



“IMO guidelines on the use of UHF at sea”

ΑΚΑΔΗΜΙΑ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ
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Introduction

Marine VHF radio refers to the radio frequency range between 156.0 and 174 MHz, inclusive. The "VHF" signifies the very high frequency of the range. In the official language of the International Telecommunication Union the band is called the VHF maritime mobile band. In some countries additional channels are used, such as the L and F channels for leisure and fishing vessels in the Nordic countries (at 155.5–155.825 MHz).

Marine VHF radio equipment is installed on all large ships and most seagoing small craft. It is also used, with slightly different regulation, on rivers and lakes. It is used for a wide variety of purposes, including summoning rescue services and communicating with harbours, locks, bridges and marinas.

A marine VHF set is a combined transmitter and receiver and only operates on standard, international frequencies known as channels. Channel 16 (156.8 MHz) is the international calling and distress channel. Transmission power ranges between 1 and 25 watts, giving a maximum range of up to about 60 nautical miles (111 km) between aerials mounted on tall ships and hills, and 5 nautical miles (9 km; 6 mi) between aerials mounted on small boats at sea level. Frequency modulation (FM) is used, with vertical polarization, meaning that antennas have to be vertical in order to have good reception.

Modern-day marine VHF radios offer not only basic transmit and receive capabilities. Permanently mounted marine VHF radios on seagoing vessels are required to have certification of some level of "Digital Selective Calling" (DSC) capability, to allow a distress signal to be sent with a single button press.

Marine VHF mostly uses "simplex" transmission, where communication can only take place in one direction at a time. A transmit button on the set or microphone determines whether it is operating as a transmitter or a receiver. Some channels, however, are "duplex" transmission channels where communication can take place in both directions simultaneously when the equipment on both ends allow it (full

duplex), otherwise "semi-duplex" is used. Each duplex channel has two frequency assignments. Duplex channels can be used to place calls on the public telephone system for a fee via a marine operator. When full duplex is used, the call is similar to one using a mobile phone or landline. When semi-duplex is used, voice is only carried one way at a time and the party on the boat must press the transmit button only when speaking. This facility is still available in some areas, though its use has largely died out with the advent of mobile and satellite phones. Marine VHF radios can also receive weather radio broadcasts, where they are available.



A VHF set and a VHF channel 70 DSC set, the DSC on top (https://en.wikipedia.org/wiki/Marine_VHF_radio)



A standard handheld maritime VHF, mandatory on larger seagoing vessels under the GMDSS rules (https://en.wikipedia.org/wiki/Marine_VHF_radio)



A classic maritime VHF set (https://en.wikipedia.org/wiki/Marine_VHF_radio)

Chapter 1 - MARITIME COMMUNICATIONS - VHF EXCHANGES

Any conversation at sea, i.e. a ship-to-ship, ship-to-shore or shore-to-ship exchange, consists of the following stages:

1. MAKING CONTACT
2. EXCHANGE OF MESSAGES
3. END PROCEDURE

1.1 Making Contacts

If the name of the ship or station being called is unknown, the following making contact procedure is recommended by SMCP (Standard Marine Navigational Phrases 1997) and SEASPEAK (1985):

CALLING STATION: All ships, all ships, all ships (in sea area ...) Calling *unknown ship in position: bearing: 1-8-5 degrees from Punta Stella distance: 4.6 miles. This is Newhaven Radio. I-O-4- N. Over.

*or: Calling unknown ship. Type: Container ship: hull colour: blue, funnel: red. ...

RESPONDING STATION: Newhaven Radio, I-O-4- N. This is Sea Urchin, N-W-F-9, in position: bearing: 1-8-5 degrees from Punta Stella, distance: 4.6 miles. Over.

In the making contact stage it is usually necessary for one station to indicate the working channel and the other to agree to it, e.g.:

CALLING STATION: Sea Urchin, This is Newhaven Radio. Switch to VHF Channel two - two. Over.

RESPONDING STATION: Newhaven Radio, This is Sea Urchin, Agree VHF channel two - two. Over.

If the name of a ship or station is known (i.e. its name and call sign), the recommended making contact procedure is as follows:

CALLING STATION: Pontebba, I - Q - W - T, Pontebba, I - Q - W - T. This is Sea Urchin, N-W-F-9, Sea Urchin, N-W-F-9, on VHF channel one - six. Over.

RESPONDING STATION: Sea Urchin, N-W-F-9. This is Pontebba, I - Q - W - T. Over.

1.2 Exchange of Messages

In the message exchange procedure the following message markers (i.e. words introducing the content and purpose of the message) are:

<u>Message Marker</u>	<u>Answer to Message Marker</u>
QUESTION	ANSWER
INSTRUCTION	(INSTRUCTION RECEIVED)
ADVICE	(ADVICE RECEIVED)
REQUEST	(REQUEST RECEIVED)
INFORMATION	(INFORMATION RECEIVED)
WARNING	(WARNING RECEIVED)
INTENTION	(INTENTION RECEIVED)

Examples:

QUESTION: What are your intentions?	ANSWER: I intend to alter course to starboard
WARNING: Buoy number: one - five unlit	WARNING RECEIVED: Buoy number: one - five unlit
ADVICE: You must anchor clear of fairway	ADVICE RECEIVED: I shall anchor clear of fairway
INFORMATION: The fairway entrance is: position: bearing 1-3-7 degrees true from North Point Lighthouse, distance: 2 decimal 3 miles	INFORMATION RECEIVED: The fairway entrance is: position: bearing 1-3-7 degrees true from North Point Lighthouse, distance: 2 decimal 3 miles
REQUEST: Please supply bunkers: quantity: 3 thousand metric tonnes	REQUEST RECEIVED: Supply bunkers: quantity: 3 thousand metric tonnes
INSTRUCTION: Steer course two - two -	INSTRUCTION RECEIVED: I shall

three degrees true. reason: to comply with traffic separation scheme	steer course two - two - three degrees true to comply with traffic separation scheme
INTENTION: I intend to reduce speed, new speed: eight knots	INTENTION RECEIVED: You intend to reduce speed, new speed: eight knots

(http://www.pfri.uniri.hr/~bopri/documents/36_VHF_Exchanges.pdf)

1.3 End Procedure

In the end procedure the conversation is terminated, by confirming the previous turn:

UNDERSTOOD or by saying: NOTHING MORE or GOING BACK TO CHANNEL ONE SIX or I'LL GIVE YOU A CALL BACK WHEN ON BUOY DELTA ONE TWO, and by adding a polite greeting:

HAVE A GOOD WATCH - HAVE PLEASANT VOYAGE TO

Finally, the closing phrase OUT or OVER AND OUT is used; e.g.:

CALLING STATION: Seaside VTS. This is Pontebba. Your message understood. Nothing more. Thank you. Have a pleasant voyage to Ceuta. Over.

RESPONDING STATION: Pontebba. This is Seaside VTS. Thank you. Have a good watch. Over and out.

1.4 Types of equipment

Sets can be fixed or portable. A fixed set generally has the advantages of a more reliable power source, higher transmit power, a larger and more effective aerial and a bigger display and buttons. A portable set (often essentially a waterproof, VHF walkie-talkie in design) can be carried on a kayak, or to a lifeboat in an emergency, has its own power source and is waterproof if GMDSS-approved. A few portable VHF's are even approved to be used as emergency radios in environments requiring intrinsically safe equipment (e.g. gas tankers, oil rigs, etc.).

Marine radios can be "voice-only" or can include "Digital Selective Calling" (DSC).

Voice-only equipment is the traditional type, which relies totally on the human voice for calling and communicating.

Digital Selective Calling equipment, a part of the Global Maritime Distress Safety System (GMDSS), provides all the functionality of voice-only equipment and, additionally, allows several other features:

- a transmitter can automatically call a receiver equipped with Digital Selective Calling, using a telephone-type number known as a Maritime Mobile Service Identity(MMSI). The DSC information is sent on the reserved Channel 70. When

the receiver picks up the call, their active channel is automatically switched to the transmitter's channel and normal voice communication can proceed.

- a distress button, which automatically sends a digital distress signal identifying the calling vessel and the nature of the emergency
- a connection to a GPS receiver allowing the digital distress message to contain the distressed vessel's position

The MMSI is used for seagoing vessels and consists of a nine-digit number identifying a VHF set or group of sets. The left hand digits of MMSI indicate the country and type of station. For example, here are MMSI prefixes of four station types:

- Ship : 232, 233, 234 or 235 are the United Kingdom – e.g. a UK ship : 232003556
- Coastal station : 00 – e.g. Solent Coastguard : 002320011
- Group of stations : 0 – e.g. 023207823
- Portable DSC equipment : for UK 2359 - e.g. 235900498

Here is an external link where you can find different countries' MMSI Numbers <http://www.vtexplorer.com/vessel-tracking-mmsi-mid-codes.html>

For use on the inland waterways within continental Europe, a compulsory Automatic Transmitter Identification System (ATIS) transmission conveys the vessel's identity after each voice transmission. This is a ten-digit code that is either an encoded version of the ship's alphanumeric call sign, or for vessels from outside the region, the ship MMSI prefixed with "9". The requirement to use ATIS in Europe, and which VHF channels may be used, are strongly regulated, most recently by the Basel agreements.

1.5 Channels and frequencies

Simplex channels here are listed with the A and B frequencies the same. The frequencies, channels, and some of their purposes are governed by the ITU. For an authoritative list see. The original allocation of channels consisted of only channels 1 to 28 with 50 kHz spacing between channels, and the second frequency for duplex operation 4.6 MHz higher.

Improvements in radio technology later meant that the channel spacing could be reduced to 25 kHz with channels 60 to 88 interspersed between the original channels.

Channels 75 and 76 are omitted as they are either side of the calling and distress channel 16, acting as guard channels. The frequencies which would have been the second frequencies for simplex channels are not used for marine purposes and can be used for other purposes that vary by country. For example, 161.000 to 161.450 MHz are part of the allocation to the Association of American Railroads channels used by railways in the USA and Canada.

Chapter 2 – IMO GUIDELINES ON THE USE OF VHF AT SEA

2.1 VHF communication technique

2.1.1 Preparation

Before transmitting, think about the subjects which have to be communicated and, if necessary, prepare written notes to avoid unnecessary interruptions and ensure that no valuable time is wasted on a busy channel.

2.1.2 Listening

Listen before commencing to transmit to make certain that the channel is not already in use. This will avoid unnecessary and irritating interference.

