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## **DZIAŁANIA ZMIERZAJĄCE DO ZMIANY KONWENCJI STCW I JEJ KODEKSÓW A I B W CELU USTANOWIENIA MIĘDZYNARODOWYCH WYMAGAŃ KWALIFIKACYJNYCH DLA OFICERÓW ELEKTRYKÓW OKRĘTOWYCH**

*W artykule przedstawiono propozycję zmian [4] do Konwencji i Kodeksu STCW w części A i B [3], przygotowane przez Bułgarię, Francję, Islamską Republikę Iranu, IFSMA, ITF, Malezję, Polskę, Ukrainę i Wielką Brytanię, wprowadzających międzynarodowe standardy szkolenia dla oficerów elektryków.*

*Zaproponowano, aby standardy kompetencji dla oficerów elektryków (z ang. Electro-Technical Officers – ETO) oraz starszych oficerów elektryków (z ang. Senior Electro-Technical Officers – SETO) umieścić w nowych Regulacjach III/6, III/7 i nowych sekcjach A-III/6, A-III/7 i B-III/6, B-III/7 Kodeksu STCW. Ta udoskonalona koncepcja standardów jest logiczną kontynuacją wcześniejszych prac, zaprezentowanych w materiałach konferencyjnych MarCon 2008 [6] i TransNav 2009 [7].*

### **1. WPROWADZENIE**

Z powodu ciągłego rozwoju technologicznego, a także zapotrzebowania na nowe kwalifikacje i umiejętności obsługi systemów elektryczno-elektronicznych, urządzeń i instalacji na statkach, można zaobserwować znaczący wzrost zapotrzebowania na wysoko wykwalifikowanych oficerów elektryków. Obecnie tacy specjaliści są zatrudniani w szczególności na statkach wycieczkowych, dużych promach i na wszystkich typach statków specjalistycznych, jednakże jak dotychczas nie ma standardów ich kwalifikacji i kompetencji na poziomie międzynarodowym [1].

Należy zauważyć szybki postęp w dziedzinie okrętowych technologii elektrycznych i elektronicznych, w tym elektrycznych napędów głównych i sieci wysokonapięciowych.

Wyżej wymienione rozwiązania powszechnie stosuje się przy budowie statków wycieczkowych, to znaczy w branży okrętowej, która rozwija się bardzo szybko. Taką tendencję można zilustrować danymi opublikowanymi w *Cruise Industry News Quarterly* [2], które mówią o zamówieniach na 49 nowych statków pasażerskich na sumę 25,8 mld dolarów amerykańskich w latach 2008–2012. Te

kontrakty są nie tylko wyzwaniem technologicznym, ale przede wszystkim nowym impulsem do rozwoju rynku pracy oficerów elektryków. Nie ma wątpliwości, że powinni oni być personelem wysoko wykwalifikowanym, odpowiednio przygotowanym do podjęcia zadań, obowiązków i odpowiedzialności zgodnie z aktualnymi wyzwaniami technologicznymi.

W tym miejscu należy zacytować opinię wyrażoną w artykule zatytułowanym *Czy oficerowie mechanicy są prawidłowo wyszkoleni w dziedzinie elektrotechniki okrętowej?* [1], w którym opisano często spotykaną w praktyce sytuację: „Żaden z okrętowych starszych mechaników nie posiada odpowiedniego wykształcenia teoretycznego i praktycznego w dziedzinie wytwarzania napięcia 6,6 kV, rozdziału energii i usuwania uszkodzeń” [1]. Aby zapobiec sytuacjom awaryjnym i ich skutkom oraz kosztom, nowe podejście dotyczące potrzeby ustanowienia i wprowadzenia w życie standardów kwalifikacji oficerów elektryków wydaje się oczywiste [4].

