



*Example syllabus on*  
***Marine Environment Awareness Course***  
*(draft)*

***MariePRO project partners from***

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**Contents**

Foreword.....	2
Introduction .....	2
Aims and objective.....	2
Targets .....	3
Entry standards .....	3
Course content and characteristics .....	4
Course duration and timetable.....	11
Teaching facilities and equipment.....	12
Evaluation .....	13
Course outline.....	13
Learning outcomes summary.....	17
Specific tasks .....	19

## ***Foreword***

The vocational education and training in the maritime field is regulated by the International Maritime Organization's IMO International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). The Convention aims to provide universal regulations for maritime education, qualifications and watchkeeping – at least in reaching the minimum requirements. Despite of the international STCW Convention, there are major differences between different countries - and VET institutions - regarding the content and structure of maritime education and training (MET). Furthermore, since at the moment (January 2016) the STCW Convention doesn't provide mandatory courses on marine environment pollution prevention, this document provides a course outline as an instrument to carry out a course on environment awareness, taking into account the whole maritime environment legislation.

The course provided has been developed following the principles of the European Union's ECVET (European Credit System for Vocational Education and Training) Recommendation to facilitate the transfer, recognition and accumulation of assessed learning outcomes achieved in formal, non-formal and informal contexts by individuals who are aiming to achieve a qualification. The Marine Environment Awareness Course outline has been created by a consortium of universities, vocational training institutes and MET actors from Finland, Germany, Italy, Malta and the UK as part of a MariePRO - Promoting Maritime ECVET Actions project. The partners involved in the project include Centre for Factories of the Future (UK), ITTL Nautico San Giorgio (IT), Mediterranean Maritime Research and Training Centre (MT), University of Bremen, Institute Technology and Education (DE), and University of Turku, Centre for Maritime Studies (FI). MariePRO project is co-funded by Erasmus+ programme of the European Union. In Finland CIMO, the national agency for the European Union's education and youth programmes, administers and is responsible for implementing the Erasmus+programme. The European Commission accepts no responsibility for the contents of this publication.

## ***Introduction***

At the moment (March 2016) STCW Convention doesn't provide mandatory courses about marine environment pollution prevention; a model course is provided - *IMO Model course 1.38, Marine environment awareness course* – but it is optional: no mandatory incorporation into the MET curricula is required.

This choice clashes to some extent with the multiplication of the environment related provisions, involving both amendments to the existing Conventions - MARPOL overall - already entered into force, and new products that are expected entering into force in the future, for example the BWM Convention and the Hong Kong Convention.

This shows that probably there will be soon an increasing need of competences in the field of the marine environment issues management, both for the seafarers and the shore based personnel.

## ***Aims and objective***

The aim of this document is to provide an effective instrument to carry out a course on environment awareness, taking into account the whole maritime environment legislation, with particular regard to the measures to prevent pollution.

The aim of the course is to achieve the necessary theoretical knowledge and leader's abilities for implementation and maintenance the required documentation for all activities, in order to

preserve surrounding environment from the produced on board garbage. To provide the learners an effective instrument to carry out a course on environment awareness, taking into account the whole maritime environment legislation, with particular regard to the measures to prevent pollution. To provide high quality information and knowledge on the marine environment to marine professionals based to IMO Model Course 1.38, based on the requirements of Sections A-II/1 of Chapter II, A-III/1 and A-III/6 of Chapter III of the STCW 78 as amended in 2010.

The course content emphasises concise communications, interpretation of documents and analysis of complex managerial issues in the maritime sector dealing with various high-ranking officials

This product wants to be something useful for maritime institution to provide a non-mandatory course, ECVET compliant, of great relevance for the seafarers and shore based personnel who can take great benefit from acquiring concrete competences about the care of marine environment.

The objective should be always an increasing awareness of the problems linked with maritime pollution among the "people of shipping" who will be able to act in a manner even more environmentally sound.

