# BRIDGE PROCEDURES GUIDE

FIFTH EDITION

INTERNATIONAL CHAMBER OF SHIPPING
*Representing the Global Shipping Industry*

# BRIDGE PROCEDURES GUIDE

FIFTH EDITION


**INTERNATIONAL CHAMBER OF SHIPPING**

*Representing the Global Shipping Industry*

# INTERNATIONAL CHAMBER OF SHIPPING

The International Chamber of Shipping (ICS) is the principal international trade association for the shipping industry, representing shipowners and operators in all sectors and trades.

ICS membership comprises national shipowners' associations in Asia, Europe and the Americas whose member shipping companies operate over 80% of the world's merchant tonnage.

Established in 1921, ICS is concerned with all technical, legal, employment affairs and policy issues that may affect international shipping.

ICS represents shipowners with the various intergovernmental regulatory bodies that impact on shipping, including the International Maritime Organization (IMO).

ICS also develops best practices and guidance, including a wide range of publications and free resources, that are used by ship operators globally.



# BRIDGE PROCEDURES GUIDE

## FIFTH EDITION

Published by
Marisec Publications
38 St Mary Axe
London, EC3A 8BH

Tel +44 20 7090 1460
Fax +44 20 7090 1484
Email publications@marisec.org
Web www.ics-shipping.org

First Published 1977
Revised Edition 1990
Third Edition 1998
Fourth Edition 2007
Fifth Edition 2016

# FOREWORD

Since first published in 1977, the intention behind the *ICS Bridge Procedures Guide* has been to reflect current best navigational practice on commercial ships, operating in all sectors and trades. The Bridge Procedures Guide is generally acknowledged as the principal industry advice on safe bridge procedures. Consequently it is used as a reference publication by Masters, watchkeeping officers, shipping companies, training institutions and accident investigators worldwide. The target audience for this Guide remains, first and foremost, Masters and officers in charge of a navigational watch at sea.

Keeping the Bridge Procedures Guide up to date and relevant is a major responsibility, and an important example of the work which ICS undertakes on behalf of the international shipping industry. Technological and regulatory developments can contribute to making keeping a safe watch a complex and increasingly challenging responsibility. The purpose of the Guide therefore is to provide clear guidance on best practice approaches to watchkeeping that make safe and effective use of modern technology.

This fully updated fifth edition continues to embrace internationally agreed standards and recommendations adopted by the International Maritime Organization (IMO). The Guide also includes extensive checklists for use by companies, Masters and those officers responsible for developing ship specific checklists for bridge procedures. A new feature of this edition is the increased use of diagrams and highlighted text emphasising key points.

The 2010 amendments to the STCW Convention have introduced *inter alia* enhanced Bridge Resource Management training for all officers in charge of a navigational watch, and stricter minimum rest hour requirements. This was a direct response to the recognition by regulators and accident investigators of the importance of the human element in ship safety.

New equipment and technology underlines the need for familiarisation with ship specific arrangements. ECDIS is a particular example of this, and this new edition of the Guide includes comprehensive ECDIS familiarisation checklists and guidance that cautions against over reliance on the system.

In addition to contributing to maritime safety, efficient and well planned sea passages are necessary for the economic health of the shipping industry. Together with new environmental requirements, including rules to reduce air emissions, there are additional pressures to ensure effective passage planning and efficient execution. This new edition continues to emphasise the importance of the passage planning process.

The Guide continues to stress the importance of effective bridge procedures to support the conduct of safe navigation, efficient ship operations and the prevention of pollution. Good practice on the bridge is the result of clear operational requirements established in the ship's Safety Management System and the Master's Standing Orders, effective management of trained and familiarised bridge personnel, and a thoroughly prepared passage plan on which the Bridge Team has been fully briefed.

The assistance of experts from ICS Member national shipowners' associations in the preparation of this Guide is gratefully acknowledged. Special thanks are due to Captain Paul Jones of BW Group who efficiently led the working group tasked with the review. This has ensured that the Guide remains relevant and maintains the high standard set by the previous editions. Other working group members were nominated by the shipowners' associations of Denmark, Germany, Ireland, Italy, Japan, Netherlands and the United Kingdom as well as by the Cruise Lines International Association (CLIA) and the International Marine Contractors' Association (IMCA).

Special thanks are also due to maritime administrations, accident investigators and colleagues from other maritime organisations who have offered recommendations or willingly given time and expertise to ensure that the Bridge Procedures Guide continues to offer the very best possible guidance on this critical subject.

# CONTENTS

# ANNEXES

# TERMS AND ABBREVIATIONS

| | |
|---|---|
| **AGC** | Anti-Grounding Cone. |
| **Airband** | Radio frequencies used to communicate with aircraft. |
| **Air Draught** | Vertical distance from the waterline to the highest point on the vessel. |
| **AIS** | Automatic Identification System. |
| **AMVER** | Automated Mutual-Assistance Vessel Rescue System: a worldwide voluntary system operated exclusively to support SAR and to make information available to all RCCs. |
| **ARPA** | Automatic Radar Plotting Aid. |
| **ASOG** | Activity Specific Operating Guidelines. |
| **ATA** | Automatic Tracking Aid. |
| **AtoN** | Aid to Navigation. |
| **BNWAS** | Bridge Navigational Watch Alarm System. |
| **Bridge Team** | The personnel on the bridge engaged in the navigation of the vessel. |
| **BRM** | Bridge Resource Management. |
| **CATZOC** | Category Zone of Confidence: the symbols used to show varying levels of accuracy, coverage and survey reliability on an ENC. |
| **CBT** | Computer-Based Training. |
| **CES** | Coast Earth Station: the maritime name for a shore-based station linking satellite communication with terrestrial communication networks. |
| **COG** | Course Over Ground. |
| **COLREGS** | Convention on the International Regulations for Preventing Collisions at Sea. |
| **Company** | The owner of a ship or any organisation or person, such as a third party ship manager or charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who on assuming such responsibility has agreed to take over all duties and responsibilities imposed by the ISM Code. |
| **COSPAS-SARSAT** | A satellite system designed to detect distress beacons transmitting on the frequency 406 MHz. |

| | |
|---|---|
| **CPA** | Closest Point of Approach. |
| **Deep Sea Pilot** | A pilot engaged in sea areas where there are specific dangers, high traffic density or other navigational hazards. |
| **DGNSS** | Differential Global Navigation Satellite System: an augmented GNSS, including DGPS, which provides increased accuracy and integrity. |
| **DOC** | Document of Compliance issued to the Company under the ISM Code. |
| **DP** | Dynamic Positioning: the ability of a ship to maintain automatically a pre-set position and heading by using its own propellers and thrusters. |
| **DPA** | Designated Person Ashore as defined in the ISM Code. |
| **DPO** | Dynamic Positioning Operator. |
| **Draught** | Vertical distance from the waterline to the keel. |
| **DSC** | Digital Selective Calling: a technique using digital codes which enable a radio station to establish contact with, and transfer information to, another station or group of stations. DSC is available in VHF, MF and HF bands. |
| **EBL** | Electronic Bearing Line. |
| **ECA** | Emission Control Area: a sea area in which particular controls exist to minimise air emissions from ships. |
| **ECDIS** | Electronic Chart Display and Information System. |
| **ECS** | Electronic Chart System: a system which is not an ECDIS or an ECDIS which is using unofficial or private navigational charts. |
| **EGC** | Enhanced Group Calling: a system for supplying MSI via satellite communications systems. |
| **eLoran** | Terrestrial navigation system derived from the Loran-C system. |
| **ENC** | Electronic Navigational Chart: an official vector chart. |
| **EP** | Estimated Position. |
| **EPA** | Electronic Plotting Aid. |
| **EPIRB** | Emergency Position Indicating Radio Beacon. |
| **Geodetic Datum** | A coordinate system, and a set of reference points, used to locate places on the surface of the Earth. WGS 84 is the Geodetic Datum used by GPS, ECDIS and ENCs. |

| | |
|---|---|
| **GMDSS** | Global Maritime Distress and Safety System: a global system for providing distress and safety services to ships at sea using terrestrial and satellite communications. |
| **GNSS** | Global Navigation Satellite System: a satellite-based system for providing position, navigation and time with global rather than regional coverage. GNSS in use include the Global Positioning System (GPS) and Global Navigation Satellite System (GLONASS). Systems under development include Galileo (Europe) and Beidou (China). |
| **GOC** | General Operator's Certificate: a GMDSS radio operator's certificate for use on ships trading beyond GMDSS Sea Area A1. |
| **HF** | High Frequency. |
| **IAMSAR** | International Aeronautical and Maritime Search and Rescue Manual: published in three volumes jointly by ICAO and IMO. |
| **IBS** | Integrated Bridge System. |
| **ICAO** | International Civil Aviation Organization: United Nations organisation with responsibility for aviation regulation and standards in the aviation industry. |
| **IHO** | International Hydrographic Organization: intergovernmental organisation with responsibility for hydrographic standards. |
| **IMO** | International Maritime Organization: United Nations organisation with responsibility for shipping regulation, including safety of life at sea, navigation safety, and the protection of the marine environment. |
| **INS** | Integrated Navigation System. |
| **ISM Code** | International Safety Management Code. |
| **ITU** | International Telecommunication Union: United Nations body with responsibility for radio regulations. |
| **LOP** | Lines of Position. |
| **LRIT** | Long Range Identification and Tracking of Ships. |
| **LSA** | Life-Saving Appliance(s). |
| **Manoeuvring Booklet** | The ship's manoeuvring booklet should contain comprehensive details of the ship's manoeuvring characteristics and other relevant data. |
| **MARPOL** | International Convention for the Prevention of Pollution from Ships. |
| **MF** | Medium Frequency. |
| **MMSI** | Maritime Mobile Service Identity: 9-digit ITU identification number allocated to ships operating DSC or an SES. |

| | |
|---|---|
| **MOB** | Man Overboard. |
| **MPX** | Master/Pilot Information Exchange. |
| **MRCC** | Maritime Rescue Co-ordination Centre. |
| **MSI** | Maritime Safety Information: navigational and meteorological warnings, forecasts and other urgent safety related messages broadcast to ships. |
| **NAVAREA** | The oceans of the world are divided into 16 areas (NAVAREA I – XVI) for the dissemination of long-range navigational and meteorological warnings under the WWNWS. |
| **NAVTEX** | A medium frequency direct printing service for broadcasting marine weather forecasts, navigational warnings, SAR alerts and other warnings and urgent information to ships in coastal waters under the WWNWS. |
| **NBDP** | Narrow-Band Direct Printing. |
| **NM** | Notice to Mariners: a method used by hydrographic offices for routine distribution of official nautical chart and publication update information. Notices to Mariners may also be used by port authorities to distribute pertinent local navigation and safety information to ships. |
| **OOW** | Officer of the Watch: the officer in charge of the navigational watch and the Bridge Team. |
| **PEC** | Pilotage Exemption Certificate: in pilotage waters, an exemption certificate may be granted based on compliance with specific local criteria. |
| **Pick Report** | Also referred to as a chart query, cursor enquiry or selection of a chart symbol. This is used on an ENC to obtain more detailed information which may be considered necessary for safe navigation. |
| **Pilotage Waters** | Waters where it is mandatory or recommended to take a pilot. |
| **Polar Waters** | The extent of Polar Waters as defined in the International Code for Ships Operating in Polar Waters (Polar Code). |
| **PRS** | Position Reference System. |
| **PSSA** | Particularly Sensitive Sea Area: an area that needs special protection through action by IMO because of its significance for recognised ecological, socio-economic or scientific attributes where such attributes may be vulnerable to damage by international shipping activities. |
| **RCC** | Rescue Co-ordination Centre: a unit responsible for promoting the efficient organisation of SAR services and for co-ordinating the conduct of SAR operations within a SAR region (see also MRCC). |
| **RCDS** | Raster Chart Display System. |
| **RIO** | Radar Image Overlay. |

| | |
|---|---|
| **RNC** | Raster Navigational Chart: an official electronic image of a paper chart. |
| **ROC** | Restricted Operator's Certificate: a GMDSS radio operator's certificate for use on ships trading only in GMDSS Sea Area A1. |
| **ROT** | Rate of Turn. |
| **SA** | Special Area: a sea area in which oceanographic and ecological conditions and sea traffic make the use of special mandatory methods for the prevention of sea pollution necessary. |
| **SafetyNET** | The international service for the broadcast and automatic reception of MSI via the Inmarsat EGC system. |
| **SAR** | Search and Rescue. |
| **SART** | Search and Rescue Transponder: a portable radar transponder or AIS transmitter for use in survival craft. |
| **SENC** | System Electronic Navigational Chart: a database that comprises ENC data, ENC updates and other data added manually that is accessed by and displayed on ECDIS. |
| **SES** | Ship Earth Station: a ship-based station which allows a ship to use satellite communications services. |
| **SMCP** | Standard Marine Communication Phrases: phrases that have been developed to cover the most important safety related fields of communications. |
| **SMG** | Speed Made Good. |
| **SMPEP** | Shipboard Marine Pollution Emergency Plan. |
| **SMS** | Safety Management System: the system required by the ISM Code enabling personnel to implement effectively the Company's safety and environmental protection policy. |
| **SOG** | Speed Over Ground. |
| **SOLAS** | International Convention for the Safety of Life at Sea. |
| **SOPEP** | Shipboard Oil Pollution Emergency Plan. |
| **SSP** | Ship Security Plan. |
| **STCW** | International Convention (and Code) on Standards of Training, Certification and Watchkeeping for Seafarers. |
| **STW** | Speed Through Water. |
| **TCPA** | Time to Closest Point of Approach. |

| | |
|---|---|
| **T&P** | Temporary & Preliminary Notices to Mariners. |
| **TMC** | Transmitting Magnetic Compass. |
| **TSS** | Traffic Separation Scheme. |
| **UKC** | Under Keel Clearance. |
| **UMS** | Un-manned Machinery Space. |
| **UTC** | Co-ordinated Universal Time: the global standard for time based on atomic and solar time measurements. UTC is interchangeable with Greenwich Mean Time (GMT) and time zone Z. |
| **VDR/S-VDR** | Voyage Data Recorder/Simplified Voyage Data Recorder. |
| **VHF** | Very High Frequency. |
| **VRM** | Variable Range Marker. |
| **VTS** | Vessel Traffic Services. |
| **WGS 84** | World Geodetic System 1984 datum as used by GPS, ECDIS and ENCs. |
| **WMO** | World Meteorological Organization: United Nations organisation with responsibility to address interaction between oceans, the atmosphere and climate. |
| **WWNWS** | World-Wide Navigational Warning Service: established by IMO in collaboration with IHO for the dissemination of navigational warnings to ships. |
| **WWRNS** | World-Wide Radio Navigation System: terrestrial and satellite radio-navigation systems that have been accepted by IMO as capable of providing adequate position information to an unlimited number of ships. |
| **XTD** | Cross Track Distance: a specified limit for deviations from the planned track. |
| **XTE** | Cross Track Error: the lateral distance between a planned track and the position of the ship. |

# INTRODUCTION

ICS attaches the utmost importance to safe navigation. Safe navigation means that the ship is not exposed to unnecessary danger and that at all times the ship can be controlled within acceptable limits.

To achieve safe navigation robust rules and procedures need to be in place. But for these to be effective they must be complied with and supported by good training and familiarisation.

Training in the principles of navigation and in navigational techniques provides the background knowledge. This can only be implemented effectively through the correct use of equipment and through adherence to established procedures.

## AN EFFECTIVE BRIDGE TEAM

Effective bridge organisation is the starting point to ensure that a system is in place to promote, support and monitor best practice and thus ensure the safety of navigation. At all times, safe navigation requires effective command, control, communication and management.

Bridge Resource Management (BRM) training is a mandatory requirement under the STCW Convention for officers in charge of the navigational watch (operational level). The skills and benefits provided by BRM training need to be transferred into practice for it to have the desired effect on watchkeeping and safe navigation.

The root cause of many if not all maritime accidents lies in ship design, equipment design and performance, operational practices and training, all of which are human related activities. It follows that virtually all accidents may be attributed to human factors or human error. In the event of navigational incidents, this may encourage accident investigations to focus on the immediate actions of the Bridge Team rather than other contributing human factors.

Working in isolation, rather than as an effective Bridge Team, creates the potential for a single point failure with the risk of an error going unnoticed or undetected. Mistakes cannot always be avoided. Good procedures and teamwork can establish measures to detect such mistakes and mitigate their effects. It is necessary to ensure that effective monitoring and cross-checking is carried out to provide sufficient barriers against accidents.

When considering the composition of the Bridge Team during different phases of a passage, the experience of individual team members should be carefully considered in order to ensure the availability of appropriate skills and competencies. The watchkeeping schedule should be developed to provide a sufficient number of qualified and experienced watchkeepers for each phase of the passage.

## PASSAGE PLANNING

A comprehensive passage plan is essential to the safety of navigation. This should always include a thorough appraisal and planning process that complies with the ship's Safety Management System (SMS), as required by the International Safety Management (ISM) Code.

The passage plan, including the intended route, should be checked by the officer responsible for navigation planning. Subsequently, the Master should separately check the plan. The Master should only approve the passage plan and associated route after any necessary amendments have been made. The passage plan should then be briefed to the other members of the Bridge Team.

Checking and subsequent approval of the passage plan should include assessment of measures to mitigate or avoid hazards, using appropriate up to date navigational charts and nautical publications, together with any other relevant safety information.

# TECHNOLOGY

Innovation and emerging technology have led to a steady increase in the number and applications of electronic systems designed to enhance safety and the efficiency of navigation. Irrespective of these developments, the fundamental principles of navigation remain unchanged, and the Bridge Team should be aware of the dangers of over reliance on particular equipment.

The introduction of new technology or equipment has sometimes been followed by unanticipated software anomalies that have resulted in suboptimal performance. Masters and Bridge Teams should be aware of the possibility of such anomalies, how to identify them, mitigating procedures and where to seek further advice.

Appropriate and structured familiarisation with navigational equipment, which is properly documented and recorded, is essential.

# PILOTAGE

The conduct of a safe passage plan will generally involve the services of a Pilot (or a Bridge Team member holding a Pilotage Exemption Certificate). The Master, the Bridge Team and the Pilot, when embarked, should work together and co-operate to ensure the safe navigation of the ship. Pilotage should be conducted within the established safe limits identified within the passage plan.

An effective Master/Pilot information exchange (MPX) is essential to ensure that the Master, Bridge Team and Pilot have appropriate levels of situational awareness prior to commencing pilotage. It may also establish a need to amend the existing berth to berth passage plan. The presence of a Pilot does not relieve the Master or the Bridge Team from their duties and responsibilities for the safety of the ship.

# THE CD ACCOMPANYING THIS GUIDE

The CD accompanying the fifth edition contains the full text of this Guide, including the Checklists in Annex 3, with a search function.

# CHAPTER 1
# EFFECTIVE BRIDGE ORGANISATION

# 1 EFFECTIVE BRIDGE ORGANISATION

## 1.1 OVERVIEW

An effective Bridge Team will manage efficiently all the resources that are available and promote good communication and teamwork. This will allow the Bridge Team to plan and complete a berth to berth passage, in full compliance with the COLREGS and the watchkeeping requirements of the International Convention (and Code) on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention), and have the ability to anticipate dangerous situations and respond to emergencies.

The information which supports an effective bridge organisation should be included in the ship's Safety Management System (SMS). This is a requirement of the ISM Code and should take into account:

- Safe manning levels;
- Safe conduct of navigation;
- Compliance with MARPOL and minimising impact on the environment;
- Effective communication and teamwork;
- Effective training and familiarisation;
- Sound shipboard operational procedures; and
- Robust and practised emergency responses.

## 1.2 BRIDGE RESOURCE MANAGEMENT AND THE BRIDGE TEAM

### 1.2.1 COMPOSITION OF THE BRIDGE TEAM

The Bridge Team should be sufficiently resourced to meet the operational requirements of the passage plan. When considering the composition of the Bridge Team and ensuring that the bridge is never left unattended at sea, the Master should take into account the following:

- Visibility, sea state and weather conditions;
- Traffic density;
- Activities occurring in the area in which the ship is navigating;
- Navigation in or near traffic separation schemes or other routeing measures;
- Navigation in or near fixed and mobile installations;
- Ship operating requirements, activities and anticipated manoeuvres;
- Operational status of bridge equipment including alarm systems;
- Whether manual or automatic steering is anticipated;
- Any demands on the navigational watch that may arise as a result of exceptional circumstances; and
- Any other relevant standard, procedure or guidelines relating to watchkeeping arrangements or the activities of the vessel.

## 1.2.2 SOLE LOOK-OUT

Under the STCW Code, the Officer of the Watch (OOW) may, in certain circumstances, be the sole look-out in daylight conditions. Clear guidance on the conduct of sole look-out should be included in the SMS (see Section 3.4.2).

## 1.2.3 THE BRIDGE TEAM

At all times during sea passages, port approaches and pilotage, the Bridge Team should continue to work effectively to ensure the safety of the ship. This will include liaison between different navigational watches, the engine room and, as appropriate, other departments.

All personnel who have bridge navigational watch or advisory duties will be part of the Bridge Team. The Master, other members of the Bridge Team and the Pilot, when embarked, should work together and co-operate to ensure the safe navigation of the ship.

## 1.2.4 THE BRIDGE TEAM AND THE MASTER

The Master has overall authority and remains responsible for all decisions with respect to the safe conduct of navigation and protection of the environment. This should be clearly stated in the SMS.

The Master should not be constrained by the Company or charterer from taking any decision which is necessary for the safety of navigation.

The Bridge Team should recognise and understand:

- The information that should be routinely reported to the Master;
- The need to keep the Master fully informed; and
- The circumstances under which the Master should be called (see Section 3.6 & Checklist B17).

When the Master is on the bridge, careful consideration should be given to the circumstances in which it may be appropriate to take control from the OOW. There will often be benefit in the OOW retaining control with the Master providing oversight and guidance.

## 1.2.5 BRIDGE TEAM LEADERSHIP, RESOURCE MANAGEMENT AND TEAMWORK

The performance of a Bridge Team relies on good leadership, teamwork and management. The importance of this is recognised under the STCW Convention and the requirement for Bridge Resource Management (BRM) training for watchkeeping officers.

A Bridge Team which has a plan and is well briefed will work effectively and be able to develop and maintain good situational awareness. The Bridge Team should then be able to anticipate dangerous situations and recognise the development of a sequence of errors. This will enable it to take action to break a chain of errors and avert an emergency (see Section 3.8).

In order to ensure that chains of errors are identified and addressed as soon as possible, an appropriate approach to raising safety concerns or doubt without any fear of reprisal or ridicule is needed. A 'just culture'[1] is an example of this type of approach.

'Challenge and response' is a leadership approach which has been demonstrated to foster effective communication and teamwork. Under no circumstances should this approach be considered as undermining the authority delegated to the OOW by the Master.

Providing that this does not compromise the immediate safety of the ship, members of the Bridge Team could be encouraged to:

- Seek clarification regarding the actions of other Bridge Team members with the aim of better understanding the decision making process; and

1 Further information may be found in the ICS Guidelines on the Application of the IMO International Safety Management (ISM) Code.

- Practise thinking aloud. This can also assist the development of junior officers by encouraging them to discuss their actions openly.

## 1.2.6 THE BRIDGE TEAM AND INTERNAL COMMUNICATION

The Bridge Team has the central role in maintaining communications with the engine room and all other operating areas.

It is essential that bridge and engine room personnel communicate regularly on matters including:

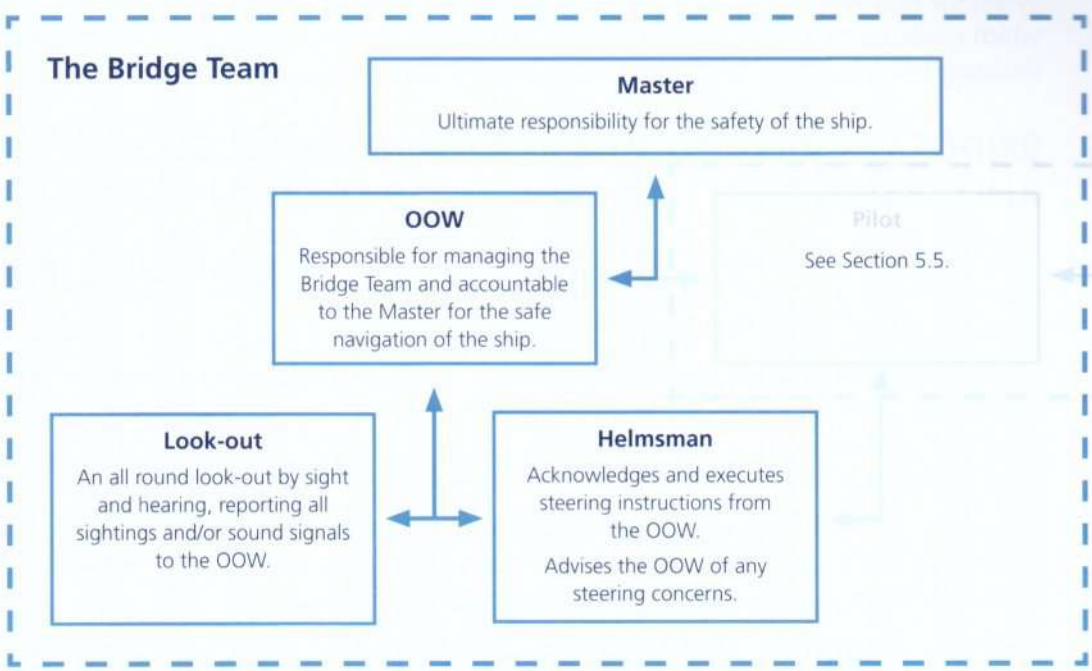
- Machinery and propulsion status, including defects;
- Any existing or anticipated circumstances, including fuel changeover procedures and planned maintenance, with the potential to affect machinery performance or the manoeuvrability of the ship;
- Any planned or anticipated speed changes; and
- Any environmental regulatory requirements (see Section 3.17).

The Bridge Team will co-ordinate the activities of the whole ship on behalf of the Master. This will be aided by good internal communications and a well briefed plan. This is particularly important during emergency situations when an effective response will depend on good communication and co-ordinated actions by all personnel.

## 1.2.7 DUTIES WITHIN THE BRIDGE TEAM

The Bridge Team refers to all personnel with bridge watchkeeping or advisory duties.

Duties and responsibilities should be clearly assigned by the OOW who should ensure that all members of the Bridge Team understand the duties assigned to them. The following diagram illustrates an example of a Bridge Team.



The presence of a Pilot does not relieve the Master or the Bridge Team from their duties and responsibilities for ship safety and prevention of pollution. Guidance on effective pilotage and associated roles and responsibilities within the Bridge Team is set out in Chapter 5.

Encouraging proactive reporting of events and actions allows the OOW to monitor the Bridge Team and detect potential deterioration in watchkeeping performance.

Maintaining Bridge Team performance will be aided by a bridge environment which is free from distractions. To avoid disruption and distraction on the bridge it is recommended that:

- Unrestricted bridge access is limited to only those with operational bridge responsibilities;
- The use of mobile phones and other personal electronic devices should be strictly controlled (see Section 1.4); and
- Internal and external communications should generally be restricted to those related to the safe navigation of the ship (see Section 1.5).

**The Bridge should be free from distractions and all non-essential activity should be avoided.**

## 1.2.8 NEW PERSONNEL AND FAMILIARISATION

The ISM Code and the STCW Convention require the Company to implement a system for familiarising new personnel with ship equipment and procedures. The familiarisation procedures should be covered in the SMS and in written instructions that the Company provides to the Master for whenever a new member of the Bridge Team is assigned to the ship.

A reasonable period of time should be allocated for familiarisation and a designated officer should be responsible for providing familiarisation.

Familiarisation should be delivered on a one to one basis in a common language and should be supported by using a checklist (see Checklists B3 & B4). Familiarisation should cover all bridge equipment and procedures appropriate to the duties and responsibilities of individual members of the Bridge Team.

Particularly with computer-based systems, there can be significant differences between the equipment installed on different ships, even within the same fleet. Noting that some equipment or systems, such as ECDIS, are particularly complex it is recognised that for any one system some familiarisation may take place on shore before joining a ship. However, for all systems some familiarisation with the equipment as installed on board a particular ship will always be required.

