

## The IMO Casualty Investigation Code



**ANNEX 1**

**RESOLUTION MSC.255(84)  
(adopted on 16 May 2008)**

**ADOPTION OF THE CODE OF THE INTERNATIONAL STANDARDS AND  
RECOMMENDED PRACTICES FOR A SAFETY INVESTIGATION  
INTO A MARINE CASUALTY OR MARINE INCIDENT  
(CASUALTY INVESTIGATION CODE)**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the function of the Committee,

NOTING with concern that, despite the best endeavours of the Organization, casualties and incidents resulting in loss of life, loss of ships and pollution of the marine environment continue to occur,

NOTING ALSO that the safety of seafarers and passengers and the protection of the marine environment can be enhanced by timely and accurate reports identifying the circumstances and causes of marine casualties and incidents,

NOTING FURTHER the importance of the United Nations Convention on the Law of the Sea, done at Montego Bay on 10 December 1982, and of the customary international law of the sea,

NOTING IN ADDITION the responsibilities of flag States under the provisions of the International Convention for the Safety of Life at Sea, 1974 (regulation I/21) (hereinafter referred to as “the Convention”), the International Convention on Load Lines, 1966 (article 23) and the International Convention for the Prevention of Pollution from Ships, 1973 (article 12), to conduct casualty investigations and to supply the Organization with relevant findings,

CONSIDERING the need to ensure that all very serious marine casualties are investigated,

CONSIDERING ALSO the Guidelines on fair treatment of seafarers in the event of a maritime accident (resolution A.987(24)),

ACKNOWLEDGING that the investigation and proper analysis of marine casualties and incidents can lead to greater awareness of casualty causation and result in remedial measures, including better training, for the purpose of enhancing safety of life at sea and protection of the marine environment,

RECOGNIZING the need for a code to provide, as far as national laws allow, a standard approach to marine casualty and incident investigation with the objective of preventing marine casualties and incidents in the future,

RECOGNIZING ALSO the international nature of shipping and the need for co-operation between Governments having a substantial interest in a marine casualty or incident for the purpose of determining the circumstances and causes thereof,

NOTING resolution MSC.257(84) by which it adopted amendments to chapter XI-1 of the Convention to make parts I and II of the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident mandatory under the Convention,

HAVING CONSIDERED, at its eighty-fourth session, the text of the proposed Casualty Investigation Code,

1. ADOPTS the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), set out in the Annex to the present resolution;
2. INVITES Contracting Governments to the Convention to note that the Code will take effect on 1 January 2010 upon entry into force of the amendments to regulation XI-1/6 of the Convention;
3. REQUESTS the Secretary-General of the Organization to transmit certified copies of the present resolution and the text of the Code contained in the Annex to all Contracting Governments to the Convention;
4. FURTHER REQUESTS the Secretary-General of the Organization to transmit copies of the present resolution and the text of the Code contained in the Annex to all Members of the Organization which are not Contracting Governments to the Convention.

## ANNEX

**CODE OF THE INTERNATIONAL STANDARDS AND RECOMMENDED  
PRACTICES FOR A SAFETY INVESTIGATION INTO A MARINE CASUALTY  
OR MARINE INCIDENT (CASUALTY INVESTIGATION CODE)**

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## Foreword

1 This Code incorporates and builds on the best practices in marine casualty and marine incident investigation that were established by the Code for the Investigation of Marine Casualties and Incidents, adopted in November 1997 by the International Maritime Organization (the Organization), by resolution A.849(20). The Code for the Investigation of Marine Casualties and Incidents sought to promote co-operation and a common approach to marine casualty and marine incident investigations between States.

### *Background*

2 The Organization has encouraged co-operation and recognition of mutual interest through a number of resolutions. The first was resolution A.173(ES.IV) (Participation in Official Inquiries into Maritime Casualties) adopted in November 1968. Other resolutions followed including: resolution A.322(IX) (The Conduct of Investigations into Casualties) adopted in November 1975; resolution A.440(XI) (Exchange of Information for Investigations into Marine Casualties) and resolution A.442(XI) (Personnel and Material Resource Needs of Administrations for the Investigation of Casualties and the Contravention of Conventions), both adopted in November 1979; resolution A.637(16) (Co-operation in Maritime Casualty Investigations) adopted in 1989.

3 These individual resolutions were amalgamated and expanded by the Organization with the adoption of the Code for the Investigation of Marine Casualties and Incidents. Resolution A.884(21) (Amendments to the Code for the Investigation of Marine Casualties and Incidents resolution A.849(20)), adopted in November 1999, enhanced the Code by providing guidelines for the investigation of human factors.

4 The International Convention for the Safety of Life at Sea (SOLAS), 1948, included a provision requiring flag State Administrations to conduct investigations into any casualty suffered by a ship of its flag if an investigation may assist in identifying regulatory issues as a contributing factor. This provision was retained in the 1960 and 1974 SOLAS Conventions. It was also included in the International Convention on Load Lines, 1966. Further, flag States are required to inquire into certain marine casualties and marine incidents occurring on the high seas\*.

5 The sovereignty of a coastal State extends beyond its land and inland waters to the extent of its territorial sea\*\*. This jurisdiction gives the coastal State an inherent right to investigate marine casualties and marine incidents connected with its territory. Most national Administrations have legal provisions to cover the investigation of a shipping incident within its inland waters and territorial sea, regardless of the flag.

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\* Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 94(7) or requirements of international and customary laws.

\*\* Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 2 or requirements of international and customary laws.

### *Treatment of Seafarers*

6 Most recently, the International Labour Organization's Maritime Labour Convention, 2006 (which has not yet come into force), provides a provision for the investigation of some serious marine casualties as well as setting out working conditions for seafarers. Recognizing the need for special protection for seafarers during an investigation, the Organization adopted, in December 2005, the "Guidelines on Fair Treatment of Seafarers in the Event of a Maritime Accident" through resolution A.987(24). The Guidelines were promulgated by the IMO and the ILO on 1 July 2006.

### *Adoption of the Code*

7 Since the adoption of the first SOLAS Convention, there have been extensive changes in the structure of the international maritime industry and changes in international law. These changes have potentially increased the number of States with an interest in the process and outcomes of marine safety investigations, in the event of a marine casualty or marine incident, increasing the potential for jurisdictional and other procedural differences between affected States.

8 This Code, while it specifies some mandatory requirements, recognizes the variations in international and national laws in relation to the investigation of marine casualties and marine incidents. The Code is designed to facilitate objective marine safety investigations for the benefit of flag States, coastal States, the Organization and the shipping industry in general.

## **PART I**

### **GENERAL PROVISIONS**

#### **Chapter 1**

#### **PURPOSE**

1.1 The objective of this Code is to provide a common approach for States to adopt in the conduct of marine safety investigations into marine casualties and marine incidents. Marine safety investigations do not seek to apportion blame or determine liability. Instead a marine safety investigation, as defined in this Code, is an investigation conducted with the objective of preventing marine casualties and marine incidents in the future. The Code envisages that this aim will be achieved through States:

- .1 applying consistent methodology and approach, to enable and encourage a broad ranging investigation, where necessary, in the interests of uncovering the causal factors and other safety risks; and
- .2 providing reports to the Organization to enable a wide dissemination of information to assist the international marine industry to address safety issues.

1.2 A marine safety investigation should be separate from, and independent of, any other form of investigation. However, it is not the purpose of this Code to preclude any other form of investigation, including investigations for action in civil, criminal and administrative proceedings. Further, it is not the intent of the Code for a State or States conducting a marine safety investigation to refrain from fully reporting on the causal factors of a marine casualty or marine incident because blame or liability, may be inferred from the findings.

1.3 This Code recognizes that under the Organization's instruments, each flag State has a duty to conduct an investigation into any casualty occurring to any of its ships, when it judges that such an investigation may assist in determining what changes in the present regulations may be desirable, or if such a casualty has produced a major deleterious effect upon the environment. The Code also takes into account that a flag State shall<sup>\*</sup> cause an inquiry to be held, by or before a suitably qualified person or persons into certain marine casualties or marine incidents of navigation on the high seas. However, the Code also recognizes that where a marine casualty or marine incident occurs within the territory, including the territorial sea, of a State, that State has a right<sup>\*\*</sup> to investigate the cause of any such marine casualty or marine incident which might pose a risk to life or to the environment, involve the coastal State's search and rescue authorities, or otherwise affect the coastal State.

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\* Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 94 or requirements of international and customary laws.

\*\* Reference is made to the United Nations Convention on the Law of the Sea (UNCLOS), article 2 or requirements of international and customary laws.

## Chapter 2

### DEFINITIONS

When the following terms are used in the mandatory standards and recommended practices for marine safety investigations they have the following meaning.

2.1 An *agent* means any person, natural or legal, engaged on behalf of the owner, charterer or operator of a ship, or the owner of the cargo, in providing shipping services, including managing arrangements for the ship being the subject of a marine safety investigation.

2.2 A *causal factor* means actions, omissions, events or conditions, without which:

- .1 the marine casualty or marine incident would not have occurred; or
- .2 adverse consequences associated with the marine casualty or marine incident would probably not have occurred or have been as serious;
- .3 another action, omission, event or condition, associated with an outcome in .1 or .2, would probably not have occurred.

2.3 A *coastal State* means a State in whose territory, including its territorial sea, a marine casualty or marine incident occurs.

2.4 *Exclusive economic zone* means the exclusive economic zone as defined by article 55 of the United Nations Convention on the Law of the Sea.

2.5 *Flag State* means a State whose flag a ship is entitled to fly.

2.6 *High seas* means the high seas as defined in article 86 of the United Nations Convention on the Law of the Sea.

2.7 *Interested party* means an organization, or individual, who, as determined by the marine safety investigating State(s), has significant interests, rights or legitimate expectations with respect to the outcome of a marine safety investigation.

2.8 *International Safety Management (ISM) Code* means the International Management Code for the Safe Operation of Ships and for Pollution Prevention as adopted by the Organization by resolution A.741(18), as amended.

2.9 A *marine casualty* means an event, or a sequence of events, that has resulted in any of the following which has occurred directly in connection with the operations of a ship:

- .1 the death of, or serious injury to, a person;
- .2 the loss of a person from a ship;
- .3 the loss, presumed loss or abandonment of a ship;

- .4 material damage to a ship;
- .5 the stranding or disabling of a ship, or the involvement of a ship in a collision;
- .6 material damage to marine infrastructure external to a ship, that could seriously endanger the safety of the ship, another ship or an individual; or
- .7 severe damage to the environment, or the potential for severe damage to the environment, brought about by the damage of a ship or ships.

However, a marine casualty does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.

2.10 A *marine incident* means an event, or sequence of events, other than a marine casualty, which has occurred directly in connection with the operations of a ship that endangered, or, if not corrected, would endanger the safety of the ship, its occupants or any other person or the environment.

However, a marine incident does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.

2.11 A *marine safety investigation* means an investigation or inquiry (however referred to by a State), into a marine casualty or marine incident, conducted with the objective of preventing marine casualties and marine incidents in the future. The investigation includes the collection of, and analysis of, evidence, the identification of causal factors and the making of safety recommendations as necessary.

2.12 A *marine safety investigation report* means a report that contains:

- .1 a summary outlining the basic facts of the marine casualty or marine incident and stating whether any deaths, injuries or pollution occurred as a result;
- .2 the identity of the flag State, owners, operators, the company as identified in the safety management certificate, and the classification society (subject to any national laws concerning privacy);
- .3 where relevant the details of the dimensions and engines of any ship involved, together with a description of the crew, work routine and other matters, such as time served on the ship;
- .4 a narrative detailing the circumstances of the marine casualty or marine incident;
- .5 analysis and comment on the causal factors including any mechanical, human and organizational factors;
- .6 a discussion of the marine safety investigation's findings, including the identification of safety issues, and the marine safety investigation's conclusions; and

- .7 where appropriate, recommendations with a view to preventing future marine casualties and marine incidents.

2.13 *Marine safety investigation Authority* means an Authority in a State, responsible for conducting investigations in accordance with this Code.

2.14 *Marine safety investigating State(s)* means the flag State or, where relevant, the State or States that take the responsibility for the conduct of the marine safety investigation as mutually agreed in accordance with this Code.

2.15 *A marine safety record* means the following types of records collected for a marine safety investigation:

- .1 all statements taken for the purpose of a marine safety investigation;
- .2 all communications between persons pertaining to the operation of the ship;
- .3 all medical or private information regarding persons involved in the marine casualty or marine incident;
- .4 all records of the analysis of information or evidential material acquired in the course of a marine safety investigation;
- .5 information from the voyage data recorder.