2.1.3 Discipline

VHF equipment should be used correctly and in accordance with the Radio Regulations. The following in particular should be avoided:

- .1 calling on channel 16 for purposes other than distress, urgency and very brief safety communications when another channel is available;
- .2 communications not related to safety and navigation on port operation channels;
- .3 non-essential transmissions, e.g. needless and superfluous signals and correspondence;
- .4 transmitting without correct identification;
- .5 occupation of one particular channel under poor conditions; and
- .6 use of offensive language.

2.1.4 Repetition

Repetition of words and phrases should be avoided unless specifically requested by the receiving station.

2.1.5 Power reduction

When possible, the lowest transmitter power necessary for satisfactory communication should be used.

2.1.6 Automatic identification system (AIS)

AIS is used for the exchange of data in ship-to-ship communications and also in communication with shore-based facilities. The purpose of AIS is to help identify vessels; assist in target tracking; simplify information exchange (e.g. reduce verbal reporting); and provide additional information to assist situation awareness. AIS may be used together with VHF voice communications. AIS should be operated in accordance with resolution A.917(22), as amended by resolution A.956(23) on Guidelines for the onboard operational use of shipborne automatic identification systems (AISs).

2.1.7 Communications with coast stations

2.1.7.1 On VHF channels allocated to port operations service, the only messages permitted are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons; as the use of these channels for ship-to-ship communications may cause serious interference to communications related to the movement and safety of shipping in port areas.

2.1.7.2 Instructions given on communication matters by shore stations should be obeyed.

2.1.7.3 Communications should be carried out on the channel indicated by the coast station. When a change of channel is requested, this should be acknowledged by the ship.

2.1.7.4 On receiving instructions from a coast station to stop transmitting, no further communication should be made until otherwise notified (the coast station may be receiving distress or safety messages and any other transmissions could cause interference).

2.1.8 Communications with other ships

2.1.8.1 VHF channel 13 is designated by the Radio Regulations for bridge-to-bridge communications. The ship called may indicate another working channel on which further transmissions should take place. The calling ship should acknowledge acceptance before changing channels.

2.1.8.2 The listening procedure outlined in paragraph 1.2 should be followed before communications are commenced on the chosen channel.

2.1.9 Distress communications

2.1.9.1 Distress calls/messages have absolute priority over all other communications. When receiving them all other transmissions should cease and a listening watch should be kept.

2.1.9.2 Any distress call/message should be recorded in the ship's log and passed to the master.

2.1.9.3 On receipt of a distress message, if in the vicinity, immediately acknowledge receipt. If not in the vicinity, allow a short interval of time to elapse before

acknowledging receipt of the message in order to permit ships nearer to the distress to do so.

2.1.10 Calling

2.1.10.1 In accordance with the Radio Regulations channel 16 may only be used for distress, urgency and very brief safety communications and for calling to establish other communications which should then be conducted on a suitable working channel.

2.1.10.2 Whenever possible, a working frequency should be used for calling. If a working frequency is not available, VHF channel 16 may be used for calling, provided it is not occupied by a distress and urgency call/message.

2.1.10.3 In case of a difficulty in establishing contact with a ship or a coast station, allow adequate time before repeating the call. Do not occupy the channel unnecessarily and try another channel.

2.1.11 Changing channels

If communications on a channel are unsatisfactory, indicate change of channel and await confirmation.

2.1.12 Spelling

If spelling becomes necessary (e.g. descriptive names, call signs, words that could be misunderstood) use the spelling table contained in the International Code of Signals, the Radio Regulations and the IMO Standard Marine Communication Phrases (SMCP).

2.1.13 Addressing

The words "I" and "YOU" should be used prudently. Indicate to whom they refer. Example: "Seaship, this is Port Radar, Port Radar, do you have a pilot? Port Radar, this is Seaship, I do have a pilot."

2.1.14 Watchkeeping

Every ship, while at sea, is required to maintain watches (Regulation on Watches in Chapter IV of SOLAS, 1974, as amended). Continuous watchkeeping is required on VHF DSC channel 70 and also when practicable, a continuous listening watch on VHF channel 16.

2.2 VHF communication procedures

2.2.1 Calling

When calling a coast station or another ship, say the name of that coast station once (twice if considered necessary in heavy radio traffic conditions) followed by the phrase THIS IS and the ship's name twice, indicating the channel in use.

Example: "Port City, this is Seastar, Seastar, on Channel 14."

2.2.2 Exchange of messages

2.2.2.1 When communicating with a ship whose name is unknown but whose position is known, that position may be used. In this case the call is addressed to all ships.

Example: "Hello all ships, this is Pastoria, Pastoria. Ship approaching number four buoy, I am passing Belinda Bank Light."

2.2.2.2 Where a message is received and only acknowledgement of receipt is needed, say "received". Where a message is received and acknowledgement of the correct message is required, say "received, understood", and repeat message if considered necessary.

Example: "Message: Your berth will be clear at 08.30 hours. Reply: Received, understood. Berth clear at 08.30 hours."

2.2.2.3 Where appropriate, the following message should be sent: "Please use/ I will use the IMO Standard Marine Communication Phrases".

When language difficulties exist which cannot be resolved by use of the IMO Standard Marine Communication Phrases , the International Code of Signals should be used.

In this case, the word "INTERCO" should precede the groups of the International Code of Signals.

Example: "Please use/I will use the International Code of Signals".

2.2.2.4 Where the message contains instructions or advice, the substance should be repeated in the reply.

Example: "Message: Advise you pass astern of me. Reply: I will pass astern of you."