The imminent entering into force of the BWM Convention will expose the need of a good understanding of its provisions among the seafarers; the same problem relates to the recent MARPOL amendments about the Annexes III, IV, V and VI. This course offers knowledge and abilities for the implementation of the documentation required and for the managing of the pollution prevention plants and arrangements, the environment-related inspections on board and the emergencies.

## ***Targets***

The targets of this course are very diversified, but minimum changes are deemed necessary to adapt the teaching techniques and the content to different category of trainees.

Given the importance of the topic is desirable that this course could make part of the basic MET programmes carried out in the EQF 4/5 institutions, but it should also be provided at the EQF 6 level and for Officers in service, in order to clarify how to make the on-board procedures more effective and keep the crew always updated with the continually changing legislation.

The course has been developed for and will be useful to international marine professionals both officers and engineers including electrical engineers, ship owners, shipping management staff (aboard the ship or onshore), ISM designated persons (DPAs) and maritime inspectors.

The major impulse that drives the decision of a Company to provide this kind of course to on-board crew and shore based personnel is the longlife learning concept.

## ***Entry standards***

Trainees should have previous basic competences in physics, chemistry and ship technology; a general knowledge on the role, the function and the structure of the IMO and the methods for IMO Convention adoption and emendation is also required.

More experienced seafarers who have attended the IMO Model Course 1.38, *Marine Environment Awareness course*, and/or any of the related IMO conventions concerning safety of life at sea, security and protection of the marine environment may take advantage of Accreditation of Prior Learning (APL), if agreed by training provider/institution, and seek credit for their prior learning as a method for demonstrating competence.

## Course content and characteristics

The course can be provided as a stand-alone training/refreshment action or it can be embedded within the EQF 4 to 6 MET programmes.

The course should incorporate the following STCW competences as a minimum (*Operational* and *Management* level).

### Section AII/1 & AII/2 of chapter II ( Master and Deck Officers) & A-II/5 – support level

*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/1, page 108

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution-prevention requirements	<p>Prevention of pollution of the marine environment and anti-pollution procedures</p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>1. approved in-service experience</li> <li>2. approved training ship experience</li> <li>3. approved training</li> </ol>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>

*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/1, page 109

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea, security and protection of the marine environment and correctly identified

*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/2, page 118

Function: Cargo handling and stowage at the management level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
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Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes	Ability to establish procedures for safe cargo handling in accordance with the provisions of the relevant instruments such as IMDG Code, IMSBC Code, MARPOL 73/78 Annexes III and V and other relevant information	Examination and assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> <li>1. approved in-service experience</li> <li>2. approved simulator training, where appropriate</li> </ol>	<p>The frequency and extent of cargo condition monitoring is appropriate to its nature and prevailing conditions</p> <p>Unacceptable or unforeseen variations in the condition or specification of the cargo are promptly recognized and remedial action is immediately taken and designed to safeguard the safety of the ship and those on board</p> <p>Cargo operations are planned and executed in accordance with established procedures and legislative requirements</p> <p>Stowage and securing of cargoes ensures that stability and stress conditions remain within safe limits at all times during the voyage</p>
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*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/2, page 120

Function: Controlling the operation of the ship and care for persons on board at the management level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and the protection of the marine environment	<p>Knowledge of international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <ol style="list-style-type: none"> <li>1. certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and their period of validity</li> <li>2. responsibilities under the relevant requirements of the International Convention on Load Lines, 1966, as amended</li> <li>3. responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, as amended</li> <li>4. responsibilities under the International Convention for Prevention of Pollution from Ships, as amended</li> </ol>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>1. approved in-service experience</li> <li>2. approved training ship experience</li> <li>3. approved simulator training, where appropriate</li> </ol>	<p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Planned renewal and extension of certificates ensures continued validity of surveyed items and equipment</p>

	5. maritime declarations of health and the requirements of the International Health Regulations 6. responsibilities under international instruments affecting the safety of the ship, passengers, crew and cargo 7. methods and aids to prevent pollution of the marine environment by ships 8. national legislation for implementing international agreements and conventions		
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*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/3, page 130

Function: Controlling the operation of the ship and care for persons on board at the operational level

