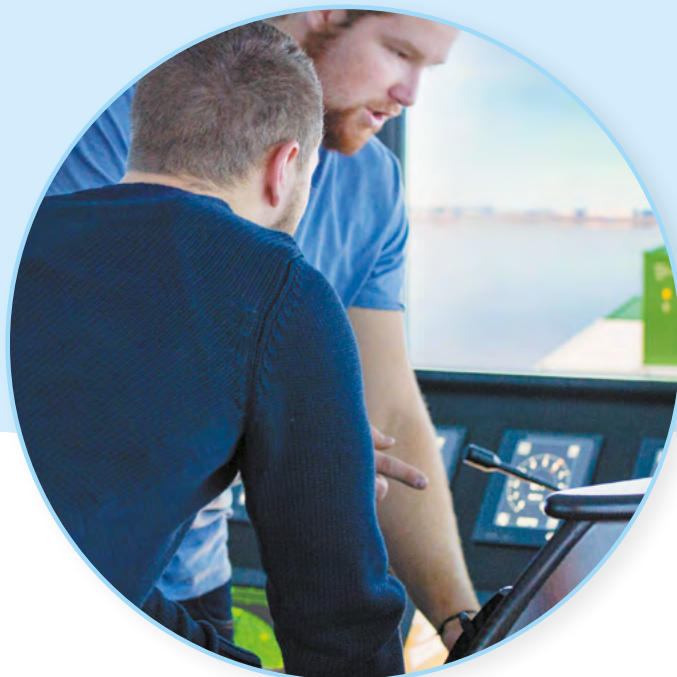




COURSE MANUAL

COMMUNICATION

OPERATIONAL LEVEL



PROJECT: COMPETING
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FOREWORD

To assist education and training entities to meet the requirements of the Standards for competences for inland navigation personnel, required by the Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation, and the Delegated Directive (EU) 2020/12 supplementing the Directive (EU) 2017/2397 as regards the standards for competences and corresponding knowledge and skills, for the practical examinations, for the approval of simulators and for medical fitness, the transnational Course Manual on COMMUNICATION for Operational level personnel was developed.

This Course Manual will be a useful transnational training tool intended to assist education and training providers and their teaching staff in organizing and introducing new education & training programmes, or in enhancing, updating and supplementing existing didactical materials with the ultimate end results of raising quality and effectiveness of the education & training programmes.

Since education & training systems as well as the cultural background of inland navigation topics differ considerably from one country to another, the Course Manual on COMMUNICATION for Operational level has been designed so as to support the preparation, organization and planning of effective teaching and training and to be used as a part of the quality assurance of the education and training institutes.

Technical content and levels of knowledge and abilities are in line with the applicable Delegated Directive (EU) 2020/12 supplementing the Directive (EU) 2017/2397 as regards the standards for competences and corresponding knowledge and skills, for the practical examinations, for the approval of simulators and for medical fitness, being an essential tool for Boatman, to be able to communicate generally and professionally and to be able to be sociable.

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1. GENERAL INFORMATION

1.1 Course curriculum- general requirements

1. Aim	Provide training to assist in the implementation of the Directive (EU) 2017/2397 and ES-QIN- Standards for competences- COMMUNICATION, for crewmembers at Operational level.
2. Objective	Provide training and practical guidance for trainees in order to be able to communicate generally and professionally, which includes the ability to use standardised communication phrases in situations with communication problems, and to be able to be sociable.
3. Entry standards	See Directive (EU) 2017/2397 -Annex 1
4. Course certificate	On successful completion of the course, a document may be issued, stating that the holder graduated this learning module.
5. Course intake limitation	Admittance may be limited by the capacity of the educational infrastructure used for this learning module.
6. Staff requirements	The trainer should meet the requirements of the Directive (EU) 2017/2397, Art. 18.
7. Training facilities, equipment and teaching aids	Training facilities and equipment Communication laboratory equipped with communication devices, suitable class room, video presentation equipment etc.
8. Learning outcomes	<i>The Boatman shall be able to communicate generally and professionally, which includes the ability to use standardised communication phrases in situations with communication problems, and to be able to be sociable.</i> At the end of the course the trainee shall be able to: <ul style="list-style-type: none">• use information and communication systems;• solve different tasks with the help of different types of digital devices, information services (such as RIS) and communication system;• collect and store data including backup and data update;• follow instructions for data protection;• present facts using technical terms;• obtain nautical and technical information to maintain safety of navigation;• follow instructions and communicate with others in terms of shipboard duties;• contribute to good social relations and cooperate with others on board;• accept social responsibility, conditions of employment, individual rights and duties; acknowledge dangers of alcohol and drugs abuse and adequately respond to misconduct and dangers;• plan, purchase and prepare simple meals in keeping with rules of hygiene.
9. Assessment & evaluation	Minimum requirements for assessment &evaluation of the trainees for graduation the learning module (i.e. minimum score for theoretical evaluation, for practical evaluation etc.) i.e. Online training record book as a pathway for the course.

2. INSTRUCTOR MANUAL

2.1 Introduction

This instructor manual provides guidance on the material that is to be presented during the training course for COMMUNICATION- OL, and has been arranged under the 10 (ten) Learning Outcomes (competences) identified in the course outline. The reference material indicated may be supplemented by additional texts or material at the discretion of the teacher/trainer.

The course outline and provisional timetable provide also guidance on the time allocation for the course, because the time actually taken for each subject area may vary especially in respect of time allocated to practical activities. The detailed teaching syllabus must be carefully studied and appropriate lesson plans or lecture notes compiled. A template of a lesson plan is presented under the point 2.2 of this Chapter. Each lesson should commence with a statement of the learning outcomes it is intended to achieve. At the end of each lesson, the participants should be told which associated portions of the reference material they should read and any activity they should undertake. Questions arising from such readings and activities

must be given priority at an appropriate time.

The presentation of the various subject areas should be done in such a way that those taking part in the course are involved in an interactive participation during the lessons and learning process. Questions from the course participants should be encouraged, as should answers to such questions from other course participants.

The lessons should aim at conveying as much practical instruction and practice as possible to the participants, in order to develop their knowledge of and their skills in the tasks they will be expected to carry out. Course materials for additional study must be prepared and distributed if required.

2.2 Lesson plan

This lesson plan is just a template to give the teachers/trainers a general idea on how to create their lessons for the various competences. This template can be used for every competence and adjusted as suitable for the institute to use.

Competence 6.1.1 Use information and communication systems;

Learning Objective

Learning outcomes

Required equipment

Lesson structure

Learning activity	Didactical method (ABC method)	Materials	Time

2.3 Background materials

Bibliographical materials, reference documents, and other didactical materials are presented in Annex 1 of this Course Manual.

2.4 Practical training

This practical training links the theoretical content of the lessons to their practical use.

Case studies

Theoretical subjects are elaborated by the candidates autonomously in case studies. The candidate should deepen his or her knowledge in defined theoretical subjects by elaborating on a variety of facts and figures about this topic and present them in front of his or her classmates afterwards.

Discussions and reflection, interactive learning

Possible solutions to theoretical and practical subjects can be discussed within (parts of) the learning group. Different views and opinions on a defined subject are exchanged and discussed by the participants in order to broaden the view of the individual on this problem and show different possible solutions and their respective advantages and disadvantages. A discussion should be monitored and steered (stimulated or consolidated) if necessary, in order to secure that every participant actively participates.

Team work

Assignments can be individual as well as group assignments, depending on the objective. An individual assignment should stimulate and show the competences of the individual. In team work assignment the participants will have exposure to a wide range of experiences from quick problem-solving involving synergy to experiences which may relate to such items as interpersonal difficulties in a group setting. Depending on the purpose of the assignment the team should be defined in advance and the assignment and the rules of the working process, if there are any, should be communicated to the group in a very clear and formal manner.

In **Annex 2** of this Course Manual are presented few exercises, case studies, practical scenarios useful for practical training and examination of the trainees.

2.5 Class room facilities and educational tools

For the theoretical part of the course a classroom is required with video presentation equipment, teaching aids etc. For the practical part of the course a communication laboratory equipped with communication devices is necessary.

2.6 Examination & assessment

According to Article 17- Assessment of competence of the Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation, Member States shall ensure that persons who apply for the Boatman certificate demonstrate that they meet the standards of competence by passing an examination that was organised:

- (a) under the responsibility of an administrative authority in accordance with Article 18 or;
- (b) as part of a training programme approved in accordance with Article 19.

The essential competence requirements set out in Annex II of the Directive (EU) 2017/2397 for Communication - Operational level are:

The Boatman shall be able to:

- communicate generally and professionally, which includes the ability to use standardised communication phrases in situations with communication problems;
- be sociable.

3. REGULATION AND CERTIFICATION

According to Chapter 2, Union Certificates of Qualification, article 4, Obligation to carry a Union certificate of qualification as a deck crew member of the Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation:

- Member States shall ensure that deck crew members who navigate on Union inland waterways carry either a Union certificate of qualification as a deck crew member issued in accordance with Article 11 or a certificate recognised in accordance with Article 10(2) or (3);
- In Annex I of Directive (EU) 2017/2397 the minimum requirements for certification as a Boatman are included, such as:
Every applicant for a Union certificate of qualification shall:

(a)

- Be at least 17 years of age;
- Have completed and approved training programme as referred in Article 19, which was a duration of at least two years, and which covered the standards of competence for the operational level set out in Annex II;
- Have accumulated navigation time of at least 90 days as part of this approved training programme or after completion thereof;

or

(b)

- Be at least 18 years of age;
- Have passed an assessment of competence by an administrative authority as referred to in Article 18, to verify that the standards of competence for the operational level set out in Annex II are met;
- Have accumulated navigation time of at least 360 days, or have accumulated navigation time of at least 180 days if the applicant can also provide of work experience of at least 250 days that the applicant acquired on a sea-going ship as a member of the deck crew;

or

(c)

- Have a minimum of five years' work experience prior to the enrolment in an approved training programme, or have at least 500 days' work experience on a sea-going ship as a member of the deck crew prior to the enrolment in an approved training programme, or have completed any vocational training programme of at least three years' duration prior to the enrolment in an approved training programme;
- have completed an approved training programme as referred to in Article 19, which was of a duration of at least nine months, and which covered the standards of competence for operational level set out in Annex II;
- Have accumulated navigation time of at least 90 days as part of that approved training programme.

4. LESSON MATERIALS

The lesson materials referred to in this course manual are for inspiration and are free to use for the teachers of the educational institutes. The lesson materials will be available on the Edinna website (<https://www.edinna.eu/>) until the end of the project.

Thematic content of the Course Manual for COMMUNICATION- OL is presented below.

The numbering of the chapters is in accordance with the Standards for competences for the Operational level- 6. COMMUNICATION.

COMPETENCE 6

6.1 General and professional communication, including using standardised communication phrases

Competences

The Boatman shall be able to:

1. Use information and communication systems;
2. Solve different tasks with the help of different types of digital devices, information services such as RIS) and communication systems;
3. Collect and store data including backup and data update;
4. Follow instructions for data protection;
5. Presents facts using technical terms;
6. Obtain nautical and technical information to maintain safety of navigation.

6.1.1 Use information and communication systems



Knowledge and skills

6.1.1.1 Knowledge of intercomm installation for intra-craft or terminal communication, of the craft's (mobile) phone, radio, (satellite) TV and camera systems

Internal communication facilities on board

According to the provisions of ES-TRIN, on board of inland vessels there are internal communication facilities in order to be possible to establish communication links from the the steering position with:

- The bow of the vessel or convoy;
- The stern of the vessel or convoy if no direct communication is possible from the steering position;
- The crew accommodation;
- The Boatmaster's cabin.

Reception at all positions of these internal communication links shall be via loudspeaker, and transmission shall be via fixed microphone. The link between the bow and stern of the vessel or convoy may be of the radio-telephone type.

