



# COURSE MANUAL

**NAVIGATION**  
*OPERATIONAL LEVEL*



**PROJECT:** COMPETING  
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**AUTHOR:** Maritieme Academie Harlingen  
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# PREFACE

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

This Course Manual will be a useful transnational training tool for conducting the Train the Trainer session and is intended to assist education and training providers and their teaching staff in organising and introducing new education & training programmes, or in enhancing, updating and supplementing existing didactic 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 Navigation has been designed so as to support the preparation, organisation 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 Directive (EU) 2017/2397 as regards the standards of competences and corresponding knowledge and skills, for the practical examinations, for the approval of simulators and for medical fitness, being an essential tool for crew members at Operational Level, to be able to assist the management of the craft in situations of manoeuvring and handling on all types of waterways and all types of ports.



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# 1. GENERAL INFORMATION

<b>1 Aim</b>	Provide training to assist in the implementation of Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation and ES-QIN - Standards of competence - Navigation for crew members at the OL.
<b>2 Objective</b>	Provide training and practical guidance for trainees in order to be able to assist the management of the craft in situations of manoeuvring and handling a craft on inland waterways.
<b>3 Entry standards</b>	See Directive (EU) 2017/2397 - Annex 1.
<b>4 Course certificate</b>	On successful completion of the course, a document may be issued, stating that the holder graduated this learning module.
<b>5 Course intake limitation</b>	Admittance may be limited by the capacity of the educational infrastructure used for this learning module (i.e. in the simulation room max. 4 trainees, on board of the real/training craft 12 trainees, etc.).
<b>6 Staff requirements</b>	The trainer should meet the requirements of Directive (EU) 2017/2397, Art. 18.
<b>7 Training facilities, equipment and teaching aids</b>	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 real/training craft or full mission ship-handling simulators are mandatory.
<b>8 Learning outcomes</b>	<p><i>The boatman shall be able to assist the management of the craft in situations of manoeuvring and handling a craft on inland waterways. The boatman shall be able to do so on all types of waterways and all types of ports.</i></p> <p>At the end of the course the trainee shall be able to:</p> <ul style="list-style-type: none"><li>• Use required equipment on board for mooring, unmooring and hauling (towage) operations;</li><li>• Connect/disconnect push/barge combinations using required equipment and materials;</li><li>• Assist with anchor manoeuvres;</li><li>• Steer the craft under supervision and comply with helm orders, taking into account the influence of wind and currents;</li><li>• Consider relevant safety measures including the use of personal protective equipment;</li><li>• Use navigational aids and instruments under supervision;</li><li>• Undertake necessary actions for safety of navigation;</li><li>• Describe the characteristics of main European inland waterways, ports and terminals for voyage preparation;</li><li>• Respect the general provisions, signals, signs and marking system;</li><li>• Follow procedures while passing locks and bridges;</li><li>• Use system of traffic control.</li></ul>
<b>9 Assessment &amp; evaluation</b>	Minimum requirements for assessment & evaluation of the trainees for graduating from 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

This instructor manual provides guidance on the materials that are to be presented during the Navigation course OL Level, and has been arranged under the eleven Learning Outcomes (competences) identified in the course outline. The reference materials indicated may be supplemented by additional texts or materials at the discretion of the instructor.

The course outline and provisional timetable also provide 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 2.1.

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 materials 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 online or offline if required.

### 2.1 Lesson plan

This lesson plan is only 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.

### 2.2 Background materials

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

#### Competence 1.1.1 Assist with mooring, unmooring and hauling (towage) operations

Learning objective

- Knowledge of rope work, splicing and maintenance of ropes and wires. Names of hawsers on board and usage and reparation fenders;
- Knowledge of manoeuvring and communicating with the one who manoeuvres and the use of technical aids and hand gestures;
- Knowledge of manoeuvring and water movement around the vessel and how to calculate the water movement;
- Knowledge of sailing in the opposite directions;
- To show the skills of mooring and unmooring.

Learning outcomes

- Use required equipment on board for mooring, unmooring and hauling (towage) operations.

Required equipment

#### Lesson structure

Learning activity	Didactical method (ABC method)	Materials	Time

## 2.3 Practical activities

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

### (Simulator) exercises

Practical exercises on board a (training) vessel or in an applicable IWT ship handling simulator can be undertaken in order to give the candidates the opportunity to deepen and enhance their theoretical knowledge into practical skills. 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 assignments 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.