Fakty i statystyki pokazują, że tacy fachowcy są niezbędni na dużych statkach. Około 2200 zdobyło swoje kwalifikacje w Polsce. Charakterystyczne, że większość z nich pracuje na statkach o fladze innej niż polska. Jednakże w razie wystąpienia awarii zachodzi pytanie o legalność ich odpowiedzialności, ponieważ ich profesjonalne kwalifikacje są uznawane wyłącznie na terytorium Polski. Istnieje więc pilna potrzeba wprowadzenia międzynarodowych standardów kwalifikacji dla oficerów elektryków.

Proponuje się, aby przepisy dotyczące certyfikatów kompetencji dla oficerów elektryków umieścić w rozdziale III „Dział Maszynowy” Konwencji STCW, jako nowe regulacje III/6, III/7 i nowe sekcje A-III/6, A-III/7 i B-III/6, B-III/7 Kodeksu STCW.

W artykule przedstawiono kwalifikacje i standardy kompetencji dla oficerów elektryków (z ang. *Electro-Technical Officers* – ETO) oraz starszych oficerów elektryków (*Senior Electro-Technical Officers* – SETO) opracowane przez Bułgarię, Francję, Islamską Republikę Iranu, IFSMA, ITF, Malezję, Polskę, Ukrainę i Wielką Brytanię podczas międzysesyjnego spotkania powołanej *ad hoc* grupy roboczej, wytypowanej do wszechstronnego przeglądu Konwencji i Kodeksu STCW, w celu przedstawienia ich na najbliższej 40. Sesji Podkomitetu ds. Szkolenia Zawodowego i Obowiązków Wachtowych (STW) Międzynarodowej Organizacji Morskiej (IMO) w Londynie.

Tekst proponowanych zmian zacytowano w wersji oryginalnej, tj. w języku angielskim.

## 2. PROPONOWANE ZMIANY DO KONWENCJI STCW

Współautorzy sugerują wprowadzenie do Konwencji STCW [4] następujących zmian:

- 1) w Regulacji I/1 paragraf 31 nową definicję (STW 40/7/4):

*Electro-technical officer* means an officer qualified in accordance with the provisions of chapter III of the convention;

2) w Regulacji I/1 paragraf 32 nową definicję (STW 40/7/4):

*Senior electro-technical officer* means an officer qualified for the operation, maintenance and repairs of electrical, electronic, computer systems and equipment, including electrical propulsion;

3) następującą nową Regulację III/5 – *Mandatory minimum requirements for certification of electro-technical officer* (STW 40/7/6):

1. Every electro-technical officer serving on a sea-going ship powered by main propulsion machinery of 750 kW propulsion power or more, shall hold an appropriate certificate.
2. Every candidate for certification shall:
  - .1 be not less than 18 years of age;
  - .2 have completed not less than 12 months combined workshop skills training and seagoing service of which not less than 6 months will be sea going service as part of an approved training which meets the requirements of section A-III/6 of the STCW Code and is documented in an approved training record book, or otherwise not less than 36 months combined workshop skills training and seagoing service of which not less than 30 months will be sea going service in engine department; and
  - .3 have completed approved education and training and meet the standards of competence specified in section A-III/6 of the STCW Code.
3. Every Party shall compare the standards of competence which it required of electro-technical officers for certificates issued before [date] with those specified for the certificate in section A-III/6 of the STCW Code, and shall determine the need for requiring those personnel to update their qualifications.
4. Seafarers may be considered by the Administration to have met the requirements of this regulation if they have served in relevant capacity on board seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more for a period of not less than 12 months within the last 60 months and meet the competence specified in section A-III/6 of the STCW Code;

4) następującą nową Regulację III/6 – *Mandatory minimum requirements for certification of senior electro-technical officer* (STW 40/7/6):

1. Every senior electro-technical officer serving on a seagoing ship powered by main propulsion machinery of more than 750 kW propulsion power shall hold an appropriate certificate.
2. Every candidate for certification shall:
  - .1 meet the requirements for certification as electro-technical officer and shall have not less than 12 months approved seagoing service as electro-technical officer whilst holding electro-technical officer certificate;
  - .2 have completed approved education and training and meet the standard of competence specified in section A-III/7 of the STCW code.

