmission of the urgency message knows that action is no longer necessary, it must cancel the message. The urgency signal and message should be sent on any international distress frequency / channel for radio telephone. In the case of a long message or medical call, a change to a working frequency should be made.

EXAMPLE

Using VHF Channel 16, or SSB 2182 kHz, 4125 kHz, 6215 kHz, 8291 kHz, 12290 kHz or 16420 kHz

(Any other frequency may be used where it is known that a coastal station or ship is keeping watch.)

- PAN PAN; PAN PAN; PAN PAN
- ALL STATIONS; ALL STATIONS; ALL STATIONS
- THIS IS
- ALBATROSS ZM1726; ALBATROSS ZM1726; ALBATROSS ZM1726 – 5 nautical miles west of Kapiti Island – dismasted and drifting – require tow – sea smooth – no immediate danger
- The number of persons on board should be transmitted
- OVER.

IMPORTANT – Listen on the same frequency for an acknowledgement.

Safety signal and message

The radiotelephone safety signal is SÉCURITÉ (pronounced SAY-CUR-E-TAY). Spoken three times, it indicates that the coastal or ship station is about to transmit a message containing an important navigational or meteorological warning. Navigational and meteorological warnings are broadcast by Maritime Radio stations as soon as possible after they have been received, repeated following the next silence period, and thereafter at scheduled times until they are cancelled or replaced. The safety signal and call should normally be sent on VHF Channel 16, or SSB 2182 kHz, 4125 kHz or 6215 kHz, and the safety message that follows is transmitted on a working frequency. Safety messages are usually addressed to ALL STATIONS, but in some cases may be addressed to a particular station.

EXAMPLE

- SÉCURITÉ; SÉCURITÉ; SÉCURITÉ
- THIS IS
- TAUPO MARITIME RADIO ZLM; TAUPO MARITIME RADIO ZLM; TAUPO MARITIME RADIO ZLM
- LISTEN 2207 kHz (working frequency) for (type of warning message).

The call is then repeated on the working frequency and followed by the safety message.

Emergency position indicating radio beacons (EPIRBs)

EPIRBs are designed to alert authorities that someone is in distress and to provide a homing signal for searching aircraft. EPIRBs operate on 121.5 mHz, 243 mHz or 406 mHz. The 406 mHz EPIRBs transmit a unique code number. Provided this number is registered with an RCC, the identity of the vessel and its owner will be known. The RCC must be notified of changes of vessel or 406mHz EPIRB ownership. The COSPAS / SARSAT international satellite system for search and rescue currently monitors 121.5 mHz, 243 mHz and 406 mHz. The system covers all waters and the information collected by satellites is passed on to the nearest RCC. Once activated for distress alerting, the EPIRB should be left running continuously until the rescue is completed. Do **NOT** turn the EPIRB off, because search and rescue operations may be tracing the signal.

From February 2009, satellite monitoring of 121.5/243 mHz beacons will cease.

There is no maintenance of 121.5 / 243 mHz satellites, and EPIRBs using these frequencies are becoming increasingly unreliable. All ships making coastal and / or international voyages should carry a 406 mHz EPIRB.

IMPORTANT: Care should be taken to avoid accidentally activating a beacon. They should be stowed correctly and not stored or disposed of without first ensuring that the batteries have been removed. Most cases of accidental transmission are found to be from EPIRBs that have been thrown in a cupboard, had gear stowed on top of them or been dumped at a tip. These transmissions are likely to interfere with

genuine distress signals, and locating the source of them is very costly and time consuming. If an EPIRB is accidentally activated, phone the nearest RCC immediately. No costs or prosecution will result from reporting an accidental activation that is reported as soon as the activation is discovered.

Personal locator beacons (PLBs)

PLBs operate on 121.5/243 and 406 mHz. While they are used extensively by hikers and as a personal beacon on small craft, they are not designed for use in the marine environment:

- they do not float
- PLBs operate for 24 hours (rather than 72 hours for EPIRBs).

Distress and safety procedure summary

The following table summarises the procedures for distress, urgency and safety communications.

Denotes text which must be said three times.

		TYPE OF CALL		
	Radio type	Distress	Distress acknowledge	Distress relay
Distress channel	VHF only	Channel 16	Channel 16	Channel 16
Is alarm signal sent (if fitted)?	SSB only	Yes 30–60 seconds 2182, 4125, 6215 kHz	No	Yes +10-second tone by coastal station
Call	VHF and SSB	"MAYDAY MAYDAY MAYDAY This is Name, Callsign Name, Callsign Name, Callsign."	"MAYDAY Name, Callsign Name, Callsign Name, Callsign." *(of the vessel in distress)*	"MAYDAY Relay MAYDAY Relay MAYDAY Relay This is Name, Callsign Name, Callsign Name, Callsign." *(of the station relaying)*
Message	VHF and SSB	"MAYDAY Name, Callsign Position Nature of distress Assistance required Persons on board Any other information, e.g. description of vessel, weather and sea state Over."	"This is Name, Callsign Name, Callsign Name, Callsign *(of the vessel acknowledging)* Received MAYDAY."	"MAYDAY Name, Callsign *(of the vessel in distress)* Distress message Over."
Remarks	VHF and SSB	Listen on same frequency Must be cancelled if no longer required		If repeated on different frequency, say: "The following received on — (*frequency*)" and repeat the distress message verbatim

		TYPE OF CALL		
	Radio type	Resumption of restricted / full working	Urgency	Safety: important navigation or meteorological warning
Distress channel	VHF only	Channel 16	Channel 16	Channel 16
Is alarm signal sent (if fitted)?	SSB only	No	Yes	Yes Urgent cyclone warning
Call	VHF and SSB	"MAYDAY All stations All stations All stations This is Name, Callsign *(of the coast station)* Time Name, Callsign *(of the vessel in distress)*	"PAN PAN PAN PAN PAN PAN All stations All stations All stations Or A specific station A specific station A specific station This is Name, Callsign Name, Callsign Name, Callsign."	"SÉCURITÉ SÉCURITÉ SÉCURITÉ All stations All stations All stations This is Name, Callsign Name, Callsign Name, Callsign." Listen — *(working frequency)* for — *(type of warning)*
Message	VHF and SSB	"— PRUDONCE *(for restricted working)* or "— SEELONCE FEENEE *(for normal working)."*	"Urgent message — over."	"All stations All stations All stations This is Name, Callsign Name, Callsign Name, Callsign." Warning message
Remarks	VHF and SSB		Listen on same frequency Must be cancelled if no longer required	

Use of cellphones during distress and urgency

Cellphones can only provide person to person communications. They cannot broadcast. Digital cellular phone coverage can change without warning depending on the density of traffic using the cellphone site on shore. Wearing of lifejackets is mandatory in all cases of distress or urgency. Keep the cellphone in a waterproof plastic bag to protect it from water in case of a capsize or swamping – it can be used while still inside the bag without loss of signal strength.

If you use your cellphone to obtain assistance:

- use a cellphone with a booster kit and external aerial if available
- dial the local number for distress or urgency messages
- provide emergency services with:
  - name of the vessel and brief description
  - cellphone number
  - position
  - nature of the problem and assistance required
  - number of persons on board
  - skipper's home address and landline number
  - any other relevant information
- once you have reported a maritime emergency, keep the line free for access by search and rescue services
- don't hang up after talking to search and rescue services, unless instructed to do so
- conserve cellphone battery as much as possible. Carry a spare battery – your phone will use more power if you are a long distance from a cellsite. Use power conservation features if available while at sea. Carry a 12-volt phone charger on board.

Be aware that:

- Many areas do not have cellphone coverage.
- In areas with coverage, signal availability is inconsistent.
- In many emergencies, vessels in the vicinity are in the best position to provide assistance. They will be unaware of an emergency unless VHF radio or flares are used.

As a back-up to VHF radio and in areas where there is good coverage, a cellphone sealed in a plastic bag may provide lifesaving communications.

Radiotelephone procedure

The use of radio communications has introduced words and abbreviations and it is important that all radio operators use the correct procedure in the appropriate context.

- Turn the radio on and select a channel.
- LISTEN. Others may be using the channel for messages more urgent than your own.
- THINK. Prepare what you are going to say before you transmit. Be succinct.
- When not transmitting, be careful not to hold the transmit button down at all times. If this button is jammed or held down by mistake, it prevents any other person from transmitting a message.
- Safety or lives may depend on clarity in communication. Speak simply and enunciate words slowly and clearly using correct procedures and avoid casual technique.

The correct voice procedure is:

Over	This is the end of my transmission. I will listen for and expect your reply.
Out	This is the end of our contact. No reply is expected and I have no further messages for you. (Also used when switching the radio off.) *This is a sign for other parties waiting to use the channel that they will not interrupt if they start transmission.*
These two keywords (over – out) have different (almost opposite) meanings and are **never used together!**	
This is	*Used to separate the target's callsign from your own.*
All understood	I understand what you want and I will do it.
Romeo, Roger, Copy *or* Acknowledged	I have received your message correctly and it is understood.
Say again	I did not receive correctly, or I don't understand your message. Please repeat it so I can be sure I have it right. *This statement is sometimes qualified by describing the portion not understood, e.g. "All after – between – and", indicating the boundaries of what was correctly received and understood.*
Correction *or* I say again	I have made a mistake; this version following is the correct one.
Wait *or* Standby	I will call you back soon. *This statement (especially* **wait***) may be followed by a figure indicating the estimated delay in minutes.*
Clear	I have finished with this communication but will remain listening.
Affirmative	Yes. *This expression is less easily lost in noise than the single syllables of "Yes" and "Right".*
Negative	No. *This expression is less easily lost in noise than the single syllables of "No" and "Wrong".*
I spell	I will spell the word using the phonetic alphabet.
Radio check	*The caller is requesting confirmation that their radio is working and an indication of strength and clarity (5x5).*
Numbers	*All numbers are to be transmitted over the radio as* **single digits only**, *e.g. nine-nine-nine, not nine hundred and ninety-nine.*

Phonetic alphabet
When it is necessary to spell out callsigns/IDs or words, the following spelling should be used:

LETTER	WORD	SPOKEN AS	LETTER	WORD	SPOKEN AS
A	Alpha	**AL** FAH	N	November	NO **VEM** BER
B	Bravo	**BRAH** VOH	O	Oscar	**OSS** CAH
C	Charlie	**CHAR** LEE	P	Papa	PAH **PAH**
D	Delta	**DELL** TAH	Q	Quebec	KEH **BECK**
E	Echo	**ECK** OH	R	Romeo	**ROW** ME OH
F	Foxtrot	**FOKS** TROT	S	Sierra	SEE **AIR** RAH
G	Golf	GOLF	T	Tango	**TANG** GO
H	Hotel	HOH **TELL**	U	Uniform	**YOU** NEE FORM or **OO** NEE FORM
I	India	**IN** DEE AH	V	Victor	**VIK** TAH
J	Juliet	**JEW** LEE ETT	W	Whiskey	**WISS** KEY
K	Kilo	**KEY** LOH	X	Xray	**ECKS** RAY
L	Lima	**LEE** MAH	Y	Yankee	**YANG** KEY
M	Mike	MIKE	Z	Zulu	**ZOO** LOO
The syllables to be emphasised are in **bold** text.					

