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Each article submitted to the journal is subject to double blind-peer review.
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ON MARITIME ENGLISH COMPETENCE PROVISION IN MET IMPLEMENTATION
Abstract
The ability to use the English language in ship-to-ship, ship-to-shore and on-board communication actually is a mandatory requirement for prospective seafarers’ education and active ones’ training. Therefore, under specification of minimum standard of competence for officers in charge of a navigational watch (on ships of 500 gross tonnage or more; function: navigation at the operational level), adequate knowledge of the English language is required to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship’s safety and operation, to communicate with other ships, coast stations and VTS centres and to perform the officer’s duties also with a multilingual crew, including the ability to use and understand the IMO Standard Marine Communication Phrases.

Keywords: maritime English, competence, sample, communication

Introduction
A broad scope of the results to be reached during the process of Maritime English teaching, needs application of the approaches, focused on development of knowledge, understanding and proficiency, developed through appropriate methods of demonstrating competence and consequent criteria for competence evaluation. Thus, the methods for demonstrating competence should include examination and assessment of evidence obtained from practical instruction, approved in-service experience, training ship experience, and approved simulator training. At the same time, criteria for evaluating competence, contains the following guidelines: correct interpretation of English language nautical publications and messages relevant to the safety of the ship and communication should be clear and understood.

The aim of the presented paper is to present a sample unit from a textbook (designed for non-native English speakers) unit designed to meet the revised STCW 78/95 requirements applied to the latest changes introduced by the International Association of Marine Aids to Navigation and Lighthouse Authorities. Consequently, the goal of the proposed models is to offer teaching approach aimed at provision MET teachers, instructors and students (both cadets and seafarers) with the components offering inclusion of the conventionally-required data into the teaching process to provide them with ability to be put at almost real maritime communication cases directly at the educational institution. The goal of the unit presented below is to provide the nautical students with adequate competence and proficiency to enable them to use specific nautical terminology and to develop oral communication skills by means of pair work and individual project work motivation.

The expected outcome covers the fluent use of adequate speech act modeling, self-representation, critical thinking development and text analytical works. The Principles of the assessment include:

Speech Fluency Development:
# pair work discussions;
# presentations of individual project works;
# presentations of the illustrations in Blind Format;
# and the tests, based on the illustrations used in the text.

Sample Unit: An Illustrated Description of the Isolated Danger, EWMB, Safe Water and Special Marks
The Isolated Danger Mark: features and function

An Isolated Danger mark is erected on, or moored on or above an isolated danger (a hazard directly below the mark) that has navigable water all around it.

Table 1. An illustrated description of the isolated danger marks [1]

<table>
<thead>
<tr>
<th>Topmark (b)</th>
<th>2 black spheres, one above the other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Black with one or more broad horizontal red bands</td>
</tr>
<tr>
<td>Shape (Buoys)</td>
<td>Optional, but not conflicting with lateral marks; pillar or spar preferred</td>
</tr>
<tr>
<td>Light (when fitted)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>White</td>
</tr>
<tr>
<td>Rhythm</td>
<td>Group flashing (2)</td>
</tr>
</tbody>
</table>

Note: (b) The double sphere topmark is a very important characteristic feature of every Isolated Danger Mark.

Individual work/Presentation: be ready to comment upon the presented illustrations.

Pair Work. Ask and answer the following questions:

Where is the Isolated Danger mark erected on or moored on or above?…………………………………

What is a very important characteristic feature of every Isolated Danger Mark?…………………………

Describe the colours of the Isolated Danger Mark…………………………………………………………

What are the shapes of the Isolated Danger Mark?…………………………………………………………

Describe the topmark of the Isolated Danger Mark…………………………………………………………

What is the light colour of the Isolated Danger Mark?………………………………………………………

What is the light rhythm of the Isolated Danger Mark?………………………………………………………

New Danger Marking: types, features and function

Experimental New Danger Buoy (Emergency Wreck Marking Buoy) is a new type of buoy recommended by IALA for marking new wrecks. The “New Danger” is a newly discovered hazards not yet indicated in nautical documents. “New Dangers” include naturally occurring obstructions such as sandbanks or rocks or man-made dangers such as wrecks:

Marking of New Dangers. “New Dangers” should be appropriately marked using Lateral, Cardinal, Isolated Danger marks or by using the Emergency Wreck Marking Buoy. If the Authority considers the risk to navigation to be especially high, at least one of the marks should be duplicated. If using a Lateral lighted mark for this purpose a VQ or Q light character shall be used.
In addition it may be marked by a Racon, coded Morse “D”(- ● ●) and by other electronic means, such as Automatic Identification System (AIS as an AtoN). Virtual Aids to Navigation may be deployed solely or in addition to physical Aids to Navigation.

New Danger Marked by 2 port lateral buoys and RACON:

The New Danger Buoy has the following characteristic features:
# Shape of Buoy: A pillar or spar.
# Coloured in equal number and dimensions of blue and yellow vertical stripes (minimum of 4 stripes and maximum of 8 stripes).
# Fitted with an alternating blue and yellow light with a nominal range of 4 nautical miles where the blue and yellow 1 second flashes are alternated with an interval of 0.5 seconds.

B1.0s + 0.5s + Y1.0s + 0.5s = 3.0s

# A Racon sending the letter "D" in the Morse Code and/or AIS transponder can be used.
# The top mark, if fitted, is a vertical/perpendicular yellow cross.

These buoys remain until:
# The wreck is well known and is indicated in nautical publications.
# The wreck has been fully surveyed and exact details such as position and least depth above the wreck are known.
# A permanent form of marking of the wreck has been carried out.

**Individual work/Presentation: be ready to comment upon the presented illustrations.**

**Pair Work. Ask and answer the following questions:**

What is a new type of buoy recommended by IALA for marking new wrecks?……………………………
What was the reason of EWMB introduction?………………………………………………………………………
Describe the “New Danger”……………………………………………………………………………………………
What are natural and man-made “New Dangers”?……………………………………………………………………
How should the “New Dangers” be marked?………………………………………………………………………………
What are the shapes of EWMB?…………………………………………………………………………………………
Describe the colours of EWMB……………………………………………………………………………………………..
What is the topmark of EWMB?…………………………………………………………………………………………
What is the light colour of EWMB?………………………………………………………………………………………
What is the light rhythm of EWMB?………………………………………………………………………………………
How long does EWMB remain?…………………………………………………………………………………………

**The Safe Water Marks: features and function**

Safe Water (aka Fairway Buoys) Marks serve to indicate navigable water all round the mark; these include centre line marks and mid-channel marks. Such a mark may also be used to indicate channel entrance, port or estuary approach, or landfall. The light rhythm may also be used to indicate best point of passage under bridges.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Red and white vertical stripes</th>
</tr>
</thead>
</table>

Table 2. An illustrated description of the safe water mark [1]
<table>
<thead>
<tr>
<th>Shape (Buoys)</th>
<th>Spherical; pillar or spar with spherical topmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topmark (if any)</td>
<td>Single red sphere</td>
</tr>
<tr>
<td>Light (when fitted)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>White</td>
</tr>
<tr>
<td>Rhythm</td>
<td>Isophase, occulting, one long flash every 10s or Morse “A”</td>
</tr>
</tbody>
</table>

**Individual work / Presentation: be ready to comment upon the presented illustrations.**

**Pair Work. Ask and answer the following questions:**

What does a Safe Water (a Fairway Buoy) mark indicate? ..............................................................

Describe the colour of Safe Water Marks. ..............................................................

What are the shapes of Safe Water Marks? ..............................................................

What is the topmark of Safe Water Marks? ..............................................................

What is the light colour of Safe Water Mark? ..............................................................

What are the light rhythms of Safe Water Mark? ..............................................................

**The Special Marks: features and function**

Special Marks indicate a special area or feature, for example:

# Ocean Data Acquisition Systems (ODAS) marks (moored in deep oceans recording weather, tide and wave information);

# Traffic separation marks where use of conventional channel marking may cause confusion.

# Spoil Ground marks.

# Military exercise zone marks.

# Cable or pipeline marks.

# Recreation zone marks.

**Table 3: An illustrated description of the special marks [1]**

<table>
<thead>
<tr>
<th>Colour</th>
<th>Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape (Buoys)</td>
<td>Optional, but not conflicting with lateral (navigational) marks</td>
</tr>
<tr>
<td>Topmark (if any)</td>
<td>Single yellow “X” shape</td>
</tr>
<tr>
<td>Light (when fitted)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>Yellow</td>
</tr>
<tr>
<td>Rhythm</td>
<td>Any, other than reserved for Cardinal, Isolated, Danger and Safe Water Marks phase characteristic not used for white lights, e.g. Fl Y, Fl (4) Y</td>
</tr>
</tbody>
</table>
Additional Special Marks may be established to meet exceptional circumstances. These additional marks shall not conflict with navigational marks and shall be promulgated in appropriate nautical documents.

**Individual work / Presentation: be ready to comment upon the presented illustrations.**

**Pair Work. Ask and answer the following questions:**

- What do the Special Marks indicate?
- What is the colour of Special Marks?
- What is the shape of Special Marks?
- What is the topmark of Special Marks?
- What is the light colour of Special Marks?
- What are the light rhythms of Special Marks?

Table 4. Individual project work: skim and scan the presented texts and conclude, why it is important for a future seafarer: don’t simply copy the contents, put appropriate word combinations into the given sentence models, motivate your answer in the form of a short summary to comply with:
- the COLREG;
- STCW; SOLAS; MARPOL; IALA recommendations

<table>
<thead>
<tr>
<th>to comply with:</th>
<th>to steer; to manoeuvre; to alter the course to starboard/starboard; to operate astern propulsion</th>
<th>to become: an officer in charge of a navigational watch; a Master</th>
<th>to perform: watchkeeping duties; the Master’s orders; the pilot’s/VTS advice;</th>
<th>a vessel engaged in dredging or underwater operation; a vessel engaged in fishing</th>
<th>a vessel restricted in her ability to manoeuvre;</th>
</tr>
</thead>
<tbody>
<tr>
<td>to prevent: the risk of collision; striking with another vessel</td>
<td>in narrow channel; in Head-on situation</td>
<td>to avoid: an accident; the immediate danger</td>
<td>to deem the risk of distress; to take an early action; to allow the safe passage</td>
<td>to join the traffic lane; to leave the traffic lane</td>
<td>not to run aground; not to impede the passage</td>
</tr>
<tr>
<td>to maintain: a proper lookout; shiphandling</td>
<td>to proceed at a safe speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on-board training; seagoing service</td>
<td>to provide: manoeuvrability of the vessel; safe navigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of course, I naturally (obviously/evidently) agree that…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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Conclusion

Inclusion of such educational models into teaching process promotes development of STCW-oriented speech competence. The development of adequate speech modelling in Maritime English can raise access to learning opportunities. It can help to improve the quality of education with advanced teaching methods, students’ self-representation and critical thinking development.

References

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STUDENTS’ PROFESSIONAL APPROACH TO THE PORT AND SHIPPING MANAGEMENT

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Abstract
The professional approach of students of the Port and Shipping Management program at the Lithuanian Maritime Academy based on their academic and practical experience is analyzed in this paper. Methods such as scientific literature analysis, written survey, comparison, SWOT analysis, evaluation and systemization were used in the research. The methodological principle is constructivism as the main criterion for the evaluation of students’ experience. It has been found that students’ theoretical knowledge helps them develop the managerial competencies in their vocational practice. Students’ activity, insights, construction of their own knowledge and learning to creatively apply it in different situations help ensure personal improvement and find a prospective job. Employment prospects are high but each student is a unique personality who forms his/her own approach to his/her career options.

Keywords: students, professional approach, port, shipping, management.