Self-teaching manuals, videos or computer-based training (CBT) programmes are examples of methods that could be used on board ship to support familiarisation. These methods should complement rather than replace one to one familiarisation with equipment and procedures.

## 1.2.9 HOURS OF REST

The STCW Code stipulates that watchkeepers, including the Master, are required to take mandatory minimum rest periods in order to be fit for duty. In summary the requirements are:

- Minimum of 77 hours rest in any 7 day period;
- Minimum of 10 hours rest in any 24 hour period; and
- The 10 hour rest period should not be split into more than 2 periods, one of which should be at least 6 consecutive hours, with the interval between periods being not more than 14 hours.

In order to provide ship operators with some flexibility, STCW contains provisions for exceptions which may be permitted by the flag State and that should also be accepted by Port State Control (PSC). It is recommended that evidence of permitted exceptions is kept on board.

The International Labour Organization (ILO) Maritime Labour Convention (MLC), compliance with which is subject to PSC, also stipulates minimum rest periods and maximum work hours for all seafarers.[2] In practice, however, the STCW requirements are slightly stricter and are those normally enforced by PSC.

## 1.2.10 RECORD KEEPING AND SCHEDULES

The STCW Code (and the ILO MLC) requires that individual seafarers' records of hours of rest are maintained in order to demonstrate compliance. Unless the flag State requires otherwise, these should follow the model formats that have been agreed by IMO and ILO.[3] Individual rest hour records are required to be signed by the seafarer to whom they refer.

The STCW Code also requires companies to maintain a schedule of working arrangements, indicating normal hours of work for different grades of seafarer, which should be posted on board ship in a readily accessible place.

Due to the complexity of complying with the regulations and maintaining accurate records and work schedules, the use of a computer-based recording system for rest hours is recommended.[4]

## 1.2.11 DRUG AND ALCOHOL POLICIES

The STCW Code includes requirements for the prevention of drug and alcohol abuse. For the purpose of preventing alcohol abuse, flag States apply a limit of not greater than 0.05% blood alcohol level (BAC), or 0.25 mg/l alcohol in the breath, to seafarers performing safety, security or environmental protection duties. However, some Administrations may apply more stringent limits.

The Company should have a drug and alcohol policy. Bridge Team members should comply with this policy at all times.

It is recommended that Company policy is enforced by the Master amongst visitors to the ship including but not limited to Pilots, contractors and officials.

If there is any concern that the Company's drug and alcohol policy is not being adhered to, the Master (or Chief Officer if appropriate) should take immediate action to ensure the safety of the ship is not compromised.

## 1.2.12 USE OF ENGLISH

English is accepted as the language of international shipping. Communications, including with ratings, should be in English or in a defined language that is common to all Bridge Team members. Communications within the Bridge Team need to be clearly understood by every member. Therefore, if English is not the working language of the ship, the Company or Master should establish and record an alternative working language in the ship's log book.

The STCW Code requires the OOW to have knowledge of written and spoken English that is adequate to:

- Understand charts and nautical publications;
- Understand meteorological information and messages concerning the ship's safety and operations; and
- Communicate with other ships and coast stations.

During an emergency, in order to ensure clear and effective communication, IMO Standard Marine Communication Phrases (SMCP) should be used, particularly for external communications.

2 Further information may be found in the ISF Guidelines on the Application of the ILO Maritime Labour Convention.

3 IMO/ILO Guidelines for the Development of Tables of Seafarers' Shipboard Working Arrangements and Formats of Records of Seafarers' Hours of Work or Hours of Rest.

4 ISF Watchkeeper is a computer program designed to assist companies comply with the individual work/rest hour record requirements and the preparation of compliant tables of shipboard working arrangements. Further details are available at www.isfwatchkeeper.com.

The same approach to communications within the Bridge Team should also apply when navigating under pilotage. The Pilot should always be expected to explain instructions exchanged with other ships, pilot boats, tugs and Vessel Traffic Services (VTS) to the Master and Bridge Team in English or a defined working language common to all personnel involved.

## 1.3 COMPANY POLICY AND PROCEDURES

The ISM Code requires every Company to have an SMS which covers instructions and procedures to ensure safe operation of ships and protection of the environment. This should include practical guidance on navigational safety including:

- Allocation of bridge watchkeeping duties and responsibilities;
- Procedures for passage planning and navigation, including departures from the passage plan;
- Chart and nautical publication update and correction procedures;
- ECDIS procedures (including chart and software updates);
- Procedures to ensure that all essential navigation equipment and main and auxiliary machinery are available and fully operational;
- Ship position reporting procedures;
- Accident and near miss reporting procedures;
- Recording of relevant events and Voyage Data Recorder (VDR) policy;
- Use of Bridge Navigational Watch Alarm System (BNWAS) modes (automatic, on and off) and procedures for ensuring correct operation;
- Bridge access and distraction prevention procedures;
- Procedures for familiarisation and effective handover when crew changes occur;
- Training and drill requirements;
- A system for identifying particular training needs;
- Company contacts, including the Designated Person Ashore (DPA);
- Emergency procedures; and
- Any other information relevant to the safe operation of the ship.

**The SMS should identify clear levels of authority and lines of communication between the Master, ship's officers, crew and the Company.**

### 1.3.1 INFORMATION DISTRIBUTION

IMO, flag States, other regulatory bodies and the shipping industry regularly publish new rules, guidance, best practice (including lessons learned from marine casualties) and information intended for ships. The Company should have a clear procedure to forward relevant information to Masters and crews.

The Company should:

- Assess the relevance of the information or requirements to its fleet and operations;
- Implement the requirements or best practice in the SMS, if appropriate; and
- Inform ships of the new requirements or recommendations and seek confirmation of receipt and implementation.

The Master and Bridge Team should:

- Review and implement the new requirements or guidance as soon as practicable; and
- Inform the Company of effective implementation or any difficulties experienced when implementing new requirements or guidelines.

## 1.3.2 ORDERS

### 1.3.2.1 Master's Standing Orders

Lines of authority on board should be in accordance with the SMS and operational procedures manuals. The Master should explain particular requirements to the Bridge Team in Master's Standing Orders. These orders should be drafted to support the SMS.

Company and Masters' Standing Orders should be read by all Bridge Team members upon joining the ship, signed and dated. A copy of the orders should be available on the bridge for reference.

### 1.3.2.2 Bridge Order Book

In addition to Master's Standing Orders, specific instructions will be needed. At least at daily intervals, the Master should write in the bridge order book what is expected of the OOW for that period. These orders should be signed by each OOW when taking over a watch, to confirm that they have read, understood and will comply with the orders.

The OOW should brief other members of the Bridge Team, as appropriate, on any particular activities or requirements for the forthcoming watch.

# 1.4 MOBILE PHONES AND PERSONAL ELECTRONIC DEVICES

The Company should have a written policy requiring that mobile phones or other personal electronic devices should only be used on the bridge in circumstances approved by the Master.

Notwithstanding occasions when use of mobile phones or personal electronic devices may be permitted, the Company policy should minimise the distraction resulting from such devices by, in general, limiting their use to operationally necessary circumstances.

# 1.5 BRIDGE INTERNET AND EMAIL

Where internet and email services are available on the bridge, the Company should have a policy to manage their use. Access to internet and email use by bridge watchkeepers should generally be limited to those circumstances where it is necessary for the safe navigation of the ship, in order to minimise distraction that might be caused to the Bridge Team.

Internet access and email on the bridge should usually be restricted to:

- Updates for nautical charts and publications, licences and permits;
- Weather information;
- Navigational warnings; and
- Information relevant to the ship's operations and passage plan.

# 1.6 EMERGENCY PREPAREDNESS

The SMS should identify potential emergency shipboard situations, and establish procedures to address these. The actions of the Bridge Team in the event of distress, damage, fire, pollution, personnel accidents, security and cargo emergencies should be included.

A programme of drills and exercises should be established to practise emergency actions and foster effective responses by the Bridge Team in the event of an emergency. This should include practising the ship specific procedures for recovery of persons from the water.[5]

**During emergencies the Bridge Team remains responsible for the safety of navigation.**

Procedures should be in place to support effective responses to emergencies (see Section 3.20) by ensuring that:

- Initial actions to establish control of an emergency are instigated;
- Communications between the Bridge Team and all personnel involved in an emergency are effective;
- If appropriate, the Bridge Team can establish and maintain communications with SAR services, shore authorities, other vessels and/or aircraft; and
- Emergency responses are reviewed to ensure their continued effectiveness.

All drills and exercises undertaken on board the ship should be recorded in accordance with Company procedures. Mandatory emergency drills should be recorded as required by the flag State.

5 Advice can found in ICS Recovery of Persons from the Water: Guidelines for the Development of Plans and Procedures.

# CHAPTER 2
# PASSAGE PLANNING

# 2 PASSAGE PLANNING

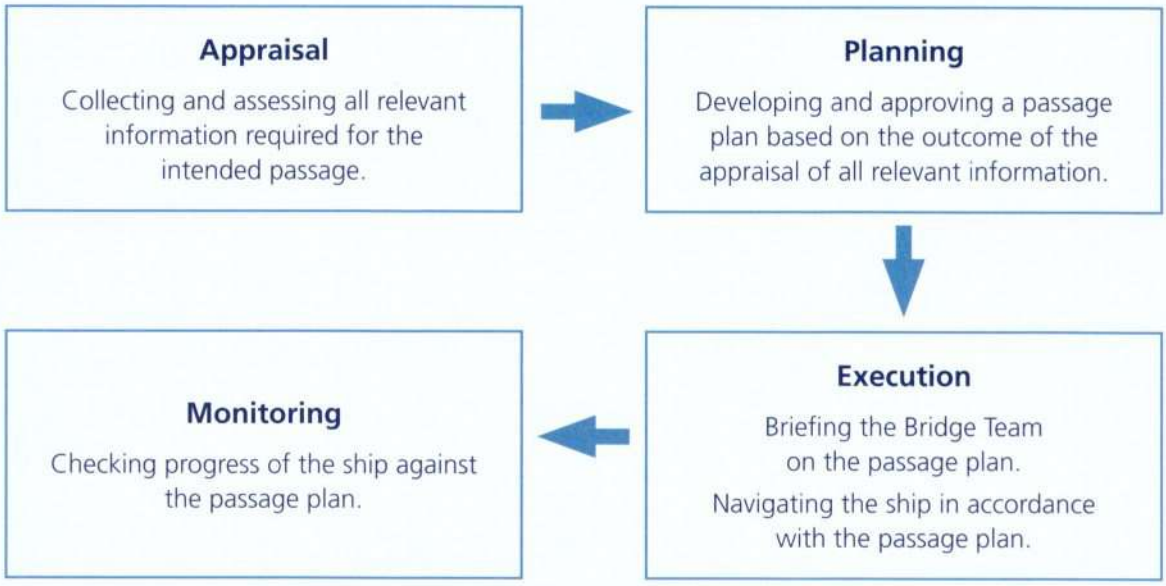
## 2.1 PRINCIPLES

The purpose of passage planning is to develop a comprehensive navigation plan for the safe conduct of the ship from berth to berth.[6]

The plan for the intended passage should identify a route which:

- Recognises hazards, and assesses associated risks and decision points;
- Ensures that sufficient sea room and depth of water is available;
- Includes appropriate position fixing opportunities;
- Complies with relevant reporting requirements and routeing measures for ships;
- Takes into account anticipated traffic and weather conditions; and
- Complies with all applicable environmental protection measures.

The four stages to achieve a safe passage plan are:




## 2.2 RESPONSIBILITY FOR PASSAGE PLANNING

It is the responsibility of the Master to ensure that the passage plan provides the basis of safe navigation for the intended passage. This responsibility is irrespective of who carries out the task of preparing the passage plan.

**The Master should check and approve the passage plan before departure.**

6 IMO Resolution A.893(21) Guidelines for Voyage Planning. In this Guide the term passage planning means the same as voyage planning.

## 2.2.1 COMPANY INVOLVEMENT

The SMS should include guidance for passage planning. If the Company provides a standard passage plan for a particular voyage this should be reviewed on board before departure.

## 2.2.2 PASSAGE PLANNING CONSTRAINTS

A comprehensive passage plan should be prepared and approved prior to departure. However, it might be impractical to include all details, particularly some of those relating to arrival. A comprehensive plan should be finalised as soon as practicable. Once finalised and at an appropriate time, the Bridge Team should be briefed on the completed plan.

# 2.3 APPRAISAL

Appraisal is the process of gathering all information relevant to the proposed passage which will allow risks to be identified and assessed to ensure that the passage plan is safe. Amongst the factors that should be considered during the appraisal of a passage plan are:

### Navigation

- Advice in sailing directions
- Anchoring and contingency options
- Availability and adequacy of charts and reliability of hydrographic data
- Availability and reliability of navigation aids
- Available sea room and traffic density
- Communications including MSI and GMDSS
- Pilotage requirements
- Draught restrictions including air draught, under keel clearance (UKC) requirements and squat
- Position fixing requirements
- Reliability of propulsion and steering systems and defects affecting the control or navigation of the ship
- Route selection and waypoints
- Routeing and reporting measures
- Weather routeing

### General/Operational

- Berth requirements
- Bridge manning
- Bunker calculations
- Cargo considerations
- Commercial and charter considerations
- Helicopter operations
- Mooring and tug operations
- Port entry requirements
- Security and anti-piracy measures
- Strength and stability

### Environmental

- Ballast water management
- Emission Control Areas (ECA)
- MARPOL Special Areas
- National or regional requirements
- Particularly Sensitive Sea Areas (PSSA)
- Port reception facilities

### Contingency

- Emergency response plans
- Notifications and reporting
- Passage plan amendments

Up to date, official charts and nautical publications (electronic or paper) should be used together with other relevant information to make a full assessment of the intended passage. This should include consultation with the Chief Engineer to ensure that sufficient appropriate fuel, water and lubricants are available, particularly taking into account environmental protection requirements.

A passage plan appraisal checklist is included in this Guide as Checklist B9.

## 2.3.1 OFFICIAL CHARTS

Only up to date, official nautical charts should be used for passage appraisal and planning. Any additional charts and publications needed for the intended passage should be identified and obtained before departure. In the case of electronic charts, sufficient permits/licences for the charts required for the intended route should be available prior to departure, or else the process for obtaining them on passage (dynamic licensing) should be clearly understood.

The following factors should be taken into account when appraising paper and electronic charts during passage planning:

### Appropriateness of Scale

For coastal and pilotage planning and for plotting each course alteration point, large scale charts should be used.

For ocean passage planning and open water legs, the largest scale charts that are appropriate should be used.

### Accuracy of Chart Data

Paper chart and RNC source data diagrams allow the reliability of chart depth information to be assessed.

The Category Zone of Confidence (CATZOC) allows the accuracy and reliability of ENC data to be assessed.

Further details of CATZOC symbols and their meanings can be found in relevant hydrographic office publications eg: UKHO NP 5012.

### Notices to Mariners

Notices to Mariners should be consulted (see Section 2.3.2). Some hydrographic offices also issue Temporary & Preliminary (T&P) Notices to Mariners for their electronic charts as well as paper charts.

**Additional Information to that found on charts may be contained in sailing directions and should be consulted.**

ENC, RNC and paper charts are usually based on the same hydrographic survey data. This means that an ENC is not more accurate than a RNC or paper chart covering the same area.

Paper charts show charted objects (including hazards) with a precision of approximately 0.3 mm (15 metres or more at scales of 1:50,000 or smaller). Due to the screen resolution of ECDIS, the precision of charted objects on ECDIS may not be substantially different from that of paper charts.

When planning a passage on ECDIS, the OOW should:

- Be aware that the charted objects on an ENC are not more accurate or precisely plotted than charted objects on the corresponding RNC or paper chart; and
- Ensure that there is a sufficient safety margin between charted hazards and the ship's intended route to allow for the accuracy and precision of charts.

## 2.3.2 OFFICIAL NAUTICAL PUBLICATIONS AND ADDITIONAL INFORMATION

A full appraisal of the passage plan should include a review and consideration of information additional to that on navigational charts, including but not limited to:

**Sailing Directions**

Provide essential information on all aspects of navigation including hazards, buoyage, weather patterns, pilotage details, regulations, port facilities and guides on port entry.

**Ocean Passage/Routeing Charts and Guides**

Provide information on established ocean routes.

**Notices to Mariners**

Provide essential corrections and amendments to official nautical charts and publications.

May also be used by Port Authorities and Harbourmasters to provide specific local safety information to ships.

**Port Guides**

Provide port approach details that include information based on the experience of seafarers.

**Lists of Lights**

Provide information on all lights of navigational significance.

**Lists of Radio Signals**

Provide information on maritime radio communications, particularly vessel reporting and VTS, GMDSS and information on availability of MSI.

**Tide Tables and Tidal Stream Atlases**

Provide detailed information on tidal conditions in coastal areas, port approaches and harbours.

**Load Line Charts**

Provide information on zones and seasonal periods for consideration when determining compliance with load line requirements.

**Maritime Security Charts**

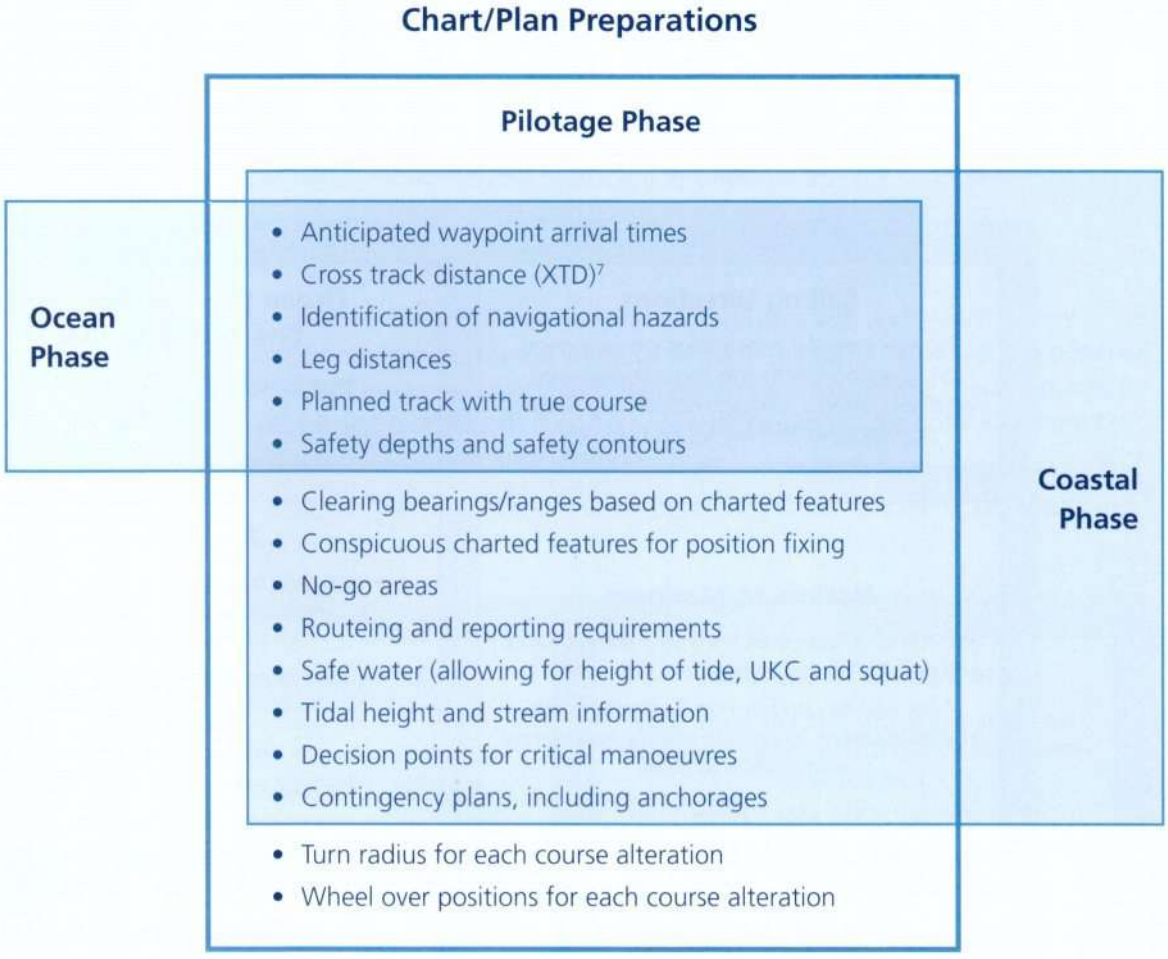
Provide security advice and information about reporting schemes in designated areas.

# 2.4 PLANNING

Following the appraisal of all charts, nautical publications and additional information, a detailed passage plan should be prepared. This should cover the entire passage from berth to berth, including pilotage areas.

Planning for any one section of a route should be undertaken using either all electronic or all paper charts rather than a mixture of chart types.

Whether planning using paper charts or ECDIS, the plotting of the route should follow established conventions that include showing the following details, where appropriate:




## 2.4.1 PASSAGE PLANNING IN OCEAN WATERS

When planning ocean passages, particular consideration should be given to:

- Ocean routeing charts which provide information on ocean currents, winds, ice limits and load lines;
- Load line charts which provide information on zones and seasonal periods required to assist in compliance with the IMO International Convention on Load Lines;
- Weather routeing services (see Section 2.4.9); and
- The use of gnomonic projection charts for plotting great circle routes, as appropriate.

The following considerations may have an impact on the selection of an ocean route:

- Ocean currents and the impact on passage speed;
- Weather conditions including anticipated seasonal variations such as heavy weather, tropical storms, ice and reduced visibility; and
- Environmental protection measures and associated requirements that may extend into an ocean route (see Section 3.17).

Landfall targets need to be identified and the expected radar and visual ranges considered. With respect to lights, this will include rising and dipping ranges and the arc/colours of sector lights.

7 To support route scanning on ECDIS an XTD should be setup for all elements of the passage, including ocean passage elements. XTD information may not be required for plotting ocean routes on paper charts.

## 2.4.2 PASSAGE PLANNING IN COASTAL WATERS

Margins of safety in coastal or restricted waters are likely to be less than for ocean passages due to the available depth of water, proximity of land, coastal infrastructure and increased traffic density.

The following factors should be amongst those taken into account when planning a passage through coastal waters:

- The importance of passing charted and other features at a safe distance;
- Advice in sailing directions;
- Available depth of water and tidal information contained in tide tables and tidal stream atlases;
- Availability of visual and radar fixing opportunities;
- Ship's routing and reporting measures, as well as the availability of Vessel Traffic Services (VTS);
- The reliability of the ship's propulsion and steering system; and
- Environmental protection measures and associated requirements, including fuel changeover procedures (see Section 3.17).

In shallow water due allowance should be made for the increased draught and effects on steering caused by ship squat, which increases with increased ship speed.

## 2.4.3 PASSAGE PLANNING IN PILOTAGE WATERS

As part of the passage plan, a pilotage plan is required when:

- The vessel is navigating in a non-mandatory pilotage area and no pilot has been embarked;
- The vessel is in pilotage waters and a pilot is embarked; or
- The vessel is in pilotage waters and pilotage is being conducted by a ship's officer holding an appropriate and valid Pilotage Exemption Certificate (PEC).

The pilotage plan contains additional details which reflect the closer proximity to navigational hazards and the need to comply with local requirements. The pilotage plan, as appropriate, should take into account:

- Recommended routes and channel information;
- Procedures for pilotage including pilot boarding points and means of embarkation;
- Local conditions, rules and restrictions on navigation;
- Reporting and communications procedures; and
- Details of the prospective berth and/or anchorages.

For further detailed guidance on pilotage refer to Chapter 5.

## 2.4.4 PASSAGE PLANNING USING ECDIS

ECDIS is a useful tool for increasing the efficiency of passage planning. Effective use of route planning tools, voyage notes and action points should be part of a comprehensive passage plan.

The following should be considered when using ECDIS for passage planning:

- Availability of and access to the required up to date ENCs and RNCs for the intended passage. This should include identification of areas where ECDIS may need to be in Raster Chart Display System (RCDS) mode and where paper charts might therefore be required;
- If reusing a previous passage plan the route will need to be rechecked to confirm that it remains safe;
- An appropriate large scale ENC or RNC should be used when planning a route;

- The need to ensure that any old or previous routes are removed from the display;
- The need to select chart symbols (pick report) on ENCs to obtain additional detailed safety and navigational information;
- A maximum acceptable cross track distance (XTD) should be applied to each leg of a route. This should comply with any requirements in the SMS and be appropriate for the area;
- Safety depths and safety contours should be calculated and setup in accordance with the UKC requirements in the SMS;
- ETA information should be set manually or using route planning tools. If this is set incorrectly it may affect tidal data and time dependent information associated with the route;
- Current and tidal data, if integrated with ECDIS and up to date, should be applied to the route; and
- Information relating to the vessel's characteristics should be checked and confirmed as correct. This includes information about draught (including any allowance for squat or additional safety margins), turn radius and vessel dimensions.

The passage plan should be saved, backed-up and locked to prevent unauthorised editing.

## 2.4.5 FINALISING THE PASSAGE PLAN

The passage plan should be appropriately concise so that critical information is not lost in excessive detail. The plan should be available in a format that can be readily understood by the Bridge Team.

When the officer planning the passage has completed preparing the berth to berth passage plan to the fullest extent possible, it should be checked and approved by the Master. Checking of the proposed passage plan should include a careful inspection of navigational charts to ensure that the route is appropriate and safe.

When checking a route on ECDIS, it should be visually inspected at optimum scale (1:1) for the ENC or RNC in use. When a route is plotted on an ENC, the route scanning function of ECDIS should be used in addition to a visual inspection. For the route scanning function to be effective, ECDIS should be correctly setup with safety depths and contours reflecting under keel clearance (UKC) requirements.

**A detailed review of the passage plan route should always be carried out in conjunction with an automated route scan when using ECDIS.**

## 2.4.6 PASSAGE PLAN BRIEFING

A briefing should be held to ensure that all Bridge Team members understand their role in executing the passage plan. The briefing should address the factors identified in Checklist B9.

**Prior to sailing, all watchkeeping officers should be appropriately briefed and confirm their understanding of the passage plan.**

## 2.4.7 AMENDMENTS TO ROUTES

Planning should be updated in the event that the intended route is amended to reflect changing circumstances and conditions before or during a passage (see also Section 3.11.4).

## 2.4.8 TRANSFERRING POSITIONS

Care must be taken when transferring route and hazard information between paper charts, electronic charts and/or different Global Navigation Satellite Systems (GNSS) to ensure that appropriate

corrections are applied. This is necessary as the geodetic datum used by different hydrographic offices, on different types of charts and equipment, may vary (see Section 4.9). The circumstances in which this may be a particular consideration include:

- Transferring positions between different GNSS systems;
- Transferring positions between GNSS systems and paper charts or RNCs; and
- Transferring positions between paper charts or RNCs and ENCs.

## 2.4.9 MARITIME SAFETY INFORMATION

Weather information (including gale warnings), NAVAREA warnings and coastal navigational warnings are broadcast by radio-telephony from coast radio stations and by NAVTEX. Long range weather warnings are broadcast via satellite communications systems, such as SafetyNET, along with NAVAREA navigational warnings as part of the World-Wide Navigational Warning Service (WWNWS).

Details of weather routeing services for ships and information for shipping are contained in lists of radio signals and in Volume D of the World Meteorological Organization (WMO) Publication No.9.

## 2.4.10 PLANNING AN ANCHORAGE

When planning to anchor, the following are amongst the factors to be considered:

- The purpose for anchoring and anticipated duration;
- Availability of appropriate space at the anchorage;
- Position fixing opportunities;
- Weather conditions and available shelter;
- Tidal height and stream for the duration of the anchorage;
- Sea room and proximity of navigational hazards, including traffic;
- Nature of seabed and holding characteristics;
- Scope of anchor cable required/available and anticipated swinging circle;
- Port requirements;
- Security measures required by the Ship Security Plan (SSP) and the latest industry best practices and guidance on responses to piracy and armed robbery at sea;
- Requirements for machinery availability;
- Availability of required services; and
- Watchkeeping arrangements to ensure maintenance of a proper look-out.

Also see Checklist B12.