Transmitting numbers
Transmitting numbers by radio can become garbled and they can be incorrectly recorded by the receiving station. Numbers should be transmitted as a series of single digits.

NUMBER	WORD	SPOKEN AS	NUMBER	WORD	SPOKEN AS
0	Zero	**ZEE** ROH	.	Decimal	**DESS** EE MUL
The syllables to be emphasised are in **bold** text.					

EXAMPLE

- You may be in distress and your GPS records that you are at the following position: 43° 85.97'S 174° 52.48'E.
- This position would be transmitted as: "We are at 4 – 3 degrees 8 – 5 decimal 9 – 7 minutes south; 1 – 7 – 4 degrees 5 – 2 decimal 4 – 8 minutes east."

Tables of SSB frequencies and VHF channels
All ships licensed to operate in the marine frequency bands between 1605 kHz and 2850 kHz must be able to transmit and receive on 2182 kHz. Distress, urgency and safety calls should be made on this frequency. The 2182 kHz frequency is also the general calling and reply frequency when establishing communication with ship and coastal stations and for use by coastal stations to announce the transmission, on other frequencies, of safety information and lists of messages on hand. Except for distress and urgency, all other communications should be carried out on a working or inter-ship frequency, leaving 2182 kHz available for such calls. Safety traffic should also be transmitted on a working frequency.

LOCAL SSB FREQUENCIES IN THE MEDIUM AND HIGH FREQUENCY BANDS (MF/HF)	
Supplementary calling frequencies	2045 kHz 2068 kHz
Inter-ship working frequencies for use after communication has been established on 2182 kHz or 2045 kHz	2456 kHz 2638 kHz 2012 kHz
Harbour authority working frequency	2162 kHz
Working frequencies for exchanging messages between private coastal stations and ships after communication has been established on 2182 kHz or 2045 kHz	2480 kHz 2444 kHz
For communication with coastal stations providing communication for aquatic sporting events. These frequencies may also be used by land stations providing communication for sporting events.	2089 kHz 2129 kHz
Working frequencies between coastal and ship stations, or inter-ship, after initial contact has been established on 4125 kHz	4146 kHz 4417 kHz
Working frequencies between coastal and ship stations, or inter-ship, after initial contact has been established on 6215 kHz	6224 kHz 6227 kHz
Working frequencies for exchanging messages between coastal stations and ships after communication has been established on a calling frequency	2207 kHz 4146 kHz 6224 kHz 8297 kHz 12356 kHz 16531 kHz

INTERNATIONAL DISTRESS AND CALLING FREQUENCIES IN THE MEDIUM AND HIGH FREQUENCY BANDS (MF/HF)	
An international distress, safety and calling frequency for radiotelephony	2182 kHz
International distress, safety and calling frequencies	4125 kHz 6215 kHz
International call frequency only	8255 kHz
International distress and safety frequency only	8291 kHz
International distress, safety and calling frequencies	12290 kHz 16420 kHz

PURPOSE OF VHF CHANNELS	CHANNEL
The international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. All ship's stations licensed for operation in the authorised bands between 156 mHz and 174 mHz must be able to transmit and receive on this channel.	16
Inter-ship navigation safety	13
For inter-ship working	6, 8
Working channels for harbour authority radio stations on port operation and ship movements	9, 10, 11, 12, 14, 19
Continuous weather transmission channels	20, 21, 22, 23
Two-frequency talk-through repeater channels, some allocated to coastguard and to other private coast stations	1, 3, 4, 5, 60, 61, 62, 63, 64, 65, 66,80, 81, 82, 83, 84, 85, 86
Working channels	25, 60, 62, 67, 68, 69, 71, 73, 74, 77

Use of callsigns/IDs
All transmissions must be identified by the name and callsign. Because many ships have the same name or a similar name to other ships, radio operators should use their callsign to correctly identify themselves.

Operating procedure
Before transmitting on any frequency/channel, radio stations (except those in distress) should first listen to ensure that other communications are not interrupted. This is particularly important on VHF channel 16, and on SSB frequencies 2182 kHz, 4125 kHz, 6215 kHz, 8291 kHz, 12290 kHz and 16420 kHz. Calling frequencies should be used for initial calls and replies only (except in cases of distress or urgency). Once communications have been established, stations shall change to a working frequency before continuing.

The following example illustrates the procedure to be used for contacting another ship station:

EXAMPLE

Calling on channel 16

- KOTARE ZM1624 (up to three times) – THIS IS OCEAN BLUE ZM1234 (up to three times) – ARE YOU RECEIVING? – OVER.
- OCEAN BLUE ZM1234 – THIS IS KOTARE ZM1624 – CHANGE TO CHANNEL 6 – OVER.

Working on channel 6

- KOTARE (up to three times) – THIS IS OCEAN BLUE – ARE YOU RECEIVING ME? – OVER.
- OCEAN BLUE – THIS IS KOTARE RECEIVING YOU LOUD AND CLEAR – GO AHEAD – OVER.
- KOTARE – THIS IS OCEAN BLUE – WILL BE ARRIVING PICTON AT ABOUT 6 PM. CAN WE MEET YOU AT THE FERRY TERMINAL THEN? – OVER.
- OCEAN BLUE – THIS IS KOTARE – WE CAN MAKE THAT MEETING – SEE YOU THEN – OVER.
- KOTARE – THIS IS OCEAN BLUE – OUT.

The above example shows VHF operation and inter-ship communication. This procedure is also used for ship–shore and MF/HF communications.

Silence period

VHF: There is no provision for silence periods in the VHF maritime mobile service.

SSB: All radiotelephone stations of the maritime mobile service licensed for operation in the frequency bands between 1605 kHz and 2850 kHz shall, during their hours of service, keep watch on 2182 kHz for 3 minutes starting on the hour and the half-hour. During these periods all transmissions between the frequencies of 2173.5 kHz and 2190.5 kHz, except for distress and urgency communications, shall stop.

The clock used by the radio operator must be checked regularly to ensure correct timekeeping, especially during the silence periods.

Radio watch
Listening on the international distress frequency of channel 16 and/or 2182 kHz by ship and coastal stations of the Maritime Radio Service is an essential part of maintaining the safety of life at sea.

Voyage or trip reports
Ship stations are encouraged to give coastal stations details of their voyages in a trip report (TR), to facilitate possible search and rescue operations. The TR comprises:

On departure:
- the abbreviation "TR"
- name and callsign of the ship
- port of departure
- port of destination and, if possible, estimated time of arrival (ETA)
- number of persons on board (POB).

EXAMPLE

TR Ocean Blue/ZM1234 leaving Wellington – ETA Picton 1800 today, three POB.

On arrival:
- the abbreviation "TR"
- name and callsign of the ship
- port and, if possible, estimated time of departure (ETD).

EXAMPLE

TR Ocean Blue/ZM1234 arrived Picton – station closing – ETD 0900 Thursday.

Additionally, fishing boats are encouraged to report their positions to the nearest coastal station:
- on leaving port for the fishing grounds
- on arrival at the fishing grounds
- when proceeding from one area to another on the same voyage, or on arrival in port.

EXAMPLE

TR Ocean Blue/ZM1234 leaving Wellington for Mernoo Bank area. ETA 0600 on the 11th. Three POB.

Every effort should be made to call notifying arrival at a safe anchorage or the end of a voyage. However, unless a vessel is reported as overdue, the absence of a closing TR will not initiate a search or other follow-up action.

Glossary of terms

Calling frequency or channel
The frequency (for MF/HF) or channel (for VHF) on which initial contact is established, prior to switching to the working frequency or channel for ongoing communication.

Channel
A VHF radio frequency designation expressed as a one or two digit number.

Coastal station
A land station in the Maritime Radio Service.

Distress frequency or channel
Channel 16 (for VHF). The distress frequencies for SSB are 2182 kHz, 4125 kHz or 6215 kHz; or 8291 kHz, 12290 kHz, 16420 kHz for MF/HF. Distress communications are not switched to the working channels or frequencies.

EPIRB
Emergency Position Indicating Radio Beacon used to facilitate search and rescue operations, operating on 121.5 mHz, 243 mHz or 406 mHz.

Frequency
A measure of the rate at which radio waves oscillate (hertz). For ship radio stations this term is commonly used for MF/HF sets and is expressed in kHz (kilohertz) or mHz (megahertz).

GPS
Global Positioning System.

MAYDAY
The distress signal. This signal indicates that a ship or aircraft or person is in grave and imminent danger and immediate assistance is required.

MF/HF
Medium and high frequency. Used to describe frequencies or channels in the range 300 kHz – 30 mHz. SSB (single side band) radios are used for communication in the MF/HF bands.

MSI
Maritime Safety Information.

Navigational warnings
Warnings regarding hazards to safe navigation of ships, issued by the Hydrographic Office and broadcast by coastal stations.

PAN PAN
Urgency signal. Used to indicate that the caller has a very urgent message to transmit.

PLB
Personal Locator Beacon. Used to facilitate search and rescue operations, operating on 121.5 mHz, 243 mHz or 406 mHz. Operates only for 24 hours and is not designed for marine use. Primary use is for persons inland beyond radio or cellphone range.

PRUDONCE
A signal which is used to advise that complete silence is no longer needed on a frequency being used for distress traffic, and that restricted working may be resumed with caution.