<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Ensure compliance with pollution-prevention requirements	Prevention of pollution of the marine environment and anti-pollution procedures  Knowledge of the precautions to be taken to prevent pollution of the marine environment  Anti-pollution procedures and all associated equipment	Examination and assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> <li>1. approved in-service experience</li> <li>2. approved training ship experience</li> </ol>	Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed

*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/3, page 131

Function: Controlling the operation of the ship and care for persons on board at the operational level

<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified

*STCW Code, as amended: Part A, Chapter II – Master and deck department*

Table A-II/5, page 138

Function: Controlling the operation of the ship and care for persons on board at the support level

<b>Competence</b>	<b>Knowledge, understanding and proficiency</b>	<b>Methods for demonstrating competence</b>	<b>Criteria for evaluating competence</b>
Apply precautions and contribute to the	Knowledge of the precautions to be taken to prevent pollution of the marine environment  Knowledge of the use and	Assessment of evidence obtained from one or more of the following: <ol style="list-style-type: none"> <li>1. approved in-service experience</li> </ol>	Procedures designated to safeguard the marine environment are observed at all times

prevention of pollution of the marine environment	operation of anti-pollution equipment  Knowledge of the approved methods for disposal of marine pollutants	2. practical training 3. examination 4. approved training ship experience	
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## Section AIII/1 & AIII/2 ( Engineers) & A-III/5- support level

STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/1, page 149

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution-prevention requirements	<p>Prevention of pollution of the marine environment</p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>3. approved in-service experience</li> <li>4. approved training ship experience</li> <li>5. approved training</li> </ol>	<p>Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>

STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/1, page 150

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea, security and protection of the marine environment	Assessment of evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea, security and protection of the marine environment are correctly identified

STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/1, page 158

Function: Controlling the operation of the ship and care for persons on board at the management level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, security and the protection of the marine environment	<p>Knowledge of relevant international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <ol style="list-style-type: none"> <li>9. certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity</li> <li>10. responsibilities under the relevant requirements of the International Convention</li> </ol>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>4. approved in-service experience</li> <li>5. approved training ship experience</li> <li>6. approved simulator training, where appropriate</li> </ol>	Stability and stress conditions are maintained within safety limits at all times



	<p>on Load Lines, 1966, as amended</p> <ol style="list-style-type: none"> <li>11. responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, as amended</li> <li>12. responsibilities under the International Convention for the Prevention of Pollution from Ships, as amended</li> <li>13. maritime declarations of health and the requirements of the International Health Regulations</li> <li>14. responsibilities under international instruments affecting the safety of the ships, passengers, crew or cargo</li> <li>15. methods and aids to prevent pollution of the environment by ships</li> <li>16. knowledge of national legislation for implementing international agreements and conventions</li> </ol>		
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STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/5, page 168

Function: Controlling the operation of the ship and care for persons on board at the support level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply precautions and contribute to the prevention of pollution of the marine environment	<p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Knowledge of the use and operation of anti-pollution equipment</p> <p>Knowledge of the approved methods for disposal of marine pollutants</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>5. approved in-service experience</li> <li>6. practical training</li> <li>7. examination</li> <li>8. approved training ship experience</li> </ol>	Procedures designated to safeguard the marine environment are observed at all times

### Section AIII/6 of Chapter III (Electrician)

STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/6, page 176

Function: Controlling the operation of the ship and care for persons on board at the operational level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Ensure compliance with pollution-prevention requirements	<p>Prevention of pollution of the marine environment</p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p> <p>Importance of proactive measures to protect the marine environment</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>6. approved in-service experience</li> <li>7. approved training ship experience</li> <li>8. approved training</li> </ol>	<p>Procedures for monitoring shipboard operations and ensuring compliance with pollution-prevention requirements are fully observed</p> <p>Actions to ensure that a positive environmental reputation is maintained</p>

STCW Code, as amended: Part A, Chapter III – Engine department

Table A-III/7, page 182

Function: Controlling the operation of the ship and care for persons on board at the support level

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Apply precautions and contribute to the prevention of pollution of the marine environment	<p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Knowledge of the use and operation of anti-pollution equipment/agents</p> <p>Knowledge of the approved methods for disposal of marine pollutants</p>	<p>Assessment of evidence obtained from one or more of the following:</p> <ol style="list-style-type: none"> <li>9. approved in-service experience</li> <li>10. practical training</li> <li>11. examination</li> <li>12. approved training ship experience</li> </ol>	Procedures designated to safeguard the marine environment are observed at all times

The content mainly deals with the environment prevention legislation, but emergency are also taken into account.