Introduction

The Port and Shipping Management (PSM) program of the Lithuanian Maritime Academy is one of many maritime studies programs, which provides the opportunity to find a job not only in Lithuania but also in other countries. Students are studying according to this program at Lithuanian Maritime Academy by acquiring the useful managerial competence during their theoretical or practical studies. The managerial competence is an ability of the manager to apply his/her professional knowledge and personal skills in the workplace by achieving the desired results of the company [2].

The authority of seaport institutions supports promising and skilled port manager specialization worldwide. It increases maritime competition and invokes new strategies [7]. The purpose of the PSM program is preparation of port and shipping managers who are able to manage the main technological processes in maritime companies, to conduct market research and negotiate with local and foreign clients and prepare all required documentation [8].

All this shows that the participants (students, teachers, administration and social partners) of studies do need to participate properly and organize educational activities by acquainting them not only to formal juridical and technological aspects but also to the motivation and career aspirations of the students based on their practice.

Employment and career options in general are a relevant problem to students. PSM students perform their professional practice in maritime companies in Lithuania (AB “Klaipėdos jūrų krovinių kompanija” (KLASCO); UAB Klaipėdos jūrų krovinių kompanija “BEGA”; LKAB “Klaipėdos Smeltė” etc.) and abroad (Bruhold OU in Estonia, Northwest Crewing GmbH in Germany etc.) to get acquainted to their future job.

Given the rapid port expansions and the direct decrease of qualified workers in maritime companies students have a variety of choices when choosing a maritime company [9]. Evaluation of PSM students’ academic and practical experience is necessary to perceive the motivation of students to employ in maritime companies as well as to improve the study program.
The grade of the exploration

Unfortunately, this object of the research is not a direct purpose of scientific researches that are focused on a general preparation of maritime- and skilled port workers based on real events of the professional life [1; 4].

The object, goal and tasks of the research

The object of the research is a professional approach of PSM students.
The goal of the research is a revelation of the wider prospect of the mentioned approach regarding students’ academic and practical experience.

Tasks of the research:
1. Analysis of the students’ position compared with their academic experience with the practical one.
2. Evaluation of students’ position in accordance with the criteria of constructivism.
3. Determination of the students’ position regarding their career prospect.

Methodological principle, methods and type of the research

Methodological principle is constructivism, which develops critical thinking and shows the importance of continuing professional development. Education is oriented to practical and useful activities, and is based on self-learning and knowledge construction in different environments. The student in his/her educational activity is active, perceptive, creating his/her knowledge and learning to apply it [6].

The professional approach of PSM students is evaluated in the context of constructivism. The evaluation criteria are as follow:
- Academic activity;
- The original creation of knowledge;
- Constant professional development;
- The practical application of knowledge.

Methods such as scientific literature analysis, written survey, comparison, SWOT analysis, evaluation and systemization were used in the research.

The type of the research is empirical, quantitative.

The design and methodological limits of the research

The reasonableness of the instrument, and ethics while dealing with respondents helped ensure the validity of the research.

The instrument of the research is a questionnaire, which consists of 9 questions, formed on the basis of SWOT analysis, which means strengths, weaknesses, threats and opportunities. SWOT analysis helps investigate the studies of students, their practice and prospect [5].

Eight closed questions (each two of them fit to strengths, weaknesses, threats and opportunities) were used in evaluation of the professional approach of students.

Strengths:
1. The acquired knowledge in studies will be useful in real life events.
2. The company, in which you completed your practice, is relevant in the labor market.

Weaknesses:
3. The microclimate in the company of practice is conflictive.
4. Company of practice did not meet your expectations.

Threats:
5. The competition for the desired workplace in the company of practice is high.
6. Skeptical attitude towards the student trainee.

Opportunities:
7. The knowledge you gained in studies were useful in the company of practice.
8. The knowledge you gained will be useful in your future work place in the maritime business.

The answers are formulated according to Likert scale, where 5 means “completely agree”, 4 - “agree”, 3 - “no opinion”, 2 - “disagree”, 1 - “completely disagree”. To make it easier to anticipate trends when the data is processed, “completely agree” is combined with “agree”, and “disagree” is combined with “completely disagree”. The 9th question is an open question. Opportunity is given to express...
The student’s opinion when answering to the question: “Share your thoughts about the prospect to find a desirable job for PSM students”.

The fourth year PSM students are taken as a sample: from a total of 21 students 18 took part in the survey, which is 86% of that students group. It is enough of the respondents to check the situation in a concrete place and time [3]. The research is homogenous. The interviewed students where from the same group, from the same study program and of the same age (23). The basis of the research is Lithuanian Maritime Academy. The main principles of the research ethics were established during the survey: it was asked to participate in the survey, the object of the research was given, confidentiality was guaranteed, and it was obliged to introduce the results of the research. The data was processed with the MS Excel. The limits of the research: the results of the research should be applied to the given population only.

The results of the research

There is the analysis of the acquired knowledge of studies that will be (or not) useful in real life events (Figure 1).

![Figure 1. The knowledge of studies will be useful in real life](image)

It was determined that above 50% agreed that the knowledge acquired will be useful in their future life. A quarter of them did not have any opinion and a tenth of them disagreed. Overall the trend is positive. We can assume that every student is individually applying their acquired knowledge in his/her life and he/she is improving it in his/her own way based on the criterion of activity.

The relevance of the practice company in the labor market is being analyzed (Figure 2).

![Figure 2. The demand of the company in the labor market](image)

It was determined that the majority of the interviewed students agreed that the company, in which the practice was completed, is relevant in the labor market, and only 6% disagreed it. We can assume that active students choose the most desired company of the labor market, which can offer a job for them in future, based on the criterion of activity.

The level of conflict is being analyzed in the practice company (Figure 3).
Figure 3. The level of conflict in the practice company

It was stated that a quarter of interviewed students agreed that the microclimate is conflictive in the company of their practice. 6% do not have any opinion. Two thirds of respondents disagree. An assumption can be made that conflicts are expected in a high emotional stress demanding work environment. An identity-based assumption can also be made that a strong character can be shaped in the environment of a high conflict level.

The possible meeting of students’ expectations in a practice company is analyzed (Figure 4).

Figure 4. The practice company meets the students’ expectations

It was stated that more than a half of students answered that the practice company did not meet their expectations. A fifth of them do not have any opinion and another fifth of them agree that the company met their expectations. This fact concludes that expectations of students should be further investigated. An evaluation can be made that students who do not lack charisma can adapt to any company of practice and it would satisfy their needs based on the criterion of improvement.

The ability of being hired in the company of practice is analyzed (Figure 5).

Figure 5. High competition in the practice company

It was stated that a half of the interviewed students agreed that competition is high in the company of practice; almost one fifth have no opinion and a third of them disagreed. Overall the competition for a
workplace is high. It is possible to assume that students who feel strong competition experience as a challenge, which leads to better work results based on the criterion of practical application.

Skeptical attitude towards the student trainee is being analyzed (Figure 6).

It was stated that one third of the students agree that they were viewed skeptically, a tenth of them do not have an opinion, more than a half disagree. An assumption can be made that the relationship between the trainee and the company administration is normal. An evaluation can be made that students do not fear skeptical view and they are reaching for their goals in the company of practice based on the criterion of improvement.

There is being analyzed the usefulness of theoretical knowledge in the practice company (Figure 7).

It was stated that more than a half agree that the studies, in which they took part, were useful in their practice place, a fifth of them do not have any opinion and another fifth of them disagree. The trend is positive. It is possible to assume that the knowledge acquired in studies helps improve the practical competence of the specialist based on the criterion of practical application.

It was investigated if knowledge gained would be useful in a future work place in the maritime business (Figure 8). It was stated that the majority agreed that the knowledge acquired in their studies would be useful, a tenth of them do not have any opinion and another one tenth of them disagree. It is possible to assume that students who completed the studies can work in any seaport company based on the criteria of improvement and practical application.
PSM students have answered to the 9th question. They see a high prospect to find a desirable job in a port company. It should be emphasized that the managerial competence should be improved not only during studies and practice, and that a future career should be accordingly planned in order to find a workplace. It is possible to assume that a professional prospect for students of the PSM program is high. However, each student should personally improve, show initiative and try to reach his/her career goals based on the criterion of practical application.

Conclusions

It was stated that the theoretical knowledge gained during PSM studies help develop the competence of the manager when comparing the academic and practical experience of students. An assumption can be made that the students’ activity, insight and self-improvement help students find a prospective workplace when evaluating the students approach based on the criteria of constructivism. It was stated that the opportunity of employment is high, however each student is an individuality who differently sees his/her career possibilities when analyzing the professional approach to the career prospect.

References

THE PECULIARITIES OF EXERCISING STATE JURISDICTION AT THE HIGH SEAS

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Abstract

The high seas are not only one of the major areas of the world’s ocean, but also a source of many lucrative resources, which may be used by all states, whether coastal or land-locked, under the freedom of the high seas which is a general principle of international law. However, the principle is not unconditional as the activities of states at the high seas are subject to the regulations prescribed under the United Nations Convention on the Law of the Sea (UNCLOS). Equality of states operating at the high seas leads to the exclusivity of the flag state jurisdiction and the principle of non-interdiction of its vessels. Nevertheless, UNCLOS foresees exceptions to the jurisdiction of flag states. The article analyses, inter alia, the preconditions of exercising flag state jurisdiction, the possibilities and peculiarities of non-state actor interference particularly regarding cases of piracy and pre-emptive self-defence.

Keywords: UNCLOS, high seas, mare nostrum, exclusive flag state jurisdiction, non-state interference

Introduction

The high sea comprises a significant amount of the world’s ocean—64 percent of the ocean’s surface and 95 percent of its volume [17]. Furthermore, transportation of goods by the sea is becoming the main means of transportation as it has been determined that approximately 7.5 million cargo containers are carried via the high seas annually [16]. Moreover, under relevant observations of the European Commission maritime transport is considered to be the key catalyst of the socio-economic development of the European economy, acting as one of the major source of revenues and jobs in Europe also resulting in a more sustainable integration in the global economic community [7]. It is noteworthy, that maritime transport is crucial to the security of Europe's energy and a vital instrument of the European energy policy as 90 % of oil is transported by sea [7]. In the light of the above, ensuring sustainability, maritime security and control over the high seas is of crucial importance not only for the EU, but for the international community as well.

Activities of states at the high seas are based on the principle of the freedom of the high seas which is to be considered a general and well-established principle of international law [24]. The latter principle implies that states are sovereign and equal while operating at the high seas [35]. Accordingly, the exclusive flag state jurisdiction preconditions the establishment of the principle of non-interference regarding the states acting on the high seas [32].

States exercise their rights and freedoms at the high seas via their vessels which fly the flag of the state (Art. 87, 91 UNCLOS). Allowing a state to fly the state’s flag, i.e. granting the state’s nationality, is a matter of domestic national law (Art. 91 UNCLOS) as the Convention only sets forth the basic principles of assessing the ship’s nationality. Thus bystander states may not contest the legitimacy of the state’s right of granting nationality to its vessels [35]. It must be noted, that under UNCLOS, a “genuine link” must be established between the vessels and its flag state (Article 91(1) UNCLOS). However, the genuine link is not a precondition for the registration of the ship, but on the contrary, such a genuine link establishes an obligation for the flag state to "effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag" (Art. 91, 94(1) UNCLOS). Thus, the flag state has the primary and exclusive obligation to ensure the safety and order at the high seas by exercising effective jurisdiction with regard to the vessels flying the state’s flag. However, not in all cases the flag states are capable or willing to enforce effective jurisdiction with regard to the vessels flying the state’s flag. Moreover, due to various grounds, e.g. different nationalities and qualifications of the vessels’ crew members [30], the increase of open registers and monetary reasons, vessels tend to alternate their nationality at their convenience entering open registers of some states [18].