In addition, inland vessels are equipped with an extensive suite of communications instruments and devices. The more prominent systems and devices for internal communications or terminal communications are:

- **Cellular telephone** - Cellular telephone systems use a large number of transceiving antennas / stations. Each one serves a limited geographic area, called a cell, and is linked together through relay and controlling stations into a network. A cellular phone can be useful and extremely convenient, but it is no substitute for proper VHF radiotelephone when it comes to safety;
- **Satellite communications systems** - Internet access on board of the vessel via vessel Internet network, but it's not like the Internet you have at home. On board of the vessel there are implemented some measures to make Internet usage equitable for everyone on board the vessels. Additionally, there are some public-use computers;
- **Hand- held radios, pagers** - used for internal communication with the crew members;

- **Intercom Systems** - is a two-way communication electronic device that contains circuitry for the purpose of transmitting and receiving audio and/or video transmissions. An intercom (intercommunication device), talkback or door phone is a stand-alone voice communications system for use on board of the vessels for the internal communication between bridge and any other vessels' compartments. Intercom allows a person speaking into a microphone to be heard on a speaker by people in a different room or area. On a vessel with a small crew, a quick and reliable communication system is truly a safety item, and the Helmsman must not leave his position to or divert his attention to carry on conversation or summon assistance. Many VHF radios can provide intercom functions with two or more remote stations and many allow full control of the radio from the remote unit. Wireless telephone systems that can connect to cell phones can be used as intercoms;
- The **public address system** shall be a loudspeaker installation enabling the broadcast of messages into all spaces where crew members or passengers, or both, are normally present, and to muster stations. It shall allow for the broadcast of messages from the navigation bridge and such other places on board the vessel as the Administration deems necessary. It shall be installed with regard to acoustically marginal conditions and not require any action from the addressee. It shall be protected against unauthorized use.

Alarm system

There shall be an independent alarm system enabling the accommodation, engine rooms and, where appropriate, the separate pump rooms to be reached. The Helmsman shall have within reach an on/off switch controlling the alarm system.

In engine rooms and pump rooms the alarm signal shall take the form of a flashing light that visible on all sides and clearly perceptible at all points.

6.1.1.2 Ability to use the craft's (mobile) phone systems, the craft's radio, (satellite) TV and camera system

Cellular telephone - the Boatmaster is equipped with a cellular telephone and on board the passenger vessel the Hotel manager as well. These devices normally operate beyond the range of cellular networks. These devices are used for the communication with the vessel agent, with the owner company, port operators etc.

For using **Internet** on board of the vessel some restrictive measures must be implemented in the internal rules and at the same time respected by the crew members and passengers. It can be used the public-use computers available on board of the vessel. Certain websites and services that use a lot of bandwidth aren't available.

Hand-held radios- two-way radio systems usually use a single radio channel and operate in a half-duplex mode: only one user on the channel can transmit at a time, so users in a user group must take turns talking. The radio is normally in receiving mode so the user can hear all other transmissions on the channel. When the user wants to talk, he presses a "push-to-talk" button, which turns off the receiver and turns on the transmitter; when he releases the button, the receiver is activated again. Multiple channels are provided so separate user groups can communicate in the same area without interfering with each other.

A **pager** (also known as a beeper) is a wireless telecommunications device that receives and displays alphanumeric or voice messages. One-way pagers can only receive messages, while response pagers and two-way pagers can also acknowledge, reply to, and originate messages using an internal transmitter. All of the pagers for that particular network have a built-in receiver that is tuned to the same frequency broadcast from the transmitter. The pagers listen to the signal from the transmitter constantly as long as the pager is turned on.

Intercom Systems on board inland vessels have to be used by the Boatmaster or Helmsman and Boatman according to the rules of procedures established by the company.

6.1.1.3 Knowledge of operation principles of the Inland AIS

The Automatic Identification System (AIS) is a vessel borne radio data system, exchanging static, dynamic and voyager related vessel data between equipped vessels and between equipped vessels and shore stations. Vessel borne AIS stations broadcast the vessel's identity, position and other data in regular intervals. By receiving these transmissions, vessel borne or shore based AIS stations within the radio range can automatically locate, identify and track AIS equipped vessels on an appropriate display like radar or Inland ECDIS. AIS system are intended to enhance safety of navigation in vessel to vessel use, surveillance (VTS), vessel tracking and tracing, and calamity abatement support.

The following modes of operations can be distinguished:

- *Vessel-to-vessel operation*: all AIS equipped vessels are able to receive static and dynamic information from all other AIS equipped vessels within the radio range;
- *Vessel-to-shore operation*: data from AIS equipped vessels can also be received by AIS base stations connected to the RIS (River Information Services) centre where a traffic image (TTI – Tactical Traffic Information and/or STI- Strategic Traffic Information) can be constructed;
- *Shore-to-vessel operation*: safety related data from shore to vessel can be transmitted.

A characteristic of AIS is the autonomous mode, using SOTDMA (Self Organising Time Division Multiple Access AIS) without any need for an organizing master station. The radio protocol is designed in a way that vessel stations operate autonomously in a self-organized manner by exchanging link access parameters. Time is divided into 1-minute frames with 2,250 time slots per radio channel which are synchronized by GNSS.

Each participant organizes its access to the radio channel by choosing free time slots considering the future use of time slots by other station. There is no need for a central intelligence controlling the slot assignment.

An Inland AIS station consists in general in following components:

- VHF transceiver (1 transmitter/2 receivers);
- GNSS (Global Navigation Satellite System) receiver;
- Data processor.

Universal ship-borne AIS, as defined by IMO- International Maritime Organization, ITU- International Telecommunication Union and IEC- International Electrotechnical Commission and recommended for the use in inland navigation uses self-organised time division multiple access (SOTDMA) in the VHF maritime mobile band. AIS operates on the internationally designated VHF frequencies AIS 1(161,975 MHz) and AIS 2 (162,05 MHz) and can be switched to other frequencies in the VHF maritime mobile band.

6.1.1.4 Ability to use Inland AIS data to address other craft

To serve the specific requirements of inland navigation, AIS has to be further developed to the so called Inland AIS while preserving compatibility with IMO's maritime AIS.

Vessel tracking and tracing systems in inland navigation shall be compatible with maritime AIS, as defined by IMO. Therefore, AIS messages shall contain:

- Static information, such as official vessel number, call sign of vessel, name of vessel, type of vessel;
- Dynamic information, such as vessel position with accuracy indication and integrity status;
- Voyage related information, such as length and beam of vessel combination, hazardous cargo on board;
- Inland navigation specific information, e.g. number of blue cones/lights according to AND or estimated time of arrival (ETA) at the lock /bridge/terminal/ border.

For moving vessels an update rate for the position information on tactical level should be switched between SOLAS- International Convention for the Safety of Life at Sea- mode and inland mode. In inland waterway mode it can be assigned between two seconds and 10 minutes. For vessels at anchor it is recommended to have an update rate of several minutes, or if information is amended.

AIS is an additional source for navigational information. AIS does not replace, but supports navigational services such as radar target tracking and VTS. AIS has its strength as a means of surveillance and tracking of vessels equipped with it. Due to their different characteristics, AIS and radar complement each other.

Generally only tracking and tracing and safety related information shall be transmitted via Inland AIS. Taking into consideration this requirement, **Inland AIS messages shall contain following information:**

Static vessel information

The Static vessel information for inland vessels shall have the same parameters and the same structure as in IMO AIS as far as it is applicable. Not used parameter fields shall be set to “not available”.

Inland specific static vessel information shall be added.

Static vessel information is broadcast autonomously from vessel or on request.	
User identifier (MMSI)	(Standard IMO AIS)
Name of vessel	(Standard IMO AIS)
Call sign	(Standard IMO AIS)
IMO number	(Standard IMO AIS/not available for inland ships)
Type of vessel and cargo	(Standard IMO AIS/amended for Inland AIS)
Overall length (decimetre accuracy)	(Standard IMO AIS/amended for Inland AIS)
Overall beam (decimetre accuracy)	(Standard IMO AIS/amended for Inland AIS)
Unique European vessel identification number (ENI)	(Inland AIS extension)
Type of vessel and convoy (ERI)	(Inland AIS extension)
Loaded/unloaded vessel	(Inland AIS extension)

Dynamic vessel information

The Dynamic vessel information for inland vessels shall have the same parameters and the same structure as in IMO AIS as far as it is applicable. Not used parameter fields shall be set to “not available”. Inland specific dynamic vessel information shall be added.

Dynamic vessel information is broadcast autonomously from vessel or on request.	
Position (WGS 84)	(Standard IMO AIS)
Speed SOG (quality information)	(Standard IMO AIS)
Course COG (quality information)	(Standard IMO AIS)
Heading HDG (quality information)	(Standard IMO AIS)
Rate of turn ROT	(Standard IMO AIS)
Position accuracy (GNSS/DGNSS)	(Standard IMO AIS)
Time of el. position fixing device	(Standard IMO AIS)
Navigational status	(Standard IMO AIS)
Blue sign set	(Inland AIS extension/regional bits in Standard IMO AIS)
Quality of speed information	(Inland AIS extension/derived from ship sensor or GNSS)
Quality of course information	(Inland AIS extension/derived from ship sensor or GNSS)
Quality of heading information	(Inland AIS extension/derived from certified sensor (e.g. gyro) or uncertified sensor)

Voyage related vessel information

The voyage related vessel information for inland vessels shall have the same parameters and the same structure as in IMO AIS as far as it is applicable. Not used parameter fields shall be set to "not available". Inland specific voyage related vessel information shall be added.

Voyage related vessel information is broadcast autonomously from vessel or on request.	
Destination (ERI location codes)	(Standard IMO AIS)
Category of dangerous cargo	(Standard IMO AIS)
Maximum present static draught	(Standard IMO AIS)
ETA	(Standard IMO AIS)
Maximum present static draught	(Standard IMO AIS/ amended for Inland AIS)
Hazardous cargo classification	(Inland AIS extension)

Traffic management information

Traffic management information is for specific use in inland navigation. This information is transmitted when required or on request to/from inland vessels only.

Lock/bridge/terminal ID (UN/LOCODE)	(Inland AIS extension)
ETA at lock/bridge/terminal	(Inland AIS extension)
Number of assisting tugboats	(Inland AIS extension)
Air draught	(Inland AIS extension)

6.1.2 Solve different tasks with the help of different types of digital devices, information services (ris) and communication systems



Knowledge and skills

6.1.2.1 Knowledge of digital devices available in inland waterway transport Information and communication systems available on board

Communication and navigation are intrinsically linked. Right from the start of voyage planning, the navigators need up-to-date information that will affect the passage of the vessel, such as chart corrections, information for safety of navigation, weather reports etc. This information needs to be communicated to the vessel and presented in a format that aids decision-making.

During the voyage, communication is essential not only among the bridge team on board, but also with shore authorities such as VTS and with the other vessels.

A **radiotelephone** is a sender and receiver for inland navigation communication. Via the radiotelephone you can make contact with other vessels and with VTS stations on the shore, such as locks, traffic supervisors. All inland navigation vessels, with some exceptions, are required to have a radiotelephone installation on board. It is advisable to use this equipment on inland waterways in order to enhance safety of navigation. The use of radiotelephone installation is mandatory according to applicable legislation in this field, legislation which provides applicable regulations also for equipment and for users of this equipment, such as radiotelephone operators.

If you have a radiotelephone on board, you are required to use it and to listen to it. On the inland waterways the radiotelephone has to be set on the channel mentioned in the applicable legislation as channel for navigation communication. A radiotelephone is a sender-receiver for short distances that operates on VHF (Very High Frequency). A radiotelephone is essential for communication in navigation.

The main four important reasons to use the radiotelephone are:

- By listening to the radiotelephone, you know what is happening in your surroundings, which vessels are in the area and what manoeuvres they are making; using this information helps you to choose a safe course;

- The radiotelephone is important for contacting traffic supervisors, bridge men and locks operators;
- Your emergency call via radiotelephone is heard by everyone listening in the area around you;
- You receive simple safety messages on board such as weather forecasts, storm warnings and shipping news.

Other media systems

Automated digital communication will become increasingly important, with **AIS- Automatic Identification System**- being a crucial example. AIS is an identification system that automatically transmits information about the name, position, speed and course of a vessel. If a vessel is equipped with AIS, data is automatically sent to shore-based installations called AIS base stations. Through AIS you can even automatically exchange data with other vessels in the vicinity. AIS has been in use for a long time in maritime shipping. To better respond to the specific needs of inland shipping, an Inland AIS has been developed.

AIS supports and facilitates navigation and increases safety. Thanks to AIS, the infrastructure can be put to better use, traffic stations can be operated more efficiently and shippers and terminals can improve their logistics planning. In this way, AIS strengthens the competitive position of inland navigation. AIS is an electronic device that broadcasts its identity and position at regular times to other vessels as well as other information with respect to ship and cargo. The AIS is also able to receive the same sort of information from other vessels.