Annex 2 of this Course Manual presents a few exercises, case studies and practical scenarios which are useful for practical training and examination of the trainees.

The ETRB is the tool on which the students can be tested.

## 2.4 Classroom 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 real/training craft or full mission ship-handling simulators are mandatory.

## 2.5 Examination & assessment

According to Directive (EU) 2017/2397, Article 17, assessment of competences:

The Commission shall adopt delegated acts in accordance with Article 31 to supplement this Directive by laying down the standards for competences and corresponding knowledge and skills in compliance with the essential requirements set out in Annex II.2. Member States shall ensure that persons who apply for the documents referred to in Articles 4, 5 and 6 demonstrate, where applicable, that they meet the standards of competence referred to in paragraph 1 of this Article 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 program approved in accordance with Article 19.

The essential requirements set out in Annex II of Directive (EU) 2017/2397 for Navigation Operational Level are:

The boatman shall assist the management of the craft in situations of manoeuvring and handling a craft on inland waterways. The boatman shall be able to do so on all types of waterways and in all types of ports. In particular the boatman shall be able to:

- Assist in preparing the craft for sailing, in order to ensure a safe voyage in all circumstances;
- Assist with mooring and anchoring operations;
- Assist in the sailing and manoeuvring of the craft in a nautically safe and economical way.

To assess the progress and level of understanding of the students it is necessary to test the students in a formative way. The main goal of these tests is to give feedback to the student.

A standard for practical examination for Boatman is developed in CESNI QP.

The Illias platform provides examples of assessments for the separated competences for Navigation at Operational Level.

### 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 Directive (EU) 2017/2397:

1. 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);
2. For deck crew members other than boatmasters, the Union certificate of qualification and the service record book as referred to in Article 22 shall be presented in a single document;
3. By way of derogation from paragraph 1 of this Article, certificates held by persons involved in the operation of a craft, other than boatmasters, issued or recognised in accordance with Directive 2008/106/EC, and therefore in accordance with the STCW Convention, shall be valid on sea-going ships operating on inland waterways.

*In Directive (EU) 2017/2397 in Annex I the minimum requirements for certification as a boatman are as follows:*

Every applicant for a Union certificate of qualification shall:

- (a)
- Be at least 17 years of age;
  - Have completed an approved training programme, as referred to in Article 19, which was of 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

- (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 proof 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 the 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/>).

As already mentioned in Chapter 2, background materials and practical activities can be found in respectively Annex 1 and Annex 2 of this Course Manual. The background materials referenced can be used as additional documentation for the teachers to create their lessons and/or add more details. Annex 2 consists of suggestions and examples of exercises, case studies and/or practical scenarios.

Thematic content of the Course Manual for NAVIGATION - OL is presented in Annex 4 of this document if necessary, which is linked to the European Standard for Qualifications in Inland Navigation (ES-QIN), Part I, Chapter 1, Point 1 Navigation.<sup>1</sup>

### COMPETENCES OF NAVIGATION - OL

*The numbering of the chapters is in accordance with the Standards for competences for the Operational level - 1. NAVIGATION*

#### OL 1 - Navigation

**1.1 The boatman shall be able to assist the management of the craft in situations of manoeuvring and handling a craft on inland waterways. The boatman shall be able to do so, on all types of waterways and all types of ports.**

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<sup>1</sup> <https://www.cesni.eu/en/standards-and-explanatory-notice/#02>

Competence	Knowledge and skills
<p>1. Assist with mooring, unmooring and hauling (towage) operations;</p>	<ol style="list-style-type: none"> <li>1. Knowledge of equipment, material and procedures used on board for mooring, unmooring and hauling (towage) operations;</li> <li>2. Ability to use required equipment on board, e.g. bollards and winches for mooring and unmooring and hauling manoeuvres;</li> <li>3. Ability to use materials available on board such as ropes and wires considering relevant safety measures including the use of personal protective and rescue equipment;</li> <li>4. Ability to communicate with the wheelhouse using intercom communication systems and hand signals;</li> <li>5. Knowledge of the effects of water movement around craft and local effects on sailing circumstances including the effects of trim, shallow water relating to craft's draught;</li> <li>6. Knowledge of the water movement affecting the craft during manoeuvring, including the interaction effects when two craft pass or overtake each other in narrow fairways, and the interaction effects on a craft moored alongside when another craft proceeds in the fairway and passes at a short distance.</li> </ol>
<p>2. Assist with coupling operations of push/barge combinations;</p>	<ol style="list-style-type: none"> <li>1. Knowledge of equipment, material and procedures used for coupling operations;</li> <li>2. Ability to connect and disconnect push/barge combinations using required equipment and materials;</li> <li>3. Knowledge of safe working rules including the use of personal protective and rescue equipment;</li> <li>4. Ability to apply safe working rules and to communicate with crew members involved.</li> </ol>
<p>3. Assist with anchoring operations</p>	<ol style="list-style-type: none"> <li>1. Knowledge of anchoring equipment, materials and procedures in various circumstances;</li> <li>2. Ability to assist with anchor manoeuvres, e.g. prepare anchor equipment for anchoring operations, to present anchor, to give sufficient amount of cable or chain to veer initially, to determine when the anchor holds the craft at its position (anchor bearing), to secure anchors on the completion of anchoring, to use dragging anchors in various manoeuvres and to handle the anchor signs;</li> <li>3. Knowledge of safe working rules including the use of personal protective and rescue equipment.</li> </ol>
<p>4. Steer the craft complying with helm orders, using steering gear properly;</p>	<ol style="list-style-type: none"> <li>1. Knowledge of functions and types of various propulsion and steering systems;</li> <li>2. Ability to steer craft under supervision and comply with helm orders.</li> </ol>
<p>5. Steer the craft complying with helm orders, taking the influence of wind and current into account;</p>	<ol style="list-style-type: none"> <li>1. Knowledge of the influence of wind and current on sailing and manoeuvring;</li> <li>2. Ability to steer the craft under supervision taking into account the influence of wind on sailing and manoeuvres in waterways with or without currents and with wind characteristics.</li> </ol>
<p>6. Use navigational aids and instruments under supervision;</p>	<ol style="list-style-type: none"> <li>1. Knowledge of the navigation aids and instruments such as rudder indicator, radar, rate of turn indicator, sailing speed indicator;</li> <li>2. Ability to use the information provided by navigation aids such as light and buoyage system and charts;</li> <li>3. Ability to use navigation instruments such as compass, rate of turn indicator and sailing speed indicator.</li> </ol>
<p>7. Undertake necessary actions for safety of navigation</p>	<ol style="list-style-type: none"> <li>1. Knowledge of safety regulations and checklists to follow in dangerous and emergency situations;</li> <li>2. Ability to recognise and respond to unsafe situations and follow-up actions according to the safety regulations;</li> <li>3. Ability to immediately warn the craft's management;</li> <li>4. Ability to use personal protective and rescue equipment;</li> <li>5. Knowledge of verification commissioned by the supervisor regarding the presence, usefulness, watertightness and securing of the craft and its equipment;</li> <li>6. Ability to execute the work according to the checklist on deck and living quarters such as waterproofing and securing of the hatches and holds;</li> <li>7. Ability to execute the work according to the checklist in the engine room; to store and secure loose items, to fill the day service tanks and check vents.</li> </ol>

Competence	Knowledge and skills
<p><b>8. Describe the characteristics of main European inland waterways, ports and terminals for voyage preparation and steering;</b></p>	<ol style="list-style-type: none"> <li>1. Knowledge of the most important national and international inland waterways;</li> <li>2. Knowledge of the main ports and terminals located in the European inland waterway transport (IWT) network;</li> <li>3. Knowledge of the influence of engineering structures, waterway profiles and protection works on navigation;</li> <li>4. Knowledge of the classification characteristics of rivers, canals and inland waterways of maritime character: bottom width, bank type, bank protection, water level, water movement, vertical and horizontal bridge clearance and depth;</li> <li>5. Knowledge of navigational aids and instruments needed when navigating on inland waterways with maritime character;</li> <li>6. Ability to explain the characteristics of various types of inland waterways for voyage preparation and steering.</li> </ol>
<p><b>9. Respect the general provisions, signals, signs and marking system</b></p>	<ol style="list-style-type: none"> <li>1. Knowledge of agreed set of rules applicable in inland navigation and police regulations applying to the relevant inland waterway;</li> <li>2. Ability to handle and maintain the craft's day and night marking system, signs and sound signals;</li> <li>3. Knowledge of the buoyage and marking system SIGNI (Signalisation de voies de Navigation Intérieure) and IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) part A.</li> </ol>
<p><b>10. Follow procedures while passing locks and bridges;</b></p>	<ol style="list-style-type: none"> <li>1. Knowledge of the shape, layout and facilities of locks and bridges, lockage (locking process), types of locks, bollards and stairs, etc.;</li> <li>2. Ability to apply procedures during approach, entering, locking and leaving the lock or bridge.</li> </ol>
<p><b>11. Use systems of traffic control</b></p>	<ol style="list-style-type: none"> <li>1. Knowledge of various traffic control systems in use such as day and night signs on locks, weirs and bridges;</li> <li>2. Ability to identify day and night signs on locks, weirs and bridges and to follow instructions of the competent authority such as bridge- and lockkeepers and traffic control operators;</li> <li>3. Ability to use radio equipment in emergency situations;</li> <li>4. Knowledge of Inland Automatic Identification System (AIS) and Inland Electronic Chart and Display Information System (ECDIS).</li> </ol>