It must be noted that the development of the concept of the high seas from the mare liberum (the free sea) [13] to the modern mare nostrum (our sea) [1] concept preconditions that the maintenance of security and order at the high seas is not only an obligation for separate states operating in the area, but also it has gradually become a social goal for the international community as a whole [1]. Given the latter,
the inability for the flag state to pursue effective control over its vessels creates preconditions for bystander states to interfere with foreign vessels on the high seas [29]. Subsequently, the principle of exclusive flag state jurisdiction is not absolute. Moreover, by exercising their jurisdiction to foreign vessels bystander states, on the one hand, ensure that the goals set in UNCLOS are achieved, but also these states are enabled to protect and (or) defend their own interest in cases of alleged offences. It must be taken into consideration that as the principle of the exclusive flag state jurisdiction is a general principle which preconditions the principle of non-interference, thus bystander states may exercise their jurisdiction only in concrete cases proscribed by law. The research follows a presumption that the genesis of the concepts of the high seas, i.e. from the Grotius’ *mare liberum* to the contemporary *mare nostrum* concept, has made a significant impact on the conditions of exercising jurisdiction at the high seas.

The nature of the problem at hand is the peculiar regime of the high seas which results in the high seas belonging to no state and all states at the same time, thus the issues of excising jurisdiction occur. The goal of the research is to define the peculiarities of exercising state jurisdiction at the high seas. In order to obtain the set goal, the following tasks are established: (i) to analyse the dynamics of the legal regime of the high seas; (ii) to analyse the process of exercising flag state jurisdiction at the high seas; (iii) to analyse the process of exercising non-state jurisdiction at the high seas. The main object of the research is the exercise of state jurisdiction at the high seas. It is to be noted, that jurisdiction at the high seas may generally be of two major categories based on their subject: exclusive flag state jurisdiction, and non-state (including coastal-state or port-state) jurisdiction as the exception of the priory mentioned exclusive flag state jurisdiction. The following methods are applied in the research: analysis of scientific literature, case study, retrospective method, interpretation and generalization. Firstly, the dynamics of the development of the high seas regime is assessed and the relevance of the *mare nostrum* concept to the rules of exercising jurisdiction is disclosed. Secondly, the article provides an overview of the conditions of exercising flag state jurisdiction and the key peculiarities of exercising the latter jurisdiction particularly with regard to the phenomenon of flying the “flag of convenience”. Furthermore, the article discusses the preconditions necessary for bystander states to interfere with foreign vessels on the high seas. Lastly, the article provides the key findings of the research.

**The development of the regime of the high seas**

Even though the high seas now are open to all states – whether coastal or land-locked (Art. 87 UNCLOS), the legal regime of the high seas has significantly developed up to this point. Up until the 20th century there were no codified legal instruments governing the high seas or the law of the sea in general – states were subject either to bilateral and (or) regional treaties, or the general principles of international law. The current regime of the high seas began to form in the early 17th century with the publishing of the worldly renowned brochure “Mare Liberum” by Hugo Grotius and was gradually codified into a coherent legal instrument with the issuance of the UNCLOS.

The freedom of navigation and trade at the high seas can be traced back to the ancient Roman ages, during which the ocean was determined as an area of public use as no attempts to claim sovereignty to any parts of the ocean were recognized [8]. However due to the significant increase of technological development since the 13th century, trade via the seas developed alongside, thus countries began to claim territorial sovereignty over various parts of the ocean aiming to strengthen their dominant positions in the market (for example, the claim of England to the “English Sea” [9]). Moreover, the Bull of Pope Alexander VI caused even more controversy as it attempted to divide the world’s ocean among two major governing powers – Spain and Portugal.

As a response to the increasing tension between Portugal and the Netherlands as the latter was restricted from the freedom of navigation and participation in the Indian trade, Grotius issued “Mare Liberum” [13] which is considered a mile-stone to the development of the freedom of the high seas. In the aforementioned brochure, Grotius claimed the seas being open to use for all and any state as the sea is limitless, inexhaustible, and it cannot be claimed as any country’s property [13]. The *Mare Liberum* concept of the freedom of the seas has prevailed in its essence and was further developed in the 1958 Geneva Convention on the High Seas and, subsequently, UNCLOS. From the territorial dimension, in light of the prohibition on occupation, the high seas are *res nullius*, i.e. it belongs to no one. Whereas in terms of usage the high seas are open to all states meaning that the high seas are also as *res communis omnium*.

The further development of the concept of the freedom of the high seas resulted in the UNCLOS proscribing not only particular obligations to the states operating at the high seas, but also a general social goal for the international community itself [1]. UNCLOS foresees that, firstly, the problems of ocean
space are closely interrelated and need to be considered as a whole, and, secondly, that this Convention will contribute to the strengthening of peace, security, cooperation and friendly relations among all nations in conformity with the principles of justice and equal rights and will promote the economic and social advancement of all peoples of the world (Preamble of UNCLOS)

The principle of the freedom of the high seas determines that the seas are open to all and any states to use under the conditions laid down in UNCLOS. However, the concept of the high seas being *mare nostrum* preconditions rights and obligations not only to distinct states operating in the area, but also sets key goals to be achieved and ensured by the international community as a whole.

**Exclusive flag state jurisdiction**

In order for the states to effectively access the freedom of the high seas, the principles of state equality and non-interference are established. Given the latter, UNCLOS procribes the exclusive and even primarily implemented flag state penal or disciplinary jurisdiction with regard to the vessels flying the state's flag (Art. 97 UNCLOS), which was not established until the Geneva convention on the High Seas in 1958.

The independence and equality of states acting at the high seas were first mentioned in the *Le Louis* case by stating that the states enjoy absolute sovereignty while operating at the high seas [34]. The concept was further developed in the *S.S. Lotus* case [37] where the Permanent Court of Justice set the key principles of state jurisdiction in case of a collision at the high seas. The Court found that jurisdictions of states which are the flag states of both of the vessels of the occurrence are of concurrent nature, thus none of the jurisdictions prevails with regard to the other (para. 85). This stance was later overruled and the UNCLOS now established the sole and exclusive jurisdiction of the flag state with regard to its own vessels.

Countries enjoy their rights and freedoms of the high seas via vessels flying the state’s flag and thus having their nationality (Art. 90 UNCLOS). It must be noted that not having a nationality is not explicitly prohibited by international law, however, it is considered a sanction which should prevent ships from either refusing a nationality or flying more than one flag as the ship without nationality is considered as having no state protection [3]. It must be noted that conceptually the registration of the vessel is to be considered an agreement between the owner of the regarded vessel and the registration state, both that, on the one end of the bargain, the owner of the vessel shall abide the regulations of the registration state, whereas the state undertakes an obligation to provide the vessel with the state’s protection [30]. Thus the registration of a vessels obliges the flag states to impose effective control over its vessels, moreover, it results in the state’s protection of its vessels.

The nationality of the vessel contains, *inter alia*, the element of the right to fly the flag which is granted by registering the vessels under the domestic law of the flag state. Even though flying a state’s flag is considered a presumption of the vessel's nationality, in order for a vessel to be viewed as having a nationality by the international community, the vessel must not only fly a flag of a particular state, but there must also be a genuine link between the regarded vessels and its flag state (Art. 91 UNCLOS). Some view the genuine link requirement as a precondition for the registration of the vessel for it to be legitimate [31, 22]. This could ultimately enable bystander states to contest the legitimacy of the registration of a vessel, however, this stance was overruled and bystander states cannot question the legitimacy of the registration of the vessels as it is solely in the competence of the flag state to determine [35]. The prevailing theory suggest that the genuine link requirement under UNCLOS serves as creating an obligation for the flag state to impose effective control of the vessel having its nationality [2, 32]. The genuine link being a consequence of rather than the necessary precondition for the registration of the vessel has been confirmed in cases *Saiga (2)* [35] and *Virginia G* [36] held before ITLOS.

The majority of issues of exercising flag state jurisdiction arise when flag states refuse to exercise effective control over their vessels or do so vaguely in an insufficient manner. One of the reasons of ineffective flag state control is the establishment of the so-called open registers. Even though the international community is putting a significant effort into eliminating these registers and generally condemns them, the registers persist due to various grounds. Firstly, owners of vessels to be registered in the open registers undergo less scrutiny, e.g. lower vessel safety standards are applied, there are no particular nationality requirements and there is no requirement to establishing a certain relation to the registering state. Secondly, owners of the vessels to be registered are provided with great fiscal benefits [30, 24]. Thus open registers have been and still are a growing tendency. Furthermore, as the open registers offer a relatively simple procedure of entering the register, accordingly it provides for a simple register exit procedure. Given that vessels and their owners registered in open registers may not have
significant or even any ties to the flag state and the latter to not exercise effective control over these ships, open registers create the phenomenon of flying the “flag of convenience” which occurs when the real effective control and ownership of the vessel is in a different state than the declared flag state [15].

Given that in cases of ships flying the “flag of convenience” the states of registration tend to avoid exercising effective control, it may be argued whether the genuine link between the ships and their registration states exists. Furthermore, these cases raise the issue of whether the nationality of a ship flying a “flag of convenience” should be acknowledged if there is no de facto control over the ship, and whether a mere fact of registration is sufficient to determine the nationality of the ship. E.g., the International Transport Workers’ Federation argues that in cases of flying the “flag of convenience” the genuine link does not exist [15]. The non-existence of the genuine link would enable bystander states to question the nationality of the ship and endorse intervention as no state is protecting the ship. However, it must be noted, that open registers are not prohibited per se under international law mostly because the genuine link required by UNCLOS is treated as a consequence of and not a precondition for the registration of the vessels. Moreover, vessel registration is regulated solely under domestic law of the registration state and no bystander state may contest the legality of the vessel’s nationality if it has been granted in accordance with national regulations [35].

Non-state interference

The exclusive flag state jurisdiction is not absolute. It is particularly when the flag state does not effectively execute its obligations, e.g. is unable or refuses to exercise effective jurisdiction over its vessels, when bystander states may seek to execute theirs under the condition laid down in UNCLOS. As mentioned before, maintaining security and stability at the high seas is not limited to the flag states controlling their vessels, but is also a task for the international community as whole under the concept of mare nostrum. Moreover, the general state-liability principle suggests that when the flag state fails in its duty, the state becomes liable in the view of other states, hence they acquire a reciprocal right to rectify the situation, which was not solved by the flag state [26].

A historical analysis suggests that interference at sea was viewed as a form of force-at-sea and needed to be justified as being necessary [14, 6]. Theoretically bystander state intervention may take two basic forms [27]. Firstly, it is the right of reconnaissance as a less obtrusive means of requiring the encountered ship to show her flag without physical interference and usually executed via the radio [32]. The second means of interference, the droit de visite or the right to visit, involves actual physical actions with regard to the encountered ship [27]. The latter right to visit a vessels is composed of two significant elements: the right of investigation of the flag where the visiting ship acquires the necessary documentation to confirm the vessel’s right to fly the flag at hand, and the right to search which is subject to the conditions laid down in UNCLOS [27]. It must be noted that under particular conditions state interference against a vessel operating under another state’s flag is justified in cases of self-defence and pre-emptive self-defence as well.

Under UNCLOS an investigation of a foreign vessel may occur when the she is suspected of being engaged in the following acts of: (i) piracy; (ii) slave trade; (iii) unauthorized broadcasting; (iv) operating without a nationality; (v) being of the same nationality of the inspecting state however refusing to show its flag or flying another state’s flag. If an encountered vessel is suspected of the latter the inspecting warship may, firstly, assert the nationality of the vessel, however, is there is substantial ground to suspect these offences the warship may board the vessel in order to collect evidence that would repel the suspicions (Art. 110(1), 110(2) UNCLOS). Furthermore, if the suspicion remains after the primary examination of the vessels documentation, it may proceed to a further examination on board the ship (Art. 110(3) UNCLOS). Due to the limited extent of the research, the article analyses the preconditions and peculiarities of exercising the most intrusive and complex means of interference in cases of piracy.

