II Международная конференция
«Инновационные аспекты морской индустрии: Морской транспорт, инженерные технологии, логистика, туризм»

BATUMI
September 08-09, 2016
II\textsuperscript{nd} International Conference "INNOVATION CHALLENGES OF THE MARITIME INDUSTRY: MARITIME TRANSPORT, ENGINEERING TECHNOLOGIES, LOGISTICS, TOURISM"

CONFERENCE PROCEEDINGS

BATUMI
September 08-09, 2016
Organizing Committee

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- Associate professor I. Dolidze - Batumi State Maritime Academy, Dean of Maritime Faculty
- Captain, professor T. Kokoladze - Batumi State Maritime Academy, Deputy Dean of Maritime Faculty
- Niclas Schaper, TEMPUS Projekt 543681-TEMPUS-1-2013-1-DE-TEMPUS-JPHES „Network of competence centres for the development of cruise tourism in the Black Sea region - CruiseT“ coordinator, professor, Paderborn University (Germany)
- Viachaslau Nikitsin TEMPUS Projekt 543681-TEMPUS-1-2013-1-DE-TEMPUS-JPHES „Network of competence centres for the development of cruise tourism in the Black Sea region - CruiseT“ manager, Doctor of Economy, Paderborn University (Germany)
- Professor R. Mamuladze - Batumi State Maritime Academy, Dean of Business and Management Faculty
- Professor emeritus VI. Chkhaidze - Batumi State Maritime Academy,
- Professor T. Melkadze Batumi State Maritime Academy
- Professor Sh. Kuntchulia - Batumi State Maritime Academy
- Professor Ts. Kurbudazé - Batumi State Maritime Academy
- Professor M. Diasamidze - Batumi State Maritime Academy
- Professor A. Makhadze Batumi State Maritime Academy
- Associate professor Z. Shubladze - Batumi State Maritime Academy
- Associate professor L. Sikharulidze - Batumi State Maritime Academy
- PhD student I. Meskhi Batumi State Maritime Academy
- N. Kurbudazé, PhD, Head of the ISO Standards Assurance Service, Batumi State Maritime Academy
- G. Bakuridze - Head of Financial Economic Department, Batumi State Maritime Academy
- M. Baramidze - Head of Rector's Administrative Office, Batumi State Maritime Academy

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1. საქართველოს რეგიონების და პოლიტიკის აქტიობის გამჭვირვალობის თანამედროვე მოცულობაში და საშუალებები;
2. IMO-ს კონფერენციის იმპлементაციის აспектები;
3. საქართველოს გარემოს და საქართველოს ხელშემწყობის თანამედროვე განვითარება;
4. ინენციური საქრომო ტექნიკის შინაგანმacht (ახალი მსგავსი-დაფინალი, ბაქონური და კონტეინერული სახელმწიფო, სახელმწიფო ტექნიკალური);
5. მედიცინის და ტექნოლოგიის ინტერპენეტორიული განვითარების უსაფრთხოება საქართველოში;
6. საუკუნეები; ტექნიკის საშუალებათა და ბიზნესის განვითარების უპირატესობის და პოზიცია;
7. ხელშესწყლობის განვითარების ტექნოლოგიური თავსახურება: ართულური და ჰიპერქულური;
8. ტექნიკის ტექნოლოგიების განვითარების თანამედროვე ტექნიკალური უსაფრთხოება და პოზიცია.

კონფერენციის სათაური: ქართული, ინგლისური, ესპანური

Conference Main Topics:

1. The main directions and means of promotion of maritime resources and potential acquisition;
2. The aspects of the IMO Conventions implementation;
3. The challenges of maritime education and training;
4. Innovations in maritime technologies (new plants/equipment, control systems and informational technologies);
5. The prospects of the sea ports and terminals infrastructure development;
6. Tendencies and problems of development of the regional economics and business;
7. Regional differences of logistics development: problems and prospects;
8. Modern tendencies and prospects of regional tourism development.
9:00 - 9:30 - Registration (conference hall, Seafarers Training and Certification Center BSMA)

9:30-9:45 - Opening ceremony, Batumi State Maritime Academy, Rector; Conference opening ceremony, welcoming speeches.

9:45-10:00 - Coffee break

10:00-10:15 - Mamuka Akhaladze, Maritime Transport Agency of Georgia, Director, welcoming speech.