Maritime pollution has always been an issue that raises diversified interests also by the non-maritime community: news about pollution incidents always bounce on TV screens and newspapers all around the world and the management of the relationship with the media should be carefully looked after by the actors involved.

Specific pedagogical instruments such as group work, simulation and role playing game are provided to develop a brand new type of course where traditional lectures should be reduced to a minimum, leaving room for an active attendance of the trainees: the topic is such that it would be easy to fall in an extremism of the pure theoretical approach, that is quite boring and no competence-oriented, so a more active approach is useful and desirable.

The course should preferably be held in English, in order to produce the minimum deviation from the original text of the legislations dealt with.

The active approach fits well with the CLIL methodology, using English as second language; this would be particularly useful for the youngest trainees or in each case where there is a need of a growth in the language competences. CLIL (*Content and Language Integrated Learning*) is a teaching methodology well established all around Europe, in which students learn a certain subject by mean of a foreign language: it has a dual-focused purpose, namely the learning of the content and the simultaneous learning of a foreign language. CLIL main characteristics are the particular attention paid to the use of active learning strategies (such as group work, simulation, etc.). the use of authentic teaching material and the use of Information and Communication Technologies.

### ***Course duration and timetable***

The course can be provided with different lengths, in order to fit with the various trainees categories:

- ✓ *refreshment version*: it means 2 days (16 hours), intended for Navigation Officers/Engineer Officers and shore based personnel (experts)
- ✓ *extended version*: it means 5 days (40 hours), intended for cadets and shore based personnel (other than experts)

The extended version covers all the relevant aspect of the topic, with great room left for the execution of the tasks; timetable could be arranged as follows, taking into account that hours and days are for reference only and in the case the refreshment (shorter) version of the Course should be chosen, the course organization should be reformulated to fit the 2-days length.

<b><i>Extended version</i></b>		
<i>Days of course</i>	<i>Morning 8:00 – 12:00</i>	<i>Afternoon 13:00 – 17:00</i>
Day 1	Describe the types of pollution and intervention techniques	Recognize the main sources of law in the marine environment field (with TASK)
Day 2	Apply the BWM Convention technical content	Apply the BWM Convention technical content (TASKS)
Day 3	Apply the MARPOL Convention technical content	Apply the MARPOL Convention technical content (TASKS)

Day 4	Apply the MARPOL Convention technical content	Apply the MARPOL Convention technical content (TASKS)
Day 5	Deal with a pollution incident	Deal with a pollution incident (TASK) + final written test

The refreshment version is largely oriented towards the new issues and the last amendments to the Conventions dealing with marine pollution; timetable could be arranged as follows:

<b>Refreshment version</b>		
<i>Days of course</i>	<i>Morning 8:00 – 12:00</i>	<i>Afternoon 13:00 – 17:00</i>
Day 1	New MARPOL amendments and the BWM Convention technical content	Apply the new MARPOL amendments and the BWM Convention technical content (TASKS)
Day 2	Further studies on new issues about marine environment protection (Energy efficiency, noise reduction, Polar Code etc.)	Deal with a pollution incident (TASK) + final written test

### ***Teaching facilities and equipment***

The course requires flipchart, video projectors or any arrangements to show slide presentations, computers (from 3 to 5 as a minimum) to be left available for trainees, with internet access, nautical charts including relevant MARPOL special area zones, videos as deemed necessary, up-to-date copy of each Convention that is topic of the course or, at least the MARPOL and BWM Convention (electronic formats are allowed and desirable).