## 5. EFFECT ON THE HUMAN ELEMENT ON SUSTAINABLE SHIPPING

The human activities of deck crews on board of ships have a direct relation with sustainability in inland shipping. Due to the standardisation of training and conformity with Directive (EU) 2017/2397 there will be an increase in 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.

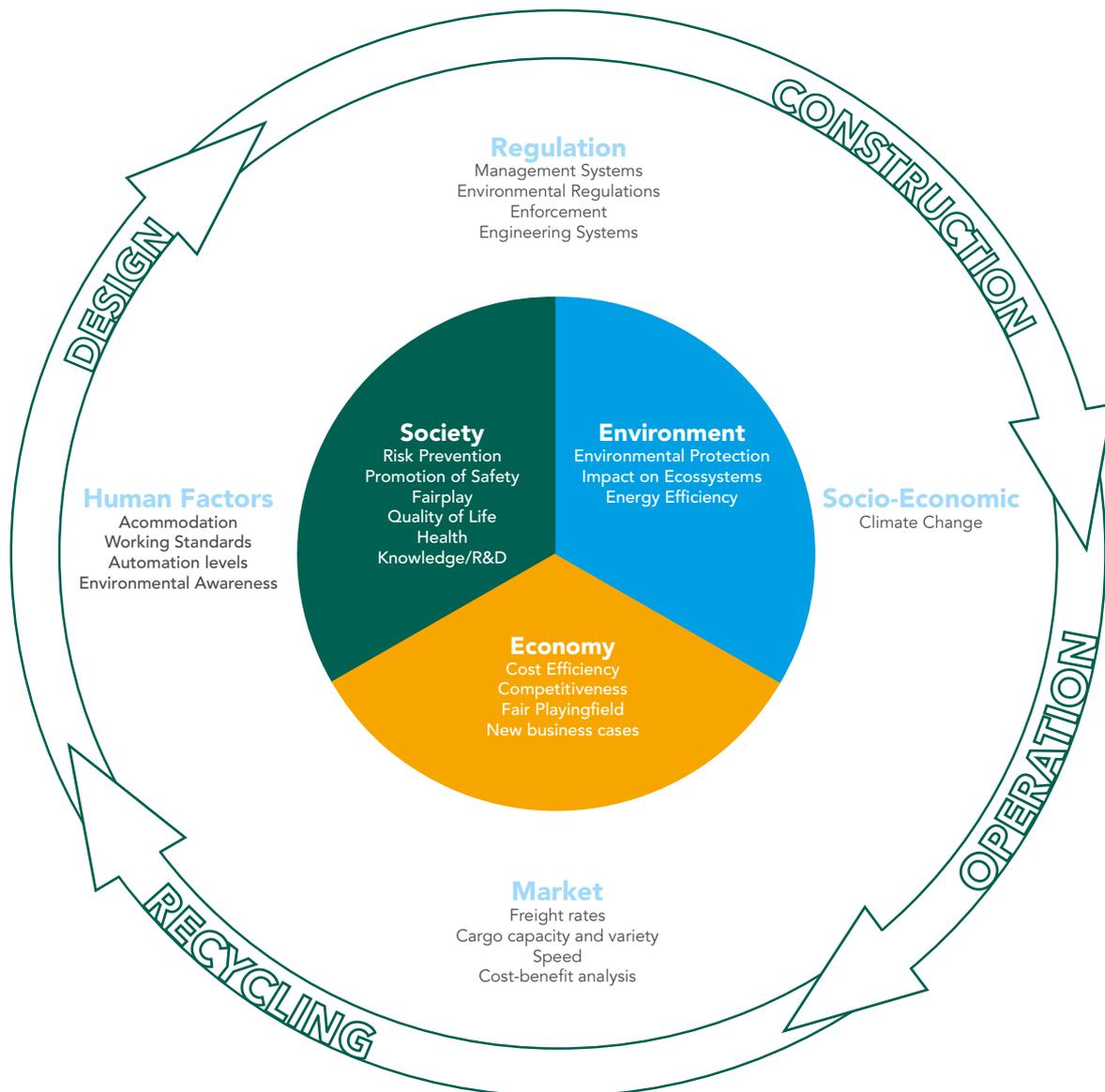


Figure 1 <https://www.maintworld.com/R-D/Application-of-European-Qualification-Framework-EQF-in-Maintenance>

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.

The eight aspects of human nature are:

#### **1. People actively make sense of things**

What's obvious to you may be far from apparent to somebody else. We explain how it is that most of what you see and understand is down to you and your expectations, rather than a response to 'what's out there'. The key problem is ensuring that the sense you make of things is enough for you to deal effectively with the reality of a continuously unfolding situation – a situation that you must also share with your colleagues.

#### **2. People take risks**

Everybody takes risks all the time. In a world that is essentially uncertain, this is not only normal but inescapable. We explain how the human perception of risk is quite different from the probability with which events actually occur. The key problem is in ensuring that your own perception of risk maps well onto the world with which you are interacting.

#### **3. People make decisions**

We explain the difference between how people think they make decisions and how they actually do it – and how experts' decision making is quite different from the way they did it when they were learning. We also explain why experience does not always lead to expertise, but that expertise always requires experience – and lots of it. The key problem is to understand what the components of a good decision are, and how to recognise when you are about to make a bad one.

#### **4. People make mistakes**

A fundamental human strength depends directly on the ability to make, and then recover from, mistakes. Without error there can be no learning or development. And without these, organisations cannot achieve their goals. The important aspect is in ensuring that potentially harmful or expensive mistakes are prevented, caught or minimised before they have a chance to get far enough to matter. We explain how this depends as much on organisational culture as on individual competence.

#### **5. People get tired and stressed**

We explain the causes and consequences of fatigue and stress and explain what you can do to avoid them or lessen their impact. We also explain why workload turns out to be as much to do with your own experience, as the actual demands placed on you by the job.

#### **6. People learn and develop**

People learn all the time. They can't stop themselves. The main problem is in ensuring that they learn the right things at the right time. People also have aspirations which can be managed by an organisation to further its own safety and profitability. However, in the absence of good management, people's aspirations will either be ignored or permitted to dominate – with potentially disastrous consequences either way. We explain the enormous power that effective, well-timed training can give to an organisation.

#### **7. People work with each other**

Working with each other sometimes requires us to work as individuals in pursuit of our own goals, and at other times as members of a team with a common purpose. The key problem is in ensuring that we have effective 'people' skills, as well as technical task skills. We explain what these other skills are, why they are important and what can go wrong when they are absent.

#### **8. People communicate with each other**

Successful communication involves the clear transmission of a message. We explain what has to happen for communication to be successful. We explain the responsibilities of both listener and messenger.

These are eight things we do that help to make us human. They are inescapable and will not go away. Understanding a little more about their nature, and how you can deal with them more effectively, will change your behaviour – and, maybe, that of those around you.

## 6. REFERENCE TO NQF, EQF, ECTS

Nowadays, the European Union (EU) consists of 27 member states, and each state has 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;
- Harmonise 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 eight reference levels (figure 2), each level describes what a learner has to know, understand and be able to do.<sup>2</sup>

EQF LEVEL 8	ACADEMIC LEVEL	DOCTORATE	
EQF LEVEL 7		MASTER	MAINTENANCE MANAGERS AND SUPERVISORS VOCATIONAL TEACHERS
EQF LEVEL 6	POST UPPER SECONDARY LEVEL	BACHELOR	
EQF LEVEL 5		HIGHER NATIONAL DIPLOMA	MAINTENANCE TECHNICIANS
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

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

Germany		<a href="http://www.dqr.de">www.dqr.de</a>
The Netherlands		<a href="http://www.nlqf.nl">www.nlqf.nl</a>
Romania		<a href="http://www.anc.edu.ro">www.anc.edu.ro</a>
Slovakia		<a href="http://www.trexima.sk/new">www.trexima.sk/new</a>

**Table 1** Overview of national organisations in the EQF context

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 the 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.

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 countries involved in the project there are websites and organisations dedicated to the use of EQF in the national context. Below you will find an overview of these organisations.

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 QFs (NQFs). Some member states do not want to adjust their procedures and this means all member states still have their own NQF procedure.

Slovakia used to have two vocational schools which prepared students for the job positions in IWT but they were closed because of low interest of young people to work in this field. Nowadays, the Transport Authority examines the candidates for lower job positions in IWT such as skipper, captains, boatmen (EQF 2 and 4). Before the exams it organises the courses for applicants.

The exam has oral and written forms and consists of various areas in IWT. The Department of Water Transport at the University of Zilina educates students for higher job positions (EQF 6, 7, 8) in IWT. The curricula are approved by the Ministry of Education, Science, Research and Sport of the Slovak Republic and its control body (Accreditation Commission). They are prepared according to the requirements of practice and standards of higher education in Slovakia.

In Germany there is a combined system of education at school and in a shipping company ending in centralised exams held by the Chamber of Commerce. Both schools and companies have to follow the curricula, but they are not responsible for the exams. The exams consist of two parts, one focussing on knowledge and one focussing on the skills. Therefore both school and shipping company contribute to the education of the students enabling them to pass the centralised exams.

In Romania there are dedicated programmes for IWT boatman (EQF 2). There are vocational schools for boatmen in Galati and Orsova, offering courses for boatmen qualification.

In the Netherlands there are qualifications set for the different levels of education within the IWT sector. For each educational level there is a set of qualifications given by the national contact point in cooperation with the work, field and educational institutes. The Netherlands' government decided to place the Captain/Manager IWT qualification in NQF level 5 (EQF5), but in a later stage it was withdrawn and placed in NQF level 4 (EQF4).

In conclusion, although the EQF system in the field of inland water transport has been accepted in all EU countries, this system 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 in the cooperation with the international or national authorities (the Rhine Commission, the Danube Commission, the Ministries of Education), shipping companies and other authorities that work in the field of IWT in the Rhine or Danube Regions. It depends on the level of general education (higher or lower) per country.

## Bibliographical materials, reference documents, didactical materials

- Directive (EU) 2017/2397 of the European Parliament and of the Council of 12 December 2017 on the recognition of professional qualifications in inland navigation and repealing Council Directives 91/672/EEC and 96/50/EC & Final drafts of competences and practical exams, 2017;
- ES-QIN, European Standard for Qualifications in Inland Navigation, CESNI 2019;
- Course Manuals for Inland Navigation OL. Example educational material; competence 1.1, 1.2, 1.3, 1.4, 1.5 (CMINET);
- Inland Navigation and Ports, NELI;
- Ship manoeuvring for inland convoy, NELI;
- Logistics course, NELI, 2011;
- RIS course, NELI;
- Train the Trainer course for Inland Navigation training, Leonardo da Vinci Program;
- Train the Trainer course Competency Based Training and Assessment Inland Waterway Transport Didactical manual, IWTCOMP, 2019;
- Manual on the Sava River Navigation, International Sava River Basin Commission, Zagreb 2018;
- Assessment of the effectiveness of the use of simulations with respect to education, assessment and examination, Prominent, July 2017;
- Digital tools to support the further integration of IWT knowledge to general logistics education and training, Prominent, July 2017;
- Prototype of digital education and training tools, Prominent, October 2017.

### Online e-learning

- INeS: [www.ines-danube.info](http://www.ines-danube.info) / [www.ines.info](http://www.ines.info)
- MOK: [www.mok.anewspring.nl](http://www.mok.anewspring.nl)

# ANNEX 2

## Practical scenarios

### A. Case studies

#### Scenario 1

##### 1.1.1.2 Assist with mooring, unmooring and hauling (towage) operations

The Practical assignment assesses all the necessary knowledge and skills of the competence Assist with mooring, unmooring and hauling (towage) operations:

Practical assessment mooring and unmooring; show the skills of mooring and unmooring on a training vessel.

#### Mooring and unmooring - assignment on deck of a training vessel

##### What are the assessment aspects for this assignment?

Hangs fenders in advance

Passes the distances

Fastens the correct trusses in the correct order

Attitude

Works safely for him-/herself and others



#### Scenario 2

##### 1.1.2.2 Assist with coupling operations of push barge combinations

Practical working with the coupling winch.

##### This practical test covers the following components

- A Theoretical knowledge of pushed navigation in general (oral)
- B Names of parts and insight into the operation of the coupling winch (oral)
- C Proficiency in operating the clutch winch (practical)
- D Safety aspects when working with the coupling winch (practical)

##### Ask 1 question from each item in the list and mark the choice:

- A.1 What do we mean by:
  - Large push tug shipping;
  - Small push tug shipping;
  - A push-barge combination;
  - A couple.
- A.2 What are (is):
  - Towing knees;
  - Pushing poles;
  - A push bow.
- A.3 What is the function of a:
  - Pet bollard (on deck of a push barge);
  - Belaying cleat (on the side deck of a push barge).

##### Ask 2 questions from each item in the list and mark the choice:

- B.1 Have the following parts pointed out or named:
  - Wire drum;
  - Pole;
  - Flywheel;
  - Reduction shaft.
- B.2 What is the function of:
  - The long delay in the coupling winch;
  - The weight and leverage on the ratchet;
  - The metal cover on top of the winch.

### Have both parts of the list executed:

- C.1 Attach the coupling wire as a control wire (via pet bollard on bollard bench and back on pet bollard);
- C.2 Loosen the coupling wire and turn it in on the wire drum.

### Assess both parts of the list:

- D.1 Carries out the activities of part C in a safe manner / pays attention to safety aspects;
- D.2 Wears the necessary PPE in the correct way during these actions.



### Coupling

#### Assessment aspects - collaboration:

- Consults in advance with the practical instructor about the division of tasks
- Uses the proper PPE
- Collaboration
- Attitude
- Works safely
- Adheres to the agreed tasks when performing
- Checks his/her work

## Scenario 3

### 1.1.3.2 Assist with anchoring operations

Practical assignment on a training vessel.

#### Anchoring

##### Assessment aspects:

- Drops the correct anchor as directed
- Lowers the anchor chain in a correct manner
- Prepares anchor winch for anchor retrieval
- Turns the anchor up at the correct speed
- Prepares the anchor winch for use
- Provides an anchor ball or anchor light

## Scenario 4

### 1.1.4.2 Steer the craft complying with helm orders, using steering gear properly

Practical assignments on the Simulator; steering on the bridge.

#### On the bridge

##### Assessment aspects:

##### Steering

- Correctly switches from pilot to emergency steering and back to pilot
- Reads the compass heading correctly and can steer a marked heading on compass

##### Application demand:

- "Why is it important to practice regularly with the emergency steering system?"
- Maintains a safe position in the fairway while sailing
- Involves the data from the navigation equipment in steering
- Recognises nautical conditions and calls for help in time if necessary



## Scenario 5

### 1.1.6.3 Using navigational aids and instruments under supervision

Practical assignment on a training vessel or simulator.

#### Assignment: Interpretation of navigation equipment

While sailing you use information from a variety of navigation equipment which is present in the wheelhouse. That is what this assignment, which you carry out during the bridge service, is about. You do this in consultation with the skipper or helmsman. You can also contact them with your questions and when you are done with them they will give the assessment. Once you have completed the assignment, you will know what the navigation equipment is for and how to use this information during steering.

First, a few general questions:

**How would you describe "navigation equipment" in general?**

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**Navigation equipment increases the safety of boating. Give an example of this.**

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**Right or wrong? (cross out the wrong answer!)**

A ship may not sail without radar in the dark	Right / Wrong
A depth gauge (echosounder) indicates the depth of the fairway	Right / Wrong
With a radar device you can determine distances to your own ship	Right / Wrong
You can register in advance for a lock with a mobile phone	Right / Wrong

### Assignment interpretation of navigation equipment on board a training vessel

Which route did you sail today?

From \_\_\_\_\_

To \_\_\_\_\_

The questions are about the route that you have sailed yourself. This means that you must enter the data for this assignment in the diagram below while sailing. Fill in the data and name the navigation device where you found / read it.

Data	Navigation device
Speed: _____ km/hour	
Course: _____ degrees (°)	
Geographic position: _____ N _____ E	
Depth below the ship: _____ metres	
Distance to the ship in front: _____ metres	
Distance to shore to starboard: _____ metres	
Course and speed of other ships in the vicinity	
Number of rotations main motor SB _____	
Number of rotations main motor PB _____	
Control settings: <input type="radio"/> automatic pilot (fill the right option) <input type="radio"/> road-dependent operation	
VHF setting 1: channel _____	
VHF setting 2: channel _____	

Previously you entered a number of data in a schedule. After sailing, you will answer the questions below.

**Why is it important that you are always informed about the speed of the ship while steering?**

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**Do you sometimes look at the depth gauge while steering and what do you do with these data?**

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The radar image contains "fixed" range markers that indicate a "fixed" distance to your own ship at a certain setting. If the setting is changed, the distance between these range markers will also change.

**How can a certain distance be exactly determined?**

(fill out the correct answer!)

- By measuring with a ruler and calculating
- By using the variable range marker
- By restarting the radar in a different distance

You have noted the geographical position of that moment in the diagram.

**What is the "geographic position"?**

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In the diagram you indicated how the steering was set up when you were sailing.

**What is the difference between steering with the autopilot and the road-dependent control?**

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**In which situation do you use the road-dependent control?**

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**Scenario 6**

**1.1.10.2 Follow procedures while passing locks and bridges**

Passage locks on board of a training vessel or simulator.

During the ARA trip (Amsterdam-Rotterdam-Antwerp), several locks must be passed. This is what this assignment, which you carry out during the bridge service, is about. You do this in consultation with the skipper. You can also contact him/her with your questions and when you have finished, he/she will give the assessment. When you have completed the assignment you will know what locks are used for, how the communication with the lock master works, what you have to pay attention to when passing a lock, how the ship is moored during the locking, etc.

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

The draft standard for the practical examination OL sets the framework for practical examinations at 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 these draft standards practical examination for OL, knowledge and skills elements that will be tested during the practical examination are specified. All elements described in the tables of competence standards on OL as "ability" are listed. 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 at 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 will be demonstrated on an approved simulator or a craft. Experts recommend the use of a craft of more than 38 metres in 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, Part 1 has to be taken into account.

No.	Competence	Examination elements	Part	Cat.
1	1.1.1 (2+3+4)	Assist in mooring, unmooring and hauling (towage) operations;	1c	I
2	1.1.2 (2+4)	Assist with coupling operations of push barge combinations;	1c	II
3	1.1.3 (2)	Assist with anchoring operations;	1b	I
4	1.1.4 (2)	Steer the craft complying with helm orders, using steering gear properly;	1a	I
5	1.1.5 (2)	Steer the craft complying with helm orders, taking the influence of wind and current into account;	1a	I
6	1.1.6 (2+3)	Use navigational aids and instruments under supervision;	1a	I
7	1.1.7 (2+3+4+6+7)	Undertake necessary actions for safety of navigation;	1a	I
8	1.1.8 (6)	Describe the characteristics of main European inland waterways, ports and terminals for voyage preparation and steering;	1a	II
9	1.1.9 (2)	Respect the general provisions, signals, signs and marking system;	1a	I
10	1.1.10 (2)	Follow procedures while passing locks and bridges;	1a	II
11	1.1.11 (2+3)	Use systems of traffic control.	1a	II

★ Examination elements tested prior to practical examination during an approved training programme

No.	Competence	Examination elements	Part	Cat.
7	1.1.7 (2+3+4+6+7)	Undertake necessary actions for safety of navigation;	1a ★	I
8	1.1.8 (6)	Describe the characteristics of main European inland waterways, ports and terminals for voyage preparation and steering.	1a ★	II

**Skills contained in examination elements numbered 1 to 11 (practical skills on deck) can be tested during an approved training programme.**

No.	Competence	Examination elements	Part	Cat.
1	1.1.1 (2+3+4)	Assist in mooring, unmooring and hauling (towage) operations;	1c	I
2	1.1.2 (2+4)	Assist with coupling operations of push barge combinations;	1c	II
3	1.1.3 (2)	Assist with anchoring operations;	1b	I
4	1.1.4 (2)	Steer the craft complying with helm orders, using steering gear properly;	1a	I
5	1.1.5 (2)	Steer the craft complying with helm orders, taking the influence of wind and current into account;	1a	I
6	1.1.6 (2+3)	Use navigational aids and instruments under supervision;	1a	I
7	1.1.7 (2+3+4+6+7)	Undertake necessary actions for safety of navigation;	1a	I
8	1.1.8 (6)	Describe the characteristics of main European inland waterways, ports and terminals for voyage preparation and steering;	1a	II
9	1.1.9 (2)	Respect the general provisions, signals, signs and marking system;	1a	I
10	1.1.10 (2)	Follow procedures while passing locks and bridges;	1a	II
11	1.1.11 (2+3)	Use systems of traffic control.	1a	II

# ANNEX 4

## Thematic content of the Course Manual

The aim of this annex is to set out the thematic content of the competences of Navigation at Operational Level of Chapter 4 if necessary.



# COMPETING

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