10:30 - 11:00: Coffee Break

II International Conference - “Innovation Challenges of the Maritime Industry: Maritime Transport, Engineering, Technology, Logistics, Tourism”

II sessiio (I, II, III sessio) / Session II (Sections I, III, III)

11:00 - 13:15 Seafarers Training & Certification Centre, Conference hall

11:00-11:15 - Shota Kunchulia, “ECDIS systems’ development and their effectiveness in navigation”

11:15-11:30 - Irakli Sharabidze, Mamuka Baramidze, Natia Dolidze, “Effective operation of maritime transport and research of problems existed in logistic systems of Georgia”

11:30-11:45 - T. Kokolashvili, L. Sikharulidze, M. Tsetskhladze, “Prospective to create unified logistic centre for Georgian sea ports, Transcausia and the Black Sea Countries”

11:45-12:00 - Unal Özdemir, Hatice Yılmaz, Ersan Başar, “INVESTIGATION OF PORT EFFICIENCY CRITERIA WITH FUZZY DEMATEL METHOD: HOPA AND BATUMI PORT”

12:00-12:15 - Umut Yıldırım, Özkan Uğurlu, Ersan Başar, Serdar Yıldız, “COMPLIANCE PROBLEMS FOR DECK CADETS”

12:15-12:30 - Iago Tsuladze, “Legislative aspects of preventive requirements of the International Convention MARPOL 73/78”

12:30-12:45 - Givi Tsiskhivili, “Optimization of loading-discharging operations on the maritime transport”

13:00 - 14:00 Lunch

14:00 - 17:00 Session III (I, II, III sessions) / Session II (Sections I, III, III)

14:00-14:15 - “Innovation Challenges of the Maritime Industry: Maritime Transport, Engineering, Technology, Logistics, Tourism”

14:15-14:30 - A. Ceal, “Assessment of Turkish Fishing Fleet”

14:30-14:45 - Givi Tsiskhivili, “Optimization of loading-discharging operations on the maritime transport”

08.09.2016
Understanding of Root Causes of Collision and Grounding Accidents

14:45-15:00 - Nino Putkaradze, T. Mikeladze, Z. Bezhano, K. Zarbaza, T. Gegenava, "Switching on the Synchronous Generator Operating in Parallel with the Ship's Electrical Network"

15:00-15:15 - Zura Dzadzigulov, Z. Bezhano, "The Main Actual Risks in Marine Insurance"

15:30-15:45 - Nadir BAŞÇINAR, Kadir SEYHAN, "AQUACULTURE IN TURKEY"

16:30-16:45 - Nino Putkaradze, Sopiko Dumbadze, Zurab Bezhano, "Global linguistic processes in the modern Georgian technical terminology"

17:20 - 18:00 - Conclusive meeting and closing of the Conference (discussion, conference results analysis and conclusion). BSMA Library.

19:00 - Gala dinner
in fishing”

12:00-12:15 - თავის ღიანადგ, ჯამშე შეხავთ, ზალი შეუბავთ, თხსმენი ჩადეგებით, გვრავ ველსარება, აგრეთში მთავრი შეიძლო ვინაირი სალამო სისტემის “SELMA MARINE” და მიერ სამეფოთიპური პასუხისმგებლობის მიღებამდე.
Otari Jijavadze, Jemal Sharadze, Zaza Shubladze, Teimuruz Chokharadze, Gurami Putkaradze, „Ship main engine’s overload electronic regulator “SELMA MARINE” and optimisation of its regulating particulars”

12:15-12:30 - ზამთარში მდგომად, დევნილი სტრატეგია, კამათი დეპარტამენტ, „ელექტრომაგნიტური მართვის მქონე ჰიდროპროპელსის სწრაფი ახლოსყრივი მანქანას სამოტორო საშუალო და ფიქსირების პროგრესიულ გზის“
Zaza Shubladze, Makvala Beqirishvili, Gurami Putkaradze, „Dependence of Electromagnetic Handling Hydropulsion Keep-alive Speed on Working Fluid Consumption and Pressure Particulars“

12:30-12:45 - თავისი ხელით, ა. მოქმედილობით, „ჯაშვილიდან სამრეკლოს გარემოების განახშობა MS Excel-ში“
Tamaz Telia, Ia Motskobili, „Assessment of investments in MS Excel“

12:45-13:00 - ფორუს უმდებლად, შესაძლო სტრატეგია, „სამრეკლოს სამშენებლო სამოტორო გარემოების ჰიდროპროპელსის ქვაპატარაში”
Tsiuri Kurbashadze, Makvala Bekirishvili, „The use of standardization and unification private aspect s in machine parts teaching“

13:00 – 14:00 საღამო/Lunch

14:00 – 15:30 ვიკითტაჰ სესია (IV-V სესიანთური) / Session II (Sections IV-V)