## 2.4.11 SHIPS' ROUTEING

Routeing measures for ships are designed to:

- Reduce the risk of collision between ships in areas of high traffic density;
- Reduce the risk of grounding; and
- Manage shipping in environmentally sensitive sea areas.

Ships' routeing measures can be adopted internationally by IMO. Such measures are recommended for use by, and may be mandatory for, all ships, or certain types of ship, or for ships carrying certain cargoes. Mandatory ship's routeing measures should always be used unless the ship has compelling safety reasons for not following them. IMO routeing schemes will be shown on charts with a note of any pertinent provisions as to their use. Fuller detail may be included in sailing directions.

## 2.4.12 SHIP REPORTING SYSTEMS

Ship reporting systems allow coastal States to monitor ships navigating through their waters and are intended to contribute to the safety of life at sea, the efficiency of navigation and the prevention of pollution.

Routinely, ship reporting systems require information on the position, course, speed, persons on board, cargo and the destination of ships. In certain areas, information on defects affecting ship navigation equipment, propulsion or steering may be requested by coastal authorities.

Where a ship reporting system has been adopted by IMO, the Master should comply with the requirements of the reporting system. Reporting may be required on entry and exit from an area covered by a reporting system or when there has been a material change in the condition of the ship. Masters may expect IMO adopted reporting systems to be able to provide information to assist the ship, if requested.

Ship reporting requirements will be referred to on charts with a note of any relevant provisions as to their use, including details of their mandatory/recommended status. Further details will be found in lists of radio signals.

### 2.4.12.1 Automated Ship Reporting and Monitoring

The Automatic Identification System (AIS) provides traffic reporting systems with the ability to monitor ships in real time. This has reduced the need for reports from vessels in certain areas but Masters should continue to make reports as required by individual reporting systems.

Masters should ensure that the static, passage and dynamic data programmed into AIS equipment is accurate, in order to avoid the transmission of false data to reporting systems and other ships.

## 2.4.13 VESSEL TRAFFIC SERVICES

Vessel Traffic Services (VTS) monitor ship compliance with local regulations and optimise traffic management. VTS is established in areas where the volume of traffic and risk to navigation and the environment is high, and in approaches to ports and other areas of confined water.

VTS reporting requirements are frequently marked on charts, with further details being provided in sailing directions and in lists of radio signals. The passage plan should include references to the specific radio frequencies to be monitored by the ship in order to communicate with VTS. Masters should expect VTS to be able to provide:

- An information service (IS) which may include reports on the position, identity and intentions of other traffic, waterway conditions, weather, hazards or any other factors that may influence the ship's passage;
- A navigational assistance service (NAS) in difficult navigational or weather conditions or when a ship is suffering defects or deficiencies. The Master may request this service from the VTS; and
- A traffic organisation service (TOS) to establish and manage priority of vessel movements, allocation of space, mandatory movement reporting, route information and speed limits or other appropriate measures.

# 2.5 EXECUTING AND MONITORING THE PASSAGE PLAN

The ship's passage should be monitored to ensure that it is executed in accordance with the plan as checked and approved by the Master and as briefed to the Bridge Team.

Further guidance on executing and monitoring the passage plan by the OOW is contained in Chapter 3.

# CHAPTER 3
# DUTIES OF THE OFFICER OF THE WATCH

# 3 DUTIES OF THE OFFICER OF THE WATCH

## 3.1 OVERVIEW

The Officer of the Watch (OOW) is the Master's representative and is responsible at all times for the safe navigation of the ship, in full compliance with the Convention on the International Regulations for the Prevention of Collisions at Sea (COLREGS).

The presence of the Master on the bridge does not relieve the OOW of responsibility for the watch. A decision by the Master to assume responsibility for the watch should be unambiguously advised to the OOW and other members of the Bridge Team.

The OOW should comply with the requirements of the SMS and the Master's standing and daily orders. Compliance ensures that agreed and robust procedures which promote safety and mitigate risks are followed by Bridge Teams to execute and monitor the passage plan.

The primary duty of the OOW is to maintain a safe navigational watch at sea or at anchor, which will require ensuring:

- Compliance with the Company's navigational policies and requirements;
- Effective watch handovers;
- Management of the Bridge Team;
- Keeping a proper look-out;
- Familiarity with the bridge layout and equipment;
- Familiarity with bridge procedures;
- Maintaining situational awareness;
- Surveillance of the ship;
- Execution of the passage plan;
- Navigation and control of the vessel;
- Collision avoidance in compliance with the COLREGS;
- GMDSS watchkeeping;
- Compliance with environmental requirements;
- Monitoring the performance of navigational equipment;
- Recording bridge activities;
- Management of emergency situations; and
- Security awareness.

## 3.2 EFFECTIVE WATCH HANDOVER

An effective watch handover should take place ensuring all pertinent information is exchanged between the oncoming and off-going Bridge Team members (see Checklist B16). As the Master's representative it is the responsibility of the OOW to be satisfied that:

- The relieving OOW is fit for duty (see Sections 1.2.9 & 1.2.11) and during the hours of darkness has had sufficient time to allow for night vision adjustment; and

- The relieving officer has verified the ship's position and status.

**The watch handover should be deferred until after any action that is imminent, or that starts before the watch has been handed over, has been completed.**

During any watch handover the following information should be discussed and verified:

- The ship's current position and proximity to navigational hazards;
- The intended track (including any amendments to the passage plan), course and speed and engine controls as appropriate;
- Machinery status with particular reference to defects affecting manoeuvrability;
- Steering mode and equipment status with particular reference to defects affecting manoeuvrability;
- The operational condition and alarm status of all navigational and safety equipment being used or likely to be used during the watch;
- Compass errors;
- The traffic situation including vessel reporting requirements completed or due;
- Weather conditions, navigational and other hazards likely to be encountered during the watch with reference to Maritime Safety Information (MSI) received;
- Condition of draught, heel/list and trim;
- Any shallow water effects, including squat;
- Any work in progress such as crew working on deck, engine room maintenance and cargo, ballasting or tank cleaning operations; and
- Any special instructions, particularly amendments to Bridge Orders.

## 3.3 MANAGING THE BRIDGE WATCH

The OOW is in charge of the Bridge Team, until properly relieved, in compliance with the SMS and Master's Standing Orders. This responsibility extends to ensuring that bridge watch manning levels are at all times maintained at a safe level for the prevailing circumstances and conditions (see Chapter 1 & Checklist B2).

An OOW should be on watch on the bridge at all times at sea or at anchor.

All members of the Bridge Team including look-outs and any helmsmen should be fit for duty (see Sections 1.2.9 & 1.2.11).

## 3.4 MAINTAINING A PROPER LOOK-OUT

Maintaining an effective look-out is essential to the safe navigation of the ship. The OOW should ensure that a proper look-out by sight and hearing, as well as by all other available means, is maintained at all times. No other activity or duties carried out should be allowed to interfere with keeping a proper look-out. While steering, a helmsman should not be considered to be the look-out, except in small ships with an unobstructed all round view from the steering position.

The OOW, supported by other members of the Bridge Team, should:

- Make a full appraisal of the risk of collision with other vessels;
- Identify navigational hazards such as wrecks, floating objects, ice and uncharted hazards;
- Determine the risk of grounding or stranding;
- Detect and respond as appropriate to any significant change in the weather, visibility or sea state;

- Identify aids to navigation, including buoys and lights;
- Respond to persons, ships or aircraft in distress; and
- Identify threats to security, especially in areas with a known risk of piracy or armed robbery.

On ships with fully enclosed bridges, sound reception equipment should be in operation continuously and be correctly adjusted to ensure its effective operation. The SMS, Master's Standing Orders and the on board procedures should address the need to maintain situational awareness, particularly when the characteristics of individual ship's bridges may isolate the Bridge Team from the outside environment.

**Electronic navigation aids including ECDIS, radar, ARPA and AIS are not substitutes for maintaining a proper look-out.**

## 3.4.1 CONTROL OF NIGHT VISION

During the hours of darkness, it is essential that the Bridge Team has adequate night vision in order to maintain a proper look-out, and the environment should support this. Shipboard procedures should allow the vision of oncoming watchkeepers to adjust to ambient light conditions before taking over the watch.

Lighting used in the bridge and adjacent areas should be of low intensity and coloured red. Light from bridge equipment can impair night vision and should be controlled by using appropriate display settings. The use of blackout curtains will help to control light levels when it is not otherwise possible to exclude it.

The use of deck lighting during the hours of darkness should be carefully considered to avoid adversely affecting night vision, even if such lighting only affects a restricted sector of the horizon.

It should be noted that even momentary exposure to bright light can temporarily destroy night vision and, during the subsequent readjustment period, the ability to maintain an effective look-out will be impaired. Consideration should be given to fitting cut-out switches to doors leading into the bridge so that adjacent light sources are momentarily switched off when doors are opened.

## 3.4.2 SOLE LOOK-OUT

Under the STCW Code, the OOW may, in certain circumstances when the Master has determined that it is safe to do so, be the sole look-out in daylight.

Prior to deciding whether to allow a sole look-out, the Master's consideration should include:

- Weather conditions;
- Visibility;
- Traffic density;
- Proximity of dangers to navigation;
- Attention necessary when navigating in or near a traffic separation scheme (TSS); and
- Defects affecting aids to navigation, propulsion and steering.

The Master should additionally be satisfied that:

- The OOW is fit for duty (see Sections 1.2.9 & 1.2.11);
- The ability of the OOW to safely navigate the ship is not compromised by the volume of the anticipated workload;
- The OOW knows who will provide back-up assistance, in what circumstances back-up should be called and how to call it quickly; and

- Back-up personnel are aware of required response times, any limitations on their movements and are able to hear and respond to alarms or communication calls from the bridge.

**The OOW should not be the sole look-out during hours of darkness.**

## 3.5 BRIDGE NAVIGATIONAL WATCH ALARM SYSTEM

The Bridge Navigational Watch Alarm System (BNWAS) should be in operation whenever the ship is at sea, including when the ship's heading or track control system is in use. The OOW should ensure that the BNWAS is operational and set correctly in accordance with the SMS and the Master's Standing Orders (see Section 4.6).

## 3.6 CALLING THE MASTER

If there is any doubt relating to the safety of the ship, the OOW should immediately call the Master.

Standard situations where the Master should be called are listed in Checklist B17.

The presence of the Master on the bridge does not relieve the OOW of responsibility for the watch, unless the Master has explicitly taken control. Any handover of responsibility must be unambiguous. The OOW should remain on the bridge, continue to manage the Bridge Team and support the Master, unless instructed otherwise.

**The Master should be called immediately if the OOW has any doubt regarding the safety of the ship or how to deal effectively with the situation.**

## 3.7 FAMILIARITY WITH BRIDGE LAYOUT AND EQUIPMENT

The OOW should know the bridge layout and be familiar with the operation of all bridge equipment to enable the safe navigation of the ship (see Section 1.2.8). The OOW should:

- Understand the status, capabilities and limitations of all bridge equipment and its effective operation;
- Recognise and respond correctly to alarms and warnings; and
- Understand the status of the ship's engines and other appropriate machinery together with any restrictions or limitations on manoeuvrability.

## 3.8 SITUATIONAL AWARENESS

Situational awareness describes an appreciation of what is happening around the ship. This includes knowing where the ship is, where it is planned to be, and whether any other vessel, event or conditions developing in the vicinity pose a risk to the safety of the ship. Situational awareness depends on the Bridge Team's ability to use information effectively to assess a situation accurately, the experience of the Bridge Team and the absence of distractions.

Good situational awareness is essential for the safe conduct of navigation and protection of the environment.

The OOW should develop and maintain situational awareness of the area around the ship, the ship's activities, and the possible impact of external influences on the safety of the ship. This will include awareness of requirements to protect marine wildlife and environmentally sensitive sea areas. Situational awareness on the Bridge will be aided by:

- A clear understanding of the passage plan;
- An effectively managed Bridge Team;
- A proper and continuous look-out by all available means;
- Familiarity with and understanding of bridge equipment and the information available from radar, AIS, ARPA and ECDIS;
- Using look-outs, ECDIS, radar and visual monitoring techniques to confirm the navigational safety of the ship;
- Using look-outs, radar and ARPA to monitor traffic; and
- Cross-checking information from different sources.

Care should be taken to ensure that the information available on electronic navigation equipment remains uncluttered and is relevant to the current situation.

**Over reliance on individual electronic systems for developing and maintaining situational awareness should be avoided.**

## 3.9 MONITORING SHIPBOARD OPERATIONS

The OOW should maintain a high level of general awareness of the ship and its routine operations. This will include:

- Maintaining a general watch over the ship's decks;
- Monitoring, where possible, people working on deck and any cargo or cargo handling equipment;
- Monitoring machinery status;
- Ensuring weather and sea state are taken into account when determining the safety of on board activities; and
- Supervision and control of the ship's safety and environmental systems.

Whenever work is being carried out in the vicinity of radar scanners, radio aerials or sound signalling apparatus, the OOW should be consulted, kept updated and should isolate and/or post appropriate warning notices on the equipment controls.

Under no circumstances should additional duties interfere with the primary duty of watchkeeping and ensuring the safe navigation of the ship.

## 3.10 NAVIGATION AND CONTROL

It is important that the OOW follows the passage plan and monitors the progress of the ship.

The OOW should not hesitate to use helm, engines, or any other manoeuvring arrangements, including sound signalling apparatus, to ensure compliance with the COLREGS.

### 3.10.1 MANOEUVRING INFORMATION

The OOW should be familiar with the handling characteristics and stopping distances of the ship. In addition, the OOW should know how these characteristics are affected by the current and anticipated machinery status. Information regarding the manoeuvring characteristics should be recorded on the Pilot Card and on the Wheelhouse Poster (see Checklists A2 & A3) and the manoeuvring booklet.

It is important not only to record on the Pilot Card ship data such as draught, but also factors which could affect manoeuvrability. For example, knowing that a ship has a particular tendency to steer to port at full speed but steer to starboard at slow speed, would be useful information.

## 3.10.2 USE OF PROPULSION

To control the main engines effectively, the OOW should understand the characteristics of:

- Bridge control systems;
- Type of main engine(s); and
- Type of propeller(s) and/or thruster(s).

The OOW should appreciate that changing speed could have implications for the operation of propulsion machinery. Whenever appropriate, timely notice of intended changes to ship speed should be passed to the engine room to allow for safe and efficient operation of machinery.

## 3.10.3 SAFE SPEED

The OOW is responsible for ensuring that the ship proceeds at a safe speed at all times. Factors to consider when determining a safe speed are listed in the COLREGS: Rule 6 and Rule 19.

Ships should anticipate the need to reduce speed to minimise the risk of damage that may be caused by their wash and wake in shallow or confined waters, particularly to small craft and on the shoreline.

## 3.10.4 STEERING CONTROL

The OOW should be familiar with the operation of all manual, automatic and back-up steering control systems on the bridge, as well as the method of control at the emergency steering position (see Checklist B3). This will allow the selection of the most appropriate steering control system for a particular situation.

A helmsman should be available at all times and be ready to take over steering control in conditions where automatic systems are inappropriate. Manual steering should be used whenever appropriate including in:

- Areas of high traffic density;
- Conditions of restricted visibility; and
- Any other potentially hazardous situations and particularly when an automatic steering system may provide insufficient control.

The changeover between automatic and manual steering should not affect or distract the attention of the Bridge Team from maintaining a proper look-out and should be:

- Completed in good time, before critical situations arise; and
- Under the supervision of the OOW.

Manual steering should be tested once per watch (see Checklist B1).

**Changes between manual and automatic steering should be verified to confirm the subsequent steering response is satisfactory.**

### 3.10.5 TRACK CONTROL SYSTEMS

Track control systems use position, course and speed information to keep a ship automatically on a planned track over the ground. Track control systems can be used to navigate between a series of waypoints with the OOW alerted before alterations of course are made.

Use of a track control system does not relieve the OOW of the duty to ensure that the ship is safely on track or navigating within an authorised cross track distance (XTD).

## 3.11 MONITORING THE PASSAGE

Compliance with the passage plan should be closely and continuously monitored by the OOW:

- To check that the ship's position is maintained within an authorised XTD, including following alterations of course to avoid collision or following a planned alteration of course;
- By fixing the position of the ship at a frequency dependent on prevailing conditions and the proximity of navigational hazards;
- By cross-checking of the ship's position by all appropriate means including:
  - By visual and/or radar fixing techniques using ranges and bearing of charted objects;
  - By echo sounder to monitor charted depths and contours; and
- By monitoring the integrity of information displayed on navigational equipment.

Monitoring should be undertaken using either appropriately prepared electronic or paper charts rather than a mixture of chart types. However, it is recognised that there will be occasions when both electronic and paper charts are in use. These transition periods should be kept as short as practicable and should be carefully managed to ensure the transfer of all appropriate navigation information.

### 3.11.1 NAVIGATION IN COASTAL OR RESTRICTED WATERS

It is important that the Bridge Team fully understands the increased dangers of navigation in coastal or restricted waters, and the importance of establishing and maintaining good situational awareness.

Procedures and Master's orders should ensure that:

- Navigation is conducted on the most suitable large scale ENC, RNC or paper charts available;
- The position of the ship is fixed at frequent intervals by the most appropriate means;
- All relevant navigation marks are positively identified by the OOW;
- The OOW is aware of mandatory reporting requirements for routeing schemes;
- The OOW takes into account the ship's draught and manoeuvring characteristics, which may affect navigation in restricted waters; and
- The OOW is aware of the squat characteristics for individual loading conditions and the effect of ship speed on squat. In shallow water, squat may have a critical effect on the manoeuvrability and the under keel clearance (UKC) of the ship.

### 3.11.2 MONITORING TECHNIQUES

The following visual techniques should be used appropriately when monitoring the passage in coastal and pilotage waters and the safety of the ship at anchor:

- Azimuth bearings of charted objects to fix the position of the ship;
- Heading transits, which can provide a leading line along which a ship can safely steer;
- Beam transits, which can provide an additional check for use when altering course; and
- Clearing bearings, which can be used to check that a ship remains within a safe area.

When radar conspicuous charted features are visible on the display, effective use can be made of radar. The following techniques should be used when monitoring the passage in coastal and pilotage waters, particularly in conditions of restricted visibility or at night:

- Parallel indexing, which is recommended to ensure the ship's track is maintained;
- Radar bearings; and
- Radar ranges.

Where ECDIS is integrated with radar and a Radar Image Overlay (RIO) feature is available (see Section 4.11.3) the alignment of the radar picture with charted features can be used to further verify the ship's position.

## 3.11.3 MONITORING A PASSAGE PLAN ON ECDIS

For ECDIS to be effective as a tool for monitoring a passage, the following checks should be conducted prior to departure from the berth:

- The correct passage plan is loaded on primary and back-up ECDIS terminals, as appropriate;
- The safety settings, particularly depth safety contours, are set in compliance with the SMS and reflect the current operational status of the ship including the actual draught. This will help to avoid inappropriate alarms; and
- Information from all sensors connected to ECDIS is available and correct. Particular attention should be paid to the availability of information from the GNSS receiver, gyro compass and log.

When using ECDIS to monitor the ship's passage, the OOW should consider:

- The capabilities and limitations of ENCs and RNCs (see Section 4.12);
- The need to select individual chart symbols (pick reports) on ENCs to obtain additional detailed safety and navigational information;
- The need to manage the amount of information displayed on an ECDIS terminal in order to avoid obscuring charted features and information, and the effects of information overload;
- The potential for positioning or related errors. Every opportunity should be taken to confirm the validity of a GNSS position using traditional fixing techniques. These fixes should, whenever possible, be plotted using electronic lines of position (LOP);
- That the benefits of looking ahead or using an offset view can enhance situational awareness;
- The display of relative or true vectors and the appropriate interpretation of them;
- The potential for and likely consequences of software anomalies. The Bridge Team should be familiar with the guidance relating to the identification of and mitigation measures for software anomalies and should ensure that the latest appropriate guidance is followed (see Section 4.1.3 & 4.1.4); and
- Time settings are normally based on UTC and therefore allowances will need to be made for local time.

**Over reliance on ECDIS should be avoided particularly if detrimental to the keeping of a proper look-out.**

The OOW should be aware that the charted detail on some ENC/RNC may not be as accurate as the GNSS position of the ship on ECDIS. Caution is needed when planning and navigating to ensure that there is a sufficient safety margin between charted hazards and the ship's intended route.

### 3.11.4 AMENDING THE PASSAGE PLAN

It is important that the OOW executes the passage plan approved by the Master. There may however be situations which require an amendment to or deviation from the passage plan.

Any deviation from the agreed passage plan may introduce new risks, which will require assessment and possible mitigating action. If it is necessary to amend the passage plan permanently then the relevant sections of the appraisal and planning process should be repeated. As appropriate, the Master should be informed and should then check and approve the amendment, and the Bridge Team should be briefed.

Circumstances that might require a revised passage plan include:

- Weather routeing developments;
- Change of ship's orders/destination port; and
- Search and Rescue (SAR) response.

Deviations, particularly to the planned course and/or speed, in addition to those necessary in order to comply with the COLREGS, may be required to ensure that the ship remains clear of hazards.

Circumstances that may require deviation from the planned route include:

- Variations in weather conditions;
- Advice and information received from Vessel Traffic Services (VTS);
- Navigational warnings; and
- Detected hazards.

Following a deviation, the ship should be returned to the planned route once it is safe to do so.

## 3.12 COMPLIANCE WITH THE COLREGS

### 3.12.1 LIGHTS, SHAPES AND SOUND SIGNALS

The conduct of a ship's navigation should always comply with the International Regulations for the Prevention of Collisions at Sea (COLREGS). This includes displaying correct lights and shapes and making the correct sound and light signals.

The OOW should be aware that some other vessels may fail to display the correct lights or shapes, or make the correct sound signals. Safe navigation will therefore require the use of all available means in order to determine whether a risk of collision exists, or to otherwise confirm the operational status of other vessels.

### 3.12.2 RISK OF COLLISION

Risk of collision can be determined at an early stage by plotting targets at longer ranges on radar. Taking regular bearings of approaching vessels within visual range will also determine whether a risk of collision exists. Plotting aids should also be used to track approaching vessels systematically.

Particular care should be taken when approaching very large ships, ships engaged in towing or ships at close range. An appreciable bearing change may be apparent under these circumstances but a risk of collision may still exist.

Careful monitoring of the situation should continue until the vessel is finally past and clear.

Particular care should be taken when navigating in or near an area of restricted visibility and the OOW should be aware of the particular obligations under Rule 19 of the COLREGS.

The OOW should use ECDIS and AIS to aid situational awareness but should not rely on either system for collision avoidance.

**Radar and ARPA are the primary electronic anti-collision aids for the OOW. Due to the risk of confusion and error, VHF radio and AIS should not be relied upon for collision avoidance.**

### 3.12.3 ACTION TO AVOID COLLISION

Early, substantial and positive action which is appropriate to the situation and that is seaman-like and readily apparent to other vessels should always be taken to avoid collision. Monitoring the effectiveness of an action to avoid collision should continue until the other vessel is finally past and clear.

## 3.13 NAVIGATION UNDER PILOTAGE

For advice on Pilotage see Chapter 5 and Checklist B8.

## 3.14 MAINTAINING AN ANCHOR WATCH

An anchoring plan should be developed that is complementary to or part of the passage plan (see Checklist B12). On anchoring, the initial duties of the OOW will include:

- A fix of the anchor position and the position of the ship at anchor;
- As appropriate, advising port authorities of the anchored position;
- Determining the ship's swinging circle;
- Selecting landmarks and transits to monitor the ship's position;
- Confirming that the appropriate status is selected on AIS; and
- Ensuring appropriate lights and shapes are displayed (and in conditions of restricted visibility, sound signals are commenced) in accordance with the COLREGS and any local regulations.

While at anchor, the duties of the OOW will include:

- Maintaining a proper look-out;
- Regularly plotting the ship's position (see Section 3.11.2) and monitoring swinging pattern;
- Identifying potential hazards and risks of collision;
- Ensuring inspection rounds are carried out periodically;
- Maintaining vessel security and access control;
- Monitoring weather conditions, tidal conditions and state of the sea including updates to forecast conditions;
- Ensuring main engines and other machinery are at a state of readiness appropriate to the conditions, in accordance with the Master's daily and Standing Orders;
- Monitoring traffic and other anchored vessels;
- Monitoring compliance with environmental protection requirements (see Section 3.17); and
- Complying with any additional regional or local requirements.

The Master should be notified immediately if the ship drags its anchor, or if sea conditions or visibility deteriorate, or if there is any doubt about the safety or security of the ship (see Section 3.6 and Checklist B17).

# 3.15 GMDSS WATCHKEEPING

To enable a ship to send and receive distress, urgency and safety information, the OOW should hold a General or Restricted Operator's Certificate (GOC/ROC) as appropriate, and be familiar with the requirements and procedures for GMDSS watchkeeping. In particular it is necessary to ensure that:

- All GMDSS communications are under the control of an appropriately certified operator;
- Communication procedures and discipline are followed so that interference with other radio users is avoided; and
- Frequencies are used for their correct purpose.

GMDSS communications are prioritised according to their importance for safety of life at sea as follows:


The International Telecommunications Union (ITU) publication *Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Services* contains relevant extracts from the ITU Radio Regulations, setting out the correct procedures to be followed.

## 3.15.1 RADIO WATCHKEEPING

The OOW is responsible for ensuring compliance with the ship's radio watchkeeping requirements. In general, a radio watch should be maintained on all frequencies necessary to receive distress, urgency and safety messages appropriate to the sea area in which the ship is operating. An example of watchkeeping requirements is as follows:

| | Sea Area | | | |
|---|---|---|---|---|
| | A1 | A2 | A3 | A4 |
| VHF Ch.16 (156.8 MHz) | X | X | X | X |
| VHF DSC Ch.70 (156.525 MHz) | X | X | X | X |
| MF DSC (2187.5 kHz) | | X | X | X |
| HF DSC (8414.5 kHz) | | | X[2] | X |
| HF DSC (4207.5, 6312, 12577, 16804.5 kHz) | | | X[2,4] | X |
| NAVTEX (518 kHz) | X | X | X[3] | |
| Satellite (SES) | X[1] | X[1] | X[2] | |
| HF Direct-Printing (1605-27500 kHz) | | | X[2] | X |

**Notes:**

1. If fitted due to operations exclusively in areas outside the range of a coast station broadcasting NAVTEX or HF direct-printing MSI service.
2. If fitted under SES or MF/HF option permitted for Sea Area A3.
3. If in range of a coast station broadcasting NAVTEX.
4. At least one of these frequencies should be monitored based on the time of day and geographical location of the ship.

## 3.15.2 EMERGENCY COMMUNICATIONS

The OOW should be familiar with the procedures for sending distress, urgency and safety messages contained in the *International Aeronautical and Maritime Search and Rescue Manual Volume III* (IAMSAR Vol III), Section 4. Particular care should be taken to ensure that alerts and messages sent by DSC, radio-telephony and satellite communications are given an appropriate priority.

In addition it is important for the OOW to ensure that:

- Alerts and messages are sent to ALL STATIONS;
- DSC alerts and messages are sent on appropriate frequencies;
- When the situation allows, DSC distress alerts are followed by a radio-telephony message;
- DSC urgency and safety alerts are followed by a radio-telephony message;
- Distress and urgency alerts are cancelled when the emergency is over; and
- During a distress a qualified operator is designated as being responsible for radio communications (on a passenger ship, the operator should have no other duties during a distress).

**Every precaution should be taken to avoid false distress alerts being sent.**

## 3.15.3 MARITIME SAFETY INFORMATION

A continuous MSI watch should be kept at sea at all times by all ships. NAVTEX should be used to meet this requirement whilst the ship is within range of a coast station broadcasting NAVTEX. Beyond this range, a watch should be kept on the appropriate MF or HF frequencies or on the ship earth station (SES) in order to receive MSI.

## 3.15.4 ROUTINE OR GENERAL COMMUNICATIONS

Routine and general communications are all those DSC, radio-telephony and satellite communications not related to emergencies or safety. The frequencies used by coast stations, port stations and reporting systems can be found in lists of radio signals. The OOW should ensure that routine and general communications do not interfere with emergency communications.