2.16 *A material damage* in relation to a marine casualty means:

- .1 damage that:
  - .1.1 significantly affects the structural integrity, performance or operational characteristics of marine infrastructure or a ship; and
  - .1.2 requires major repair or replacement of a major component or components;  
or
- .2 destruction of the marine infrastructure or ship.

2.17 *A seafarer* means any person who is employed or engaged or works in any capacity on board a ship.

2.18 *A serious injury* means an injury which is sustained by a person, resulting in incapacitation where the person is unable to function normally for more than 72 hours, commencing within seven days from the date when the injury was suffered.

2.19 *A severe damage to the environment* means damage to the environment which, as evaluated by the State(s) affected, or the flag State, as appropriate, produces a major deleterious effect upon the environment.

2.20 *Substantially interested State* means a State:

- .1 which is the flag State of a ship involved in a marine casualty or marine incident; or
- .2 which is the coastal State involved in a marine casualty or marine incident; or
- .3 whose environment was severely or significantly damaged by a marine casualty (including the environment of its waters and territories recognized under international law); or
- .4 where the consequences of a marine casualty or marine incident caused, or threatened, serious harm to that State or to artificial islands, installations, or structures over which it is entitled to exercise jurisdiction; or
- .5 where, as a result of a marine casualty, nationals of that State lost their lives or received serious injuries; or
- .6 that has important information at its disposal that the marine safety investigating State(s) consider useful to the investigation; or
- .7 that for some other reason establishes an interest that is considered significant by the marine safety investigating State(s).

2.21 *Territorial sea* means territorial sea as defined by Section 2 of Part II of the United Nations Convention on the Law of the Sea.

2.22 *A very serious marine casualty* means a marine casualty involving the total loss of the ship or a death or severe damage to the environment.

### **Chapter 3**

#### **APPLICATION OF CHAPTERS IN PARTS II AND III**

3.1 Part II of this Code contains mandatory standards for marine safety investigations. Some clauses apply only in relation to certain categories of marine casualties and are mandatory only for marine safety investigations into those marine casualties.

3.2 Clauses in Part III of this Code may refer to clauses in this part that apply only to certain marine casualties. The clauses in Part III may recommend that such clauses be applied in marine safety investigations into other marine casualties or marine incidents.

## PART II

### MANDATORY STANDARDS

#### Chapter 4

#### MARINE SAFETY INVESTIGATION AUTHORITY

4.1 The Government of each State shall provide the Organization with detailed contact information of the marine safety investigation Authority(ies) carrying out marine safety investigations within their State.

#### Chapter 5

#### NOTIFICATION

5.1 When a marine casualty occurs on the high seas or in an exclusive economic zone, the flag State of a ship, or ships, involved, shall notify other substantially interested States as soon as is reasonably practicable.

5.2 When a marine casualty occurs within the territory, including the territorial sea, of a coastal State, the flag State, and the coastal State, shall notify each other and between them notify other substantially interested States as soon as is reasonably practicable.

5.3 Notification shall not be delayed due to the lack of complete information.

5.4 **Format and content:** The notification shall contain as much of the following information as is readily available:

- .1 the name of the ship and its flag State;
- .2 the IMO ship identification number;
- .3 the nature of the marine casualty;
- .4 the location of the marine casualty;
- .5 time and date of the marine casualty;
- .6 the number of any seriously injured or killed persons;
- .7 consequences of the marine casualty to individuals, property and the environment;  
and
- .8 the identification of any other ship involved.

## **Chapter 6**

### **REQUIREMENT TO INVESTIGATE VERY SERIOUS MARINE CASUALTIES**

- 6.1 A marine safety investigation shall be conducted into every very serious marine casualty.
- 6.2 Subject to any agreement in accordance with chapter 7, the flag State of a ship involved in a very serious marine casualty is responsible for ensuring that a marine safety investigation is conducted and completed in accordance with this Code.

## **Chapter 7**

### **FLAG STATE'S AGREEMENT WITH ANOTHER SUBSTANTIALLY INTERESTED STATE TO CONDUCT A MARINE SAFETY INVESTIGATION**

- 7.1 Without limiting the rights of States to conduct their own separate marine safety investigation, where a marine casualty occurs within the territory, including territorial sea, of a State, the flag State(s) involved in the marine casualty and the coastal State shall consult to seek agreement on which State or States will be the marine safety investigating State(s) in accordance with a requirement, or a recommendation acted upon, to investigate under this Code.
- 7.2 Without limiting the rights of States to conduct their own separate marine safety investigation, if a marine casualty occurs on the high seas or in the exclusive economic zone of a State, and involves more than one flag State, then the States shall consult to seek agreement on which State or States will be the marine safety investigating State(s) in accordance with a requirement, or a recommendation acted upon, to investigate under this Code.
- 7.3 For a marine casualty referred to in paragraph 7.1 or 7.2, agreement may be reached by the relevant States with another substantially interested State for that State or States to be the marine safety investigating State(s).
- 7.4 Prior to reaching an agreement, or if an agreement is not reached, in accordance with paragraph 7.1, 7.2 or 7.3, then the existing obligations and rights of States under this Code, and under other international laws, to conduct a marine safety investigation, remain with the respective parties to conduct their own investigation.
- 7.5 By fully participating in a marine safety investigation conducted by another substantially interested State, the flag State shall be considered to fulfil its obligations under this Code, SOLAS regulation I/21 and article 94, section 7 of the United Nations Convention on the Law of the Sea.

## **Chapter 8**

### **POWERS OF AN INVESTIGATION**

8.1 All States shall ensure that their national laws provide investigator(s) carrying out a marine safety investigation with the ability to board a ship, interview the master and crew and any other person involved, and acquire evidential material for the purposes of a marine safety investigation.

## **Chapter 9**

### **PARALLEL INVESTIGATIONS**

9.1 Where the marine safety investigating State(s) is conducting a marine safety investigation under this Code, nothing prejudices the right of another substantially interested State to conduct its own separate marine safety investigation.

9.2 While recognizing that the marine safety investigating State(s) shall be able to fulfil obligations under this Code, the marine safety investigating State(s) and any other substantially interested State conducting a marine safety investigation shall seek to co-ordinate the timing of their investigations, to avoid conflicting demands upon witnesses and access to evidence, where possible.

## **Chapter 10**

### **CO-OPERATION**

10.1 All substantially interested States shall co-operate with the marine safety investigating State(s) to the extent practicable. The marine safety investigating State(s) shall provide for the participation of the substantially interested States to the extent practicable\*.

## **Chapter 11**

### **INVESTIGATION NOT TO BE SUBJECT TO EXTERNAL DIRECTION**

11.1 Marine safety investigating State(s) shall ensure that investigator(s) carrying out a marine safety investigation are impartial and objective. The marine safety investigation shall be able to report on the results of a marine safety investigation without direction or interference from any persons or organizations who may be affected by its outcome.

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\* The reference to “extent practicable” may be taken to mean, as an example, that co-operation or participation is limited because national laws make it impracticable to fully co-operate or participate.

## **Chapter 12**

### **OBTAINING EVIDENCE FROM SEAFARERS**

12.1 Where a marine safety investigation requires a seafarer to provide evidence to it, the evidence shall be taken at the earliest practical opportunity. The seafarer shall be allowed to return to his/her ship, or be repatriated at the earliest possible opportunity. The seafarers human rights shall, at all times, be upheld.

12.2 All seafarers from whom evidence is sought shall be informed of the nature and basis of the marine safety investigation. Further, a seafarer from whom evidence is sought shall be informed, and allowed access to legal advice, regarding:

- .1 any potential risk that they may incriminate themselves in any proceedings subsequent to the marine safety investigation;
- .2 any right not to self-incriminate or to remain silent;
- .3 any protections afforded to the seafarer to prevent the evidence being used against them if they provide the evidence to the marine safety investigation.

## **Chapter 13**

### **DRAFT MARINE SAFETY INVESTIGATION REPORTS**

13.1 Subject to paragraphs 13.2 and 13.3, where it is requested, the marine safety investigating State(s) shall send a copy of a draft report to a substantially interested State to allow the substantially interested State to make comment on the draft report.

13.2 Marine safety investigating State(s) are only bound to comply with paragraph 13.1 where the substantially interested State receiving the report guarantees not to circulate, nor cause to circulate, publish or give access to the draft report, or any part thereof, without the express consent of the marine safety investigating State(s) or unless such reports or documents have already been published by the marine safety investigating State(s).

13.3 The marine safety investigating State(s) are not bound to comply with paragraph 13.1 if:

- .1 the marine safety investigating State(s) request that the substantially interested State receiving the report to affirm that evidence included in the draft report will not be admitted in civil or criminal proceedings against a person who gave the evidence; and
- .2 the substantially interested State refuses to provide such an affirmation.

13.4 The marine safety investigating State(s) shall invite the substantially interested States to submit their comments on the draft report within 30 days or some other mutually agreed period. The marine safety investigating State(s) shall consider the comments before preparing the final report and where the acceptance or rejection of the comments will have direct

impact on the interests of the State that submitted them, the marine safety investigating State(s) shall notify the substantially interested State of the manner in which the comments were addressed. If the marine safety investigating State(s) receives no comments after the 30 days or the mutually agreed period has expired, then it may proceed to finalize the report.

13.5 The marine safety investigating State(s) shall seek to fully verify the accuracy and completeness of the draft report by the most practical means.

## **Chapter 14**

### **MARINE SAFETY INVESTIGATION REPORTS**

14.1 The marine safety investigating State(s) shall submit the final version of a marine safety investigation report to the Organization for every marine safety investigation conducted into a very serious marine casualty.

14.2 Where a marine safety investigation is conducted into a marine casualty or marine incident, other than a very serious marine casualty, and a marine safety investigation report is produced which contains information which may prevent or lessen the seriousness of marine casualties or marine incidents in the future, the final version shall be submitted to the Organization.

14.3 The marine safety investigation report referred in paragraphs 14.1 and 14.2 shall utilize all the information obtained during a marine safety investigation, taking into account its scope, required to ensure that all the relevant safety issues are included and understood so that safety action can be taken as necessary.

14.4 The final marine safety investigation report shall be made available to the public and the shipping industry by the marine safety investigating State(s), or the marine safety investigating State(s) shall undertake to assist the public and the shipping industry with details, necessary to access the report, where it is published by another State or the Organization.

## **PART III**

### **RECOMMENDED PRACTICES**

## **Chapter 15**

### **ADMINISTRATIVE RESPONSIBILITIES**

15.1 States should ensure that marine safety investigating Authorities have available to them sufficient material and financial resources and suitably qualified personnel to enable them to facilitate the State's obligations to undertake marine safety investigations into marine casualties and marine incidents under this Code.

15.2 Any investigator forming part of a marine safety investigation should be appointed on the basis of the skills outlined in resolution A.996(25) for investigators.

15.3 However, paragraph 15.2 does not preclude the appropriate appointment of investigators with necessary specialist skills to form part of a marine safety investigation on a temporary basis, neither does it preclude the use of consultants to provide expert advice on any aspect of a marine safety investigation.

15.4 Any person who is an investigator, in a marine safety investigation, or assisting a marine safety investigation, should be bound to operate in accordance with this Code.

## Chapter 16

### PRINCIPLES OF INVESTIGATION

16.1 **Independence:** A marine safety investigation should be unbiased to ensure the free flow of information to it.

16.1.1 In order to achieve the outcome in paragraph 16.1, the investigator(s) carrying out a marine safety investigation should have functional independence from:

- .1 the parties involved in the marine casualty or marine incident;
- .2 anyone who may make a decision to take administrative or disciplinary action against an individual or organization involved in a marine casualty or marine incident; and
- .3 judicial proceedings.

16.1.2 The investigator(s) carrying out a marine safety investigation should be free of interference from the parties in .1, .2 and .3 of paragraph 16.1.1 with respect to:

- .1 the gathering of all available information relevant to the marine casualty or marine incident, including voyage data recordings and vessel traffic services recordings;
- .2 analysis of evidence and the determination of causal factors;
- .3 drawing conclusions relevant to the causal factors;
- .4 distributing a draft report for comment and preparation of the final report; and
- .5 if appropriate, the making of safety recommendations.

16.2 **Safety focused:** It is not the objective of a marine safety investigation to determine liability, or apportion blame. However, the investigator(s) carrying out a marine safety investigation should not refrain from fully reporting on the causal factors because fault or liability may be inferred from the findings.