Non-state interference in cases of piracy as regulated under UNCLOS

The most intrusive means of state-interference at the high seas are the cases of foreign vessel seizure of a ship when she is suspected of piracy. The interference in these cases is justified under the exercise of universal state jurisdiction as pirates are hostis humani generis (enemies of the human race), hence all states have the right to pursue actions against pirating vessels. It must be noted that the nationality of the vessel engaged in piracy is not precluded of its nationality as it is determined under domestic law of the flag state (Art. 104 UNCLOS). However, given that pirates are the enemies of the whole international community, in the view of it, pirates are denied of the protection of the vessels flag state [37].
Actions of a vessel and its crew member may be deemed as piracy if they meet all of the criteria set in UNCLOS. The actions must be, firstly, unlawful and violent. Another requirement is the *lucri causa* or the aim for personal gain. It must be noted that the *lucri causa* requirement is not limited to actions of plunder and may encompass a broader scope of the definition, e.g. as public and private interest may often crossover [24]. The third requirement is the “two ship” requirement stating that in order for an event to be deemed as piracy, there must be one vessel which is accused of piracy and another vessel which may be determined as the victim of the offence. For example, in the Santa Maria case two member of the crew hijacked the ship, took over control using force which ultimately lead to gross casualties, however under the applicable provisions of the Convention on the High Seas, Santa Maria was not considered a case of piracy as there was only one ship and no other was involved in the act [12]. Lastly, the requirement of the acts of piracy to take place at the high seas is established. With regard to the latter, some criticise this requirement and argue that under UNCLOS piracy was artificially or virtually eliminated as most of the piracy acts nowadays take place in the exclusive economic zone of states [22].

The states are entitled to seize a vessel taken by piracy and arrest all the persons in charge of the offence (Art. 105 UNCLOS). Even more, the courts of the State which carried out the seizure may decide upon the penalties to be imposed, and may also determine the action to be taken with regard to the vessel (Art. 105 UNCLOS). However, the practical exercise of such jurisdiction shows to be problematic.

**Peculiarities of dealing with piracy at the high seas**

States may exercise their jurisdiction with regard to pirating vessels by invoking their rights envisaged in Art. 105 and 110 UNCLOS. However, the practical implementation of the right to prosecute the culprits is rather complex as the detainees may only be prosecuted under particular domestic regulation of piracy in as much as it mirrors the *iure gentium* [24] and accordingly the composition of the offence under UNCLOS as well. Thus, the national law of the state which has detained the culprits must foresee a particular crime of piracy as the regarded persons cannot be charged for separate offences.

The issue becomes evident while assessing the Somali pirate attack and hijack of Russian vessels in May 5, 2010 [20]. Russian authorities arrested the persons which were responsible for the attack, however after a brief period of time they had to be released as it was impossible to prosecute the persons under domestic law as piracy was not criminalised under the law. Accordingly, the UN General Assembly urged the states to adopt the necessary means in order for the provisions of UNCLOS to be effectively used[11], subsequently the majority of the members of UNCLOS, including Lithuania, adopted the necessary legal amendments of their national law.

Another aspect that must be taken into consideration is the compliance of the actions of seizure and detention with the requirements under the Convention for the Protection of Human Rights and Fundamental Freedoms (hereinafter – the ECHR). For example in 2008 a group of Somali pirates were detained by the Danish Navy force. However, the Danish authorities decided not pursuing criminal charges and released the defendants considering that they would have required extraditing the persons to Somalia where they would have faced torture and death penalty. Such extradition where the defendants would face inhumane treatment is prohibited under Danish law and ECHR. Cases Rigopoulos [28], Medveyev [21] and Vassis [39] before the European Court of Human Rights (hereinafter – the ECHR) are significant to the analysis of the compliance of detention and arrest with the conditions under the ECHR. In all of the latter cases the applicants before the ECHR who were detained for their criminal activities of piracy invoked their rights under Art. 5(3) ECHR stating that persons must be brought *promptly* (note: emphasis added by the author) before a judge or other officer authorised by law to exercise judicial power and shall be entitled to trial within a reasonable time. The applicants claimed that the detention period of 10 or more days violated their rights under Art. 5(3) ECHR. However, the ECHR found that the requirement of being promptly presented before a judge was not violated as that particular duration was actually needed to transport the detainees before the respective authorities due to the travel distance and speed via the seas.

**Terrorism as modern-day piracy**

In 1985 a group of passengers claiming to be members of the Palestinian liberation front hijacked “Achille Lauro”, which was flying the Italian flag, and took over control of the ship by force, taking the crew and passengers as hostages, threatening to use force against the hostages and detonate a bomb on the vessel. The hijackers boarded the “Achille Lauro” legitimately in one of the ports, however the attack itself took place when the vessel was at the high seas. Even though the “Achille Lauro” incident met most
of the elements of piracy in its essence, e.g. the actions of the hijackers were unlawful, violent and took place at the high seas, formally the incident was not considered an act of piracy under UNCLOS solely on the grounds that a second ship was not involved, and the actions of the hijackers were considered more likely to be a terrorist attack. Nevertheless, this case raised a question of whether a terrorist attack may be considered as piracy in terms of the nature of the actions per se.

It has been argued whether vessels and persons suspected of terrorism may be subject to universal jurisdiction of states just as piracy under UNCLOS. It may be stated that the definition of piracy under both the 1958 Geneva Convention and UNCLOS is not exhaustive thus is open for interpretation. Subsequently, if by the nature acts of terrorism may be assimilated to piracy, states would be granted the right to exercise universal jurisdiction. Nonetheless, another issue that occurs is that there is no universally recognized definition of terrorism under international law accordingly making the exercise of universal jurisdiction with regard to terrorism relatively impossible as it is unclear what constitutes an act of terrorism [32]. Currently the issue is left for debate and no final unanimous decision has been reached.

Self-defence upon the high seas

Art. 92 UNCLOS foresees that vessels are subject to the exclusive jurisdiction of the flag state saving in exceptional cases expressly provided for in international treaties. One of these exceptional cases may be considered self-defence which even though is not explicitly established under UNCLOS, is a universally recognized inherent right of states (Art. 51 of the Charter of the United Nations). It must be noted that in order for self-defence to be justified it must meet certain criteria laid down in relevant treaties and in compliance with the established principles of international law meaning that the actions must be necessary, proportionate with regard to the offence, unavoidable, of non-punitive nature and aimed at maintaining security of the state and international peace.

The question arises whether pre-emptive self-defence (or anticipatory self-defence) falls under the scope of Art. 51 of the UN Charter. Some argue, that pre-emptive self-defence is beyond the scope of the UN Charter [8], however, practise shows that under certain conditions anticipatory self-defence may be justified [4]. The criteria to justify pre-emptive self-defence were established in the Caroline case providing that a state which claims to have used pre-emptive self-defence must prove whether the actions were instant, if the possible attack was of substantial magnitude, the reaction was overwhelming, moreover, the means of self-defence left no room for deliberation of the response [19].

The use of pre-emptive self-defence upon the high seas has its peculiarities namely due to the specifics of operating at sea. It may be put into question whether in cases of pre-emptive self-defence the criteria of non-deliberation can be duly met since evidently authorities do actually have a significant amount of time to consider their further actions. The most significant examples throughout history are the Torrey Canyon incident, Virginian incident and the so-called Algerian emergency, the latter two being of similar essence, however controversially regarded by the international community. The Torrey Canyon incident regarded Great Britain’s alleged pre-emptive self-defence with respect to a Liberian vessel Torrey Canyon that grounded on the high seas off England, and subsequently caused a gross crude oil spill near England’s shores in 1967. The authorities of Great Britain sanctioned the bombing of Torrey Canyon on grounds of self-defence. The legality of such actions was in question as at the time of the incident international law did not provide with ground for such actions, however, international subsequent international practice and opinion bear out the legitimacy of such actions of England ex post [27]. The Virginian incident occurred when a vessel although sailing under the flag of the United States, was actually under the control of Cuban insurgents who fraudulently obtained United States registry and were employing the vessel to run men and guns to support the revolution against Spain’s governance. On the high seas, the Spanish authorities, invoking their rights to anticipatory self-defence, seized the Virginian and brought her to Santiago de Cuba where the crew and passengers were sentenced to death for treason, all of this being in accordance with international law and the Caroline criteria [19]. Another noteworthy incident is the Algerian emergency during 1956-1962 where France Navy was entitled to visit and search foreign ships on the high seas in an effort to stem the flow of arms and munitions into Algeria and subsequently thousands of vessels were searched, thus the flag states of many of the affected vessels vigorously protested to the French Government. The dispute remained unsolved, however, it provoked an imminent reaction from the international community as the actions of France were deemed as not meeting the criteria established in the Caroline case namely due to the duration of the actions and amount of searched ships [19].

In the view of the above, it may be stated, that cases of pre-emptive self-defence are assessed ad hoc and confirmed as justifiable ex post (Torrey Canyon), however, all of these cases undergo scrutiny under
the criteria set in the *Caroline* case, thus the states claiming invoking their rights of self-defence must prove that the necessity of self-defence was instant, overwhelming, leaving no choice of means, and no moment of deliberation, moreover, that the means themselves were proportionate and tailored to the nature of the offence.

Conclusions

International law does not provide an explicit definition of what the high are. Instead UNCLOS defines the *ratione loci* of the application of its provisions establishing the regime of the high seas in a negative form by determining to which waters the provisions of the high seas do not apply (Art. 86 UNCLOS). Accordingly, the provisions governing the high seas apply to those parts of the world ocean which are beyond the territory of the State and its exclusive economic zone. Moreover, contemporary law of the sea suggests that the concept of the high seas has developed from it being *mare liberum* to *mare nostrum*. This resulted in the UNCLOS proscribing not only particular rights and obligations to states acting at the high seas, but UNCLOS also foresees broad social goals to be achieved by the international community as a whole. Thus the concept of the high seas, where it belong to everyone and no one at once, and that the preconditions the peculiarities of the exercise of state jurisdiction at the high seas.

The status of the high seas, i.e. it being open for all states to use and that all of the states operating in it are equal, preconditions the formation of the principle of exclusive flag state jurisdiction. Furthermore, the research shows, that no state may exercise its jurisdiction to foreign ships due to the states operate at the high seas with accordance with the principle of state sovereignty. Prior to the issuance of UNCLOS it was held that the jurisdiction of states are concurrent, however, the aforementioned Convention establish the principle of exclusive flag state jurisdiction. It is in solely in the competence of the state to grant its nationality to the ships in question and bystander states cannot contest the fact of the ship’s registration under domestic law. With regard to the nationality of the ship, it must be noted that the nationality of her is not a precondition for the registration, on the contrary, registration fact itself constitutes an obligation for the flag state to establish effective control over vessels flying its flag and operating at the high seas. However, not all flag states fulfil the latter obligation which is evident when analysing the phenomenon of “flags of convenience”, when states establish open registers to grant state nationality to foreign vessels, subsequently exercising none or very vague control over the vessels, grant fiscal advantages, and generally apply lower safety standards.