For the execution of the active tasks fac-simile certificates and real-life formats of the record books are also needed; certificates have to be compiled in such a way that seem to be authentic, but some of them should be expired.

Certificates:

- ✓ *International Oil Pollution Prevention (IOPP) Certificate*
- ✓ *International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk*
- ✓ *International Sewage Pollution Prevention (ISPP) Certificate*
- ✓ *International Air Pollution Prevention (IAPP) Certificate*
- ✓ *Engine International Air Pollution Prevention (EIAPP) Certificate*
- ✓ *International Energy Efficiency (IEE) Certificate*

Plans and books:

- ✓ *Shipboard Oil Pollution Emergency Plan*
- ✓ *Oil Record Book, parts I and II*
- ✓ *Shipboard Marine pollution emergency plan for Noxious Liquid Substances*
- ✓ *Procedures and Arrangements Manual (chemical tankers)*

- ✓ *Cargo Record Book*
- ✓ *Garbage Management Plan*
- ✓ *Garbage Record Book*
- ✓ *Bunker delivery notes*

Note: traditional lectures by ppt presentations should be kept to a minimum, but for this purpose relevant presentations should be prepared by the trainer with no particular requirements other than the adequacy to the course, as evaluated on the basis of his professional judgement skills.

## ***Evaluation***

The final assessment should follow a dual mechanism:

1. Theoretical evaluation: final written test (pass/fail type) – weight 40%
2. Competence oriented evaluation: results from observations during simulation activity, to be followed by a debriefing that allows the assessment to be positive and not punitive - weight 60%

Since the content can slightly differ from one course to another and the course itself should be adapted to the audience, by opinion of the trainer, also taking into account prior learning, the topics to be included in the written test can be chosen by the trainer.

Anyway Section 11 of this document provides some guidelines about the most suitable type of assessment for each subject.

The adequateness of the dialogues during simulation (in terms of politeness too) and the behavior during eventual remarks within the debriefing are elements of evaluation.

## ***Course outline***

<i>Knowledge understanding and proficiency</i>	<i>Lecture hours</i>	<i>Tasks hours</i>
<b>1. Describe the types of pollution and intervention techniques</b>		
1.1. General causes and effects of marine pollution	1,0	
1.1.1. Difference between organic and non-organic substances		
1.1.2. Eutrophication		
1.1.3. Effect on plankton		
1.2. Systems to counteract an oil pollution incident	3,0	
1.1.4. Use of booms		
1.1.5. Skimmers		
1.1.6. Sorbers		
1.1.7. Disperdants		
1.1.8. Procedures for biological action and in situ burning		
1.1.9. Case studies		
	<b>4,0</b>	

<b>2. Recognize the main sources of law in the marine environment field</b>		
2.1. Brief history of the marine environment legislation	0,25	
2.2. General legislation about maritime pollution	1,0	
2.2.1. UNCLOS (Montego Bay)		
2.2.2. Local legislation (where applicable)		
NB: countries that must comply with the EU legislation, it has to be analyzed (ex. directive 2009/123/CE)		
2.3. Brief analysis of the main IMO instruments about environment protection and pollution prevention:	1,75	
2.3.1. PSSAs concept		
2.3.2. Anti-fouling ( <i>AFS Convention and Biofouling Guidelines</i> )		
2.3.3. Ship recycling ( <i>Hong Kong Convention</i> )		
2.3.4. <i>BWM Convention</i>		
2.3.5. <i>MARPOL Convention</i> (history from OILPOL until today)		
2.3.6. MEPC resolutions systems		
2.3.7. Polar code		
Task 1		1,5
Debriefing of Task		0,5
	<b>2,0</b>	<b>2,0</b>
<b>3. Apply the BWM Convention technical content</b>		
3.1. Necessity of the ballast on board and associated risks for the spreading of <i>Aquatic Invasive Species</i>	0,5	
3.2. Application of the Convention	0,25	
3.3. Ballast water management Documentation	0,5	
3.3.1. <i>Ballast Water Record Book</i>		
3.3.2. <i>International Ballast Water Management Certificate</i>		
3.4. Ballast water technical management	1,0	
3.4.1. Ballast water exchange		
3.4.2. <i>Ballast water management system – BWMS</i>		
3.4.3. Special provisions in polar waters		
3.5. Biologic pollution cases	0,5	
3.5.1. <i>Zebra Mussel</i>		
3.5.2. <i>Golden mussel</i>		
3.5.3. <i>North American Comb jelly</i>		
3.5.4. <i>Cladoceran Water Flea</i>		
3.5.5. <i>Mitten crab</i>		
3.5.6. <i>Round Goby</i>		
3.5.7. <i>North Pacific Seastar</i>		
3.5.8. <i>Asian kelp</i>		
3.5.9. <i>European Green Crab</i>		
3.6. Technologies for the ballast water treatment	1,25	
3.6.1. Filtering		