14:00-14:15 - ერთი ხანი, ჩამოქმედებული დღე, შემადგენლობა, „პროექტი ჰქონდა-ის და პრაქტიკული ხელენჯირი ჰარავალების მაქსუმალური უსაფრთხოების კომპონენტები და გეომაგნიტური დამთავრების შესურათი“
Enver Khalvashvi, Natalia Fokina, Maia Elizbarashvili, „ANGULAR AND TEMPERATURE DEPENDENCIES OF CHARACTERISTICS IN KCuf3 AND LIGHTLY DOPED LANTHANUM MANGANITE SINGLE CRYSTALS“

14:15-14:30 - მარი დარსხელები, თხერკი ყველაფერი, „განსაზღვრის რეგულაცია პროექტში გამოყენებულ დამთავრების ქრონოლოგიის სამოტორო გარემოები“
Mzia Diasamidze, Irma Takidze, “Second Order Statistical Moments of the Phase Fluctuations of Scattered Radiation in the Collision Magnetized Plasma“

14:30-14:45 - ხანი უმაღლავი, თხრობა დაესაზღვრება, „გარებები და გამორჩეულობები“
Natala Dumbadze, Tengiz Diasamidze, „Aluminium and Shipbuilding“

14:45-15:00 - თავისი ხელით, ა. მოქმედილობით, „სამრეკლოს სამშენებლო სამოტორო გარემოების განახშობა MS Excel-ში. დეფიციტის მხოლოდ გარემოება“
Tamaz Telia, Ia Motskobili, „Transportation volume optimization on the deficit model example in MS Excel“

15:00 – 15:30 ყირსთკინძა / Coffee Break

15:30-17:00 - შესაძლოდ სამუშაო მაგისტრობობა და სახელმძღვანელო სამედიცინო სალონისნართობები/ BSMA labs and workshops tour

17:30 – 18:00 თავისი ხელით გამოყენება და მობილური მოლოდნები (ფორუმში, პროექტში პარკონიქვები ექსპორტი და სუმბობის, მეყუნები სალოუსიანთ) სამშენებლო-სახელმძღვანელო / Conclusive meeting and closing of the Conference (discussion, conference results analysis and conclusion). BSMA Library.

19:00 საღამოდ გამოაქვთ. / Gala dinner.

11:00 – 13:00  I სესიის დღემდე (VI-VII-VIII სესიანთური) შესაძლოდ სახისათვის გასაღერძის ბიბლიოთეკა Session I (Sections VI-VII-VIII), BSSA Library

11:00-11:10 - რელიგიური ღონისძიება, „უამორჩეული ღონისძიება შე თქვენი ქვეყნიერება: სამოლოდნება“
Manuchar Loria, „Cultural tourism in the Black Sea Countries: Bulgaria“

11:10-11:20 - ციხეთან მსგავსი, „სამრეკლოთი ღონისძიები პარკების პირველი ოქმის აღწერილები და საბურთო პროექტები“
Irakli Katsadze, „The existed acquisition level and future prospects of Georgian tourism potential“

11:20-11:30 - გერგანა ზხელაძე, სალოები ღონისძიება, „სამრეკლოთი ღონისძიების ჯასომართლებრივი ღირებულები და დემოგრაფია“
Gergana Zhelyazkova, Slaveya Zhelyazkova, „TOWARDS VIABILITY AND SUSTAINABILITY OF THE TOURISM IN
II International Conference - “Innovation Challenges of the Maritime Industry: Maritime Transport, Engineering, Technology, Logistics, Tourism”
II съезд молодежи - "Инновации в судостроении: морской транспорт, инженерия, технологии, логистика, туризм"

BULGARIA"

11:30-11:40 - Светлана Овчарова, "Развитие рекреационного туризма на Болгарском Черном море"
Snezhanka Ovcharova, “DEVELOPMENT OF RECREATIONAL CRAFT TOURISM ON BULGARIAN BLACK SEA COAST”

11:40-11:50 - Василина Наталия, Гордия Анастасия, "Условия привлечения дельфинария "Акварель" как объекта семейного туризма в Керченском заливе"
Vasiliya Natalya, Gordius Anastasia, “Condition of tourism attraction of dolphinarium “Akvarel” as the object of the family-sanitary tourism of Kherson area”

11:50-12:00 - Светлана Овчарова, "Сравнение инфраструктуры гостиниц и туристических агентств"
Leviniskaya T. L., “Ecological aspects of yacht infrastructure development”

12:00-12:10 - Полякова Наталия, "Маркетинг MICE-туризма: ведение маркетинга и развитие бизнеса"
Pereispina Natalia, Miusov M.V., “MICE-tourism impact on destinations and its prospects in Odessa”