**16.3 Co-operation:** Where it is practicable and consistent with the requirements and recommendations of this Code, in particular chapter 10 on Co-operation, the marine safety investigating State(s) should seek to facilitate maximum co-operation between substantially interested States and other persons or organizations conducting an investigation into a marine casualty or marine incident.

**16.4 Priority:** A marine safety investigation should, as far as possible, be afforded the same priority as any other investigation, including investigations by a State for criminal purposes being conducted into the marine casualty or marine incident.

**16.4.1** In accordance with paragraph 16.4 investigator(s) carrying out a marine safety investigation should not be prevented from having access to evidence in circumstances where another person or organization is carrying out a separate investigation into a marine casualty or marine incident.

**16.4.2** The evidence for which ready access should be provided should include:

- .1 survey and other records held by the flag State, the owners, and classification societies;
- .2 all recorded data, including voyage data recorders; and
- .3 evidence that may be provided by government surveyors, coastguard officers, vessel traffic service operators, pilots or other marine personnel.

**16.5 Scope of a marine safety investigation:** Proper identification of causal factors requires timely and methodical investigation, going far beyond the immediate evidence and looking for underlying conditions, which may be remote from the site of the marine casualty or marine incident, and which may cause other future marine casualties and marine incidents. Marine safety investigations should therefore be seen as a means of identifying not only immediate causal factors but also failures that may be present in the whole chain of responsibility.

## **Chapter 17**

### **INVESTIGATION OF MARINE CASUALTIES (OTHER THAN VERY SERIOUS CASUALTIES) AND MARINE INCIDENTS**

**17.1** A marine safety investigation should be conducted into marine casualties (other than very serious marine casualties – which are addressed in chapter 6 of this Code) and marine incidents, by the flag State of a ship involved, if it is considered likely that a marine safety investigation will provide information that can be used to prevent marine casualties and marine incidents in the future.

**17.2** Chapter 7 contains the mandatory requirements for determining who the marine safety investigating State(s) are for a marine casualty. Where the occurrence being investigated in accordance with this chapter is a marine incident, chapter 7 should be followed as a recommended practice as if it referred to marine incidents.

## **Chapter 18**

### **FACTORS THAT SHOULD BE TAKEN INTO ACCOUNT WHEN SEEKING AGREEMENT UNDER CHAPTER 7 OF PART II**

18.1 When the flag State(s), a coastal State (if involved) or other substantially interested States are seeking to reach agreement, in accordance with chapter 7 of Part II on which State or State(s) will be the marine safety investigating State(s) under this Code, the following factors should be taken into account:

- .1 whether the marine casualty or marine incident occurred in the territory, including territorial sea, of a State;
- .2 whether the ship or ships involved in a marine casualty or marine incident occurring on the high seas, or in the exclusive economic zone, subsequently sail into the territorial sea of a State;
- .3 the resources and commitment required of the flag State and other substantially interested States;
- .4 the potential scope of the marine safety investigation and the ability of the flag State or another substantially interested State to accommodate that scope;
- .5 the need of the investigator(s) carrying out a marine safety investigation to access evidence and consideration of the State or States best placed to facilitate that access to evidence;
- .6 any perceived or actual adverse effects of the marine casualty or marine incident on other States;
- .7 the nationality of the crew, passengers and other persons affected by the marine casualty or marine incident.

## **Chapter 19**

### **ACTS OF UNLAWFUL INTERFERENCE**

19.1 If in the course of a marine safety investigation it becomes known or is suspected that an offence is committed under article 3, *3bis*, *3ter* or *3quarter* of the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, 1988, the marine safety investigation Authority should immediately seek to ensure that the maritime security Authorities of the State(s) concerned are informed.

## **Chapter 20**

### **NOTIFICATION TO PARTIES INVOLVED AND COMMENCEMENT OF AN INVESTIGATION**

20.1 When a marine safety investigation is commenced under this Code, the master, the owner and agent of a ship involved in the marine casualty or marine incident being investigated, should be informed as soon as practicable of:

- .1 the marine casualty or marine incident under investigation;
- .2 the time and place at which the marine safety investigation will commence;
- .3 the name and contact details of the marine safety investigation Authority(ies);
- .4 the relevant details of the legislation under which the marine safety investigation is being conducted;
- .5 the rights and obligations of the parties subject to the marine safety investigation;  
and
- .6 the rights and obligations of the State or States conducting the marine safety investigation.

20.2 Each State should develop a standard document detailing the information in paragraph 20.1 that can be transmitted electronically to the master, the agent and the owner of the ship.

20.3 Recognizing that any ship involved in a marine casualty or marine incident may continue in service, and that a ship should not be delayed more than is absolutely necessary, the marine safety investigating State(s) conducting the marine safety investigation should start the marine safety investigation as soon as is reasonably practicable, without delaying the ship unnecessarily.

## **Chapter 21**

### **CO-ORDINATING AN INVESTIGATION**

21.1 The recommendations in this chapter should be applied in accordance with the principles in chapters 10 and 11 of this Code.

21.2 The marine safety investigating State(s) should ensure that there is an appropriate framework within the State for:

- .1 the designation of investigators to the marine safety investigation including an investigator to lead the marine safety investigation;
- .2 the provision of a reasonable level of support to members of the marine safety investigation;

- .3 the development of a strategy for the marine safety investigation in liaison with other substantially interested States;
- .4 ensuring the methodology followed during the marine safety investigation is consistent with that recommended in resolution A.884(21), as amended;
- .5 ensuring the marine safety investigation takes into account any recommendations or instruments published by the Organization or International Labour Organization, relevant to conducting a marine safety investigation; and
- .6 ensuring the marine safety investigation takes into account the safety management procedures and the safety policy of the operator of a ship in terms of the ISM Code.

21.3 The marine safety investigating State(s) should allow a substantially interested State to participate in aspects of the marine safety investigation relevant to it, to the extent practicable.

21.3.1 Participation should include allowing representatives of the substantially interested State to:

- .1 interview witnesses;
- .2 view and examine evidence and make copies of documents;
- .3 make submissions in respect of the evidence, comment on and have their views properly reflected in the final report; and
- .4 be provided with the draft and final reports relating to the marine safety investigation\*.

21.4 To the extent practical, substantially interested States should assist the marine safety investigating State(s) with access to relevant information for the marine safety investigation. To the extent practical, the investigator(s) carrying out a marine safety investigation should also be afforded access to Government surveyors, coastguard officers, ship traffic service operators, pilots and other marine personnel of a substantially interested State.

21.5 The flag State of a ship involved in a marine casualty or marine incident should help to facilitate the availability of the crew to the investigator(s) carrying out the marine safety investigation.

## **Chapter 22**

### **COLLECTION OF EVIDENCE**

22.1 A marine safety investigating State(s) should not unnecessarily detain a ship for the collection of evidence from it or have original documents or equipment removed unless this is

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\* The reference to 'extent practical' may be taken to mean, as an example, that co-operation or participation is limited because national laws make it impractical to fully co-operate or participate.

essential for the purposes of the marine safety investigation. Investigators should make copies of documents where practicable.

22.2 Investigator(s) carrying out a marine safety investigation should secure records of interviews and other evidence collected during a marine safety investigation in a manner which prevents access by persons who do not require it for the purpose of the investigation.

22.3 Investigator(s) carrying out the marine safety investigation should make effective use of all recorded data including voyage data recorders if fitted. Voyage data recorders should be made available for downloading by the investigator(s) carrying out a marine safety investigation or an appointed representative.

22.3.1 In the event that the marine safety investigating State(s) do not have adequate facilities to read a voyage data recorder, States with such a capability should offer their services having due regard to the:

- .1 available resources;
- .2 capabilities of the readout facility;
- .3 timeliness of the readout; and
- .4 location of the facility.

## **Chapter 23**

### **CONFIDENTIALITY OF INFORMATION**

23.1 States should ensure that investigator(s) carrying out a marine safety investigation only disclose information from a marine safety record where:

- .1 it is necessary or desirable to do so for transport safety purposes and any impact on the future availability of safety information to a marine safety investigation is taken into account; or
- .2 as otherwise permitted in accordance with this Code<sup>\*</sup>.

23.2 States involved in marine safety investigation under this Code should ensure that any marine safety record in its possession is not disclosed in criminal, civil, disciplinary or administrative proceedings unless:

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\* States recognize that there are merits in keeping information from a marine safety record confidential where it needs to be shared with people outside the marine safety investigation for the purpose of conducting the marine safety investigation. An example is where information from a marine safety record needs to be provided to an external expert for their analysis or second opinion. Confidentiality would seek to ensure that sensitive information is not inappropriately disclosed for purposes other than the marine safety investigation, at a time when it has not been determined how the information will assist in determining the contributing factors in a marine casualty or marine incident. Inappropriate disclosure may infer blame or liability on the parties involved in the marine casualty or marine incident.

- .1 the appropriate authority for the administration of justice in the State determines that any adverse domestic or international impact that the disclosure of the information might have on any current or future marine safety investigations is outweighed by the public interest in the administration of justice; and\*
- .2 where appropriate in the circumstances, the State which provided the marine safety record to the marine safety investigation authorizes its disclosure.

23.3 Marine safety records should be included in the final report, or its appendices, only when pertinent to the analysis of the marine casualty or marine incident. Parts of the record not pertinent, and not included in the final report, should not be disclosed.

23.4 States need only supply information from a marine safety record to a substantially interested State where doing so will not undermine the integrity and credibility of any marine safety investigation being conducted by the State or States providing the information.

23.4.1 The State supplying the information from a marine safety record may require that the State receiving the information undertake to keep it confidential.

## **Chapter 24**

### **PROTECTION FOR WITNESSES AND INVOLVED PARTIES**

24.1 If a person is required by law to provide evidence that may incriminate them, for the purposes of a marine safety investigation, the evidence should, so far as national laws allow, be prevented from admission into evidence in civil or criminal proceedings against the individual.

24.2 A person from whom evidence is sought should be informed about the nature and basis of the investigation. A person from whom evidence is sought should be informed, and allowed access to legal advice, regarding:

- .1 any potential risk that they may incriminate themselves in any proceedings subsequent to the marine safety investigation;
- .2 any right not to self-incriminate or to remain silent;
- .3 any protections afforded to the person to prevent the evidence being used against them if they provide the evidence to the marine safety investigation.

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\* Examples of where it may be appropriate to disclose information from a marine safety record in criminal, civil, disciplinary or administrative proceedings may include:

- 1 where a person the subject of the proceedings has engaged in conduct with the intention to cause a destructive result; or
- 2 where a person the subject of the proceedings has been aware of a substantial risk that a destructive result will occur and having regard to the circumstances known to him or her it is unjustifiable to take the risk.

## **Chapter 25**

### **DRAFT AND FINAL REPORT**

25.1 Marine safety investigation reports from a marine safety investigation should be completed as quickly as practicable.

25.2 Where it is requested, and where practicable, the marine safety investigating State(s) should send a copy of a draft marine safety investigation report for comment to interested parties. However, this recommendation does not apply where there is no guarantee that the interested party will not circulate, nor cause to circulate, publish or give access to the draft marine safety investigation report, or any part thereof, without the express consent of the marine safety investigating State(s).

25.3 The marine safety investigating State(s) should allow the interested party 30 days or some other mutually agreed time to submit their comments on the marine safety investigation report. The marine safety investigating State(s) should consider the comments before preparing the final marine safety investigation report and where the acceptance or rejection of the comments will have direct impact on the interests of the interested party that submitted them, the marine safety investigating State(s) should notify the interested party of the manner in which the comments were addressed. If the marine safety investigating State(s) receives no comments after the 30 days or the mutually agreed period has expired, then it may proceed to finalize the marine safety investigation report\*.

25.4 Where it is permitted by the national laws of the State preparing the marine safety investigation report, the draft and final report should be prevented from being admissible in evidence in proceedings related to the marine casualty or marine incident that may lead to disciplinary measures, criminal conviction or the determination of civil liability.

25.5 At any stage during a marine safety investigation interim safety measures may be recommended.

25.6 Where a substantially interested State disagrees with the whole or a part of a final marine safety investigation report, it may submit its own report to the Organization.

## **Chapter 26**

### **RE-OPENING AN INVESTIGATION**

26.1 Marine safety investigating State(s) which have completed a marine safety investigation, should reconsider their findings and consider re-opening the investigation when new evidence is presented which may materially alter the analysis and conclusions reached.

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\* See chapter 13 where provisions with respect to providing interested parties with reports on request may alternatively be included as a mandatory provision.