2.2.2.5 If a message is not properly received, ask for it to be repeated by saying "Say again".

2.2.2.6 If a message is received but not understood, say "Message not understood".

2.2.2.7 If it is necessary to change to a different channel say "Change to channel" and wait for acknowledgement before carrying out the change.

2.2.2.8 During exchange of messages, a ship should invite a reply by saying "over".

2.2.2.9 The end of a communication is indicated by the word "out".

2.3 Standard messages

2.3.1 Since most ship-to-shore communications are exchanges of information, it is advisable to use standard messages which will reduce transmission time.

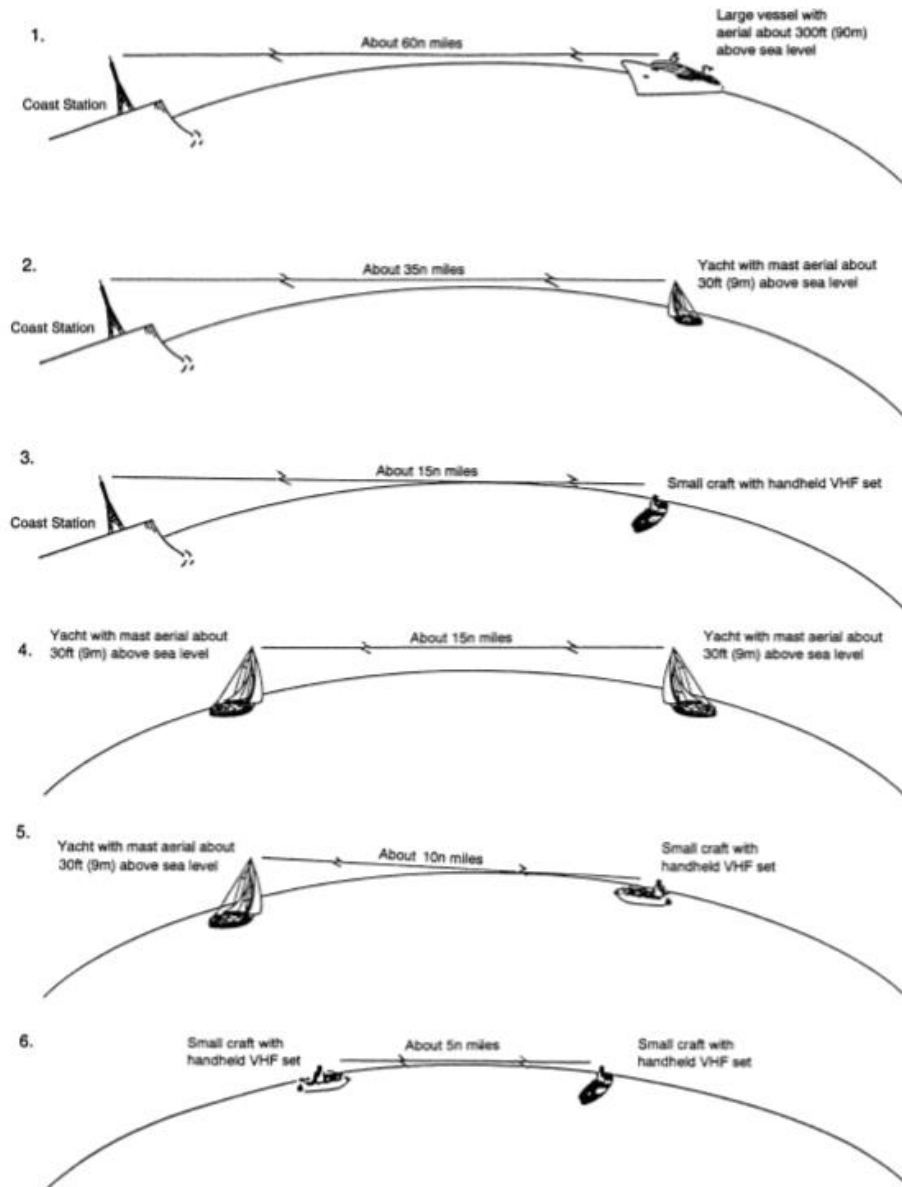
2.3.2 Commonly used standard messages are given in the IMO Standard Marine Communication Phrases (SMCP) , which should be used whenever possible.

2.4 Typical VHF Ranges

APPENDIX II

TYPICAL VHF RANGES

(Extract from Admiralty List of Radio Signals Volume 5 published by the United Kingdom Hydrographic Office)



(http://solasv.mcga.gov.uk/m_notice/mgn/mgn324.pdf)

It should be noted that the fact that a transmitter and receiver are within radio sight does not automatically guarantee that an acceptable signal will be received at that point. This will depend, amongst other things on the power of transmission, the sensitivity of the receiver and the quality and position of the transmitting and receiving aerials. The range may also be affected to some degree by the pressure, temperature and humidity of the air between the transmitter and receiver.