SÉCURITÉ
A signal which is used to indicate that the caller is about to transmit a message containing an important navigational or meteorological warning.

SEELONCE FEENEE
A signal which is used to advise that distress communications have ceased and normal working may be resumed.

Ship station
Any mobile radio station located on board a vessel that is not permanently moored. These vessels can range in size from runabouts to cargo and passenger ships.

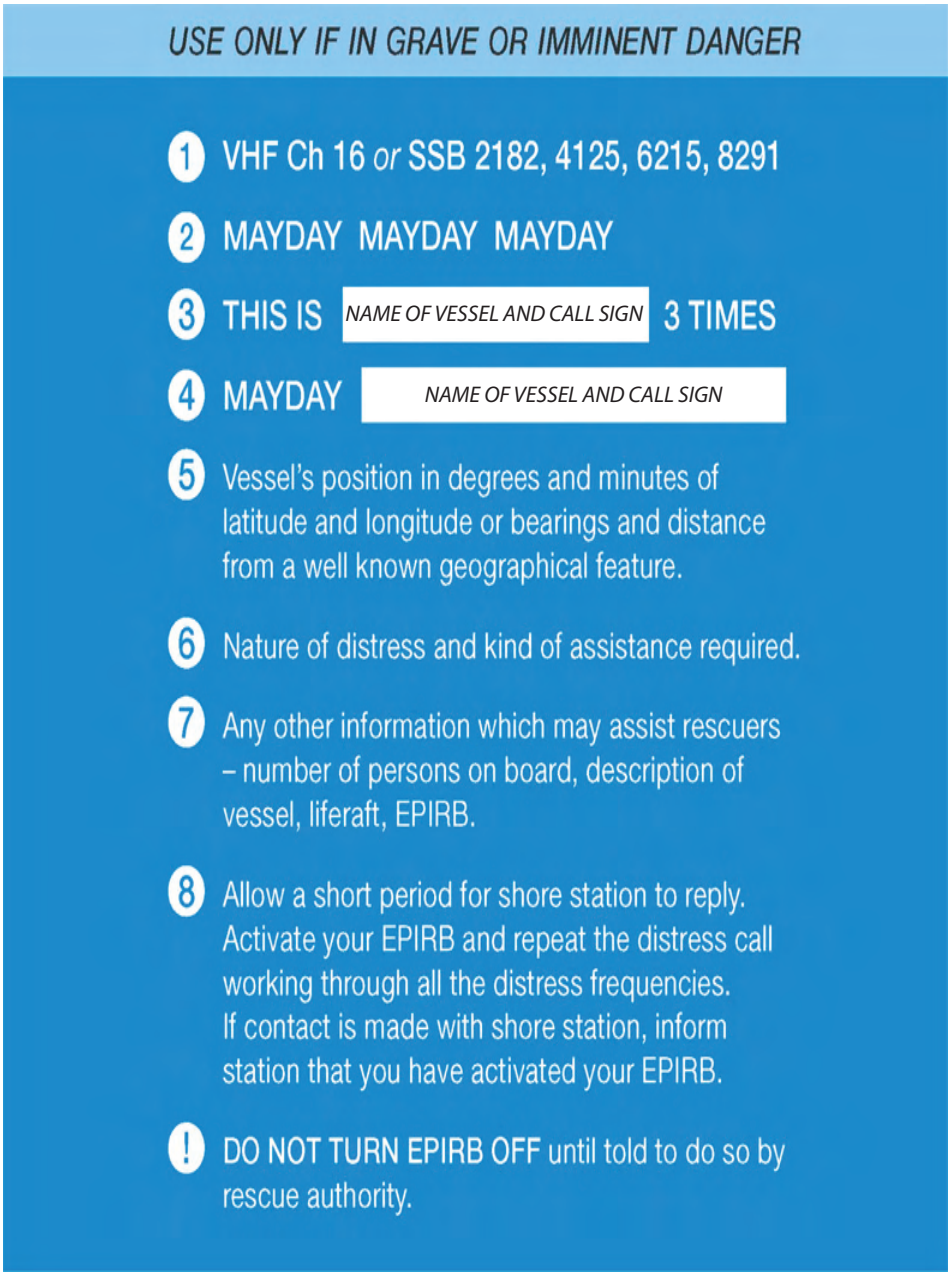
SSB
Single side band mode of transmission as used on MF/HF maritime frequencies.

UTC
The time kept at the Greenwich Meridian.

VHF
Very high frequency. Used to describe frequencies or channels in the range 30–300 mHz.

Working channel or frequency
The channel (for VHF) or frequency (for MF/HF) on which communications are carried out after initial contact has been established on the calling frequency or channel.

Radio distress calling



You can download the complete *Maritime New Zealand Radio Handbook Guide* from the following address:
http://www.maritimenz.govt.nz/publications/radio/RadioHandbook2007.pdf

Canoe building workshop in Nauru

In May, SPC, in collaboration with the Nauru Fisheries and Marine Resources Authority (NFMRA), hosted a workshop in Nauru on canoe building.

SPC's Fisheries Development Officer (FDO), William Sokimi, assisted with setting up the canoe-building training component by organising tools and building materials in preparation for the workshop, which was conducted by Kiribati-based boatbuilder, Mike Savins.

Nine local boatbuilders from the communities of Anetan, Anibare, Bauda, Boe, Denig and Meneng were trained in modern canoe building techniques by Mike Savins. SPC ordered building materials and tools for the workshop while NFMRA provided the venue and managed the logistics. At the end of the training, four canoes had been built: three one-person FAO KIR 7 (4.7 m) design (Fig. 1) and one two-person FAO KIR 6 (6.5m) design (Fig. 2).

Figure 1.
KIR 7 one-person canoe

Figure 2.
KIR 6 two-person canoe

Canoe safety awareness briefings

These briefings, done by the FDO during the second phase of the project, addressed safety issues relevant to canoe fishing activities. The FDO informed community fishers about the importance of maintaining a pre-departure checklist as part of a Safe Operations Plan (SOP). Such a checklist ensures that measures are put into place to counter any challenging situations or emergencies that may arise while on a fishing trip. SPC has developed and promoted a standard safety checklist card for small craft, but this is directed at power-driven vessels rather than paddle-driven craft. However, most of the recommended items on the card, especially those not related to the use of small engines, can be adapted to suit canoe safety (Fig. 3).

Although most of these concepts are common knowledge for regular fishers, it is a handy reminder for them and is important information for new fishers. One important consideration in relation to canoe fishing safety is that the fisher should carry the essential fishing gear and safety items in one or several sealed containers that can also serve as flotation devices in case of emergency. Part of the safety briefings included discussions on canoe handling, and participants were briefed on safe procedures for boarding canoes and how to recover from accidents such as capsizing and foundering. Participants were given a general idea of how these accidents happen, how to prevent them and how to react if they do occur.

Overall, the canoes constructed for the project proved ideal for the Nauruans. The one-person canoe can safely take the load of two people without any problems and still have ample freeboard to maintain some buoyancy. The two-person canoe is able to seat three people and still maintain ample safe freeboard.

Figure 3. Canoe safety checklist card

Safety night at the movies

Charlie Ess[1]

Source: National Fisherman, September 2007
(http://www.nationalfisherman.com)

Believing that people sometimes forget basic safety practices, fishing vessel safety organizations have for some time been busy shooting, editing and producing safety-training videos that (hopefully) will lead fishermen to reconsider such things as ice in the rigging, slack tanks, cold-water survival and carbon monoxide poisoning.

But even after advocates of safety training had delivered their message about the benefits of learning how to don an immersion suit and maintain their EPIRBs, life rafts and other safety equipment, there loomed what was dubbed the final frontier in promoting a safer life at sea: fishing vessel stability.

Hence, *Fishing Vessel Stability*, a video from the Sitka-based Alaska Marine Safety Education Association that focuses on the science of keeping fishing boats keel down in the sea and bringing crews home safety.

The Alaska Marine Safety Education Association (AMSEA), with financial help of the Coast Guard and in conjunction with the University of Alaska's Marine Advisory Program, organized the 20-minute video into nine chapters that outline conditions that jeopardize a vessel's stability.

Jerry Dzugan, who is executive director of AMSEA, says that 35 per cent of the USA's fishing vessel losses can be attributed to compromises in stability. Seiners try to brail too many salmon aboard at one time; trawlers attempt to lift too large a cod end. In other cases, someone forgets to batten down a watertight door when decks are awash, and, as nearly all skippers will attest, nasty weather compounds problems fast.

While the discussions on proper loading commence in a somewhat predictable manner, the footage gleaned from various capsizings should keep you at the edge of your seat.

Many Alaska fishermen will well remember the footage shot from a nearby tender when a giant wave in the Gulf of Alaska smacked the 50-foot herring and salmon seiner *Linda's Draw* over on her side. The footage circulated widely throughout Alaska via television news channels, which reported the story back in the mid-1980s when many in the herring fleet were racing to Sitka to make an opening.

Though many lessons may be derived from the stability discussion, the salient point of the mishap is that the boat's large and heavy seine skiff, which had been tied down on deck, shifted to port. With heavy weather coming, it now seems inevitable that the seiner would be susceptible to large seas.

Another type of loading problem takes place when the net is full of salmon, pollock or other fish. The AMSEA video, available in videotape or DVD, is rich in footage of skippers rolling the money bags of large salmon seine sets over the bulwarks. Modern hydraulics and heavy fishing gear enable crews to roll more fish over the rail than in years past, but the video stresses what might happen as the bag comes aboard and freeboard disappears.

Slack tanks are another cause of sinkings. *Fishing Vessel Stability* has plenty of fishing footage and easy-to-follow graphics depicting what happens when fish, fuel or water slosh from one extreme of the tank to the other then concentrate in one corner to eliminate the boat's freeboard on one side.

Fishermen plying the waters of north latitudes in winter can relate to the chapter on icing. Ice builds quickly on rigging and superstructure when bucking into heavy freezing spray. The solution? Slow down. Get the crew out on deck with the heavy hammers, baseball bats, and whatever else will bust the ice off of cables, stays, machinery and rails.

Downflooding has also claimed its share of boats. The culprit in many cases turns out to be a forgotten door or hatch that's not shut tight and lets water in as the vessel rides out heavy weather. Frequent inspections of through-hull fittings, seals on weather-tight doors, port-holes and other access openings could save the boat.