UNCLOS foresees a general obligation for all states and the international community as whole to ensure safety at the high seas regions. Thus when the flag state is incompetent to implement its effective jurisdiction, bystander states have the right to engage in reciprocal action. Hence the exclusive flag state jurisdiction is not absolute in its essence as the UNCLOS foresees exceptions to the later principle of flag state jurisdiction. These exceptions enable bystander states to exercise their jurisdiction to vessels flying another state’s flag or stateless vessels operating at the high seas under the condition laid down in UNCLOS. The most intrusive means of state-interference are in cases of piracy. In these cases regardless the flag the ship is flying, are regarded as having no protection from any state as they are the “common enemy” of the international community. Thus UNCLOS proscribes the right for any state to seize a ship suspected of being engaged in piracy at the high seas and to trial the persons accused under domestic law. However, the practical implementation of these rights has shown to be rather problematic, as the persons suspected of piracy may only be prosecuted under a particular provision prescribing acts of piracy and not under a combination of distinct offenses. Moreover states may exercise their jurisdiction seeking to protect their own interests, e.g. in cases of self-defence or unauthorized broadcasting at the high seas. Even though self-defence is an inherent under Article 51 of the UN Charter, the actual implementation of provisions regarding self-defence in high seas has their peculiarities. Neither international law, nor UNCLOS define whether pre-emptive self-defence is a legitimate means of non-state interference at the high seas. The alleged actions of pre-emptive self-defence must meet the *Caroline* criteria, which disclose that the reaction must be instant to an overwhelming offence, leaving no choice of means, no moment of deliberation and of non-punitive nature. The doctrine does not provide to what extent is self-defence justifiable as in its essence actions of self-defence at high seas is neither instant, nor leaving no moment for deliberation due to there is always a significant gap of time to strategize future actions. Given the latter, actions of pre-emptive self-defence at high seas are asserted *ad hoc* and confirmed *ex post*. It is additionally noteworthy, that in order to ensure effective enforcement of environmental requirements, the port-state may apply its jurisdiction over foreign vessels for the environmental offenses committed at the high seas (e.g. causing pollution).
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APPLICATION OF PLC’S IN CONTROLLING
THE SHIP’S AUXILIARY SYSTEMS

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Abstract
The paper describes application PLC’s (programmable logic controller’s) with graphical programming languages FBD (function block diagram) on the ship’s auxiliary systems such as separators, compressors, boilers, cargo systems. Shown the method of preparation of the algorithm works and receiving logic control circuit system on the compressor system example. This method of design control circuits is used for the study subjects “THE SHIP’S CONTROL SYSTEMS” and used by students in the calculations in the graduation projects. Using PLC’s with programming languages FBD it allows faster and easier to learn the principles of control a particular system.

Keywords: PLC’s, control system, compressor, logical equation, method, simulation.

Introduction
The purpose of work show the possibility and benefits of using the PLC’s with programming languages FBD on the ship’s auxiliary control systems. In such systems typically operate with a small number of input and output devices. This allows the use of standard PLC’s the company „Grouzet” with a set of input parameters up to 12 and output devices up to 8. If desired, you can use the expansion units up to 20 and 12 parameters and devices, respectively. This form controllers is used the programm „Millenium-3A”, where the programming process make with the simplest logic elements, such as logical AND, OR, NOT, and logic devices such as trigger, timer, PID-regulator. The program allows you to create control schemes of varying complexity. The main advantage of this programming is the simplicity of drawing up the algorithm works in the visual design of the control circuit.

Using graphical programming language FBD instead of a text programming language SP is much easier you work if it is needed to change the program or eliminate the sistem fault. Functional programming language requires no special training and it is available for self-study [1,2]. As an example of using the PLC’s with programming languages FBD on the ship’s auxiliary control systems used real compressor control circuit.

Logic control circuit for PLC’s will build upon this methodology:
1) the ship's equipment selection and analysis (basic device, principle of operation, components, operating modes, the mode of operation algorithms);
2) the basic parameters and limits the choice of (input and actuator tabulation);
3) the functional condition of the tabulation;
4) drawing up a logical equation;
5) the main actuator logical framework compilation;
6) the main actuator logical scheme combinations;
7) the ship's auxiliary control circuit simulation.

Compressor control system with PLC application
Using the introduction described the logical control circuit for PLC’s creation methodology will be developed the compressor logic control circuit. Control circuit algorithm will be mainly according to the company “Sauer” compressor algorithm described in the manual. The compressor is mounted on a 2012 built 25000DWT chemical tanker. Compressor model "Sauer wp100". So programmed PLC model - XD26 (230VAC) with the programm "Millenium-3A “ [3,4].
1.1. Compressor control system basic parameters

1. The electric voltage = 440 VAC
2. PLC supply voltage = 230VAC
3. LED indication lamp supply voltage = 24 VDC
4. The compressor power = 17.5 kW
5. Maximum working pressure = 30 bar
6. The air temperature limit = 80 °C
7. Cooling water outlet temperature = 38° C

The basic input and output parameters and limits of the compressor shown in Table 1 and Table 2.

Table 1. The basic input and output parameters and limits of the compressor

<table>
<thead>
<tr>
<th>In</th>
<th>Name</th>
<th>Normal operating range</th>
<th>Zero range</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Manual range</td>
<td>1 (manual)</td>
<td>zero range</td>
</tr>
<tr>
<td>b</td>
<td>Auto range</td>
<td>1 (automatic)</td>
<td>0 (zero range)</td>
</tr>
<tr>
<td>c</td>
<td>Oil level switch</td>
<td>1 (low level)</td>
<td>0 (normal)</td>
</tr>
<tr>
<td>d</td>
<td>Air temperature switch</td>
<td>1 (high temperature)</td>
<td>0 (normal)</td>
</tr>
<tr>
<td>e</td>
<td>Overcurrent switch</td>
<td>1 (overload)</td>
<td>0 (normal)</td>
</tr>
<tr>
<td>f</td>
<td>Cooling water switch</td>
<td>1 (high temperature)</td>
<td>0 (unlocked)</td>
</tr>
<tr>
<td>g</td>
<td>Low pressure switch</td>
<td>1 (set min pressure)</td>
<td>0 (not set min)</td>
</tr>
<tr>
<td>h</td>
<td>High pressure switch</td>
<td>1 (set max pressure)</td>
<td>0 (not set max)</td>
</tr>
<tr>
<td>i</td>
<td>Heater on</td>
<td>1 (to turn on)</td>
<td>0 (to turn off)</td>
</tr>
</tbody>
</table>

Table 2. The basic input and output parameters and limits of the compressor

<table>
<thead>
<tr>
<th>Out</th>
<th>N</th>
<th>Name</th>
<th>Operat.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>O1</td>
<td>LED Signal lamp operational</td>
<td>1</td>
<td>compressor operates</td>
</tr>
<tr>
<td>F2</td>
<td>O2</td>
<td>LED Alarm. Oil level</td>
<td>1</td>
<td>low oil level</td>
</tr>
<tr>
<td>F3</td>
<td>O3</td>
<td>LED Alarm. Air temperature</td>
<td>1</td>
<td>air temperat. of 80 °C</td>
</tr>
<tr>
<td>F4</td>
<td>O4</td>
<td>LED Alarm. Overcurrent</td>
<td>1</td>
<td>compr. motor overload</td>
</tr>
<tr>
<td>F5</td>
<td>O5</td>
<td>LED Alarm. Cooling water high temp</td>
<td>1</td>
<td>water temp. of 38°C</td>
</tr>
<tr>
<td>F6</td>
<td>O6</td>
<td>Compressor elektromotor</td>
<td>1</td>
<td>compression process</td>
</tr>
<tr>
<td>F7</td>
<td>O7</td>
<td>Cooling water elektromotor</td>
<td>1</td>
<td>cooling process</td>
</tr>
<tr>
<td>F8</td>
<td>O8</td>
<td>Condensate drain solenoid valve</td>
<td>1</td>
<td>opened every15 minute</td>
</tr>
<tr>
<td>F9</td>
<td>O9</td>
<td>Cooling water inlet solenoid valve</td>
<td>1</td>
<td>opened comp. process</td>
</tr>
<tr>
<td>F10</td>
<td>OA</td>
<td>Heater</td>
<td>1</td>
<td>operat. before compr. process</td>
</tr>
</tbody>
</table>

1.2. Compressor control system functional state tabulation

1. Compressor start-up manual mode

   Manual mode activation

Forcing a manual mode can be activated of the button. Compressor start instantly launches the compressor electric motor, electric motor of the compressor cooling water, cooling water input solenoid valve. Compression cycle of the first 15 seconds of the beginning of condensate drainage through the condensate drainage solenoid valves (step 1). Condensate drainage time pressure load is removed from the compressor electric motor shaft, so the electric motor may be overload. Condensate drainage compression occurs during 15 seconds every 15 minutes (step 2). On the manual mode operator himself stops and runs the compressor.

2. Compressor start-up automatic mode

   Automatic mode activation

Forcing a automatic mode is activated of the button. Compressor start instantly launches the compressor electric motor, electric motor of the compressor cooling water, cooling water input solenoid valve. Compression cycle of the first 15 seconds of the beginning of condensate drainage through the condensate drainage solenoid valves (step 1). Condensate drainage compression occurs during 15 seconds every 15 minutes (step 2). Automatic mode the compressor turns on / off depending on the pressure sensor signals. Start-up pressure switch is triggered when the pressure in the compressor receiver will be lower than the low set-point pressure. Stop-off pressure switch is triggered when the pressure in the compressor receiver
will be higher than the high set-point pressure. So when compressor operate on the start state two pressure switches must be closed and on the stop state operation both switches must be open. While the compressor reservoir pressure will not reach a high set-point of the pressure switch, the compressor will operate at normal compression cycle. When the compressor reservoir pressure reaches the high set-point pressure compressor stopped until the compressor reservoir pressure will not fall before the low set-point pressure. Further work of the compressor cycle is repeated.

3. Compressor emergency mode
Emergency operation of the compressor is formed when the alarm sensors parameters of the compressor to preserve the normal range. There are two levels of protection. In the first case is only activated alarm and the compressor continues to operate. Faults are eliminated during operation of the compressor. In the second case activated alarm and the compressor stops. Further operation of the compressor can be only after the fault.

Fault 1. Low oil level
Triggered compressor low oil level switch, which indicates a low oil level in the compressor oil tank. Illuminates LED indication - low oil level. The second protection level.

Fault 2. High compressed air outlet temperature
Triggered compressor compressed air outlet temperature switch, which indicates that the compressor outlet air temperature exceeds 80 °C. LED display lights up - high temperatures. The first protection level.

Fault 3. Electric compressor overload
Triggered compressor overload switch which indicates that current value of the electric motor windings becomes significantly higher than the nominal value of the overload relay is triggered. LED display lights up - overload. The second protection level.

Fault 4. Cooling water temperature switch
Triggered the cooling water temperature switch, which indicates that the cooling water temperature exceeds 38 °C. LED display lights up - cooling water high temperature. The first protection level

Based on a predetermined algorithm of work is a functional state (Table 3) and logical equations for the actuators. Using these equations determined the structure of the control system compressor. The scheme management in different modes tested on a real stand and fully corresponds to the original algorithm.