Inland ECDIS is a system for the display of electronic inland navigation charts and additional information. Its purpose is to contribute to the safety and efficiency of inland navigation and thus also to the protection of the environment. Inland ECDIS is used simultaneously to reduce the workload when navigating the ship as compared to traditional navigation, and for information methods. Inland ECDIS also provides the basis for other River Information Services (RIS), e.g. Inland AIS. The electronic chart developed according to the ECDIS standard differs fundamentally from a paper chart. Its presentation on a screen has some advantages over a paper chart. The electronic display of the chart is only one aspect of ECDIS. Inland ECDIS is also an information system, which enables its users to recall other information about the displayed objects besides their graphics presentation.

6.1.2.2 Ability to use the craft's digital devices according to instructions to perform simple tasks

Using the radiotelephone

If there is a radiotelephone on board, the crew members are required to use it and to listen to it. On the inland waterways the radiotelephone has to be set on the channel mentioned in the applicable legislation as channel for navigation communication. A radiotelephone is a sender-receiver for short distances that operates on VHF (Very High Frequency). A radiotelephone is essential for communication in navigation.

The main four important reasons to use radiotelephone are:

- By listening to the radiotelephone, the user knows what is happening in your surroundings, which vessels are in the area and what manoeuvres they are making; using this information helps user to choose a safe course;
- The radiotelephone is important for contacting traffic supervisors, bridge men and locks operators;
- The emergency call sent via radiotelephone is heard by everyone listening in the area around the vessel from which the message was sent.

It can be received simple safety messages on board such as weather forecasts, storm warnings and shipping news.

Using AIS

AIS was in the first place a vessel- to-vessel communication device to display position course over ground and its use was in the first place for collision avoidance. The structure of the messages and the way it was broadcast gave rise to the use of an AIS device on shore where an observer could monitor the movements of the vessels in range. This principle is taken by authorities to observe the vessel traffic. Special devices were developed that could not only observe the traffic but also affect the traffic or relate to one vessel in the traffic. This device developed the so-called base station. In order to obtain a surveillance of stretches of water larger than the range of one base station, these were developed into networks. Apart from the normal messages that are sent at (different) time periods, special messages were developed, the so-called binary messages.

Using ECDIS

Information mode

Information mode shall be used for information only and not for navigation. In information mode all kinds of chart orientation, rotation, zooming and planning are allowed. However, it is recommended to use the same fixed ranges as in the navigation mode and the chart orientation whether:

- To north, or;
- To the fairway axis at the actual position, or;
- To the actual ships-heading.

It should be possible to scroll the chart manually on the screen with the fairway axis in line with the vertical screen axis.

Inland ECDIS may be connected to a positioning sensor to scroll the chart picture automatically and to display the section of chart matching the actual surrounding, namely in the operator-selected range.

Navigation mode

In navigation mode, the Inland ECDIS display shall be integrated with the own vessel's radar information. The radar information shall be clearly distinguishable from the SENC information.

The integrated display shall be in accordance with the requirements for radar on inland waterways as specified in Section 4, Chapter 4.14 of these technical specifications.

The Integrated Display shall only be presented in the head-up orientation. Other orientations are permitted in systems with an additional maritime ECDIS type approval. If such a system is used in true motion and/or north-up mode on European inland waterways, it is considered to be working in information mode. It shall be possible to temporarily remove either the ECDIS or the radar information by a single operator action.

The vessel's position shall be derived from a continuous positioning system of which the accuracy is consistent with the requirements of safe navigation. Navigation mode shall provide an indication when the input from the position-fixing system is lost. Navigation mode shall also repeat, but only as an indication, any alarm or indication passed to it from a position fixing system.

6.1.3 Collect and store data including backup and data update



Knowledge and skills

6.1.3.1 Knowledge of the use of the craft's communication system for data collection, storage and update

One of the craft's communication system is the **radiotelephone service** that enables the establishment of radio communications for specific purposes by using agreed channels and agreed operational procedure using ATIS. ATIS is a system for automatic identification of ship radiotelephone transmitters according to the Annex B of the European Standard ETSI EN 300 698-1.

The radiotelephone service categories on Inland Waterways are:

- *Vessel-to-vessel-radio communications* between vessel stations;
- *Nautical information-radio communication* between vessel stations and stations of the competent authorities for the operational services on Inland Waterways;
- *Vessel-to-port authorities- radio communications* between vessel stations and stations of the competent authorities for the operational services in Inland Ports;
- *On board communications-internal radio communications* on board of a vessel or radio communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions.

Inland Automatic Identification System (AIS) is another craft's communication system based on a protocol using VHF maritime mobile band, for the exchange of navigation data. The radiotelephone equipment is using the VHF frequencies according to Appendix 18 of the Radio Regulations. The use of the channels, the transmitting frequencies and service categories are shown in Annex 2 of RAINWAT- Regional Arrangement on the Radiocommunication Service for Inland Waterways and the limitations to the operational requirements are shown in the Annex 3 of RAINWAT.

Radar equipment on Inland Waterways is using the band 9.2-9.5 GHz.

The **AIS equipment** is normally using AIS 1 and AIS 2 frequencies from the Appendix 18 of the Radio Regulations.

Administrative provisions

- No vessel station may be established or operated without a Vessel Station Licence, issued by the competent authority of the country where the ship is registered;
- The operation of a vessel station shall be performed by a person holding a radio operator's certificate for the radiotelephone service on Inland Waterways;
- Before being put into operation the vessel station may be subject to an inspection by the competent authority which issued the ship station licence;
- Each vessel station participating in the radio communication service on Inland Waterways shall have a call sign, the official name of the vessel, an ATIS code which has to be in accordance with the technical requirements given in Annex B of ETSI EN 300 698-1. The formation of the vessel call signs shall be in accordance with Article 19 of the Radio Regulations;
- In the service categories vessel-to-vessel, nautical information and vessel-to-port authorities, the official name of the vessel shall be used;
- A call sign shall also be assigned to handheld equipment used for the service category on board communications. The use of this call sign is on non-mandatory basis.

Operating procedure

The general radiotelephone procedure for the Maritime Mobile Service provided in the Radio Regulations (Article 57) shall apply to radiotelephone communications and test transmissions of the radiotelephone service on Inland Waterways. The relevant provisions of the Radio Regulations are to be found in the Guide concerning the radiotelephone service on Inland Waterways, elaborate by the CCNR-Central Commission for the Navigation on the Rine and Danube Commission, edition 2017.

6.1.3.2 Ability to process data under strict supervision

In communications between vessel stations and land stations, the language of the country in which the land stations are situated should be used. In communication between vessel stations, the language of the country in which the vessel concerned sails shall be used. In case of difficulties of understanding, the language specified in the appropriate Police Regulations has to be used. Any suitable language may be used where no Police Regulations exist.

After a transition period ending on 1 February 2022, where no Police Regulation exists, the following provisions for communications will be applicable:

- Vessel-to-port authorities: primarily the English language should be used. As fall back the language of the country in which the land stations are situated can be used;
- Vessel-to-vessel: primarily the English language should be used for navigational purposes.

In the service categories vessel-to-vessel, nautical information and vessel-to-port authorities, the transmission of the message shall deal exclusively with the safety of human life, movement and the safety of vessels except on the vessel-to-vessel channels specially defined for the use of communications with a social character.

Ship stations are obliged to acknowledge the receipt of messages addressed to them. When it is necessary to spell out call signs, service abbreviations, words, figures or marks, the tables given in Appendix 14 of Radio Regulations shall be used.

6.1.4 Follow instructions for data protection

Knowledge and skills

6.1.4.1 Knowledge of data protection regulations and professional secrecy

Personal data protection

The protection of natural person with regard to the processing of personal data and on the free movement of such data, are documented in the EU Regulation 2016/679 of the European Parliament and of the Council on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

The protection of natural persons in relation to the processing of personal data is a fundamental right. This EU Regulation is intended to contribute to the accomplishment of the area of freedoms, security and justice and of an economic union, to economic and social progress, to the strengthening and the convergence of the economics within the internal market, and to the well-being of natural persons.

Rapid technological developments and globalization have brought new challenges for the protection of personal data. The scale of the collection and sharing of personal data has increased significantly. Technology allows both private companies and public authorities to make use of personal data on an unprecedented scale in order to pursue their activities.

Natural persons increasingly make personal information available publicly and globally. Technology transformed both the economy and social life, and should further facilitate the free flow of personal data within the Union and the transfer to third countries and international organizations, while ensuring a high level of the protection of personal data. The principles of data protection should apply to any information concerning an identified or identifiable natural person.

Professional secrecy

Professional secrecy may be defined as a special moral duty, binding in both commutative and legal justice, and inherent in certain workplaces and functions of a fiduciary nature exercised in society, whereby they who fill such offices or perform such functions are obligated to maintain a virtuous or discreet silence with reference to the confidential information received by them in the course of duty.

The information, data or documents held by a person by virtue of his profession or function, regarding his intimate life, health or any other situation regarding a certain person are professional secrets. The following information can be considered secret:

- Everything that is explicitly or tacitly brought to the attention of the trusted person;
- All information seen or heard;
- Information relating to third parties.

In general, the maintenance of professional secrecy is enshrined by introducing in individual employment contracts a confidentiality clause defined by the Labour Code, which establishes precisely what information is subject to professional secrecy.

6.1.4.2 Ability to process data according to data protection regulations and professional secrecy

The principles relating to processing of personal data, included in the EU Regulation 2016/679 are:

Personal data shall be:

- Processed lawfully, fairly and in a transparent manner in relation to the data subject;
- Collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes;
- Adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed;
- Accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay;
- Kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed;

- Processed in the manner that ensure appropriate security of the personal data, including protection against unauthorized or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organizational measures.

Cybersecurity

Cyber security is the practice of protecting systems, networks, and programs from digital attacks. These cyber-attacks are usually aimed at accessing, changing, or destroying sensitive information; extorting money from users or interrupting normal business processes.

Implementing effective cyber security measures is particularly challenging today because there are more devices than people, and attackers are becoming more innovative.

The rapid evolution in the use of, and reliance upon, digital and communication technologies, as well as the advances in automation and the potential for integration of multiple electronic systems supporting management functions and business applications, increases the importance of addressing inherent vulnerabilities. It is therefore vital that vessel owners, operators and masters understand and implement appropriate and proportionate measures to address the resilience and cyber security issues that arise. Only by doing so can they fully meet their responsibilities for the secure and safe operation of their vessel. Cyber security is not just about preventing hackers gaining access to systems and information, potentially resulting in loss of confidentiality and/or control. It also addresses the maintenance of confidentiality, integrity and availability of information and systems, ensuring business continuity and the continuing utility of digital assets and systems.

To achieve this, consideration needs to be given to not only protecting vessel systems from physical attack, force majeure events etc., but also to ensuring the design of the systems and supporting processes is resilient and that appropriate reversionary modes are available in the event of compromise. Personal security aspects are also important. The inside threat from shore-based or shipboard individuals who decide to behave in a malicious manner, or the untrained user that makes errors cannot be ignored. Vessel owners and operators need to understand cyber security and promote awareness of this subject to their stakeholders, including their crew members.

In the maritime sector there are a lot of policies, regulation, guidelines etc. regarding the cyber security risk management but for inland navigation it is essential to put in place common and standardised solutions that are the fruit of exchanges between the different stakeholders at the international level,

the public and private sector, and on the level of manufacturers and operators. In this regard, inland navigation would be able to rely particularly on the experience and good practices of the maritime and rail sector. The achievements of ENISA (European Union Agency on Cyber security) in supporting the implementation of NIS Directive- Directive (EU) 2016/1148 concerning measures for a high common level of security of network and information systems across the Union, will be also valuable in the development of a concept for cyber security inland navigation.

6.1.5 Present facts using technical terms

6.1.5.1 Knowledge of the required technical and nautical terms as well as terms related to social aspects in standardised communication phrases

Using technical and nautical terms

Communication is an essential part of human interaction. The benefits of effective communication are many and obvious as they enhance all aspects of our personal and professional lives. Ineffective and misunderstood communications in our personal lives may give rise to problems or embarrassment but in our professional lives the results of misunderstandings may have much more serious problems. In the world of international shipping, with crewmembers from many countries sailing on vessels trading to all parts of the world, effective communication between those on board and between ship and shore is vitally important.