AMSEA's video also focuses on the loss of stability from towing hang-ups, heavy seas, shifting loads and weight creep.

Stability is also a topic covered in the comprehensive fishing safety video *Safe at Sea: An Overview*, produced in British Columbia. The DVD (also available in VHS format) was produced by Fish Safe BC in conjunction with the BC Food Alliance and, besides a general safety overview, focuses on safety preparedness, cold-water survival and vessel stability.

To explain stability, the video makes good use of wooden models to explain center of gravity, center of buoyancy and righting arm. Graphics show the effects of slack tanks, shifting loads, and down-flooding as well as what happens after loading too many crab pots on the aft deck of a small boat with a planing hull.

With a playing time of more than an hour, the Fish Safe BC video draws upon a wealth of fishing footage and takes an eclectic approach to the information by using an

1. National Fisherman's North Pacific Bureau Chief.

extensive mixture of voices, including those of maritime architects, marine accident investigators, physicians, survival experts and fishermen.

Safe at Sea: An Overview has been pieced together so that it does not lag with long-winded voiceover, nor does it stoop to the cheesy cable channel format that so often repeats short clips for dramatic effect. The video flows well yet lays out the principles of survival at sea.

The video flows so well, in fact, that you may forget for a few moments that it has been meant to promote training. The producers apparently anticipated this and have provided a list of viewing questions inside the video jacket.

A section on cold-water survival clears up a few myths about swimming skills. While mariners known for churning out lap after lap in a pool might think they could survive falling overboard off British Columbia, experts point out that they must first survive cold shock, which accounts for about half of immersion-related drowning fatalities in BC. Survival time in the water thereabouts, which averages about 4.4° C, ranges from 3 to 5 minutes.

Should a fisherman fall overboard and survive cold-water shock, swimming failure would be the next hurdle. A fisherman featured in the video recalls the sight of his friend swimming for a short while then sinking out of sight.

The prescription for much of the above is to wear a personal flotation device. PFDs keep the head above the water and insulate the torso from cold shock, and you can swim in them.

The subject of hypothermia comes up in *Safe at Sea* and also in *Defensive Diving*, another AMSEA training video. While the common sense practice of getting the victim into warm, dry clothing and giving him or her something warm to drink seems obvious in treating mild forms of hypothermia (victim is conscious, alert, shivering), divers or other fishermen whose exposure to cold water have taken them beyond that stage often require expert medical attention and evacuation at sea.

Besides hypothermia, a diver has the additional danger of nitrogen buildup in his body if he stays too deep too long because surfacing quickly can produce the bends.

The video passes along the tip that if a diver needs an emergency evacuation because of the bends, having the airplane or helicopter pilot maintain an altitude below 1,000 feet greatly reduces the effects of excessive nitrogen in the body.

Defensive Diving conveys the generalities of boat safety like other safety training videos, but with the added point that what happens on a boat can adversely affect the diver below; anchors dragging, a wind switch, and current or tide changes can all cause the diver's air hose to become tangled.

In dive fisheries, which claimed the lives of 36 divers nationally from 1993 to 2004, much of the safety responsibility is in the hands of the people on deck. Knowledge of the boat's anchoring system, compressor pump, air tank and keeping track of what is happening around the boat may make the difference between life and death.

Two testimonies laced within the video spell out the importance of matching the perceptions of a diver and his tender to what constitutes danger. In one instance, a speeding vessel passed too close to a geo-duck dive boat, snagged the diver's air hose and began towing him backward through the water. In this instance, the tending crewman had gone below to fetch a pack of cigarettes.

In the second vignette, a diver describes an ominous dark cloud passing over him, the obvious shadow of a very large object at the water's surface, about 50 feet above him. He found out later that a tug towing a raft of logs had hailed the dive boat to warn of possible dangers, but the tending crewman dismissed the situation as harmless and never notified the diver.

Among more subtle dangers, a switch in the wind can position a boat so the exhaust from the small gasoline engine driving the air compressor enters the air supply system, sending deadly doses of carbon monoxide to the diver.

As many marine safety instructors are quick to point out, it's the little tricks that can often make a big difference in promoting a healthier life at sea. Teaching those tricks in an entertaining yet memorable way makes these videos worth watching.

AMSEA videos and DVDs available at:
http://www.amsea.org/products.html#Anchor-Video-12581

FishSafe BC videos and DVDs available at:
http://www.bcseafoodalliance.com/BCSA/SAFETY_TRAINING.html

Some inventive tricks of the trade that could save you money, save your vessel or save your life

How to repack a stuffing box while your boat is in the water

The number-one cause of engine-room flooding on fishing vessels (according to *National Fisherman*, May 1997, p. 33) is the main shaft packing gland, often called the stuffing box (Fig. 1). The stuffing box is located where the main driveshaft enters the stern tube. The shaft exits the stern tube at the cutlass bearing to supply power to the propeller.

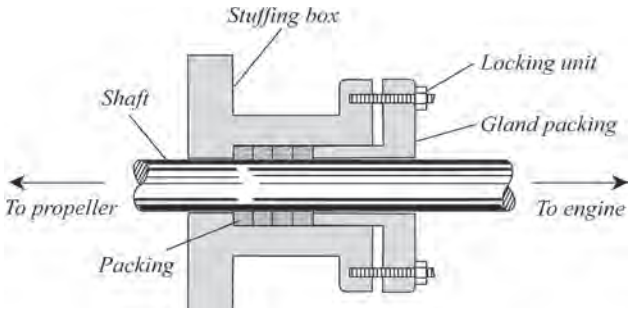


Figure 1. A typical stuffing box.

A main stuffing box works exactly like a pump shaft gland or the seal in a valve. The shaft tube – or stern tube – is effectively a large hole in the hull of the vessel leading directly to the engine room from the sea. Keeping the joint between the shaft and the shaft tube from leaking poses a special problem because the shaft is always rotating when the vessel is under way.

The problem is solved by packing the engine-room end of the shaft with rings of silicon- or graphite-impregnated fibre. This material is called packing. Packing comes in coils and is square shaped in cross section. It has to be cut in lengths equal to the circumference of the shaft. One piece makes one ring. Usually about 6–10 rings of packing are stuffed into the sleeve around the shaft, into the stuffing box, and then packed down with an adjustable gland. Do not pack the stuffing box with a continuous ring of packing: it will fail very quickly. The diameter of the sleeve is larger than the rest of the stern tube and the packing butts up against the back end of the stuffing box where the diameter is smaller. Pressure on the gland can be increased or decreased by adjusting the nuts on the packing gland. The gland compresses the packing so that it increases in thickness around the shaft and keeps water out while still allowing the shaft to rotate.

In most systems, a little seawater is allowed to trickle into the engine room from outside. This water cools the packing and the shaft, and actually acts as a lubricant. Seawater is allowed to pass into the engine room, in this case, via the cutlass bearing – at the other end of the shaft – or by means of water scoops on the outside of the stern tube, which is usually embedded within the skeg. These scoops are usually designed so that water is scooped into the stern tube as the vessel moves forward in the water.

Some packing glands are designed so that grease or oil can be dripped or pumped into the stuffing box to lubricate the packing and keep water out. Other designs have water pumped directly into the stuffing box – usually engine coolant water – and out the cutlass bearing. Shaft gland packing is usually renewed at annual haulouts.

In any case, if the packing fails, water can enter the engine room at an alarming rate. Packing can fail by simply wearing out or, as is more often the case, by burning up because of lack of lubrication, if the gland is too tight. The gland is usually tightened as a first measure when flooding starts. However, if too much packing is worn or burnt, the gland will bottom out and further tightening will not be possible. At this time more packing rings are needed or the packing needs to be changed completely. If the packing completely fails, water can enter the engine room faster than the bilge pump can remove it, and the vessel will be in immediate danger of sinking. If the gland is loosened to put in more packing, flooding will increase. If the vessel is at the dock, auxiliary pumps can be brought in and the boat can be saved, but what can be done at sea to repair a leaking stuffing box or to completely change the packing?

The solution is fairly simple and should be known by all fishers – it could save your life. All that is needed is spare packing, some air-conditioner putty (putty that is waterproof and will not harden), skin or scuba diving gear, and a few tools. It is a good idea to have a packing removal tool on board at all times. This resembles a corkscrew on a long T-handle. Before loosening the gland or removing any packing, a chunk of air-conditioning putty is formed into a large 'worm'. The length of the 'worm' should be three times the diameter of the shaft so it will go all the way around. Additional putty is needed if there are water scoops on the skeg. A diver goes down under the stern of the vessel and presses the 'worm' of putty around the shaft where it exits the cutlass bearing. Next, balls of putty are stuffed into the water scoops on either side of the skeg. The stern tube should now be temporarily watertight. Water pressure should keep the putty in place long enough for the packing to be changed. Fig. 2 shows the location of the stern tube and stuffing box of a typical boat, and where, exactly, the putty goes around the shaft.

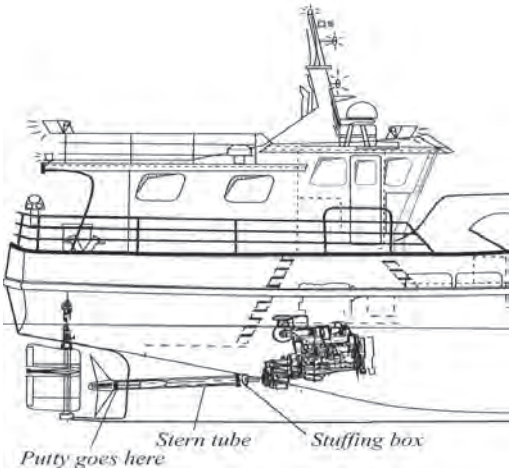


Figure 2. Profile of a typical boat showing exactly where the putty goes to stop water coming in while changing packing in the stuffing box.

Working quickly, the engineer can now loosen the packing gland, remove all of the worn or burnt rings of packing using the packing removal tool, and add additional or all new rings to the stuffing box. Rings should be cut so that they are about 1 mm smaller than the circumference of the shaft. The packing should be cut at a 45-degree angle so that the cut ends overlap each other. The cuts on the rings should be alternated so that one ring is placed with the cut facing up and the next is placed with the cut facing down, and so on, or with the cuts at 45-degree angles to each other.