## 3.15.5 GMDSS LOG KEEPING

A GMDSS radio log should be kept in order to provide a record of all events connected with the radio communications facilities on board. As a minimum the following should be recorded:

- A summary of communications relating to distress, urgency and safety. This includes any periods when a radio watch is discontinued and the reasons for doing so;
- The position of the ship at least daily;
- The identities of other stations with which the ship communicates or attempts to communicate;
- Records of any difficulties experienced with communications;
- Incidents involving unnecessary or inappropriate transmissions with the identities of the stations concerned, if known; and
- Cancellation of any false alerts.

The requirements relating to the retention of radio logs are determined by the flag State and the ITU Radio Regulations and should be included in the SMS.

### 3.15.6 COMMUNICATIONS EQUIPMENT TESTS

Radio equipment should be tested in accordance with the SMS (including flag State requirements) and the manufacturers' maintenance and operation manuals. Particular care should be taken to avoid the transmission of false distress/urgency alerts when testing GMDSS equipment.

Daily, weekly and monthly radio tests should be recorded in the GMDSS radio log and demonstrate continued compliance with the functional requirements of SOLAS, and should include but not be limited to:

| | |
|---|---|
| **Daily** | • Function of DSC facilities (VHF, MF and HF) using built-in test functions<br>• Battery supplies to GMDSS equipment including charging condition |
| **Weekly** | • Function of DSC facilities by way of a test call with a coastal station (if in range or at the earliest opportunity if out of range)<br>• Reserve power supplies to GMDSS equipment other than batteries |
| **Monthly** | • Enhanced group calling (EGC) function<br>• EPIRB function (using built-in test) and condition<br>• SART function (using built-in test) and condition<br>• Condition and security of batteries<br>• Condition of aerials and insulators<br>• Function test of survival craft two-way VHF equipment |

### 3.15.7 FALSE DISTRESS ALERTS

Bridge Teams should be aware that the transmission of false distress and urgency alerts is a significant problem for the GMDSS. All effort should be made to reduce the possibility of a false alert being sent. Actions to be taken in the event of a false distress alert being sent are identified in Checklist B19.

Ships should use any means available to inform the appropriate authorities that a false distress alert has been transmitted and that it should be cancelled. Records of any false alert and subsequent remedial actions should be maintained on board.

Unless repeated violations occur, no action will normally be taken against the ship provided that a false alert is reported and cancelled without inappropriate delay.

## 3.16 LONG RANGE IDENTIFICATION AND TRACKING

Cargo ships of 300 gross tonnage and upwards and all passenger ships engaged on international voyages are required to be fitted with a system to transmit automatically the following Long Range Identification and Tracking (LRIT) information:

- The identity of the ship;
- The position of the ship; and
- The date and time of position provided.

LRIT is not part of the GMDSS but can contribute to effective SAR efforts.

## 3.17 ENSURING ENVIRONMENTAL COMPLIANCE

### 3.17.1 POLLUTION PREVENTION

The OOW should be familiar with the International Convention for the Prevention of Pollution from Ships (MARPOL) and the ship's Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plan (SMPEP) and any additional Company or national/regional requirements, as appropriate. The OOW should be fully conversant with relevant requirements for:

- MARPOL Annexes I to VI, particularly regarding Special Areas (SA) and Emissions Control Areas (ECA);
- Particularly Sensitive Sea Areas (PSSA);
- Ballast water management requirements;
- Fuel changeover procedures; and
- Any other regional or national restrictions.

### 3.17.2 REPORTING OBLIGATIONS

A potential pollution incident may be indicated by a slick in the vicinity of the ship. All ships should make a report to the relevant authorities when an incident involving another ship is observed or when an on board incident involves:

- A discharge or probable discharge of oil or noxious liquid substances above the permitted level for whatever reason, including when securing the safety of the ship or saving life; or
- A discharge or probable discharge of harmful substances in packaged form, including those in containers, portable tanks, vehicles and barges.

A report is also required if the ship suffers damage, failure or a breakdown that affects the safety of the ship or impairs safe navigation, and results in a discharge or probable discharge into the sea of a harmful substance. Reports are not required simply because there has been a breakdown or failure of machinery or equipment.

### 3.17.3 REPORTING POINTS

The SOPEP/SMPEP should include in an appendix the list of agencies or officials of administrations designated to receive and process reports from ships.

In the absence of a local agency or if there is any delay in contacting a listed reporting point, the nearest coastal radio station, reporting station or Rescue Co-ordination Centre (RCC) should be contacted by the quickest available means.

## 3.18 PERIODIC CHECKS OF NAVIGATIONAL EQUIPMENT

### 3.18.1 OPERATIONAL CHECKS

Operational checks on navigational equipment should be undertaken when preparing for sea and prior to port entry (see Checklists B1, B6 & B7) and at any other time required by the SMS.

Before entering restricted or coastal waters, it is important also to check that full control of engine and steering function is available.

### 3.18.2 ROUTINE TESTS AND CHECKS

Daily tests and checks of bridge equipment should be undertaken, including the following:

- Manual steering should be tested at least once per watch (see Checklist B1);
- Gyro and magnetic compass errors should be checked and recorded at least once a watch, when this is possible;
- The synchronisation of all compass repeaters, including repeaters at the emergency steering position, should be regularly checked;
- To ensure adequate performance, information from electronic equipment should always be compared and verified against information from different independent sources; and
- All available positioning systems and sources (GNSS, DGNSS, satellite communications terminals with integrated GNSS, and terrestrial radio-navigation aids) should be cross-checked.

Checks should confirm that the equipment is functioning properly and that it is successfully communicating with any other bridge system to which it is connected:

- Built-in test facilities should be used frequently, including alarm self-test functions;
- Configuration settings should be checked and confirmed to be in accordance with the SMS and the passage plan; and
- Operational settings and alarms should be correctly set and checked on the equipment and/or the BNWAS.

### 3.18.3 SOFTWARE ANOMALIES

The OOW should be able to detect software anomalies (see Sections 4.1.3 & 4.1.4) as they occur by:

- Carrying out regular performance checks;
- Carrying out regular cross-checks of information with other systems; and
- Following manufacturer and SMS instructions for maintenance and operation.

## 3.19 RECORDING BRIDGE ACTIVITIES

Records of bridge activities should be maintained by the OOW. The Company should have a policy for the maintenance of navigational records on paper and/or electronically (if approved by the flag State) within the SMS.

Information concerning position, course and speed should be recorded with sufficient detail to reconstruct a complete voyage if necessary:

- Paper and/or electronic records from course recorders, echo sounders and NAVTEX receivers should be retained and be suitably dated and time marked if practicable; and
- Voyage Data Recorder (VDR) and ECDIS voyage records should be maintained and download procedures understood and followed. Procedures for preserving this information should be covered in the SMS.

## 3.20 EMERGENCY SITUATIONS

### 3.20.1 MANAGEMENT

The Bridge Team should be aware that it could be called upon to respond to an emergency on board its own ship or another vessel to which it is obliged to render assistance.

In order to effectively manage emergency situations, the OOW should:

- Be fully conversant with the emergency checklists contained in this Guide (see Annex 3, Section C) and similar checklists and procedures within the SMS;
- Be familiar with the initial action to take in response to emergency situations; and
- Know the general emergency alarm signals and the actions to be taken on hearing or sounding an alarm.

The OOW should not hesitate in taking immediate emergency action before the Master arrives on the bridge. Following initial response, checklists such as those in this Guide (see Annex 3, Section C), may be used to ensure that all actions for an effective response to an emergency are completed.

SOLAS requires that an illustrated table describing the ship's life-saving appliances should be kept on the bridge.

### 3.20.2 SEARCH AND RESCUE

The OOW should be aware of the obligations relating to distress at sea and the instructions in the *International Aeronautical and Maritime SAR Manual Volume 3* (IAMSAR Vol III) relating to the alert, conduct and co-ordination of a distress (see Checklist C9).

Ships may be requested to provide assistance by a Rescue Co-ordination Centre (RCC). Ships able to render assistance are required to proceed at their best speed towards the casualty. If responding to a distress, the co-ordinating RCC should be informed to assist its rescue planning. Any decision by a ship not to provide assistance should be justifiable, recorded in the log book by the Master and the appropriate RCC should be informed.

A ship is only released from the obligation to provide assistance when informed that assistance is no longer required by the vessel in distress, the appropriate RCC, or another vessel which has already rendered assistance.

Every passenger ship will have on board a plan for co-operation with appropriate SAR services for use in the event of an emergency. The plan should be reviewed regularly and updated as required. These plans should also be available for Port State Control (PSC) inspection.

Ship's personnel should be familiar with the prescribed signals for indicating distress and communicating with ships rendering assistance and SAR units (including aircraft).

## 3.21 DANGER REPORTING

Ships should broadcast danger messages as required by SOLAS. The OOW should send a danger message if the ship experiences any of the following:

- Dangerous ice;
- A dangerous derelict or any other direct danger to navigation;
- A tropical cyclone;
- Sub-freezing air temperatures associated with gale force winds causing severe ice accretion on superstructures; and
- Winds of Force 10 or above on the Beaufort scale for which no storm warning has been received.

All danger messages should be transmitted as safety messages and include the following basic information:

- The kind of ice, derelict or danger observed;
- The position of the ice, derelict or danger; and
- The UTC time and date when the danger was last observed.

## 3.22 HELICOPTER OPERATIONS

Watchkeeping officers on a ship that is likely to be engaged in the transfer of personnel or stores by helicopter should use and be familiar with the *ICS Guide to Helicopter/Ship Operations*.

## 3.23 SECURITY AWARENESS

Masters and watchkeeping officers should be familiar with:

- General guidance on measures to reduce security risks on ships provided by flag and coastal States;
- Responsibilities and procedures included in the Ship Security Plan (SSP) in response to changes in the security level; and

- Advice on reporting, identifying threats and appropriate ship protection measures as contained in the latest industry best practices and guidance on responses to piracy and armed robbery at sea.

Good situational awareness (see Section 3.8) when navigating in a reporting area or designated risk area, or in an area where the security level has been raised, is essential to timely identification of a threat and effective protection of the ship.

# CHAPTER 4

# OPERATION AND MAINTENANCE OF BRIDGE EQUIPMENT

# 4 OPERATION AND MAINTENANCE OF BRIDGE EQUIPMENT

## 4.1 GENERAL

**The consequences of over reliance on automatic systems for navigation and collision avoidance may be severe and include the risk of collision, grounding and pollution.**

Masters and watchkeeping officers should be trained and competent in the use of the ship's navigation and bridge equipment and be familiar with its operation (see Section 1.2.8 & Checklists B3 & B4). This should include understanding:

- The contents and use of operating manuals with particular reference to configuring safety critical features;
- How equipment and software updates are managed and how to verify that updates have been applied;
- Procedures for identifying equipment failures and responding to them; and
- The capabilities and limitations of systems and equipment.

This Guide is complementary to, and should be used in conjunction with, manufacturers' operating and maintenance manuals and specific user policies, which should be included in the SMS.

### 4.1.1 CARRIAGE REQUIREMENTS

Masters and officers in charge of the navigational watch should be familiar with the relevant carriage requirements which apply to their ship.

### 4.1.2 EQUIPMENT PERFORMANCE

Periodic checks on equipment should be carried out and any defects reported to the Master. Defects should also be recorded in the log book and as appropriate identified on the Pilot Card (see Checklist A2).

Regular preventive maintenance of all equipment should be carried out according to shipboard maintenance procedures, making use of manufacturers' instructions and manuals.

### 4.1.3 SOFTWARE ANOMALIES

Computer systems are widely used to support navigation, communications and cargo management. For safe and efficient operation, such systems rely on the suitability and stability of their software. There have been instances when deficiencies in the design or operation of software have led to the system being compromised, with the safety of the ship potentially being at risk. Such deficiencies are widely known as software anomalies.

In order to detect and appropriately manage software anomalies it is recommended that:

- Shipboard familiarisation should equip the Master and watchkeeping officers with an understanding of the normal operating condition of equipment;

- Any deviation from the normal or anticipated operation of software should be investigated to identify the cause(s) and remedial measures implemented in accordance with available guidance;
- New or otherwise previously unknown software anomalies should be reported to the equipment manufacturer; and
- Masters and watchkeeping officers should be familiar with guidance available, including from equipment manufacturers, regarding the identification, mitigation and the reporting channels for anomaly related issues.

**Masters and watchkeeping officers should be familiar with and practise procedures within the SMS to monitor the performance of shipboard equipment.**

## 4.1.4 ECDIS ANOMALIES

A number of ECDIS operating anomalies have been identified and subsequently addressed through software updates[8] (see Section 4.13.3). The International Hydrographic Organization (IHO) has produced an ECDIS Data Presentation and Performance Check in Ships[9] that is designed to alert watchkeeping officers to the possibility that the installed ECDIS software may require an update from the manufacturer.

The ship's SMS should contain procedures to ensure that:

- ECDIS data presentation and performance checks are conducted following a software update, ECDIS upgrade or at any time when the Master or watchkeeping officers have concerns over the performance of the ECDIS on board; and
- Any occurrence of apparently new or known, but insufficiently addressed, anomalies is reported directly to the relevant manufacturer[10] and to the IHO[11].

ECDIS is a complex system and it is possible that further anomalies may be identified. However, it is also possible that through misinterpretation of information and/or inappropriate system settings, OOWs can also affect the safe and efficient operation of navigation and related systems. The importance of effective generic ECDIS training and familiarisation with ECDIS, as installed on board, to avoid this potential problem is emphasised (see Section 1.2.8).

## 4.1.5 CYBER SECURITY

The exchange of electronic data between ships and shore authorities, service providers, charterers and owners/operators has increased significantly over recent years. The use of electronic data exchange, including updates to navigational systems and software, exposes users to the possibility of unauthorised or malicious access. This creates a risk to the safety and security of shipboard systems.

In order to protect commercial interests, as well as to ensure that safety and environmental protection are not compromised, it is important that seafarers comply with Company cyber security procedures. Company procedures should take into account industry guidelines as well as any regulatory requirements addressing cyber security.

8 IMO Circular MSC.1/Circ.1503 ECDIS – Guidance for Good Practice.

9 The ECDIS Data Presentation and Performance Check in Ships and feedback form can be downloaded from www.iho.int.

10 Contact information for manufacturers is contained in the list of the latest versions of ECDIS software, which can be downloaded from www.iho.int.

11 Contact e-mail: info@iho.int.

# 4.2 STEERING GEAR AND AUTOMATIC PILOT

## 4.2.1 OPERATION AND TESTING

The OOW should ensure that requirements for the operation and testing of the steering gear are followed (see Checklist B1) and in particular:

- In restricted waters or restricted visibility, an additional steering gear power unit is in operation when such units are capable of simultaneous operation; and
- The complete steering system is tested within 12 hours prior to departure.

## 4.2.2 STEERING CONTROL

Steering control of the ship will usually comprise manual steering and an automatic pilot (autopilot) or other track control system. At each steering position there should be a gyro repeater and rudder angle indicator.

If an autopilot is fitted, a steering mode selector switch for changing between automatic and manual steering, and a manual override control to allow immediate manual control of the steering, should be available.

In an emergency, steering control may require use of alternative power supplies, auxiliary steering gear or direct control of the steering gear in the steering compartment.

## 4.2.3 AUTOPILOT - HEADING CONTROL

Heading control will steer to maintain the ship's heading but, unlike automatic track-keeping, does not have the ability to compensate for the effects of wind and tidal-stream/current on the ship's course over ground (COG).

## 4.2.4 AUTOPILOT - AUTOMATIC TRACK-KEEPING

Automatic track-keeping steers the ship towards a waypoint or to follow a route whilst remaining within a specified cross track distance (XTD). The ship will steer to maintain a COG which keeps the ship on track and moving towards the next waypoint.

An autopilot performing automatic track-keeping functions and its alarm outputs should always be monitored closely, particularly to ensure that the OOW is able to check that it is safe for the autopilot to make an alteration of course.

The ability of the autopilot to follow a planned track closely will depend upon the accuracy of the cross track error (XTE) information sent to the autopilot from the navigation system.

## 4.2.5 OFF-COURSE ALARM

As part of the steering control system, there is an off-course alarm to warn the OOW when the ship deviates from its heading.

Examples of appropriate independent devices include:

- A magnetic off-course alarm independent from other bridge equipment and inputs; and
- A second gyro compass or transmitting heading device, as appropriate, with a heading comparison unit connected to both compasses.

The alarm should be in use at all times when the autopilot is in operation, and should also be integrated with the BNWAS.

It should be noted that the off-course alarm may not always sound when the ship deviates from its planned track. The ship may be moved off track by wind and tidal stream/currents even though the heading remains unchanged.

**The use of an autopilot and the off-course alarm does not relieve the OOW from frequently checking that the planned course is safe and is being maintained.**

### 4.2.6 BERTHING SYSTEMS

There are a range of highly accurate berthing systems available which allow precise approach to a berth usually for specific ship types or in particular locations. Such systems may use laser, doppler or GNSS technology to measure accurately the ship's movements relative to the berth or another ship.

The Bridge Team should be aware of the type of systems in use and their capabilities and limitations.

## 4.3 COMPASS SYSTEMS

### 4.3.1 MAGNETIC COMPASS

The magnetic compass is generally fitted above the navigating bridge on the centreline and fitted with a periscope so that the compass is readable from the helmsman's position.

Where the magnetic compass is needed to provide heading outputs to other bridge systems, a transmitting magnetic compass (TMC) is fitted. TMC outputs should be corrected for compass error and the TMC should be tested once a week.

A compass deviation card should be maintained on the bridge. The deviation will need to be determined and the compass adjusted at intervals during the ship's life, particularly after any major steel conversion work to the ship. Particular caution should be observed when using the magnetic compass on ships that carry or have recently carried magnetic cargoes such as iron ore and steel.

Compass safe distances are specified on all electrical bridge equipment and provide the minimum distances from the magnetic compass that equipment can be installed.

A TMC may have variation automatically applied. However, this correction will not include deviation. When correcting TMC outputs for compass error, care should be taken to ensure that the correct values for variation and deviation are applied.

### 4.3.2 GYRO COMPASS

The gyro compass should be run continuously. Should a gyro compass stop for any reason, it should be restarted and subsequently regularly checked and only relied on again when it has "settled" and the error is known.

Where the gyro has no direct speed log or position input, manual corrections should be made as required.

The gyro will usually support a number of repeaters, including a required repeater at the emergency steering position. Gyro repeaters on the bridge should be checked against the main gyro at least once per watch and after significant manoeuvring. Other repeaters should be checked frequently.

### 4.3.3 GNSS COMPASS

A Global Navigation Satellite System (GNSS) compass provides an alternative to a gyro compass as a non-magnetic transmitting heading device able to provide heading data to AIS, radar and automatic plotting aids. A GNSS compass or equivalent is required on ships navigating in Polar Waters at latitudes above 80 degrees.

### 4.3.4 COMPASS ERRORS

As a safeguard against any wandering from the correct heading going undetected, gyro and gyro repeater headings should be frequently checked.

Magnetic and gyro compass errors should be checked and recorded each watch, where possible, using either azimuth or transit bearings.

A deviation card for the magnetic compass should be maintained and be available to the Bridge Team.

### 4.3.5 RATE OF TURN

When ships are manoeuvring, particularly large ships where the distance between the bow and the pivot point of the ship is considerable, rate of turn indication provides feedback on how quickly the ship is turning. Rate of turn measurement is used by automatic track-keeping systems to perform controlled turns.

## 4.4 SPEED AND DISTANCE LOG

Speed and distance measuring equipment, depending upon type, will provide measurement of speed and distance travelled through the water or over the ground.

### 4.4.1 SPEED MEASUREMENT

Speed over the ground (SOG) is the speed of a vessel referenced to the surface of the earth. Speed through the water (STW) is the speed of a vessel referenced to the water in which it is navigating.

In general, STW is used for radar collision avoidance and SOG is used for navigation. Caution should be exercised if SOG is used for collision avoidance as differences can arise in the aspect of a target and its vector particularly due to strong cross tides.

Speed made good (SMG) can be measured from two fixed points on a chart, and is also calculated and transmitted by electronic position fixing systems.

### 4.4.2 TYPES OF SPEED LOG

Electromagnetic and doppler type logs can be either single-axis and measure speed in the fore and aft direction (longitudinal) or dual-axis and measure fore and aft (longitudinal) and also athwartships (transverse) movement. When connected to rate of turn data, dual-axis logs are also able to calculate the speed and direction of movement of the bow and stern.

### 4.4.3 RECORDING OF DISTANCE TRAVELLED

Log distances should be recorded in the log book at the end of each watch. To ensure the accuracy of recorded speed and distance log equipment, it should be installed, maintained and calibrated in accordance with manufacturers' instructions.

## 4.5 ECHO SOUNDERS

Cargo vessels of 300 gross tonnage and above and all passenger vessels are required to carry an echo sounder for measuring the depth of water. The echo sounder should have a minimum of two range scales: shallow (20m) and deep (200m).

The echo sounder should always be used when making a landfall and kept switched on in coastal and pilotage waters. If the echo sounder is fitted with a shallow water alarm, the alarm should be set to an appropriate safe depth to warn of approaching shallow water.

Care should be taken to check that the units of soundings on the echo sounder are the same as those used on the chart in use. When comparing echo and chart soundings, due allowance should be made for the draught of the ship, any depth reading offset, and height of tide.

## 4.6 BRIDGE NAVIGATIONAL WATCH ALARM SYSTEM

The Bridge Navigational Watch Alarm System (BNWAS) monitors bridge activity and OOW awareness, and can detect operator disability which could lead to marine accidents. The system uses stages of visual and audible alarms to alert the Bridge Team. If for any reason the OOW does not respond or is incapable of responding, the Master and/or other appropriate personnel will be automatically alerted.

The BNWAS alert period should be sufficient so that alarms do not unnecessarily distract the OOW from watchkeeping duties.

Additionally, the BNWAS can provide the OOW with a means of calling immediate assistance to the bridge.

**The BNWAS should be operational whenever the ship is underway, particularly when the autopilot is in operation, and may be used at anchor.**

## 4.7 NAVIGATION LIGHTS AND SIGNALLING EQUIPMENT

The OOW is responsible for ensuring that the navigation lights, emergency navigation lights and signalling equipment are in working order and are ready for immediate use at all times.

The condition of lights, flags and shapes should be checked at regular intervals.

Sound signalling equipment should be checked daily and maintained in an operational condition.

## 4.8 VOYAGE DATA RECORDER

### 4.8.1 OVERVIEW

Voyage Data Recorders (VDR) record and securely store information concerning the position, movement, physical status, command and control of a ship. VDR equipment enables accident investigators to review the circumstances leading up to an incident, and helps to identify the cause(s).

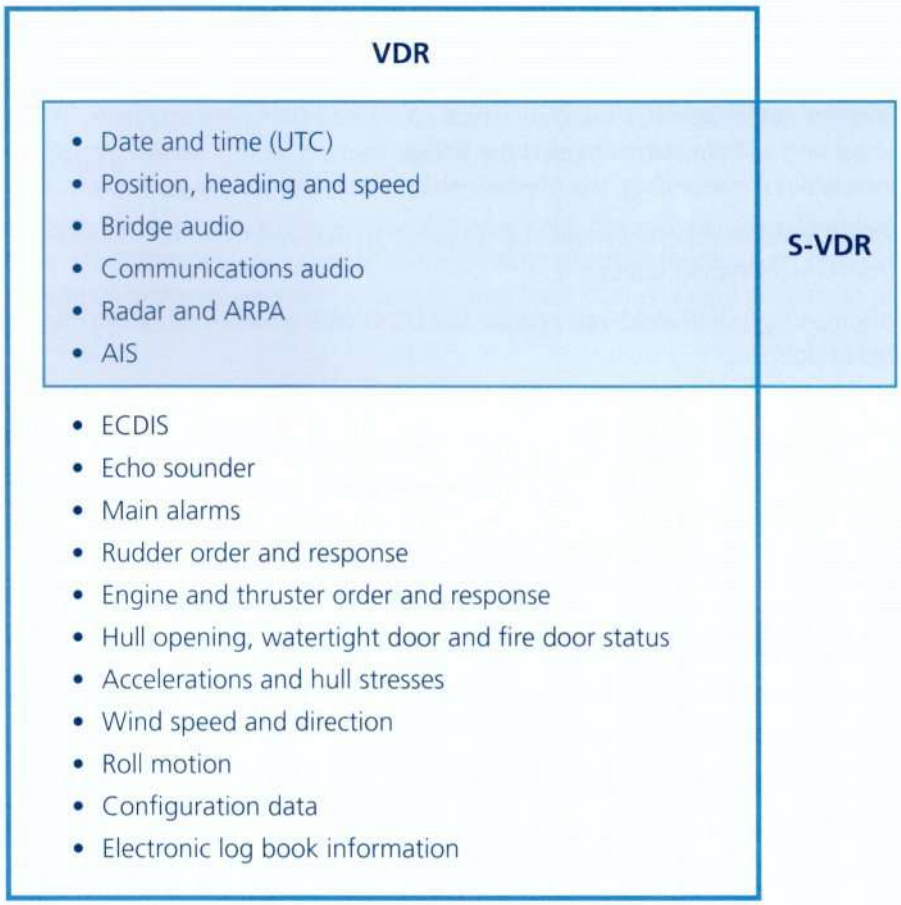
Additionally, VDRs provide the Company with information that can enhance ship operation and management, and provide the owner/operator with a comprehensive record of events during a given period.

A simplified VDR (S-VDR)[12] is not required to store the same range of information as a VDR, but nonetheless records and securely stores information concerning the position, movement, physical status, command and control of a ship for use by accident investigators and owners.

12 All passenger ships and ships other than passenger ships of 3,000 gross tonnage and upwards are required to fit a VDR. Cargo ships of 3,000 gross tonnage and upwards built before 1 July 2002 may fit an S-VDR.

## 4.8.2 VDR REQUIREMENTS

A VDR is required to maintain a sequential record of information, covering at least a 48 hour period, which as a minimum should include:




Any information or data source listed as being required to be recorded by a VDR should be recorded by an S-VDR if the data is available in an appropriate format.

## 4.8.3 PRESERVING RECORDS

Records should be retained for at least 30 days/720 hours on the VDR long term recording element, and at least 48 hours on its fixed and float-free recording element. After these times, older records on each of the recording elements may be overwritten with new data and will be lost. Watchkeeping officers should understand and be familiar with the procedures for preserving records as required by the SMS.

**VDR and S-VDR recordings provide important information for marine accident investigators. All watchkeeping officers should be familiar with the procedures for preventing these records being overwritten.**

## 4.8.4 VDR TESTING

The system should include functions to carry out a performance test at any time. Testing is required annually, and should always be carried out following repair or maintenance work to the VDR or to any source providing data to the VDR. This test may be conducted using the playback equipment and should ensure that all the required data items are being correctly recorded.

### 4.8.5 VDR PLAYBACK

Company policy relating to the playback of VDR data should be contained within the SMS. Playback of VDR data may provide a tool for analysing the performance of the Bridge Team.

## 4.9 ELECTRONIC POSITION FIXING SYSTEMS

Electronic position fixing systems provide an automatic and continuous position update for ships fitted with a suitable single or multi-system receiver.

### 4.9.1 GLOBAL NAVIGATION SATELLITE SYSTEM

A Global Navigation Satellite System (GNSS) is a satellite-based system that provides a means of obtaining continuous worldwide position, time and speed (over ground) information. There are two such systems available to ships which provide near global coverage:

- Global Positioning System (GPS) operated by the United States; and
- Global Navigation Satellite System (GLONASS) operated by the Russian Federation.

Beidou (China) has been recognised as a component of the World-Wide Radio Navigation System (WWRNS) and Galileo (Europe) is anticipated to achieve recognition in 2016. Both systems are expected to be fully functional in the near future. Other satellite systems may in future also be able to provide GNSS services.

### 4.9.2 DIFFERENTIAL GNSS

GNSS generally have a base accuracy in the order of 15-25 metres. Differential GNSS receivers offer greater navigational accuracy by applying corrections received from ground-based reference stations.

### 4.9.3 GNSS RECEIVERS

Whether as stand-alone equipment or as part of an integrated system, GNSS receivers provide:

- Position (including service quality information and geodetic datum corrections);
- Ground referenced course and speed; and
- Route storage and cross track distance (XTD) monitoring. By entering the passage plan into the GNSS receiver, the OOW has an independent method of monitoring the passage.