Many accidents are found to be due mainly to operational issues of improper procedures, maintenance and design, rather than to proper implementation of regulations but effectiveness of bridge resource management and particularly ineffective relationship between Boatmaster and crewmembers are recurrent. Communication difficulties often occur in these areas due in part to cultural differences but also to language "barriers".

It is a self-evident fact that people speaking different languages can generally not converse at all and even people speaking their own language can misinterpret spoken messages. Many will recall playing games where a message passed through a series of people can become quite unrecognizable from the original message after being re-worded or abbreviated by individuals passing a message one to the other.

For effective communications, when the sender of a message communicates with the intended recipient, there has to be a correlation between what the sender is thinking about. Text or words must therefore be used

in a consistent way, and the first requirement for communication is a set of messages that are used consistently.

If we know why we fail sometimes to send the intended communications we can start to address the problem. The most obvious solution to the problem of failure of communications through different languages is, of course, to use the same one.

The language usually used on board of the vessel is the national language of the crew. However, in these days of multinational crews, a variety of languages may be used or alternatively one working language adopted. Whichever is used, ships trading internationally must conduct ship to shore communications in a language that can be understood. Navigational and safety communications must be precise and unambiguous to avoid confusion and error.

6.1.5.2 Ability to use required technical and nautical terms as well as terms related to social aspects in standardised communication phrases

Using standard communication phrases

It is recommended to use:

- Standard navigational vocabulary such as, Standardized UNECE Vocabulary for Radio-Connections in Inland Navigation;
- RIVERSPEAK- EDINNA Standard Inland Navigation Communication Phrases.

These Standards are not mandatory but rather that through constant repetition on board of the vessels and in training institutes the phrases and terms were expected to become normally accepted and used amongst crewmembers in preference to words of similar meanings.

Effective communications are an essential ingredient to safe and efficient ship operations. Communication can be achieved in many ways but the prime method for operational communications is through speech. And when in an operational situation such as berthing a ship or fighting a fire, it is vitally important that those involved can communicate effectively.

The Standardized UNECE Vocabulary for Radio-Connections has been prepared with a view to:

- Improving the safety of navigation and piloting of vessels;
- Standardizing the vocabulary used for communications in inland navigation.

General instructions have to be followed in order to use the phrases and expressions contained in this Vocabulary.

The general instructions include:

- Procedure/description of the message;
- Distress/emergency/safety messages.

The RIVERSPEAK Standard Communication Phrases for Inland Navigation have been developed to:

- Enhance the safety in inland navigation through standardization of communication in the English language;
- Support the training institutions and their students in achieving the above objective.

The main focus of the RIVERSPEAK standard communication phrases lies on the communication between ships and with land stations on inland waterways, lakes and in coastal areas, and shipboard-communication on board of inland barges. Distress-, Urgency- and Safety communication forms an important part of the phrases.

RIVERSPEAK is available as APPS, with images and sound. It is free of charge and can be played on any device. It will form an excellent tool for lecturers and students to teach and learn the practical way of communication and language used in inland navigation. The RIVERSPEAK programme consists of ten bi-lingual versions (EN, DE, NL, FR, PL, RO, HR, BG, RU, IT) i.e. ten different languages that are now commonly used to communicate on the inland waterways, combined with the English standard of communication.

6.1.6 Obtain nautical and technical information to maintain safety of navigation

6.1.6.1 Knowledge of the available information sources

River Information Services (RIS) is the concept whereby information services in inland navigation support traffic and transport management in inland navigation, including interfaces with other modes of transport. Directive 2005/44/EC on harmonised river information services on the EU's inland waterways requires Member States to implement RIS according to certain standards.

The RIS Directive refers to the four key technologies: Inland Electronic Chart Display and Information System (Inland ECDIS), Notices to Skippers (NtS), Inland AIS and Electronic Reporting International (ERI). These technologies are based on technical and operational standards which were initially defined and are

continuously updated by the RIS Expert Groups. The RIS Directive demands Member States to implement RIS according to these standards. A major contribution to the standardisation process has been the European Commission's adoption through technical regulations of standards for Inland ECDIS, Notices to Skippers (NtS), Vessel Tracking and Tracing (VTT) and Electronic Reporting International (ERI).

The services included in the RIS concept are for example:

- Information on fairways to plan, execute and monitor voyages by Boatmasters and fleet managers (e.g. water levels, aids to navigation, fairway information, opening hours of locks etc.). The information comprises geographical, hydrological, meteorological and traffic related data;
- Traffic information services comprise information on vessel positions to allow for tactical or strategic planning;
- Traffic management aims at optimising the use of the infrastructure as well as facilitating safe navigation especially at RIS Centers as well as at locks and bridges;
- Calamity abatement services (CAS) are responsible for registering vessels and their transport data at the beginning of a trip and updating the data during the voyage with the help of a vessel reporting system. In case of an accident the responsible authorities are capable of providing the data immediately to the rescue and emergency teams;
- Information for transport management includes estimated times of arrival (ETA's) provided by Boatmasters and fleet managers based on fairway information making it possible to plan resources for port and terminal processes. Information on cargo and fleet management basically comprises two types of information: information on the vessels and the fleet and detailed information on the cargo transported;
- Statistics and customs services: the RIS improves and facilitates the collection of inland waterway statistical data in the Member States;
- Waterway charges and port dues: the travel data of the vessel can be used to automatically calculate the charge and initiate the invoicing procedure.

RIS are servicing operational perspectives such as:

- Traffic-related information benefits all parties when it comes to safety;
- Transport-related information which focuses mainly on efficiency.

The RIS Directive was adopted in 2005 by the European Parliament and the Council on 7 September 2005. DG MOVE began an evaluation in January 2019 of whether the RIS Directive had achieved its objectives. On the basis of this evaluation, it will decide whether an impact assessment should be carried out with a view to a possible revision of the Directive.

The results of the evaluation of the RIS Directive are foreseen at the end of 2019 or at the latest during the first half of 2020, which could lead to the possible full revision of the RIS Directive.

Besides, the future concept of RIS depends on the revision of the RIS Directive and transversal topics such as automation of inland navigation and cybersecurity, as well as the introduction of electronic documents and digital tools, could potentially imply an in-depth evolution of these four key RIS standards.

6.1.6.2 Ability to use information sources to obtain necessary nautical and technical information to maintain safety of navigation

RIS system: For the purpose of RIS, modern river information systems consist of one or more harmonized IT systems. An IT (Information Technology) system is the totality of human resources, hardware, software, communication means and regulations in order to fulfil the task of processing information.

RIS area: The RIS area is the formally described area, where RIS are active. A RIS area may comprise the waterways in a geographical river basin, including the territories of one or more countries (e.g. in a situation where a waterway forms the borderline between two countries)

Vessels navigating in a RIS area shall make use of mandatory services and are recommended to make use as far as possible of the information provided by RIS and relevant services.

Decisions concerning the actual navigation and the manoeuvring of the vessel remain within the responsibility of the Boatmaster. Any information provided by the RIS cannot replace any decision made by the Boatmaster.

Depending on the level of information available and on the requirements of the competent authority, the vessels are recommended to be equipped step by step with:

- A radio equipment for the simultaneous reception of inland navigation radio on two VHF channels (ship/ship and ship/shore);
- A radar for the presentation of the traffic in the close surroundings of the vessel;
- A PC with mobile communication facilities (GSM) for the reception of e-mail and Internet, and for electronic reporting;
- An Inland ECDIS device with electronic navigational charts (ENCs);
 - In information mode;
 - In navigation mode (with radar overlay).
- A vessel tracking and tracing system, such as AIS, with position receiver (GNSS) and radio transceiver using Inland ECDIS for visualisation.

A RIS function is understood to be a contribution to a service. The functional decomposition of River Information Services (RIS) allows the allocation of information supply to user demand.

An example of connections between services, functions, users and information levels it is shown in Guidelines and recommendations For River information services- UNECE 2018.

6.2 Social responsibilities on board

Competences

The Boatman shall be able to:

- I. Follow instructions and communicate with others in terms of shipboard duties;
- II. Contribute to good social relations and cooperate with others on board;
- III. Accept social responsibility, conditions of employment, individual rights and duties; acknowledge dangers of alcohol and drugs abuse and adequately respond to misconduct and dangers;
- IV. Plan, purchase and prepare simple meals.

6.2.1 Follow instructions and communicate with others in terms of shipboard duties

6.2.1.1 Knowledge of importance of orders given by the craft's management, formal and informal instructions, rules and procedures and of the importance of being a role model for inexperienced crew members

Vessel operations are complex and require utmost precision. It is therefore the constant endeavour of the vessel's management to ensure that high level of professionalism is in progress at all times.

The Boatmaster, being the overall in-charge of everything on board, is responsible for the functioning of the vessel in every aspect. Thus, it is obvious for him to promulgate his requirements with respect to the safety of navigation and other operations carried out on the vessel.

Keeping this intention in mind, the Boatmaster puts his requirements into writing to avoid any confusion in the matter. Crewmembers on board, thereafter become familiar with the Boatmaster's "Standing and Night Orders".

Crewmembers are familiar with the plethora of codes, conventions, rules and regulations that cover every vessel activity, ranging from the daily routines as well as the rare circumstances that call for specialized actions.

Keeping this whole array of requirements in mind, the Boatmaster chalks out the orders best suited to his personal judgment and to the capabilities of the crewmembers, considering the nature of the vessel, her trade patterns and bridge team practices. These orders might also reflect anything that has caused concern in the past or something that might've upheld high standards of teamwork.

Basically, it is a written document establishing ground rules so as to establish a system of engagement to develop mutual confidence.

6.2.1.2 Ability to follow up orders given by the craft's management and other instructions and rules, as well as to accompany inexperienced crew members

The standing orders are a set of guidelines to ensure safe vessel navigation and operations whether at river or at port. These set of guidelines by the Boatmaster encompass a very wide array of aspects of navigation and rules of conduct for the crewmembers. Standing orders are to be followed at all times by the crewmembers on duty, and is duly signed by every crewmember on board, making them liable to adhere to the orders. That is to say that the standing orders are in-force and applicable at all times the vessel is at river, at port or at anchor.

The night orders are a supplement to the standing orders that come into force as the Boatmaster proceeds to take rest during the night. The standing orders are in force at all times whereas the night orders add specific points to the withstanding standing orders.

The Boatmaster exercises due experience and knowledge every time he takes over command. He assesses every situation keeping in mind the extent of the capabilities of his bridge team, the crew and the technical facilities at his disposal.

All crewmember's are familiar with the term "The Boatmaster's word is final". Well, let us just say that this is why these orders are put down in writing; to make their striking importance crystal clear. Keeping such high importance in mind, the orders should be executed with the same fervour. New crew members joining a vessel must be familiarized with their duties and important information about the ship. This is to ensure that the new people on board vessel understand their responsibilities thoroughly before commencing their duties.

The most crucial point would be to adhere to the orders, minimizing any scope of human error. However, it is only natural to err and therefore, any such error should be brought to a senior officer's notice

immediately. When the Boatmaster has clearly mentioned in both the standing as well as the night orders that he must be called in case of any doubt, the responsible crewmember must do so as soon as the need to think the same arises.

Every crewmember should also remember that he signs the orders at the bottom, clearly adhering to a clause that very candidly binds him to it. It is the duty of the Boatmaster of the vessel to ensure that each new crew member is given proper familiarization training to ensure personal safety and well-being of the vessel.

The Boatmaster would designate a qualified person in charge of training the new crew members of the vessel. The main aim of the familiarization training is to make the new crew members aware of important safety procedures that are to be carried out on vessels while working or during an emergency situation. The Boatmaster must also ensure that the new crew members know the following:

- Location of life jackets, along with the procedure to wear the life jacket;
- Location of escape routes;
- Actions for man overboard situation;
- Different types of alarms on board vessel;
- Location of his or her cabin, along with the location of the nearest escape route and fire extinguisher;
- Procedure for abandon vessel alarm;
- His or her duties in the muster list and during emergency situations;
- Basics of fire prevention on vessel;
- Actions to be taken in case of medical emergency before further medical assistance is received;
- Important instructions on various drills on board the vessel;
- Procedure to operate fire extinguishers;
- Procedure to raise an alarm in case of an accident or emergency.