After all of the packing has been replaced and the gland tightened, the diver should dive under the vessel again and remove all the putty. The gland should then be adjusted so that a trickle of water flows into the engine room while the shaft is turning at idle speed. Often, one more ring has to be added after the packing has seated itself. The packing gland should be watched carefully for the first two or three days after the packing has been changed to make sure that it is not overheating or leaking too much. If the packing is too tight, it can wear a groove in the shaft and the shaft will need replacing.

As you can see, a vessel and the lives of those aboard can be saved with just a few dollars' worth of putty and some ingenuity.

How to fix a leaking pipe or a leaking hose

A leaking pipe can be fixed with a piece of rubber sheeting – or inner-tube rubber – and two hose clamps. Cut a piece of rubber sheeting large enough to overlap the leak and go all the way around the pipe. Attach two hose clamps to the pipe so they apply pressure to the rubber sheet on either side of the leak (Fig. 3). Tighten the clamps until the leak stops. If the leak is particularly bad, you may need to use four hose clamps. If there is no rubber sheeting in the vessel's stores, cut a piece from a diver's wet suit or from a gum boot. If there are no hose clamps, use baling wire.

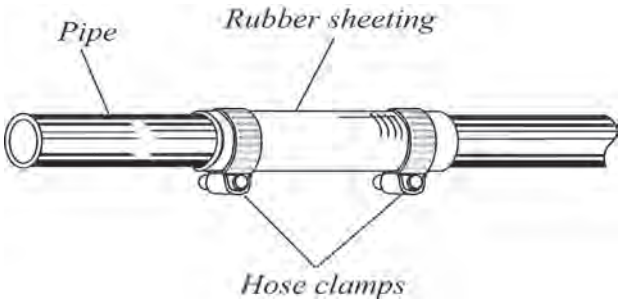


Figure 3. Temporary repair of a leaking pipe using rubber sheeting and two hose clamps.

If there is hose available that has an inside diameter the same as the outside diameter of the leaking pipe, then the same method as above can be used to fix the leak except that hose is used instead of rubber sheeting. First, cut the pipe with a hacksaw so that the leaking section is removed and you have two clean cut pipe ends. Next, cut a length of hose long enough to fill the gap in the pipe and overlap the cut pipe ends. There should be enough room on either end for one or two hose clamps. Then, slip the hose clamps over the pipe. Slide the hose onto one end of the pipe until one end is near the gap in the pipe. Then, slide the hose over the gap in the pipe and over the other cut end of pipe. Tighten the hose clamps on either side of the gap. If two hose clamps are needed on each side, alternate the direction of the tightening screws – one facing left, one facing right – so that the hose does not pucker.

Similarly, a leaking hose can be fixed using a short length of pipe (nipple) and two hose clamps. First, cut a short length of pipe that has an outside diameter the same as the inside diameter of the leaking hose. Next, cut the hose all the way through where it is leaking. You may have to trim off a bit of hose if it is damaged. Insert the small piece of pipe half way into one of the cut ends of hose. (There are commercially made male-to-male hose inserts with ribs made specifically for this job, but a scrap piece of pipe will do in most cases.) Slip both hose clamps over the hose and insert the other end of the small pipe into the other cut end of the hose (Fig. 4). Now tighten the hose clamps, one on either side of the cut in the hose. If the hose is being used for pumping liquid at too high a pressure for your patch to hold, try adding two more hose clamps.

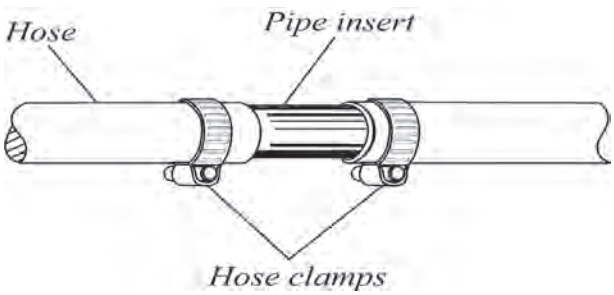


Figure 4. Temporary repair of a leaking hose using a pipe nipple and two hose clamps.

Hydraulic hoses cannot be fixed using the above method: hydraulic systems operate at very high pressures and hose clamps will not hold. If a hydraulic hose springs a leak, it is time to replace the hose. However, if there are no spares aboard, a temporary repair can be done if you have some spare fittings. You will need two reusable female swivel hose end fittings and a male-to-male nipple (either JIC, BPT, or NPT, as long as it matches), a hacksaw and two adjustable wrenches.

First cut the hose with the hacksaw on either side of the damaged portion so that you have two clean hose ends with straight 90-degree cuts. Next, attach a reusable female swivel fitting to each hose end using the adjustable wrenches. Then join the two hoses by tightening each of the female hose ends over the male nipple. This repair can also be done using one female swivel hose end fitting and one male hose end fitting.

If no spares are available, it is often possible to 'borrow' a hydraulic hose from another system on the vessel that is not being used. For instance, you could borrow a hose from a longline fishing reel to make the steering work. Just remember to loop the circuit back together where you borrowed the hose so all of the hydraulic fluid does not leak out.

In each of the cases above, the temporary repair should be fixed properly the next time the vessel returns to port. Makeshift repairs do not usually last long – do not depend on them.

How to make a box patch (cofferdam)

A vessel that is holed as a result of a collision or by striking a reef, or from rotten planking or hull plate, can sink if repairs are not carried out quickly. Large, irregular holes are often very difficult or impossible to plug with round or wedge-shaped wood plugs. A box patch, or cofferdam, is a good way to temporarily plug up an irregular hole in the hull of a vessel. A box patch consists of four parts: (1) a stiff piece of plywood, steel plate or aluminium plate with a hole drilled in the centre – this piece should be larger than the hole in the hull; (2) a smaller stiff piece of wood or steel or aluminium that is longer than the hole in the hull is wide, but not necessarily larger than the entire hole; (3) some sort of sealing material, such as foam rubber or rubber sheeting, that is roughly the same size as piece 1; and (4) a large bolt with nut and flat washers that is long enough to pass from the outside of the vessel through all three pieces of the patch and be tightened from the inside of the vessel.

The box patch can be made from almost anything on the vessel if no spare material is available. A cupboard door or engine-room deck plate would do for piece 1; a length of 4x2 timber or a piece of angle iron would do for piece 2 – this could be 'borrowed' from some other part of the vessel; and a life jacket, seat cushion, diver's wetsuit, gumboot or item of foul weather gear would do for the sealing material (3).

Some crude measurements have to be made before the pieces are cut, but nothing has to be pretty or precise in a box patch. After the pieces are cut and holes are drilled or cut into the three pieces, the bolt and one flat washer are put into the holes on pieces 1 and 2. Piece 3 and the nut and one washer for the bolt are left on board. The patch – parts 1 and 2 and the bolt – must be taken outside the vessel, usually by a diver or someone in the water who can reach down to the level of the hole. Sometimes this can be done from the inside of the vessel, as in the case of a rectangular patch that will fit through the hole in one direction – don't drop it! The patch is then pulled up tight to the hole and piece 3 is placed over the bolt so that the ends of piece 3 extend beyond the hole in the hull. The washer and nut are then screwed onto the bolt and the nut is tightened (Fig. 5). As the bolt is tightened, the outside of the patch will be pulled tightly to the hole, compressing the sealing material around the edges of the hole and, hopefully, sealing it and stopping the leak.

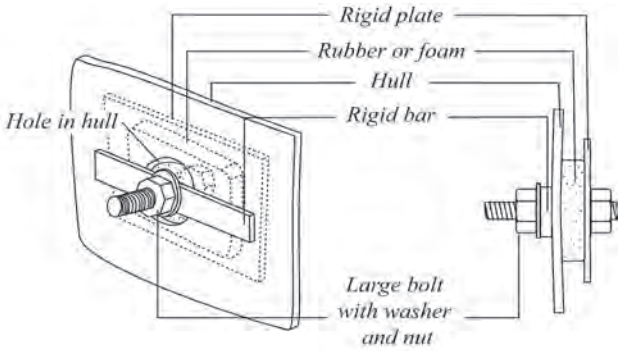


Figure 5. A box patch, or cofferdam, used to temporarily repair a hole in a vessel's hull.

If the hull is rounded where the hole is, the sealing material – if it is thick enough – will conform to this shape. Otherwise, piece 1 may have to be bent (in the case of a steel or aluminium patch), or two bolts will have to be used to bend it (in the case of a wood patch).

There are commercially available box patches that look like umbrellas. These can be put in place from inside the vessel, as they collapse and then expand again when tightened. They work exactly like a butterfly bolt that is used to hang pictures on a wall with no studs.

Spanish windlass

A Spanish windlass (Fig. 6) is a device that acts like a block and tackle or chain fall, only it doesn't have any fancy parts and can be made from what is available on any vessel. Only two things are needed to make a Spanish windlass: a length of rope and a piece of timber or pipe. It can be assembled in a matter of minutes and enables one person to move or lift large objects, open or seal hatches, hold a breaking-up vessel together, or

secure shifting cargo. A Spanish windlass could also be used to secure a box patch. A vessel could thus be saved by a piece of rope and a stick of wood.

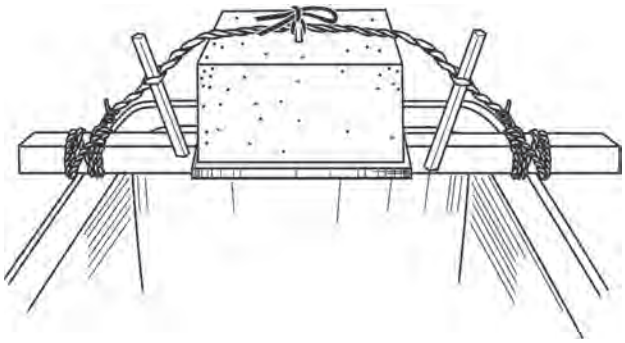


Figure 6. Two Spanish windlasses being used to secure a FAD anchor block on the stern of a boat.