### 4.9.4 GEODETIC DATUM

A GNSS calculates positions referenced to a particular global geodetic datum. This may not be the same as the geodetic datum of the chart in use, with the result that the position when plotted is in the wrong place.

Where the difference or datum shift is known, a "satellite-derived positions" note on the chart provides the offset to apply to the position before it is plotted.

Many GNSS receivers have internal facilities to transform positions between different geodetic datums. This eliminates the need to apply datum offsets manually.

### 4.9.5 CHART ACCURACY AND PRECISION

ENC, RNC and paper charts are based on hydrographic surveys which are conducted using the best position-fixing technology available at the time. Although a ship navigating with GNSS may know its position to an accuracy of better than 10 metres, the positions of hazards and other objects on the seabed may only be known to an accuracy of 20 metres or less.

Paper charts show charted objects (including hazards) with a precision of approximately 0.3 mm (15 metres or more at scales of 1:50,000 or smaller). Due to the screen resolution of ECDIS, the precision of charted objects on ECDIS may not be substantially different from that of paper charts.

### 4.9.6 ALTERNATIVE POSITIONING SYSTEMS

Research projects continue to investigate the viability of independent terrestrial alternatives to GNSS which can provide positional information to ships in the event of a GNSS failure.

Although the use of hyperbolic positioning systems at sea has declined, some navigation authorities have developed eLoran, derived from Loran-C, in order to provide a suitable back-up to GNSS in areas with eLoran coverage.

## 4.10 AUTOMATIC IDENTIFICATION SYSTEM

### 4.10.1 AIS OVERVIEW

AIS is a maritime mobile band VHF broadcast system that can automatically exchange static, dynamic and voyage data on a ship-to-ship and ship-to-shore basis. Information transmitted by AIS includes:

- Static data that is set up during equipment installation and includes information such as MMSI, IMO number, international call sign, length, beam and ship type;
- Dynamic data that is current navigation information including position, course, speed and navigational status (at anchor, moored, underway or special conditions); and
- Voyage data relates to the specific voyage and includes information on draught, destination, ETA and hazardous cargo.

Not all vessels carry AIS and watchkeeping officers should be aware that other ships, in particular leisure craft, fishing boats and warships, might not be displayed on AIS. In addition, AIS may be switched off based on the Master's professional judgement.

It is important that the AIS is operated correctly and that watchkeepers are familiar with the equipment, including how to check that all information being transmitted by AIS is both accurate and updated. Poor quality broadcast data can significantly reduce the potential value of this system.

### 4.10.2 AIS AIDS TO NAVIGATION

AIS is increasingly being used to provide additional information to ships such as AIS Aids to Navigation (AtoN). AIS AtoN can provide the following information:

- Type and name of AtoN;
- Position of AtoN;
- AtoN status such as an indication of a buoy light failure or a buoy being out of position; and
- Additional safety related information, such as tide or wind conditions.

#### 4.10.2.1 Physical AIS Aids to Navigation

Physical AIS AtoN are actual aids to navigation that are fitted with AIS transponders. Examples include navigational buoys and lighthouses.

#### 4.10.2.2 Virtual AIS Aids to Navigation

Virtual AIS AtoN do not physically exist but are transmitted by a coastal authority and are generally designed for temporary applications such as the immediate marking of a wreck, identifying a hazard to navigation or defining an area. There is however the potential for more permanent uses of virtual AtoN such as in areas where it is difficult to establish fixed AtoN.

Virtual AIS AtoN are not marked on charts.

### 4.10.3 SATELLITE AIS

This system uses satellites to detect AIS signals. Additional satellite AIS technology is being developed and may be introduced in the future.

### 4.10.4 AIS AND SEARCH AND RESCUE

There are a number of Search and Resuce (SAR) devices which can use AIS to send distress alerts. These include AIS-EPIRB, AIS-MOB and AIS-SART. Watchkeeping officers should be familiar with how these are displayed on AIS or on an ECDIS integrated with AIS.

## 4.11 RADAR AND RADAR PLOTTING AIDS

Watchkeepers should understand the differences between X-Band (3cm) and S-Band (10cm) radars including their characteristics and the impact of different weather conditions on the performance of each.

The OOW should be familiar with the capabilities and limitations of the radar plotting aid integrated with the radar, and any inter-switching arrangements which allow radar displays to change between X-Band and S-Band transceivers.

### 4.11.1 SAFE USE OF RADAR

Unless switched off, usually for particular safety reasons, radar should be kept running and fully operational when the vessel is at sea. Radar is the principal electronic collision avoidance tool for bridge watchkeepers and supports effective passage plan monitoring. However, over reliance on radar to the detriment of maintaining a proper look-out by sight and by hearing should be avoided.

When using radar, the OOW should keep in mind the following:

- The quality of the radar picture needs to be checked regularly. This may be done automatically using a performance monitor;
- An incorrectly aligned heading marker can give misleading information in potential collision situations. Heading marker alignment should be checked periodically against both the gyro heading and the fore and aft line of the ship;
- Small vessels, ice and other floating objects such as containers, may not be detected by the radar;
- Echoes may be obscured by sea or rain clutter. Careful use of sensitivity and clutter controls will assist in improving detection;
- Masts or other structural features may cause shadow or blind sectors on the display. The OOW and look-out should be aware of the need to check these blind sectors regularly;
- Clear weather provides an opportunity for watchkeepers to verify radar target detection performance; and
- Regular practice of parallel indexing techniques should take place, particularly during coastal navigation.

### 4.11.2 DETECTION OF TARGETS

The choice of radar range will depend upon factors including visibility, traffic density, proximity of navigational hazards and speed of own ship.

In addition to monitoring targets at the radar range appropriate to the current conditions, regular checks should be made at both shorter and longer ranges in order to help develop and maintain situational awareness. At shorter ranges, small targets are more easily detected. Advanced warning of land and approaching vessels, particularly high speed craft, is achieved by regular scanning at longer ranges. This is an important factor in determining safe speed.

## 4.11.3 RADAR IMAGE OVERLAY

When a Radar Image Overlay (RIO) is applied to an electronic chart using ECDIS, care should be taken to ensure that the orientation, heading alignment and scale remain correct. The OOW can check these factors by confirming that the radar image correlates with charted features.

The OOW should adjust the colour and transparency of RIO to ensure that radar contacts can be viewed clearly on ECDIS without obscuring charted features. The use of RIO is not a substitute for maintaining an anti-collision plot on a separate radar/ARPA display.

## 4.11.4 RADAR AND COLLISION AVOIDANCE

### 4.11.4.1 Accuracy of Heading and Speed Inputs

To determine the closest point of approach (CPA) of a target and to determine whether or not there is a risk of collision, radar requires an accurate input of own ship's heading and speed through the water.

Yawing or inaccuracies in speed or heading inputs will reduce the accuracy of target vectors. Particularly in head on situations where there are strong currents, the vectors may indicate that a target is passing clear when in fact the vessel is passing ahead, or nearly ahead, and a risk of collision exists.

### 4.11.4.2 Plotting Periods

Multiple observations are required to determine a target's course, speed and CPA. A single observation is not adequate. The accuracy of a target vector will be reduced if there is a change in the ship's own course and speed or the target vessel's course and speed. A change in course or speed of the target during the plotting period may not be immediately detected.

The estimation of the course and speed of the target and risk of collision is only valid up to the time of the last observation. The situation should therefore be kept closely under review.

### 4.11.4.3 Changing Target Bearing

It should not be assumed that, because the relative bearing of a target is changing, there is no risk of collision. Although an alteration of course and/or speed may alter the relative bearing, risk of collision can still exist, especially at close quarters.

## 4.11.5 RADAR PLOTTING AIDS

Radars are required to be equipped with a plotting aid. Radars on smaller ships may be fitted with either automatic tracking aid (ATA) or electronic plotting aid (EPA) functions. Automatic Radar Plotting Aids (ARPA) are required on vessels of 10,000 gross tonnage and above. Plotting aids provide an automatic tool for the systematic plotting of detected objects as required by the COLREGS.

ARPA offers a number of automated collision avoidance features, including the ability to conduct a trial manoeuvre before being committed to it. However, the OOW should be aware of the dangers of being overly reliant on ARPA and should:

- Understand the types of errors that are possible and recognise the operational warnings that may appear on the display;
- Understand the limitations of ARPA;
- Treat the apparent precision on a digital display with caution when the anticipated CPA is approaching the minimum considered safe, particularly when approaching at close range or when large vessels are involved; and
- Regularly test and verify the ARPA functions and accuracy using the built-in self-test facilities.

## 4.11.6 HEADING AND SPEED INPUTS

Correct and reliable speed and heading inputs into ARPA are essential if information is to be processed correctly.

For collision avoidance purposes speed and heading inputs should be sea stabilised (water track) to provide the ARPA with speed and course through the water. It may be hazardous to use ARPA in a ground stabilised (bottom tracked) mode for assessing risk of collision where there are strong currents or tides.

**To determine the CPA of a target and whether there is a risk of collision, there should be an accurate input of own ship's heading and speed through the water.**

## 4.11.7 AUTOMATIC RADAR TARGET ACQUISITION

Guard zones can be established on ARPA. Targets which enter guard zones will be automatically acquired and then processed by ARPA. The OOW can specify the size and position of guard zones to manage the number of targets acquired.

Caution should be exercised when using automated acquisition features as inconspicuous targets may not be detected. Automatic acquisition cannot provide complete situational awareness to the OOW and is not a substitute for regular inspection of the radar image or manual acquisition of targets of interest or concern at the earliest opportunity.

## 4.11.8 AIS TARGETS ON ARPA

Radar/ARPA systems are able to display AIS target information alongside or merged with ARPA information if connected to the AIS transponder on board. The ARPA display should clearly indicate whether target information comes from ARPA or AIS.

**AIS information, particularly CPA and TCPA, should not be relied upon for collision avoidance.**

## 4.11.9 RADAR AND NAVIGATION

Particularly when navigating in or near restricted visibility, radar provides a valuable tool to be used to fix the position of the ship and cross reference GNSS positions.

The OOW should check:

- Overall performance of the radar and adjust settings as appropriate;
- Heading line alignment;
- Accuracy of the Variable Range Marker(s) (VRM), Electronic Bearing Line(s) (EBL) and fixed range rings; and
- If in use, that parallel index lines are correctly set.

### 4.11.9.1 Parallel Indexing

Parallel indexing is a technique for assessing the distance at which the ship will pass a fixed object (such as a headland) on a particular course.

This technique requires an index line to be drawn parallel to the planned ground track that touches the edge of a radar echo of a fixed object, at a range equal to the desired passing distance.

This technique can be used in both relative motion and sea stabilised true motion. In relative motion the static object will move along the parallel index line in a direction and at a speed reciprocal to that of the ship's ground track. In sea stabilised true motion, the VRM will move along the parallel index as the ship moves towards the static object.

#### 4.11.9.2 Charts on Radar

Radars may have the ability to display Electronic Navigational Charts (ENC) which can enhance situational awareness.

#### 4.11.9.3 Electronic Mapping Functions

Electronic mapping facilities are available on some radars for displaying maps, navigation lines and routes. Such facilities should be used with caution.

Maps can be drawn to include chart features such as buoys, channel limits, separation zones and anchorages using a number of different lines and symbols. Once completed, maps can be stored in the radar's memory.

Any map or passage plan should to be geographically referenced so that it will appear on the radar correctly orientated and located relative to the ship's position.

Errors in the ship's position used by the radar, or any errors in the accuracy of the maps or poor radar ground stabilisation can cause map interpretation problems.

### 4.11.10 SEARCH AND RESCUE TRANSPONDER

A Search and Rescue Transponder (SART) is a self-contained emergency device that may be one of two types, a radar-SART, or an AIS-SART. A radar-SART will indicate a distress by creating a series of 12 dots on X-band radar display. To ensure stable reception of a radar-SART, interference rejection should be switched off. An AIS-SART should be detected by AIS (see Section 4.10.4) but will not appear on radar.

## 4.12 CHARTS AND NAUTICAL PUBLICATIONS

### 4.12.1 CARRIAGE OF CHARTS AND NAUTICAL PUBLICATIONS

It is required that all ships carry adequate and up to date official nautical charts, sailing directions, lists of lights and radio signals, Notices to Mariners, tide tables and all other nautical publications necessary to appraise, plan, execute and monitor a passage.

Use of a chart and publication management system will help to ensure that charts and publications are effectively maintained. A management system should record the charts, publications and licences/permits carried, and also when the charts and other publications were last corrected.

### 4.12.2 OFFICIAL CHARTS AND NAUTICAL PUBLICATIONS

Official nautical charts can be either in paper or electronic format. Official nautical publications can also be in either paper or digital form.

In order for a nautical chart or publication to be considered as official, it must be produced or approved by an authorised hydrographic office or relevant government institution in accordance with International Hydrographic Organization (IHO) resolutions and recommendations.

**Only up to date official charts and publications should be used for appraisal, planning, execution and monitoring of a passage plan.**

### 4.12.3 ELECTRONIC CHARTS

Users of electronic charts should be aware that:

- ENC and RNC are official charts produced by a hydrographic office; and
- All other commercially available alternatives are unofficial or private charts.

Only a type-approved ECDIS with an appropriate back-up operating with up to date official electronic charts meets the safe navigation requirements of SOLAS (see Annex 2 of this Guide).

#### 4.12.3.1 Electronic Navigational Charts

ENCs are official vector charts. These charts store hydrographic information in a database rather than as a picture. An ECDIS uses the database to create System Electronic Navigational Charts (SENC) and displays such charts seamlessly. The use of a database in this way allows watchkeeping officers to select which charted features are displayed and to add information to the chart manually.

For watchkeeping officers, the advantages of ENCs over RNCs and paper charts include:

- ENCs use WGS 84 as the geodetic datum, which is compatible with GPS systems without the need for correction;
- Feature sets which can be selected to be relevant to the navigational situation. The Standard Display provides the minimum amount of information for safe navigation;
- The ability to zoom in to different display scales whilst retaining size and shape of text and symbols;
- The ability to select chart symbols (pick report) on ENCs to obtain additional detailed safety and navigational information;
- Automated audible and visual warning alarm activation when an anti-grounding cone (AGC), safety zone or look ahead feature crosses a charted hazard, including safety depths and safety contours; and
- ENCs are updated using digital information provided by hydrographic offices. This makes the process of updating charts more efficient, and eliminates the potential for errors when updating charts by hand.

Watchkeepers should be aware of the effects of over and under zooming of charts. Over zooming results in a chart being displayed at a scale larger than the scale at which it was created. This is normally indicated by a warning and the display of vertical lines on the chart affected.

Under zooming results in a chart being displayed at a scale smaller than that at which it was created. This is normally indicated by a warning only.

**If an ENC is over or under zoomed, not all charted information required for safe navigation may be displayed.**

#### 4.12.3.2 Raster Navigational Charts

RNCs are official raster charts that are exact copies of paper charts and are produced by digitally scanning an original paper chart. It is not possible to change the way information is displayed on an RNC and therefore there is no risk of concealing charted information.

RNCs have limitations including:

- Charts are displayed individually and there may not be a seamless transition between charts;
- The chart data itself cannot trigger automatic visual and audible alarms. A manually created danger object or line is required;
- Zooming in to the chart can result in a loss of clarity and definition of the image; and
- Geodetic datum and projections may differ between RNCs.

Only a type-approved ECDIS with an appropriate back-up operating with up to date official electronic charts meets the safe navigation requirements of SOLAS (see Annex 2 of this Guide).

#### 4.12.3.3 Chart Licences and Permits

Companies, Masters and watchkeeping officers should be aware that access to ENCs and RNCs is controlled by licences/permits. To view a particular ENC or RNC a valid licence/permit will need to be loaded onto each ECDIS.

Licences and permits are available from the hydrographic office which produced the ENC or RNC. Common licensing arrangements include:

- Pre-pay licensing based on intended use. Normally licences and permits are specific to a ship and typically allow a chart to be viewed for a period of 3, 6 or 12 months on that ship; or
- Dynamic or pay as you sail (PAYS) licensing based on actual passage. Ships have access to all charts for planning purposes but only pay for charts that they use during navigation.

Licences and permits should be managed using the ship's chart management system.

# 4.13 ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM

## 4.13.1 OVERVIEW

Electronic Chart Display and Information Systems (ECDIS) may operate as a stand-alone terminal(s) or as part of an Integrated Bridge System (IBS). Only a type-approved ECDIS operating with up to date ENCs and with appropriate back-up may be used to meet the chart carriage requirement under SOLAS.

ECDIS can display large amounts of information which, unless carefully managed, can overload and potentially confuse watchkeepers. It is important to recognise that not all available information needs to be displayed at all times, and that essential navigational information may be hidden or obscured on a cluttered display. General guidance for the level of information displayed in different navigation scenarios should be provided in the SMS.

Other systems, including type-approved ECDIS when using unofficial or private charts, are categorised as Electronic Chart Systems (ECS).

**ECDIS is an aid to safe navigation. ECDIS does not conduct safe navigation or relieve the Master or OOW of their responsibilities for conducting safe navigation.**

## 4.13.2 CHART UPDATES

Procedures for updating ENCs and RNCs on ECDIS should be included in the SMS. Chart updates should be controlled and monitored using the on board chart management system.

## 4.13.3 ECDIS SOFTWARE UPDATES

ECDIS is a computer-based system and periodically, as for any computer-based system, the manufacturer may be expected to release updates to the software that runs the system.

Appropriate procedures are necessary to install system software updates correctly. In some cases failure to follow such procedures has resulted in an ECDIS failure, non-availability of the system and subsequent delay to the affected ship. It is recommended that, unless exceptional circumstances prevail, system software updates are carried out when a ship is in port or otherwise not immediately dependent on ECDIS. It is also recommended that software system updates are carried out strictly in accordance with the manufacturers' instructions and guidelines, by suitably qualified personnel.

## 4.13.4 BACK-UP REQUIREMENTS

In order to provide a resilient on board navigation system, IMO carriage requirements stipulate that, in addition to a type-approved ECDIS, the overall system should include an adequate independent back-up (see Annex 2 of this Guide) providing:

- Independent facilities enabling a safe takeover of the functions of the ECDIS in order to ensure that a system failure does not result in a critical situation; and
- A means to provide for safe navigation for the remaining part of the voyage in case of ECDIS failure.

There are a number of potential options that could meet these requirements, including:

- A second type-approved ECDIS connected to an independent power supply and separate GNSS receiver;
- An appropriate up to date folio of official paper charts for the intended voyage; or
- A type-approved chart-radar. A chart-radar is a type of radar display which has an integrated navigation function, capable of displaying ENCs in compliance with IHO standards, which can be used for route planning and monitoring in a similar way to an ECDIS.

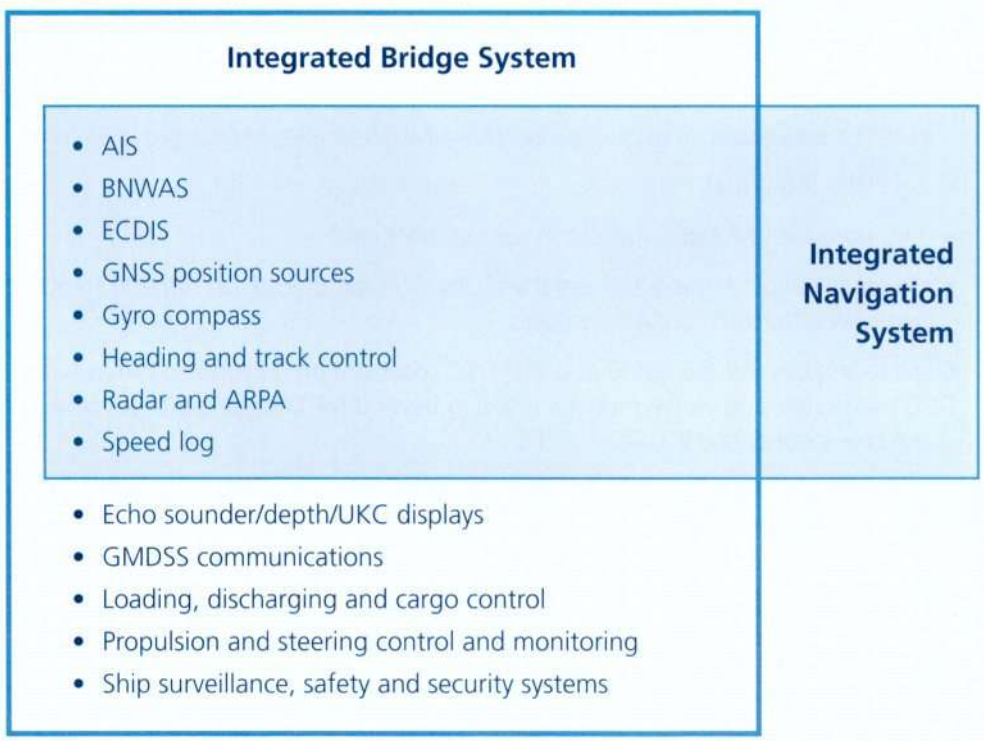
Normal and alternative/emergency power supplies should be available to each ECDIS and back-up system. The OOW should be familiar with the process for switching between power supplies.

## 4.14 INTEGRATED BRIDGE SYSTEMS AND INTEGRATED NAVIGATION SYSTEMS

An Integrated Bridge System (IBS) is a combination of systems which are interconnected in order to allow centralised access to sensor information and control of passage planning, execution and monitoring functions.

An Integrated Navigation System (INS) may be a part of an IBS or may be a stand-alone system. An INS is designed to enhance the safety of navigation by integrating route monitoring, collision avoidance and navigation control.

Both IBS and INS use multi-function workstations which integrate some or all of the systems and equipment covered in this Chapter including:




IBS and INS should be sufficiently robust that the failure of any one part of the system does not result in the failure of the whole system.

Factors which will determine the extent to which the IBS and INS design allows certain bridge functions to be automated include: the design of the bridge, the type and compatibility of equipment fitted, and the layout of displays and user interfaces.

## 4.15 GMDSS COMMUNICATIONS

GMDSS equipped ships should be able to:

- Transmit ship-to-shore distress alerts by two independent means; and
- Receive shore-to-ship alerts (usually relayed by a Rescue Co-ordination Centre (RCC)).

In addition, GMDSS equipped ships should be able to transmit and receive:

- Ship-to-ship alerts;
- SAR co-ordinating communications;
- On-scene communications;
- Locating signals;
- Maritime Safety Information (MSI);
- Routine or general communications to and from shore; and
- Bridge-to-bridge communications.

### 4.15.1 GMDSS EQUIPMENT

Carriage requirements for GMDSS equipment by all ships, and ships operating in Sea Areas A1, A2, A3 and A4, are provided in SOLAS. All SOLAS ships should have at least the following equipment:

- A VHF radio installation which supports continuous watch and communications via digital selective calling (DSC) on VHF DSC Channel 70, and voice communications on VHF Channels 6, 13 and 16;
- A Search and Rescue Transponder (SART);
- A NAVTEX receiver for the reception of MSI;
- A ship earth station (SES) capable of receiving MSI unless operating exclusively within range of NAVTEX broadcasts or exclusively outside GMDSS satellite service provider coverage;
- An EPIRB (406MHz);
- Two portable VHF radios for use in survival craft; and
- Passenger ships should also have the ability to communicate on Airband frequencies with commercial aircraft for SAR purposes.

Ships sailing beyond the range of a VHF DSC coast station (beyond Sea Area A1) should have a MF DSC transmitter and watch receiver. If sailing beyond MF DSC range (beyond Sea Area A2) then a ship should have either an HF DSC or a SES.

Digital selective calling (DSC) is used for calling and replying, and for transmitting, acknowledging and relaying distress alerts. It allows a specific station Martime Mobile Service Identity (MMSI) to be contacted and made aware that the calling station wishes to communicate with it, and to indicate how to reply, or which station to listen to for subsequent distress traffic. Calls can also be addressed to ALL SHIPS or ALL STATIONS.

# CHAPTER 5
# PILOTAGE

# 5 PILOTAGE

The guidance in this Chapter on Pilotage should be read in conjunction with the guidance on effective Bridge Team organisation in Chapter 1 and passage planning in Chapter 2 of this Guide.

## 5.1 OVERVIEW

Effective co-ordination between the Master, other members of the Bridge Team and the Pilot is a prerequisite for safe pilotage.

Pilots possess particular local knowledge and have ship handling and tug management skills to assist the Bridge Team during the most critical and potentially hazardous phases of a voyage.

If a ship's officer holds a valid Pilotage Exemption Certificate (PEC) issued by the responsible authority, it may not be necessary to engage a pilot when the ship is in pilotage waters. In certain circumstances, remote pilotage services may be provided by a shore-based pilot.

Efficient pilotage will depend on:

- Effective communication between the Master, Bridge Team and Pilot;
- Accurate exchange of information between the Master, Bridge Team and the Pilot, particularly on matters relating to safety, helm and telegraph orders;
- Mutual understanding of duties and responsibilities; and
- A complete awareness and understanding of the ship's systems, equipment and any deficiencies which may affect handling characteristics and manoeuvrability.

As appropriate, ship's personnel, shore-based ship management and pilots should be trained in or be familiar with and practise Bridge Resource Management (see Section 1.2).

**The presence of a Pilot does not relieve the Master or the Bridge Team from their duties and responsibilities for the safe conduct of the ship.**

## 5.2 PREPARATION FOR PILOTAGE

### 5.2.1 THE PILOTAGE PLAN

Appraisal and planning of a berth to berth passage plan should include the completion and approval by the Master of a pilotage plan (see Section 2.4). The pilotage plan may not be complete until after the Master/Pilot information exchange (MPX) has taken place. The Master should be prepared to agree amendments to the pilotage plan as necessary.

The appraisal and planning process is not a substitute for a full MPX (see Checklist A1), covering the most up to date information available when the Pilot embarks.

Particular information may be required by port authorities in advance of arrival. The Master should be prepared to provide:

- Any of the ship particulars in Checklist A1 and A2;
- Declarations relating to cargo, stores, crew, passengers and dangerous goods;
- Arrival intentions including arrangements for cargo discharge and bunkering; and

- Any other information requested by port authorities.

### 5.2.2 THE PILOT

The Master should expect the Pilot(s) to be qualified, certified and experienced for the intended pilotage and adequately rested and alert. The Master has a right to request a replacement Pilot should it be deemed necessary.

Masters should be aware that a Pilot may refuse to conduct a pilotage if it is considered that the ship may be a danger to the safety of navigation or to the environment. In the event of a refusal to conduct a pilotage the Pilot may be expected to report the reason to the appropriate authority for further action.

The Master should understand that the Pilot should report, without delay, to the appropriate authority:

- Any circumstance that may affect the safety of navigation or compromise the prevention of pollution;
- Any accident or near miss which may have occurred during the pilotage; and
- Any irregularities with navigational lights, shapes and signals on board.

### 5.2.3 THE SHIP AND BRIDGE TEAM

The following preparations for pilotage will enable the Bridge Team to utilise effectively the Pilot's particular skills, knowledge and experience:

- A pilotage plan (see Section 2.4.3);
- The Bridge Team should be briefed regarding the pilotage and the duties of those involved;
- The Pilot Card (see Checklist A2) should be completed; and
- Communications should be established with Pilot, port VTS and port authorities as appropriate.

### 5.2.4 THE PILOT CARD

The Pilot Card should be updated to include all details of the current ship condition and all relevant information for that particular passage/port. It is important that all defects which may affect the ship's manoeuvrability or have an impact on the pilotage are recorded, and that a procedure for unambiguously advising any such defects to the Pilot is followed.

It is recommended that the Pilot Card is prepared in accordance with the IMO standard format (see Checklist A2).

## 5.3 SAFE PILOT BOARDING

### 5.3.1 PILOT BOARDING TIME

To allow sufficient time for a comprehensive MPX, the ship should ensure that it is available to embark the Pilot at the agreed embarkation time. Any delays in embarkation may reduce the time available for a comprehensive MPX and to make and agree any necessary amendments to the pilotage plan.

### 5.3.2 EMBARKING THE PILOT

The Master should ensure the availability of a properly maintained means of pilot embarkation and disembarkation that is positioned, rigged, checked and manned in accordance with IMO recommendations (see Checklist A4) and, where applicable, local requirements. If embarking a pilot by helicopter, reference should be made to the *ICS Guide to Helicopter/Ship Operations*.