Apart from duty and safety instructions, the responsible person in charge of the familiarization training would instruct the new crew member regarding important issues such as:

- Garbage management plan and how to handle garbage on vessel;
- Oil pollution prevention plan;
- Life boat/life raft release procedure.

6.2.1.3 Knowledge of company or on board rules

The company or on board rules have to refer at least on:

- Working time;
- Paid annual leave;
- Night shifts;
- Rest periods;
- Seasonal work;
- Keeping records;

- Health assessments;
- Occupational safety, accidents and health;
- Medical care, accommodation and food;
- Social security.

In the development of these rules the company have to take into consideration the international regulations and the national laws in this field, as well.

6.2.1.4 Ability to comply with company or on board rules

Inland navigation is an activity which imposes on crew members particular demands not found in land-based jobs. Crew members are often required to spend both their working and leisure hours in the confined environment of a vessel with the same individuals. This can make crew members more susceptible to the stresses of everyday life than those working ashore. In this environment, the need for discipline and good behaviour is of particular importance.

In order to comply with the company rules and procedures the crew members will be instructed before they start to work in the company and respectively on board the vessel and they must receive the appropriate documents regarding the standard working and living conditions on board of the vessel, and the code of conduct as well.

An inland vessel is a small floating city with a limited number of crew members who have to behave with a certain code of conduct with fellow members. Any misbehaviour or deliberate damage either to the vessel or fellow members can hinder general operation or threaten the safety of the vessel. Rightfully so, a strict code of conduct on board of the vessel is necessary for the crew members to be followed on board for the proper functioning of the vessel and for the safety of navigation as well.

6.2.2 Contribute to good social relations and cooperate with others on board



Knowledge and skills

6.2.2.1 Knowledge of cultural diversity

Nowadays, shipping industries are challenged with multi-ethnic, multilingual, and multicultural crews. This challenge is not necessarily a positive term but rather a threat, or conflict. People who have to work in multinational crews have to be prepared to serve in such environment, and to ignore the negative connotation of the term "challenge".

The threat or conflict can occur taking into account the miscommunication instances, or even lack of communication on board the vessel, which may have fatal consequences on people, vessel, and environment.

However, with all shortcomings, multiculturalism means globalization which, in its turn, tends to be a dominant characteristic of the world industries and trade. This is the reason that the people working on board have to have multicultural competences such as:

- Cultural competence - ability to interact effectively with people of different cultures and socio-economic backgrounds, particularly in the context of human resources. Cultural competence should be understood as a process achieved in time. Members of diverse cultures living and working together may not always agree, may become confused in problem solving, since they possibly have different ways of dealing with them. However, different approaches can be very valuable and beneficial when people have learnt to fit in;
- Linguistic competence - ability to create the reality in which the people live. Besides job-related, technical competence intercultural communicative competence is major. Communication failures combined with, or grown from fatigue or stress, rapid decision in emergency situations may lead to disaster.

6.2.2.2 Ability to accept different cultural standards, values and habits

Cross-culture teams are now a familiar reality on vessels. They share the same workplace and "home" away from their mother country for long periods of time. They should all agree on a common goal, and adopt a common strategy so as to be a homogenous team whose final purpose is to accomplish their task, and keep the vessel and their lives safe.

In order to achieve productive outcomes in their work, members of a vessel crew should avoid exclusion, discrimination, they should be flexible and adaptable, and give respect to people of other cultures.

Diversity in race, language, culture should be seen as beneficial and constructive, not destructive. If cultural diversity is ignored, and people do not see unity in diversity, the whole team, i.e. vessel crews, will perform below expectations and norms, which are very strict aboard vessel.

Once the cultural stereotypes are recognised and accepted it would be easier to understand why members of different cultures feel and act in their own way.

A further step is cultural creativity, in which each member can contribute with his/her ideas and thoughts. Therefore, unless people are educated

about aspects of different cultures, chances are that any kind of relationships are fruitful interaction is ruined. In some cultures, little comments or jokes can be detrimental or offending. Some persons may feel uncomfortable if they are treated in the same way with others, belonging to different cultures, especially if those certain individuals have little knowledge of foreign languages.

Aboard vessels, more than anywhere else, team members should be united, and establish cohesion not rebellion, since they all should pursue the same goal: well-done work in safety conditions. Multicultural diversity, with all disagreements, delay in decisions, stress, and misperception should not lead to confusion or difficulty in workplace relationships.

Challenges in a multicultural diversity are unavoidable. Also, adaptation and flexibility are crucial. Vessel crew members should be made aware of the fact the regardless of the ethnic or cultural background, people should meet on the same path, of respect and understanding of each other's values.

6.2.2.3 Ability to work and live in a team

Working together requires a lot of work, both from a manager and team members. Good teamwork requires some basics as well, such as open communication, clear vision, and clear group roles.

There is a power in a group of people who work together toward a shared goal. A properly managed team brings the best out of each person, allowing them to reach much more than if they were working alone.

However, teamwork is not simply about working together on a daily basis. It's also about recognizing every individual's strengths, embracing them, and constantly pulling each other up.

Teamwork is the ability to work together toward a common vision and the ability to direct individual accomplishments toward organizational objectives. The strength of the team is each individual member and the strength of each member is the team.

It's about being honest about your own work and someone else's work. It means being able to ask for help, but also, if you see that someone's doing something and not doing it well, just tell them about it. It's not about hurting someone's feelings. It's about doing something in the right way or, even better, doing something in an extraordinary way. It's a core value for us.

Crew members spend long period of time on board the vessel, living together, eating together, working together, basically doing life together, regardless of nationality or age or even gender. One imperative part of working well together is teamwork. Collaborating

with the colleagues can help solve problems easily. The team can brainstorm a solution or a new way of doing things. If one crew member works alone, he might not achieve the same results and he might spend longer time at a task.

By working with the colleagues on board the vessel, the communication can be improved as there are opportunities for open discussions and team members can cooperate more easily. Working as a team allows the crew member to learn from the team members. In the event something goes awry, the team can work together to efficiently fix the problem and in the process learn how to do things differently compared to if they do it alone. Teamwork benefits employees on a personal level. Work together to understand how to resolve conflicts and learn from your team mates is very beneficial for the productivity of work on board the vessel.

6.2.2.4 Ability to participate in team meetings and to carry out the distributed tasks

A team meeting is the best way to update and train the vessel crew members with new information. Management level personnel are responsible to conduct regular team and safety meetings on board vessel.

It is important for the management level personnel to understand the vital aspects of the meeting techniques held on board vessel. Some of the important points are:

- Time is an important factor as vessel's job is divided in to a time slots of 24 hour. Meeting to be carried out at the best suited time for all the crew members, say in the evening after dinner;
- The agenda of the meeting to be understood before conducting it;
- Group size to be considered so that each and every person involved in the meeting must understand the importance of it;
- Duration of the meeting should not be too short or too long. If the meeting is stretched too long, it will break the concentration of the staff;
- Better to cover one topic in one meeting;
- Meetings to be interactive and all the disagreements to be welcomed and to be dealt successfully;
- Always motivate when interacting with a person and call every one by name;
- Appreciate the work of the ship staff and if any point is raised in the meeting;
- Safety points to be discussed even if it's not a safety meeting;
- New amendments and circulars to be discussed and their importance to be explained;
- Ask ship staff about their own experience over the topic;
- Conclusion to be made at the end of the meeting.

The complexity from on board a vessel, underline the importance of crew members that are able to coordinate and cooperate with each other to facilitate task objectives through a shared understanding of resources (e.g. team members' knowledge, skills and experience), the crew's goals, and the constraints under which they work. So, crew members on board a vessel face a dynamic, shifting and complex environment which rises a commensurate of task demands that members have to resolve through a coordinated process that combine their cognitive, motivational/affective and behavioural resources.

In order to carry out efficiently the distributed tasks the crew members need to share an understanding and knowledge of how to control the technology and equipment with which they are interacting. This includes operating procedures, limitations and likely failures.

It is also important that crew members understand the task at hand and how to carry it on. This is shared knowledge about what information is important and how different types of information must be combined to give meaning. It is also important for the crew members to understand the dynamics of the environment and how this impacts on their tasks. This includes task procedures, task strategies, environmental constraints, likely contingencies and scenarios.

Each team member has to understand his/her role in the overall task, what they as an individual team member contribute and how this is accomplished. When facing a task they are not experts in, crew members are forced to communicate more in order to learn the new elements in the task they as a team must adapt to.

6.2.2.5 Knowledge of importance of respect for team work

Encouraging mutual respect at the work place will help to:

- reduce workplace stress, conflict and problems. An increase in workplace respect will help to improve communication between colleagues, increase teamwork and reduce stress as peace in the workplace;
- increase productivity, knowledge and understanding. As mutual understanding and respect increase, the exchange of ideas will rise which will increase company knowledge and innovation. Reducing the amount of pettiness and workplace politics will also assist in increasing productivity.

Additionally, the company will experience a more positive culture and an increase in employee satisfaction and a decrease in turnover. Respect in the workplace is vital, and it is not solely the responsibility of your employees. Respect is a very important contributor to forming a positive work culture. There are many ways that leaders and employees can demonstrate respect to colleagues.

All staff members should:

- Effectively manage their anger. Controlling anger is important when in a professional work environment. Leaders and employees need to learn to let the little things go. Urge employees to avoid getting fixated and annoyed with things out of their control. Instead, they should learn to understand their triggers; maybe there is a particular provoking colleague or situation that gets them worked up;
- Always communicate in a polite manner. Rude and abrasive discourse between colleagues will likely harm the positive workplace culture that you are striving for. No one wants to come to work if their colleagues are going to degrade, belittle and insult them. As a result, it should strive to incite a polite and positive working atmosphere;
- Encourage and help each other. Improving their communication skills is step one. Once the employees learn to partake in respectful discourse, they will likely feel more confident and encouraged to share ideas and thoughts;
- Avoid judging their peers. Judging people is an easy way to destroy a positive workplace. It stops employees getting to know each other and can result in anger and aggravation. Encourage the employees to get to know each other instead and so it start to develop a more peaceful atmosphere.

6.2.2.6 Ability to respect sexually-related and cultural differences and to report related problems including mobbing and (sexual) harassment

The term "gender difference" would refer to those average group differences between men and women that are likely due to sexually monomorphic psychological adaptations combined with culturally dimorphic socialization.

Gender diversity in the workplace is the equal treatment and acceptance of both male and female employees in an organization. Diversity adds value to an organization due to the different viewpoints and backgrounds of diverse individuals.

A diversity approach to the workforce is founded on the premise that harnessing these differences will create a productive environment in which everyone feels that they are valued and their talents and skills are being used optimally, and that this contributes to meeting the organization's goal.

Building and maintaining a diverse workforce can itself embody the principles of equality and non-discrimination, helping to defuse prejudices and stereotypes and showing that a society free of discrimination is possible, effective and desirable.

Cultural difference involves the integrated and maintained system of socially acquired values, beliefs, and rules of conduct which impact the range of accepted behaviours distinguishable from one societal group to another.

10 Tips for Responding to Cultural Differences:

- Keep an Open Mind!
- Learn to Cope with Failure!
- Be Flexible!
- Maintain a Healthy Curiosity!
- Hold Positive and Realistic Expectations!
- Be Tolerant of Differences!
- Regard Others Positively!
- Be Good Guests!

Two patterns of **vessel board discrimination** can be identified:

Direct/open discrimination- the act of treating someone less favourable because of certain attributes they have or are perceived to have (e.g. denying women certain shipboard duties because of assumptions about her physical capabilities).

Indirect/hidden discrimination- occurs when an organization's practices, policies or procedures disadvantage people who share certain protected characteristics such as: age, sex, disability, sexual orientation (e.g. having an unwritten rule that says certain jobs within a company are only to be ever done by a particular ethnic group).

Discrimination at work can come in various forms, such as:

- Harassment - constantly picking on one particular member of the group;
- Sexual harassment- making unwanted advances of a sexual nature towards a particular person;
- Bullying -regularly joking about, shouting at or demeaning a particular employee;
- Stereotyping - pigeon-holing particular minority groups;
- Insensitivity- dismissing the concerns of persons who feel they are victims;
- Mobbing- to crowd around and jostle or annoy, especially in anger or excessive enthusiasm.