Table of Transmitting Frequencies in the VHF maritime mobile band

(Extract from Admiralty List of Radio Signals Volume 5 published by the United Kingdom Hydrographic Office)

Channel designators	Notes	Transmitting frequencies (MHz)		Inter Ship	Port operations and ship movement		Public correspondence	
		Ship stations	Coast stations		Single frequency	Two frequency		
01		156 025	160 625			X	x	
		156 050	160 650			X	x	
02	m), o)	156 075	160 675		x	X	x	
		156 100	160 700		x	X	x	
03	m), o)	156 125	160 725		x	X	x	
		156 150	160 750		x	X	x	
04	m), o)	156 175	160 775		x	X	x	
		156 200	160 800		x	X	x	
05	m), o)	156 225	160 825		x	X	x	
		156 250	160 850		x	X	x	
06	m), o)	156 275	160 875		x	X	x	
06	f)	156 300		x				
		156 325	160 925			X	x	
07		156 350	160 950			X	x	
08	h)	156 375	156 375	x	x			
		156 400		x				
09	i)	156 425	156 425		x			
		156 450	156 450	x	x			
10	h)	156 475	156 475	x	x			
		156 500	156 500	x	x			
11	j)	156 525	156 525	Digital selective calling for Distress, Safety and Calling				
		156 550	156 550		x			
12		156 575	156 575		x			
		156 600	156 600		x			
13	i)	156 625		x				
		156 650	156 650	x	x			
14	h), i)	156 675	156 675	x	x			
		156 700	156 700		x			
15	g)	156 725	156 725		x			
		156 750	156 750	x	x			
16	n)	156 775			x			
		156 800	156 800	Distress, Safety and Calling				
17	n)	156 825			x			
		156 850	156 850	x	x			
18	g)	156 875		x				
		156 900	161 500		x	X	x	
		156 925	161 525			X	x	

Continued on next page

Channel designators	Notes	Transmitting frequencies (MHz)		Inter Ship	Port operations and ship movement		Public correspondence
		Ship stations	Coast stations		Single frequency	Two frequency	
19		156 950	161 550			x	x
79		156 975	161 575			x	x
20		157 000	161 600			x	x
80		157 025	161 625			x	x
21		157 050	161 650			x	x
81		157 075	161 675			x	x
22	m)	157 100	161 700		x	x	x
82	m), o)	157 125	161 725		x	x	x
23	m), o)	157 150	161 750		x	x	x
83	m), o)	157 175	161 775		x	x	x
24	m), o)	157 200	161 800		x	x	x
84	m), o)	157 225	161 825		x	x	x
25	m), o)	157 250	161 850		x	x	x
85	m), o)	157 275	161 875		x	x	x
26	m), o)	157 300	161 900		x	x	x
86	m), o)	157 325	161 925		x	x	x
27		157 350	161 950			x	x
87		157 375	161 975		x		
28		157 400	162 000			x	x
88	h)	157 425			x		
AIS 1	l)	161 975	161 975				
AIS 2	l)	162 025	162 025				

(http://solasv.mcga.gov.uk/m_notice/mgn/mgn324.pdf)

General notes

a) Administrations may designate frequencies for the following purposes, intership, port operations and ship movement services for use by light aircraft and helicopters to communicate with ships or participating coast stations in predominantly maritime support operations. However, the use of the channels which are shared with public correspondence shall be subject to prior agreement between interested and affected administrations.

b) The channels in this table, with the exception of Channels 06, 13, 15, 16, 17, 70, 75 and 76, may also be used for high-speed data and facsimile transmissions, subject to special arrangement between interested and affected administrations.

c) The channels in this table, but preferably Channel 28 and with the exception of Channels 06, 13, 15, 16, 17, 70, 75 and 76, may be used for direct-printing telegraphy and data transmission, subject to special arrangement between interested and affected administrations.

d) The frequencies in this table may also be used for radiocommunications on inland waterways.

e) Administrations having an urgent need to reduce local congestion may apply 12·5 kHz Channel interleaving on a non-interference basis to 25 kHz channels, provided:

— Recommendation ITU-R M.1084-2 shall be taken into account when changing to 12·5 kHz Channels;

— it shall not affect the 25 kHz Channels of the Appendix 18 maritime mobile distress and safety frequencies, especially the Channels 06, 13, 15, 16, 17, and 70, nor the technical characteristics mentioned in Recommendation ITU-R M.489-2 for those channels;

— implementation of 12·5 kHz channel interleaving and consequential national requirements shall be subject to prior agreement between the implementing administrations and administrations whose ship stations or services may be affected.

Specific notes

f) The frequency 156·300 MHz (Channel 06) may also be used for communication between ship stations and aircraft stations engaged in co-ordinated search and rescue operations. Ship stations shall avoid harmful interference to such communications on Channel 06 as well as to communications between aircraft stations, ice-breakers and assisted ships during ice seasons.

g) Channels 15 and 17 may also be used for on-board communications provided the effective radiated power does not exceed 1 W, and subject to the national regulations of the administration concerned when these channels are used in its territorial waters.

h) Within the European Maritime Area and in Canada, these frequencies (Channels 10, 67 & 73) may also be used, if so required, by the individual administrations concerned, for communication between ship stations, aircraft stations and participating land stations engaged in co-ordinated search and rescue and anti-pollution operations in local areas.