3. Every Party shall compare the standards of competence which it required of senior electro-technical officers for certificates issued before [date] with those specified for the certificate in section A-III/7 of the STCW Code, and shall determine the need for requiring those personnel to update their qualifications.

Seafarers may be considered by the Administration to have met the requirements of this regulation if they have served in relevant capacity on board seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more for a period of not less than 12 months within the last 60 months and meet the competence specified in section A-III/7 of the STCW Code.

### 3. SUGEROWANE POPRAWKI DO KODEKSU

Nowe sekcje A-III/6 *Mandatory minimum requirements for certification of electro-technical officer* oraz B-III/6 *Guidance regarding – the training and certification for electro-technical officers* powinny być wprowadzone po sekcjach A-III/5 and B-III/5. Nowa sekcja A-III/6 powinna zawierać następujące wymagania odnośnie do praktyki na statkach i standardów kompetencji dla oficerów elektryków (ETO) [4]:

#### **Section A-III/6**

*Mandatory minimum requirements for certification of electro-technical officer*

#### **Training**

1. The education and training required by paragraph 2.3 of regulation III/6 shall include training in electronic and electrical workshop skills relevant to the duties of electro-technical officer.

#### **Onboard training**

2. Every candidate for certification as electro-technical officer shall follow an approved program of onboard training which:
  - .1 ensures that during required period of seagoing service the candidate receives systematic practical training and experience in the tasks, duties and responsibilities of an electro-technical officer;
  - .2 is closely supervised and monitored by qualified and certificated officers aboard the ships in which the approved seagoing service is performed; and
  - .3 is adequately documented in training record book.

#### **Standard of competence**

3. Every candidate for certification as electro-technical officer shall be required to demonstrate ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-III/6.
4. The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/6 and it shall take into account the guidance given in part B of this Code.

5. Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence tabulated in columns 3 and 4 of table A-III/6.

W nowej Sekcji B-III/6 powinno wprowadzić się następujące zalecenia:

In addition to the requirements stated in table A-III/6 of this Code, Parties are encouraged to take into account resolution A.702(17) concerning radio maintenance guidelines for the global maritime distress and safety system within their training programmes.

Nowa Sekcja A-III/7 *Mandatory minimum requirements for certification of senior electro-technical officer* powinna być wprowadzona za sekcjami A-III/6. Nowa Sekcja A-III/7 powinna zawierać następujące wymagania odnośnie do praktyki na statkach i standardów kompetencji dla starszych oficerów elektryków (SETO):

#### **Section A-III/7**

*Mandatory minimum requirements for certification of senior electro-technical officer*

#### **Standard of competence**

1. Every candidate for certification as senior electro-technical officer of seagoing ships powered by main propulsion machinery of more than 750 kW shall be required to demonstrate ability to undertake the tasks, duties and responsibilities listed in column 1 of table A-III/7.
2. The minimum knowledge, understanding and proficiency required for certification is listed in column 2 of table A-III/7. This incorporates, expands and extends in depth the subjects listed in column 2 of the table A-III/6 for electro-technical officer.
3. Training and experience to achieve the necessary level of theoretical knowledge, understanding and proficiency shall take into account the relevant requirements of this part.
4. Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4 of table A-III/7.

## **4. MINIMALNE STANDARDY KOMPETENCJI DLA „ETO” I „SETO”**

W tabeli 1 pokazano wyszczególnienie minimalnych standardów kompetencji dla oficerów elektryków, w tabeli 2 – dla starszych oficerów elektryków.