It is very simple to make a Spanish windlass. First, find a piece of rope that is a little over twice as long as the distance between the two objects in question. The two objects are usually one that is stationary, such as a bulkhead, frame or stringer, and one that has to be moved or secured, such as an engine block, a loose hatch or a bulky piece of shifting cargo. Next, tie the rope into a loop so that the doubled length is just a little longer than the distance between the two objects. The rope may have to be slipped around the two objects before the knot is tied. A good knot to use is a lover's knot (or any other knot that will not slip). Then, insert the piece of timber or pipe between the two parts of the loop near the middle. Lastly, start rotating the wood or pipe so that the rope is twisted. As the rope twists, it becomes shorter and pulls the two objects together. If the wood or pipe 'handle' is long enough and the rope strong enough, one person can exert a force equivalent to several tonnes.

Care must be taken not to release the handle or it will spin around and could cause serious injury. If the windlass is to be left in place, as when securing a hatch or deck cargo, then the handle should be tied down to prevent it from spinning. Care must also be taken that the object being moved is not heavier than the breaking strength of the rope being used. If only small rope is available, it can be doubled to form two loops. Spanish windlasses can be used routinely to secure cargo on deck before setting out on a voyage, if chain and chain binders are not available. They can also be used to move heavy cargo around on deck before securing it.

How to repair an electrical fuse

Almost all electronic devices are protected from current surges by fuses or circuit breakers. Circuit breakers can be reset if they trip during a current surge, but burnt fuses need to be replaced. There are many types of fuses, including glass fuses, ceramic cartridge fuses, blade fuses and wire fuses (Fig. 7). Most have a weak-link wire or metal strip element that burns out if voltage, current or temperature in the circuit exceeds the required rating. A glass fuse, for example, contains a tiny strip of wire or metal foil element that burns or melts when the current flowing through the circuit exceeds the limits set by the manufacturer.

Figure 7. Ceramic cartridge and glass cartridge fuses, the most common fuses used in vessel electronics and electrical systems.

Usually, a technician will try to solve the problem that blew the fuse before applying current to a new fuse. Often, however, this takes more than one try. The supply of fuses can become exhausted quickly, even before the electrical problem is sorted out. What do you do when you are 200 miles out to sea and you just blew the last 20 amp glass fuse for your SSB radio, or for your main engine starting system?

There are two or three ways to fix a blown fuse. The easiest way is to remove the old fuse and wrap it in a small piece of aluminium foil. On a glass or ceramic cartridge Buss fuse, the foil must make good electrical contact with the two metal ends of the fuse. The aluminium foil replaces the burnt element. Next, reinstall the fuse in the fuse holder and turn the appliance on. If the foil burns out quickly, either you did not put a large enough piece on the fuse or you have not yet solved the original electrical problem. There is some danger that you could jury-rig the device with an overrated fuse and burn out the appliance. In an emergency situation you may not have any other choice but to try.

Another way to fix a blown glass or cartridge fuse is to solder a short piece of wire between the two metal ends of the old fuse. The wire replaces the original element. You will need solder and a soldering iron. There is fuse wire available for doing this that comes in various ratings, marked in amps on the wire spool. Fuse wire is made specifically for wire fuses but can be used to fix blown glass or cartridge fuses. If fuse wire is not available, any wire will do as long as the diameter of the strand used is similar to the wire inside the fuse that blew. If you do not have a soldering iron, it is possible to wedge the wire between the fuse and the fuse holder. You could also try twisting a piece of wire between the two ends of the fuse holder. In any case, the circuit needs to be completed with a substitute weak-link element.

As a very last resort, bypass the fuse altogether. However, this could cause electrical shock or fire, so do not do this unless all other possibilities are exhausted. In no case

should a makeshift fuse be left in an electronic device longer than is necessary. Such fuses should be used only in emergency situations or for returning to port.

How to make hydraulic oil

Hydraulic hoses and fittings on fishing vessels often break, causing hydraulic oil to leak out on deck or into the bilge or lazarette. If the leak is noticed right away and the hydraulic system is stopped, then repairs can be made and the tank can be topped up with reserve hydraulic fluid. What do you do, however, when the leak is in the engine-room bilge or lazarette and is not noticed right away? What if you have already used up all the spare hydraulic oil? Even if you can repair the leaking hose or fitting, you still need hydraulic oil. If it means you can no longer fish, you may go broke but at least you will still be alive, but what if the hydraulic hose that has broken goes to your steering ram in the lazarette and you have no more hydraulic fluid? You can stay off the reef and make it back to port using other supplies on the vessel.

Hydraulic oil is easy to make on a diesel vessel: mix motor oil and diesel fuel in a ratio of about 80% oil to 20% diesel. Fill the hydraulic tank with this mixture, then test-run the system. If the hydraulic pump starts to overheat or appears to be running sluggishly, add a little more diesel to the mixture. If the hydraulic pump is racing or not supplying enough power to run the fishing reel or the steering, whatever the case, add a little more motor oil. The important thing is to try to match the viscosity of the homemade oil to the viscosity of the real thing – that is, the hydraulic oil that your system usually uses.

Return to port as soon as possible and replace the homemade hydraulic oil with proper hydraulic oil. Do not run the system on the mix of motor oil and diesel longer than is absolutely necessary. Also, the hydraulic system should be flushed out with hydraulic oil before it is refilled, and the filter should be changed.

How to start a diesel engine when the battery is weak

If you are at sea and your diesel engine is not starting because the battery is nearly dead, and you have no starting fluid and no means of charging the battery, there are two things you can try.

Lead-acid batteries will sometimes retain a bit of charge on the plates in the form of lead sulphate, which can be knocked back into solution in the electrolyte. It is not a good idea ever to do this to a battery, but in an emergency situation, one more engine crank can sometimes be gained if you strike the battery posts with a hammer. The posts are connected directly to the plates, and striking them will often shake some lead sulphate loose, giving you just enough power for one more crank. Do not strike the posts hard enough to break the battery and do not hit each post more than two or three times. If you do not get results right away, give up and go to Plan B.

Another way to help start a diesel engine in an emergency situation, when the battery bank has little charge left, is to dump the compression on the cylinders. Some diesel engines, particularly those with hand-crank starters, have special valves built into each cylinder to dump compression during starting. When the engine is being handstarted, all the valves are in the open position (i.e. there is no compression) so the crank is fairly easy to turn. When the hand crank has reached top speed, one valve is closed and that cylinder should fire. The remaining valves are then closed one at a time as the engine speed increases to full idle with all cylinders firing.

Even if there are no dumping valves on your engine, you can duplicate the procedure by shorting out each cylinder at the exhaust valve. First remove the valve cover and then wedge a screwdriver or coin under the exhaust valve tappet of each cylinder so that the exhaust valves are stuck in the open position (Fig. 8). This is not good for an engine and should be done only as a last resort. When all of the exhaust valves are open, the engine will be relatively easy to crank as there will be no compression in the cylinders. The low battery may now be able to do the job.

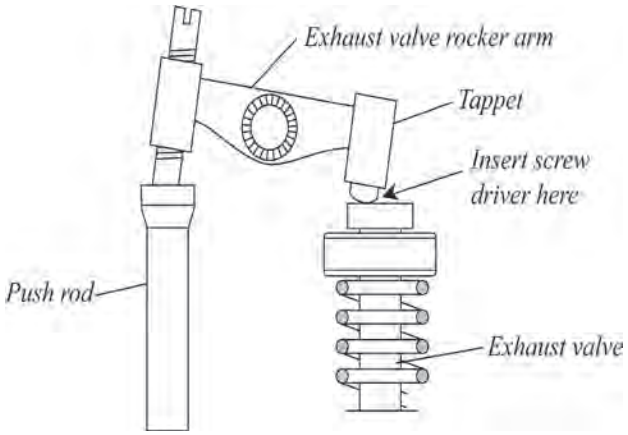


Figure 8. Exhaust valve assembly showing position to place screwdriver to dump compression.

As the engine begins to turn over, remove the wedge from one tappet and that cylinder should fire. At this time the wedges should be removed from the remaining tappets one at a time until all cylinders are firing. It should be no problem to run the engine at idle speed for a short time without the valve cover, but you should replace the cover once all the cylinders are firing. The engine should not be shut down again until after you return to port. At that time, it may be a good idea to readjust the valves and closely examine all tappets, valve stems and push rods for damage.

Surfing the Net for sea safety information

Here are several links to websites on the Internet that hold a wealth of information, news, newsletters, training sites, and links to other relevant sea safety information and organisations. Browse some of these links and you will be surprised at the amount of information available.

If you have any favourite websites with sea safety information please forward the details to the editor at steveb@spc.int and they will be included in the next *Sea Safety Bulletin.*

Alaska Marine Safety Education Association (AMSEA): http://www.amsea.org/

AMSEA Commercial Fishing Vessel Emergency Instruction & Drill Manual: http://www.amsea.org/documents/EmergInstr-DrillManual.pdf

Australia New Zealand Safe Boating Education Group: http://www.safeboating.org.au/

Australian Transport Safety Bureau: http://www.atsb.gov.au/

Boat handling and boat safety articles by David Pascoe: http://www.yachtsurvey.com/boat_handling_safety.htm

Boatsafe: http://www.boatsafe.com/

Boatsafe online boating safety course: http://www.boatingbasicsonline.com/

Docksider Reports: http://www.docksidereports.com/

FishSafe: http://www.fishsafe.info

Lloyd's Register – Fairplay: Safety at Sea International: http://www.lrfairplay.com/Shipping_news/Safety_at_sea.html?product=SAS

Maritime New Zealand: http://www.maritimenz.govt.nz/

Maritime New Zealand – Safe Boating: an essential guide: http://www.maritimenz.govt.nz/publications/Recreational/SBEG05.pdf