Table 3. Predetermined algorithm of work

|                      | a | b | c | d | e | f | g | h | i | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 |
|----------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| Turn on the heater   | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Step 1. Manual (0-15) sec | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 0  |
| Step 2. Manual (0-15) min | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 1  | 0  |
| Step 1. Auto (0-15) sec | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 0  | 0  |
| Step 2. Auto (0-15) min | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 1  | 0  |
| Step 3. Auto stop     | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 1. Low oil level | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 2. Low oil level | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 2. High air tem. | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 2. High air tem. | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 3. Overload.    | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 3. Overload.    | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
| Fault 4. Cool.water tem. | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  |
| Fault 4. Cool.water tem. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  |
1.3. Compressor control system logical equation compilation

\[ F_1 = abcdefghi + abcdefghi + abcdefghi \]  
\[ F_2 = abcdefghi + abcdefghi \]  
\[ F_3 = abcdefghi + abcdefghi \]  
\[ F_4 = abcdefghi + abcdefghi \]  
\[ F_5 = abcdefghi + abcdefghi \]  
\[ F_6 = abcdefghi + abcdefghi + abcdefghi \]  
\[ F_7 = abcdefghi + abcdefghi + abcdefghi \]  
\[ F_8 = abcdefghi + abcdefghi + abcdefghi \]  
\[ F_9 = abcdefghi + abcdefghi + abcdefghi \]  
\[ F_{10} = abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi + abcdefghi \]  

1.4. Compressor control system logic circuit compilation

![Figure 1. Compressor control system logic circuit](image-url)
1.5. Compressor control system functional scheme simulation

Compressor control system specification
1. The compressor electric motor
2. The cooling pump electric motor
3. Condensate drainage solenoid valves
4. The cooling water solenoid valve
5. The air outlet temperature alarm sensor
6. The air outlet pressure alarm sensor
7. The oil tank level alarm sensor
8. The outlet cooling water temperature alarm sensor
9. LED heater operation indication
10. LED compressor operation indication
11. LED overload indication
12. LED oil level max indication
13. LED compressed air temperature max indication
14. Selector switch modes - "0", "arm", "automatic"
15. The heater power switch
16. PLC

Compressor functional scheme shows that the PLC interacts with a real compressor elements. Blue color image input signals for PLC. The red color image output signals from the PLC. Green color shape of the light display on the compressor panel [5,6].
Conclusions

Using PLC’s with graphical programming languages FBD makes visually accessible control scheme and allows you to quickly and easily learn management principles specific system. The program allows you to inspect the work algorithms of the system and make the necessary changes the ship's technical staff without special training.

In the learning process this technique is the design of ship control systems used by students in the calculations in the graduation projects. Calculation results are verified on a stand in the automation laboratory with a complete imitation of a particular control system.

References

MARITIME PASSENGER TRANSPORT SHOULD LOOK UP AT AIR TRANSPORT

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Abstract
It is awkward that the most important carriage by sea - i.e., the carriage of passengers - has always been in the shadow of the carriage of goods in the eyes of the law. The first widely accepted applicable international convention was adopted only in the 70s of the last century (the Athens Convention Relating to the Carriage of Passengers and their Luggage by Sea). The PAL Protocol 2002 to the Athens convention and EU Regulation 392/2009 have brought significant changes in the transport of passengers and their luggage by sea. What are the implications and can we hope that these two documents will affect the maritime transport of passengers and their luggage all around the globe?

Keywords: carriage of passengers by sea, strict liability, fault, PAL Protocol 2002, Athens Convention.

Introduction
Considering the migrations to Australia that may have taken place as long as 60,000 years ago, it is clear that carriage by sea is one of the oldest known modes of mobility and migration. Ancient legal sources contain the rules about maritime transport, which has long represented an interesting and economical alternative from the time the first records were preserved to the invention of steam machine [18] and to the present. The first scientific steam novelties were the invention of Hero of Alexandria in the 1st century CE. The steam engine changed the world when it was introduced to railway transport, becoming a commercial success with the Rocket, a steam locomotive made by English engineer George Stephenson in 1829. Maritime transport of goods and passengers was the only means of carrying out long haul mobility among the sea-divided continents until the middle years of the last century; and only in the 1950s and 60s of the 20th century was the long haul transport of passengers overtaken by air transport. That obviously did not happen to the carriage of goods. Legal rules regarding such transport tended to lag behind the transport itself.

Carriage of passengers by sea in 20th century

The 20th century was a century of international unification regarding legal rules in the field of transport. Unfortunately, at time the motivation emerged from disaster. The SOLAS convention [20] was introduced in 1914 [4] as a result of the sinking of the RMS Titanic. The very first SOLAS prescribed numbers of lifeboats and other emergency equipment, safety procedures and continuous radio watches. [4] It never entered fully into force as it was introduced at the dawn of the 1st world war (and when it did, the results were often darkly comical, many boats top-heavy from by highly placed lifeboats capsizing as a result). Nevertheless, it demonstrated the will of international maritime community to introduce international rules that would enhance the safety of maritime transport of passengers.

There were other disasters in field of transport of goods that contributed to unification of maritime law. The Torrey Canyon disaster in 1967 led to International Convention on Civil Liability for Oil Pollution Damage (CLC) 1969, the MV Erica [21] shipwreck in 1999 lead to the Erica I, II and III packages of European Union and IMO proposals for raised compensation limits for oil pollution disasters, a mandatory ship reporting system and agreement on phasing out single hull tankers. In the USA the OPA 90 was the direct result of the Exxon Valdez oil spill that occurred in Alaska in 1989. The Herald of Free Enterprise disaster [2] in 1987 brought changes to the latest SOLAS in 1990, including the incorporation of the International Safety Management Code in 1994 into chapter IX. The aim of the ISM Code [6] is to provide an international standard for the safe management and operation of ships and for pollution prevention. The Code establishes safety-management objectives and requires a safety management system (SMS) to be established by the company that manages the ship (e.g., the shipowner, bareboat charterer or any other person who has assumed responsibility for operating the ship). Shipping companies are expected to designate a person or persons ashore having direct access to the highest level of
management. There were other legislative actions as well but only the most important due to the most notorious maritime disasters were mentioned.

Table 1. Maritime disasters in 20th and 21st century that claimed more than 1,000 casualties [8]

<table>
<thead>
<tr>
<th>Date</th>
<th>Ship</th>
<th>Casualties</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.12.1987</td>
<td>Doña Paz</td>
<td>4,386</td>
</tr>
<tr>
<td>26.02.1916</td>
<td>Provence</td>
<td>3,100</td>
</tr>
<tr>
<td>26.09.2002</td>
<td>MV Le Joola</td>
<td>1,863</td>
</tr>
<tr>
<td>06.12.1917</td>
<td>Mont-Blanc</td>
<td>1,600</td>
</tr>
<tr>
<td>14-15.04.1912</td>
<td>RMS Titanic</td>
<td>1,503</td>
</tr>
<tr>
<td>26.09.1954</td>
<td>Toya Maru</td>
<td>1,172</td>
</tr>
<tr>
<td>03.12.1948</td>
<td>Kiangya</td>
<td>1,100 +</td>
</tr>
<tr>
<td>28.09.1994</td>
<td>Estonia</td>
<td>1,049</td>
</tr>
<tr>
<td>15.06.1904</td>
<td>General Slocum</td>
<td>1,030</td>
</tr>
<tr>
<td>03.02.2006</td>
<td>Al Salam Boccaccio 98</td>
<td>1,020</td>
</tr>
<tr>
<td>29.05.1914</td>
<td>Britain’s Empress of Ireland</td>
<td>1,014</td>
</tr>
<tr>
<td>28.09.1912</td>
<td>Kichemaru</td>
<td>1,000</td>
</tr>
<tr>
<td>29.08.1916</td>
<td>Hsin Yu</td>
<td>1,000</td>
</tr>
<tr>
<td>18.03.1921</td>
<td>Honk Kong</td>
<td>1,000</td>
</tr>
</tbody>
</table>

The transport of passengers deserved more attention in legislative efforts of 20th century. The first international conventions for transport of passengers were: [14]

# The International Convention for the Unification of Certain Rules Relating to Carriage of Passenger Luggage by Sea, 1967;

In comparison to carriage of goods by sea these conventions were born rather late. [12] What is even more peculiar is the fact that the air transport of passengers that is actually the youngest mode of transport of passengers obtained its first convention in Warsaw in 1929 (Convention for the Unification of Certain Rules Relating to International Carriage by Air), a bare few years after the first Atlantic crossing by air. Nevertheless the Athens convention from 1974 is a milestone in international regulation of transport for passengers by sea. The Athens conventions a legal source for maritime transport of passengers if: (a) the ship is flying the flag of or is registered in a State Party to this Convention, (b) the contract of carriage has been made in a State Party to this Convention, or (c) the place of departure or destination, according to the contract of carriage, is in a State Party to this Convention. The number of contracting states is 25, constitute 31.81% of the gross tonnage of the world’s merchant fleet. [17] The most important provision in the Athens Convention is that regarding the liability of the carrier. The Athens Convention provides that the carrier is liable for the damage suffered as a result of the death of or personal injury to a passenger and the loss of or damage to luggage if the incident which caused the damage so suffered occurred in the course of the carriage and was due to the fault or neglect of the carrier or of his servants or agents acting within the scope of their employment. The burden of proving that the incident which caused the loss or damage to passenger, occurred in the course of the carriage as well the extent of the loss or damage suffered by passenger, lies with the passenger. That means that in the normal course of carriage the passenger is obliged to prove the guilt of the carrier. On the other hand, the guilt of a carrier or of his servants or agents acting within the scope of their employment is presumed, unless the contrary is proved, if the death of or personal injury to the passenger or the loss of or damage to cabin luggage arose from or in connection with a shipwreck, collision, stranding, explosion or fire, or defect in the ship. In respect to loss of or damage to other luggage (registered luggage), such fault or neglect shall be presumed, unless the contrary is proved, irrespective of the nature of the incident, which caused the loss or damage. In all other cases the burden of proving fault or neglect shall lie with the passenger.

Another important rule in the Athens convention [1] is the one that is usually unknown to people that do not deal with transport, the rule of limitation of liability of a maritime carrier. [3] The Athens convention provides that the liability of the carrier for the death of or personal injury to a passenger shall in no case exceed 700,000 francs per passenger, per carriage. The same applies in cases where in accordance with the law of the court damages are awarded in the form of periodical payments; the equivalent capital value of those payments shall not exceed the limit of liability as noted above. The
The limits of liability were also set for the loss of or damage to cabin luggage in the sum of 12,500 francs per passenger, per carriage; for vehicles including all luggage carried in or on the vehicle in the sum of 50,000 francs per vehicle, per carriage. The aggregated liability of the carrier should in no case exceed 18,000 francs per passenger, per carriage.

The first protocol that amended the Athens convention was from 1976: the Protocol to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea of 13 December 1974. The number of Contracting States is 17, which constitutes 31.54% of the gross tonnage of the world’s merchant fleet. [17] It has to be emphasized that from the mid-70s on all the international treaties and protocols that amended international treaties contained new currency that was used instead of Franc Poincaré. Franc Poincaré is a unit of account that was used in the international transport conventions during the 20th century to the time that the SDR was introduced.

The new unit of account was the Special Drawing Right as defined by the International Monetary Fund - SDR (Special Drawing Rights). [16] The SDR is an international reserve currency, created by the International Monetary Fund (IMF) in 1969. Its function is to supplement IMF member countries’ official reserves. The value of the SDR was initially defined as equivalent to 0.888671 grams of fine gold. At the time this value was the equivalent of one U.S. dollar. The SDR was redefined as a basket of currencies after the collapse of the Bretton Woods system in 1973. Currently, the SDR basket consists of the U.S. dollar, euro, Japanese yen, and British pound sterling. By 1 October 2016 the basket will be expanded to include the Chinese Renminbi (RMB) as the fifth currency. SDRs can be exchanged for freely usable currencies. As of November 30, 2015, 204.1 billion SDRs had been created and allocated to members. The exchange rate between Franc Poincaré and the SDR was 15:1. This means that the limit for death or injury of a passenger was set to a maximum amount of 46,666 SDR. The amount for cabin luggage was limited to 833 SDR, for vehicles 3,333 SDR and 1,200 SDR for registered luggage.