12:10-12:20 - Стефанова, "Создание туристических зон, обеспечения безопасности и развития инфраструктуры""
Ludmila Smarozova, “Local Production of Regional Economy and Tourism Development”

12:20-12:30 - Вазха Анна, "Сравнение инфраструктуры гостиниц и комплектации товарооборота""
Vazha Ananidze, “On the issue of cruise tourism development in Georgia”

12:30-12:40 - Оксана Леврикова, Наталия Васильева, "Медицинский туризм как приоритет элемента туризма в Керченском заливе"
Oksana Lavrikova, Natalia Vasileva, “MEDICAL TOURISM AS PRIORITY ELEMENT OF TOURISM IN KHerson LAND”

12:50-13:00 - Ревиска Наталия, "Стратегия развития мирового туризма на территории страны"
Reviska Natalia, “FORMATION OF EFFECTIVE BUSINESS MODEL FOR COMPETENCE CENTER IN TOURISM”

13:00-13:10 - Асан Махадзе, "Динамика развития туризма на Большой Гагаузии""
Aslan Makhadze, Inga Parsnadze, “Dynamics of tourism development in the Black Sea basin and Transcaucasian Countries”

13:10-13:20 - Теона Зийдзе, "География туризма в регионе"
Teona Zoidze, “Georgia’s tourism excursion service nowadays and perspectives of its development”

13:20-13:30 - Тамара Кобианидзе, Накаба Кубо, "Вино и вино туризм как важный компонент брендинга территории"""
Tamar Kobianiidze, Kakhaber Jakeli, Nutsiko Mcchedlishvili, “Wine and wine tourism as the most important component of the branding of the territory”

13:30 - 14:30 Ланч/Lunch

14:30-14:40 - Роман Мамуладзе, Мери Габашвили, "Условия морского туризма в регионе"
Roman Mamuladze, Meri Gabashvili, “General condition at Global Labour market, employment and unemployment rates in Georgia”

14:40-14:50 - Ирина Голубкова, Бакулих Е.А., "Мировые тренды инфраструктуры водных транспортных систем"”

15:00-15:10 - Николай Примачев, Александра Самоilenко, "Принципы устойчивого положения системных систем транспортной системы"""
Nicholas Primachev, Alexandra Samoilenko, “PRINCIPLES OF SUSTAINABLE POSITIONING OF THE MARINE TRANSPORT INDUSTRY”

15:10-15:20 - Шарко В.В., Марина Покровская, "Возможности реализации и принципы устойчивого развития транспортной системы"""
Sharko V.V., The prospects of development and management of destinations of Kherson area

15:20-15:30 - "Устойчивое развитие, содействие в экономическом развитии и устойчивое экономическое развитие""
Nana Okruashvili, "Regional marketing and its role in the region’s socio-economic development"

15:30-15:40 -Georgia, Manfred Seyfried, "Tourism and Innovation: the role of tourism in driving sustainable growth and development in Georgia"

Meri Gabaidze, Giorgi Mamuladze, "Georgian seafarers on the Global Labour Market – situation and perspectives"

15:40-15:50 - Georgia, Gavrilou, Aron, "Regional forums for sustainable development and economic relations"  

Nanuli Charbadze, Leila Khardina, Luiza Sikharulidze, "Trading ports in the system of international transport and economic relations"

15:50-16:00 - Georgia, Marina Putkaradze, "Environmentalization of the transport infrastructure as the factor of “green” development"

Gela Mamuladze, "Important aspects of the customer relationship and company’s innovative policy on the modern stage"

16:00-16:10 - Georgia, Zekarija, "Sustainable development of the transport sector and the role of transport infrastructure in the modern economy"  

Medea Kavtaradze, Natia Bezhanidze, "The tendencies of the world trade development and the analysis of the foreign trade on Georgian example"

16:30-16:40 - Georgia, Nika Paniabidze, "Sustainable development of the transport sector and the role of transport infrastructure in the modern economy"  

Lady Zenelazde, "The Black Sea Economic Cooperation (BSEC) and challenges to Georgia"

16:40-16:50 Georgia, Nino Khazaradze, Ekaterina Babunashvili, "Inclusive Economic Growth in the Country’s Regional Development Aspect"

Nino Tchiliaia, "Challenges of maritime transport in Ajara AR and practical approaches of its development"

16:50-17:00 - Georgia, Nino Tchiliaia, "Challenges of maritime transport in Ajara AR and practical approaches of its development"

Jemile Guseinova, "The modern tendencies of power sector of Georgia in the frames of European integration (on the example of gas industry)"