According to the European Parliament Report on measures to prevent and combat mobbing and sexual harassment at workplace, in public spaces, and political life in the EU (2018/2055 (INI)), sexual harassment and mobbing are two of the most extreme yet widespread forms of gender-based discrimination,

for which 90% of the victims are female. Up to 55% of women in the EU have been sexually harassed in the EU and one in ten women has been subjected to sexual harassment or stalking using new technologies. Often, in the workplace, sexual harassment and mobbing can be exacerbated by problems such as the working structure of a company or organization, incompetent management, social vulnerabilities of the target, a negative or hostile environment, and a culture which accepts or even inadvertently rewards harassment.

In terms of support, there is the difficulty of reporting harassment and mobbing. Too often, women and girls are afraid to report any kind of violence. They are afraid for many reasons, for example, because they are ashamed or afraid of not being believed, or at worst not being helped by the police or judicial authorities. In addition, as a great deal of sexual harassment occurs in the workplace and is perpetrated by superiors, colleagues or customers, women are also afraid of losing either their jobs or legitimate opportunities for career advancement. These are only some of the reasons why women may not report harassment.

One potential solution is to intensify compulsory training courses for police and judicial authorities. Another is to design clear, independent and safe procedures in the workplace, at universities or in schools, to allow women to feel free to report cases of violence or mobbing, without fear of retaliation. Sexual harassment and mobbing can have lasting damaging effects on the victims, including profound implications on psychological (anxiety and fear), and physical (bruising, wounds, and even death) health. The individual consequences of workplace harassment can vary from minor stress episodes to long-term sick leave, and may sometimes even be a cause of suicide.

6.2.3 Accept social responsibility, conditions of employment, individual rights and duties; acknowledge dangers of alcohol and drug abuse and adequately respond to misconduct and dangers

Knowledge and skills

6.2.3.1 Ability to identify misconduct and potential dangers

A risk assessment is simply an assessment of risk. It is an examination of a task or job that may be carried out on board to identify the presence of hazards that may cause harm to people, property or the environment.

The most Common Life-Threatening Accidents On Board vessels are:

- Man overboard;
- Enclosed space accidents;
- Electrical shock accidents;
- Machinery explosion;
- Mooring operations;
- Falling from height;
- Slips, falls and tripping;
- Fire.

No crew member wants to get hurt or suffer injuries while working on board the vessel. We all know it's a hostile working environment on board the vessel and no matter how many precautions are taken, accidents are bound to happen as a result of one main and common reason - human error.

A series of regulations has been introduced and implemented to ensure the safety and security of the crew members working on board the vessels. As crew member working on board the vessel, it is important to be aware of dangers and take extra precautions to avoid them.

6.2.3.2 Ability to proactively respond to misconduct and potential dangers

Crew members should participate in ensuring safe working conditions and should be encouraged to express views on working procedures adopted as they may affect safety and health, without fear of dismissal or other prejudicial measures.

Crew members should:

- Cooperate as closely as possible with the vessel owner in the application of the prescribed safety and health measures;
- Take care of their own safety and health and of the other persons who may be affected by their acts or omissions at work;
- Use and take care of personal protective equipment and clothing at their disposal and not misuse any means provided for their own protection or the protection of others;
- Report forthwith to their immediate supervisor any situation which they believe could pose a hazard and which they cannot properly deal with themselves;
- Comply with the prescribed safety and health measures;
- Participate in safety and health meetings.

The crew members should implement the safety and health policy and programme as delegated to them by the Boatmaster in a diligent and professional manner and demonstrate their full support for vessel safety.

6.2.3.3 Ability to work independently according to instructions

One of the foremost qualities employers look for in their employees is the ability to work independently. In this case the employer has to ensure to the worker know how to safely perform any task in his/her job, and must provide to the workers proper training. They must explain the job duties and show to the workers how to do them.

The worker should be able to explain and show how to do his/her duties to the supervisor. It is important that every worker understands their duties. The employer may not know that the one worker needs more training. It is important for workers do not perform any task until receiving proper training.

The more important issue it is to follow the procedures established on board the vessel for different works. Learn and apply safety rules and procedures. You are responsible for following all the steps of safety procedures in your job. This includes checking to make sure personal protective equipment (PPE) works properly; knowing how to use it; and making sure you use it. Don't leave your work site area unless your employer tells you. Other work areas may have hazards you don't know about, such as power lines, slippery floors or toxic chemicals.

If you see or have an incident, if work conditions become unsafe, or if you see unsafe work practices, report them to your supervisor immediately. Employers must make sure everyone knows what to do in an emergency; whether it is a fire alarm, power failure, or other situation. Employers must provide an emergency response plan that you must have easy access to and be familiar with.

One of the foremost qualities employers look for in their employees is the ability to work independently. Thus, when crafting your resume, this is a skill you will definitely want to highlight and emphasize wherever it is applicable and appropriate.

To work independently means:

- Becoming self-aware, self-monitoring and self-correcting;
- Knowing what you need to do;
- Taking the initiative rather than waiting to be told what to do;
- Doing what is asked to the best of your ability, without the need for external prodding, and working until the job is completed;
- Learning to work at a pace that you can sustain;
- Taking ownership of your mistakes without looking for excuses; and
- Refusing to let self-doubt or negative emotions due to negative past experiences take you off course.

6.2.3.4 Knowledge of individual workers' rights and duties

Every worker has the right to a safe workplace, but they also have responsibilities to keep their own workplaces safe.

Worker rights:

- To know about hazards in his/her workplace and how to deal with them:
 - What hazards exist on the worksite?
 - What are the safety procedures that reduce risk of injury?
 - Where are the emergency supplies?
 - What are the emergency procedures?

The answers on these questions have to be known BEFORE start working. The employee has the right to know how to do his/her work safely and properly, and the supervisor must make sure that the employees know all the hazards on a worksite, and how to deal with them. In addition the employees have the right and the responsibility to receive proper training to manage any risks of getting hurt.

- To participate in making his/her workplace safe. If the employees see something unsafe at his/her workplace they can have suggestions on how to make the workplace safer, they can tell to the supervisor all the safety problems on the workplace and have the right to participate in ensuring the safety at the workplace;
- To refuse unsafe work, if employee are not sure how to do it safely and properly.

6.2.3.5 Knowledge of the dangers of the use of alcohol and drugs in the working and social environment. (Awareness of police regulation rules and toxicology)

Alcohol abuse on the workplace can cause:

- Loss of productivity and poor performance;
- Lateness and absenteeism;
- Safety concerns;
- Bad behaviour or poor discipline;
- Av dverse effects on company image.

Alcohol can also cause resentment among employees who have to 'carry' colleagues whose work declines because of their drinking. Drinking even small amounts of alcohol before or while carrying out work that is 'safety critical', will also increase the risk of an accident.

Drug misuse at the workplace can be a serious problem not only for the misuser but also for the business where they work and, sometimes, for their co-workers. The possession of some drugs is illegal, exposing the misuser to the risk of criminal charges as well as causing harmful effects to their health. You could be breaking the law if you knowingly allow drug-related activities in your workplace and you fail to act. It is just as important to know the implications

to both your employees and business of not tackling drug misuse, particularly where safety is involved. All kinds of people are involved in drug misuse - they do not conform to any stereotype. A lot of people who are involved in drug misuse are in work.

What are the signs that someone is taking drugs?

If you are going to tackle drug misuse at work effectively, you may want to start by examining your own knowledge about the types of drugs available and the harmful effects they can have on the misuser and your business. So your first task will probably be to gather information to raise your awareness and that of your managers or supervisors. This can be a starting point but you may also want to approach some of the organisations listed in the 'What an employer can do?' page for useful reading material, educational videos and other information.

Drugs can affect the brain and the body in a number of ways. They can alter the way a person thinks, perceives and feels, and this can lead to either impaired judgement or concentration. Drug misuse can also bring about the neglect of general health and well-being. This may adversely influence performance at work, even when the misuse takes place outside the workplace.

6.2.3.6 Ability to identify dangers to safe craft operation related to alcohol and drugs

Any level of alcohol consumption or illegal drugs by crew members on board the vessel has implications for the safety of the vessel, the crew and any passengers. Even small quantities of alcohol have been shown to sufficiently impair crew member's fitness for duty and increase the risk of accidents. The consumption of alcohol on board vessel is being progressively phased out through strict regulations and screening. The majority of organizations enforce a non-alcohol policy on-board their vessels.

The adverse effects on personal health and general safety on board the vessel are also compelling reasons for avoiding not only alcohol consumption but also drug abuse. A crew member can expect little sympathy from their employer or the authorities if caught in possession of, or using, illegal substances.

Also, legislation with severe penalties, where drugs and alcohol are adjudged to have contributed to an accident, is being introduced worldwide on an increasing scale. Penalties imposed not only cover injuries to personnel and damage to property but also the enormous costs involved in preventing or cleaning-up damage to the environment.

Promoting Prevention

Any administration has the following responsibilities to protect the health and safety of people on board:

- Health checks and medical examinations: ensuring checks for drug and alcohol abuse are included in the seafarers' medical examination both on initial screening and during seafarers' periodic medical checks;
- Training & education: provide the support, guidance and expertise to assist the development of schemes to prepare trainers, the application of training and the education of seafarers and shore workers in the effects, symptoms and results of drug and alcohol abuse;
- Promoting and raising the profile of prevention: coordinate accident reports and provide risk assessment data and other information that may be used by the country's maritime industry to raise the profile of the subject and to promote the dangers posed by drug and alcohol abuse;
- Setting safety limits: prescription of a maximum blood alcohol level for crew members as a minimum safety standard and any other prohibitions on the consumption of drugs, including prescribed medications, or alcohol that can impair the ability of crew members or those on board engaged in safety sensitive operations;
- Provision of rehabilitation services: provide rehabilitation services for those crew members diagnosed as having or who have acknowledged a drug or alcohol abuse problem;
- Non-discrimination: develop and introduce legislation that ensures rehabilitated crew members, following an individual's successful completion of an approved treatment programme, are not discriminated against by employers;
- Declaring drug and alcohol abuse to be a medical condition: encourage those with drug and alcohol abuse problems to seek assistance thereby reducing health and safety risks to fellow seafarers on board vessels;
- Focal point: to act as a focal point for industry and to express and share the national views/experiences gained from prevention programmes at international level.

6.2.4 Plan, purchase and prepare simple meals



Knowledge and skills

6.2.4.1 Knowledge of the possibilities of food provision and of principles of healthy nutrition

Diet and nutrition

The ship owner and the Boatmaster of a vessel must ensure that food and drinking water are suitable in respect of quantity, nutritional value, quality and variety.

A good variety of food provides a healthy diet. Meals should provide a balance of carbohydrates, protein, fat, fibre, vitamins and minerals. Food should be prepared and cooked with minimum levels of salt, fat and sugar. As a general guide:

Carbohydrates are high energy food which includes: bread, potatoes, rice, pasta and breakfast cereals.

Proteins include: fish, meat, poultry, eggs, milk and other dairy products.

Vitamins and minerals are contained in fruits and vegetables, fresh, frozen, dried and canned included fruit juice.

Drinks as with food a balanced intake is important. Not too much sugar, caffeine and calories. Water, fruit juices and low-fat milk are all good alternatives.

Provisions should be made for any special needs because of religion, special dietary requirements, or customary dietary practices where certain rules or requirements in relation with some food or with the way food is prepared must be observed.

Catering staff should be aware of the dangers associated with food allergies. If a person with a food allergy inadvertently eats even a small amount of that food this can make them very ill or in extreme cases cause death. Some problem ingredients are: peanuts, nuts, gluten, fish, soya, celery, mustard, sesame seeds, sulphur dioxide.

This list is illustrative only as there are likely to be other ingredients that can cause adverse reactions in persons who are sensitive to them.

Provisioning a craft is an important responsibility.

Trying to predict where you will be able to restock after leaving a major port can be stressful. Having to plan what you and the crew members will eat for days, weeks and months in advance, is a major responsibility. Location, dietary requirements, facilities on board and how you cook all play an apart in how you stock on board. And there is no right way to provision or a magic list of "must have" foods.

A good place to start when provisioning is in the pantry. Non-perishable foods like canned goods, dry-stores and general pantry items have a long shelf life and can be bought well in advance of departing port relieving some of the last-minute anxiety.