Table 2. Limitation of liability for passenger and luggage claims in international treaties [13]

<table>
<thead>
<tr>
<th></th>
<th>Death or Personal Injury</th>
<th>Cabin Luggage</th>
<th>Vehicle</th>
<th>Registered Luggage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convention 1961</td>
<td>250,000 fp</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Convention 1967</td>
<td>200,000 fp</td>
<td>10,000 fp</td>
<td>30,000 fp</td>
<td>16,000 fp</td>
</tr>
<tr>
<td>Athens Convention 1974</td>
<td>700,000 fp</td>
<td>12,500</td>
<td>50,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Protocol 1976 (Athens Convention 1974)</td>
<td>46,666 SDR</td>
<td>833 SDR</td>
<td>3,333 SDR</td>
<td>1,200 SDR</td>
</tr>
<tr>
<td>Protocol 1990 (Athens Convention 1974)</td>
<td>175,000 SDR</td>
<td>1,800 SDR</td>
<td>10,000 SDR</td>
<td>2,700 SDR</td>
</tr>
<tr>
<td>Protocol 2002 (Athens Convention 1974)</td>
<td>250,000 SDR</td>
<td>2,250 SDR</td>
<td>12,700 SDR</td>
<td>3,375 SDR</td>
</tr>
</tbody>
</table>

The second protocol that amended the Athens convention was signed in 1990: the Protocol of 1990 to amend the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 (PAL Protocol 1990). The protocol is not yet in force. The number of Contracting States is 3. Their combined merchant fleets constitute 0.36% of the gross tonnage of the world’s fleet. [17] Its aim was to raise the amounts of limits of liability from the Athens convention that seemed absurdly low already at that time. It is even more peculiar that only in 2012 were these amounts raised for EU member states and a few other countries. The PAL Protocol 1990 raised the limits from the Athens convention as follows: the limit for death or injury of a passenger was set to a maximum amount of 175,000 SDR, for cabin luggage to 1,800 SDR, for vehicles 10,000 SDR and 2,700 SDR for registered luggage. The third protocol that amended the Athens convention from 2002 (PAL Protocol 2002) belongs to the next section, which deals with extensive changes in the maritime carriage of passengers and their luggage by sea.

**Carriage of passengers by sea during the 21st century**

There was no doubt by the end of the millennium that international regulation of the carriage of passengers by sea did not provide satisfactory legal protection for passengers. [9] The result of such awareness was the creation of the PAL Protocol 2002 and EU legislative activities. Three main novelties,

---

1 Franc Poincaré: 65.5 milligrams of gold of millesimal fineness 900.
2 Special drawing right: IMF Rule O-2 (a) defines the value of the U.S. dollar in terms of the SDR as the reciprocal of the sum of the equivalents in U.S. dollars of the amounts of the currencies in the SDR basket, rounded to six significant digits. Its value per 18 April 2016: 1 EUR = 0.8063520000 SDR.
or one might say even innovations in comparison to the usual small steps concept of changes in maritime law, introduced by the PAL Protocol 2002 were:

1. Double two-tier liability system with introduction of strict liability as the first tier and raised limits of liability.
2. Compulsory insurance of carrier.
3. Possibility of actio directa for the passenger against the insurance company.

Two-tier liability was used in international convention for the first time in the Convention for the Unification of Certain Rules for International Carriage by Air, 1999 (Montreal convention). It basically means that the carrier is liable for the loss suffered as a result of the death of or personal injury to a passenger on two legal bases. There is double two-tier liability in the PAL Protocol 2002.

In cases where death or personal injury of a passenger is caused by a shipping incident or accident, the carrier shall be liable to the extent that such loss in respect of that passenger on each distinct occasion does not exceed 250,000 SDR. The only defenses the carrier is allowed are (and this must be proved by the carrier):

   a) That the damages resulted in an act of war, hostilities, civil war, insurrection or a natural phenomenon of an exceptional, inevitable and irresistible character; or
   b) That the damages were wholly caused by an act or omission committed with the intent to cause the incident by a third party.

In these two cases the carrier is not liable. This kind of exculpation of carrier shows that there is a strict liability. Strict liability, at least in civil law countries, is a result of the increased risk of operation. There is a classical civil law concept of strict liability, e.g. in Article 149 of the Obligations Code of Slovenia. "Presumption of causality: Damage occurring in connection with a dangerous object or dangerous activities shall be deemed to originate from the dangerous object or dangerous activities unless it is shown that such was not the case." [11] If damages exceed the 250,000 SDR limit, the carrier shall be further liable unless the carrier proves that the incident, which caused the damages, occurred without his fault or as a result of his neglect. The liability ceiling is 400,000 SDR. In cases where damages that the passenger suffered were not caused by a shipping incident, the carrier shall be liable if the incident which caused the damages was the result of something of which the carrier is guilty - i.e., fault or neglect. The burden of proving fault or neglect lies with the passenger. The double two-tier refers to the fact that there are two kinds of circumstances in which passengers could encounter damages. One is during usual navigation and the other when there was a shipping incident (first two-tiers). The second is connected to the extent of damages. There is one legal base for the damages up to 250,000 SDR and another one up to 400,000 SDR (second two-tiers).

A carrier has to produce the guarantee of a bank or similar financial institution in order to cover liability in respect to the death of and personal injury to passengers. A carrier is obliged to provide the compulsory insurance of liability or other financial security in the amount of not less than 250,000 SDR per passenger on each distinct occasion. There are two different cases in which the carrier is obliged to provide insurance: a) if a ship is registered in a state party to the PAL Protocol 2002 and she is licensed to carry more than twelve passengers or b) with no respect whether the ship is registered in a state party to the PAL Protocol 2002 if she actually performs the whole or a part of the carriage. The proof that the carrier of a member state or of a non-member state actually performing the carriage has to be carried on board the ship is a certificate attesting that insurance or other financial security is in force in accordance with the provisions of the PAL Protocol 2002. The certificate must be issued by the state's appropriate authority.

The passenger has the right to file an actio directa against the insurer or other person providing financial security. If the passenger files his claim directly to the insurer or other person providing financial security he is only entitled to demand up to 250,000 SDR. This amount is the limit even if the passenger deems that the damages were suffered with that kind of acts or omissions of the carrier that ban the right to limit. Obviously the defendant (the insurer or other person providing financial security) has a right to invoke the defenses (other than the bankruptcy or winding up), which the carrier is entitled, as well. The defendant builds his defense on an assumption that the damage resulted from the willful misconduct of the passenger. This defendant is not entitled to invoke any other defense in proceedings brought by the passenger against the defendant.

The goal of the creators of this international maritime instrument was by all means dual. First is that the convention or protocol enters into force as soon as possible. Second is that it been widely accepted and that it has a large number of member states with a high percentage of the gross tonnage of the world’s merchant fleet. Neither the first nor the second goal seems to have been fulfilled for the PAL Protocol 2002. The EU commission was looking forward to the protocol being enacted but the international
industry’s community seemed to be repulsed at the notion and as a result a lot of states did not ratify the protocol, including EU members. The main reason was that P&I clubs did not want to provide carriers with a blue card that was a condition for the member state to issue states certificates. [15] The IMO Reservation and Guidelines for Implementation of the Athens Convention [5] were the answer to this Gordian knot. In 2006, at its ninety-second session, the Legal Committee adopted the Reservation and Guidelines. These have recommended ratification of the 2002 Protocol with “the reservation stipulating that states parties will reserve the right to issue and accept certificates issued by other States Parties with such special exceptions and limitations in relation to war risks as the insurance market conditions at the time of issue of the certificate may necessitate.” [5]

At the same time, the EU commission did not stand idly by. In 2009, the Regulation (EC) No 392/2009 of the European Parliament and of the Council was adopted. At least two important moments were the result of such action. The first was that Regulation 392/2009 contained the provision that it shall apply from the date of the entry into force of the PAL Protocol 2002 for the EU, and in any case from no later than 31 December 2012. The second was that Regulation 392/2009 went beyond the PAL Protocol 2002 in protection of passenger (consumer) rights. A carrier need own an advance payment of such amount that it is up to 15 days of the identification of a person entitled to damages. The sum should be sufficient to cover immediate economic needs on a basis proportionate to the damage suffered. The amount appears rather high if one keeps in mind that in the event of the death, the payment has to be not less than 21,000 EUR. Regulation 392/2009 is a part of the EU overall policy on transport. [19] It goes beyond the PAL Protocol 2002 with the advance payment capacity and enactment for internal (domestic) carriage as well (carriage by sea within a single Member State on board ships of Classes A and B under Article 4 of Directive 98/18/EC).

In 2011 two important Council decisions were taken: a Council decision concerning the accession of the European Union to the Protocol of 2002 to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974, with the exception of Articles 10 and 11 (2012/22/EU) and Council Decision of 12 December 2011 concerning the accession of the European Union to the Protocol of 2002 to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974, as regards Articles 10 and 11 (2012/23/EU). By these decisions the EU acceded to the PAL Protocol 2002 as well and, more important, by the end of 2012 the protection of passengers in the EU was raised to a higher level.

Transport of passengers by sea should be regulated, as is the transport of passengers by air. [7] That is, without the limitation of liability of the carrier. [10] As there are a lot of countries that do not even want to ratify the PAL Protocol 2002, this kind of thinking is maybe too ambitious at this time. Yet all objections regarding limitless transport that was feared as “non-insurable” has turned out to be false. Nothing horrifying happened to air carriers or to insurance companies after the introduction of the Council Regulation (EC) No 2027/97 of 9 October 1997 on air carrier liability in the event of accidents and Convention for the Unification of Certain Rules for International Carriage by Air in 1999 (Montreal Convention). Both legal regulations deprived carrier from his longstanding right to limit his liability in cases of death of or personal injury to the passenger. It is not entirely clear whether the abolition of this carries right was due to accidents such as Japan Airlines flight 123 (the deadliest single-aircraft accident in history with 520 fatalities) or simply the achieved standard of civilization. The airline industry has willy-nilly had to accept the fact that in the case of aviation accidents it was not fair to transmit to passengers such a high degree of risk as provided by the Warsaw Convention from 1929 and the amending Protocols. Therefore we can foresee that in the future maritime transport will follow in the trail of its younger brother, air transport. At least one monumental change has happened since the adoption of the Regulation 392/2009 and of the PAL Protocol 2002. For the very first time in history, at least up to 250,000 SDR, the liability of carrier is strict. That was a standard for other modes of carriage for a long time already.

Conclusion

The destiny of the PAL protocol 2002 in theatres all across the globe is rather uncertain. The Protocol raised a lot of eyebrows when it was adopted. The first reason was obviously the fact that the P&I clubs did not want to cover the compulsory liability insurance for carriers. As the insurance market did not accept the concept of the PAL protocol 2002, countries did not want to accede to it - they did not want to act against the perceived interest of their own maritime carriers. The other reason for rejection of the PAL protocol 2002 might be that the carrier may be liable for death or injury of a passenger even though he may not be guilty of the passenger’s death or injury. This strict liability is the result of the
circumstances of death or injury and based on a financial amount - i.e., damages suffered by a passenger up to 250,000 SDR. Strict liability is usually a result of the increased risk of operation. A shipwreck, collision, stranding, explosion or fire, or defect in the ship are by all means these kind of circumstances. The above-mentioned averages represent an increased risk of operation or one could say that under that circumstances that the carriage by sea is a dangerous activity. If the damages exceed 250,000 EUR the liability of the carrier is presumed fault, though. If the death or injury of a passenger occurred during the case of usual navigation then the liability regime is also at fault. Fault (intent or neglect) of the carrier should be presumed, in these circumstances as well, unless the carrier proves the contrary. The reason for presumed guilt should be the fact that this kind of liability regime, when there is a fault liability in question, is a standard of civilization as regards to a cultured legal system. It is a fact that in the case of shipwreck, collision, stranding, explosion or fire, or defect in the ship, a passenger is in danger for his life or injury. On the other hand, it is also a fact that the passenger is usually mostly in danger of death or injuries in the course of usual carriage by its own actions. There is no reason for a special advantage of carrier in comparison to any other mode of transport or even any other business activity. Their ships are incorporated, anyway. Therefore the air carriage regime of liability would balance in a meaningful way the relation between the carrier and the passenger. Yet it remains clear that passengers will have to wait for some more years for maritime transport to achieve the air transport passenger legal protection standards.