17:00-17:10 - Georgia, Nodia, "The modern tendencies of power sector of Georgia in the frames of European integration (on the example of gas industry)"

17:10-17:20 - Georgia, Nodia, "The modern tendencies of power sector of Georgia in the frames of European integration (on the example of gas industry)"

Natalia Jijavadze, "Macroeconomic problems of Georgian Sea Ports development"

17:20-17:30 - Georgia, Nodia, "The modern tendencies of power sector of Georgia in the frames of European integration (on the example of gas industry)"

George Gabedava, "Contemporary situation of Georgian Ports, problems and perspectives"

17:30 - 18:00 - Georgia, Nodia, "The modern tendencies of power sector of Georgia in the frames of European integration (on the example of gas industry)"

Conclusive meeting and closing of the Conference (discussion, conference results analysis and conclusion). BSMA Library.

19:00 - Gala dinner

09.09.2016

Visit to BSMA-based Seafarers’ Training and CertificationCentre
EVOLUTION OF MARITIME TRAFFIC MANAGEMENT STRATEGIES FROM VESSEL TRAFFIC SERVICE (VTS) TO SEA TRAFFIC MANAGEMENT (STM)

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1- INTRODUCTION
Maritime trade is gaining importance day by day because of its economy and efficiency. Commercial fleet is growing up 5% yearly, also fishing fleet is getting bigger 3-4% per year; there are approximately 90 thousand of commercial vessels and 4.7 million of fishing vessels sailing overseas (FAO, 2014, UNCTAD, 2015). In this case, maritime traffic problem is naturally emerging, especially in close coastal areas, straits and channels. International/national maritime organizations, institutions and administrations are trying to find out a solution for this traffic problem since 1950's. Best approach is to establish land stations and monitor the traffic from land. VTS centers established to achieve this, VTSs made valuable contributions to organize maritime traffic. Vessels must be equipped with some electronic devices (AIS etc.) for monitoring by VTS. However, in some cases VTS may become helpless because of unequipped vessels. Especially 80% of fishing fleet can be considered as unequipped vessel in this perspective (UNCTAD, 2015). Therefore, it is hard to manage traffic in dense areas if these fishing vessels are involved to the traffic. According to the study, small fishing vessels (LOA<12 m and 12<LOA<24 m) are an important threat for safety of maritime traffic, which needs to be solved.

2- INTERNATIONAL AND NATIONAL BASEMENT OF UNEQUIPPED FISHING VESSELS
If the subject is construction and equipping requirements, definitely one of the most important, force major international regulations is SOLAS for maritime industry. The first version adopted in 1914 in response to the Titanic disaster. The main objective of the SOLAS Convention is to specify minimum standards for the construction, equipment and operation of ships, compatible with their safety. Flag States are responsible for ensuring that ships under their flag comply with its requirements, and a number of certificates are prescribed in the Convention as proof that this has been done (IMO, 2015a).

SOLAS regulations starts from 300/500 gross tonnages (GT) for cargo vessels and passenger vessels over 100/500 GT. So rules and regulations do not cover the vast majority (more than 70% of all fishing vessels/boats) of fishing vessels. Other reason, which removes the fishing vessels out of scope, is SOLAS Chapter 1, Part A, Regulation 3: Exceptions. This regulation clearly states that; fishing vessels are not covered (IMO, 2015a).

SOLAS Chapter 4, Global Maritime Distress and Safety Systems (GMDSS), Part A, Regulation 1: Application: “This chapter applies to all cargo ships of 300 GT and upwards (IMO, 1974). This is the
first regulation of Radio Communications Chapter, so regulations of this chapter also do not cover approximately 80% of fishing vessels around the World.

SOLAS Chapter 5, Regulation 19: AIS must be fitted onboard all ships of 300 GT and upwards engaged on international voyages, cargo ships of 500 GT and upwards not engaged on international voyages and all passenger ships irrespective of size. But there is not any obligation for fishing vessels because fishing vessels out of scope of SOLAS (IMO, 1974).

Torremolinos 1977 was the first international convention directly focused on safety of fishing vessels. It established a safety regime for fishing vessels of 24m in length and above. Convention contained detailed regulations and safety requirements concerning the standards of construction and equipment to be applied essentially to new, decked, seagoing fishing vessels of 24 m in length and over. Also mentioned about fire protection, detection, extinguition, and firefighting; protection of the crew; life-saving appliances; emergency procedures, musters and drills; radiotelegraphy and radiotelephony and ship borne navigational equipment. Unfortunately, convention did not get sufficient ratifications to get entry into force; the common opinion was that the convention regulations were very stringent (Plaza Montero and López Pulido, 2006).