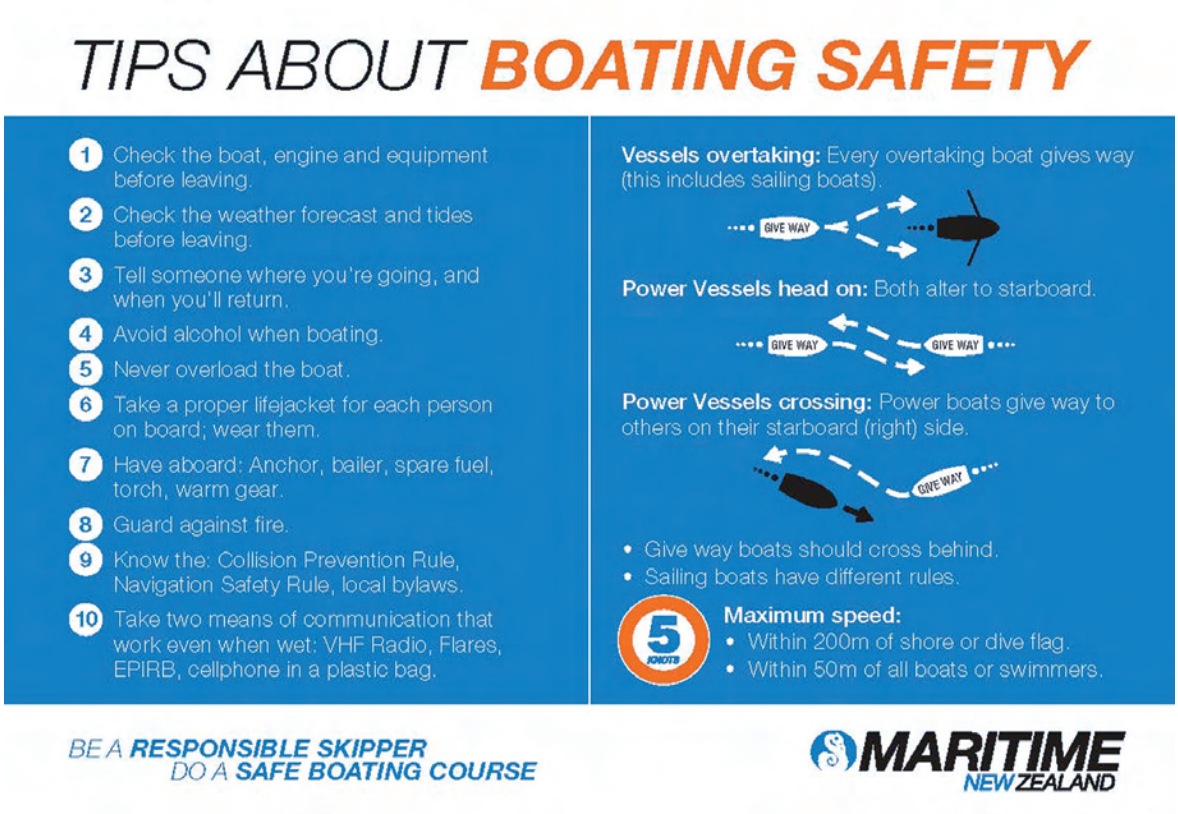
Maritime New Zealand – Radio Handbook for Coastal Vessels: http://www.maritimenz.govt.nz/publications/radio/RadioHandbook2007.pdf

North Pacific Fishing Vessel Owners' Association Vessel Safety Program: http://www.npfvoa.org/

Royal National Lifeboat Institution sea safety pages: http://www.rnli.org.uk/what_we_do/sea_and_beach_safety/sea_safety/sea_safety_home

Safety at Sea International Newsletter: http://www.safetyatsea.net/

Seafish Marine Services Safety at Sea: http://www.seafishmarineservices.com/Projects.htm



Safety at sea in the Cook Islands

Steve Beverly[1]

Cook Islands is located in the South Pacific Ocean between French Polynesia and Kiribati (Line Islands) on the east, and Niue, American Samoa and Tokelau on the west. To the north and south are large high-seas areas. The Cook Islands group is composed of 15 small islands and atolls that occupy over 2 million square kilometres of ocean. The islands are divided into two groups: Northern and Southern (Fig. 1). The capital and main population centre of Cook Islands is Rarotonga in the Southern group, which is the largest of the 15 islands and where the domestic tuna and swordfish longline fleet is based. A much smaller fleet of fishing boats works out of Aitutaki, which is also in the Southern group and lies about 100 nautical miles north of Rarotonga.

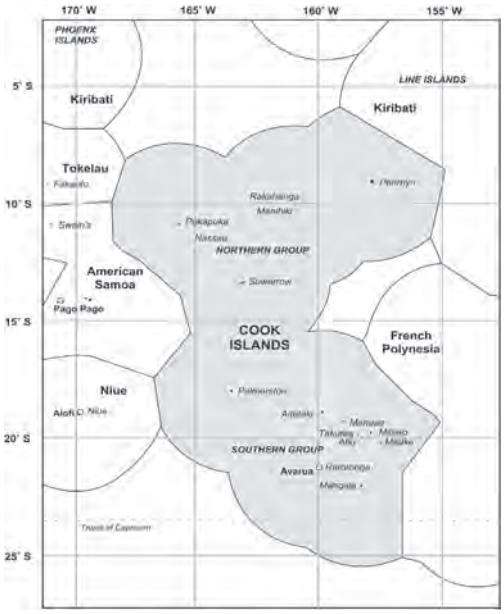


Figure 1. The Cook Islands

Recently, I conducted on-board training and technical assistance for the domestic longline fleet in both Rarotonga and Aitutaki. At the time of the project, the Rarotonga fleet consisted of six small longline boats averaging 14 metres in length and with an average age of over 30 years. There were two 12-metre boats operating out of Aitutaki Island. The assistance provided by SPC to the domestic fleet included improving fishing strategies, fishing techniques, fish handling, vessel operation, fish processing and sea safety.

As it turned out, sea safety came to the forefront when there was a real search-and-rescue incident involving one of the domestic boats during the project. After I left Cook Islands there was another, more drastic incident. Together, the two sea safety incidents point out the need for continued vigilance and offer good lessons about why it is important to be prepared for any eventuality.

On 17 August 2007, having completed most of my work in Rarotonga, I set out with the captain and crew of F/V *Mary J* (Fig. 2) for a one-day longline fishing trip in the waters just west of Aitutaki. *Mary J*'s licence requires that they fish outside the 6 nm limit. New longline gear (long floatlines) had been made up the day before so that the captain and crew could attempt their first tuna longline set. Previously, they had been surface fishing for mahi mahi using the homemade reel on *Mary J*.

Figure 2. F/V *Mary J* just prior to departure on the fishing trip.

Prior to departure, I made an inventory of all safety gear and appliances on *Mary J*. Taking stock of safety gear is a routine part of all FDO field assignments with SPC. On board *Mary J* I found an in-date four-person life raft; life rings; ample life jackets; in-date distress signals including rockets, hand-held flares and smoke signals; and, most importantly, a 406 EPIRB. In addition, there were SSB and VHF radios and a hand-held portable water-resistant VHF radio. Before we left, the captain, Mark Baxter, gave a routine call to Radio Aitutaki to announce our planned departure, giving the destination, number of crew and planned ETA back in Aitutaki. It is a requirement for all vessels operating in Cook Islands to call in upon departure and arrival and twice daily while at sea (at 08:10 and 20:10). On the 08:10 and 20:10 calls, positions are given to the land-based radio stations. In the case of boats operating out of Rarotonga, calls are made to Radio Rarotonga either on VHF channel 16 or on channel 4125 on the SSB radio. From Aitutaki, since the vessels are small and have limited range, calls are usually made on channel 16 on the VHF.

1. Fisheries Development Officer, Secretariat of the Pacific Community

Before our departure, just after starting the main engine, Captain Baxter heard an alarm. It turned out that it was the high-water alarm for the engine room. The water was pumped out and as a result of the flooding, the gearbox oil had to be changed as water had entered it. Nobody noticed that the high water had also entered the starter motor for the main engine. After the necessary maintenance was carried out a search was conducted to try to determine where the water had come from. It was decided that it must have been from the shaft seal. This was filled with grease once again (it was a grease-sealed shaft gland) and we departed with a dry engine room and new oil in the gearbox. All seemed well.

The longline was set soon after we traversed the 6 nm line. This was going to be an exercise in technique – not so much in fish finding – so no effort was put into finding the best fishing area. We set 150 hooks on about 4 km of line and then allowed the line to soak. Setting was finished at about 11:00. The plan was to start hauling at 16:00, which would have allowed a five-hour soak time. However, at about 13:00 things started going wrong once again. The starter motor on the main engine began spinning as if someone had engaged the ignition key, and emitting a loud screeching noise. When the hatch to the engine room was opened, smoke poured out. Obviously, the water that had entered the engine room earlier had got into the starter. Repairs were made and the engine was re-started. It was noticed, though, that water had begun to enter the engine room again, apparently not from the shaft gland but from an unknown source. Captain Baxter decided to abort the rest of trip, start hauling the line immediately and return to port for repairs.

The engine was re-started, the line was located and hauling commenced. About 10 minutes into the haul, however, the starter acted up again. This time the noise was even louder than before and clouds of smoke billowed out of the engine room. The main engine was shut down and operations were halted so that the situation could be evaluated. Luckily the battery cables were able to be disconnected before a fire broke out. Smoke was allowed to clear from the engine room and an inspection was carried out. Unfortunately, though, the main engine would not start again. The batteries for the radios and bilge pump depend on an alternator that operates off the main engine. Battery power would need to be conserved as a priority. Although they were fully charged at the time of the shutdown, they would not last indefinitely.

The first thing Captain Baxter did was to make a call to Radio Aitutaki while the batteries where still good to alert them of the situation. A phone patch was put through and contact was made with the only vessel on Aitutaki that could carry out a search-and-rescue mission, F/V *Orongo*. We were told that they would depart Aitutaki as soon as possible and steam towards us to offer assistance.

Soon after *Orongo* departed they called *Mary J* to get a position. For some reason they misinterpreted the information we gave and they headed for 18°26'S 159°54'W instead of 18°56'S 159°54'W, putting them off course by about 30 nm. After several hours of drifting farther away from Aitutaki while continuing to take on water, we began to be concerned. Subsequent calls to *Orongo* revealed the problem: they were searching too far north. With the batteries getting weaker the radio signal was becoming garbled, and they were too far out of range for our small hand-held VHF radio. Finally, to remedy the situation, we asked for their position. We plotted a course from that position to our own and told them to steam full speed on a course of 230°T for about two hours and they should be able to visually spot us. We saw them on the horizon just as darkness was setting in (Fig. 3).

Figure 3. F/V *Orongo* arrives at dusk and prepares to tow F/V *Mary J*.