Preserved foods have always been a necessary evil on a craft. Although quality pre-package foods are easy to find these days, shelf stable product can also be crammed with salt and other preservatives. It pays to take a few minutes to read labels and try to make not only convenient but healthy purchases. Lots of good quality food items can be preserved in glass because of their acidity and shouldn't be overlooked.

It is important do not forget about the everyday items like oil, vinegar, mustard, ketchup, sugar, butter, tea and coffee. Some of these things can be found in larger cans or bottles and decanted for use in the galley or, if spoilage is a concern, be sure to buy several containers that will easily fit in the fridge. Buying in bulk is great way to save money and cut down on packaging. The items like rice, sugar, cornmeal, powdered milk, pasta, dried beans etc. should be stored in airtight containers. Proper storage will prevent spoilage and bugs. This is also a good time to consider what you and your crew like snack on, as it is easy to toe at food on board, especially when on passage.

Shopping for meat can sometimes be the hardest and more expensive part of provisioning. Ordering larger cuts of beef, pork or lamb, and breaking them down yourself is a cost-effective way to buy meat. Doing same basic butchering yourself allows you to control portion sizes and reduce waste. The same rule can be applied for fowl. Fresh fruits and vegetables are the last things to stock up on before leaving port. Markets are also the best place to get the fresh eggs, which can keep to a month unrefrigerated. When we hear the word provisioning, we automatically think on foodstuffs, but there are a host of other consumables that have to be considered, water is very important. Know your tankage and your replenishment methods and before leaving on an extended voyage, pay attention to your weekly eater consumption. These will determine if you need to stock extra water on board. It is important to having at least some bottled water for emergencies.

The buying part of provisioning is only half the battle, once back on board you still need to stow all that booty. Make sure you have enough time to unpack and put everything away properly without the pressure of everyday duties.

6.2.4.2 Ability to prepare simple meals in keeping with rules of hygiene

Health and hygiene

Catering staff should be properly trained in food safety and personal hygiene, as they are responsible for ensuring that high standards of personal hygiene and cleanliness are maintained at all times through the galley, pantry and mess rooms. For food preparation the following requirements have to be taken into consideration:

- There should be no smoking in galleys, pantries, store rooms or other places where the food is prepared or stores;
- Hands and fingernails should be washed before handling food using a dedicated hand basin, a bacterial liquid soap from a dispenser and disposable towels. It is important to thoroughly wash and dry hands after using the toilet, blowing your nose or handling refuse or contaminated food. An alcohol gel may be used to supplement the use of soap and water;
- All cuts, however small, should be reported immediately and first-aid attention provided to prevent infection;
- An open cut, burn or abrasion should be covered with a blue waterproof dressing which must be changed regularly. Anyone with a septic cut or a boil etc. should stop working with food until it is completely healed. Illness, coughs and colds, rashes or spots, however mild, should be reported immediately when the symptoms appear;
- A person suffering from diarrhoea and/or vomiting, which may be signs of food poisoning or a sickness bug, should not work in food-handling area until medical clearance has been given;
- Catering staff should wear clean protective clothing, including appropriate protective gloves if necessary, when handing and preparing meals;
- Catering staff should not wear jewellery, apart from a plain wedding band;
- The cleanliness of all food, crockery, cutlery, linen, utensils, equipment and storage is vital. Cracked or chipped crockery and glassware should not be used. Foodstuffs that may come into contact with broken glass or broken crockery should be thrown away;
- Fresh fruits and salad should be thoroughly washed in fresh water before being eaten;
- Foodstuffs and drinking water should not be stored where germs can thrive. Frozen food must be defrosted in controlled conditions. Food should be prevented from sitting in the thaw liquid by placing it on grids in a container or on a shelf. Frozen food that has been defrosted is not to be refrozen;
- The risks of cross contamination should be eliminated by thoroughly stripping and cleaning the relevant parts of equipment when successive different foods are to be used (especially raw and cooked foods). It is important to wash hands after handling raw meat, fish, poultry or vegetables;

- Raw food should be kept apart from cooked food or food that requires no further treatment before consumption (e.g. milk). Separate refrigerators are preferred although, if stored in the same unit, the raw food must always be placed at the bottom to avoid drips contaminating ready prepared food. Food should also be covered to prevent drying out, cross contamination and adsorption of odour;
- Separate work surfaces, chopping board and utensils should be set aside for the preparation of raw meat and must be used for the preparation of foods that will be eaten without further cooking. Colour coding is an established way to ensure separation between the two activities;
- Ensure all food is kept at the correct temperature to prevent the multiplication of bacteria;
- Crockery and glassware should not be left submerged in washing up where it may easily be broken and cause injury. Such items should be washed individually as should knives and any utensils or implements with sharp edges. Crockery, glassware and utensils should preferably be washed in a dishwasher, where much higher temperatures can be achieved compared with hand washing.

Some domestic cleaning substances contain bleach (sodium hypochlorite) or caustic soda (sodium hydroxide) whilst some disinfectants contain carbolic acid (phenol). These substances can burn the skin and they are poisonous if swallowed. They should be treated with caution and should not be mixed together or used at more than recommended strength. Inadvertent contact with toxic chemicals or other harmful substances should be reported immediately and the appropriate remedial action taken. Cleaning substances and materials should be stored in a suitable locker/cupboard separate from food-handling areas. Wherever possible, cleaning products that are not injurious to individuals or the environment should be used.

Food waste, empty food containers and other garbage are major sources of pollution and disease and should be placed in proper covered storage facilities safely away from foodstuffs.

Inspection

Accommodation spaces, including the galley, must be kept clean and proper. Cleaning must take place on a daily basis. They must be used for goods or stores belonging to the one (s) for whom the room is intended.

The Boatmaster, together with one or more crewmembers, inspect all accommodation spaces at intervals of no more than one week. The result hereof must be entered in the vessel's logbook.

5. EFFECT OF THE HUMAN ELEMENT ON SUSTAINABLE SHIPPING

The human activities of deck crew members on board of vessels have a direct relation with the sustainability in Inland Shipping. Due to the uniformization of training and conformity with Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation, there will be an increase of navigational safety.

Different factors affect the development of sustainability in shipping, from regulatory to socio-economic factors, market related aspects and human factors, which all together contribute in different ways to the development of these three pillars. Since many different stakeholders are involved in the process, it follows that one of the main factors in supporting Sustainable Shipping is the understanding of all parties' concerns, needs and expectations.

The shipping industry is run by people, for people. People design ships, build them, own them, crew them, maintain them, repair them and salvage them. People regulate them, survey them, underwrite them and investigate them when things go wrong. While these people vary in all sorts of ways, they are all, nevertheless, people - with the same basic set of capabilities and vulnerabilities.

Humans are not simply an element like the weather. They are at the very centre of the shipping enterprise. They are the secret of its successes and the victims of its failures. It is human nature that drives what happens every day at work - from the routine tasks of a ship's rating, right through to policy decisions.

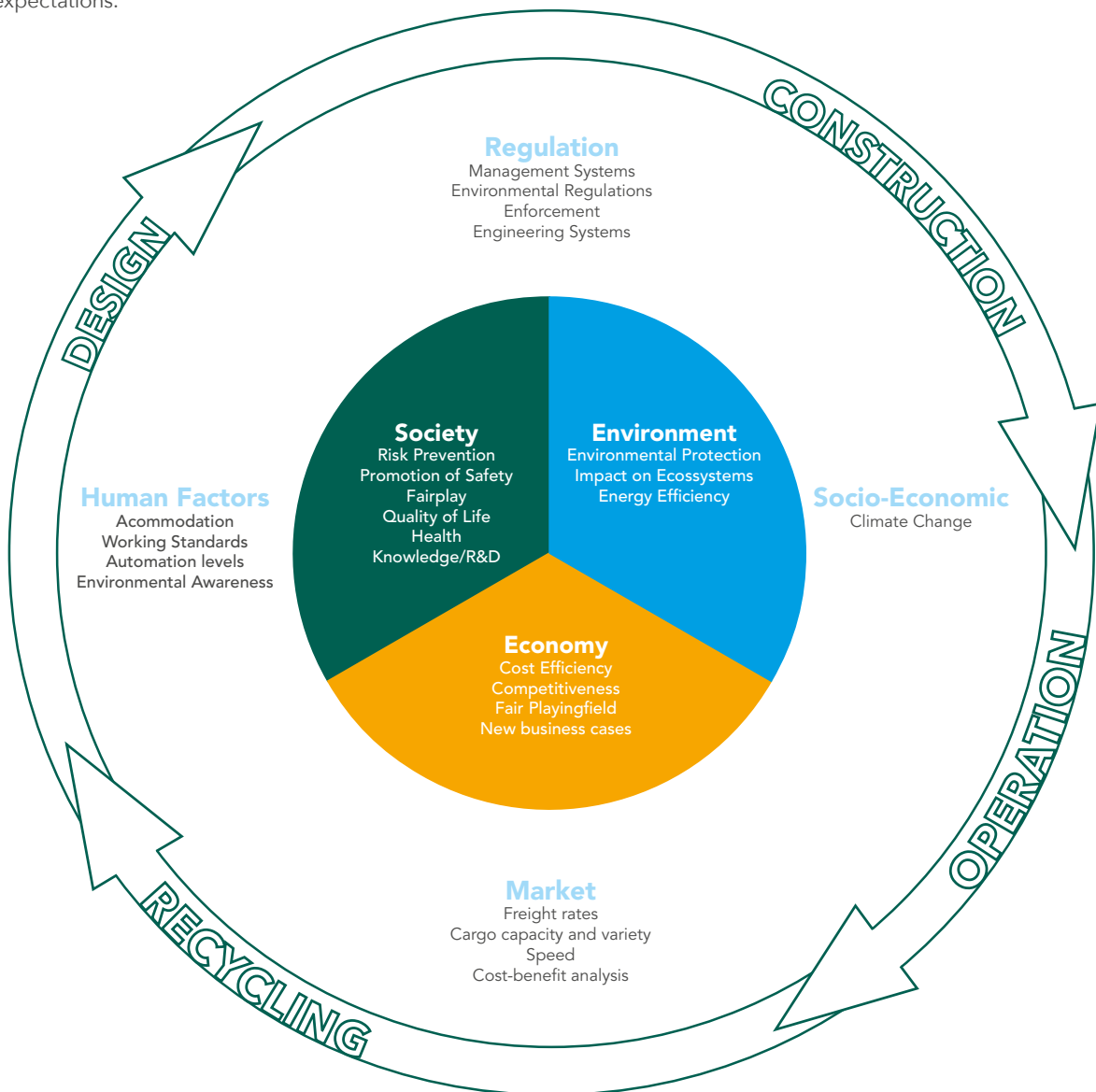


Figure 1 <https://www.maintworld.com/R-D/Application-of-European-Qualification-Framework-EQF-in-Maintenance>

6. REFERENCE TO NQF, EQF, ECTS

Nowadays, the European Union (EU) consists of 27 member states, and each state has got a different education system. Therefore, the European Commission (EC) prepared the **European Qualifications Framework (EQF)** because it wanted to:

- Make national qualifications more readable across Europe;
- Harmonize national qualification systems of different countries to a common European reference framework;
- Promote workers' and learners' mobility between the countries of the EU and to facilitate their lifelong learning.

The EQF system has got eight reference levels (Figure 1), each level describes what a learner has to know, understand and be able to do¹.

Inland waterway transport (IWT) plays a relevant role in the EU in cargo exchange, especially in the international scale on the network of the European waterways. On one hand the transport is still more economical than any other mode of transport for many types of cargo, particularly such as bulk, general, liquid cargo and containers. On the other hand, it is the friendliest mode to the environment.