In 1993, less supporting, technological developments and the need for some technical changes, has led to another conference, which adopted a protocol to the 1977 Convention. But the lower limit of the protocol was still 24m, and application of safety requirements to vessels between 24m and 45m LOA, was left to regional decisions. As the 1993 Torremolinos Protocol was still not in force in the 2000s. In 2012, Cape Town Agreement on the Implementation of the Provisions of the 1993 Protocol relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 was adopted. Cape Town Agreement of 2012 will enter into force 12 months after the date on which not less than 22 States the aggregate number of whose fishing vessels of 24 m in length and operating on the high seas is not less than 3600 have expressed their consent to be bound by it (Plaza Montero and López Pulido, 2006).

Safety regulations for all fishing vessels are left almost entirely to national discretion (URL1, 2015). There are some strong safety regulations among the IMO member states that include equipment standards, inspection requirements and certification or licensing of vessel operators and crew. In general, these regulations vary in each country. For example, Canada, Norway and the United Kingdom (UK) have extensive requirements, while other countries are less stringent. Generally vessels with the length of about 15m or larger are addressed (Wang et al., 2005).

There are many different local regulations and legislations about equipping and construction of fishing vessels and fishing vessel’s safety. More or less for every country, local rules based on international regulations; especially, the size limits of the vessels, which subjected to regulations. Due to impossibility of mention about the local regulations of all countries; 8 countries (Canada, United States, China, Japan, Denmark, Spain, Turkey, South Africa) were determined according to their geographic regions, and these countries’ regulations were sampled. America, Asia Pacific, Europe and Africa have sampled by the following countries. The main purpose of this examination is to find out common points and differences of local regulations. Generally, regulation’s coverage area starts from 12m LOA or 25GT, which means vessels less than 12m LOA are still not under coverage of these regulations. For instance, According to radio installation regulations; “All vessels over 25GT should be fitted with VHF radio.”, but small vessels not objected to carry VHF radio. And there are not any additional regulations about AIS carriage.
3- MARITIME TRAFFIC AS AN INTERNATIONAL ISSUE

Primary proof for increasing maritime traffic is adoption of Convention on Facilitation of International Maritime Traffic (FAL). This convention adopted in 1995 and entered in to force in 1967. This convention mainly focused on the standardization of legal procedures and documentation between ship and port. But the main purpose was to make maritime traffic safer and more efficient. Also in second half of the 20th century, further increasing ship traffic and maritime accidents, led to the adoption of COLREG 1972. COLREG is an extensive form of 1960 Collision Regulations, mainly focused on organization of maritime traffic and responsibilities of vessels. In the late 20th century, the total global maritime trade volume reached almost 6 billion tons according to UNCTAD's statistics. The increasing number of vessels and emerging technology has enabled the development of new systems for the regulation of maritime traffic (Douvere and Ehler, 2011).

4- MANAGEMENT OF MARITIME TRAFFIC BY VTS

New technological innovations in, maritime trade, fishing industry, exploration of new oil resources in sea bed, other underwater operations and harbor constructions led to more maritime activities over the sea (Degre, 1995). These important activities were increased the risk of accidents in all navigable waters and apparently in confined waterways or port approaches in particular (Ustaoglu and Furusho, 2002). This has been accompanied by a considerable increase in the damage resulting accidents. Maritime traffic management was necessary not only for safety of transportation but also for the efficiency and effectiveness of transportation. Therefore, VTS become an essential system to manage maritime traffic. VTS was not specifically referred to in the SOLAS 1974, but in June 1997 IMO's Maritime Safety Committee (MSC) adopted a new regulation to Chapter V (Safety of Navigation). After all, a revised SOLAS chapter V was adopted by IMO MSC in December 2000, and entered into force on 1 July 2002 (IMO, 2015b).

SOLAS chapter 5 refers to the IMO Guidelines on VTS (resolution A. 857 (20)) for detailed regulations. The guidelines contains 2 annexes and these annexes give information about; general definitions and clarifications, objectives, responsibility, liability, communication, reporting, organization, information about participating vessels, planning and implementation of VTS, recruitment, qualifications and training of VTS operators (IMO, 1997).

IMO VTS guidelines subdivided the functions into internal and external functions. Internal functions are the preparatory activities that have to be performed to enable a VTS to operate. In this context, data collection, data evaluation and decision making are main internal functions of VTS. External functions are activities executed with the purpose of influencing the traffic characteristics. Functions regarding traffic characteristics mainly can be listed as; allocation of space, routine monitoring of vessels in the vicinity area, monitoring and assisting maneuvers to prevent accidents (such as collision, grounding, etc.) (IMO, 1997).