The first thing *Orongo* did was to transfer an engineer to *Mary J*, who quickly determined that the problem was not fixable at sea. We would have to be towed back. A tow line and bridle were rigged up and *Orongo* prepared to head for Aitutaki. However, Captain Baxter did not want to leave his longline as, depending on how long repairs would take, he may not be able to return to search for it the following day. Using the hand-held VHF radio, Captain Baxter gave instructions to the captain of *Orongo* (who was his brother, Clive Baxter) on which way to steer and whether to go slower or faster so that the crew on *Mary J* could pull in the entire longline by hand (the hydraulic system worked off the main engine so the reel wasn't operating). It took over four hours to haul in just 150 hooks, but the entire line was recovered. Incidentally, there was a fairly good catch.

When the line hauling was finished, *Orongo* headed for Aitutaki with *Mary J* in tow. During all this time the bilge pump on *Mary J* ran almost continuously to keep the engine room from flooding. One 12 VDC pump burned out and had to be replaced by another. This was the last spare, but luckily, it was there. We arrived back in Aitutaki at around midnight to a waiting crowd of family and friends. Aitutaki is a small island and news had travelled fast that there was trouble with *Mary J* and that we were being towed in.

This story is a good example of why it is important to be prepared for any eventuality at sea and to always have

all necessary safety devices on board. *Mary J* had all of these devices and it paid off. If the vessel had not had a working VHF radio or a spare bilge pump, this story may have ended differently. As it turned out, we didn't have to rely on the EPIRB, the distress signals, the fire extinguishers, the life raft or the life jackets, but it was reassuring to know that they were there and that they were all in-date and in working order.

The incident also points out the need for good communication and cooperation. The degree of cooperation between two different fishing companies in Aitutaki was inspiring. Often, rival companies are reluctant to help each other and want to discuss salvage fees or salvage rights before offering assistance. With the Aitutakians there was no question – friends were in trouble and a job needed to be done. When he heard there was a problem, the owner of *Orongo*, Mike Henry, turned his boat over to the Baxters immediately.

The regime of ship-to-shore radio communication practised in Cook Islands is a model that should be followed everywhere in the Pacific. Not only does it allow those on land to know where all the vessels are, but all the boats listening on those frequencies and at those times will know where the other boats in the fleet are located. This is very important if a search-and-rescue mission has to be carried out.

As it turned out, there was another safety-at-sea incident in Cook Islands soon after I finished my project and left for Noumea. F/V *Moana* (Fig. 4), one of the Rarotonga-based domestic longline boats, rolled over and sank during a regular longline fishing trip. Fortunately, the crew were able to launch the life raft and everyone was subsequently rescued. They were located by another fishing vessel, F/V *Bounty*, with the help of *Moana's* EPIRB.

Figure 4. F/V *Moana* at the wharf at Avatiu, Rarotonga, Cook Islands, a few days before she sank at sea during a longline fishing trip.

After Solomon Islands, seven miraculous survivors in Papua New Guinea

Source: Oceania Flash, 4 January 2008

Just a few days after five Solomon Islanders were found alive and well after drifting at sea for nearly three weeks, early this week the authorities in Papua New Guinea found seven people who had been reported missing at sea more than a month ago.

The small vessel, locally known as a "banana boat", left the island of Bougainville (eastern part of the island group) in early December. Two weeks ago, in spite of the fact that research efforts had been undertaken in the province of Milne Bay after the small boat's disappearance, the operations were abandoned.

Papua New Guinea's national radio station reported that rescue services had, in fact, found debris they thought came from the small motor boat carrying the lost passengers (who included a police agent and two students).

From the beginning of this misadventure a month ago, the small vessel drifted in a southwesterly direction, covering a distance of about 500 kilometres to end up in the province of Milne Bay at the south-eastern tip of the main island.

According to provincial authorities in Milne Bay, the seven people on the boat were found in relatively good physical condition, although they have not yet given any details on how they managed to survive. They are now supposed to be taken back to their home island.

Also at the beginning of the week, in nearby Solomon Islands, five men who had been reported missing after going out to sea on board a motorboat on 14 December were found in the middle of the ocean before being able to reach shore. They were rescued by a cargo ship about 275 kilometres off the coast of the main island of Guadalcanal.

After the vessel's departure on 14 December, it did not reach its destination – the island of Utupua (Santa Cruz Islands in the far south-eastern part of the group, near the island of Vanikoro) – and search efforts by the rescue services from the capital did not turn up anything.

Given the vessel's location at the time it was found by a merchant marine ship passing through the area, the five Solomon Islanders had drifted some 400 kilometres east of their starting point. The national radio station, SIBC, reported that they were in satisfactory condition in spite of two weeks of hardship and drifting.

Fishermen adrift in Pacific drank shark blood to survive

Source: FISHupdate.com, 28 January 2008
(http://www.fishupdate.com/news/fullstory.php/aid/9830)

Three Nauru fishermen lost at sea for 11 days said they survived on the blood and meat of a shark. The men were found by a Taiwanese fishing boat off the coast of Papua New Guinea on 13 January, about 1600 kilometres from where they were fishing when their runabout broke down earlier in the month, Canada.com reported.

Stevie Notte, 38, Gabriel Mwareow, 32, and Solomon Tom, 25, had only left the Pacific island of Nauru for a day's fishing and had little food and no water with them. As they drifted helplessly for 11 days with only a small piece of board to hold up as protection from the sun, they caught one tuna and one shark for food, Notte said, adding, "we drank the blood of the shark, we were so thirsty." When there was a brief shower of rain, he said, "we licked the boat to get water."

Nauru officials asked the Australian navy to assist with the initial search and Notte said that on the fourth and fifth days adrift they saw aircraft flying overhead, but could not attract the pilots' attention. "What kept me alive was my children. I kept thinking about them. I couldn't die at sea with them waiting for me. I had to try my best to stay alive," Notte said.

On the 11th day, when they saw the Taiwan fishing boat in the distance, they started a small fire in their aluminium boat hoping the fishing boat crew would see the smoke. "Tom and Gabriel held me up to wave at the fishing boat," Notte said.

They did not stop waving or put out the fire until the fishing boat got close and dropped a small boat over the side to rescue them. The *Fong Seong 767* kept the Nauruans on board until it docked in Majuro in the Marshall Islands weeks later to offload its cargo of tuna.

Gabriel Mwareow commenting on his sea survival experience two weeks after he was rescued by the Taiwanese longliner

Solomon Tom, one of the lucky drifters, displaying the SPC sea safety checklist with SPC Fisheries Development and Training Adviser Michel Blanc

SPC sea safety posters and cards are great tools to remind fishers of the things to do and the safety items to take onboard before going to sea

Sea safety awareness project in Tamil Nadu, India

John Swamy

A sea safety awareness/training project funded by the Rural Development and Panchayat Raj Department, Government of Tamil Nadu, under the Asian Development Bank's Tsunami Emergency Assistance Project, is under way. Implemented by the South Indian Federation of Fishermen Societies (SIFFS), the project is directly targeting over 30,000 active, seagoing, small-boat fishermen and over 60,000 women and children of fishing communities. The project will cover 547 fishing villages in all the 12 coastal districts of Tamil Nadu. It is probably the largest sea safety training/awareness campaign in the world targeting small-boat fishermen.

The project includes sea safety training workshops for small-boat fishermen; survival at sea training with a demonstration of 13 pieces of safety equipment suitable for carriage in small fishing boats; sea safety awareness workshops for women and children of fishing communities; distribution of a handbook on small-boat sea safety; screening of a 30-minute film on sea safety; and the formation of village safety/rescue volunteer groups in the 547 fishing villages. Data on sea safety incidents along the entire coast of Tamil Nadu will be collected during the project period.

The project is being facilitated by a team of 30, supported by village volunteers and small-scale fishermen's federations along the coast of Tamil Nadu, and coordinated from four zonal offices at Pondicherry, Karaikal, Rameshwaram and Nagercoil. A web-based sea safety incident reporting and data input system will be linked to the sea safety website of SIFFS, where the current status of the project, accident data analysis and other information relevant to sea safety will be published regularly.

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www.siffs.org

FishSAFE New Zealand

Source: Maritime New Zealand
(http://www.fishsafe.org.nz)

FishSAFE began as a group of people from very different backgrounds, committed to improving safety outcomes in the fishing fleet. It is succeeding in that – and the benefits have grown as the mutual respect does.

FishSAFE is a tripartite relationship, formed in 2005, between the government (primarily New Zealand's maritime safety regulator, Maritime New Zealand, and its injury prevention/accident compensation body, the Accident Compensation Corporation or ACC), the Seafood Industry Training Organisation (SITO) and the commercial fishing industry. Pete Dawson, CEO of the Federation of Commercial Fishermen, is the chair of FishSAFE.

The FishSAFE programme for inshore fishers was launched in May 2006. A set of health and safety guidelines, written by inshore fishers for inshore fishers, are the focus of free one-day workshops. The workshops are complemented by a free mentor service, with current or ex-fishers working one-on-one with skippers to assist them in increasing the level of safety on board their boats. So far over 620 individual fishers, from over 420 boats, have been through the workshops. SITO has recently set up the framework to allow fishers going through the programme to achieve a unit standard outcome. Participants can also apply for a reduction in their ACC levies of around 8%.

Feedback from the programme has been extremely positive, and best of all, ACC reports that the numbers of injury claims from participants have reduced from previous levels. The programme has also raised awareness of safety and led to a growth in observed "safety culture" throughout the industry.

A similar programme for the aquaculture sector was launched in July 2007. The original guidelines for the inshore sector were rewritten by a group from the

aquaculture industry and the workshop was modified to use aquaculture-related examples. Mentors have also been established from the aquaculture sector. Guidelines for factory fishing vessels are also in development, with representatives from the major fishing companies drafting specific sections.

Maritime New Zealand and others across the maritime industry (non-fishing) have been impressed by the feedback from the workshops and the observable safety impacts, and have used the same concept to work with the passenger and non-passenger sectors. There is also much interest in the programme from elsewhere in the New Zealand government sector.

FishSAFE is much wider than simply these training programmes, though. It has proven to be the means by which relationships between government and industry have been taken to a new level of partnership – everyone has learnt to listen and respect other viewpoints, while understanding that partnership doesn't necessarily mean agreement. Robust debate has taken place regarding government policy proposals, and the resulting initiatives are all the better for it. Industry has a forum in which to raise important issues and ensure that government advisers know the impact that their decisions have, while industry in turn has a deeper insight into the reasons why government does things the way it does.

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