- i) The preferred first three frequencies for the purpose indicated in note a) are 156·450 MHz (Channel 09), 156·625 MHz (Channel 72) and 156·675 MHz (channel 73).
- j) Channel 70 is to be used exclusively for digital selective calling for distress, safety and calling.
- k) Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for intership navigation safety communications. It may also be used for the ship movement and port operations service subject to the national regulations of the administrations concerned.
- l) These Channels (AIS 1 and AIS 2) will be used for an automatic ship identification and surveillance system capable of providing worldwide operation on high seas, unless other frequencies are designated on a regional basis for this purpose.
- m) These Channels (18 and 82 to 86) may be operated as single frequency channels, subject to special arrangement between interested or affected administrations.
- n) The use of these Channels (75 and 76) should be restricted to navigation-related communications only and all precautions should be taken to avoid harmful interference to Channel 16, e.g. by limiting the output power to 1 W or by means of geographical separation.
- o) These channels may be used to provide bands for initial testing and the possible future introduction of new technologies, subject to special arrangement between interested or affected administrations. Stations using these channels or bands for the testing and the possible future introduction of new technologies shall not cause harmful interference to, and shall not claim protection from, other stations operating in accordance with ITU Radio Regulations / Volume 1 / Chapter SII - Frequencies / Article S5 / Frequency allocations.

Chapter 3 – RADIO: OPERATIONAL GUIDANCE ON THE USE OF VHF AND AIS AT SEA

1. The International Maritime Organisation (IMO) has noted with concern the widespread misuse of VHF channels at sea especially the distress, safety and calling Channels 16 (156.8 MHz) and 70 (156.525 MHz), and channels used for port operations, ship movement services and reporting systems. Although VHF at sea makes an important contribution to navigation safety, its misuse causes serious interference and, in itself, becomes a danger to safety at sea. IMO has asked Member Governments to ensure that VHF channels are used correctly.

2. All users of marine VHF on United Kingdom vessels, and all other vessels in United Kingdom territorial waters and harbours, are therefore reminded, in conformance with international and national legislation, marine VHF apparatus may only be used in accordance with the International Telecommunications Union's (ITU) Radio Regulations. These Regulations specifically prescribe that:

(a) Channel 16 may only be used for distress, urgency and very brief safety communications and for calling to establish other communications which should then be concluded on a suitable working channel;

(b) Channel 70 may only be used for Digital Selective Calling not oral communication;

(c) On VHF channels allocated to port operations or ship movement services such as VTS, the only messages permitted are restricted to those relating to operational handling, the movement and the safety of ships and to the safety of persons;

(d) All signals must be preceded by an identification, for example the vessel's name or callsign;

(e) The service of every VHF radio telephone station must be controlled by an operator holding a certificate issued or recognised by the station's controlling administration. This is usually the country of registration, if the vessel is registered. Providing the Station is so controlled, other persons besides the holder of the certificate may use the equipment.

3. Appendix I to this notice contains the IMO Guidance on the use of VHF at sea. Masters, Skippers and Owners must ensure that VHF channels are used in accordance with this guidance.

4. Appendix II to this notice illustrates typical VHF ranges and a table of transmitting Frequencies in the Band 156 – 174 MHz for Stations in the Maritime Mobile Service, incorporating changes agreed by the 1997 World Radio Conference.

5. Channels 6, 8, 72 and 77 have been made available, in UK waters, for routine ship-to-ship communications, Masters, Skippers and Owners are urged to ensure that all ship-to-ship communications working in these waters is confined to these channels, selecting the channel most appropriate in the local conditions at the time.

6. Channel 13 is designated for use on a worldwide basis as a navigation safety communication channel, primarily for international navigation safety communications. It may also be used for the ship movement and port services.

Use of VHF as Collision Avoidance Aid

7. There have been a significant number of collisions where subsequent investigation has found that at some stage before impact, one or both parties were using VHF radio in an attempt to avoid collision. The use of VHF radio in these circumstances is not always helpful and may even prove to be dangerous.

8. At night, in restricted visibility or when there are more than two vessels in the vicinity, the need for positive identification is essential but this can rarely be guaranteed. Uncertainties can arise over the identification of vessels and the interpretation of messages received. Even where positive identification has been achieved there is still the possibility of a misunderstanding due to language difficulties however fluent the parties concerned might be in the language being used. An imprecise or ambiguously expressed message could have serious consequences.

9. Valuable time can be wasted whilst mariners on vessels approaching each other try to make contact on VHF radio instead of complying with the Collision Regulations. There is the further danger that even if contact and identification is achieved and no difficulties over the language of communication or message content arise, a course of action might still be chosen that does not comply with the Collision Regulations. This may lead to the collision it was intended to prevent.

10. In 1995, the judge in a collision case said "It is very probable that the use of VHF radio for conversation between these ships was a contributory cause of this collision,

if only because it distracted the officers on watch from paying careful attention to their radar. I must repeat, in the hope that it will achieve some publicity, what I have said on previous occasions that any attempt to use VHF to agree the manner of passing is fraught with the danger of misunderstanding. Marine Superintendents would be well advised to prohibit such use of VHF radio and to instruct their officers to comply with the Collision Regulations."

11. In a case published in 2002 one of two vessels, approaching each other in fog, used the VHF radio to call for a red to red (port to port) passing. The call was acknowledged by the other vessel but unfortunately, due to the command of English on the calling vessel, what the caller intended was a green to green (starboard to starboard) passing. The actions were not effectively monitored by either of the vessels and collision followed.

12. Again in a case published in 2006 one of two vessels, approaching one another to involve a close quarter's situation, agreed to a starboard to starboard passing arrangement with a person on board another, unidentified ship, but not the approaching vessel. Furthermore, the passing agreement required one of the vessels to make an alteration of course, contrary to the requirements of the applicable Rule in the COLREGS. Had the vessel agreed to a passing arrangement requiring her to manoeuvre in compliance with the COLREGS, the ships would have passed clear, despite the misidentification of ships on the VHF radio. Unfortunately by the time both vessels realised that the ships had turned towards each other the distance between them had further reduced to the extent that the last minute avoiding action taken by both ships was unable to prevent a collision.