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CIVIL, GOVERNMENTAL AND AUXILIARY FLEET CONVERSION FOR MILITARY PURPOSES

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Abstract
In order to minimize military expenses, existing state/service fleet ships and ships and floating units to be built in future must be adopted for mobilization, to be used for the military purposes in case of possible global, regional or local military escalation. There is a necessity to modernize the existing, previously built ships and other floating structures for the possible role and tasks in different scale armed conflicts, special operations and support missions.

Keywords: conversion, coastal protection, patrol vessel.

Introduction

The modern, unstable political situation forces states to protect their maritime zones, to maintain fighting ships, coastal artillery, numerous submarines to attack enemy ships and minelayer units to conduct mine warfare. However, each sea state is obliged to ensure the safety of not only the coasts and seas, but also protect inland areas. These tasks require many resources.

An important role in Latvian security and security of the whole region is Latvian membership in NATO, military cooperation with other Baltic States, the Nordic countries and with the United States, which is Latvia’s most important strategic partner. This cooperation makes the geopolitical situation secure, but require a spending of at least 2% of the country’s budget for defense. In the case of Latvia, even 2% cannot provide full financial coverage for needed equipment and resources; we need find optimal solution to provide military capable ships with the minimum expenses.

Close previous cooperation between Latvian National Defense forces’ Navy and the Fishery control department gives the best opportunity to take, for example, a Fishery Control patrol vessel and the plans and documents used in its development as a basis for the creation of ship conversion and military adaptation plans, rebuilding drawings, stability calculations, and financial expenses for government-owned vessels. The aim of the research is to create ship conversion and military customization rebuilding plans, drawings and stability calculations for governmental-owned vessels using fishery protection and environmental monitoring patrol vessel MARE, owned by the State Environmental Service, as an example.

Goals and tasks of the research. Using generally accepted research methods (theoretical and data processing):

1. figure out the present condition of governmental and civil fleet;
2. define military tasks for mobilized ships;
3. calculate the additional equipment (including weapons) installation sets;
4. evaluate the project’s economic strengthens and weaknesses.

Vessel MARE

The vessel MARE (project 90127) is a mono hull boat designed and built for the State Environmental Service of the Republic of Latvia to carry out fishery patrolling duties. The patrol vessel is based on Baltic Workboat yard’s project Patrol 24 and has similar type sister vessels in Latvia (project Rānda), Estonia (project Valve), Poland (projects SG111 and SG 112), Ireland (project Banrion Uladh) and Croatia (project Ivan Kamber). MARE is slightly modified from her sister ships having the length between perpendiculars of 22.2 m and an overall breadth of 6.1m. She has a classic propeller system, where the power is transferred from the main engine through the gearbox to the shaft line and propeller.

1 A/S “Baltic Workboats” inner unpublished material
The propulsions system consists of two Volvo Penta diesel engines and provides the vessel with maximum speed of 17 knots and navigation distances of a maximum of 450 nautical miles from the shore. The hull of the vessel is built of marine grade 5000 aluminum with 6 watertight bulkheads in the hull that divides it in 7 watertight compartments.

Selection of the criteria for a specialized ship is a difficult process, which requires deep knowledge in multiple disciplines. The "ideal" multifunctional patrol vessel should have the following functions and operational criteria: patrolling, SAR, oil pollution prevention, inspection team supply, fishery inspection, mine deployment, anti-saboteur warfare and mine hunting. Using the aforementioned criteria, it is possible to model different ship configurations, research how technical requirements collaborate with operational requirements and their effects on financially-economic indicators, as a result of which it becomes possible to select the most adequate and effective project.

Usage of UAV on the small patrol boats allows to increase the abovementioned patrol boat potential, enabling them to carry out monitoring in larger sea areas, participating in oil slick searches, search and rescue (SAR) operations, and enabling to detect and identify navy ships, enemy small combat boats, including USVs (Unmanned Surface Vehicles) and even submarines, UUVs (Unmanned undersurface vehicles) and mines in shallow areas.

According to the collected data for the purpose of the present article, the average age of a Latvian National Armed Forces Navy Flotilla vessel is 26.6 years. Despite the recent purchase of ships and their good previous performance in emergency situations, unfortunately the Latvian Navy has limited ability to be engaged in activities outside the military sphere, the ability to quickly respond to an environmental or other disasters, which is a priority in peace time. Therefore, it is necessary to provide naval forces prepared for such unorthodox applications. The Republic of Latvia is obliged to support international operations in the world and to make sure to come to the aid of others, first of all NATO allies.

Aigars Prusis (Aigars Prūsis) in his article "Modern Navy" ("Mūsdienu kara flote") believes that "the Latvian Naval forces must take a number of high-speed patrol boats with effective weapons." However, the authors of the present research want to stress another issue - Latvian Naval Forces have a catastrophic lack of technical fleet ships and floating structures: cranes, bunkering vessels, barges, pontoons and tugs. It is not clear how, if necessary, the non-proliferation of sensitive information during top-secret cargo loading or unloading can be ensured, if civilian cargo masters and cranes are participating in cargo operations.

The average age of the State Ministry of the Interior and the Civil Service fleet vessel is 12.4 years, which is twice less than for NAF JS ships. The greatest interest in the case of mobilization in this fleet segment is in the project Baltic-2400 ships belonging to the State Border Guard and the State Environmental Service, as well as high-speed project Baltic-1010 patrol boats belonging to the State Border Guard. These ships, after mobilization, can be used in coastal and harbor water area patrol, search and rescue operations and in the fight against underwater saboteurs.

High-speed RIB patrol boats C-1010, belonging to the State Border Guard, after mobilization, are useful in patrolling harbors, ports and river estuaries, transportsations of special anti-terrorist units and teams.

The existing fleet analysis shows that the Latvian civil service and the fleet is composed of a sufficient number of vessels that are capable after mobilization and appropriate modification to perform military and logistical functions according to defined tasks. Exceptionally, the Latvian Navy fleet may need to increase not only the battleship amount, but also in order to provide Host Nation Support, may need to increase the quantity of supply and technical fleet ships which are used to provide a continuous warships activity - bunkering, bilge water collecting vessels, floating cranes, river and sea class tugs and dredgers which are able to maintain a sufficient depth of the port fairway and all other technical and auxiliary vessels, which are necessary for normal functioning of the flotilla.

**Patrol boat MARE (project 90127) conversion procedure**

There are several steps for ship conversion, using as example project 90127, MARE. Each mobilized vessel before joining the Latvian Naval Forces Flotilla should be excluded from the Latvian Maritime Administration Ship Register and the with the Order of the Minister of Defense must be included in Latvian Naval Vessel Register, due to the existing legislative requirements.

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5 http://aigarsprusis.blogspot.com/2008/05/msdienu-latvijas-kara-flote.html
The vessel, joining the Latvian Naval Forces Flotilla composition must comply with the Rules of Procedure of the Ministry of Defense "Military Service Equipment Regulations", which were issued in accordance with the third paragraph of the Military Service Law, Article 9, as far as this regulation do not conflict with the rules of procedure of the Ministry of Defense AMR 10-1 "Navy ships regulations", approved by the Ministry of Defense on 16th December 2003 decree Nr.432, and other Navy flotilla operation of regulatory legislation.

_Military communication assurance._ In order to successfully cooperate with other NAF ships and NAF units, it is necessary to ensure the military radio communication. Standard ship radio equipment operates on a different frequency range and data transmission is not well secured and encrypted. The authors offer to equip patrol boat MARE with station "Harris' Falcon III". A similar solution was implemented on sister ship RK-20 "Rānda".

_Watertight control._ According to SOLAS (International Convention for the Safety of Life at Sea) regulations, a vessel must remain afloat on the surface, after flooding in any of the compartments. Similar to the sister ships RK-20 "Rānda", SG-111 and SG-112, it is necessary to separate the superstructure from the ship's interior spaces with a watertight door. This will provide a full confinement for the central cabin section and increases the viability of the vessel.

_Hull surface painting._ Each mobilized vessel after joining the Latvian Naval Forces Flotilla should change hull color to united Latvian warship’s color (code RAL 7046).

_Flag Change._ Each mobilized vessel after joining the Latvian Naval Forces Flotilla and including with the Order of the Minister of Defense in Latvian Naval Vessel Register must change Latvian National Flag to the Latvian Naval ensign.

**Technical conversion**

_MANTA mine eviction apparel mounting._ Mine eviction apparel is made from aluminum AD31T1 square type pipes with dimensions of 60 mm X 40 mm X 4 mm. Each apparel weight is from 35 to 40 kg. Apparel should be mounted on patrol boat main deck so that the free ends of the rails must be placed 1m behind the ship's stern.

_NARWHAL system mounting._ For NARWHAL (Naval Remote Weapon Gun, Highly accurate, Lightweight) 20A installation, it is necessary to do the hull conversion works. On the main deck between frames, 29 and 34 a box-shaped front storage compartment is located, which needs to be dismantled by means of a plasma or gas cutting equipment. Total demountable structure weight is of about 280 kg.
After dismantling the deck structure light gun deck mounting should be connected to the main deck with ten H10 nickel screws. Total cannon complex weight including base and deck-mountings weight is approximately 410 kg, so that the total onboard assembling structural weight change is about +130 kg, which, in principle, is equal to two average weight adult persons. Therefore, it cannot fundamentally affect the ship's stability.

Vessel stability is the vessel’s ability after it moved off from its steady state to assume that position again. After the hull conversion, it is necessary to re-calculate the ship static, dynamic resilience to prove that the ship is seaworthy and rebuilding of these type vessels will not affect the safe navigation, and reconditioned patrol MARE will be able to fulfil the necessary tasks not compromising stability in heavy sea.

According to the data collected for the purpose of the present research, the average price of all project Baltic-2400 ships is 3.16 mln. EUR and a building time of 12-16 months. This could cause some difficulties, in necessity to urgently restore the fleet composition. Therefore, the most convenient and fastest option is the conversion of an existing ship that can take up to 3 months, from which most of the time is required for armory and special equipment delivery from external suppliers. According to the authors’ calculation, ship conversion will take up to 7 days and costs less than 10000 EUR.

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Conclusions

In a situation where there are various threats for the country, it is necessary to organize and maintain the services and power units whose task is to guarantee the protection of the community. The presence of potential risk also creates the necessity to maintain armed forces. Realization of the development plans - development and implementation of theoretical and practical training for the staff, taking part in joint exercises with the other countries armed forces, the implementation of the armory and equipment purchase plans, promotion of public support to the armed forces, etc. provides an effectively operation of Armed forces.

The most effective Baltic-2400 class patrol boat conversion options based on vessel’s characteristics and structural features are: rearmament with 20mm NARWHAL gun complex, equipment with synthetic aperture sonar, equipment with mine-laying apparel or equipment with an underwater saboteur’s and diver detection module.

The economic evaluation shows that in exceptional cases the quickest and least expensive fleet replenishment option is exactly the civil service fleet mobilization and conversion. In critical circumstances, it is not possible to wait 12 months for a new ship construction; often it is not possible to wait even three months for special equipment delivery.

The author of the present master thesis considers that it is necessary to carry out the previously purchase of special equipment and deployment to the National Armed Forces Naval Force Flotilla reserve warehouses, that allows immediate conversion.

References

1. A/S “Baltic Workboats” inner unpublished material
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