**Tabela 1**

Wyszczególnienie minimalnych standardów kompetencji dla oficerów elektryków [4]

Table A-III/6. Specification of minimum standards of competency for ETO

**Function: electrical, electronic and control engineering at operational level**

| Column 1  | Column 2  | Column 3  | Column 4   |
|---|---|---|--|
| Competence  | Knowledge, understanding and proficiency  | Methods for demonstrating competence  | Criteria for evaluating competence   |
| Monitor the operation of electrical, electronic and control systems | <p>Basic understanding of the operation of mechanical engineering systems including :</p> <p>.1 Prime movers including main propulsion plant<br/>.2 Engine room auxiliary machineries<br/>.3 Steering systems<br/>.4 Cargo handling systems<br/>.5 Deck machineries<br/>.6 Hotel systems</p> <p>Basic knowledge of heat transmission, mechanics and hydromechanics</p> <p><i>Knowledge of:</i><br/>Electro-technology and electrical machines theory<br/>Fundamentals of electronics and power electronics<br/>Electrical power distribution boards and electrical equipment<br/>Fundamentals of automation, automatic control systems and technology<br/>Instrumentation, alarm and monitoring systems<br/>Electrical drives<br/>Technology of electrical materials<br/>Electro-hydraulic and electro-pneumatic control systems<br/>Appreciation of the hazards and precautions required for the operation of power systems above 1000 Volts</p> | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience<br/>.2 approved training ship experience<br/>.3 approved simulator training, where appropriate<br/>.4 approved laboratory equipment training</p> | <p>Operation of equipment and system is in accordance with operating manuals</p> <p>Performance levels are in accordance with technical specifications</p> |
| Monitor the operation of Automatic                                  | Preparation of control systems of propulsion and auxiliary  | Examination and assessment of evidence obtained from  | Surveillance of main propulsion plant and auxiliary systems is   |

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|--|---|---|--|
| control systems of propulsion and auxiliary machinery  | machinery for operation   | one or more of the following:<br>.1 approved in-service experience<br>.2 approved training ship experience<br>.3 approved simulator training, where appropriate<br>.4 approved laboratory equipment training  | sufficient to maintain safe operation condition  |
| Operate generators   | Coupling, load sharing and changing over generators   | Examination and assessment of evidence obtained from one or more of the following:<br>.1 approved in-service experience<br>.2 approved training ship experience<br>.3 approved simulator training, where appropriate<br>.4 approved laboratory equipment training | Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations  |
| Operate computers and computer networks on ships   | Understanding of:<br>.1 main features of data processing<br>.2 construction and use of computer networks on ships<br>.3 bridge based, engine room based and commercial computer use   | Examination and assessment of evidence obtained from one or more of the following:<br>.1 approved in-service experience<br>.2 approved training ship experience<br>.3 approved simulator training, where appropriate<br>.4 approved laboratory equipment training | Computer networks and computers are correctly checked and handled  |
| Use hand tools, electrical and electronic measurement equipment for fault finding, maintenance and repair operations | Safety requirements for working on shipboard electrical systems.<br>Knowledge of the causes of electric shock and precautions to be observed to prevent shock.<br>Construction and operational characteristics of shipboard AC and DC systems and equipment<br><br>Construction and operation of electrical test and measuring equipment<br>Application of safe working practices | Assessment of evidence obtained from one or more of the following:<br>.1 approved workshop skills training<br>.2 approved practical experience and tests  | Implementation of safety procedures is satisfactory<br>Recognizes and reports electrical hazards and unsafe equipment<br><br>Selection and use of test equipment is appropriate and interpretation of results is accurate<br>Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice<br>Commissioning and performance testing of equipment and systems |

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|                                      |  |   | brought back to service after repair is in accordance with manuals and good practice  |
| Use English in written and oral form | Adequate knowledge of the English language to enable the officer to use engineering publications and to perform the officer's duties | Examination and assessment of evidence obtained from practical instructions | English language publications relevant to the officer's duties are correctly interpreted<br><br>Communications are clear and understood |

**Function: Maintenance and repair at operational level**

|   |   |  |  |
|---|---|--|--|
| Maintain and repair automation and control systems of main propulsion and auxiliary machinery | <p>Appropriate electrical and mechanical knowledge and skills</p> <p><i>Safety and emergency procedures</i></p> <p>Safe isolation of equipment and associated systems required before personnel are permitted to work on such plant or equipment</p> <p>Practical knowledge for the test, maintenance, fault finding and repair</p> <p>Test, detect faults and maintain and restore electrical and electronic control equipment to operating condition</p> <p>Knowledge of the principles and maintenance procedures of navigation equipment, internal and external communication system.</p> <p><i>Theoretical knowledge:</i></p> <p>Electrical and electronic systems operating in flammable areas</p> <p><i>Practical knowledge:</i></p> <p>Carrying out safe maintenance and repair procedures</p> <p>Detection of machinery malfunction, location of faults and action to prevent damage</p> | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> <p>.3 approved simulator training, where appropriate</p> <p>.4 approved laboratory equipment training</p> | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and reassembly of plant and equipment is in accordance with manufacturers safety guidelines and shipboard instructions and legislative and safety specifications. Action taken leads to the restoration of automation and control systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
| Maintain and repair bridge navigation equipment and   |   |  | The effect of malfunctions on associated plant and systems is  |



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|---|--|--|--|
| ship communication systems  |  |  | <p>accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and reassembly of plant and equipment is in accordance with manufacturers safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of bridge navigation equipment and ship communication systems by the method most suitable and appropriate to the prevailing circumstances and conditions</p>  |
| Maintain and repair electrical, electronic and control systems of deck machinery and cargo handling equipment |  |  | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> <p>Isolation, dismantling and reassembly of plant and equipment is in accordance with manufacturers safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of deck machinery and cargo handling equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
| Maintain and repair control and safety systems of hotel equipment   |  |  | <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly</p>   |

|  |  |  |  |
|--|--|--|--|
|  |  |  | <p>used and actions taken are justified</p> <p>Isolation, dismantling and reassembly of plant and equipment is in accordance with manufacturers safety guidelines and shipboard instructions, legislative and safety specifications. Action taken leads to the restoration of control and safety systems of hotel equipment by the method most suitable and appropriate to the prevailing circumstances and conditions</p> |
|--|--|--|--|

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

|  |   |  |  |
|--|---|--|--|
| Organize and manage subordinate crew                     | <p>A knowledge of personnel management, organization and training on board ships</p> <p>A knowledge of international maritime conventions and recommendations, and related national legislation</p>   | Examination and assessment of evidence obtained from approved in service training and experience   | <p>The crew are allocated duties and informed of expected standards of work and behaviour in a manner appropriate to the individuals concerned</p> <p>Training objectives and activities are based on an assessment of current competence and capabilities and operational requirements</p>            |
| Ensure compliance with pollution prevention requirements | <p><i>Prevention of pollution of the marine environment</i></p> <p>Knowledge of the precautions to be taken to prevent pollution of the marine environment</p> <p>Anti-pollution procedures and all associated equipment</p>  | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training ship experience</p> | Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed   |
| Prevent, control and fight fire on board                 | <p><i>Fire prevention and fire-fighting appliances</i></p> <p>Knowledge of fire prevention</p> <p>Ability to organize fire drills</p> <p>Knowledge of fire-fighting systems</p> <p>Action to be taken in the event of fire, including fires involving oil systems</p> | Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3   | <p>The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship</p> <p>Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly</p> |

|                                       |   |   |  |
|---------------------------------------|---|---|--|
|                                       |   |   | The order of priority, and the levels and time-scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem |
| Operate life-saving appliance         | Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids.<br>Knowledge of survival at sea techniques | Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4 | Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and comply with accepted safety practices and standards                        |
| Apply medical first aid on board ship | Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship  | Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3                | Identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life   |

**Tabela 2**

Wyszczególnienie minimalnych standardów kompetencji dla starszych oficerów elektryków [4]

Table A-III/7. Specification of minimum standards of competency for SETO

**Function: electrical, electronic and control engineering at operational level**

| Column 1   | Column 2  | Column 3   | Column 4  |
|--|---|--|---|
| Competence   | Knowledge, understanding and proficiency  | Methods for demonstrating competence   | Criteria for evaluating competence  |
| Monitor and evaluate electrical power generation and consumption | <i>Expanded theoretical knowledge</i><br>Electro-technology and electrical machines theory<br>Electronics and power electronics<br>Electrical power distribution boards and electrical equipment<br>Automation, control systems and | Examination and assessment of evidence obtained from one or more of the following:<br>.1 approved in-service experience<br>.2 approved training ship experience<br>.3 approved simulator training, where appropriate | The methods of measuring the load capacity of the generators and motors are in accordance with technical specifications<br>Performance levels are in accordance with technical specifications |

|   |   |   |   |
|---|---|---|---|
| Maintain safety of equipment, systems and services  | <p>instrumentation</p> <p><i>Practical knowledge</i></p> <p>Operation and maintenance of:</p> <ul style="list-style-type: none"> <li>.1 electrical generation and distribution systems</li> <li>.2 electrical propulsion plant</li> <li>.3 auxiliary machinery, including pumping, auxiliary boiler plant and steering-gear control systems</li> <li>.4 integrated control systems</li> <li>.5 electrically operated cargo-handling equipment and deck machinery</li> </ul> |   | Safety of equipment, systems and services is in accordance with manufacturers safety guidelines and shipboard instructions, legislative and safety specifications.  |
| Diagnose faults, maintain and restore electrical power, electronic and control equipment to operating condition | Understand and diagnose the underlying cause of malfunctions in electrical power, electronic and control systems and equipment  | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul> | <p>Maintenance activities are correctly planned in accordance with technical, legislative, safety and procedural specifications</p> <p>The effect of malfunctions on associated plant and systems is accurately identified, ship's technical drawings are correctly interpreted, measuring and calibrating instruments are correctly used and actions taken are justified</p> |
| Diagnose faults, maintain and restore navigation and communication equipment to operating condition             | Understand and diagnose the underlying cause of malfunctions in navigation and communication systems and equipment  | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> </ul>  | <p>The methods of comparing actual operating conditions are in accordance with recommended practices and procedures</p> <p>Actions and decisions are in accordance with recommended operating specifications and limitations</p>  |
| Operate, maintain and manage power systems in excess of 1000 Volts  | <p><i>Theoretical knowledge:</i></p> <p>High voltage technology</p> <p>Safety precautions and procedures</p> <p>Electrical propulsion of the ships, electrical motors and control systems</p> <p><i>Practical knowledge:</i></p> <p>Safe operation and maintenance of high voltage systems including knowledge of the special technical type of high</p>  | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> <li>.4 approved laboratory equipment training</li> </ul> | Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations   |

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|  | voltage systems and the danger resulting from operational voltage of more than 1000 V |  |  |
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**Function: controlling the operation of the ship and care for persons on board at the management level**