26.2 When significant new evidence relating to any marine casualty or marine incident is presented to the marine safety investigating State(s) that have completed a marine safety investigation, the evidence should be fully assessed and referred to other substantially interested States for appropriate input.

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Extract from NP 44 - Malacca Strait and west coast of Sumatera Pilot



NP 44

# **MALACCA STRAIT AND WEST COAST OF SUMATERA PILOT**

**Malacca Strait and its northern approaches,  
Singapore Strait and its approaches, the west coast of Sumatera,  
and Cocos Islands**

**EIGHTH EDITION  
2006**

**PUBLISHED BY THE UNITED KINGDOM HYDROGRAPHIC OFFICE**

## Diurnal variation

### 1.157

- 1 There is a regular diurnal variation of about 3 hPa, with maxima at 1000 and 2200 and minima at 0400 and 1600.

## Tropical cyclones

### 1.158

- 1 **North of equator.** Tropical cyclones are not encountered within the area covered by this volume but intense tropical storms very occasionally move W across Gulf of Thailand and Kra Isthmus, to the N of the area, between July and October.
- 2 **South of equator.** Tropical cyclones form and pass through the area, mainly between 5°S and 20°S. They occur during the period October to May, and rarely at other times, and are most frequent between November and April. The diagrams (1.158.1 to 1.158.8) show recorded tracks over a 20 year period.

## Winds

### Average distribution

#### 1.159

- 1 Wind roses showing the frequency of wind distribution for the area in January, April, July and October are given in diagrams 1.159.1 to 1.159.4.

## Open waters

### 1.160

- 1 **North areas.** In the N of the area the NE monsoon blows from December to March with the height of the monsoon occurring in January. The mean winds during this period are force 4 in the NW and NE but light and variable around Singapore and the S part of Malacca Strait. In April the winds are lighter and more variable across the whole of the N area before the onset of the SW monsoon in May, which then continues until October. In the N and NW parts of the area the strength of the SW monsoon is usually steadier and stronger than the NE monsoon.
- 2 **Central areas.** To the W of Sumatera between about 2°N and 5°S the winds are lighter and more variable throughout the year but with a slight predominance of winds from between W and SW.

**South areas.** The SE trade winds of South Indian Ocean affect the S part of the area between 10°S and 15°S throughout the year and extend N to replace the W winds between 5°S and 10°S from April to early November.

## Land and sea breezes

### 1.161

- 1 Land and sea breezes affect all parts of the region although the land breeze is generally weaker than the sea breeze. In some coastal areas of W Sumatera the land breeze may be accentuated by down-slope winds off the high ground just inland from the coast where sudden squalls may occur.

## Squalls

### 1.162

- 1 Squalls are a well known feature of Malacca Strait. Between April and November, squalls known as *Sumateras* develop in Malacca Strait in the late afternoon or overnight and move E to affect the W coast of Malaysia and Singapore Island. These squalls are usually accompanied by cumulonimbus cloud, thunderstorms and torrential rain, and generally last for around 1 to 4 hours. Gusts of 40 to 50 kn

have occasionally been recorded in association with these squalls. The frequency of these *Sumateras* is around 6 to 8 in June and August and 3 to 4 in other months between May and September.

- 2 South-west squalls may be encountered over the N part of Malacca Strait during the SW monsoon (May to October) by day or night, and these tend to be of longer duration than *Sumateras*. North-west squalls sometimes affect this area in November just before the onset of the NE monsoon over the NE part of the Indian Ocean but very few occur during the period of the NE monsoon.

Waterspouts are not uncommon in Malacca Strait and, if practicable, ships are advised to steer a course well clear of them.

## Gales

### 1.163

- 1 Winds of force 7 or more are rare over most of the area to the N of around 5°S. They occur on 1% or less of occasions but around 2% of occasions in the extreme NW of the area at the height of the SW monsoon in July. In the S of the area, between 5°S and 15°S, winds of force 7 or more occur on around 1 to 2% of occasions but by July the percentage increases to 6% in the extreme SE and 10% in the extreme SW.

## Cloud

### 1.164

- 1 Over the sea areas the average cloud amount in January, to the N of about 10°S, is around 5 oktas, and 4 oktas to the S of 10°S. At the height of the SW monsoon in July, there is a small increase in cloud cover in the extreme N of the area to around 6 oktas and to 5 oktas in the extreme SW, but a small decrease to around 4 oktas to the S of Jawa and Sumatera.
- 2 In coastal areas there is usually a distinct diurnal variation with cumulus type cloud forming during the morning and reaching a maximum around late afternoon. In addition, cloud amounts are generally greatest on wind-facing coasts than to the lee of high ground.

## Precipitation

### General

#### 1.165

- 1 The mean annual rainfall is abundant and varies in coastal areas from around 1500 to 4500 mm and exceeds 5000 mm in the mountainous inland areas of W Sumatera. The highest rainfall occurs on mountainous wind-facing coasts whilst somewhat drier conditions prevail in the lee. Whilst there is considerable variability according to locality and season there are no dry seasons. However, the driest months in Melaka, Phuket and Pinang are January and February during the height of the NE monsoon, and in Banda Aceh during June and July. In Cocos Islands the driest months tend to be between September and November.
- 2 During the transition between the monsoons, March to May and October to November, rainfall generally reaches a maximum, the latter being the wettest period, except in Cocos Islands.

Heavy showers and thunderstorms are responsible for most of the rain. The thundery showers are usually of short duration but often torrential. Maximum rainfall in coastal areas frequently occurs in the late afternoon or early evening.

## Thunderstorms

### 1.166

- 1 This is one of the most thundery regions of the world with thunderstorms occurring throughout the year. In the N and NE of the area the frequency of thunderstorms falls to a minimum in January and February, although the variation from month to month is small along the W coast of Sumatera. The frequency of thunderstorms in Cocos Islands is significantly lower; these tend to occur in the first half of the year.

## Fog and visibility

### 1.167

- 1 Visibility is generally good except in thundery showers when visibility may fall to near fog limits. Fog is rare over the open sea although patchy radiation fog may form on coasts towards dawn, particularly near marshy areas and river valleys, but it generally clears soon after sunrise.
- 2 Haze is most likely between June and November, tending to be at its most dense between August and October. When a drought affects NW Australia, the haze is often particularly thick and it may spread across most of the region giving a grey tint to the sky and visibility of around 8 to 10 miles. On rare occasions visibility decreases to as little as 4 miles.

## Air temperature

### 1.168

- 1 There is no marked seasonal variation in temperature over the whole region. Throughout the year the days are usually hot and, on account of the high humidity, somewhat oppressive. The mean annual air temperature over the open sea is between 26° and 28°C, with the lower temperature during February in the N and during August in the S.
- 2 In coastal areas the average maximum temperature is around 32°C and the average daily minimum about 23°C. Extreme temperatures of 40°C and 17°C have been recorded at some locations (see the climate information tables for the mean temperatures at a number of coastal stations within the area of this publication). The air temperature of Cocos Islands is largely controlled by the sea surface temperature and therefore the variation in the air temperature is small throughout the year.

## Humidity

### 1.169

- 1 Humidity is closely related to air temperature and generally decreases as the temperature increases. During the early morning, when the air temperature is normally at its lowest, the humidity is generally at its highest, and falls to a minimum in the afternoon.
- 2 Over the open sea the average humidity is around 77 to 81% throughout the year and the seasonal variation is small. In the N half of the area the most humid period is October to December when the SW monsoon gives way to the NE monsoon, and lowest during the height of the NE monsoon between January and March. In the S half of the area the humidity tends to be marginally higher in the first half of the year.
- 3 In coastal areas the daily variation in humidity is much greater than over the more open waters and averages around 94% near dawn and 68% in the afternoon. Areas in the lee of high ground, or affected by land breezes, may record lower than average values whereas on wind-facing coasts higher than average values are likely.

## CLIMATE INFORMATION

### 1.170

- 1 The information which follows gives data for several coastal stations (Diagram 1.170) that regularly undertake weather observations. Some of these stations have been re-sited and so the position given is the latest available. It is emphasised that the data reflects average conditions at the specific location of the observation station which may not totally represent conditions over the open sea or in the approaches to ports in the vicinity.
- 2 The following comments briefly list some of the differences to be expected between conditions over the open sea and the nearest reporting station (see *The Mariner's Handbook* for further details):
  - Wind speeds tend to be higher at sea than on land, although funnelling in narrow inlets can result in an increase in wind strength.
- 3 Precipitation along mountainous wind-facing coasts can be considerably higher than at sea to windward. Similarly, precipitation in the lee of high ground is generally less.
  - Air temperature over the sea is less variable than over the land.
  - Topography has a marked effect on local conditions.



*Hyundai Discovery's Master's Standing Orders*



## MASTER'S STANDING ORDERS (BRIDGE)

### GENERAL:

- THE OFFICER ON WATCH (O.O.W.) MUST KEEP HIS WATCH ON THE BRIDGE, WHICH HE MUST IN NO CIRCUMSTANCES TO LEAVE UNTIL HE IS PROPERLY RELIEVED. HE IS THE MASTER'S REPRESENTATIVE AND HIS PRIMARY RESPONSIBILITY AT ALL TIMES IS THE SAFE NAVIGATION OF THE VESSEL FOR WHICH HE MUST AT ALL TIMES COMPLY WITH THE APPLICABLE INTERNATIONAL REGULATIONS FOR THE PREVENTION OF COLLISION AT SEA (COLREG 72).
- ON TAKING OVER THE WATCH, THE SHIP'S ESTIMATED OR TRUE POSITION, INTENDED TRACK, COURSE AND SPEED SHALL BE CONFIRMED; ANY NAVIGATIONAL HAZARDS EXPECTING TO BE ENCOUNTERED DURING THE WATCH SHOULD BE NOTED.
- THE SAFETY AND NAVIGATIONAL EQUIPMENT WITH WHICH THE SHIP IS PROVIDED AND THE MANNER OF ITS OPERATION SHALL BE CLEARLY UNDERSTOOD.
- THE O.O.W. SHALL NOT UNDERTAKE ANY DUTIES, WHICH WOULD INTERFERE WITH THE SAFE NAVIGATION OF THE VESSEL.
- THE O.O.W. SHOULD BEAR IN MIND THAT THE ENGINE IS AT HIS DISPOSAL AND HE SHOULD NOT HESITATE TO USE HER IN CASE OF EMERGENCY. HE SHOULD ALSO BEAR IN MIND THAT SOUND SIGNAL APPARATUS AND MORSE LIGHT OR ALDIS LAMP ARE TO BE USED IN ACCORDANCE WITH THE APPLICABLE REGULATIONS FOR THE PREVENTION OF COLLISION AT SEA.
- THE O.O.W. CONTINUES TO BE RESPONSIBLE FOR THE SAFE NAVIGATION OF THE VESSEL DESPITE THE PRESENCE OF THE MASTER ON BRIDGE, UNTIL THE MASTER INFORMS HIM SPECIFICALLY THAT HE HAS ASSUMED THE COMMAND AND THIS IS MUTUALLY UNDERSTOOD.
- PERSONS NOT DIRECTED CONCERNED WITH NAVIGATION OF THE VESSEL SHALL NOT BE PERMITTED ON THE BRIDGE WITHOUT PERMISSION OF THE MASTER.
- THE PRESENCE OF THE PILOT ON THE BRIDGE IS AN ADVISORY CAPACITY IN NO WAY REDUCES THE RESPONSIBILITY OF THE WATCH OFFICER.
- THE OOW MUST RESTRICT TIME SPENT IN THE CHARTROOM TO THE MINIMUM.
- IF THE SAFE NAVIGATION PERMITS TO ENSURE THAT SAFETY ROUND OF THE VESSEL ARE MADE PERIODICALLY.