The Pilot should:

- Use appropriate personal protective equipment; and
- Liaise with the Master so that the ship is positioned and manoeuvred to permit safe boarding.

The Pilot may be expected to check that boarding equipment appears properly rigged and manned.

## 5.4 MASTER/PILOT INFORMATION EXCHANGE

The Pilot and the Master should exchange information regarding the Pilot's intentions, the ship's characteristics and operational factors as soon as practicable after the Pilot has boarded the ship.

For an effective Master/Pilot information exchange (MPX), use should be made of the MPX checklist (see Checklist A1). It is essential that the MPX results in clear and effective communication and should cover:

- Presentation of a completed standard Pilot Card (see Checklist A2);
- The pilotage plan and the circumstances when deviation from the plan may be required. Any amendments to the plan should be agreed, and any changes in individual Bridge Team responsibilities made, before pilotage commences;
- Updates on local conditions such as weather, depth of water, tides and tidal streams;
- An update on traffic conditions;
- Ship's dimensions and manoeuvring information should be provided in the form of the Wheelhouse Poster (see Checklist A3). A manoeuvring booklet containing more detailed information should also be available on the bridge;
- Any unusual ship handling characteristics and machinery, navigational equipment and crew limitations that could affect the safe conduct of pilotage and berthing;
- Information on berthing arrangements including the use, characteristics and number of tugs, mooring boats, mooring arrangements and other external facilities;
- Contingency plans should also be considered. These should identify possible abort points in the event of a malfunction or a shipboard emergency; and
- Formal confirmation of the working language.

**All defects that might affect the manoeuvrability of the vessel or the pilotage should be reported to the Pilot.**

There will be circumstances when a debriefing with the Pilot after pilotage could identify improvements in the conduct of future pilotage operations by the Bridge Team.

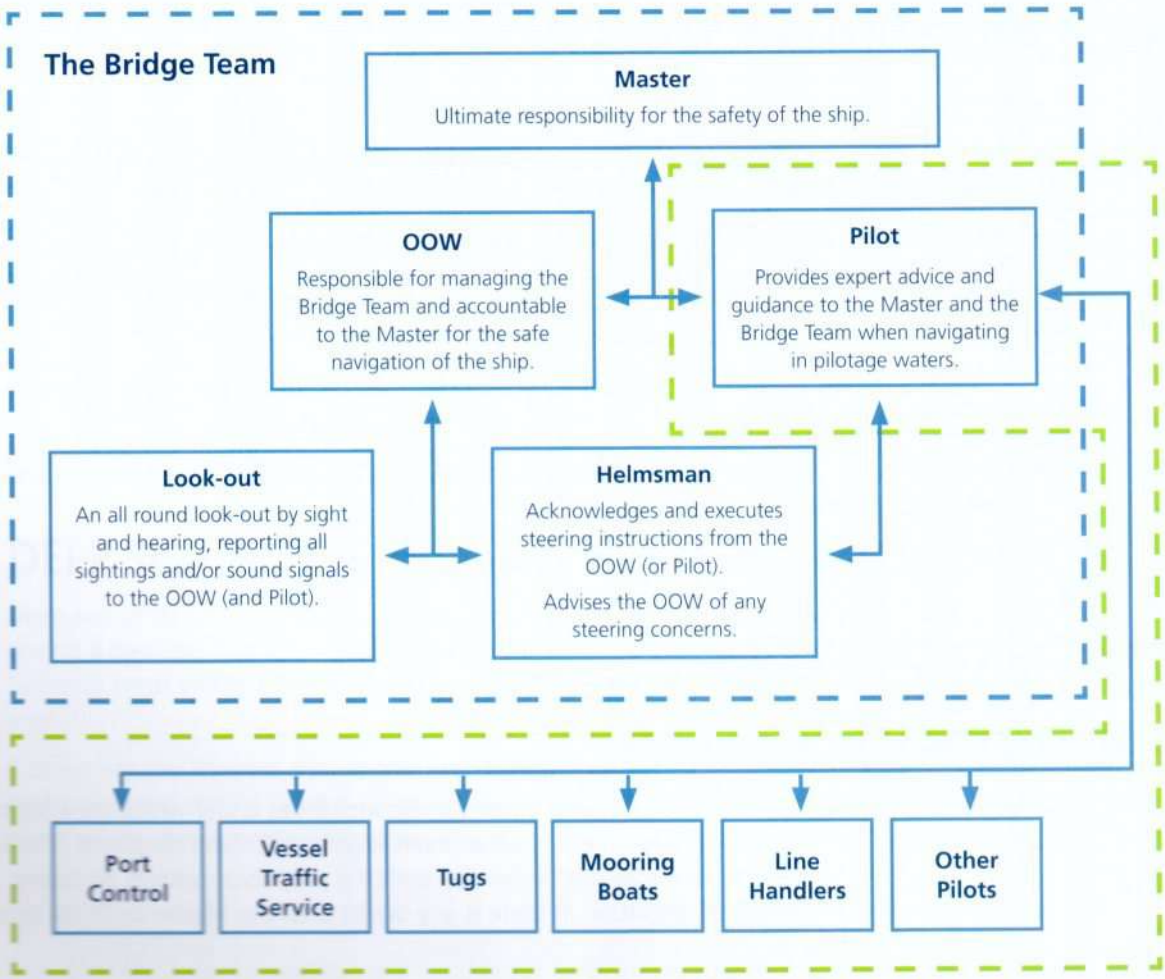
### 5.4.1 ADDITIONAL PILOTS

If more than one pilot is required or supernumerary pilots board:

- All pilots should be involved in the MPX; and
- Each pilot's role and responsibility, including duty periods, should be understood by the entire Bridge Team.

# 5.5 DUTIES AND RESPONSIBILITIES

The Master has ultimate responsibility for the safety of the ship and prevention of pollution. The Bridge Team is not relieved of its responsibility for safe navigation following the embarkation of the Pilot. The following diagram illustrates an example of a Bridge Team and Pilot co-operating and working together.




The Pilot should effectively communicate expert local knowledge, information and advice to the Bridge Team in English or a defined working language that is understood by the Master, Pilot and Bridge Team. Pilots should in turn be supported by all appropriate shipboard personnel in their execution of safe navigation.

At all times it should be clearly understood by the Bridge Team, including by the Pilot, whether the Master, Pilot or OOW has control of steering and propulsion.

## 5.5.1 BRIDGE TEAM RESPONSIBILITIES

When deciding on the composition of the Bridge Team, consideration should be given to the need for sufficient resources to ensure that the following are effectively achieved:

- Operating navigation equipment and providing assistance and advice to the Pilot as necessary;
- Monitoring the actions of the Pilot and other members of the Bridge Team;
- Monitoring ship progress against the pilotage plan by conducting track monitoring and regular fixing of the position of the ship, particularly after each course alteration;
- Monitoring under keel clearance (UKC);
- Verifying verbal orders from the Pilot and confirming that they have been carried out correctly;

- Monitoring the rate of turn, rudder angle and RPM indicators when helm and engine orders are given;
- Identifying misunderstandings and ensuring that clarifications are sought immediately if in any doubt; and
- Advising the Master if the safety of the ship is in any doubt.

### 5.5.2 PILOT'S RESPONSIBILITIES

Throughout the pilotage and berthing the Pilot should:

- Use the agreed working language and if necessary the IMO Standard Marine Communication Phrases (SMCP) when directing or advising the Bridge Team;
- Understand the roles and responsibilities of individual Bridge Team members;
- Make use of the information provided during the MPX regarding manoeuvring characteristics;
- Respond to information, advice and questions from the Bridge Team;
- Advise the Bridge Team of any failures or deficiencies, such as the unavailability of tugs, in good time;
- Keep the Bridge Team appraised of pilotage progress and any anticipated need to deviate from the pilotage plan; and
- Inform the Bridge Team of any handover between pilots.

## 5.6 MANOEUVRING

### 5.6.1 MOORING OPERATIONS

The Pilot and the Master should discuss and agree the circumstances under which the Pilot may directly operate controls for key equipment (such as main engine, helm and thrusters). The Master should bear in mind that the Pilot may not be familiar with the propulsion system on board, or its characteristics and methods of operation. If there is any doubt then the Master or OOW should control these systems.

The Pilot should co-ordinate the work of the Bridge Team, tugs, mooring boats and linesmen during mooring operations. The Pilot's intentions and actions should be explained to the Bridge Team in the defined working language.

In supporting the Pilot, the Master and Bridge Team should:

- Ensure that the Pilot's directions are conveyed to the mooring stations and are correctly implemented;
- Ensure that the mooring stations provide relevant feedback information; and
- Advise the Pilot once directions have been complied with, or where an omission has occurred or if a potential problem exists.

### 5.6.2 USE OF TUGS AND MOORING BOATS

The number of tugs, how they will operate (on a line or alongside), their capabilities and their limitations should form part of the MPX and be understood by the Bridge Team. It is important that when used, the size and power of tugs is appropriate for the size of the ship.

Communications between the Pilot, tugs and mooring boats should be monitored and verified. The Pilot should keep the Bridge Team informed about the orders given to tugs and mooring boats. Any concerns should be reported to the Master and Pilot.

Care should be taken when operating with tugs and mooring boats to ensure that they are not endangered by the actions of the ship. This is also important when making fast or letting go tugs.

The Bridge Team should be aware of the effects of interaction between ships, tugs and/or mooring boats and fixed structures.

## 5.7 PREPARING THE OUTBOUND PILOTAGE PLAN

After berthing, the outbound pilotage plan may be discussed with the Pilot to support the appraisal and planning stages of the passage plan. Notwithstanding this, a complete MPX should be take place before departure.

## 5.8 PILOTAGE EXEMPTION CERTIFICATES

Where pilotage is compulsory a ship should engage a pilot, unless there is an officer on board to whom the pilotage authority has issued a Pilotage Exemption Certificate (PEC) for the specific port or pilotage area.

A PEC holder should act as the Pilot and take on the duties and responsibilities of a pilot whilst providing local information and advice to the Master and other members of the Bridge Team.

The presence of a PEC holder on board does not prevent the Master from requesting a pilot if necessary.

## 5.9 DEEP SEA PILOTS

Deep sea pilots can, in appropriate circumstances, be an asset and enhance the safety of the ship during a passage. There is no mandatory requirement to use a deep sea pilot under SOLAS. There are however areas where the IMO and/or coastal State(s) recommends or strongly recommends the use of a pilot.

Companies and Masters should give due consideration to recommendations relating to the safety of navigation and should carefully consider the rationale should a deep sea pilot not be embarked in areas where they are recommended.

# ANNEXES

## ANNEX 1 – DYNAMIC POSITIONING

## ANNEX 2 – ECDIS CARRIAGE REQUIREMENTS

## ANNEX 3 – CHECKLISTS

SECTION A – PILOTAGE
SECTION B – BRIDGE
SECTION C – EMERGENCIES

# ANNEX 1 – DYNAMIC POSITIONING

## 1.1 GENERAL

The guidance provided in this Annex addresses the interface between Dynamic Positioning (DP) systems and bridge procedures. This Annex should be considered supplementary to detailed DP procedure manuals, checklists and training requirements for those operating DP vessels.

## 1.2 OPERATIONAL PLANNING ON DP SHIPS

In addition to making a conventional berth to berth passage, many vessels undertake operations involving navigation in areas where different forms of hazard exist, for example in offshore oil fields and wind farms. The berth to berth plan should reflect the guidance in Chapters 2 and 5 and address operational planning within a worksite environment.

When arriving at the operational area or worksite, it is necessary for a detailed operational plan to be available covering the approach and other phases of the envisaged operation. If the vessel is using DP mode, allowance should be made for the capabilities and limitations of the DP system and its peripheral equipment.

When developing the operational plan, Activity Specific Operating Guidelines (ASOG) should be consulted, and the following factors are among those that should be taken into account:

- Guidance contained within the ship's operational procedures manuals, together with any instructions or guidance from the vessel's owners or managers, or from the agency responsible for operations within the worksite area;
- Any conditions that may necessitate changes being made to the operational planning;
- Location of hazards within the worksite area, depth of water on and around the worksite;
- Whether vessel manoeuvrability is impaired by any aspect of the operation;
- Expected weather, visibility, sea state and currents;
- Availability of vessel power;
- Level of vessel redundancy and the redundancy requirements of the operation;
- Availability of position reference, including contingency and back-up references;
- Any restrictions that might be imposed by the field operator regarding the placing or manoeuvring of underwater hardware;
- Proximity of other vessels at any stage of the operation and the effects upon the manoeuvrability of own vessel or the integrity of its position references; and
- Ability of own vessel to react to changes in weather, power or operational status.

All of the above will form part of a formal risk assessment which will cover all aspects of the operation.

Contingency planning is an essential part of any DP operation. DP operations are often conducted in close proximity to other vessels or fixed structures. Anchored installations pose their own unique problems due to the subsurface anchor lines. Contingency plans should cover: safe escape routes and actions to be taken in the event of unforeseen circumstances, catastrophic DP system failure, or any significant degradation of any vessel systems.

## 1.3 NAVIGATION IN DP MODE

During DP operations, the DP Operator (DPO) should be aware of the proximity of other vessels or fixed structures which might present a collision hazard. This is especially important as vessels engaged in DP operations are often constrained in their ability to manoeuvre. The appropriate lights and other signals in accordance with the COLREGS should be displayed.

The DPO is responsible for the continuous monitoring of the ship's position and of the status of the various Position Reference Systems (PRS) providing positional data. If data from more than one PRS is being automatically pooled or combined, then the DPO should be aware of the relative weightings applied to individual PRS.

Many operations involving DP capable vessels entail vessel positioning relative to a moving target. An example would be a shuttle tanker conducting tandem loading operations from a Floating Production, Storage and Offloading (FPSO) vessel. Under these circumstances, the DPO should be aware of the motion characteristics of the target. There should also be provision of appropriate position references, including both absolute references, such as Differential GPS, and relative references with position data referenced to the moving target.

Other operations involving DP capable vessels entail deployment of divers, remotely operated vehicles (ROVs), pipelines, cables and other underwater equipment either individually or as part of a combined operation. The DPO should be aware of the limitations in manoeuvring imposed and the hazards presented by such equipment or operations.

## 1.4 CONTROLLING SPEED AND DIRECTION IN DP MODE

The DPO is responsible for monitoring all equipment related to the control of the position and heading of the vessel whilst in DP mode. DP relies on a complex computer controlled system which integrates functions relating to the power plant, propulsion systems, motion and environmental sensors, and position and heading references.

DP systems will employ complex mathematical modelling techniques to provide adaptive positioning control. This modelling process takes time to establish within the system. Before commencing operations upon which the precise positioning of the ship is a critical factor, the DPO should ensure that sufficient time has been allowed for the model to become established.

Effective control of a vessel in DP mode is dependent upon the efficient operation of propulsion units, propellers and thrusters. The DPO should continually ensure that propulsion commands are matched by feedback values from all thrust units.

The DPO should also constantly be aware of the demands being made on the power plant and ensure that sufficient power is available for effective control of the vessel, with an appropriate power reserve. Similarly, individual propulsion units (propellers and thrusters) should be monitored continuously.

In deteriorating environmental conditions, the DPO should continue to monitor the accuracy with which the vessel's position and heading are being maintained. If position and/or heading excursions are outside acceptable limits, then due consideration should be given to suspending operations until more favourable conditions prevail.

## 1.5 OPERATION AND MAINTENANCE OF DP SYSTEMS

As Dynamic Positioning is a vessel function rather than a specific piece of equipment, it can be described as an integration of a variety of components such as Position Reference Systems (PRS), gyro compasses, motion and environmental sensors, computers, propulsion systems and the vessel's power plant. DP systems are controlled by means of an Operator Station, usually located on the bridge.

Before commencing DP operations, or transferring to DP control from conventional navigation, all systems should be carefully checked and tested; a pre-DP checklist is normally provided for this purpose.

Upon transferring from conventional navigational control to DP control, the DPO should check that control of all propulsion units and thrusters is effective, i.e. that all units are being correctly commanded by the DP system. This is normally done in a 'manual' DP mode, with position and heading of the vessel controlled by a joystick located on the DP panel.

When in automatic DP mode, the DPO should set warning and alarm limits to appropriate values in order to give indications of heading or position excursions. In many DP vessels, full system redundancy is provided. Multiple gyro compasses, wind sensors, PRS and computers contribute to the level of redundancy.

The DPO should monitor and compare input data from duplicated sensors. The system should give warnings and alarms against data discrepancies. If the system features triple modular redundancy, with triplicated sensors, then a 'voting' capability allows automatic detection of an errant sensor and automatic rejection of an incorrect sensor and its data.

All PRS have inherent limits to their levels of reliability and accuracy. It is normal to deploy more than one PRS with data pooling to provide a 'best fit' position. The DPO should avoid common mode failure scenarios resulting from the deployment of PRS of the same type. Typical position reference systems include:

- Differential GPS;
- Microwave range/bearing systems;
- Hydro-acoustic systems;
- Taut wire systems; and
- Laser-based systems.

If the operation necessitates the deployment of three Position Reference Systems, then they should use at least two different measuring principles.

# ANNEX 2 – ECDIS CARRIAGE REQUIREMENTS

The table below is designed to assist Companies, Masters and watchkeeping officers to determine how the SOLAS chart carriage requirement may be implemented on board.

| Electronic Chart and Equipment Status | | | | | |
|---|---|---|---|---|---|
| **Are official ENCs available for Area of Operation?** | **YES** | **NO** | | **YES** | **NO** |
| **What digital charts are being used in ECDIS by the mariner?** | ENC (Coverage to an appropriate scale for navigation) | RNC (Coverage to an appropriate scale for navigation) | | RNC (Coverage to an appropriate scale for navigation) | Unofficial/ private charts[6] |
| **How is the ECDIS operating?** | As ECDIS | As ECDIS in RCDS mode | | As ECDIS in RCDS mode | As ECS |
| **What back-up system is required?** | Independent ECDIS or other back-up solution required[7] | Independent ECDIS or other back-up solution required[7] | **OR** | Not required[3] | Not required[3] |
| **What are the requirements for the carriage of official paper charts?** | Not required[1] (Except if back-up is a folio of official paper charts[7]) | An 'appropriate' folio of up to date paper charts to be used with the ECDIS in RCDS mode[2] | | Up to date official paper charts required for safe navigation areas where ENCs are not available | All up to date official paper charts required for safe navigation for the intended voyage |
| **Does ECDIS fulfil chart carriage requirements?** | YES[1] | YES[1] | | NO[4] | NO[5] |

Note to table above:

1. Some flag States may require specific documentation to allow this.
2. Flag State defines meaning of 'appropriate'.
3. Back-up system is only required if ECDIS is intended to meet chart carriage requirements.
4. For ECDIS to fulfil carriage requirements vessels should use ENCs where these are available. Availability refers to the absolute availability of charts from hydrographic offices and not just those available on board the ship.
5. Paper charts (not ECDIS) should remain the primary means of navigation.
6. If private charts are used in an ECDIS the system is regarded as operating as an ECS. An ECS does not meet IMO chart carriage requirements.
7. Flag State specific requirements should be complied with. Commonly used back-up methods are:
   a. A second ECDIS, connected to an independent power supply and a separate GNSS position input;
   b. Up to date paper nautical charts sufficient for the intended voyage; and/or
   c. A type-approved chart-radar.

# ANNEX 3 – CHECKLISTS

## SECTION A – PILOTAGE

The checklists in Section A provide a guide for the creation of appropriate Company and/or on board checklists which suit the particular needs of the ship.

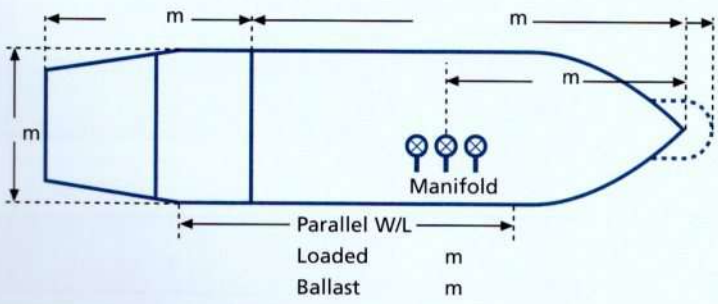
# A1 MASTER/PILOT INFORMATION EXCHANGE

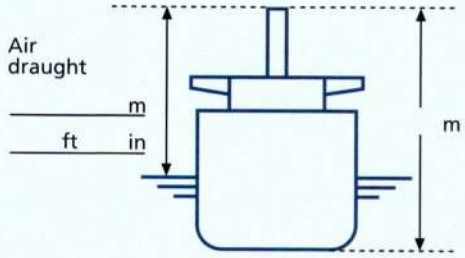
| SHIP IDENTITY | | |
|---|---|---|
| Name: | Call Sign: | Flag: |
| Agent: | Year Built: | IMO Number: |
| Cargo: | Ship Type: | Last Port: |
| **ADDITIONAL SHIP'S CONTACT INFORMATION** | | |
| Telephone: | Email: | Other: |
| **PILOT BOARDING INSTRUCTIONS** | | |
| ETA at Pilot Station: | Pilot ETA at Boarding Station: | Approach Course and Speed: |
| Embarkation Side: | Requested Boarding Arrangements: | |
| **SHIP PARTICULARS** | | |
| Refer to the ship particulars in the Pilot Card (Checklist A2) | | |
| **ANCHORS (Length of Cable Available)** | | |
| Refer to the ship particulars in the Pilot Card (Checklist A2) | | |
| **MANOEUVRING DETAILS AT CURRENT CONDITION** | | |
| Refer to the steering information in the Pilot Card (Checklist A2) | | |
| **MAIN ENGINE DETAILS** | | |
| Refer to the main engine information in the Pilot Card (Checklist A2) | | |
| **BERTH AND TUG DETAILS** | | |
| Intended Berth and Berthing Plan: | | |
| Side Alongside: | Estimated Transit Time to Berth: | Tug Rendezvous Position: |
| Number of Tugs: | Tug Arrangements: | Total Bollard Pull: |
| **WEATHER AND SEA CONDITIONS (At Boarding Station and at Berth)** | | |
| Tidal Information (Heights and Times): | | |
| Expected Currents: | | |
| Weather Forecast: | | |

| PILOTAGE PLAN |
| --- |
| |
| **REGULATIONS (VTS Reporting, Anchor/Look-out Attendance, Maximum Allowable Draught)** |
| |
| **OTHER IMPORTANT DETAILS (Including Navigation Hazards, Ship Movements, Berthing Restrictions, Manoeuvring Peculiarities)** |
| |

# A2 PILOT CARD

| SHIP PARTICULARS | | |
|---|---|---|
| Name: | | Call Sign: |
| Displacement: | DWT: | Year Built: |
| Length: | Beam: | Bulbous Bow: |
| Draught Fwd: | Draught Aft: | Draught Amidships: |
| Air Draught: | Port Anchor:<br>Shackles | Stbd Anchor:<br>Shackles |
| | | 1 shackle = 27.4m/15 fathoms |




| MAIN ENGINE | | | |
|---|---|---|---|
| Type: | Max Power: kW | | Max Power: HP |
| | RPM/Pitch | Loaded Speed (kts) | Ballast Speed (kts) |
| Full Ahead: | | | |
| Half Ahead: | | | |
| Slow Ahead: | | | |
| Dead Slow Ahead: | | | |
| Dead Slow Astern: | | | |
| Slow Astern: | | | |
| Half Astern: | | | |
| Full Astern: | | % ahead power | |
| Engine Critical RPM: | Maximum Number of Consecutive Engine Starts: | Time from Full Ahead to Full Astern: | |
| Time Limit Astern: | Minimum Steering Speed: | | |

| STEERING | | |
|---|---|---|
| Number of Propellers: | Direction of Turn: | Propeller Arrangement: |
| Time from Hard-Over to Hard-Over: | Rudder Angle for Neutral Effects: | |
| Thrusters (Positions and Power): | Steering Characteristics: | |

| EQUIPMENT CHECKED AND READY FOR USE | | |
|---|---|---|
| Anchors: | | Cleared Away: YES/NO |
| Compasses: | | |
| Compass Error: | | |
| Speed Log: | | Doppler: YES/NO<br>Speed: Water/Ground<br>Axis: Single/Dual |
| Echo Sounder: | | |
| GNSS: | | Type: |
| ECDIS: | | |
| X-Band Radar: | | ARPA: YES/NO |
| S-Band Radar: | | ARPA: YES/NO |
| VHF (Including Handheld): | | |
| Steering Gear: | | Number of Power Units In Use: |
| Engine Telegraphs: | | |
| Rudder/RPM/ROT Indicators: | | |
| Mooring Winches and Lines: | | |
| Navigation Lights: | | |
| Whistles: | | |

| EQUIPMENT OPERATIONAL DEFECTS |
|---|
| |

| OTHER IMPORTANT DETAILS |
|---|
| |

*Reference: IMO Resolution A.601(15) Provision and Display of Manoeuvring Information On Board Ships*

Master:..... Date:.....

# A3 WHEELHOUSE POSTER

Ship's name..... Call sign.....Gross tonnage.....Net tonnage.....