13. Although the practice of using VHF radio as a collision avoidance aid may be resorted to on occasion, for example in pilotage waters, the risks described in this note should be clearly understood and the Collision Regulations complied with.

Use of VHF Automatic Identification Systems (AIS)

14. AIS operates primarily on two dedicated VHF channels (AIS1 – 161.975 MHz and AIS2 – 162.025 MHz). Where these channels are not available regionally, the AIS is capable of automatically switching to alternate designated channels. AIS has

now been installed on the majority of commercial vessels, and has the potential to make a significant contribution to safety. However the mariner should treat the AIS information with caution, noting the following important points:

15. Mariners on craft fitted with AIS should be aware that the AIS will be transmitting ownship data to other vessels and shore stations. To this end they are advised to:

15.1 initiate action to correct improper installation;

15.2 ensure the correct information on the vessel's identity, position, and movements (including voyage-specific, see Annex IV) is transmitted; and

15.3 ensure that the AIS is turned on, at least within 100 nautical miles of the coastline of the United Kingdom.

16. The simplest means of checking whether own-ship is transmitting correct information on identity, position and movements is by contacting other vessels or shore stations. Increasingly, UK Coastguard and port authorities are being equipped as AIS shore base stations. As more shore base stations are established, AIS may be used to provide a monitoring system in conjunction with Vessel Traffic Services and Ship Reporting (SOLAS Chapter V, Regulations 11 and 12 refer).

17. Many ship owners have opted for the least-cost AIS installation to meet the mandatory carriage requirement. By doing so, many of the benefits offered by graphic display (especially AIS on radar) are not realized with the 3-line 'Minimum Keyboard Display' (MKD).

18. The Pilot Connector Socket and suitable power outlet should be located somewhere of practical use to a marine pilot who may carry compatible AIS equipment. This should be somewhere close to the wheelhouse main conning position. Less accessible locations in chart rooms, at the after end of the wheelhouse are not recommended.

19. The routine updating of data into the AIS, at the start of the voyage and whenever changes occur, should be included in the navigating officer's checklist and include: - ship's draught; -hazardous cargo; -destination and ETA; -route plan (way points); - correct navigational status; -short safety-related messages.

20. The quality and reliability of position data obtained from targets will vary depending on the accuracy of the transmitting vessel's GNSS equipment. It should be noted that older GNSS equipment may not produce Course Over Ground and Speed Over Ground (COG/SOG) data to the same accuracy as newer equipment. 21. Operational guidance for Automatic Identification Systems (AIS) on board ships can be found in the MCA Guidance on the Safety of Navigation - Implementing SOLAS Chapter V (accessible from the MCA website at www.mcga.gov.uk) and reproduced in Appendix IV of this notice.

Chapter 4 - RECOMMENDATION ON PERFORMANCE STANDARDS FOR SHIPBORNE VHF RADIO INSTALLATIONS CAPABLE OF VOICE COMMUNICATION AND DIGITAL SELECTIVE CALLING

4.1 INTRODUCTION

The VHF radio installation, in addition to meeting the requirements of the Radio Regulations, the relevant ITU-R Recommendations and the general requirements set out in resolution A.694(17), should comply with the following performance standards.

4.2 GENERAL

4.2.1 The installation, which may consist of more than one piece of equipment, should be capable of operating on single-frequency channels or on single- and two-frequency channels.

4.2.2 The equipment should provide for the following categories of calls using both voice and digital selective calling (DSC): .1 distress, urgency and safety; .2 ship operational requirements; and .3 public correspondence.

4.2.3 The equipment should provide for the following categories of communications using voice:

- .1 distress, urgency and safety;
- .2 ship operational requirements; and
- .3 public correspondence.

4.2.4 The equipment should comprise at least:

- .1 a transmitter/receiver including antenna;
- .2 an integral control unit or one or more separate control units;
- .3 a microphone with a press-to-transmit switch, which may be combined with a telephone in a handset;
- .4 an internal or external loudspeaker;
- .5 an integral or separate digital selective calling facility; and
- .6 a dedicated DSC watchkeeping facility to maintain a continuous watch on channel 70.

4.2.5 The installation may also include additional receivers.

4.2.6 A distress alert should be activated only by means of a dedicated distress button. This button should not be any key of an ITU-T digital input panel or an ISO keyboard provided on the equipment.

4.2.7 The dedicated distress button should:

- .1 be clearly identified; and

.2 be protected against inadvertent operation.

4.2.8 The distress alert initiation should require at least two independent actions.

4.2.9 The equipment should indicate the status of the distress alert transmission.

4.2.10 It should be possible to interrupt and initiate distress alerts at any time.

4.3 CLASS OF EMISSION, FREQUENCY BANDS AND CHANNELS

4.3.1 The equipment may be designated for operation on one or more channels selected from and in accordance with Appendix 18 of the Radio Regulations.

4.3.2 The radiotelephone facility should be capable of operating as follows:

.1 in the band 156.3 MHz to 156.875 MHz on single-frequency channels as specified in Appendix 18 to the Radio Regulations; and

.2 in the band 156.025 MHz to 157.425 MHz for transmitting and the band 160.625 MHz to 162.025 MHz for receiving on two-frequency channels as specified in Appendix 18 to the Radio Regulations.