### TAKING OVER THE WATCH:

THE OFFICER OF THE WATCH SHOULD NOT HAND OVER THE WATCH TO THE RELIEVING OFFICER IF HE HAS ANY REASON TO BELIEVE THAT THE LATER IS APPARENTLY UNDER ANY DISABILITY WHICH WOULD PRECLUDE HIM FROM CARRYING OUT HIS DUTIES. THE RELIEVING OFFICER ON WATCH SHOULD NOT TAKE OVER THE WATCH UNTIL HIS VISION IS FULLY ADJUSTED TO THE LIGHT CONDITIONS AND HE HAS PERSONALLY SATISFIED HIMSELF REGARDING:

- A. STANDING ORDERS AND OTHER SPECIAL INSTRUCTIONS OF THE MASTER.
- B. THE POSITION, COURSE AND SPEED OF THE VESSEL.
- C. WEATHER, VISIBILITY, CURRENTS, PREVAILING AND PREDICTED TIDES AND EFFECT OF THIS FACTORS UPON COURSE AND SPEED.
- D. THE NAVIGATIONAL SITUATIONS INCLUDING, BUT NOT LIMITED, TO THE FOLLOWING:
  1. THE OPERATIONAL CONDITION OF ALL NAVIGATIONAL EQUIPMENT.
  2. ARPA ALARM SETTINGS (CPA 1.5 N.M., TCPA 15.0 MINUTES).
  3. ARPA VECTORS FOR COLLISION AVOIDANCE ARE SET ON RELATIVE VECTORS AND SPEED INPUT FROM THE SPEED LOG.
  4. AUTO PILOT SETTINGS.
  5. ERRORS OF GYRO AND MAGNETIC COMPASSES.
  6. THE PRESENCE AND MOVEMENTS OF THE VESSEL IN SIGHT OR KNOWN TO BE IN THE VICINITY.
  7. NAVTEX WARNINGS ALREADY RECEIVED ARE CHECKED AND EVALUATED.

IF AT THE TIME O.O.W. IS TO BE RELIEVED CARRY OUT A MANOEUVRE OR OTHER ACTION TO AVOID ANY HAZARD IS TAKING PLACE, THE RELIEF OF HIM SHOULD BE DEFERRED UNTIL SUCH ACTION IS COMPLETED.

### PERIODICAL CHECKS OF NAVIGATIONAL EQUIPMENT:

THE O.O.W. SHOULD MAKE REGULAR CHECKS TO ENSURE THAT:

- THE HELMSMAN OR THE AUTOMATIC PILOT IS STEERING THE CORRECT COURSE.
- THE AUTOMATIC PILOT IS TESTED IN MANUAL POSITION AT LEAST ONCE A WATCH.
- THE GYRO AND STANDARD COMPASSES ARE FREQUENTLY COMPARED. AFTER ANY MAJOR ALTERATION REPEATERS TO BE SYNCHRONISED IF NECESSARY.
- THE NAVIGATIONAL EQUIPMENT, NAVIGATION AND SIGNAL LIGHTS ARE FUNCTIONING PROPERLY.
- THE LARGEST SUITABLE CHART FOR THE AREA IS USED.

- FIXES SHOULD BE TAKEN AT FREQUENT INTERVALS WHEN NAVIGATING IN COASTAL WATERS. O.O.W. SHOULD POSITIVELY IDENTIFY ALL RELEVANT NAVIGATION MARKS.

## **CALLING THE MASTER:**

- IF RESTRICTED VISIBILITY (**IF VISIBILITY LESS THAN FOUR MILES**) IS ENCOUNTERED OR SUSPECTED.
- NAVIGATION EQUIPMENT FAILURES OR PROBLEMS.
- MAIN ENGINE, STEERING GEAR OR ANY OTHER ESSENTIAL EQUIPMENT PROBLEMS.
- DETERIORATING OF WEATHER CONDITIONS.
- IF TRAFFIC CONDITION OR THE MOVEMENTS OF OTHER VESSELS ARE CAUSING CONCERN AND MASTER'S ORDERS FOR CPA CRITERIA CANNOT BE KEPT.
- IF DIFFICULTY IS EXPERIENCED IN MAINTAINING THE COURSE AND SPEED.
- ON FAILURE TO SIGHT THE LAND, NAVIGATION MARK OR TO OBTAIN SOUNDINGS BY THE EXPECTED TIME.
- IN ANY OTHER EMERGENCY SITUATIONS OR SITUATIONS IN WHICH YOU ARE IN DOUBT.
- DESPITE OF REQUIREMENTS TO NOTIFY THE MASTER IMMEDIATELY IN THE FORCING CIRCUMSTANCES, THE O.O.W. SHOULD IN ADDITION NOT HESITATE TO TAKE IMMEDIATE ACTION FOR THE SAFETY OF THE SHIP WHERE THE CIRCUMSTANCES SO REQUIRE.

**ALWAYS GIVE MASTER ENOUGH TIME TO EVALUATE SITUATION!**

## **COLLISION AVOIDANCE:**

- **1.5 N.M.** MINIMUM CPA TO BE MAINTAINED IN HEAD-ON SITUATION.
- **2.0 N.M.** MINIMUM CPA TO BE MAINTAINED IN CROSSING SITUATION.
- **6.0 N.M.** TO BE THE MINIMUM SAFE DISTANCE FOR SUBSTANTIAL ALTERATION OF THE COURSE IN ORDER TO CLOSE QUARTERS SITUATIONS TO BE AVOIDED.
- TAKE TIMELY AND SUBSTANTIAL ACTION IF IT BECOMES APPERANT THAT THE VESSEL REQUIRED TO KEEP OUT OF THE WAY IS NOT TAKING APPROPRIATE ACTIONS IN COMPLIANCE WITH THE COLREG RULES.

**THE OOW SHOULD NEVER USE VHF AND AIS FOR COLLISION AVOIDANCE!**

## **DUTIES ON ANCHOR:**

- WHILST ON ANCHOR CHECK POSITION & DISTANCE WITH SHORE AND OTHER VESSELS FREQUENTLY. ENSURE AN EFFICIENT LOOK OUT IS MAINTAINED AND CALL MASTER IF ANCHOR DRAGGING.
- ENSURE THAT ANCHOR SIGN BY DAYTIME AND LIGHTS BY NIGHT ARE DISPLAYED.
- HOIST/LOWER, SWITCH ON/OFF FLAGS AND LIGHT ON TIME.

**Zodiac's SMS Instructions for Collision Avoidance**



## **Collision Avoidance**

6.99 Action to avoid collision shall be positive and made in ample time (i.e. long range). It must be such as to be readily apparent to an observer on the other vessel (observing visually or by radar). Breach of this rule is a factor in more than 80% of collisions.

6.100 A succession of small alterations of course shall be avoided. If necessary, the radar trial manoeuvre facility should be used to ensure that the required passing distance is achieved in the first instance.

6.101 The effect of collision avoidance action must result in both vessels passing at a safe distance and must be monitored to make sure that it is having the desired effect

6.102 In complex (multi-ship) situations, always try to consider the likely actions of the other vessels and attempt to allow for them. In such situations, it is particularly important to take action at long range and avoid becoming involved in a close-quarters situation. In general, it is always better to take action at long range rather than allowing a close-quarters situation to develop and then resolving it. Taking action at long range gives the opportunity to monitor and take further action in good time, should the other vessel take unusual action or otherwise fail to comply with the rules.

6.103 In coastal waters, consider whether alterations of course should be brought forward or delayed in order to avoid conflict with other vessels (e.g. when turning across traffic lanes). If in doubt, call the Master.

6.104 The VHF or AIS should not in general be used for collision avoidance, and in no circumstances whatsoever may they be used to agree a course of action which is contrary to the International Regulations for Preventing Collisions at Sea. Valuable time can be wasted in trying to establish contact, positive identification cannot be guaranteed, and even if contact is established, misunderstandings may arise. The VHF may be used for alerting an approaching vessel where the vessel is at anchor or Not Under Command.

6.105 If the vessel is at anchor or stopped at sea, Not Under Command, the Officer of the Watch shall maintain a particularly vigilant watch for approaching vessels. In the event of a vessel approaching so as to pose risk of collision, the Officer of the Watch shall call the Master and notwithstanding this, use every means at his disposal to identify and warn the approaching vessel of the situation and the vessel's inability to manoeuvre. If the vessel is considered to be in grave and imminent danger, this would include the transmission of a DSC Distress Alert and Message.

6.106 The primary means to determine whether risk of collision exists is to carefully monitor the compass bearing of an approaching vessel. Visual bearings should be supported by the use of ARPA. Care should be taken in interpreting ARPA data, as instantaneous output data may be untypical. The display should be monitored over a sufficient period to ensure that consistent information is being obtained. In collision avoidance mode, the ARPA should be fed with speed-through-the-water input (i.e. log or manual input) and NOT speed-over-the-ground (e.g. GPS input). The latter can give serious errors in aspect, possibly resulting in misinterpretation of right of way, when vessels are in different tidal regimes.

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**MGN 324 (M+F) Radio: Operational Guidance on the Use Of VHF Radio and Automatic Identification Systems (AIS) at Sea**



## MGN 324 (M+F)

### **Radio: Operational Guidance on the Use Of VHF Radio and Automatic Identification Systems (AIS) at Sea**

**Notice to all Owners, Masters, Officers and Pilots of Merchant Ships, Owners and Skippers of Fishing Vessels and Owners of Yachts and Pleasure Craft.**

*This notice replaces Marine Guidance Notes MGN 22, 167 & 277*

#### **Summary**

Given the continuing number of casualties where the misuse of VHF radio has been established as a contributory factor it has been decided to re-issue the MCA Operational Guidance Notes on the use of VHF Radio. It has also been decided to include operational guidance notes for AIS equipment on board ship formerly contained in Marine Guidance Notice 277.

#### **Key Points**

- The use of marine VHF equipment must be in accordance with the International Telecommunications Union (ITU) Radio Regulations.
- Although the use of VHF radio may be justified on occasion as a collision avoidance aid, the provisions of the Collision Regulations should remain uppermost
- There is no provision in the Collision Regulations for the use of AIS information therefore decisions should be taken based primarily on visual and/or radar information.
- IMO Guidelines on VHF Communication Techniques are given in Appendix I
- Typical VHF ranges and a Table of Transmitting frequencies in the Band 156 - 174 MHz for Stations in the Maritime Mobile Service is shown at Appendix II
- IMO Guidelines for the Onboard Operational Use of Shipborne Automatic Identification Systems (AIS) is shown in Appendix III
- MCA Guidance on the use of AIS in Navigation together with a list of MCA AIS base stations is shown in Appendix IV.

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 intership 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 own-ship 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 realised 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](http://www.mcga.gov.uk)) and reproduced in Appendix IV of this notice.

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**GUIDANCE ON THE USE OF VHF AT SEA**

*(Extract from: IMO Resolution A.954 (23). Proper use of VHF Channels at Sea (Adopted on 5<sup>th</sup> December 2003))*

**1. VHF COMMUNICATION TECHNIQUE**

**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.

**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.

**1.3 Discipline**

- (a) VHF equipment should be used correctly and in accordance with the Radio Regulations. The following in particular should be avoided:
- (b) calling on channel 16 for purposes other than distress, and very brief safety communications, when another calling channel is available;
- (c) non - essential transmissions, e.g. needless and superfluous signals and correspondence;
- (d) communications not related to safety and navigation on port operation channels; communication on channel 70 other than for Digital Selective Calling;
- (e) occupation of one particular channel under poor conditions;
- (f) transmitting without correct identification;
- (g) use of offensive language.

**1.4 Repetition**

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

**1.5 Power reduction**

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

**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 facilities. The purpose of AIS is to help identify vessels, assist in target tracking, simplify information exchange and provide additional information to assist situational 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 operation use of shipborne automatic identification systems.

**1.7 Communications with coast stations**

On VHF channels allocated to port operations service, the only messages permitted are restricted to those relating to the operational handling, the movement and 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.

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

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

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

### **1.8 Communications with other ships**

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.

The listening procedure outlined above should be followed before communications are commenced on the chosen channel.

### **1.9 Distress communications**

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

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

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.

### **1.10 Calling**

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.

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

In case of difficulty to establish contact with a ship or shore station, allow adequate time before repeating the call. Do not occupy the channel unnecessarily and try another channel.

### **1.11 Changing channels**

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

### **1.12 Spelling**

If spelling becomes necessary use the spelling table contained in the International Code of Signals and the radio regulations and the IMO Standard Marine Communication Phrases (SMCP)

### **1.13 Addressing**

The words "I" and "You" should be used prudently. Indicate to whom they refer.

Example of good practice:

"Seaship, this is Port Radar, Port Radar, do you have a pilot?"

"Port Radar, this is Seaship, I do have a pilot."