Max. displacement.....tonnes, and Deadweight.....tonnes, and Block coefficient.....at summer full load draught

Draught at which the manoeuvring data were obtained

| Loaded | Ballast |
|---|---|
| Trial/Estimated | Trial/Estimated |
| ___m forward | ___m forward |
| ___m aft | ___m aft |

## STEERING PARTICULARS

Type of rudder(s) _____
Maximum rudder angle _____°
Time hard-over to hard-over
with one power unit _____s
with two power units _____s
Minimum speed to maintain course propeller stopped _____knots
Rudder angle for neutral effect _____°

## ANCHOR CHAIN

| | No. of shackles | Max. rate of heaving (min/shackle) |
|---|---|---|
| Port | | |
| Starboard | | |
| Stern | | |

(1 shackle = _____m/_____fathoms)

## PROPULSION PARTICULARS

Type of engine _____, ___kW (___HP). Type of propeller _____

| Engine order | Rpm/pitch setting | Speed (knots) Loaded | Ballast |
|---|---|---|---|
| Full sea speed | | | |
| Full ahead | | | |
| Half ahead | | | |
| Slow ahead | | | |
| Dead slow ahead | | | |
| Dead slow astern | | Critical revolutions ___rpm<br>Minimum rpm ___ ___knots | |
| Slow astern | | Time limit astern ___rpm<br>Time limit at min. rev. ___rpm | |
| Half astern | | Emergency full ahead to full astern ___s<br>Stop to full astern ___s | |
| Full astern | | Astern power ___% ahead<br>Max. no. of consecutive starts ___ | |

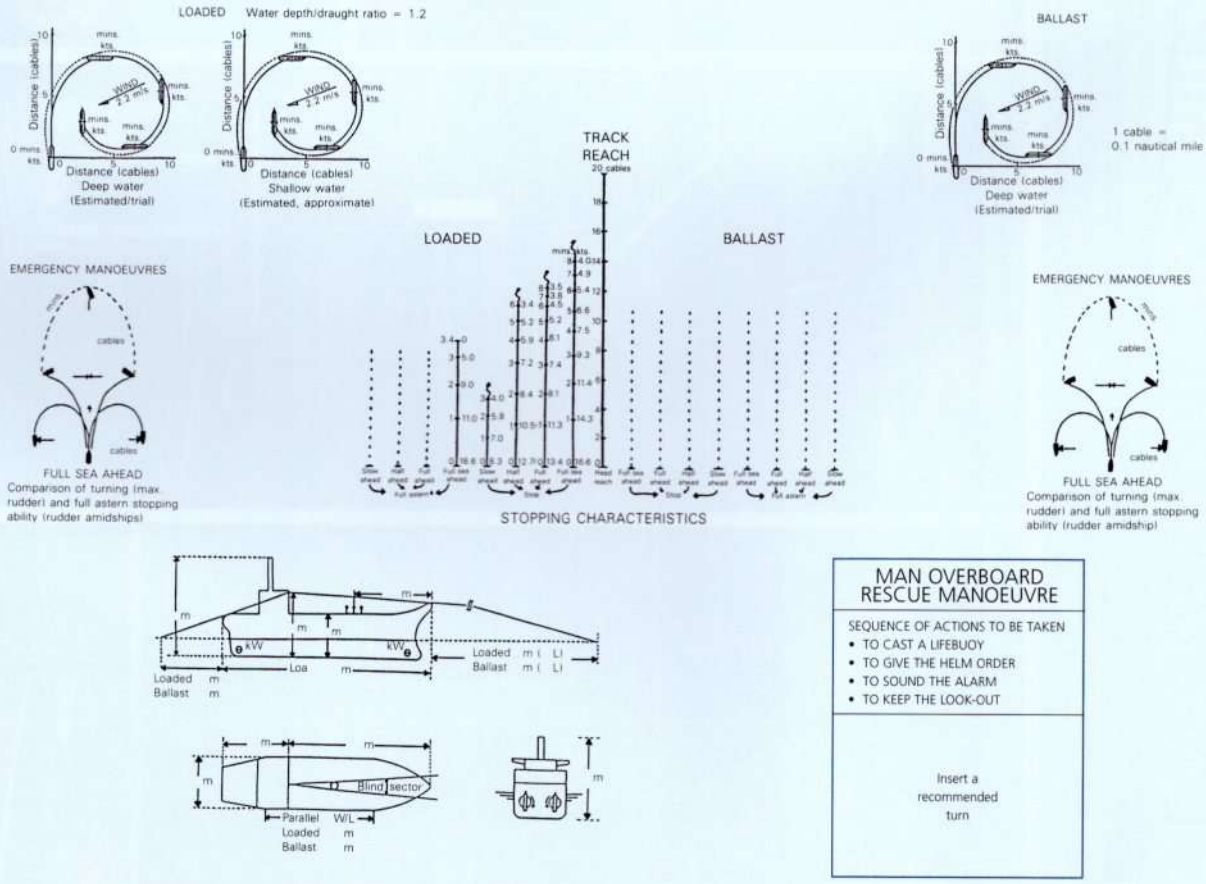
## THRUSTER EFFECT at trial conditions

| Thruster | kW (HP) | Time delay for full thrust | Turning rate at zero speed | Time delay to reverse full thrust | Not effective above speed |
|---|---|---|---|---|---|
| Bow | | s | °/min | min s | knots |
| Stern | | s | °/min | min s | knots |
| Combined | | s | °/min | min s | knots |

## DRAUGHT INCREASE (LOADED)

| Estimated Squat Effect | | | Heel Effect | |
|---|---|---|---|---|
| Under keel clearance | Ship's speed (knots) | Max. bow squat estimated (m) | Heel angle (degree) | Draught increase (m) |
| m | | | 2 | |
| | | | 4 | |
| | | | 8 | |
| m | | | 12 | |
| | | | 16 | |

## TURNING CIRCLES AT MAX. RUDDER ANGLE




## MAN OVERBOARD RESCUE MANOEUVRE

SEQUENCE OF ACTIONS TO BE TAKEN

- TO CAST A LIFEBUOY
- TO GIVE THE HELM ORDER
- TO SOUND THE ALARM
- TO KEEP THE LOOK-OUT

Insert a recommended turn

PERFORMANCE MAY DIFFER FROM THIS RECORD DUE TO ENVIRONMENTAL, HULL AND LOADING CONDITIONS

*Reference: IMO Resolution A.601(15) Provision and Display of Manoeuvring Information On Board Ships*

# REQUIRED BOARDING ARRANGEMENTS FOR PILOT

IMO INTERNATIONAL MARITIME ORGANIZATION

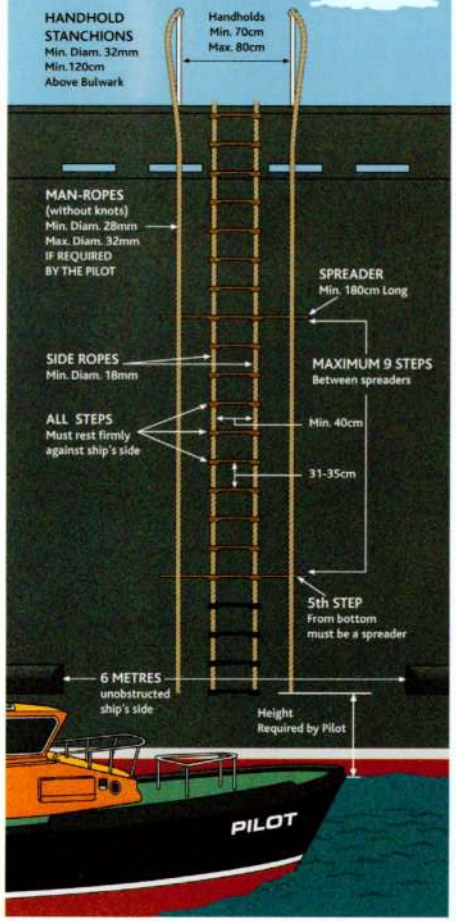
In accordance with SOLAS Regulation V/23 & IMO Resolution A.1045(27)

**INTERNATIONAL MARITIME PILOTS' ASSOCIATION**

H.Q.S. "Wellington" Temple Stairs, Victoria Embankment, London WC2R 2PN Tel: +44 (0)20 7240 3973 Fax: +44 (0)20 7210 3518 Email: office@impahq.org

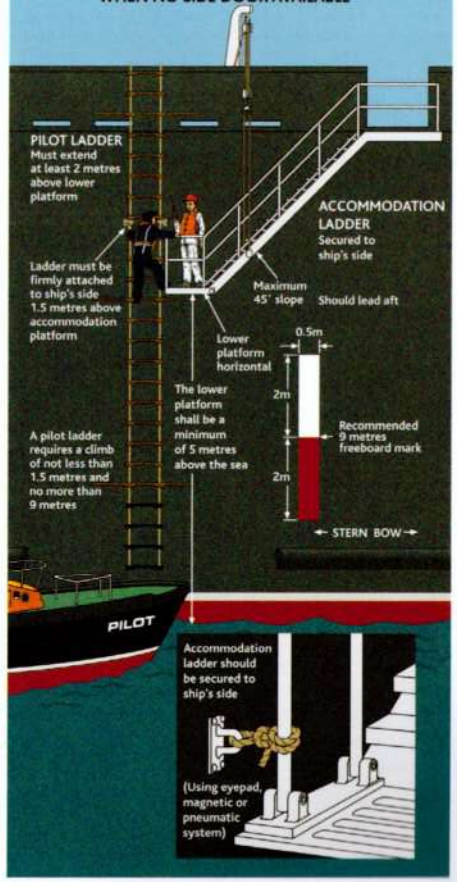
This document and all IMO Pilot-related documents are available for download at: http://www.impahq.org

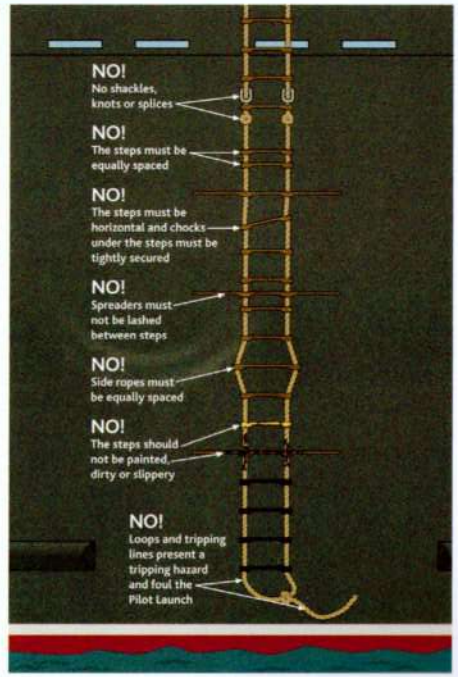
## RIGGING FOR FREEBOARDS OF 9 METRES OR LESS



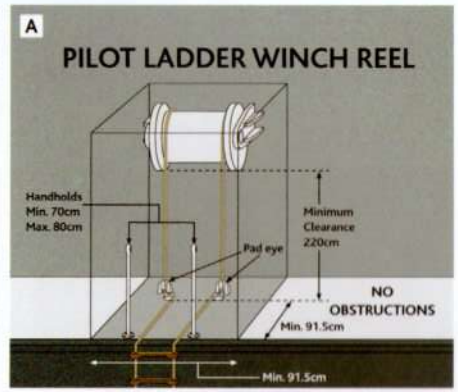

## COMBINATION ARRANGEMENT FOR SHIPS WITH A FREEBOARD OF MORE THAN 9 METRES

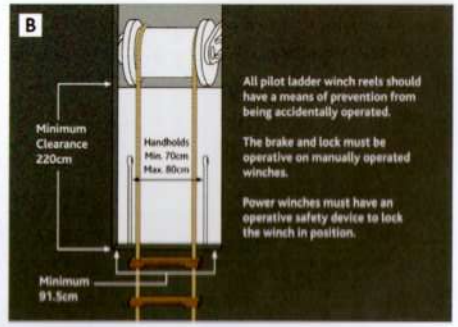
WHEN NO SIDE DOOR AVAILABLE

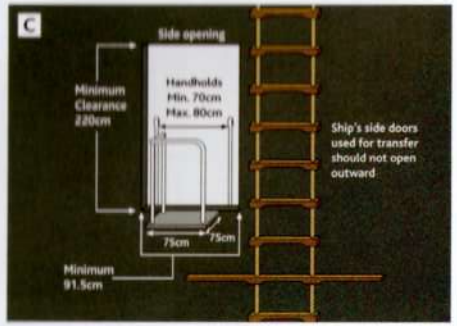






# SECTION B – BRIDGE

The checklists in Section B provide a guide for the creation of appropriate Company and/or on board checklists which suit the particular needs of the ship.

Signature blocks are included on some checklists. This reflects those checklists where a positive statement of completion of the actions in the checklist may be considered appropriate.

# B1 STEERING GEAR TEST ROUTINES

These routines should be carried out at any time when required and if there is doubt as to the performance of the steering gear. Checks of steering equipment may also be required by coastal States on entry into their waters.

| | Date last checked | Checked by |
|---|---|---|
| **Every Watch/After Prolonged Use of Autopilot** | | |
| Check and confirm rudder response to manual steering from all bridge positions using each steering gear power unit singly and together | | |
| **Before Entering Coastal or Congested Waters** | | |
| Check communications between bridge and steering gear compartment | | |
| Check and confirm rudder response to manual steering from all bridge positions using each steering gear power unit singly and together | | |
| **Prior to Departure (No More Than 12 Hours Prior to Departure)** | | |
| Check communications between bridge and steering gear compartment | | |
| Test and confirm correct operation of the following: | | |
| • Main steering gear | | |
| • Auxiliary steering gear | | |
| • Remote steering gear control systems | | |
| • Steering positions on the bridge | | |
| • Emergency power supply | | |
| • All rudder angle indicator repeaters show the correct rudder position | | |
| • Remote steering gear control system power failure alarms | | |
| • Steering gear power unit failure alarms | | |
| • Automatic isolating arrangements and other automatic equipment | | |
| **Emergency Steering Drills** | | |
| Emergency steering drills should take place at least every three months and should include direct control from within the steering gear compartment, the communications procedure with the bridge and, where applicable, the operation of alternative power supplies | | |

### Checks and Tests

- Confirm the full rudder movement according to the required capabilities of the steering gear;
- Check the timing of rudder movement from hard-over to hard-over, using each steering gear power unit singly and together, to ensure consistency with previous tests; and
- Visually inspect the steering gear and linkages for damage.

### Changeover Procedures

The regular testing of manual steering should be an opportunity for all Bridge Team members to practise procedures for changeover between different steering modes, as appropriate. Typically, these will include:

- Automatic track-keeping to automatic heading control;
- Automatic heading control to hand steering;
- Hand steering to non-follow-up; and
- Hand steering to emergency steering.

# B2 EXAMPLE OF A BRIDGE MANNING MATRIX

This is an example of a bridge manning matrix planning tool. This particular example, developed for a specific ship, is not a recommendation for appropriate manning levels on all ships.

| | Conditions | | Master | OOW | Look-out | Helmsman | Pilot | Engine | Helm |
|---|---|---|---|---|---|---|---|---|---|
| **Entering & Leaving Port** | All | All | ♟ | ♟ | ♟ | ♟ | ♟ | M | H |
| **Restricted Waters** | All | Clear weather | | ♟ | ♟ | Option | | U | A |
| | | Restricted visibility | ♟ | ♟ | ♟ | ♟ | | M | H |
| **Coastal Waters** | All | Clear weather | | ♟ | ♟ | | | U | A |
| | | Restricted visibility | Option | ♟ | ♟ | ♟ | | Option | H |
| **Ocean Waters** | Daylight | Clear weather | | ♟ | Option | | | U | A |
| | | Restricted visibility | | ♟ | ♟ | Option | | U | H |
| | Darkness | Clear weather | | ♟ | ♟ | | | U | A |
| | | Restricted visibility | | ♟ | ♟ | Option | | U | H |
| **At Anchor** | Day | All | | ♟ | Option | | | U | |
| | Night | All | | ♟ | ♟ | | | U | |

| Key: | Engine | Helm |
|---|---|---|
| **Manned** | M | |
| **Unmanned** | U | |
| **Hand Steering** | | H |
| **Auto** | | A |

# B3 FAMILIARISATION WITH BRIDGE EQUIPMENT

| Compass and Heading Devices | Tick |
|---|---|
| Location and operation of the standard magnetic compass and azimuth mirror | |
| Date of last compass swing | |
| Location of deviation card and compass error log | |
| Location and operation of magnetic off-course alarm | |
| Location and operation of the TMC control unit | |
| Location and operation of gyro compass, repeaters and azimuth mirrors | |
| Gyro compass error | |
| Location and operation of off-course alarm | |
| **Radar and Radar Plotting Aids** | |
| Location and operation of radar(s) including operation performance monitors | |
| Operation of ARPA (or other plotting aids) | |
| **Echo Sounder** | |
| Location and operation of echo sounding devices | |
| Location of echo sounder repeaters | |
| Location of echo sounder spares and spare recording paper (if not digital unit) | |
| **Speed and Distance Logs** | |
| Location and operation of speed logs | |
| Location and operation of speed log repeaters | |
| **GMDSS (including Maritime Safety Information)** | |
| Location and operation of GMDSS station, isolation of aerials, location of batteries/back-up power | |
| Location and operation of VHF/MF/HF equipment (including DSC) | |
| Location and operation of ship earth station (SES) | |
| Location and operation of NAVTEX receiver | |
| Location and operation of weather fax receiver and any weather routeing program | |
| Location of spare paper for weather fax receiver | |
| Location of the GMDSS log | |
| Location and operation of EPIRB | |
| **Position Fixing Systems** | |
| Location and operation of GNSS | |
| Location and operation of terrestrial radio-navigation systems | |
| Location of antenna(s) | |
| **General Bridge Equipment** | |
| Location and operation of the chronometer, master clocks system and stopwatch | |
| Location of compass error log | |
| Location of binoculars | |
| Location of sextant(s) | |
| Location of log books | |
| Location and operation of bridge windscreen wipers and clear view screens including water wash | |

| | |
|---|---|
| **Internal Communications** | |
| Location and operation of internal communications | |
| Location and operation of emergency internal communications | |
| **Propulsion and Steering** | |
| Location of manoeuvring characteristics information and data | |
| Location and operation of engine telegraph | |
| Location and use of engine movement recorder | |
| Location and operation of thruster controls | |
| Operation of steering, steering changeover and emergency steering systems | |
| Location and use of rate of turn indicator | |
| **Orders and Logs** | |
| Location and content of the SMS and Master's Standing Orders | |
| Location of Master's daily/night orders | |
| Location and content of instructions for unmanned spaces | |
| **Passage Planning and Monitoring** | |
| Location of passage plan for proposed/current passage | |
| Location of charts for proposed/current passage | |
| Completion of ECDIS familiarisation (see Checklist B4) | |
| Location of navigational publications, light lists, radio signals, digital and/or hard copies | |
| Location and operation of chart management system | |
| Location of navigation warnings and weather information | |
| Location of Notices to Mariners digital and/or hard copies | |
| **AIS** | |
| Location and operation of AIS | |
| **Alarm Systems** | |
| Location and operation of BNWAS | |
| **Voyage Recording** | |
| Location and operation of VDR or S-VDR | |
| Recovery/saving data from VDR or S-VDR | |
| Location and operation of bridge audio recording system | |
| Location and operation of the course recorder | |
| Location of spare recording paper for course recorder, and other spares (if electro mechanical) | |
| Location of LRIT equipment | |
| Location of bridge procedures manual, SMS and ship specific procedures | |
| **Navigation Lights, Shapes and Signalling Equipment** | |
| Location and operation of navigation and signal light controls and alarm panel | |
| Location of bridge operated deck lighting | |
| Location of spare bulbs for navigation lights and equipment | |
| Location and operation of daylight signalling lamp | |
| Location of mains sockets and batteries | |
| Understand the recharging procedure for back-up battery supplies | |
| Location of flags, shapes and manual sound signalling apparatus | |
| Location and operation of sound signalling panel | |

| Emergency Equipment and Security | |
|---|---|
| Location of muster point information | |
| Location of spare lifejackets | |
| Location of man overboard lifebuoys and methods of release | |
| Location and operation of fire detection and alarm panel | |
| Location of fire and general alarm activation points | |
| Location of emergency fan stop | |
| Location of watertight door remote controls | |
| Location of emergency fire pump(s) stop/start | |
| Location of counter-piracy equipment | |
| **Other** | |
| | |
| | |
| | |
| | |

Bridge Team Member: ..... Date: .....

Master's Signature: ..... Date: .....

NB: The above points are recommendations only. It is essential that the checklist is amended to reflect the bridge equipment installed on board.

# B4 ECDIS FAMILIARISATION

| Initial Preparation | Tick |
|---|---|
| Establish if the vessel is approved to use ECDIS for navigation | |
| Establish whether there are Company procedures concerning the use of ECDIS and ensure that these are followed | |
| Establish whether any passwords are needed for the management of the system and, if so, obtain the details | |
| Establish how one to one familiarisation is supported, such as by a CBT package and/or a built-in mode | |
| Identify the primary ECDIS equipment and the facilities for back-up (if the back-up is a second ECDIS of a different type to that of the primary installation, then this familiarisation checklist should be completed for both systems) | |
| Understand ship procedures in event of ECDIS failure | |
| Location of user manuals for ECDIS and its back-up | |
| Location of Base and Update media | |
| Understand the procedures to obtain additional chart permits | |
| Understand the position fixing systems that feed the ECDIS. Determine the method of switching between sources, such as primary and secondary position fixing systems | |
| Determine what other systems supply ECDIS, such as speed logs, GNSS, gyro compass, radar/ARPA (acquired targets, radar picture overlay), AIS and echo sounder. For each, establish the reference framework, e.g. ground, water or ship stabilised | |
| Determine where to find maintenance records related to the ECDIS and service reports, non-conformity reports and inspection, validation reports | |
| Determine the power supply modes and their specifications such as UPS duration | |
| **Basic Operation** | |
| Determine how to switch the ECDIS on and off | |
| Establish the function(s), position and general operation of the physical controls and switches, including cursor control, and the access and selection of menu items | |
| Understand how to access the main menu and select menu options | |
| Determine the methods for setting day/night viewing modes, brightness, contrast and colour correction | |
| Determine how to switch between traditional and simplified symbology | |
| Determine how to put equipment in route monitoring mode and route planning mode | |
| Determine the methods for scrolling and zooming charts, including determining the current scale of displayed charts and setting the display to a particular scale | |
| Determine how to select the Display Base and Standard Display | |
| Determine how to display other information from ENCs, including the display of All Other Information | |
| Determine how to check that information concerning own ship, such as dimensions, is correct | |
| Determine how to select the safety contour and safety depth | |
| Determine how to select two or four colour contour mode | |
| Determine how to select deep and shallow area display options | |
| Determine how to set all other safety parameters | |
| Establish how alarms and other alerts are given by the ECDIS and understand the procedure needed to acknowledge them | |

| Electronic Charts | |
|---|---|
| Determine how to access the chart directory and to identify whether charts are ENCs, RNCs or unofficial (private) | |
| Determine how to select a chart for display on the screen | |
| Determine how to load new chart licence keys | |
| Determine how to load base data | |
| Determine how to check the update status of loaded charts | |
| Determine how to update charts using the normal cumulative update procedures | |
| Determine how to apply non-cumulative or electronically transmitted updates | |
| Determine how to apply manual updates | |
| **Navigation Tools and Functions** | |
| Determine how to display the legend of general information | |
| Determine how to select information about an object using a pick report/chart query | |
| Determine how Category Zone of Confidence (CATZOC) information can be displayed | |
| Determine how to access the presentation library | |
| Determine what Marine Information Overlays (MIOs) are available and how to access them | |
| Determine the single operator action needed to remove MIOs from the display | |
| Determine the single operator action needed to set the Standard Display setting | |
| Determine how to view, add, edit and delete Mariners' Notes | |
| Determine how to access all navigational elements and parameters, such as past track, vectors, position lines (LOP) and anti-grounding cone (AGC) | |
| Establish the facilities provided for the measurement of range and bearing (e.g. EBLs and VRMs) and determine their use | |
| Determine the method(s) used for inserting parallel index lines | |
| Determine what other navigational tools are available and how to access them | |
| Determine how to change to using the ECDIS back-up system | |
| Determine the procedure for identifying and reacting to sensor/GNSS failure | |
| Determine how to switch chart text (text for charted objects) on and off | |
| **Route Planning** | |
| Determine how to load existing routes and enable for editing | |
| Determine how to initiate a new route plan | |
| Determine how to initiate and plan alternate routes | |
| Determine how to save route plan | |
| Determine how to add, delete and adjust graphically the position of waypoints | |
| Determine how to add, edit and delete critical points | |
| Determine how to display time varying objects relevant for the timing of the planned voyage | |
| Establish all the features available for planning routes, such as use of straight and curved segments, wheel over positions, turn radius, and inserting pilotage aids | |
| Determine the ship's procedures for displaying MSI, T&P Notices and other relevant notes into the passage plan | |
| Determine how to use the facilities for checking the planned route | |
| Determine how to load the planned route and alternatives into the back-up system | |
| If available, determine how to use RCDS mode where ENCs are not available and as appropriate | |

| Route Monitoring | |
|---|---|
| Determine how to load a pre-planned route | |
| Determine how to select the primary or an alternative route, and how to distinguish between them on the display | |
| Determine the single operator action that selects the charted display of own ship's position | |
| Determine the available display orientation modes, and how to switch between them (e.g. north up, head up or course up) | |
| Determine the available display motion modes and how to select them and change the parameters, such as the position of own ship on the display when Relative Motion is selected | |
| If Radar or AIS targets can be displayed on the ECDIS, determine what target vector modes are available and how to switch between and differentiate them | |
| Determine how to create time labels along the ship's track | |
| Establish familiarity with the Route Monitoring display, including the display of position, heading, course, speed and time | |
| Determine how to set the length of own ship's vector and intermediate time marks | |
| Determine how to display radar and AIS MIOs, if available | |
| Determine how to use the ECDIS as the input to a track-keeping autopilot (this will require reference to the autopilot handbook) | |
| Determine how to input lines of position (LOP) to form the reference for an estimated position (EP) | |
| Determine how to configure the ECDIS to use the above reference for subsequent estimated position (EP) | |
| Determine how to switch to dead reckoning (DR) mode and to identify when the ECDIS is in DR mode | |
| Determine how to use the review facilities of the voyage recorder (if appropriate and not essential knowledge prior to sailing) | |

*Reference: Based on Industry Recommendations for ECDIS Familiarisation*

Bridge Team Member: ..... Date: .....

Master's Signature: ..... Date: .....

# B5 ECDIS SETUP

| Action | Tick |
|---|---|
| Check primary position fixing system is setup correctly and prove the ECDIS is correct by inputting a manual fix into the system | |
| Check system time is configured correctly | |
| Ensure ECDIS setup is replicated on all ECDIS units | |
| Ensure navigation tools are configured correctly | |
| Ensure safety depth and safety contour settings are configured correctly | |
| Ensure system units are configured correctly | |
| Ensure that all relevant overlays are loaded | |
| Ensure that area alerts are configured correctly (if system in use allows alarm configuration) | |
| Ensure that docking mode is configured correctly | |
| Ensure that navigation alarms are configured correctly, including safety frame/anti-grounding cone | |
| Ensure that route alarms are configured correctly | |
| Ensure that targets are configured correctly | |
| Ensure that the preferred radar is selected | |
| Ensure that vessel data is setup correctly | |
| Ensure the audible alarm is working correctly | |
| Ensure the chart motion, chart orientation, screen layout, colour palette and additional ENC settings are configured correctly | |
| Ensure the correct display setting is available for execution of navigation in accordance with ECDIS check off cards for pilotage and confined waters, and coastal navigation and open ocean | |
| Ensure the correct route is loaded for route monitoring | |
| Ensure the correct waypoint and route monitoring information is being displayed | |

Time and Date:.....

OOW Signature:.....

NB: The above points are recommendations only. It is essential that the checklist is amended to reflect the appropriate manufacturer's operating manuals and Company procedures.

# B6 PREPARATIONS FOR SEA

| Passage Plan | Tick |
|---|---|
| Berth to berth passage plan for the intended passage prepared and available on the bridge with the route plotted on up to date and appropriate scale charts (official paper or electronic) | |
| Passage plan checked and approved by the Master | |
| Passage plan briefed to the Bridge Team | |
| Route displayed on ECDIS and/or other electronic navigation aids, as appropriate | |
| Up to date charts and nautical publications available | |
| Latest Notices to Mariners (week number): | |
| **Equipment Checks (Tested and Ready for Use)** | |
| AIS (voyage data updated and correct) | |
| Anchors, cables and winches | |
| Ancillary bridge equipment (e.g. binoculars) | |
| BNWAS | |
| Clocks synchronised with engine room | |
| Controllable pitch propeller controls and indicators | |
| Course and engine movement recorder/bridge movement book | |
| Deck power | |
| ECDIS and/or other electronic navigation aids | |
| Echo sounder | |
| Electronic position fixing systems | |
| Emergency engine stops | |
| Engine(s)/propulsion (ahead and astern) | |
| GMDSS communications and GMDSS log | |
| Gyro/magnetic compass and repeaters, including repeater in steering gear area | |
| Internal communications (particularly bridge to engine room/bridge to mooring stations) | |
| LRIT | |
| Navigation lights, shapes and sound signals | |
| Radar(s) and ARPA | |
| RPM and ROT indicators | |
| Signalling equipment including flags, search lights and signal lamps | |
| Speed and distance log | |
| Stabilisers | |
| Steering gear (Checklist B1) | |
| Thrusters | |
| VDR/S-VDR | |
| **Port and Pilotage** | |
| Master/Pilot information exchange checklist completed (Checklist A1) | |
| Pilot Card prepared (Checklist A2) | |
| Pilot boarding time confirmed | |
| Pilot boarding arrangements ready for disembarkation of the Pilot (Checklist A4) | |

| | |
|---|---|
| Port and VTS channels monitored | |
| Port, VTS and Pilot advised of any special requirements | |
| Preparations for pilotage complete (Checklist B8) | |
| **Securing for Sea** | |
| Cargo and cargo handling equipment secure | |
| Cargo/passenger details available | |
| Hull openings secure and watertight | |
| Stability and draught information available | |
| Watertight doors closed | |
| **Before Sailing** | |
| All crew on board | |
| Anchors cleared away | |
| Bridge Team fit for duty | |
| Engine room ready | |
| Mooring stations manned and ready | |
| MSI checked and communicated to Bridge Team | |
| Pressure on fire main | |
| Stowaway/security search completed | |
| **Other** | |
| | |
| | |
| | |
| | |

Time and Date:.....

OOW Signature:.....

NB: The above points are recommendations only. It is essential that the checklist is amended to reflect the appropriate operating manuals and Company procedures.

# B7 PREPARATIONS FOR ARRIVAL

| Passage Plan | Tick |
|---|---|
| Pre-arrival documentation complete and sent | |
| Passage plan updated with additional information received since departure | |
| Updated passage plan checked and approved by the Master | |
| Updated passage plan briefed to the Bridge Team | |
| Updated passage plan available on the bridge with the route plotted on up to date and appropriate scale charts (official paper or electronic) | |
| Updated route displayed on ECDIS and/or other electronic navigation aids, as appropriate | |
| Is cargo/ballast rearrangement required | Y/N |
| **Equipment Checks (Tested and Ready for Use)** | |
| Clocks synchronised with engine room | |
| Controllable pitch propeller controls and indicators | |
| Deck power | |
| ECDIS and/or other electronic navigation aids | |
| Echo sounder | |
| Electronic position fixing systems | |
| Emergency engine stops | |
| Engine(s)/propulsion (ahead and astern) | |
| Gyro/magnetic compass and repeaters, including repeater in steering gear area | |
| Internal communications (particularly bridge to engine room/bridge to mooring stations) | |
| Navigation lights, shapes and sound signals | |
| RPM and ROT indicators | |
| Signalling equipment including flags, search lights and signal lamps | |
| Steering gear (Checklist B1) | |
| Thrusters | |
| **Before Arrival** | |
| Anchors cleared and ready for use | |
| Any stabilisers housed | |
| Bridge Team ready | |
| Cargo/passenger details available | |
| Engine room ready | |
| If available, use more than one steering gear power unit | |
| Manual steering engaged | |
| Mooring stations manned and ready | |
| Pressure on fire main | |
| Stability and draught information verified and available | |
| Watertight doors closed | |
| **Port and Pilotage Requirements** | |
| Master/Pilot information exchange checklist completed (Checklist A1) | |
| Pilot Card prepared (Checklist A2) | |

| | |
|---|---|
| Pilot boarding time confirmed | |
| Pilot boarding arrangements ready for disembarkation of the Pilot (Checklist A4) | |
| Port and VTS channels monitored | |
| Port, VTS and Pilot advised of any special requirements | |
| Preparations for pilotage complete (Checklist B8) | |
| **Other** | |
| | |
| | |
| | |
| | |

Time and Date:.....

OOW Signature:.....

NB: The above points are recommendations only. It is essential that the checklist is amended to reflect the appropriate operating manuals and Company procedures.

# B8 PILOTAGE

| Action | Tick |
|---|---|
| Appropriate scale charts available with route plotted | |
| Appropriate flags and navigation lights or shapes displayed | |
| Bridge appropriately manned to: | |
| • Maintain a proper look-out | |
| • Monitor the progress of the ship and navigational safety | |
| • Monitor communications between Pilot, shore, tugs and mooring craft | |
| • Carry out orders and instructions given by the Master and Pilot | |
| Bridge watch and crew standby arrangements | |
| ECDIS terminals are setup correctly for navigation in pilotage waters with route displayed | |
| Engine room and mooring stations regularly updated on pilotage progress | |
| MPX completed and pilotage plan agreed by the Master (Checklist A1) | |
| Pilot briefed on the Pilot Card (Checklist A2) and Wheelhouse Poster (Checklist A3) concerning manoeuvring characteristics | |
| Mooring stations informed of berthing arrangements | |
| Pilot informed of any propulsion or steering gear defects or limitations | |
| Pilot informed of ship's heading, speed, engine setting and draught on arrival on the bridge | |
| Pilot informed of the location of life-saving appliances provided for their use | |
| Preparation for departure (Checklist B6) or arrival (Checklist B7) checks complete | |
| Working language agreed | |
| **Other** | |
| | |
| | |
| | |
| | |

# B9 PASSAGE PLANNING

| Factors to Consider when Developing a Passage Plan and Associated Route | Tick |
|---|---|
| **Appraisal** | |
| Adequacy and reliability of aids to navigation | |
| Adequacy and reliability of charts and hydrographic data | |
| Appropriate scale charts for ocean, coastal, harbour and berthing phases | |
| Guides to port entry | |
| List of lights | |
| Local area warnings | |
| NAVAREA navigational warnings | |
| New charts and licences ordered as appropriate | |
| Notices to Mariners | |
| Planning charts | |
| List of radio signals | |
| Routeing and load line charts | |
| Sailing directions and pilot books | |
| Tide tables and tidal stream atlases | |
| **Passage Requirements** | |
| Anchoring locations | |
| Any special ship operational requirements for the passage | |
| Bunker calculations | |
| Cargo and any special stowage/carriage restrictions | |
| Communications/GMDSS watchkeeping considerations | |
| Draught restrictions including air draught and under keel clearance (UKC) requirements | |
| Helicopter operations | |
| Load line requirements | |
| Log book requirements | |
| Passage reporting requirements | |
| Passage speed and ETA calculations | |
| Position fixing intervals | |
| Reliability of propulsion and steering systems or any known defects affecting navigation or control of vessel | |
| Routeing and reporting measures | |
| Safety contours | |
| Safety depths | |
| Security concerns | |
| Ship-to-ship transfers | |
| Squat | |
| Strength and stability | |
| Watch schedules | |

| Environmental Considerations | |
|---|---|
| Ballast water | |
| Emission Control Area (ECA) limits and fuel changeover procedures | |
| MARPOL Special Areas, PSSAs, or national and regional requirements | |
| Notifications/advice to crew on board | |
| **Weather/Conditions** | |
| Abnormal waves | |
| Currents and tides | |
| Heavy weather | |
| Ice | |
| Swell | |
| Tropical storms | |
| Visibility | |
| Weather routeing | |
| Winds | |
| **Contingencies** | |
| Emergency anchorages | |
| Emergency response plans | |
| Notifications and reporting | |
| Plan amendments | |
| **Other** | |
| | |
| | |
| | |
| | |

**Officer Responsible** – passage plan completed and checked.

Signature: ..... Date:.....

**Master** – passage plan checked and approved.

Signature: ..... Date:.....

**Officer Responsible** – approved passage plan briefed to the Bridge Team.

Signature: ..... Date:.....

# B10 NAVIGATION IN COASTAL WATERS

| Considerations | Tick |
|---|---|
| Appropriate scale charts available with route plotted | |
| Bridge manning appropriate to maintain a proper look-out | |
| ECDIS terminals are setup correctly for navigation in coastal waters with route displayed | |
| Echo sounder checked | |
| Effects of weather and currents for the area understood | |
| Engines ready for immediate use | |
| Gyro/magnetic compass errors checked | |
| Helmsman is available at immediate notice | |
| Manual steering checked and ready for use (Checklist B1). Use more than one steering gear power unit, as appropriate | |
| Measures taken to comply with environmental requirements and applicable pollution regulations | |
| MSI is monitored and plotted as appropriate | |
| Position of the ship is fixed regularly and cross referenced at appropriate intervals | |
| Proximity to shallow water and the effect of squat monitored | |
| Radar performance and radar heading line marker alignment checked | |
| Ship security procedures understood and followed | |
| Traffic conditions in the area understood | |
| Vessel reporting requirements are understood and followed | |
| Vessel routeing requirements are understood and followed | |
| Weather monitored, particularly in areas prone to poor visibility | |
| **Other** | |
| | |
| | |
| | |
| | |

# B11 NAVIGATION IN OCEAN WATERS

| Considerations | Tick |
|---|---|
| Appropriate scale charts available with route plotted | |
| All measures have been taken to comply with environmental requirements and applicable pollution prevention regulations | |
| ECDIS terminals are setup correctly for navigation in ocean waters with route displayed | |
| Bridge manning appropriate to maintain a proper look-out | |
| Confirm the ship's position at appropriate intervals | |
| Monitor changes in weather and make regular barometer observations | |
| Monitor NAVAREA navigational warning broadcasts and other long range weather reports | |
| Participate in area reporting systems (e.g. AMVER) as appropriate | |
| **Other** | |
| | |
| | |
| | |
| | |

# B12 ANCHORING AND ANCHOR WATCH

| Anchoring Appraisal and Planning | Tick |
|---|---|
| Anchoring plan checked and approved by the Master | |
| Anchoring position identified taking into account: | |
| • Availability of appropriate space at the anchorage | |
| • Proximity of navigational hazards including traffic | |
| • Scope of anchor cable required/available | |
| • Suitable seabed type and holding conditions | |
| • Tidal height checked to confirm that sufficient water is available for the duration of the anchorage | |
| • Tidal stream checked with particular reference to effect on slow speed manoeuvring | |
| • Weather conditions and available shelter | |
| Anchors, cables and winches checked and ready for use | |
| Engine room and anchor party informed of the time of anchoring | |
| Intended anchor position of the ship reported to the port authority | |
| Lights, shapes and sound signalling apparatus checked and ready for use | |
| Reduction to manoeuvring speed in ample time | |
| Security measures required by the Ship Security Plan (SSP) | |
| **While at Anchor the OOW Should:** | |
| Check at sufficiently frequent intervals whether the ship is remaining securely at anchor by taking bearings of fixed navigational marks or readily identifiable shore objects | |
| Determine and plot the ship's position on the appropriate chart as soon as practicable | |
| Monitor swinging pattern | |
| Ensure that inspection rounds of the ship are made periodically | |
| Ensure that proper look-out is maintained | |
| Ensure that the ship exhibits the appropriate lights and shapes and that appropriate sound signals are made in accordance with all applicable regulations | |
| Ensure that the state of readiness of the main engines and other machinery is in accordance with the Master's instructions | |
| Ensure vessel access control precautions are maintained | |
| If visibility deteriorates, call the Master | |
| Modify AIS status | |
| Call the Master and undertake all necessary measures if the ship drags anchor | |
| Observe meteorological and tidal conditions and the sea state | |
| Take measures to protect the environment from pollution by the ship and comply with applicable pollution prevention regulations | |
| **Other** | |
| | |
| | |
| | |
| | |

# B13 RESTRICTED VISIBILITY

| Action | Tick |
|---|---|
| Inform the Master of reduced visibility as required in Master's Standing Orders and the SMS | |
| Advise the engine room | |
| Increase bridge manning levels, as necessary (Checklist B2) | |
| Look-outs posted | |
| Select hand steering | |
| Engines ready for immediate manoeuvre | |
| Close all watertight doors and openings | |
| **Equipment Preparations** | |
| AIS | |
| Echo sounder | |
| Fog signalling apparatus | |
| Navigation lights | |
| Radar, ARPA or other plotting aids | |
| VHF | |
| **Compliance with Regulations** | |
| Rule 19 – conduct of vessels in restricted visibility | |
| Rule 35 – sound signals in restricted visibility | |
| Rule 5 – look-out | |
| Rule 6 – safe speed | |
| **Contingency Planning** | |
| Consider the possibility of anchoring the vessel if in doubt and vessel in suitable depth | |
| **Other** | |
| | |
| | |
| | |
| | |

# B14 HEAVY WEATHER/TROPICAL STORM AREAS

| Action | Tick |
|---|---|
| Inform the Master of the weather conditions | |
| Inform the engine room of the weather conditions | |
| Inform the crew of the need to avoid upper deck areas made dangerous by weather | |
| Rig safety lines/hand ropes where necessary | |
| Adjust vessel course and speed as necessary to ease vessel/avoid worst of motion | |
| Manoeuvre the ship to minimise the risk of broaching, pooping and/or synchronous rolling | |
| Monitor weather reports | |
| Make weather reports to appropriate authorities. In the case of tropical storms, danger messages in accordance with SOLAS | |
| Secure: | |
| • All weather deck openings (doors/hatches) | |
| • Anchors and winches | |
| • Cargo (as appropriate) | |
| • Loose or movable objects in cabins and accommodation | |
| • Loose or movable objects on deck | |
| • Loose or movable objects in the engine room | |
| • Loose or movable objects in the galley | |
| • Loose or movable objects in the storerooms | |
| • Close all ports and deadlights | |
| **Other** | |
| | |
| | |
| | |
| | |

# B15 NAVIGATION IN ICE*

| Action | Tick |
|---|---|
| Inform the Master of the proximity of ice | |
| Inform the engine room of the proximity of ice | |
| Inform the crew of the proximity to ice | |
| Close all watertight doors | |
| Moderate speed as appropriate in the conditions | |
| Increase the frequency of sounding tanks and bilges | |
| Monitor ice advisory service broadcasts | |
| Transmit danger messages in accordance with SOLAS | |
| **Other** | |
| | |
| | |
| | |
| | |

* Preparations for navigation in ice for ships operating in Polar Waters should be in accordance with the ship's Polar Waters Operating Manual (PWOM).

# B16 CHANGE OF WATCH AT SEA

| | Remarks |
|---|---|
| Sufficient time has been allowed for night vision to be established | |
| Master's daily orders | |
| GMDSS log up to date | |
| Deck log up to date | |
| Position, course and speed | |
| Passage plan progress | |
| Passage plan look-ahead including hazards for the watch | |
| Draught, air draught and UKC | |
| Effect of heel, trim, water density and squat | |
| Current traffic conditions | |
| Maritime Safety Information: | |
| • Weather | |
| • Navigational warnings | |
| Status of navigation and bridge equipment: | |
| • AIS | |
| • Autopilot | |
| • BNWAS | |
| • Course and engine movement recorder | |
| • ECDIS | |
| • Echo sounder | |
| • GNSS | |
| • Gyro and magnetic compass | |
| • Navigation lights, shapes and signals | |
| • Radar and ARPA | |
| • VDR/S-VDR | |
| Status of communications equipment: | |
| • EPIRB | |
| • NAVTEX | |
| • SES | |
| • VHF/MF/HF | |
| Status of propulsion and steering equipment: | |
| • Engine room watch | |
| • Hand steering tested | |
| • Main engines and generators | |
| • Steering system | |
| Status of watertight doors | |
| Status of fire zones | |
| Any special work in progress | |

## B17 CALLING THE MASTER

If the Master needs to be called, particularly where there is concern about the safety of the ship, this should be done early enough to allow the Master sufficient time to understand and respond effectively to the situation.

Failing to call the Master in a timely manner can lead to an increased level of risk in relation to:

- Collision;
- Grounding;
- Safety of life;
- Damage to the environment;
- Vessel delays;
- Cargo leaks or spills;
- Property damage;
- Commercial losses; or
- Reputation losses due to delays or damage.

| Occasions to Call the Master |
|---|
| As required by the SMS, Master's Standing Orders and daily orders, including: |
| • If restricted visibility is encountered or expected |
| • If traffic conditions, density or the movements of other ships are causing concern |
| • When a distress alert has been received or a distress signal has been sighted |
| • If difficulties are experienced in maintaining course |
| • When there is a significant difference between the latest observed position and the expected position of the ship |
| • On failure to sight land, a navigation mark or obtain soundings by the expected time |
| • If, unexpectedly, land or a navigation mark is sighted or an unexpected change in soundings occurs |
| • If amendments to the passage plan require immediate approval |
| • If there is a breakdown of the engines, propulsion machinery remote control, steering gear or any essential navigational equipment, alarm or indicator |
| • If the communications or GMDSS radio equipment malfunctions |
| • In heavy weather, if any doubt about the possibility of weather damage |
| • If the ship meets any hazard to navigation, such as ice or a derelict |
| • If any vessel security concerns arise |
| • In any emergency situation |
| • In any cases when the situation is beyond the experience of the OOW or if there is any doubt regarding the safety of the ship, or ability to comply with regulatory requirements |
| **Other** |
| |
| |
| |
| |

# B18 PRE-OPERATIONAL DYNAMIC POSITIONING

This checklist should be considered supplementary to detailed DP procedures and checklists required for those operating DP vessels.

| Item | | Status | | | | | Remarks |
|---|---|---|---|---|---|---|---|
| **Computers** | | A | Running | | Online | | |
| | | B | Running | | Online | | |
| | | A/B Difference Messages | | | | | |
| **Thrusters** | | 1 | Running | | Enabled | | |
| | | 2 | Running | | Enabled | | |
| | | 3 | Running | | Enabled | | |
| | | 4 | Running | | Enabled | | |
| | | 5 | Running | | Enabled | | |
| | | 6 | Running | | Enabled | | |
| **Power and Generators** | | 1 | Running | | Standby | | |
| | | 2 | Running | | Standby | | |
| | | 3 | Running | | Standby | | |
| | | 4 | Running | | Standby | | |
| **Bus Tie Switch** | | Open/Closed | | | | | |
| **Equipment Class** | | | Consequence Analysis Enabled | | | | |
| **Control Gain** | | Low/Medium/High | | | | | Customised/Relaxed |
| **Alt Rot Point** | | Number Selected: | | | Position: | | |
| **Wind Sensors** | | 1/2 | Available | | Selected | | Gyro differences checked |
| **Gyros** | | 1 | Running | | Selected | | Repeater checked<br>Gyro alarms checked |
| | | 2 | Running | | Selected | | |
| | | 3 | Running | | Selected | | |
| **MRU** | | 1 | | | MRU differences checked | | |
| | | 2 | | | | | |
| **Printer** | | Running | | | Paper OK | | Outstanding messages checked |
| **PRS** | **DGPS** | 1 | Running | | Diff Available | | IMCA DQI Factor |
| | | | HDOP | | AOD(Sec) | | |
| | **DGPS** | 2 | Running | | Diff Available | | IMCA DQI Factor |
| | | | HDOP | | AOD(Sec) | | |
| | **Taut Wires** | Port | | | Deployed | | Water depth: m |
| | | Stbd | | | Deployed | | Water depth: m |
| | **Fan Beam** | Deployed | | | Rng/Brg: | | Reflector location |
| | **HPR** | 1 | Running | | Pole Up/Down | | Transponder deployed |
| | | 2 | Running | | Pole Up/Down | | Transponder deployed |

| | | | | |
|---|---|---|---|---|
| **Communications** | VHF: | Working Channels:<br>Listening Channels: | | Tested |
| | UHF: | Channels: | Tested | |
| | Internal | | Tested | |
| | Talkback | | Tested | |
| **Weather Forecast** | Time Received: | | | |
| **Signals Displayed** | | | | |
| **30 Minute Setting Time Complete** | | | | |
| **MCR Checklist Complete** | | | | |
| **Tasks Agreed** | | | | |
| **Permit to Work** | Reference Number: | | Expiry Time: | |

OOW/DPO Signature: ..... Date:.....

# B19 FALSE DISTRESS ALERTS

| False Alert Sent on VHF DSC | Tick |
|---|---|
| Reset the VHF DSC immediately | |
| Cancel the alert on VHF DSC Channel 70 | |
| Transmit a broadcast message to ALL STATIONS on VHF Channel 16 giving the ship's name, call sign and MMSI and cancel the false distress alert | |
| Record details of the false alert and actions to cancel the alert | |
| **False Alert Sent on MF DSC** | |
| Reset the MF DSC immediately | |
| Cancel the alert on MF DSC 2187.5 kHz | |
| Transmit a broadcast message to ALL STATIONS on 2182 kHz giving the ship's name, call sign and MMSI and cancel the false distress alert | |
| Record details of the false alert and actions to cancel the alert | |
| **False Alert Sent on HF DSC** | |
| Reset the HF DSC immediately | |
| Cancel the alert on the HF DSC distress frequencies on which it was sent: | |
| • 4207.5 kHz | |
| • 6312 kHz | |
| • 8414.5 kHz | |
| • 12577 kHz | |
| • 16804.5 kHz | |
| Transmit a broadcast message to ALL STATIONS giving the ship's name, call sign and MMSI, and cancel the false alert on each of the radio-telephony distress frequencies in the bands on which the HF DSC was sent: | |
| • 4125 kHz | |
| • 6215 kHz | |
| • 8291 kHz | |
| • 12290 kHz | |
| • 16420 kHz | |
| Record details of the false alert and actions to cancel the alert | |
| **False Alert Sent via SES** | |
| Send a distress priority message cancelling the distress alert to the appropriate RCC via CES through which the false distress alert was sent | |
| Record details of the false alert and actions to cancel the alert | |
| **False Alert Sent on EPIRB** | |
| Reset the EPIRB immediately | |
| The ship should contact the nearest coast station or an appropriate coast earth station or RCC and cancel the distress alert | |
| Record details of the false alert and actions to cancel the alert | |

# SECTION C – EMERGENCIES

The checklists in Section C provide a guide for the creation of appropriate Company and/or on board checklists which suit the particular needs of the ship.

It is recommended that emergency drills and on board training should include scenarios with incidents as addressed in these emergency checklists. During such drills and training, the use of emergency checklists should be encouraged to ensure an effective response to emergencies.

In any emergency there are several actions that require almost immediate attention. The following emergency checklists indicate essential actions. However, factors including the design of a particular bridge or the layout of its equipment may support carrying out some of the identified actions in a different order.

Raising the alarm, taking immediate action to safeguard the ship and crew and calling the Master are essential actions that should take priority over other actions.

# C1 MAIN ENGINE FAILURE

| Action | Tick |
|---|---|
| Call Master | |
| Take immediate action to keep ship away from danger | |
| Check position of vessels in the vicinity | |
| Check for navigational hazards | |
| Not Under Command (NUC) lights, shapes and sound signals, as appropriate | |
| Prepare for anchoring if water depth and conditions are appropriate | |
| Modify AIS status | |
| Inform VTS or port authority, as appropriate | |
| Broadcast SAFETY or URGENCY message, if appropriate | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

# C2 STEERING FAILURE

| Action | Tick |
|---|---|
| Call Master | |
| Disengage autopilot | |
| Engage alternate or emergency steering | |
| Manoeuvre as appropriate/stop engine(s) | |
| Inform engine room of steering failure | |
| Take way off ship if safe to do so | |
| Not Under Command (NUC) lights, shapes and sound signals, as appropriate | |
| Check position of vessels in the vicinity | |
| Prepare engine for manoeuvre | |
| Check for navigational hazards | |
| Prepare for anchoring if water depth and conditions are appropriate | |
| Modify AIS status | |
| Inform VTS or port authority, as appropriate | |
| Broadcast SAFETY or URGENCY message, if appropriate | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

# C3 TOTAL ELECTRICAL POWER FAILURE (BLACKOUT)

| Action | Tick |
|---|---|
| Call Master | |
| Take immediate action to keep the ship away from danger | |
| Not Under Command (NUC) lights, shapes and sound signals, as appropriate | |
| Contact engine room/duty engineer | |
| Select emergency power supplies for bridge and navigational equipment | |
| Check position of vessels in the vicinity | |
| Check for navigational hazards | |
| Prepare for anchoring if water depth and conditions are appropriate | |
| Inform VTS or port authority, as appropriate | |
| Modify AIS status | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

# C4 COLLISION

| Action | Tick |
|---|---|
| Call Master | |
| Sound general emergency alarm | |
| Manoeuvre as appropriate/stop engine(s) | |
| Close watertight doors and automatic fire doors | |
| Muster crew at damage control stations | |
| Muster any passengers | |
| Conduct damage control procedures* | |
| Broadcast URGENCY or DISTRESS message, if appropriate | |
| Sound all tanks, bilges, void spaces and cofferdams | |
| Check for spills/pollution, internal and over the side | |
| Inform VTS or port authority, as appropriate | |
| Switch on deck lighting | |
| Offer assistance to other vessel | |
| Preserve VDR records | |
| Preserve ECDIS records | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with ship specific damage control procedures.

# C5 STRANDING OR GROUNDING

| Action | Tick |
|---|---|
| Call Master | |
| Sound general emergency alarm | |
| Close watertight doors and automatic fire doors | |
| Manoeuvre as appropriate/stop engine(s) | |
| Switch to high cooling water intakes | |
| Consider use of anchor | |
| Exhibit aground lights or shapes and make sound signals, as appropriate | |
| Inform VTS or port authority, as appropriate | |
| Modify AIS status | |
| Muster crew to damage control stations | |
| Conduct damage control procedures* | |
| Assess the nature of the sea bed | |
| Assess tides and currents | |
| Assess weather conditions and forecasts | |
| Sound around ship | |
| Determine location of deep water in relation to the ship | |
| Consider reducing draught | |
| Consider taking on additional ballast to prevent unwanted movement and damage | |
| Plan and prepare to refloat as appropriate | |
| Broadcast URGENCY or DISTRESS message, if appropriate | |
| Preserve VDR records | |
| Preserve ECDIS records | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with ship specific damage control procedures.

# C6 MAN OVERBOARD (MOB)

| Action | Tick |
|---|---|
| Release lifebuoy with light and smoke signal on side that person has fallen overboard | |
| Assign the look-out to indicate the position of the person in the water | |
| Activate GNSS MOB marker | |
| Mark MOB position on ECDIS | |
| Engage hand steering | |
| Take immediate manoeuvring action to preserve safety of person in water | |
| Sound general emergency alarm, including three prolonged blasts on ship's whistle | |
| Call Master | |
| Post extra look-outs | |
| Commence recovery manoeuvre | |
| Prepare for recovery of persons from the water* | |
| Broadcast DISTRESS message, if appropriate | |
| Engines on standby | |
| Assume role of On-Scene Co-ordinator | |
| Hoist signal flag OSCAR | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with the ship specific plan for recovery of persons from the water.

# C7 FIRE

| Action | Tick |
|---|---|
| Call Master | |
| Sound general emergency alarm | |
| Shut down ventilation system | |
| Muster crew to fire control stations | |
| Conduct fire control procedures* | |
| Assess proximity of navigational hazards, including traffic, and manoeuvre the ship as appropriate | |
| In case of fire in: | |
| • Engine room – Checklist C1 as appropriate | |
| • Steering gear compartment – Checklist C2 as appropriate | |
| • Generator compartments – Checklist C3 as appropriate | |
| Broadcast URGENCY or DISTRESS message, if appropriate | |
| Inform VTS or port authority, as appropriate | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with ship specific fire control procedures.

# C8 FLOODING/HULL FAILURE

| Action | Tick |
|---|---|
| Call Master | |
| Sound the general emergency alarm | |
| Close all watertight doors | |
| Muster crew to damage control stations | |
| Conduct damage control procedures* | |
| In case of flood in: | |
| • Engine room – Checklist C1 as appropriate | |
| • Steering gear compartment – Checklist C2 as appropriate | |
| • Generator compartments – Checklist C3 as appropriate | |
| Broadcast URGENCY or DISTRESS message, if appropriate | |
| Inform VTS or port authority, as appropriate | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with ship specific damage control procedures.

# C9 SEARCH AND RESCUE AND RECEIVING DISTRESS ALERTS

| Action | Tick |
|---|---|
| Record contents of distress alert and/or message | |
| Call Master | |
| Establish communications with the RCC and/or On-Scene Co-ordinator and other SAR units as appropriate | |
| Maintain radio watch | |
| Monitor X-Band radar and AIS for SART signals as appropriate | |
| Consult IAMSAR Manual Volume III and industry guidance on rescue procedures | |
| Post additional look-outs | |
| Monitor the distress situation | |
| Prepare for recovery of persons from the water* | |
| Maintain log/record of events and decisions | |
| **Other** | |
| | |
| | |
| | |
| | |

* Actions required will be in accordance with the ship specific plan for recovery of persons from the water.

# C10 ABANDONING SHIP

| Action | Tick |
|---|---|
| Broadcast DISTRESS message on authority of the Master | |
| Instruct crew to don lifejackets and immersion suits as appropriate | |
| Muster crew at lifeboat stations | |
| Prepare LSA for launch | |
| Collect and prepare EPIRB, SART and SOLAS radios | |
| Embark and launch life-saving appliances | |
| Ensure lifeboats and liferafts remain in close proximity to ship and in contact with each other | |
| Activate EPRIB and SART | |
| **Other** | |
| | |
| | |
| | |
| | |

# RECOMMENDED INDUSTRY PUBLICATIONS

ICS Guidelines on the Application of the IMO International Safety Management (ISM) Code

ICS Guidance for Ship Operators on the IMO International Ship and Port Facilities Security (ISPS) Code

ICS Model Ship Security Plan

ICS Guide to Helicopter/Ship Operations

ICS Tanker Safety Guide (Chemicals)

ICS Tanker Safety Guide (Liquefied Gas)

ICS Guide to Drug Trafficking and Abuse

ICS/OCIMF International Safety Guide for Oil Tankers and Terminals (ISGOTT)

ICS/CDI/OCIMF/SIGTTO Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases

ISF Guidelines on the IMO STCW Convention and Code

ISF Guidelines on the Application of the ILO Maritime Labour Convention

ISF On Board Training Record Book for Deck Cadets

ISF On Board Training Record Book for Deck Ratings

ISF Watchkeeper Work and Rest Hour Software

These and other useful industry publications are available from maritime booksellers or:

Marisec Publications
38 St Mary Axe
London, EC3A 8BH

Tel +44 20 7090 1460
Fax +44 20 7090 1484
Email publications@marisec.org

www.ics-shipping.org