EQF LEVEL 8	ACADEMIC LEVEL	DOCTORATE	MAINTENANCE MANAGERS AND SUPERVISORS VOCATIONAL TEACHERS
EQF LEVEL 7		MASTER	
EQF LEVEL 6	POST UPPER SECONDARY LEVEL	BACHELOR	
EQF LEVEL 5		HIGHER NATIONAL DIPLOMA	
EQF LEVEL 4	UPPER SECONDARY LEVEL	HIGHER NATIONAL CERTIFICATE, UPPER SECONDARY DIPLOMA	MAINTENANCE MECHANICS
EQF LEVEL 3	SECONDARY LEVEL	SECONDARY DIPLOMA OR VOCATIONAL DIPLOMA	
EQF LEVEL 2	PRIMARY LEVEL	SECONDARY SCHOOL WITH NO DIPLOMA	
EQF LEVEL 1		PRIMARY SCHOOL	

Figure 2 EQF levels compared with achieved education and maintenance personnel positions

1 <https://www.maintworld.com/R-D/Application-of-European-Qualification-Framework-EQF-in-Maintenance>, 1 December 2016

The field of IWT includes various job positions that are related to its segments such as vessels, ports and waterways. Project IWTCOMP focused on EQF and the job qualifications in IWT in 4 countries (Germany, the Netherlands, Romania and Slovakia) because each country uses a different education system.

In all the EU countries involved in the project there are organisations dedicated to the use of EQF in the national context.

The IWTCOMP project outlined the fact that regarding international sectoral qualifications there is (still) not an agreement on the approach and international process of comparing the EQF levels via the National QF's (NQF's). Some member states do not want to adjust their procedures and this means all member states all still have their own NQF procedure.

In conclusion, although the EQF system in the field of inland water transport has been accepted in all EU countries, this system EQF is not used by all countries. This is due to the reason that some institutes have to focus on the professional competences based on national and international legislation. The curricula at schools, universities and training centres are prepared according to the international or national standards and these curricula are approved/or not by national designated authorities in each country. The educational programmes developed in COMPETING project can be considered to fit the level 2 for Operational level and 3 for Management level.

ANNEX 1

Reference documents

- Human Resource Management and Social Responsibility on Board- Management level- Course Compendium- 2018- Danube SKILLS project;
- Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation;
- Delegated Directive (EU) 2020/12 supplementing Directive (EU) 2017/2397 as regards the standards for competences and corresponding knowledge and skills, for the practical examinations, for the approval of simulators and for medical fitness;
- How to prevent and mitigate fatigue- Booklet SKULD Guide, 2013- www.skuld.com;
- Standardized UNECE Vocabulary for Radio-Connections in Inland Navigation- UNECE, 2009;
- RIVERSPEAK- EDINNA Standard Inland Navigation Communication Phrases, 2017;
- Digital Inland Waterway Area-Towards a Digital Inland Waterway Area and Digital Multimodal Nodes, European Commission, 2017;
- Inland ECDIS Standard, Danube Commission, 2019;
- International Standard for Tracking and Tracing on Inland Waterways (VTT)- UNECE, 2007;
- Vessel Tracking and Tracing Standard for Inland Navigation, Edition 1.2/2013- CCNR;
- Commission Regulation (EC) No. 415/2007 concerning the technical specifications for vessel tracking and tracing system, modified by Implementing Regulation (EU) No. 689/2012, as amended;
- Regional Arrangement on the Radio-communication Service for Inland Waterways- RAINWAT- 2012;
- Guidelines and recommendations For River information services- UNECE 2018;
- Inland AID Shipborne Equipment- Test Standard Inland AIS- CESNI 2017, Edition 2.0;
- Living and working conditions in inland navigation in Europe- ILO Working Paper No. 297, 2013;
- <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32017L2397>

Exercises, case studies, practical scenarios

I. Exercises

1. What the abbreviation ES-QIN means?

ES-QIN means European Standards for Qualifications in Inland Navigation, and was approved by the Delegated Directive (EU) 2020/12 supplementing Directive (EU) 2017/2397 of the European Parliament and of the Council as regards the standard for competences and corresponding knowledge and skills, for the practical examinations, for the approval of simulators and for medical fitness.

2. List the more prominent systems and devices for internal communication that you use on board the vessel

The more prominent systems and devices for internal communications or terminal communications are:

- Cellular telephone;
- Satellite communications systems;
- Hand- held radios, pagers;
- Intercom Systems;
- Public address system.

3. What are the EU Regulation for the processing of personal data, and the main principles of processing of personal data?

The protection of natural person with regard to the processing of personal data and on the free movement of such data, are documented in the EU Regulation 2016/679 of the European Parliament and of the Council.

According to EU Regulation 2016/679, personal data shall be:

- Processed lawfully, fairly and in a transparent manner in relation to the data subject;
- Collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes;
- Adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed;
- Accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay;
- Kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed;

- processed in a manner that ensure appropriate security of the personal data, including protection against unauthorized or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organizational measures.

4. Give few examples of human errors that led to accidents on board the vessel

- Fatigue due to lack of sleep / Physical problems;
- Fatigue due to excessive workload;
- Adverse effects of medication;
- Alcohol;
- Drugs;
- Failure to communicate among crew members (misunderstanding, inappropriately expressed orders, language, ...);
- Communication error among crew members due to personal problems;
- Communication error with other crafts;
- Communication error with ground personnel;
- Distraction during the watch caused by performing several tasks at the same time;
- Distraction during the watch caused by non-work tasks (telephone, etc.);
- Navigation error due to poor technical training or inexperience;
- Navigation error due to misuse of vessel equipment;
- Not following the vessels procedures;
- Ignorance of the procedures;
- Ignorance of the use of craft equipment;
- Ignorance of regulations;
- Ignorance of working language.

5. How many women work on board of your vessel/company as crew members on board inland navigation vessels?

6. List some foods from the category of carbohydrates

High-energy food which includes: Bread, potatoes, rice, pasta and breakfast cereals.

II. Role play

1. Using radiotelephone devices, initiate vessel-to-vessel communication by participation of the trainees.
2. Using Riverspeak vocabulary, exercises with the trainees, the communication on board the vessel.

III. Communication scenarios

1. Flooding/hull failure

Action
Call Boatmaster
Sound the general emergency alarm
Close all watertight doors
Muster crew to damage control stations
Conduct damage control procedures*
In case of flood in: <ul style="list-style-type: none">• 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

2. Fire

Action
Call Boatmaster
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: <ul style="list-style-type: none">• 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

3. Man overboard (MOB)

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 Boatmaster

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

4. Stranding or grounding

Action
Call Boatmaster
Sound general emergency alarm
Close watertight doors and automatic fire doors
Manoeuvre as appropriate/stop engines)
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

5. Collision

Action

Call Boatmaster

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

6. Steering failure

Action

Call Boatmaster

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

7. Information service, Navigational warnings

Unknown object(s) in position (.....).

Unlit derelict (abandoned) vessel adrift in vicinity (.....) at (..... date and time).

Dangerous wreck / obstruction located in position (.....) marked by (.....type of buoy).

Hazardous mine (bomb) adrift in vicinity (.....) at (.....date and time).

Uncharted reef / rock / shoal reported in position (.....).

Pipeline is leaking gas / oil in position (.....). Wide berth requested.

Depth of water not sufficient in position (.....).

Navigation closed in area (.....).

8. Meteorological warnings

Gale warning or storm warning was issued at (..... UTC) starting at (.....UTC)

Gale warning or storm warning. Wind at (.....UTC) in (.....met. area) from (directioncardinal/half cardinal points) and force (Beaufort) backing or veering to (.....cardinal/half cardinal points).

Storm warning was issued at (.....UTC) starting at (.....UTC).

Storm warning at (.....UTC).

Present movement (.....cardinal points) at (.....knots).

Winds of (..... knots) within radius of (.....nautical miles) of centre.

Water over (..... metres). Further information on VHF (Channel.....) / (frequency.....) at (..... UTC)

IV. Case studies

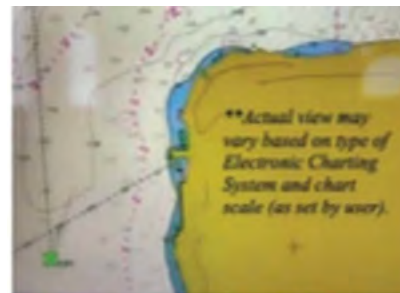
CASE-STUDY 1

Incorrect AIS Information Leads To Collision of Vessels And Fatalities

In the early morning, before sunrise, two towing vessels were approaching an almost 90° bend on a river in opposite directions. Neither vessel was broadcasting the correct total length of their vessel and tow to other AIS users. The first vessel's AIS broadcast showed 22 meters, yet the overall length of the vessel and its two-barge tow was 205 meters.

The second vessel's AIS broadcast showed 61 meters, but the overall length of the vessel and its 40-barge tow was 488 meters. As the vessels rounded the bend and completed their turns, they collided, causing the down-bound towing vessel to capsize and sink with several fatalities.

The accurate display of a vessel's full length becomes particularly important in situations that prevent vessels from seeing each other until they are in very close proximity.



488m tug and tow. Above, incorrect total length. Below, correct total length.

Reference: nautinst.org

Lessons learned

- AIS is a valuable tool that shares critical vessel information with other vessel operators. However, the usefulness of AIS is dependent on accurate vessel data entry;
- While correct overall length is important for all vessels, tug and tow operations are particularly vulnerable to errors due to the changing value of their total length with each job;
- Incorrect AIS information will give a false mental picture to other vessel operators in the vicinity and can contribute to accidents.

Draft model examination at operational level - communication (annex to cesni (21) 25)

The draft standard for the practical examination OL sets the framework for practical examinations on OL. To provide guidance to authorities on how to conduct an exam in this regard, the CESNI/QP working group has decided to develop a model examination in accordance with ES-QIN.

In this draft standards practical examination for OL, knowledge and skills elements that shall be tested during the practical examination are specified. Listed are all elements described as describes in the tables of competence standards on OL as “ability”. Skills are usually tested during a practical examination. However, some abilities have knowledge elements. In this model examination, the term “examination element” is used to indicate both skills and knowledge.

The model examination is carried out on the assumption that the applicant has passed the knowledge elements (theoretical examination) from the standards for competence on OL as well as the assessment of the skills that for practical reasons were not assessed on board the craft during this practical part prior to the model examination.

For practical reasons, the exam is divided into four parts:

Part 1: Navigation

- Part 1a Steering the craft (including applicable regulations);
- Part 1b Assisting with anchor operations;
- Part 1c Mooring, unmooring and docking operations for pushed convoys / coupled convoys from deck, including operation and maintenance;
- Part 1d Loading and unloading.

Part 2: Sailing the craft

Skills shall be demonstrated on an approved simulator or a craft. Experts recommend the use of a craft of more than 38 meters length.

Part 3: Security and communication

- Part 3a Safety and environment;
- Part 3b Communication.

Part 4: Technology and maintenance

- Part 4a Propulsion engine / machines;
- Part 4b Marine engineering, electricity, electronics, measurement and control technology;
- Part 4c Maintenance and repair.

For this Course Manual the Part 3 has to be taken into account.

The examination elements are listed in the table below:

- ★ All examination elements with a red star may be tested prior or during a practical examination or in a written assignment.

No.	Competence	Examination elements	Part	Cat.
52	6.1.4 (2)	Follow instructions for data protection;	3b	II
53	6.1.5 (2)	Present facts using technical terms;	3b	II
58	6.2.4 (2)	Plan, purchase and prepare simple meals;	3a	II

Other examination elements that shall be tested during a practical exam which do not belong to any of the aforementioned groups:

No.	Competence	Examination elements	Part	Cat.
49	6.1.1 (2+4)	Use information and communication systems;	3b	II
50	6.1.2 (2)	Solve different tasks with the help of different types of digital devices, information services (such as River Information Services (RIS)) and communication systems;	3b	II
51	6.1.3 (2)	Collect and store data including backup and data update;	3b	II
54	6.1.6 (2)	Obtain nautical and technical information to maintain safety of navigation;	3b	I
55	6.2.1 (2+4)	Follow instructions and communicate with others in terms of shipboard duties;	3b	II
56	6.2.2 (2+3+4+6)	Contribute to good social relations and cooperate with others on board;	3a	II
57	6.2.3 (1+2+3+6)	Accept social responsibility, conditions of employment, individual rights and duties; acknowledge dangers of alcohol and drug abuse and adequately respond to misconduct and dangers;	3a	II

Examination elements tested prior to practical examination during an approved training programme. The applicant shall master the examination elements marked with red star ★

No.	Competence	Examination elements	Part	Cat.
52	6.1.4 (2)	Follow instructions for data protection;	3b ★	II
53	6.1.5 (2)	Present facts using technical terms;	3b ★	II
58	6.2.4 (2)	Plan, purchase and prepare simple meals;	3a ★	II

COMPETING

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