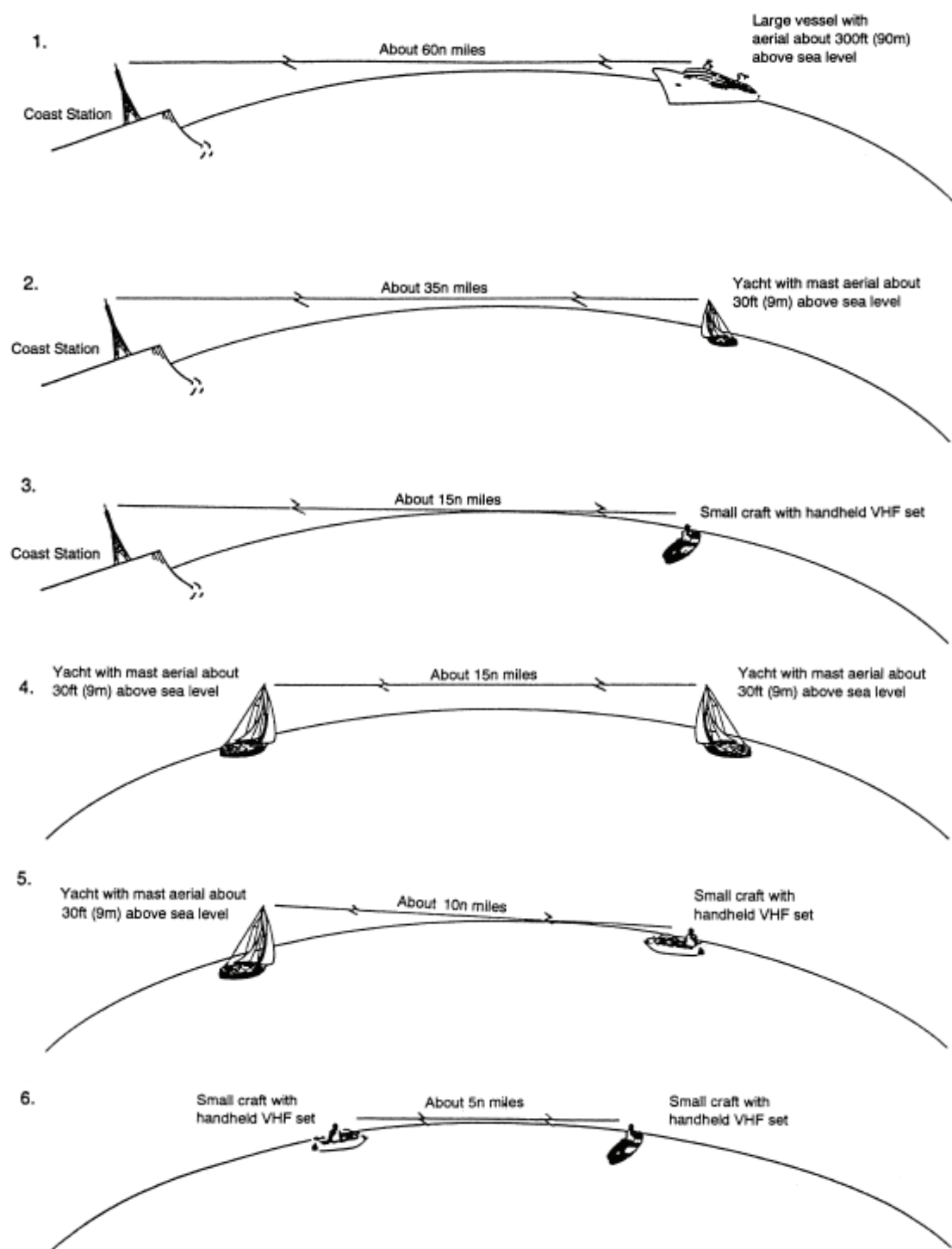
### **1.14 Watchkeeping**

Every ship, while at sea, is required to maintain watches. Continuous watch keeping is required on VHF DSC Channel 70 and also when practicable, a continuous listening watch on VHF Channel 16.

In certain cases Governments may require ships to keep a watch on other channels.

**TYPICAL VHF RANGES**

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



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	60	156 025	160 625			X	x
		156 050	160 650			X	x
02	61 <i>m), o)</i>	156 075	160 675		x	X	x
		156 100	160 700		x	X	x
03	62 <i>m), o)</i>	156 125	160 725		x	X	x
		156 150	160 750		x	X	x
04	63 <i>m), o)</i>	156 175	160 775		x	X	x
		156 200	160 800		x	X	x
05	64 <i>m), o)</i>	156 225	160 825		x	X	x
		156 250	160 850		x	X	x
06	65 <i>m), o)</i>	156 275	160 875		x	X	x
	66 <i>f)</i>	156 300		x			
07		156 325	160 925			X	x
		156 350	160 950			X	x
08	67 <i>h)</i>	156 375	156 375	x	x		
		156 400		x			
09	68	156 425	156 425		x		
	69 <i>i)</i>	156 450	156 450	x	x		
10		156 475	156 475	x	x		
	70 <i>h)</i>	156 500	156 500	x	x		
		156 525	156 525	<b>Digital selective calling for Distress, Safety and Calling</b>			
11		156 550	156 550		x		
12	71	156 575	156 575		x		
		156 600	156 600		x		
13	72 <i>i)</i>	156 625		x			
		156 650	156 650	x	x		
14	73 <i>k)</i>	156 675	156 675	x	x		
		156 700	156 700		x		
15	74	156 725	156 725		x		
		156 750	156 750	x	x		
16	75 <i>g)</i>	156 775			x		
		156 800	156 800	<b>Distress, Safety and Calling</b>			
17	76 <i>n)</i>	156 825			x		
		156 850	156 850	x	x		
18	77 <i>g)</i>	156 875		x			
		156 900	161 500		x	X	x
	78 <i>m)</i>	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				

Note—For assistance in understanding the Table, see notes a) to o)

### 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.

### OPERATION OF AIS ON BOARD

*(Extract from IMO Resolution A.917. (22). Guidelines for the onboard operational use of shipborne Automatic Identification Systems (AIS) (Adopted on 29<sup>th</sup> November 2001). As amended by Resolution A.956. (23). (Adopted 5<sup>th</sup> December 2003).*

#### INHERENT LIMITATIONS OF AIS

31. The officer of the watch (OOW) should always be aware that other ships, in particular leisure craft, fishing boats and warships, and some coastal shore stations including Vessel Traffic Service (VTS) centres, might not be fitted with AIS.

32. The OOW should always be aware that other ships fitted with AIS as a mandatory carriage requirement might switch off AIS under certain circumstances by professional judgement of the master.

33. In other words, the information given by the AIS may not be a complete picture of the situation around the ship.

34. The users must be aware that transmission of erroneous information implies a risk to other ships as well as their own. The users remain responsible for all information entered into the system and the information added by the sensors.

35. The accuracy of the information received is only as good as the accuracy of the AIS information transmitted.

36. The OOW should be aware that poorly configured or calibrated ship sensors (position, speed and heading sensors) might lead to incorrect information being transmitted. Incorrect information about one ship displayed on the bridge of another could be dangerously confusing.

37. If no sensor is installed or if the sensor (e.g. the gyro) fails to provide data, the AIS automatically transmits the 'not available' data value. However the built in integrity check cannot validate the contents of the data processed by the AIS.

38. It would not be prudent for the OOW to assume that the information received from the other ship is of a comparable quality and accuracy to that which might be available on own ship.

#### USE OF AIS IN COLLISION AVOIDANCE SITUATIONS

39. The potential of AIS as an anti collision device is recognised and AIS may be recommended as such a device in due time.

40. Nevertheless, AIS information may be used to assist collision avoidance decision making. When using the AIS in the ship to ship mode for anti collision purposes, the following precautionary points should be borne in mind:

- a. AIS is an additional source of navigational information. It does not replace, but supports, navigational systems such as radar target tracking and VTS; and
- b. The use of AIS does not negate the responsibility of the OOW to comply at all times with the Collision Regulations

41. The user should not rely on AIS as the sole information system, but should make use of all safety relevant information available

42. The use of AIS on board ship is not intended to have any special impact on the composition of the navigational watch, which should be determined in accordance with the STCW Convention.

43. Once a ship has been detected, AIS can assist tracking it as a target. By monitoring the information broadcast by that target, its actions can also be monitored. Changes in heading and course are, for example, immediately apparent, and many of the problems common to tracking targets by radar, namely clutter, target swap as ships pass close by and target loss following a fast manoeuvre, do not affect AIS. AIS can also assist in the identification of targets, by name or call sign and by ship type and navigational status.

**USE OF AIS IN NAVIGATION**

*(Extract from MCA Guidance on the Safety of Navigation – Implementing SOLAS Chapter V)*

1. AIS is designed to be able to provide additional information to existing Radar or ECDIS displays. Until the optimum display modes have been fully evaluated and decided upon internationally, AIS will comprise “stand alone” units without integration to other displays.

2. AIS will provide identification of targets together with the static and dynamic information listed in the IMO Guidelines paragraph.12. Mariners should, however, use this information with caution noting the following important points:

a.) Collision avoidance must be carried out in strict compliance with the COLREGs. There is no provision in the COLREGs for use of AIS information therefore decisions should be taken based primarily on visual and / or radar information.

b.) The use of VHF to discuss actions to take between approaching ships is fraught with danger and still discouraged. (See above). The MCA’s view is that identification of a target by AIS does not remove the danger. Decisions on collision avoidance should be made strictly according to the COLREGs.

c.) Not all ships will be fitted with AIS, particularly small craft and fishing boats. Other floating objects which may give a radar echo will not be detected by AIS.

d.) AIS positions are derived from the target’s GNSS position. (GNSS = Global Navigation Satellite System, usually GPS). This may not coincide exactly with the target.

e.) Faulty data input to AIS could lead to incorrect or misleading information being displayed on other vessels. Mariners should remember that information derived from radar plots relies solely upon data measured by the own-ship’s radar and provides an accurate measurement of the target’s relative course and speed, which is the most important factor in deciding upon action to avoid collision. Existing ships of less than 500 gt. which are not required to fit a gyro compass are unlikely to transmit heading information.

f.) A future development of AIS is the ability to provide synthetic AIS targets and virtual navigation marks enabling coastal authorities to provide an AIS symbol on the display in any position. Mariners should bear in mind that this ability could lead to the appearance of “virtual” AIS targets and therefore take particular care when an AIS target is not complemented by a radar target. AIS will sometimes be able to detect targets which are in a radar shadow area.

The MCA has established an Automatic Identification System (AIS) network in accordance with SOLAS Chapter V Regulation 19 and the European Traffic Monitoring Directive 2002/59/EC for base station transponders. The AIS network consists of base stations located as shown in the table on page 15.

The AIS Network is defined to operate within IMO guidelines and will be capable of receiving all message types and in particular AIS message type 5: Ship Static and Voyage related data, provided as 6 minute intervals in accordance with ITU R M. 1371-1. This automated procedure will enable identification and tracking of suitably equipped vessels without further intervention from either the vessel's crew or Coastguard personnel.

#### **Areas Covered**

The diagram below provides an indication of the areas covered by the AIS Network (Although the prediction indicates no coverage in the Southern Irish Sea, the trial to date has shown the area is covered).