4.6.2. Marking and labelling		
4.6.3. Documentation		
4.6.4. Packing		
4.7. Prevention of pollution by sewage from ships (Annex IV)	1,0	
4.7.1. Risks from sewage		
4.7.2. Survey and certificates		
4.7.3. Special areas		
4.7.4. Discharge of sewage		
4.7.5. Special provisions in polar waters		
4.8. Prevention of pollution by garbage from ships (Annex V)	2,0	
4.8.1. Definition of garbage		
4.8.2. Special areas		
4.8.3. Discharge of garbage		
4.8.4. Garbage management plan		
4.8.5. Filling the garbage record book		
4.8.6. Special provisions in polar waters		
4.9. Prevention of Air Pollution from Ships (Annex VI)	2,0	
4.9.1. Survey and certificates		
4.9.2. Special areas		
4.9.3. Ozone-depleting substances (relation with Montreal P.)		
4.9.4. Nitrogen oxides NOx		
4.9.5. Sulphur oxides SOx and particulate matter		
4.9.6. Volatile organic compounds – VOC		
4.9.7. Shipboard incineration		
4.9.8. Reception facilities		
4.9.9. Bunker delivery note		
4.9.10. Greenhouse gas – GHG (relation with Kyoto P.)		
4.9.11. Energy efficiency for ships and related technology		
4.9.12. Noise reduction from ships		
Relevant IMO products:		
✓ Resolution A.446(XI), A.497(XII), A.897(21)		
✓ Resolution A.496(XII)		
✓ Resolution MEPC.193(61)		
✓ Resolution MEPC.201(62)		
✓ Resolution MEPC.202(62)		
✓ Resolution MEPC.203(62)		
✓ Resolution MEPC.245(66)		
✓ Resolution MEPC.251(66)		
Task 1, Task 2, Task 3, Task 4, Task 5		7,0
Debriefing of Tasks		1,0
	<b>8,0</b>	<b>8,0</b>



<b>5. Deal with a pollution incident</b> 5.1. Manage the emergency 5.2. Contact competent authorities 5.3. Dealing with media 5.4. Case studies  Task 6 Debriefing of Tasks	1,0 0,5 1,0 1,5     <b>4,0</b>	     2,0 1,0 <b>3,0</b>
<b>Final written test</b>		1,0
<b>TOTAL</b>	<b>22,0</b>	<b>18,0</b>

Note: Lecture hours and tasks hours are for guidance only

### ***Learning outcomes summary***

The following table provides a summary of the learning outcomes to be demonstrated at the end of the course. The reference numbers refer to the content groups specified in the Course Outline (Section 10).

<b>Reference number</b>	<b>Competence</b>	<b>Knowledge</b>	<b>Skills</b>	<b>Learning Outcomes</b>	<b>Assessment Suggested</b>	<b>Nominal Hours Suggested</b>
1	<i>Applies different types of pollution and intervention techniques</i>	Basis of the applicable marine ecology  Biofouling procedures for produced  Ships and company procedures for environment preserving	Implement correctly and on time all techniques and means for marine environment protections  Motivate all crew to safeguard the sea environment	Able to apply intervention techniques in different types of pollution at sea scenarios  Properly handle a pollution incident	Written/Oral Ongoing assessment is also to be performed	4h
2	<i>Identifies the main sources of law in the marine environment field</i>	Basic international requirements and local rules and marine regulatory framework		Identifies different sources of law about specific type of pollution at sea	Written/Oral	4h

		IMO products implementation status and feedback				
3	<i>Apply the BWM Convention technical content</i>	<p>Ship's ballast plan</p> <p>Ballast system and respective controlling equipment</p>	<p>Initiate correct actions in order to prevent any pollution into the sea</p> <p>Operate with the ballast and over board discharge systems</p> <p>Maintain and correctly record relevant entries in the ships log book for solid waste and ballast operations</p>	<p>Handle the ballast water system</p> <p>Monitor the adequateness of the relevant documents and log book</p>	Written/Oral/Simulation	8h
4	<i>Apply the MARPOL Convention technical content</i>	<p>Principles and safe methods of arranging for the proper loading, stowage and carriage of oil, gas and chemical cargoes</p> <p>Garbage handling on board</p> <p>Vessel's plan for solid waste handling</p> <p>Sewage</p>	<p>Initiate correct actions in order to prevent any pollution into the sea</p> <p>Operate relevant discharge controlling apparatus</p> <p>Maintain and correctly record relevant entries in the ships log</p>	<p>Handle oil, chemical products, harmful substances in packaged form, sewage and garbage</p> <p>Properly manage discharges at sea</p> <p>Monitor the adequateness of the relevant documents</p>	Written/Oral/Simulation	16h

		handling and discharge  Controlling machinery providing emission content information	book for solid waste and ballast operations	and log book		
5	<i>Deal effectively with a pollution incident</i>	Emergency procedures	Correctly communicate in case of actual marine pollution	Execute the right procedures in the case of an emergency	Simulation/Oral	7h

### ***Specific tasks***

The following are active tasks designed to offer a competence based approach and to facilitate the assessment (other active tasks to be added as deemed necessary by the trainer).

#### ***TASK 1 – Searching for legislative information other than IMO prescription (group work)***

*Phase 1:* the trainer should create the conditions for the need of information about the laws adopted by certain Country that use different or more stringent requirements in respect to the IMO prescriptions dealt with during the frontal lessons;

*Phase 2:* the trainees should be divided into groups (from 2 to 5 persons), providing a web access for each of them;

*Phase 3:* the trainer should assign a subject to the groups, clearly specifying the information to be found on the web, involving local regulations (for example EU regulations, directives and recommendations);

*Phase 4:* enough time should be left to the trainees to find information on the web and produce a brief report;

*Phase 5:* each group should expose what has been found to the other trainees and to the trainer, in order to create a peer-to-peer teaching experience; the content, the use of appropriate terms and the exposition/dialectic performance are all elements of evaluation.

*The task can involve different subjects for different groups or the same subject for each group, in order to make comparison between different performances.*

#### ***TASK 2 - Searching for IMO technical information (group work)***

*Phase 1:* the trainer should create the conditions for the need of more detailed information about the topics dealt with during the frontal lessons, to be found on specific resolutions;

*Phase 2:* the trainees should be divided into groups (from 2 to 5 persons), providing a web access for each of them;

*Phase 3:* the trainer should assign a subject to the groups, clearly specifying the information to be found on the web, mainly involving IMO resolutions called back from the conventions;

*Phase 4:* enough time should be left to the trainees to find information on the web and produce a brief report;

*Phase 5:* each group should expose what has been found to the other trainees and to the trainer, in order to create a peer-to-peer teaching experience; the content, the use of appropriate terms and the exposition/dialectic performance are all elements of evaluation.

*The task can involve different subjects for different groups or the same subject for each group, in order to make comparison between different performances.*

### ***TASK 3 - Navigation involving special areas (group work)***

*Phase 1:* the trainer should create a certain number of passage planning sheets involving positions with different distance from the coast and different placing in respect to the MARPOL special areas, and in addition she/he can prepare a scenario involving special coastal advice in form of a NAVTEX warnings (for example involving areas not to be considered adequate for the ballast intake) or special needs of the ship;

*Phase 2:* the trainees should be divided into groups (from 2 to 5 persons), and each group should be asked to prepare a plan for the discharge of MARPOL products or the intake of ballast, taking into account the information provided;

*Phase 4:* enough time should be left to the trainees to find information, if needed, about the boundaries of the special areas in order to prepare a list of actions that can be carry out without contravene MARPOL prescriptions, for each leg/position of the voyage plan;

*Phase 5:* each group should then present the conclusions to the class; the content, the use of appropriate terms and the exposition/dialectic performance are all elements of evaluation.

### ***TASK 4 - Technical arrangements and ship documentation (project work/group work)***

*Phase 1:* the trainer should create different ship's data sheets including, but not limited to, information such as type, date of keel laying, GT, dimensions;

*Phase 2:* the trainees should be divided into groups (from 2 to 5 persons), and each group should be asked to prepare a list of all the requirements that the assigned ship should respect to be in compliance with MARPOL and BWM Conventions, both from the technical and administrative point of view (plants, arrangements, certificates, registers, books, etc.);

*Phase 5:* each group should then present the conclusions to the class; the content, the use of appropriate terms and the exposition/dialectic performance are all elements of evaluation.

### ***TASK 5 - PSC inspection simulation (role playing game)***

The simulation should be obviously limited to the marine environment issues.

*Phase 1:* the trainer should create a scenario providing information such as the type of ship concerned (flag, GT, etc.) and the Country where the inspection takes place;

*Phase 2:* the trainees should be divided into two groups (from 2 to 5 persons), one expected to act like PSC Officers and the other expected to act like the crew of the ship; this second group should be provided with mock Certificates;

*Phase 3:* enough time should be left for the trainees to study the situation and prepare the simulation; in this phase major attention from the assessor should be paid to the crew because they have to demonstrate the ability to select the correct documentation for their ship, minding to the validity of the certificate and simulate the correct filling of at least one page of the proper record books;

*Phase 4:* the simulation takes place and all the events are up to the trainees; in this phase major attention from the assessor should be paid to the PSCO because they have to demonstrate the ability to check the correctness and validity of the documentation presented and the adequate filling of the proper record books. For both groups the instauration of an appropriate conversation and the behavior during eventual remarks are elements of evaluation.

***TASK 6 - Simulation of pollution accident (role playing game)***

*Phase 1:* the trainer should create a scenario providing information such as the type of ship concerned (flag, GT, etc.) and the waters/port where the casualty takes place;

*Phase 2:* the trainees should be divided into the following groups (from 2 to 5 persons), each expected to act as required by their own role:

- ✓ Group 1: Ship's crew (from 3 to 8 persons), that means Master, Officers, Environmental Officer where applicable, Safety Officers etc.
- ✓ Group 2: Company (from 3 to 8 persons), that means DPA, media referent, crisis unit, managers, etc.
- ✓ Group 3: Coastal State Authorities and rescue crew (from 1 to 4 persons), that means harbour master, SAR units etc.
- ✓ Group 4: Media (from 1 to 3 persons), that means local and global media (TV and newspaper journalists etc.)
- ✓ Group 5 (optional): ship's classification societies and flag Authorities
- ✓ Group 6 (optional): other ships' crew
- ✓ Group 7 (optional): salvage crew
- ✓ Group 8 (optional): P&I clubs or other insurance companies

*Phase 3:* groups will be placed in different rooms, if possible allowing them to communicate each other using VHF W/T or interphone where applicable; enough time should be left for the trainees to study the situation and prepare the simulation, but no information should be submitted about the type of emergency because it should be unexpected;

*Phase 4:* the simulation takes place when the trainer will inform the group acting like the crew of the ship about the type of emergency; the trainer has to provide groups with sheets containing information coherent with their own role (press releases, ship's plan etc.), but events are up to the trainees. For both groups the instauration of an appropriate conversation and the behavior during eventual remarks are elements of evaluation.