4.3.3 The digital selective calling facility should be capable of operating on channel 70.

4.3.4 Class of emission should comply with Appendix 19 of the Radio Regulations.

4.4 CONTROLS AND INDICATORS

4.4.1 General

4.4.1.1 Change of channel should be capable of being made as rapidly as possible, but in any event within 5 s.

4.4.1.2 The time taken to switch from the transmit to the receive condition, and vice versa, should not exceed 0.3 s.

4.4.1.3 An on/off switch should be provided for the entire installation with a visual indication that the installation is switched on.

4.4.1.4 A visual indication that the carrier is being transmitted should be provided.

4.4.1.5 The equipment should indicate the channel number, as given in the Radio Regulations, to which it is tuned. It should allow the determination of the channel number under all conditions of external lighting. Where practicable, channels 16 and 70 should be distinctively marked.

4.4.1.6 Control of the equipment should be possible at the position from which the ship is normally navigated. Control from that position should have priority if additional control units are provided. When there is more than one control unit, indication should be given to the other units that the equipment is in operation.

4.4.1.7 The equipment should not be able to transmit during a channel switching operation.

4.4.1.8 Operation of the transmit/receive control should not cause unwanted emissions.

4.4.2 Radiotelephone facility

4.4.2.1 Provision should be made for changing from transmission to reception by use of a press-to-transmit switch. Additionally, facilities for operation on two-frequency channels without manual control may be provided.

4.4.2.2 The receiver should be provided with a manual volume control by which the audio output may be varied.

4.4.2.3 A squelch (mute) control should be provided on the exterior of the equipment.

4.5 PERMISSIBLE WARMING-UP PERIOD

The equipment should be operational within 1 min of switching on.

4.6 SAFETY PRECAUTIONS

The equipment, when operating, should not be damaged by the effects of open-circuited or short-circuited antenna terminals.

4.7 TRANSMITTER OUTPUT POWER

4.7.1 The transmitter output power should be between 6 and 25 W.

4.7.2 Provision should be made for reducing the transmitter output power to a value of between 0.1 and 1 W. However, this reduction of the power is optional on channel 70.

4.8 RECEIVER PARAMETERS

4.8.1 Radiotelephone facility The sensitivity of the receiver should be equal to or better than $2\mu\text{V}$ e.m.f. for a signal-to-noise ratio of 20 dB.

4.8.2 Digital selective calling facility With a DSC modulated input signal having a level of $1\mu\text{V}$ e.m.f. to its associated VHF receiver, the DSC equipment should be capable of decoding the received message with a maximum permissible output character error rate of 10^{-2} .

4.8.3 Immunity to interference The immunity to interference of the receiver should be such that the wanted signal is not seriously affected by unwanted signals.

4.9 ANTENNA SYSTEM

The VHF antenna or antennae should be vertically polarized and, as far as practicable, be omnidirectional in the horizontal plane. The installation should be suitable for efficient radiation and reception of signals at the operating frequencies.

4.10 LOUDSPEAKER AND TELEPHONE HANDSET (radiotelephone facility)

4.10.1 The receiver output should be suitable for use with a loudspeaker or a telephone handset. The audio output should be sufficient to be heard in the ambient noise level likely to be encountered on board ships.

4.10.2 It should be possible to switch off the loudspeaker without affecting the audio output of the telephone handset, if provided.

4.10.3 In the transmit condition during simplex operation, the output of the receiver should be muted.

4.10.4 In the transmit condition during duplex operation, only the telephone handset should be in circuit. Care should be taken to prevent any electrical or acoustic feedback, which could cause singing.

4.11 DIGITAL SELECTIVE CALLING FACILITY

4.11.1 The facility should conform to the provisions of the relevant ITU-R Recommendations pertaining to the DSC system.

4.11.2 The DSC facility should comprise:

.1 means to decode and encode DSC messages;

.2 means necessary for composing the DSC message;

.3 means to verify the prepared message before it is transmitted;

.4 means to display the information contained in a received call in plain language;

.5 means for the manual entry of the position information; additionally, automatic entry may be provided; and

.6 means for the manual entry of the time at which the position was determined; additionally, automatic entry may be provided.

4.11.3 Distress message storage

4.11.3.1 If the received messages are not printed immediately, sufficient capacity should be provided to enable at least 20 received distress messages to be stored in the DSC facility.

4.11.3.2 These messages should be stored until readout.

4.11.4 It should be possible to initiate and make distress and safety calls from the position from which the ship is normally navigated. The means for initiating a distress call should be as prescribed in 2.6.

4.11.5 Initiation of DSC distress calls should supersede any other operation of the facility.

4.11.6 Self-identification data should be stored in the DSC unit. It should not be possible for the user easily to change these data.

4.11.7 Means should be provided to enable routine testing of the DSC facilities without radiation of signals.

4.11.8 Provision should be made for:









.1 a specific aural alarm and visual indication to indicate receipt of a distress or urgency call or a call having distress category. It should not be possible to disable this alarm and indication. Provision should be made to ensure that they can be reset only manually; and

.2 aural alarms and visual indication for calls other than distress and urgency.

4.12 POWER SUPPLY

The VHF radio installation should be powered from the ship's main source of electrical energy. In addition, it should be possible to operate the VHF installation from an alternative source of electrical energy.

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