MCA District	Base Station	Latitude			Longitude			AIS
		Degrees	Minutes	N / S	Degrees	Minutes	W / E	MMSI
Aberdeen	Dunnett Head	58	40.313	N	3	22.491	W	002320722
	Durness	58	34.000	N	4	44.500	W	002320720
	Gregness	57	7.643	N	2	3.136	W	002320721
	Noss Head	58	28.750	N	3	2.972	W	002320723
	Rosemarkie	57	37.900	N	4	4.800	W	002320719
	Windy Head	57	38.924	N	2	14.590	W	002320718
Belfast	Limavady	55	6.712	N	6	53.390	W	002320709
	Orlock Head	54	40.416	N	5	34.966	W	002320708
Brixham	East Prawle	50	13.200	N	3	42.500	W	002320710
Clyde	Glengorm	56	37.917	N	6	7.885	W	002320714
	Kilchairan	55	45.900	N	6	27.200	W	002320711
	Law Hill	55	41.800	N	4	50.500	W	002320712
	Pulpitt Hill	56	24.300	N	5	29.000	W	002320713
	South Knapdale	55	55.100	N	5	27.600	W	002320717
	Tiree	56	30.238	N	6	57.776	W	002320716
Dover	Fairlight	50	52.300	N	0	38.100	E	002320715
	MRCC Dover	51	7.800	N	1	20.200	E	002320705
	North Foreland	51	22.300	N	1	26.900	E	002320706
Falmouth	Lands End	50	8.068	N	5	38.096	W	002320704
	Lizard Point	49	57.821	N	5	12.396	W	002320733
	Scillies	49	55.710	N	6	18.180	W	002320734
Forth	Inverbervie	56	51.200	N	2	15.700	W	002320735
	MRSC Forth	56	16.731	N	2	35.380	W	002320732
	St. Abbs Crosslaw	55	54.455	N	2	12.295	W	002320741
Holyhead	South Stack	53	18.600	N	4	41.000	W	002320776
Humber	Cullercoats	55	4.374	N	1	27.799	W	002320775
	Flamborough Head	54	7.848	N	0	5.205	W	002320766
	Whitby	54	29.000	N	0	36.000	W	002320778
Liverpool	MRSC Liverpool	53	29.800	N	3	3.200	W	002320777
	Snaefell	54	15.829	N	4	27.596	W	002320770
Milford	Dinas	52	0.300	N	4	53.700	W	002320774
	St. Anns Head	51	40.950	N	5	10.500	W	002320781
Portland	The Grove	50	32.885	N	2	25.098	W	002320763
Shetland	Collafirth Hill	60	32.040	N	1	23.352	W	002320771
	Compass Head	59	52.066	N	1	16.318	W	002320772
	Saxa Vord	60	49.600	N	0	50.600	W	002320764
	Wideford Hill	58	59.300	N	3	1.400	W	002320765
Solent	Needles	50	39.700	N	1	34.600	W	002320779
	Newhaven	50	46.800	N	0	3.000	E	002320773
	Selsey	50	43.788	N	0	48.141	W	002320780
Stornoway	Butt of Lewis	58	27.683	N	6	13.851	W	002320769
	Forsnaval	58	12.801	N	7	0.499	W	002320768
	Melvaig	57	50.542	N	5	46.883	W	002320767
	Rodel	57	44.900	N	6	57.500	W	002320764
Swansea	Hartland Point	51	1.795	N	4	31.300	W	002320765
	Mumbles Hill	51	34.200	N	3	59.100	W	002320779
	Severn Bridge (2)	51	36.400	N	2	37.800	W	002320773
Thames	MRSC Thames	51	51.271	N	1	16.908	E	002320780
Yarmouth	Langham	52	56.600	N	0	57.200	E	002320769
	MRCC Yarmouth	52	36.300	N	0	42.500	E	002320768
	Skegness	53	8.916	N	0	20.784	E	002320767

## MGN 324 (M+F) Correction

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### Radio: Operational Guidance on the Use Of VHF Radio and Automatic Identification Systems (AIS) at Sea

Notice to all Owners, Masters, Officers and Pilots of Merchant Ships, Owners and Skippers of Fishing Vessels and Owners of Yachts and Pleasure Craft.

*This notice should be read in conjunction with MGN 324 (M+F)*

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**PLEASE NOTE:-**

Where this document provides guidance on the law it should not be regarded as definitive. The way the law applies to any particular case can vary according to circumstances - for example, from vessel to vessel and you should consider seeking independent legal advice if you are unsure of your own legal position.

**Summary**

**CORRECTION**

Key Notes:

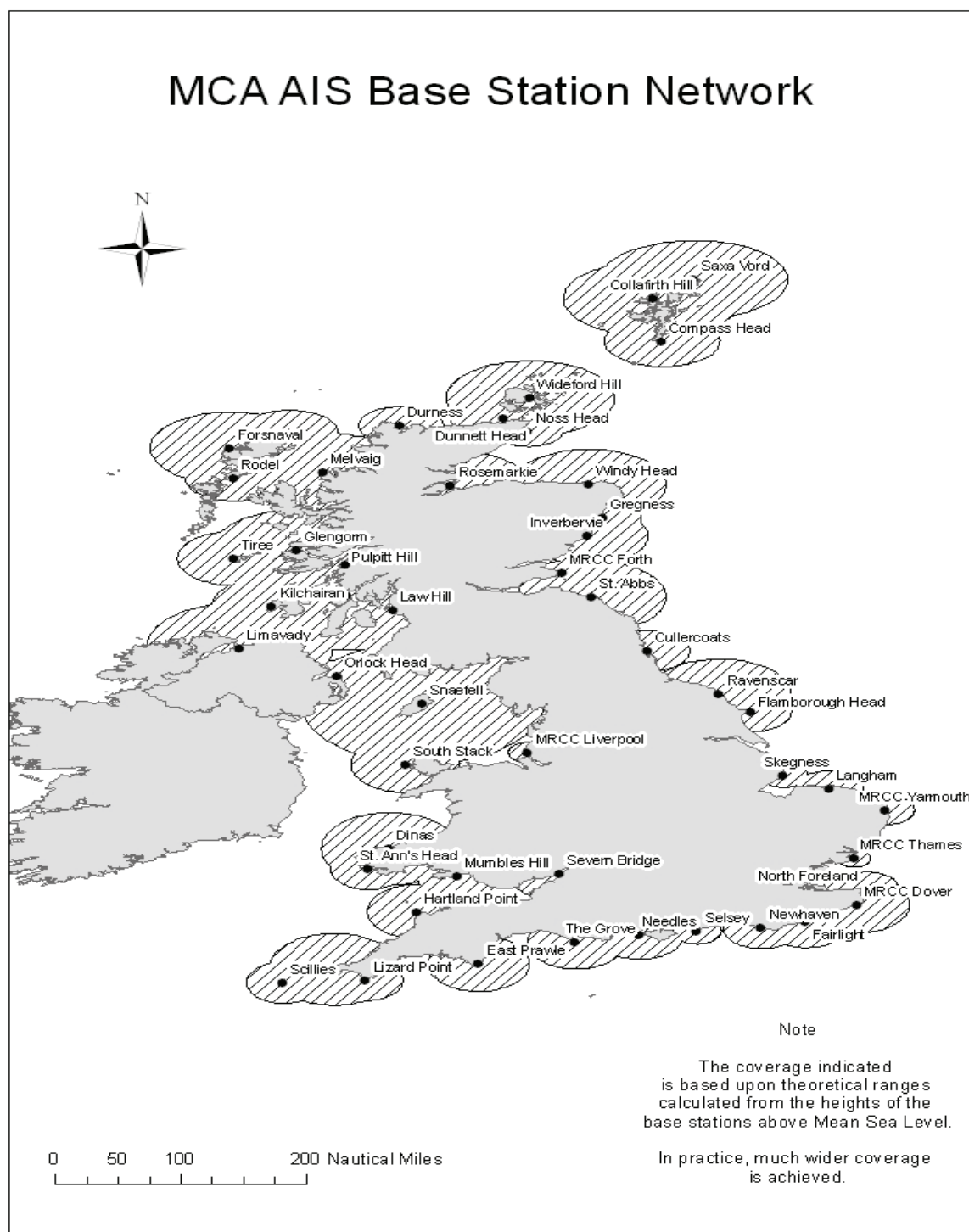
Corrections for Marine Guidance Note 324 (M+F)

Page 14: Replace the diagram for Areas Covered

Page 15: Replace the table

## Areas Covered

The diagram below provides an indication of the areas covered by the MCA AIS Network.



MCA District	Base Station	Latitude			Longitude			AIS
		Degrees	Minutes	N / S	Degrees	Minutes	W / E	MMSI
Aberdeen	Dunnett Head	58	40.313	N	003	22.491	W	002320712
	Durness	58	34.288	N	004	45.177	W	002320713
	Gregness	57	07.638	N	002	03.225	W	002320735
	Noss Head	58	28.727	N	003	03.038	W	002320711
	Rosemarkie	57	37.994	N	004	04.498	W	002320763
	Windy Head	57	38.892	N	002	14.696	W	002320736
Belfast	Limavady	55	06.712	N	006	53.390	W	002320764
	Orlock Head	54	40.422	N	005	35.042	W	002320765
Brixham	East Prawle	50	13.049	N	003	42.608	W	002320766
Clyde	Glengorm	56	37.916	N	006	07.948	W	002320739
	Kilchairan	55	45.958	N	006	27.333	W	002320741
	Law Hill	55	41.745	N	004	50.501	W	002320769
	Pulpitt Hill	56	24.241	N	005	29.147	W	002320767
	South Knapdale	55	55.055	N	005	27.731	W	002320768
	Tiree	56	30.229	N	006	57.853	W	002320740
Dover	Fairlight	50	52.300	N	000	38.100	E	002320704
	MRCC Dover	51	07.750	N	001	20.200	E	002320705
	North Foreland	51	22.494	N	001	26.830	E	002320706
Falmouth	Lands End	50	08.068	N	005	38.096	W	002320721
	Lizard Point	49	57.853	N	005	12.463	W	002320720
	Scillies	49	55.753	N	006	18.223	W	002320723
Forth	Inverbervie	56	51.103	N	002	15.700	W	002320770
	MRCC Forth	56	16.711	N	002	35.217	W	002320734
	St. Abbs Crosslaw	55	54.449	N	002	12.383	W	002320710
Holyhead	South Stack	53	18.545	N	004	41.168	W	002320771
Humber	Cullercoats	55	04.379	N	001	27.794	W	002320708
	Flamborough Head	54	07.084	N	000	05.204	W	002320709
	Ravenscar	54	23.828	N	000	30.347	W	002320780
Liverpool	MRCC Liverpool	53	29.818	N	003	03.499	W	002320772
	Snaefell	54	15.832	N	004	27.657	W	002320718
Milford	Dinas	52	00.253	N	004	53.686	W	002320742
	St. Anns Head	51	40.953	N	005	10.555	W	002320719
Portland	The Grove	50	32.918	N	002	25.170	W	002320722
Shetland	Collafirth Hill	60	31.994	N	001	23.454	W	002320737
	Compass Head	59	52.066	N	001	16.318	W	002320714
	Saxa Vord	60	49.700	N	000	50.376	W	002320774
	Wideford Hill	58	59.276	N	003	01.532	W	002320781
Solent	Needles	50	39.711	N	001	34.723	W	002320775
	Newhaven	50	46.950	N	000	03.007	E	002320776
	Selsey	50	43.829	N	000	48.217	W	002320744
Stornoway	Butt of Lewis	58	27.683	N	006	13.862	W	002320715
	Forsnaval	58	12.803	N	007	00.379	W	002320738
	Melvaig	57	50.534	N	005	46.950	W	002320717
	Rodel	57	07.475	N	006	09.552	W	002320716
Swansea	Hartland Point	51	01.213	N	004	31.337	W	002320778
	Mumbles Hill	51	34.161	N	003	59.061	W	002320743
	Severn Bridge	51	36.721	N	002	38.769	W	002320777
Thames	MRCC Thames	51	51.295	N	001	16.793	E	002320779
Yarmouth	Langham	52	56.528	N	000	57.234	E	002320773
	MRCC Yarmouth	52	36.470	N	001	43.316	E	002320733
	Skegness	53	08.938	N	000	20.692	E	002320732

## More Information

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telephone numbers are correct at time of publishing



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*An executive agency of the  
Department for  
**Transport***



Extract from Zodiac's Navigational Audit of *Hyundai Discovery* - dated 17/05/2011