IALA divides VTS in to three different types according to their main functions and objectives; Information Service (INS), Navigational Assistance Service (NAS), Traffic Organization Service (TOS). INS is responsible to provide information to all vessels in the vicinity area. This information is about safe passage of the area, position, identity and intentions of local traffic, meteorological and geographical state of the area. TOS is responsible for operational management of traffic movements in the vicinity area conducted through VHF communications; in order to organize the traffic properly and avoid the happening of accident. NAS is responsible for supporting the decision making process.
of shipmasters, if masters request. NAS aims to assist the traffic in order to ensure safe and accurate passage, by providing requested information on VHF (ALA, 2012, Praetorius et al., 2015). VTS centers that already established in 41 different countries and 196 different places, that can easily understood; governments choose the most risky places (Guide, 2015, Van Westrenen and Praetorius, 2014). Especially narrow waterways and straits, because safety, security and efficient shipping are common concerns of all countries. Despite all of these, according to accident statistics VTS is not the perfect system to manage maritime traffic. According to MAIB accident statistics between years 2005 and 2010, there were 1161 maritime accidents happened in VTS areas of UK (only UK flagged (over 500 GT) cargo vessels and fishing vessels included). Detailed figures have shown in Table 1.

<table>
<thead>
<tr>
<th>Type of vessel/year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchant vessels ≥ 500 GT</td>
<td>83</td>
<td>53</td>
<td>53</td>
<td>58</td>
<td>51</td>
<td>67</td>
<td>365</td>
<td>31%</td>
</tr>
<tr>
<td>Fishing vessels</td>
<td>136</td>
<td>140</td>
<td>169</td>
<td>106</td>
<td>118</td>
<td>127</td>
<td>796</td>
<td>69%</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>193</td>
<td>222</td>
<td>164</td>
<td>169</td>
<td>194</td>
<td>1161</td>
<td></td>
</tr>
</tbody>
</table>

As seen on the Table 1, in this 6 yearly period average 190 accidents happened per year only in VTS areas. For merchant vessels, numbers of the accidents decreased until 2007 and then tend to increase again. Also for the fishing vessel accidents, there are fluctuations. Consequently; in 2005, 219 accidents have happened and in 2010 totally 194 accidents happened, so number of accidents were more or less same. In addition, if we consider the world, although the decline in the overall accident, yet it is not minimized. Therefore, maritime traffic management is still one of the biggest problems in shipping industry. Concerned departments of many countries, especially UK, US and European Union countries focused on this issue; in order to improve VTS system or develop new system for management of maritime traffic.

5- SEA TRAFFIC MANAGEMENT (STM) CONCEPT

STM is a developing method for the management of maritime traffic more efficiently and safely (Correa et al., 2014, Sundström, 2015). STM concept comes from MONALISA project, so primarily we have to consider MONALISA projects in order to recognize the origin of STM concept. In early 2010, MONALISA project was started as a kind of motorway of the sea project which aims at giving a concrete contribution to the efficient, safe and environmentally friendly maritime transport. This was done through development, demonstration and dissemination of innovative e-navigational services to the shipping industry, which can lay the groundwork for a future international deployment. Quality assurance of hydrographic data for the major navigational areas in Swedish and Finnish waters in the Baltic Sea contributes to improving safety and optimization of ship routes (Siwe et al., 2014a). Main aim of STM is to establish a well-built information transfer system between ship and ship to shore. In order to improve safety and efficiency of maritime traffic, and also minimize the adverse effects of growing maritime industry (marine pollution, air pollution etc.). Four important key performance indicators for STM strategic enablers have been defined as follows (Sundström, 2015):

1. Voyage Management services will provide support to individual ships in both the planning process and during a voyage including: route planning, route exchange, and route optimization services.

2. Flow Management services will support both land organizations and ships in optimizing overall traffic flow through areas of dense traffic and areas with particular navigational challenges.
3. Port Collaborative Decision Making services will increase the efficiency of port calls and departures for all stakeholders through improved information sharing, situational awareness, optimized processes, and collaborative decision making during port calls and departures.