|  |   |  |   |
|--|---|--|---|
| Plan and schedule operations   | <p>Knowledge of:</p> <ul style="list-style-type: none"> <li>.1 computer-based management systems of periodical maintenance and repairs</li> <li>.2 preparations for dry docking and shipyard repairs and maintenance</li> <li>3. class requirements</li> </ul>  | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> </ul> | <p>The planning and preparation of operations is suited to the design parameters of the power installation and to the requirements of the voyage</p>  |
| Monitor and control compliance with legislative requirements and measures relating to electrical and electronic equipment and systems to ensure safety of life at sea and protection of the marine environment | <p>Knowledge of relevant international maritime law embodied in international agreements and conventions</p> <p>Regard shall be paid especially to the following subjects:</p> <ul style="list-style-type: none"> <li>.1 certificates and other documents required to be carried on board ships by international conventions, how they may be obtained and the period of their legal validity</li> <li>.2 responsibilities under the relevant requirements of the International Convention for the Safety of Life at Sea</li> <li>.3 responsibilities under the International Convention for the Prevention of Pollution from Ships</li> <li>.4 maritime declarations of health and the requirements of the International Health Regulations</li> <li>.5 responsibilities under international instruments affecting the safety of the ships, passengers, crew or cargo</li> <li>.6 methods and aids to prevent pollution of the environment by ships</li> </ul> | <p>Examination and assessment of evidence obtained from one or more of the following:</p> <ul style="list-style-type: none"> <li>.1 approved in-service experience</li> <li>.2 approved training ship experience</li> <li>.3 approved simulator training, where appropriate</li> </ul> | <p>Procedures for monitoring operations and maintenance comply with legislative requirements</p> <p>Potential non-compliance is promptly and fully identified</p> <p>Requirements for renewal and extension of certificates ensure continued validity of survey items and equipment</p> |

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|  | .7 knowledge of national legislation for implementing international agreements and conventions |  |  |
|--|--|--|--|

## 5. UWAGI KOŃCOWE

Propozycja poprawek do Konwencji i Kodeksu STCW dotyczących wprowadzenia międzynarodowych standardów kwalifikacji dla oficerów elektryków przedstawiona w tym artykule powstała w wyniku prac Międzysesyjnej Grupy Roboczej we wrześniu 2008 roku. Dokument w tej sprawie był podstawą do dyskusji podczas 40. Sesji Podkomitetu STW IMO w lutym 2009 roku, podczas której zajmowano się wszechstronnym przeglądem Konwencji i Kodeksu STCW.

Bezpośrednio przed 40. Sesją STW wpłynęły nowe dokumenty dotyczące oficerów elektryków, dostarczone przez Japonię (STW 40/7/54), Danię (STW 40/7/56) i Niemcy (40/7/17).

Ostatecznie podstawą do dyskusji były trzy opcje:

- propozycja dwóch poziomów standardów oficerów elektryków – ETO i SETO,
- propozycja również dwóch poziomów: jeden oficera elektryka, a drugi elektromontera (poziom wsparcia) – przygotowana przez Niemcy, wsparta przez USA,
- opcja Danii i Japonii, przeciwnych wprowadzeniu nowego dyplomu oficera elektryka do Konwencji, a będących za podniesieniem poziomu szkolenia oficerów mechaników w dziedzinie elektrotechniki i elektroniki.

W trakcie 40. Sesji STW rozpoczęto dyskusję, mającą na celu dojście do kompromisu i opracowania takiej propozycji, która mogłaby być zaakceptowana przez większość krajów członkowskich IMO. Prace zakończono we wrześniu 2009 roku. Na spotkaniu Międzysesyjnej Grupy Roboczej zatwierdzono powyższe decyzje i przekazano do dalszych prac na 41. Sesję STW.

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## **OPERATIONS LEADING TO THE CHANGE OF THE STCW CONVENTION AND CODES A AND B FOR ESTABLISHING INTERNATIONAL QUALIFICATION STANDARDS FOR ELECTRO-TECHNICAL OFFICERS**

### *Summary*

*Paper presents prepared by Bulgaria, France, Islamic Republic of Iran, IFSMA, ITF, Malaysia, Poland, Ukraine and the United Kingdom proposal of amendments [4] to the STCW Convention and its Code part A and B [3] establishing international qualification standard for electro-technical officers. It is proposed that the certificates of competency for electro-technical officer and senior electro-technical officers shall be placed in Chapter III “Engine Department” of the STCW Convention, under new Regulations III/6, III/7 and new sections A-III/6, A-III/7 and B-III/6, B-III/7 of the STCW Code. This amended concept it is a logical continuation and further development of the paper which concerned the same issue and was presented at the MarCon 2008 [6] and TransNav 2009 [7] proceedings.*