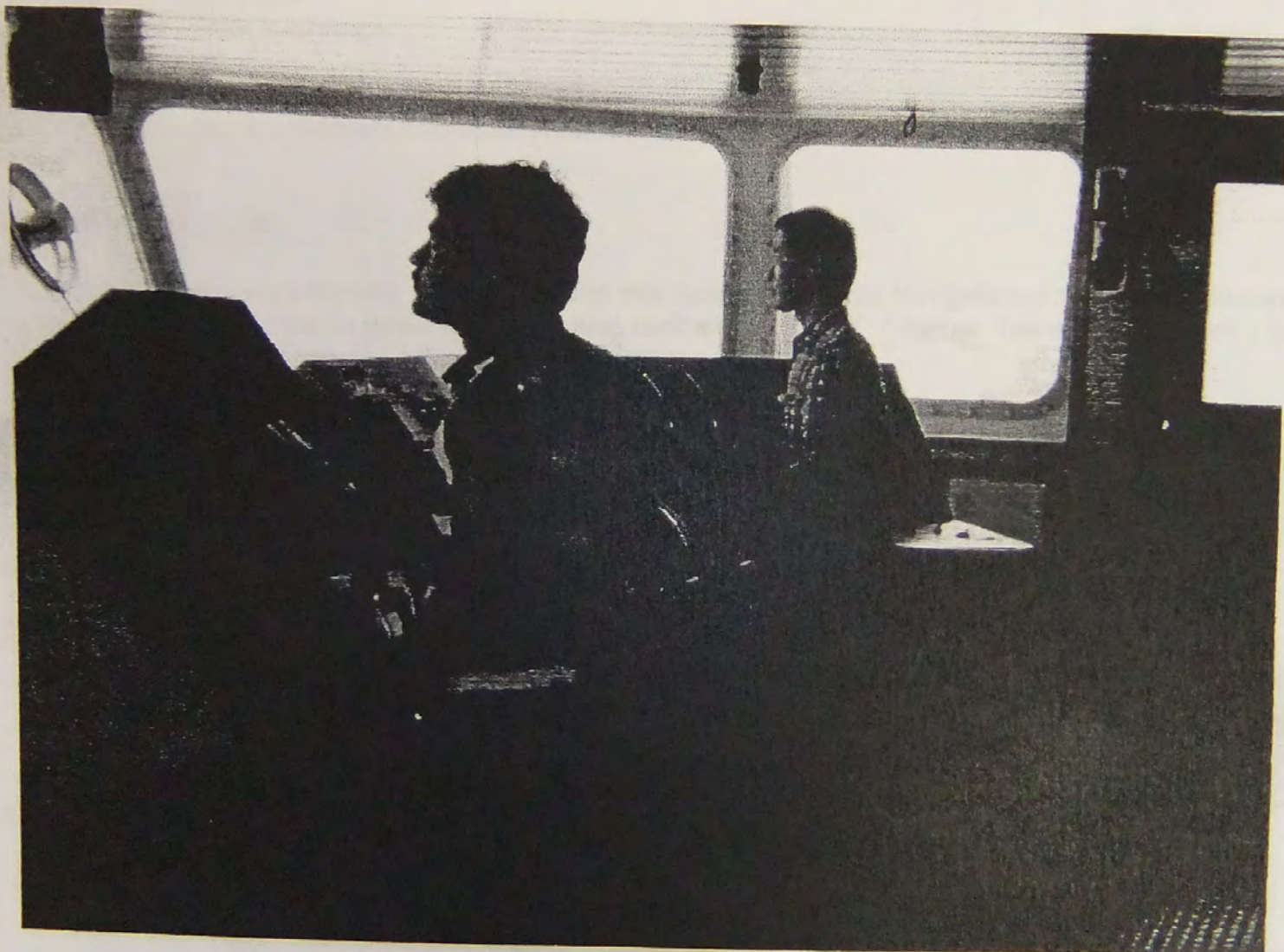


# NAVIGATIONAL AUDIT REPORT

**Zodiac Maritime Agencies Ltd.**

m/v "HYUNDAI DISCOVERY"

## NAVIGATIONAL AUDIT



# NAVIGATIONAL AUDIT REPORT

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- Ship's manoeuvring characteristics;
- S-VDR – down loading procedures

## 15. CONCLUSION, ASSESSMENT AND RECOMMENDATION:

- 1/ Navigation was performing in safe manner and in compliance with International rules and company's requirements
- 2/ BTM implemented
- 3/ Bridge team appeared in good navigational skill
- 4/ Passage planning – Very Good

Navigation audit assessment: VERY GOOD



Extract from the International Regulations for Preventing Collisions at Sea 1972 (as amended)  
(COLREGS)



**Extract of The International Regulations for Preventing Collisions at Sea  
1972 (as amended) (COLREGS)**

- Rule 2 - Responsibility

(a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

(b) In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.

- Rule 3 — General definitions

For the purpose of these Rules, except where the context otherwise requires: —

(k) Vessels shall be deemed to be in sight of one another only when one can be observed visually from the other.

(l) The term “restricted visibility” means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes.

- Rule 5 – Look-out

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

- Rule 6 – Safe Speed

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed the following factors shall be among those taken into account:

(a) By all vessels:

(i) the state of visibility;

(ii) the traffic density including concentrations of fishing vessels or any other vessels;

(iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;

(iv) at night the presence of background light such as from shore lights or from back scatter of her own lights;

(v) the state of wind, sea and current, and the proximity of navigational hazards;

(vi) the draught in relation to the available depth of water.

(b) Additionally, by vessels with operational radar:

(i) the characteristics, efficiency and limitations of the radar equipment;

(ii) any constraints imposed by the radar range scale in use;

(iii) the effect on radar detection of the sea state, weather and other sources of interference;

(iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;

(v) the number, location and movement of vessels detected by radar;

(vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity

- Rule 7 - Risk of collision

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and

conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed

to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

(d) In determining if risk of collision exists the following considerations shall be among those taken into account:

(i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change;

(ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

- Rule 8 - Action to avoid collision

(a) Any action taken to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

(b) Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar; a succession of small alterations of course and/or speed should be avoided.

(c) If there is sufficient sea-room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that it is made in good time, is substantial and does not result in another close-quarters situation.

(d) Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance. The effectiveness of the action shall be carefully checked until the other vessel is finally past and clear.

(e) If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.

(f) (i) A vessel which, by any of these Rules, is required not to impede the passage or safe passage of another vessel shall, when required by the circumstances of the case, take early action to allow sufficient sea-room for the safe passage of the other vessel.

(ii) A vessel required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision and shall, when taking action, have full regard to the action which may be required by the Rules of this Part.

(iii) A vessel the passage of which is not to be impeded remains fully obliged to comply with the Rules of this Part when the two vessels are approaching one another so as to involve risk of collision.

- Rule 19 - Conduct of vessels in restricted visibility

(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.

(c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of Section I of this Part.

(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;

(ii) an alteration of course towards a vessel abeam or abaft the beam.

(e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.

- Rule 35 - Sound signals in restricted visibility

In or near an area of restricted visibility, whether by day or night, the signals prescribed in this Rule shall be used as follows:

(a) A power-driven vessel making way through the water shall sound at intervals of not more than 2 minutes one prolonged blast.

Simulator - ship model details





## **General Description**

### **Power Plant**

CNTNR21L Container Vessel KMSS ULTRA is powered by 1 diesel engine rating 49106 kW at 106 rpm.

### **Propulsors**

CNTNR21L is propelled by 1 fixed pitch propeller. Direction of propulsor revolution is right.

### **Speed**

Top speed of CNTNR21L at 100% throttle setting and calm conditions is 26,5 kn ahead and 7,7 kn astern.

### **Rudders**

This ship is steered with 1 rudder with maximum angle 35 deg. The rudder uses 70 deg from full port to full starboard.

### **Thrusters**

This ship is equipped with 1 bow tunnel thruster rating 2000 kW.

### **Stopping Ability**

Stopping performance can be judged from crash stop manoeuvre. Crash stop distance of CNTNR21L is 3060 m which makes 11,4 ship lengths. Such crash stop performance is fair and satisfies IMO's requirements as described in IMO Resolution MCS.137(76) Standards for Ship Manoeuvrability.

### **Turning Ability**

The turning ability may be judged from turning circles. Turning circle test performed at 100% throttle setting and 35 deg starboard steering order results in advance 1060 m or 4,0 ship's length and tactical diameter 1217 m or 4,5 ship's length. Turning ability of CNTNR21L is fair and satisfies IMO's requirements.

### **Manoeuvring Ability**

Zigzag test performed at 80% throttle setting show first overshoot angle 3,1 deg in the 10-10° test and 7,5 deg in the 20-20° test. Zigzag test results indicate that manoeuvring ability of CNTNR21L is good and satisfies IMO's Resolution MCS.137(76).

### **Steering Ability**

Steering ability of CNTNR21L is good. The ship is course stable.



## Ship Data

### Identification

Model name	CNTNR21L
Ship database file name	CNTNR21L.sdb
Type of ship	Container Vessel
Loading condition	Loaded
Ship's name	KMSS ULTRA

### General Data

IMO#	
Year Built	
Builder	
Call Sign	
MMSI	
Bulbous Bow	No
Gross Tonnage, t	
Net Tonnage, t	
Deadweight, t	0
Displacement, t	87400
Length between perpendiculars, m	268
Length overall, m	285
Beam moulded, m	40
Draught fore, m	12,7
Draught aft, m	12,7
Block coefficient	0,626
Radius of inertia, multiples of $L_{pp}$	0,18
Lateral windage area, $m^2$	6799
Speed ahead, kn	26,5
Speed astern, kn	7,7
Transverse metacentric height, m	1,5

### Engines

Number of engines	1
Type of engine	Diesel
Total shaft power, kW	49106
Revolutions, rpm	106,0
Stall Revolutions, rpm	106,0

### Propellers

Number of propellers	1
----------------------	---



Type of propulsion .....	Propeller
Max azimuthing angle, deg .....	0,0
Max azimuthing rate, deg/s .....	0,0
Revolutions, rpm .....	106,0
Direction of rotation .....	Clockwise
Diameter, m .....	8,3
Pitch, P/D @ 0.7R .....	1,023

## Rudders

Number of rudders .....	1
Rudder type .....	Normal
Max rudder angle, deg .....	35,0
Max rudder rate, deg/s .....	3,0
Rudder area, m <sup>2</sup> .....	n/a
Total rudder area, % of $L_{pp}T$ .....	n/a

## Bow Thrusters

Number of bow thrusters .....	1
Power, kW .....	2000,0
Propeller revolutions, rpm .....	197,6
Propeller diameter, m .....	2,8
Propeller pitch, P/D @ 0.7R .....	0,80

## Bow Anchors

Number of bow anchors .....	2
Mass, t .....	12,1
Chain break load, t .....	682,0

## Radar Position

Longitudinal radar position, m .....	-73,7
Lateral radar position, m .....	3,7
Vertical radar position, m .....	39,3

## Viewpoint Position

Longitudinal viewpoint position, m .....	-70,0
Lateral viewpoint position, m .....	0,0
Vertical viewpoint position, m .....	30,0

## Speed

Throttle Setting		Propeller		Speed	
		revolutions	pitch	deep $H/T = \infty$	shallow $H/T = 1.5$
		rpm	P/D	kn	kn
Full sea speed	1	106,0		26,5	23,0
Full Ahead	0,8	55,0		14,5	13,7
Half Ahead	0,5	45,0		12,0	11,2
Slow Ahead	0,25	35,0		9,0	8,7
Dead Slow Ahead	0,125	25,0		6,5	6,2
Dead Slow Astern	-0,125	-25,0		-2,7	-2,7
Slow Astern	-0,25	-35,0		-3,8	-3,7
Half Astern	-0,5	-45,0		-4,9	-4,8
Full Astern	-1	-71,0		-7,7	-7,5

Table 1. Propeller revolutions and pitch and ship speed as function of machinery telegraph setting. Deep and shallow water

Extract from The United Nations Convention On the Law of the Sea (UNCLOS)



# Extract from the United Nations Convention on the Law of the Sea (UNCLOS)

## PART VII

### HIGH SEAS

#### SECTION 1. GENERAL PROVISIONS

##### Article 98. Duty to render assistance

1. Every State shall require the master of a ship flying its flag, in so far as he can do so without serious danger to the ship, the crew or the passengers;

(c) after a collision, to render assistance to the other ship, its crew and its passengers and, where possible, to inform the other ship of the name of his own ship, its port of registry and the nearest port at which it will call.

IMO Resolution **MSC.255(84): The Code of The International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code)**, which entered force in January 2010.

#### Chapter 10

##### CO-OPERATION

10.1 All substantially interested States shall co-operate with the marine safety investigating State(s) to the extent practicable. The marine safety investigating State(s) shall provide for the participation of the substantially interested States to the extent practicable\*.

The reference to “extent practicable” may be taken to mean, as an example, that co-operation or participation is limited because national laws make it impracticable to fully co-operate or participate.

**16.3 Co-operation:** Where it is practicable and consistent with the requirements and recommendations of this Code, in particular chapter 10 on Co-operation, the marine safety investigating State(s) should seek to facilitate maximum co-operation between substantially interested States and other persons or organizations conducting an investigation into a marine casualty or marine incident.

**16.4 Priority:** A marine safety investigation should, as far as possible, be afforded the same priority as any other investigation, including investigations by a State for criminal purposes being conducted into the marine casualty or marine incident.

**16.4.1** In accordance with paragraph 16.4 investigator(s) carrying out a marine safety investigation should not be prevented from having access to evidence in circumstances where another person or organization is carrying out a separate investigation into a marine casualty or marine incident.

**16.4.2** The evidence for which ready access should be provided should include:

- .1 survey and other records held by the flag State, the owners, and classification societies;
- .2 all recorded data, including voyage data recorders; and
- .3 evidence that may be provided by government surveyors, coastguard officers, vessel traffic service operators, pilots or other marine personnel.

**16.5 Scope of a marine safety investigation:** Proper identification of causal factors requires timely and methodical investigation, going far beyond the immediate evidence and looking for underlying conditions, which may be remote from the site of the marine casualty or marine incident, and which may cause other future marine casualties and marine incidents. Marine safety investigations should therefore be seen as a means of identifying not only immediate causal factors but also failures that may be present in the whole chain of responsibility.