4. Sea System Wide Information Management (SWIM) will ensure interoperability of STM services facilitating data sharing using a common information environment and structure (e.g., the Maritime Cloud). These strategic enablers constitute the target concept of STM, and their implementation will improve safety, environmental sustainability, and operational efficiency in shipping (Sundström, 2015). STM seeks to create an organized traffic management entity called Sea Traffic Coordination Center (STCC) that will act as a central hub maintaining record of all vessels at sea using the AIS and/or radar, enabling the distribution of vessel routes between ship-to-ship and ship-to-shore. STCCs will be the most important component of STM, because STCCs will be equipped with AIS/radar. That will allow STCCs to monitor real position, speed, course etc. of all vessels in vicinity area and see the bigger picture to organize the traffic properly. VTSs also organizing traffic by similar way, but the better point of STCC is it will be allowable to monitor the paced routes of vessels in the vicinity area by using Sea SWIM (Maritime Cloud). According to IMO; Maritime Cloud is a communication framework enabling efficient, secure, reliable and seamless electronic information exchange between all authorized maritime stakeholders across available communication systems.

6.- FUTURE BENEFITS OF STM

STM is a solution for traffic management, but benefits of STM won’t be restricted with maritime traffic. If the concept will well adapt to all vessels, according to a study of Siwe et al. (2014) possible future benefits of STM can be listed as following Table 2 (Siwe et al., 2014b): Most of these benefits listed at the table will emerge naturally, because shorter sailing distance means less fuel and time consumption. Less fuel and time consumption means more money saving or more profit for most of the concerning parties. Andersson and Ivehammar (2013), conduct a study with 1278 merchant vessels. As a result of this study, estimated total cost for one day’s traffic was approximately 29 million Euros. If route distance can be reduced by 1% for all vessels, 102 million Euros will be saved per year (Andersson and Ivehammar, 2014). In addition to STM’s economic benefits, environmental pollution will reduce due to less fuel consumption.

<table>
<thead>
<tr>
<th>Party</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo Owner</td>
<td>Cost reduction: Lower rates, because of the efficient route planning</td>
</tr>
<tr>
<td></td>
<td>Service improvement: Accurate real-time goods information to customers</td>
</tr>
<tr>
<td>Ship owner/Operator</td>
<td>Cost reduction: Fuel savings – shorter distance, slow-steaming/just in time arrivals, shorter port turnaround time</td>
</tr>
<tr>
<td>Port Authorities</td>
<td>Service improvement: More efficient planning, Manual communication only needed as an exception. Safety: Possibility to check pilot exemptions online.</td>
</tr>
<tr>
<td>Terminals</td>
<td>Better planning due to common port information and goods information</td>
</tr>
<tr>
<td>Port services</td>
<td>More reliable plans, due to more accurate and up to date data.</td>
</tr>
<tr>
<td>Crew</td>
<td>Safety: Fewer accidents due to improved situational awareness Less administration: simplified procedures and automation of data collection</td>
</tr>
<tr>
<td>Ship brokers and agents</td>
<td>Improved services with up to date info. Better focus on value-add services.</td>
</tr>
</tbody>
</table>
Pilots
Better planning due to more reliable up to date information.

Passengers
Safety: Fewer accidents, improved SAR operations.

Customs
Better planning, due to earlier heads up on arrivals.

Coast Guard
Improved focus on suspicious vessels avoiding STM

Locks and Bridges
Improved Just-in time planning and passages

Insurance
Fewer accidents – less cost.

General public
Safety: Fewer accidents – possible growth of cruise industry. Lower societal cost for cleaning.
Environment: More CO2 efficient transport

Atmosphere
Less COx, NOx and SOx per transported goods.

Marine life
Less emission, less oil spill due to fewer accidents. Proactive route advice for Environmentally Sensitive Areas, e.g. the Great Barrier Reef. Advice regarding seasonal Environmentally Sensitive Areas, e.g. seabirds in the Baltic.

Other marine industry
Safety: reduced risk for accidents: less direct damages to wind farms, less oil spill disturbing agriculture

7- CONCLUSION
STM Concept is more complex and active if compared with VTS system. Extensive planning and traffic management strategy of STM will be useful to make maritime cargo and passenger traffic more efficient. But if we consider the whole maritime traffic, small vessels and boats are a real concern which will affect implementation of STM Concept. Examined literature and legislations proved that small vessels 12<LOA<24 m and small boats LOA<12 m are out of coverage almost for all countries’ legislations. Track and coordinate the traffic including small fishing vessels (less than 12m LOA) is quite difficult for VTS operators or port control officers; because it is difficult to establish good cooperation between land and fishing vessel without any communication devices. STM is mainly based on information exchange, data circulation, coordination and cooperation between all parties of maritime traffic. In order to accomplish these, small fishing boats 7<LOA<24 m, must be considered as a part of STM.

Consequently, in order to implement STM better; all members of maritime traffic including small boats and fishing vessels should be equipped with a useful tracking device like AIS or similar and all members of maritime traffic should carry any useful communication device like VHF or Citizen Band Radio. Otherwise STM may be weak to manage the whole maritime traffic.

REFERENCES:


