

**ΑΚΑΔΗΜΙΑ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ ΜΑΚΕΔΟΝΙΑΣ**  
**ΣΧΟΛΗ ΠΛΟΙΑΡΧΩΝ**

Πτυχιακή Εργασία

**«Safety Issues for Passenger and Ro-Ro Vessels»**



**ΣΠΟΥΔΑΣΤΗΣ: ΤΣΙΡΙΔΗΣ ΜΕΝΕΛΑΟΣ**

**ΕΠΙΒΛΕΠΩΝ ΚΑΘΗΓΗΤΗΣ: ΠΑΠΑΛΕΩΝΙΔΑ ΠΑΡΑΣΚΕΥΗ**

**ΝΕΑ ΜΗΧΑΝΙΩΝΑ 2017**

**ΑΚΑΔΗΜΙΑ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ  
Α.Ε.Ν ΜΑΚΕΔΟΝΙΑΣ**

**ΠΤΥΧΙΑΚΗ ΕΡΓΑΣΙΑ**

**ΕΠΙΒΛΕΠΩΝ ΚΑΘΗΓΗΤΗΣ: ΠΑΠΑΔΕΩΝΙΔΑ ΠΑΡΑΣΚΕΥΗ**

**ΘΕΜΑ: Safety Issues for Passenger and Ro-Ro Vessels  
ΤΟΥ ΣΠΟΥΔΑΣΤΗ: ΤΣΙΡΙΔΗ ΜΕΝΕΛΑΟΥ  
Α.Γ.Μ:3149**

**Ημερομηνία ανάληψης της εργασίας: 27/04/15**

**Ημερομηνία παράδοσης της εργασίας: 28/06/17**

<i>A/A</i>	<i>Ονοματεπώνυμο</i>	<i>Ειδικότητα</i>	<i>Αξιολόγηση</i>	<i>Υπογραφή</i>
<i>1</i>				
<i>2</i>				
<i>3</i>				
<b>ΤΕΛΙΚΗ ΑΞΙΟΛΟΓΗΣΗ</b>				

**Ο ΔΙΕΥΘΥΝΤΗΣ ΣΧΟΛΗΣ :**

## Table of Contents

Abstract.....	5
Introduction.....	6
1.Types of ships .....	7
1.1 Container Transport Ship.....	12
1.2 Vehicle Transportation Ships.....	13
2. Passenger vessels .....	14
3. Ro – Ro Vessels .....	18
4. Maritime transport in the EU .....	20
5. Security on board ships and port facilities .....	25
6. Freight / transportation security .....	26
7. Passenger rights .....	28
7.1 Obligations of the Carrier .....	28
7.2 Passenger's Rights to Modify a Ticket.....	31
7.3 Passenger's Rights in the Case of Changing the Terms of the Contract on the Liability of the Carrier .....	32
7.4 Passenger Rights in the Event of Delay Delay .....	33
7.5 Passenger Rights in the Event of Travel Delay .....	35
7.6 Legal Protection .....	36
8. The ISM Code for Safety .....	37
9. Sea safety .....	39

10. Safety regulations for passenger ships .....	41
10.1 Stability requirements and gradual decommissioning of ro-ro passenger ships.....	43
10.2 Safety requirements for persons with reduced mobility .....	44
11.The Norman Atlantic Incident .....	46
12.How safe are Ro-Ros? .....	48
Conclusion .....	52
References.....	54

## **Abstract**

Passenger ships in operation today are liable to a huge range of directions and gauges covering each part of ship development and operation. Various episodes throughout the years have prompted enhancements in security necessities, including those identifying with flame wellbeing measures -, for example, escape courses and fire assurances frameworks for the huge chamber regular of voyage ships - and life-sparing machines and game plans.

Other than enhancements in the specialized directions, the section into drive of the International Safety Management (ISM) Code for traveler transports in 1998 was an imperative stride in concentrating on the "human component" side of transportation, by giving a global standard to the sheltered administration and operation of boats and for contamination counteractive action. In the interim, the section into constrain on 1 February 1997 (with a stage in period to 2002) of the 1995 corrections to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 has prepared for enormously improved seafarer principles and also giving IMO itself forces to check Parties' consistence with the Convention. The STCW Convention, as corrected since 1995, incorporates particular preparing necessities for team on traveler ships, for example, preparing in swarm administration, for use in crisis clearing.

Vast traveler boats can deliver an enormous measure of waste - directions on rubbish and sewage administration are contained in MARPOL 73/78. Roll-on, roll-off ships all have their own specific wellbeing concerns.

*Keywords: Operation, Passenger, Ro-Ro, Safety, Security, Ships, Vessels*

## **Introduction**

Security at sea is a fundamental component of maritime transport policy, from the point of view of protecting passengers, crew members, the marine environment and coastal areas. Given the global dimension of maritime transport, the International Maritime Organization (IMO) is developing uniform international standards. Among the most important international agreements are the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention on Standards of Training, Certification and Watchkeeping Seafarers' (STCW). Rapid adaptation of EU legislation under these international conventions is an important objective of EU maritime transport policy and EU involvement in the development and improvement of international agreements as well as the introduction of additional EU-level measures play equally Essential role.



**Figure 1.** Flag of the International Maritime Organization

(Wikipedia, International Maritime Organization, 2017, Available at [https://en.wikipedia.org/wiki/International\\_Maritime\\_Organization](https://en.wikipedia.org/wiki/International_Maritime_Organization) [accessed 24 June 2017] )

## 1. Types of ships

Freight transport across the world from one point of the Earth to another is largely sea-borne, with every ship. But the transport of people is largely done by the sea. The history of shipping has so far evolved to be a giant economic and social activity. At first it was done locally to meet the needs of neighboring areas in one country, and then spread across all the lengths and widths of the Earth. Shape, size and special equipment of ships are the main points of reference in which time changes occur, but also their basic variations. In this way, we can classify ships in main categories and small categories. Over the years, the variety of industrial materials and raw materials has greatly increased, resulting in the construction of various types of ships of all types and sizes so as to be able to meet all the needs of global commercial development. In conclusion, we can say that the various essential reasons (human needs, industrial development, technological development, economic organization, etc.) have contributed to the creation of various types of ships, classifying them according to the type of construction, the type and the transport area, the means of propulsion, the purpose and mission they serve.

In the first phase, ships are divided into four major categories:

(1) Trucks Ships: They are vessels used to transport various loads which may be: Solid, Liquid and Liquid, Mixed.

(2) Passenger Ships: Ships used for the carriage of passengers. They are configured so that some of them can carry cars at the same time as passengers.

(3) Special Destination: Ships for special purposes such as fishing, cable laying, recreation, etc.

(4) Auxiliary Marine: Are ships or floating shipyards built for special purposes in specific areas.



**Figure 2.** Ship Truck

(Washington Ports, Port of Seattle, Ship Truck, n.d., Available at <http://washingtonports.org/wp-content/uploads/port-photos/seattle/POSeattle%20ship%20truck.jpg> [accessed 20 June 2017] )



**Figure 3.** Passenger Ship

(OMI, Passenger Ships, n.d., Available at <http://www.imo.org/fr/OurWork/Safety/Regulations/Pages/PassengerShips.aspx> [accessed 29 May 2017] )

General cargo ships are vessels specially designed to carry General cargo loads as the various cargoes in bags, parcels, boxes, barrels, containers, etc. They are exclusively their own loading and unloading equipment (Beers or curtains), which, especially on today's ships, can have tremendous potential. As a rule, they have at least one Tween deck in all or more of their holds, precisely in order to protect the loads between them, separating the various batches of non-identical and mostly incompatible loads, but also the lower loads are protected from the weight of loads loaded on them. Another advantage of the tiller is that it is possible to load a bulk load and some or some other loads above it in the bucket. Their size, in old and newer grades, ranges from 14,000 to 16,000 tons of deadweight, although some 21,000 tons are still present. They are rather small-sized vessels, so that they can be reached even in ports with low water depths. The openings of their holdings are large enough to be able to place loads with long standardization, such as pipes, plates, etc. The decks, left and right of the nests of the holdings, are spacious and free of fittings and obstacles, in order to be able to load and load (Deck cargo) on them. In addition to the "General Load" transfer, these ships have the potential to be used successfully for the transport of bulk cargoes, mainly grain, fertilizer, sugar, coal, etc. It is a multiple-use vessel in the maritime transport sector. This is why they are described as "Multi-use" ships.

Combined transport vessels are a development of Bulk Carriers, which stemmed from the need for better and most efficient use of bulk carriers. This is because, although the transport of such cargoes has been constantly increasing, which has also resulted in Bulk carriers' tendency towards "gigantism", many times these ships have been obliged to travel without a freight from the port of landing to the next Port of loading. For this reason, some new types of ships have been devised, which are capable of double or triple use in terms of cargo, that is to say, sometimes to load a bulk ore, sometimes bulk (bulk) and sometimes any other bulk cargo.

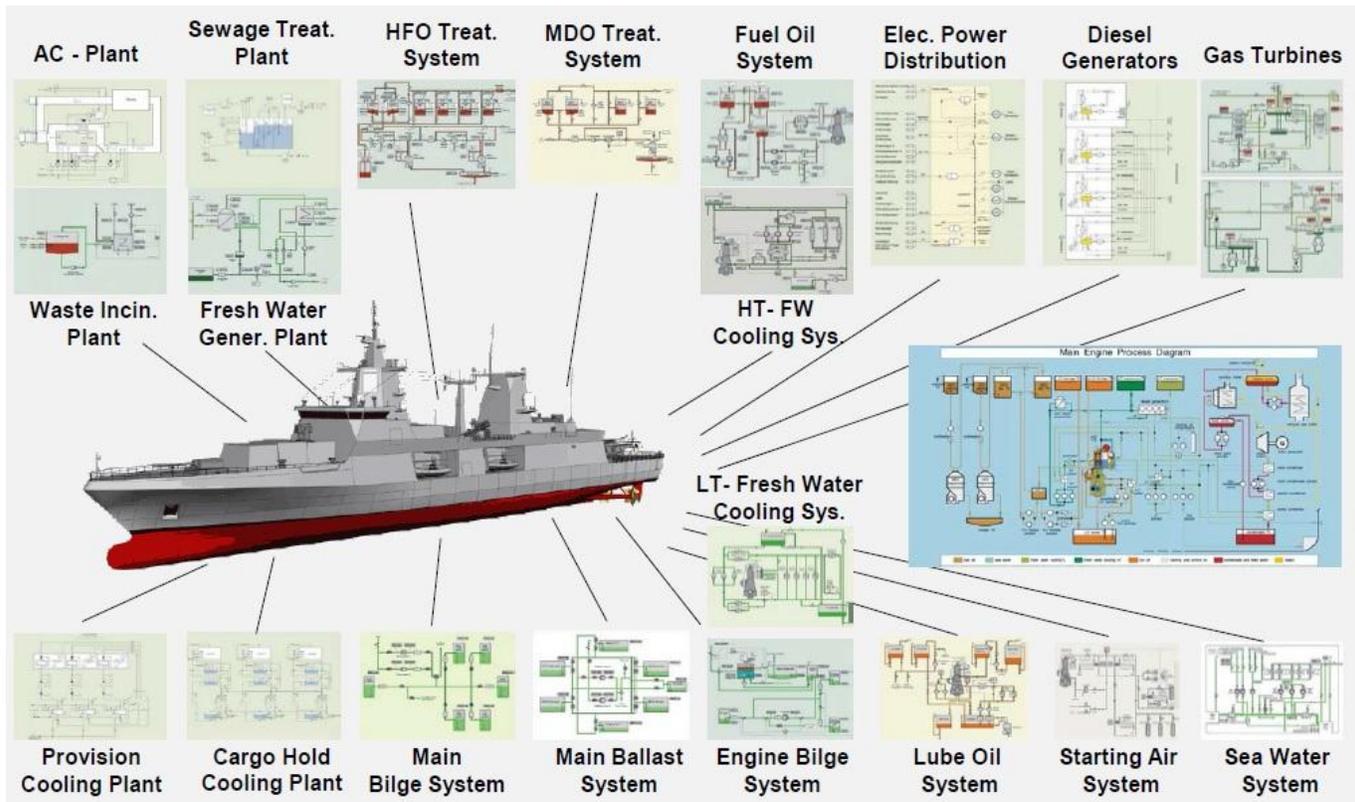


**Figure 4.** Bulk Carrier Saar N

(Maritime Connector, Dry Cargo, n.d., Available at <http://maritime-connector.com/wiki/dry-cargo/> [accessed 29 April 2017] )

The main objective of these ships was to be able to carry at the same time at least two completely different loads, a liquid and a solid. However, this idea seems to have been abandoned very quickly, because suspicions and concerns have arisen about the possible addition of loads from leakages of liquid cargoes and the creation of flammable or explosive mixtures which would certainly be dangerous to the safety of the crew and ship's. That is why, ultimately, the alternative use of these ships prevailed, which, in the final analysis, did not substantially damage the ships concerned. Thus, ships have been constructed which have been specially shaped inside their holdings and their general equipment so as to be able to alternatively load dry and wet loads, thus ensuring their greatest possible employment in the field of freight and transport. These ships made their presence strong at the beginning of the 1960s and because they were able to combine

different properties they were called Combination carriers or Mixed ships as they were better known in navy language. It is worth mentioning that in Bulkers, mixed vessels are the only ones that have exceeded even 250,000 tones of deadweight.



**Figure 5.** Below-deck propulsion plant with auxiliary machinery and services

(Engineers Journal, Merchant shipping and the marine engineering technology revolution , 2014, Available at <http://www.engineersjournal.ie/2014/07/17/merchant-shipping-and-the-marine-engineering-technology-revolution/> [accessed 19 June 2017] )

## 1.1 Container Transport Ship

This ship has emerged from the effort to establish a freight transport system, mainly 'general cargo', in specially crafted crates, with the main goal of making transport safer, faster and cheaper than conventional transportation methods. The cargo spaces of this ship are specially designed so that cargo boxes can be loaded with ease, order and security. These containers, for obvious reasons, are called "Containers" and, in the international maritime dialect, are called "Containers". For the same reason the particular ship is called "Container ship".



**Figure 6.** Container Ship CMA CGM Corte Real

(Maritime Connector, Dry Cargo, n.d., Available at <http://maritime-connector.com/wiki/dry-cargo/>  
[accessed 29 April 2017] )

## 1.2 Vehicle Transportation Ships

This vessel is a closed-type truck, which is suitably configured to be able to load and transport vehicles in which various goods are stored. It is considered to be a variant or extension of the Container Ship, except that the goods are stored in large wheeled vehicles instead of in containers. Another difference is that the vehicles are unloaded by self-propelled ("rolling" on their wheels), without the use of other means of loading and unloading.

In this particular feature is also the international name of these ships as Roll off / Roll on (roll = roll), and often called "Ro-Ro". In our language, their predominant name is "Truck Cargo", although it is often used as the "Car-Cargo".



**Figure 7.** Car carrier cargo ship / Ro-Ro

(Nautice Expo, Car carrier cargo ship / Ro-Ro, n.d., Available at <http://www.nauticexpo.com/prod/mitsubishi-heavy-industries-ship-ocean/product-32135-412621.html>

[accessed 20 May 2017] )

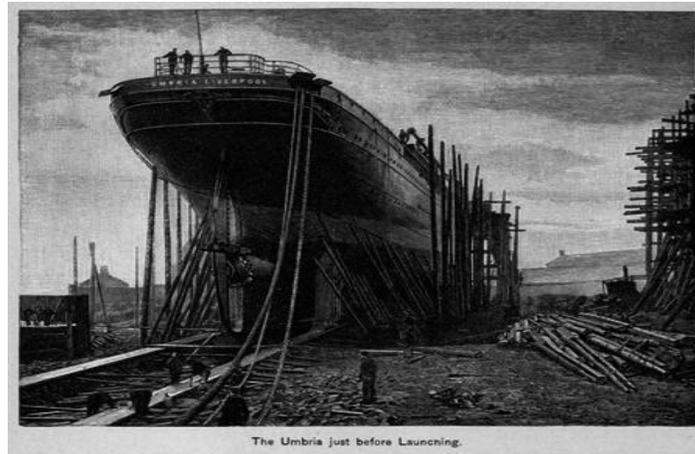
## **2. Passenger vessels**

Passenger ships are the second largest category of ships, after lorries, at least a number of ships. As mentioned above, these ships are primarily intended for the transport of passengers, and some of them are designed to carry vehicles and even small quantities of goods. A key characteristic of these ships is the existence of many decks, above and below the main deck, which are, as a rule, closed and protected from the various weather conditions. Also, another important feature is the existence of many reception, accommodation, accommodation, etc., such as cabins, lounges, dining rooms, entertainment, entertainment, dance, etc.

The first worthy passenger ships began to be built and circulated at a wide international level towards the end of the 18th century. The Atlantic Ocean was the Sea that initially monopolized the interest, as well as the competition of the first passenger shipping companies. England, France, Germany, and a little later Norway were the first major competitors in the field of passenger shipping, in an attempt to join the Old Europe with the New World of Europe, namely with America and a little later with Australia, Mainly migrants, rather than visitors or tourists. For history, we mention that the largest passenger ships that originally appeared were English 'Umbria' and 'Etruria' and the German 'Furst Bismark'.

Subsequently, a large number of passenger ships, which recorded history in international passenger shipping, became known throughout the world, both in the early 19th century and later in the interwar period, before and after the Second World War, etc. A common feature of these ships and those that followed later was the attempt by manufacturers to give them, as much as possible, mainly high speed, large size (displacement, etc.) and, of

course, great amenities for passengers. Basically and predominantly for competition between similar passenger ships, even today.



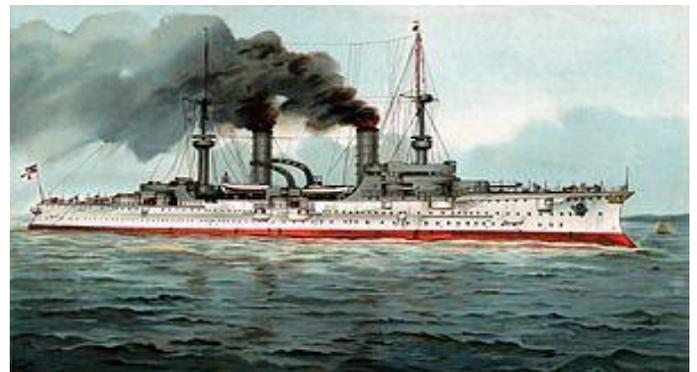
**Figure 8.** Umbria under construction

(Wikipedia, RMS Umbria, 2016, Available at [https://en.wikipedia.org/wiki/RMS\\_Umbria](https://en.wikipedia.org/wiki/RMS_Umbria) [accessed 10 April 2017] )



**Figure 9.** Etruria under sail

(Wikipedia, RMS Etruria, 2017, Available at [https://en.wikipedia.org/wiki/RMS\\_Etruria](https://en.wikipedia.org/wiki/RMS_Etruria) [accessed 10 May 2017] )



**Figure 10.** SMS Fürst Bismarck

(Wikipedia, SMS Fürst Bismarck, 2017, Available at [https://en.wikipedia.org/wiki/SMS\\_F%C3%BCrst\\_Bismarck](https://en.wikipedia.org/wiki/SMS_F%C3%BCrst_Bismarck) [accessed 13 June 2017] )

Shortly thereafter, History has recorded rapid developments in the passenger shipping sector, coupled with the development of the shipbuilding industry, and given the fact that the large "competitor", who appeared a little later, the aircraft, was missing. The transition from cloth to steam and then to Diesel, a development from which the cargo ship also benefited, imposed the presence of the passenger ship as a major means of mass transportation of people and not only at international as well as local level.

Thus, passing through the history of the last century, we arrive at today's time when the passenger ship, although subjected to cruel and rather fierce competition from the airplane, remains in the Maritime Transport area with a fairly modified role, especially in terms of its area and radius of action. Also, the shape and type of the old passenger ship has changed significantly so that it adapts to the real human needs of our day and we can not overlook the technological improvements or alterations designed to better serve the passengers or even to the economical exploitation of the ship. Especially these latter forces us to separate the ships of this category into subcategories.

Passenger ships are those which are so designed that their total tonnage is reserved for the transport and accommodation of passengers. Of course, in many of them there is room for loading and transporting a small quantity of goods, but their prime destination is mainly the transport of passengers. These ships can carry passengers in distant or near distances, in the ocean, in closed seas, in coastal shipping, etc. For this reason, we can divide them into at least four smaller groups, namely:

Panopore Passengers ships carry passengers from one country to another, traveling overseas. Previously, these ships were called Overcoats. Nowadays, however, this type of trip has probably disappeared, obviously out of great competition.

Small-scale passenger ships are usually employed in the carriage of passengers in "closed" seas or between islands, which may be in close proximity, but in an ocean, e.g. The Mediterranean, the Caribbean, the islands of Japan, Indonesia, the Philippines, etc.

Coastal passenger ships cover transport needs between ports of a particular country. It is worth noting, however, that the type of "Single Passenger Ship" has today greatly restricted its action in the field of passenger shipping, especially the seagoing ship. Many of these have been turned into "tours" (as will be described below), while many are also used in minor activities, such as hotel units. Very little and to a strictly limited extent are used for their primary purpose.

The need, first of all, for man to cover all his transportation needs, even in places where his geophysical image is not so smooth, coupled with the constant effort for more efficient and more economical Waterway Transport that is affordable And remarkable to the passenger, but also profitable to the entrepreneur, led to new ideas and new technologies in the field of passenger shipping.



**Figure 11.** Coastal cruise ship gets Haiti mission

(Marine Log, Coastal cruise ship gets Haiti mission, 2010, Available at <http://www.marinelog.com/docs/NEWSMMIX/2010mar00193.html> [accessed 10 April 2017] )

### **3. Ro – Ro Vessels**

A RoRo or R / R vessel is a modern type of ship, more ferryboat, an extension of regular containerships container ships or mainly non-motorized vehicles eg. Trailers.

These loads, vehicles, or containers are loaded - in fact rolled, usually "rolled" - by special tractors by trailing them into the loading area of the ship from a special folding catapult, where finally the stack is promoted by specially installed lifts their. This loading process is called Roll on (- board). Their unloading, which is done similarly but counterclockwise, is called the Roll off (- board), where the name of this shipbuilding also came from. The loading and unloading of these vessels is very fast. It is estimated that the loading time required for these ships is 1/6 that required for container ships.

The RoRo ferry Pride of Burgundy that runs the Dover-Cale route with the possibility of carrying 600 cars.

RoRo can also play a ferry role, while worth mentioning are the very large RoRo used to transport cars from their factories to their destination markets and are called PCC (Pure Car Carrier) or PCTC (Pure Car Truck Carrier). With the launch of RoRo Faust in June 2007 with a capacity of 8,000 cars, the new Large Car Truck Carrier (LCTC) was created.

RoRo ferry boats, with large outdoor catamarans close to the waterline and open decks of vehicles, with few internal watertights, have a reputation for high-risk designs (sometimes the RoRo acronym grows deplorably in "Roll On / Roll Over" Roll over means reversal]). A poorly secured loading hatch can lead to water inflow and sinking of the ship, as happened for example with the Herald of Free Enterprise in 1987. Still water regurgitation on the deck can lead to free-surface phenomena, leading to destabilization and eventual overturning ship's.



**Figure 12.** Ro-Ro Vessel

(Raunek K. , What are Ro-Ro Ships?, Marine In Sight, 2017, Available at <http://www.marineinsight.com/types-of-ships/what-are-ro-ro-ships/> [accessed 1 April 2017] )



**Figure 13.** Mark V Class Vessels: World's Largest Ro-Ro Ships

(Rishab J., Mark V Class Vessels: World's Largest Ro-Ro Ships, Marine In Sight, 2016, Available at <http://www.marineinsight.com/types-of-ships/mark-v-class-vessels-worlds-largest-ro-ro-ships/> [accessed 3 April 2017] )

## **4. Maritime transport in the EU**

The internal maritime transport market was completed in the early 1990s and operates satisfactorily. In December 1986, the Council implemented the principle of freedom to provide services (Articles 49 and 50 TEC, new Articles 57 and 58 TFEU) in the field of maritime transport between Member States and between Member States and third countries [Regulation 4055/86] . In 1992, the principle of freedom to provide services extended to maritime transport within Member States (maritime cabotage or cabotage) for European shipowners whose vessels are registered in a Member State and flying its flag, provided that such vessels fulfill all the conditions required for cabotage operations in that State [Regulation 3577/92]. For ships carrying out cabotage between continental ports and for cruise ships, crew matters fall within the jurisdiction of the State in which the vessel is registered. For small ships (below 650 tonnes), however, and for ships carrying out cabotage to and from the islands, crew matters fall within the remit of the host State. The re-registration of ships within the European Union aims to improve the exploitation conditions and the competitiveness of the European merchant fleet [Regulation 789/2004]. A Directive on the Agreement on the organization of working hours of seafarers concluded by the Union of Union Shipowners and the European Union Transport Workers Federation is important for harmonizing both the working conditions of seafarers and Conditions of competition in this area [Directive 1999/63].

Detailed rules have initially defined how Articles 81 and 82 of the EC Treaty (Articles 101 and 102 TFEU) apply to maritime transport so as not to distort competition within the common market [Regulation 1419/2006]. These specific rules have been replaced by the general competition rules applicable to all sectors [Regulation 1/2003, see section 15.2.1]. However, block exemptions (cf. Section 15.3.3) still apply for a transitional period in favor of maritime conferences and consortia ("Conferences and consortia") which provide international liner shipping services from or to one or more EU ports

[Regulation 823 / 2000]. Thanks to these exemptions from the general rules of Articles 101 and 102 (TFEU), shipowners can jointly organize the services they offer by rationalizing their maritime transport activities and economies of scale, but thus offering users, Better quality services. The exemptions allow in particular the coordination and joint setting of travel times, the identification of intermediate ports, the exchange, sale or mutual chartering of space or container locations on board vessels, pooling of ships, port facilities and offices Exploitation. Commission guidelines provide guidance on the application of Article 81 of the EC Treaty (new Article 101 TFEU) in the maritime sector. European guidelines on State aid to maritime transport seek to increase the transparency of public interventions and determine which aid schemes can be implemented to protect European interests in this area.

International safety standards for passenger ships apply in the European Union. SOLAS international conventions on the safety of life at sea and MARPOL for the prevention of pollution by ships are implemented by Member States and therefore by ships flying their flag [Regulation 2158/93]. Member States are required to carry out an initial specific inspection and subsequent annual inspections on commercial and passenger ships to check compliance with the terms of the SOLAS [Directive 1999/35]. Passenger ships carrying inland voyages not covered by the SOLAS Convention are covered by a European directive which seeks to ensure maximum safety for passengers and at the same time to impose uniform conditions of competition based on converging standards in European shipping [ / 45]. In order to avoid exceeding the maximum capacity of ships and to provide accurate information to rescue services in the event of an accident, another directive obliges shipping companies serving European ports to record the names of crew members and passengers of passenger ships [Directive 98 / 41]. A rights regulation A Regulation on the rights of passengers in maritime and inland waterway transport aims, inter alia, to ensure a high level of protection for passengers, comparable to other modes of transport [Regulation 1177/2010]. The European Union applies the International Management Code for the Safe Operation of Ships and for Pollution Prevention, adopted by the International Maritime Organization (ISM Code) [Regulation 336/2006]. Ships calling at European Union ports traveling in waters under the jurisdiction of Member

States are required to apply international and relevant European law on safe shipping, maritime safety, protection of the marine environment and shipboard living and working conditions (Port State control) [Directive 2009/16, last amended by Regulation 2016/2072].

The independent European Maritime Safety Agency assists the Commission in the drafting of maritime safety legislation, monitors their implementation by the Member States and coordinates research activities following marine casualties or unintentional or deliberate maritime pollution from ships [Regulation 1406/2002, last amended by Regulation 2016/1625]. It must: ensure competition in the sector; provide technical and scientific support and high-level expertise for the proper implementation of European legislation in the fields of maritime safety and prevention of ship-source pollution; to monitor the application of this legislation by the Member States ; And assess the effectiveness of the existing measures. A directive establishes common rules on ship inspection and survey organizations and intends to ensure a high level of competence and independence for these bodies [Directive 2009/15]. To prevent pollution of the sea by oil (as was the case with the Erika shipwrecks on the French coast in December 2000 and the Prestige on the Spanish coast in December 2002), a regulation established an accelerated phasing-in scheme for double-hull or equivalent design requirements Of MARPOL 73/78 on single hull oil tankers [Regulation 417/2002].

International relations are, of course, very important in the field of maritime transport. One of the first measures in this area was therefore to establish a consultation procedure on relations between Member States and third countries and on actions in this field within international organizations [Decision 77/587]. Most rules and specifications for offshore vessels, especially maritime safety, are being negotiated within the International Maritime Organization (IMO), a United Nations special body, all of which are members of the EU. The EC / EU included in a directive the quality standards for training programs, training programs, certificates, medical rules and rest periods included in the IMO Convention on the Training, Certification and Watchkeeping of Seafarers [Directive 2008/106].

The EU has designated the liability of carriers carrying out maritime transport in the event of an accident [Regulation 392/2009] and has acceded to the Protocol of 2002 to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 [Decision 2012/22 ]. Member States have set minimum standards for certain tankers calling or departing from European ports and have inspected ships by offshore pilots in the North Sea and the Channel [Directive 79/115]. The European vessel traffic monitoring and information system seeks to enhance the safety and efficiency of maritime traffic, improve the authorities' response to incidents, accidents, or possibly dangerous incidents at sea, including search and rescue operations, and Contributing to the prevention and detection of pollution from ships [Directive 2002/59, last amended by Directive 2014/100]. A directive simplifies reporting formalities for ships when arriving and / or departing from EU ports and via an electronic one-stop shop [Directive 2010/65]. Another directive seeks to improve maritime safety and the prevention of marine pollution through the uniform application of international instruments concerning equipment to be placed on EU vessels and to ensure the free movement of such equipment within Of the Union [Directive 2014/90]. Directive 2005/65 requires Member States to take various measures to enhance port security. The EU Member States have agreed to sign and ratify or to accede to the International Convention on Civil Liability for Bunker Oil Pollution Damage (Convention 2002/762). They also agreed to ratify or accede to the International Convention on Civil Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Marine (Habitats Convention) which seeks to protect the victims of maritime pollution at international level (Decision 2002/971 ). A Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) assists and advises the European Commission on all aspects of maritime safety and the prevention or reduction of pollution from shipping activities (Regulation 2099/2002, last amended by Regulation 2016/103).

Market monitoring was necessary at the end of the 1970s due to unfair competition from the fleets of some state-trading countries and certain Far East countries. Therefore, a Council Decision created an information system allowing the European institutions to keep abreast of the activities of certain third countries in the maritime transport sector [Decision 167/2006]. Another Council Decision provides for countermeasures in the event of unfair competition in the maritime transport sector [Decision 83/573]. A regulation provides for concerted action against third country measures to ensure free access to ocean freight transport [Regulation 4058/86]. A European procedure should be followed to tackle unfair pricing practices in maritime transport by third country carriers seriously disrupting the structure of freight transport to, within and within the European Union [Regulation 4057/86].

## 5. Security on board ships and port facilities

The terrorist attacks of 11 September 2001 led to the adoption of the ISPS (International Ship and Port Facility Security Code) Code in 2002 at an IMO conference and amendments to other international agreements. The objective is to improve the protection of ships and port facilities, particularly against terrorist attacks. Regulation (EC) No 725/2004 of 31 March 2004 aims at ensuring the uniform interpretation and application of the decisions adopted by the IMO. The EU's maritime safety strategy started with the adoption on 24 June 2014 by the Council of a political and strategic action to tackle effectively and globally the challenges of maritime safety by exploiting all relevant instruments at an international, And national level. At the same time, on 6 March, the Commission and the Vice-President / High Representative had forwarded to Parliament and the Council a joint and complete communication on the subject entitled "Towards an open and secure global maritime sector: evidence of a European Union strategy" On Safety at Sea "(JOIN (2014) 0009).



**Figure 14.** ISPS Code being applied in Southampton, England, with signs prohibiting access to areas next to ships

(Wikipedia, International Ship and Port Facility Security Code, 2017, Available at [https://en.wikipedia.org/wiki/International\\_Ship\\_and\\_Port\\_Facility\\_Security\\_Code](https://en.wikipedia.org/wiki/International_Ship_and_Port_Facility_Security_Code) [accessed 3 June 2017])

## **6. Freight / transportation security**

All commodities and commodities (raw materials and finished goods) are transported by all means of transport to the land, sea and air from / to any part of the world.

In times of recession and economic crisis, the ability of a business to absorb the effects of unexpected damage during the transport of a commodity is minimal, to nonexistent.

As is well known, in all cases of moving goods, there is always the risk of loss, destruction, theft, sinking, collision, overturning and other types of damage that can be anticipated with insurance cover.

Something that has become a prerequisite for carrying out transportation and additional service has become an indispensable part of the transport itself.

Despite the false impression that security increases the cost of transport, in fact the insurance rate is minimal in the face of the cover it provides.

Our company believes that insurance coverage gives credibility to transportation and ensures smooth compensation, without any problems and delays, in case of damage. Because we are never sure, better to be sure, this is our philosophy and for that reason we have as a company covered our civil liability towards third parties (towards our customers). Transport safety covers the risks that may arise during the transport of a cargo, and relieves the trader of the stress of "if something happens on the road".

Whether goods are to be transported within Greece or imported from abroad by any means of transport, you should never forget to omit transport insurance which, at a minimal cost, secures the merchandise, whatever its value.

In transport insurance there are the following basic insurance clauses covering the merchandise as follows:

Clause C: Damage from collision, collision, tipping, fire, explosion, sinking, or flooding of a ship, general bargain sacrifice, cargo discharge into the sea are covered. Also included is the participation in general expenses and bonuses.

Clause A: All transport hazards (including cover for B and C, plus losses due to theft, piracy, malicious action) are covered except for those explicitly excluded from the contract. The basic exceptions to the contract are the insult of the insured, the normal wear and tear of the commodity, the same defect, the war, the terrorist actions, the delay, etc.

With an extra premium, war damage, seizure, abandoned mines (only for sea trips), damage from strikers, terrorists can be agreed, and special clauses can cover some products that have peculiarities such as frozen meat, charcoal, timber, beverage bottles, etc. Transport safety is the necessary "tool" of a modern businessman who imports, exports or distributes goods.

## **7. Passenger rights**

Sea transport is one of the most common means of transport in Greece, especially during the summer holidays. However, it is not uncommon for passengers to suffer from poor service provision on the part of shippers - shipowners either because of long delays or even cancellations. What most, if not almost all, passengers are unaware of is the fact that current legislation gives us widespread reimbursement and compensation rights and / or compels carriers to provide us with compensatory benefits. Law 3709/2008 (Government Gazette 213 / A / 14.10.2008) establishes a series of important rights for passengers in maritime transport.

### **7.1 Obligations of the Carrier**

Firstly, the carrier has a wide range of obligations to the passenger (Article 15 of Law 3709/2008):

*Non-discrimination* - The carrier is obliged to provide non-discriminatory services to passengers.

*Safety* - It is also required to take the necessary safety and hygiene measures for passengers. People with reduced mobility or those in need of special care (such as infants, young children, pregnant women, the elderly) to provide every possible help and service.

*Compliance with the contract of carriage* - It must provide the passenger with the seat as well as the cabin type agreed, as specified on the ticket.

*Ticket details* - It must further specify the ship, trip, date, departure time and scheduled arrival. Prior to the delivery of the ticket, he informs the passenger verbally about the name of the ship, the trip, the date and the scheduled time of departure and arrival.

*Notification of delays* - The carrier is obliged to publicly announce the itineraries by any appropriate means and to inform the public in good time of their performance. In the event of canceling, canceling, changing or delaying scheduled services, it must also inform passengers by telephone or by SMS or e-mail. If there is a delay in departure, it must communicate it with passengers accessible forms of announcement (visual and audio announcement in Greek and English) on board, indicating both the estimated time and the reason for the delay.

*Disabled* - It is up to the operator to provide all possible assistance to people with reduced mobility or to persons in need of special care (such as infants, young children and their attendants, pregnant women, elderly persons), such as escorting, where appropriate, support By appropriate staff to handle luggage and to serve personal needs.

*Discounts* - Before issuing the ticket, the publisher informs the passenger concerned of the prices and discounts.

*Insertion of rights* - The carrier is responsible for the placement in prominent points on board ships and Ticket Agencies in Greek and English, in which the rights and obligations of the passenger and the carrier are indicated. This table is additionally available in Braille and in large font text at the ship's reception upon request by a passenger.

*Complaints* - The carrier adheres to organized procedures for receiving, recording and resolving or responding to complaints - protesting passengers and providing passengers with visual and sound announcement prior to the arrival of the ship at the first port of the route with clear information on these procedures.

*Damage or loss of repairs* - The carrier shall be liable in full for any damage to or loss of baggage on board the ship, provided it is delivered for safekeeping and evidence is issued (Article 5 (2) of the Act).

*Promotion to the final destination* - The carrier is obliged to promote the passenger to his final destination in the most expedient manner and at his own expense if the voyage is

delayed or canceled due to damage to or damage to the ship or the carrier's fault (Article 8 (1) Law).

*Food and accommodation* - The carrier is also obliged to provide the passenger with food and accommodation at the port of call at his own expense when due to the loss of response he has had to depart for his final destination the day after his arrival and between him and at least 6 hours Or when arrival at the port of call was between 00.00 and 05.00 hours and departure for its final destination is expected to take place at a time exceeding six hours (Article 8 (2) of the Act).

## **7.2 Passenger's Rights to Modify a Ticket**

If the passenger wishes to modify his ticket for the same or another trip, he has the right to request this from the carrier up to 24 hours before the scheduled departure of the ship, if there are seats. If, of course, the value of the new ticket is lower, the passenger is not entitled to a refund of the dispute (Article 4 (1c) of the Act).

If the passenger has not been able to travel, the passenger does not lose the value of his ticket but is entitled to the refund of the whole or that value by the carrier in the following cases (Article 4 (1b) of the Act):

Reimbursement of at least 50% of the fare plus parcels and VAT, if it returns the body of the ticket itself up to 12 hours before the scheduled time of departure of the ship.

Reimbursement of at least 75% of the fare plus parcels and VAT, provided he returns the body of the ticket for up to 7 days before the scheduled departure date of the ship.

Refund of the entire fare, plus parcels and VAT, if it returns the body of the ticket itself up to 14 days before the scheduled departure date of the ship.

Reimbursement of the entire fare, plus parafiscal charges and VAT, irrespective of the carrier's notification time, when the passenger is unable to travel on the scheduled day and time for which the ticket was issued for reasons of force majeure, in particular for reasons of health, Transport.

These entitlements do not apply to a ticket already modified during the fourteen days preceding the original date of the trip.

### **7.3 Passenger's Rights in the Case of Changing the Terms of the Contract on the Liability of the Carrier**

In the event of failure to provide the agreed category or cabin type, the passenger has the following rights (Article 4 (1a) of the Act):

Whether to withdraw from the contract, taking back the value of his ticket twice.

Whether to travel to a position lower than that for which he paid the ticket, taking the difference in the ticket price twice.

In the event that the passenger does not wish to withdraw and the carrier has a higher capacity, the passenger is not entitled to claim the difference of the extra payment. If the highest position is made at the request of the passenger, the latter must pay the difference in the fare price reduced by 50%.

## 7.4 Passenger Rights in the Event of Delay

If there is a delay in the ship's departure from the scheduled time due to damage to or damage to the ship or for reasons attributable to the carrier, the passenger has the following rights (Article 6 of the Act):

*Suspension* - Abstain from the contract and return the fare, or

*Stay on board* - Stay on board as long as the delay is delayed and forward to the destination of the sea voyage by the same ship or first available or other ship, with the care and expense of the carrier.

*Food* - If the delay extends beyond four hours from the scheduled departure time, the passenger has the right to receive food with care and expense from the carrier.

*Accommodation* - Also, if the expected departure time is at least the next day of the scheduled departure time and at least 6 hours are interrupted or the delay is expected to last beyond the six hours and the scheduled departure time is between 00.00 to 05.00 hours, To be provided by the carrier on board the ship or in a hotel if this is feasible. Where accommodation is not feasible, a passenger compensation equal to twice the passenger fare is payable to the passenger.

*Percentage of financial compensation* - If it was eventually forwarded to its destination with the same or the first available or other ship with care and expense of the carrier and the delay was longer than 3 or 6 hours respectively from its scheduled time of arrival at its destination, the passenger is entitled to receive financial compensation of 25% or 50% on the fare or other compensation provided by agreement between the parties. This right shall be exercised at the port of departure or arrival of the ship.

*Double payment* - If a charge is not forwarded to its destination within a reasonable time with the same or the first available or another ship as the carrier is liable to receive a financial compensation twice the passenger fare and the paid carriage fare or other compensating benefit After agreement by the parties. The reasonable time may not exceed 24 hours from the scheduled time of departure of the ship.

## **7.5 Passenger Rights in the Event of Travel Delay**

In the event of a delay due to the extension of the journey time due to damage or damage to the ship or for reasons attributable to the carrier, the passenger is entitled (Article 7 (1) and (2) of the Act):

*Withdrawal* - Withdrawal from the contract and descending to an intermediate port, when the corresponding fare is returned for the remainder of the route, or

*Percentage of financial compensation* - To continue the trip and in case of late arrival at the destination of more than 3 or 6 hours, financial compensation of 25% or 50% on the fare respectively or other compensatory benefit upon agreement of the parties.

## **7.6 Legal Protection**

If the carrier fails to meet his obligations under the law and fails to satisfy the above rights of the passenger, he may initially lodge complaints with the Consumer Ombudsman (CO) and the General Secretariat for Consumers). In the majority of cases, disputes filed with the OT are resolved out of court even with consumer redress agreements. The powers of the GSC to impose particularly high fines through the Minister for Development are a sufficiently daunting tool against maritime carriers, which do not respect the rights of passengers.

In the event of a passenger being delayed or canceled due to the fault of the shipping carrier, it may appeal to the competent civil tribunals in very short proceedings to compensate both for its positive property damage (eg ticket loss, room deposit) And loss of earnings (eg lost wages) and for moral damage.

## **8. The ISM Code for Safety**

The ISM (International Safety Management Code) is based on the creation and operation of a ship's secure ship management system, certified by the issue of two types of certificates, one for the Office of Compliance and one for the each ship (Safety Management Certificate). These certificates are issued by the flag or - as is usually the case with cargo shipping - the classification society acting on its behalf.

Offices managing ships with more than one flag, ie the most, are required to keep as many DOCs as the flags. Flagships authorized by multiple flags may issue multiple DOCs with a single visit to the office for inspection. Each SMC is linked to a single DOC and if the DOC is recalled for some reason - e.g. serious findings during port control from the outset - automatically becomes void and the ship does not leave the port unless the reasons for revocation disappear and no new one is issued.

The Safety Management System (PSC) philosophy is based on a written report of management imperfections in the execution of procedures at the office and - most importantly - on the ship. These imperfections are called non-conformities and specific procedures for how they are corrected are provided. The repeat non-conformity previously corrected is considered a serious misconduct. The finding of a serious misconduct is called major non-conformity and may result in the recall of the DOC of the manager.

In any case, it is important for the office to be able to prove that its HRC is working. The system works if administrative deficiencies:

- They are localized on time.
- They are mentioned in writing.
- They are dealt with within a reasonable time.
- And most of all they do not.

Compliance or non-compliance with the ISM Code is evidenced by the documents of the HRC. In the event of an accident, the finding by the authorities that the RCC operates is a strong indication of the responsibility of the manager and the crew and can only result in a minor non-conformity.

## **9. Sea safety**

The Ministry of Mercantile Marine places great emphasis on the issue of transport safety, because there is a very special feature. Because shipping is carried out by ships, under conditions that are often unfavorable, the security measures to be taken should be particularly upgraded.

At the international level, there is the so-called Uniformity on the transport of dangerous goods. Because shipping is a link in the whole transport chain, there would be a very big problem with different regulations on the transport of dangerous goods at sea with those on land, either by road or by rail.

So many issues are common. I will focus more on the purely maritime transport of dangerous packaged species. For maritime transport, at least in Greece, two different regulations apply. Of course, they have many common elements, but the regulations are two because they have a different implementation philosophy.

There are regulations, which are related to domestic transport, of dangerous goods in packaged form. And there is also the second pillar, which is the regulations governing the maritime transport of dangerous packaged goods but by ships on international voyages. These are ships that either leave Greece and go abroad, whether coming from abroad and arriving in Greek ports.

The basic decree, which regulates the safety of the domestic transport of dangerous packaged species, is Presidential Decree 405/96. This is called "Regulation on the loading, unloading, handling and residence of dangerous goods in ports and their carriage by sea" and regulates issues not only of the transport of dangerous goods, but also what security measures should be taken in the inland port areas, Loading and unloading of these dangerous goods.

Greece has set as a philosophy the ban on the transport of dangerous packaged articles by ships carrying passengers at the same time, ie so-called passenger ships. Article 2 of the Rules of Procedure concerns internal transport, ie ships sailing between Greek ports and whose purpose is to introduce security measures concerning the loading and unloading by Greek or foreign vessels of the movement and stay of dangerous packaged species, The sea and land area of ports and bays, as well as the maritime area of the area of jurisdiction of port authorities and port officials. In order to make this a little clearer, each port and its operator, eg. Port organizations to lay down the terms and conditions under which dangerous packaged species will be safely loaded into the area of interest.

## **10. Safety regulations for passenger ships**

The identification of marine areas is of great importance in determining the application of Directive 98/18 / EC to different categories of passenger ships. The directive includes a procedure for the publication of lists of marine areas, which proved to be difficult to apply. It is therefore necessary to establish a functional and transparent procedure to enable effective monitoring of the implementation of the Directive.

In order to harmonize the level of safety of passenger ships throughout the Community, the derogation granted to Greece as regards the timetable for the implementation of the safety requirements should be abolished.

Directive 2003/25 / EC of the European Parliament and of the Council of 14 April 2003 on specific stability requirements for ro-ro passenger ships (5) introduces enhanced stability requirements for passenger ferries operating on international voyages And to Community ports; this strengthened measure should also apply to certain categories of such ships operating on domestic voyages operating under the same sea conditions. Failure to apply these stability requirements justifies the gradual decommissioning of ro-ro passenger ships after certain years of operation.

In view of the structural modifications that ro-ro ro-ro passenger ships may need to undergo in order to comply with the specific stability requirements, these requirements should be introduced over a period of several years in order to provide sufficient Time in the affected maritime sector to comply: for this, a phasing-in timetable should be provided for existing ships. This phasing-in timetable should not affect the imposition of specific stability requirements in the maritime areas covered by the annexes to the Stockholm Agreement of 28 February 1996.

It is necessary to take swift and flexible account of changes in relevant international instruments, such as the International Maritime Organization (IMO) conventions, protocols, codes and resolutions.

Pursuant to Directive 98/18 / EC, the International Code for the Safety of High Speed Craft contained in IMO Maritime Safety Committee MSC 36 (63) of 20 May 1994 applies to all high-speed passenger craft engaged on domestic voyages . The IMO has adopted a new High Speed Craft Code, the 2000 International Code for the Safety of High Speed Craft (HSC 2000 Code), contained in MSC 97 (73) of 5 December 2000 of the IMO Maritime Safety Committee And applies to all high-speed craft built from 1 July 2002 onwards. It is important to ensure that Directive 98/18 / EC can be updated in a flexible manner so that developments occurring at international level also apply to high-speed passenger craft engaged on domestic voyages.

It is important that appropriate measures are taken to ensure safe access for persons with reduced mobility to passenger ships and high speed passenger craft engaged on domestic voyages in the Member States.

## **10.1 Stability requirements and gradual decommissioning of ro-ro passenger ships**

1. All ro-ro passenger ships of categories A, B and C of which the keel has been fitted or which are at a similar stage of construction on or after 1 October 2004 shall comply with the provisions of Articles 6 , 8 and 9 of Directive 2003/25 / EC of the European Parliament and of the Council of 14 April 2003 on specific stability requirements for ro-ro passenger ships.
2. All ro-ro passenger ships of categories A and B of which the keel has been fitted or which are at a similar stage of construction before 1 October 2004 shall comply with the provisions of Articles 6, 8 and 9 of Directive 2003/25 / EC by 1 October 2010 at the latest, unless they have been decommissioned on that date or at a later date when they reach the age of 30 but in any case from 1 October 2015 at the latest.

## **10.2 Safety requirements for persons with reduced mobility**

1. Member States shall ensure that appropriate measures are taken, based, where possible, on the guidelines in Annex III to enable persons with reduced mobility to have secure access to all passenger ships of categories A, B, C And D and to all high speed craft which are used for public transport and which have the keel installed or which are at a similar stage of construction on or after 1 October 2004.
2. Member States shall consult and cooperate with the representative organizations of persons with reduced mobility on the implementation of the guidelines contained in Annex III.
3. For the purpose of the retrofitting of passenger ships of categories A, B, C and D and high-speed passenger craft used for public transport and in which the keel has been installed or which are at a similar stage of construction before 1 October 2004, Member States shall apply the guidelines set out in Annex III where this is reasonable and economically feasible.

In applying the guidelines of the Annex, Member States shall follow IMO Circular MSC / 730 of 24 June 1996 entitled "Recommendation on the design and operation of passenger ships to meet the needs of the elderly and those with disabilities".

### Access to the ship

Ships must be built and equipped in such a way that persons with reduced mobility can easily and safely embark and disembark and have access to the various decks either independently or through ramps, lifts or lifts. The instructions for this access should be posted on other ship's accesses, as well as other appropriate points throughout the ship.

### Signaling

Shipboard sign-on for passenger assistance should be accessible and legible for persons with reduced mobility (including those with sensory disabilities) and be hung on key points.

### Means for transmission of advertisements

The operator of the ship shall have on board systems for the visual and orthographic transmission of advertisements such as delays, program changes and on-board services to persons with various forms of reduced mobility.

### Alarm

The alarm system and the familiar buttons must be designed so that it can alert and also be used by all passengers with reduced mobility, including those with sensory and mental disabilities.

### Additional requirements to ensure mobility within the ship

Handrails, corridors, and passenger corridors, door openings and doors should allow people to move to wheelchairs. Lifts, vehicle decks, passenger lounges, habitats and toilets must be designed in such a way as to be accessible, in a reasonable and proportionate manner, to persons with reduced mobility. "

## 11.The Norman Atlantic Incident

MS Norman Atlantic is a roll-on/roll-off passenger (ROPAX) ferry owned by the Italian ferry company Visemar di Navigazione. The ferry was chartered by ANEK Lines from December 2014. On 28 December 2014, she caught fire in the Strait of Otranto, in the Adriatic Sea. The bodies of nine victims (three Greek, two Italian, two German, a Georgian and a Turkish passenger) were recovered from the sea, while nineteen others remain missing. Additionally, two crewmembers of the Albanian tug Iliria were killed during the salvage operations on 30 December.

A fire broke out on the car deck. At this time, Norman Atlantic was carrying 222 vehicles, 487 passengers, and 55 crew.



**Figure 15.** Burning Norman Atlantic

(Waterfield, B., Tzafalias, M., 2014, Burning Norman Atlantic ferry had serious safety 'deficiencies', Telegraph, Available at <http://www.telegraph.co.uk/news/worldnews/europe/italy/11315815/Burning-Norman-Atlantic-ferry-had-serious-safety-deficiencies.html> [accessed 17 June 2017] )

Passengers assert that the order to abandon ship was not given until four hours after the fire had started. Despite their cabins filling with smoke, no alarm had sounded. They also state that the crew of Norman Atlantic gave them little assistance.

An international rescue effort, led and coordinated by the Italian Coast Guard was started to evacuate the 466 passengers and crew on board.

Italian authorities opened a criminal investigation into the fire. The investigation would determine whether or not criminal negligence played a part in the fire.

Paris MoU, an international independent organization that "aims at eliminating the operation of sub-standard ships through a harmonized system of port State control" as it states on its website, inspected the vessel in the port of Patras on December 19 and found several shortfalls in the security systems.

The investigation found six different issues, including a problem with the fire doors.

Area	Defective item	Nature of defect
Fire safety	07105 - Fire doors/openings in fire-resisting divisions	Malfunctioning
Certificate & Documentation - Documents	01302 - SAR Co-operation plan for pass.ships trad on fixe	Not approved
Emergency Systems	04103 - Emergency, lighting, batteries and switches	Missing
Structural Conditions	02101 - Closing devices/watertight doors	Not as required
Life saving appliances	11199 - Other (life saving)	Other
Life saving appliances	11199 - Other (life saving)	Other

**Figure 16.** Safety Issues in Norman Atlantic

(Pozzebon, S., 2014, The Burning Italian Ferry Had Known Fire Door Issues Before It Set Sail, Business Insider, Available at <http://www.businessinsider.com/paris-mou-finds-safety-issues-on-norman-atlantic-2014-12> [accessed 13 June 2017] )

## **12.How safe are Ro-Ros?**

Because of the publicity surrounding accidents involving passenger ro-ro ships such as the Herald of Free Enterprise, Scandinavian Star and Estonia, it is sometimes assumed that this type of ship is much more dangerous than others. This is not borne out by statistics. The World Casualty Statistics for 1994 published by Lloyd's Register of Shipping show that passenger/ro-ro cargo loss rate per thousand ships was 2.3 - the same as the average figure for all ships.

However, when one considers loss of life at sea the picture changes. Between 1989 and 1994, the Lloyd's Register figures show that 4,583 lives were lost in accidents at sea. Of these 1,544 were lost in accidents involving passenger/ro-ro cargo ships - exactly one third, even though ro-ro ships make up only a small fraction of world merchant marine tonnage. This would seem to indicate that although passenger ro-ro ships are involved in an average number of accidents the consequences of those accidents are usually far worse.

Since coming into being in 1959, IMO has adopted numerous international conventions and other instruments which are designed to improve maritime safety in general. Some of these are particularly relevant to ro-ros. The International Regulations for Preventing Collisions at Sea, 1972, for example, contain a series of measures to improve the safety of shipping in confined waters, such as straits and narrow channels. These include the introduction of traffic separation schemes and other routeing measures. Ro-ros, such as passenger ferries, frequently operate in such waters which are not only confined but are frequently congested as well.

However, since the early 1970s, when ro-ros were appearing in increasing numbers, IMO has developed various measures with the special features of ro-ro ships in mind. These are dealt with the following different subject headings: Subdivision and damage stability, Fire safety, Cargo safety.

A ro-ro vessel is one of the most sought after cargo ships to work on. Providing both cargo and passengers carrying capabilities, ro-ro ships reaches ports more frequently and have shorter voyages. The flexibility, speed and the ship's functionality to blend with other transportation modes has made it popular among seafarers. However, the problem with the RO-RO ship is its design, which includes cargo in upper decks and accommodation at even higher levels. The effects of wind and bad weather on high accommodation can also disturb the ship's stability. In Ro-Ro ships which carry only cargo, the general arrangement of cargo access door is close to the water line. In the event of listing, the door can get submerged leading to high chances for ingress of water inside the ship which will lead to capsize. One weak point of ro-ro vessel is that sometimes the cargo door itself is used as a ramp which makes the ship more vulnerable to damages. The subdivision of ro-ro ship from inside lacks from the transverse bulkheads, leading to lower water tight integrity when water ingress or flooding takes place. Lack of bulkhead also leads to spreading of fire more quickly as no subdivision is present to contain the fire. When a ship is to be abandoned, life raft and lifeboats are used to leave the ship as soon as possible. The location of lifeboat and life rafts on ro-ro ships is usually very high, which makes it even difficult to lower them at sea especially when the ship is listing. Another reason which acts externally on the Ro-Ro vessel is the rough weather, which may result in reduction in the stability and cause heavy rolling of the ship. Heavy rolling has led to capsizing of ships in the past. Cargo stowage is very important operation on Ro-Ro vessel for any loose cargo (trailer, cars etc.) can give rise to a chain reaction leading to heavy shift in cargo position. The trucks and trawlers loaded on board also carry cargo inside them and any shift of that cargo can also lead to listing of the ship. It is very difficult to have a sequential loading of cargo as cargo arrives on terminals at different intervals and due to lack of time on port. This further leads to uneven cargo distribution, something for which nothing can be done about. Lack of proper cargo distribution has been the reason for several ship accidents in the past.

Many of the accidents to ro-ros that have occurred have been because regulations were not properly implemented or through human error. This is true of other ship types as well, of course, but ro-ro ships are perhaps more complex than most ships and any errors made can lead to catastrophic consequences, because of the large number of people on board.



**Figure 17.** Problem of Stability in a Ro-Ro ship

(Karan, C.,2016, 8 Reasons That Make Ro-Ro Ship Unsafe to Work On, Available at <http://www.marineinsight.com/marine-safety/8-reasons-that-make-ro-ro-ship-unsafe-to-work-on/> [accessed 10 June 2017] )

More importantly, action should be taken before an incident occurs, applying the proactive policy IMO adopted in the 1990s. The review of large passenger ship safety, initiated by the Organization in 2000, is an example of a proactive holistic approach to the consideration of safety issues pertaining to passenger ships, with particular emphasis on large cruise ships. This work culminated in the adoption of a series of amendments to SOLAS adopted in December 2006, with anticipated entry into force in July 2010. The amendments will have a profound impact on the design of future passenger ships, taking into account the guiding philosophy based on the dual premise that the regulatory framework should place more emphasis on the prevention of a casualty from occurring in

the first place and that future passenger ships should be designed for improved survivability so that, in the event of a casualty, persons can stay safely on board as the ship proceeds to port.

The outcome of this proactive initiative has resulted in an entirely new regulatory philosophy for the design, construction and operation of passenger ships that will better address the future needs of the passenger ship industry. Many of the new regulations adopted will apply equally to passenger ro-ro ferries as to cruise ships.

IMO has also recognized the need to focus on those ferries which do not come under SOLAS and is working on the development of standards for "non-convention" vessels - those passenger ferries which for reasons of being operated inland or solely on domestic routes are not required to conform with SOLAS. On 20 January 2006, IMO signed a Memorandum of understanding (MoU) with Interferry formalizing the two Organizations' intent to work together towards enhancing the safety of non-Convention ferries by collaborating, through IMO's Integrated Technical Co-operation Programme, on related capacity-building activities within developing countries.

Period	Barge	Bulk	Cargo	Chemical / Product	Container	Dredger	Fishery	LPG/LNG	Other	Passenger	Ro-ro	Supply / Offshore	Tanker	Tug	Unknown	
2005	5	6	61	6	2	4	34	1	3	12	7	3		5		149
2006	6	8	61	11	4	3	23		3	12	10	3	2	7	1	154
2007	6	12	70	6	3	2	33		7	8	5	5	1	11	1	170
2008	3	8	58	7	2	5	36	1	5	4	8	1	3	7	1	149
2009		10	51	8	4		29		5	5	6	3	2	5		128
2010	1	11	60	5	5	2	21		3	3	1	2	3	7		124
2011		13	36	2	3	2	14	1	5	7	3	1	2	2		91
2012		8	61	8	5	2	12	1	3	6	5	3	1	6		121
2013	3	15	40	10	4		13		6	8	2	2		7		110
2014	1	3	25	2	4	1	14		3	7	5	2	1	7		75
<b>Total</b>	<b>25</b>	<b>94</b>	<b>523</b>	<b>65</b>	<b>36</b>	<b>21</b>	<b>229</b>	<b>4</b>	<b>43</b>	<b>72</b>	<b>52</b>	<b>25</b>	<b>15</b>	<b>64</b>	<b>3</b>	<b>1,271</b>

**Figure 18.** Total Losses by type of vessel 2005-2014

(World Shipping Organization, 2015, Safety and Shipping Review 2015, Allianz Global Corporate & Specialty, Available at [http://www.worldshipping.org/industry-issues/safety/Safety\\_of\\_Ships\\_Shipping-Review-2015.pdf](http://www.worldshipping.org/industry-issues/safety/Safety_of_Ships_Shipping-Review-2015.pdf) [accessed 4 June 2017] )

## Conclusion

Enhancing the safety of passenger ships, especially ferries, is at the core of the interest of the International Maritime Organization (IMO) Maritime Safety Committee (MSC).

The issues came to the table after the long-running accident on the Italian Norman Atlantic ferry, which was chartered by ANEK and the similar accident at the Grimaldi Group's Sorrento Ferry on April 28, 2015, which fortunately - all rescued The occupants after abandoning the ship with rescue boats and preliminary discussions were held during the Commission meeting in London.

The 95th Maritime Safety Committee (MSC) meeting was held from 3 to 12 June and, as it appears, will continue to work on the safety of passenger ships and the long-term update of the action plan.

The Commission looks forward to a report on the outcome of the Conference on Enhancing the Safety of Ships Passing Non-International Navigation, held in April in Manila, Philippines.

At this conference, guidelines were issued to help reduce the casualty losses involved in these vessels by answering the question of whether ships are fit for the purpose they serve.

As it is known, MSC is expected to approve the following meeting in May 2016:

- Draft amendments to the SOLAS II-1 chapter on subdivision and stability in case of failure.
- Draft SOLAS II-2/13 amendments to the ship evacuation procedure.
- Draft SOLAS II-1/22 amendments to the watertight doors (the MSC will also be asked to approve the relevant guidance plan for watertight doors on passenger ships that may be opened during navigation and the relevant draft Commission circular )
- Adopt the encyclopedia plan on the revised guidelines for the design and operational recommendations for vapor recovery systems of cargo ferry boats.

- Adopt the Circular Scheme on amendments to the revised guidelines for the maintenance and inspection of fire protection systems and appliances.

Also, during the session, the Commission discussed and approved in principle the working paper submitted by our country to inform delegations about the existence of a "time gap" that the Greek administration has identified in the scope of the Noise Code (Noise Code) in respect of those ships which have concluded a shipbuilding agreement before 01.07.2014, their crates are put in place after 01.01.2015 and are scheduled to be received before 01.07.2018, and therefore do not fall Within the scope of the Code Ms.

The Commission has asked our country to come up with a concrete proposal to regulate this issue at the next Summit.

Finally, the following amendments of the Board of Directors were adopted. SOLAS:

(A) Amendments to Chapter II-2 (Regulations 4.5, 11.6 & 20) for Vessel Ventilation Devices on new tankers built after 01.01.2017,

(B) Amendments to the International Maritime Solid Bulk Cargoes Code (IMBC) regarding new requirements for the carriage of cargo as well as the fire risk assessment of bulk tankers. These amendments provide that, after January 1, 2017, crews of ships using their own bulk cargoes shall implement operational risk analysis of fire safety in the loading / unloading areas, procedures to be defined in the Safety Management System of the Ship (ISM).

(C) Revision of the Intact Stability Code with regard to the non-mandatory provisions of Part B in relation to means of repression for ice coating on timber transport vessels.

- The Commission adopted the International Code of Safety for Ships using Gases or other low-flashpoint fuels, which is now mandatory on 1 January 2017 for cargo ships with a capacity exceeding 500 GT and for LV Ships using natural gas as a fuel.

It also adopted relevant amendments to the SOLAS Management Board regarding the training and qualifications of crew members working on ships to which this Code applies.

## References

- Bryson, B. (1995). *Notes from a Small Island*. London: Doubleday.
- EMSA (2015). *Evaluation of risk from watertight doors*. EMSA/OP/10/2013. DNV GL AS. Available at <http://www.emsa.europa.eu/implementation-tasks/ship-safety-standards/items.html?cid=92&id=2420> [accessed 14 May 2017].
- Engineers Journal (2014). *Merchant shipping and the marine engineering technology revolution*. Available at <http://www.engineersjournal.ie/2014/07/17/merchant-shipping-and-the-marine-engineering-technology-revolution/> [accessed 19 June 2017].
- IMO (1997). *IMO and ro-ro safety*. Available at <http://www.imo.org/en/OurWork/Safety/Regulations/Documents/RORO.pdf> [accessed 3 June 2017].
- Karan, C. (2016). *8 Reasons That Make Ro-Ro Ship Unsafe to Work On*, Marina In Sight. Available at <http://www.marineinsight.com/marine-safety/8-reasons-that-make-ro-ro-ship-unsafe-to-work-on/> [accessed 10 June 2017].
- Klein, R. A. (2002). *Cruise ship blues: The underside of the cruise ship industry*. New Society Pub.
- Knapp, S. (2007). *The Econometrics of Maritime Safety: "Recommendations to Enhance Safety at Sea"*. Erasmus Research Institute of Management (ERIM).
- Marine Log (2010). *Coastal cruise ship gets Haiti mission*. Available at <http://www.marinelog.com/docs/NEWSMMIX/2010mar00193.html> [accessed 10 April 2017].
- Maritime Connector (n.d.). *Dry Cargo*. Available at <http://maritime-connector.com/wiki/dry-cargo/> [accessed 29 April 2017].
- Nautice Expo (n.d.). *Car carrier cargo ship / Ro-Ro*. Available at <http://www.nauticexpo.com/prod/mitsubishi-heavy-industries-ship-ocean/product-32135-412621.html> [accessed 20 May 2017].

OMI (n.d.). *Passenger Ships*. Available at <http://www.imo.org/fr/OurWork/Safety/Regulations/Pages/PassengerShips.aspx> [accessed 29 May 2017].

OMI (n.d.). *Safety of ro-ro ferries*. Available at <http://www.imo.org/en/OurWork/Safety/Regulations/Pages/RO-ROFerries.aspx> [accessed 1 June 2017].

Otto, S., Pedersen, P. T., Samuelides, M., & Sames, P. C. (2002). *Elements of risk analysis for collision and grounding of a RoRo passenger ferry*. *Marine Structures*, 15(4), 461-474.

Pozzebon, S. (2014). *The Burning Italian Ferry Had Known Fire Door Issues Before It Set Sail*, Business Insider. Available at <http://www.businessinsider.com/paris-mou-finds-safety-issues-on-norman-atlantic-2014-12> [accessed 13 June 2017].

Raunek, K. (2017). *What are Ro-Ro Ships?*. *Marine In Sight*. Available at <http://www.marineinsight.com/types-of-ships/what-are-ro-ro-ships/> [accessed 1 April 2017].

Rishab, J. (2016). *Mark V Class Vessels: World's Largest Ro-Ro Ships*. *Marine In Sight*. Available at <http://www.marineinsight.com/types-of-ships/mark-v-class-vessels-worlds-largest-ro-ro-ships/> [accessed 3 April 2017].

Senjanović, I., Parunov, J., & Ciprić, G. (1997). *Safety analysis of ship rolling in rough sea*. *Chaos, Solitons & Fractals*, 8(4), 659-680.

Vanem, E., & Skjong, R. (2006). *Designing for safety in passenger ships utilizing advanced evacuation analyses—A risk based approach*. *Safety Science*, 44(2), 111-135.

van't Veer, R., De Kat, J. O., & Cojeen, P. (2002, October). *Large passenger ship safety: time to sink*. In *Proceedings of the Sixth International Ship Stability Workshop*, New York, Oct (pp. 13-16).

Vassalos, D., Kim, H. S., Christiansen, G., & Majumder, J. (2002a). *A mesoscopic model for passenger evacuation in a virtual ship-sea environment and performance-based evaluation*.

Vassalos, D., Christiansen, G., Kim, H. S., Bole, M., & Majumder, J. (2002b). *Evacuability of passenger ships at sea. Safety at Sea and Marine Equipment Exhibition (SASMEX)*.

Vassalos, D. (2006). *Passenger ship safety: containing the risk*. *Marine technology*, 43(4), 203-212.

Wang, J. (2001). *The current status and future aspects in formal ship safety assessment*. *Safety Science*, 38(1), 19-30.

Washington Ports (n.d.). *Port of Seattle, Ship Truck*. Available at [http://washingtonports.org/wp-content/uploads/port\\_photos/seattle/POSeattle%20ship%20truck.jpg](http://washingtonports.org/wp-content/uploads/port_photos/seattle/POSeattle%20ship%20truck.jpg) [accessed 20 June 2017] .

Waterfield, B., Tzafalias, M. (2014). *Burning Norman Atlantic ferry had serious safety 'deficiencies'*, *Telegraph*. Available at <http://www.telegraph.co.uk/news/worldnews/europe/italy/11315815/Burning-Norman-Atlantic-ferry-had-serious-safety-deficiencies.html> [accessed 17 June 2017].

Wikipedia (2016). *RMS Umbria*. Available at [https://en.wikipedia.org/wiki/RMS\\_Umbria](https://en.wikipedia.org/wiki/RMS_Umbria) [accessed 10 April 2017].

Wikipedia (2017). *International Maritime Organization*. Available at [https://en.wikipedia.org/wiki/International\\_Maritime\\_Organization](https://en.wikipedia.org/wiki/International_Maritime_Organization) [accessed 24 June 2017].

Wikipedia (2017). *International Ship and Port Facility Security Code*. Available at [https://en.wikipedia.org/wiki/International\\_Ship\\_and\\_Port\\_Facility\\_Security\\_Code](https://en.wikipedia.org/wiki/International_Ship_and_Port_Facility_Security_Code) [accessed 3 June 2017].

Wikipedia (2017). *RMS Etruria*. Available at [https://en.wikipedia.org/wiki/RMS\\_Etruria](https://en.wikipedia.org/wiki/RMS_Etruria) [accessed 10 May 2017].

Wikipedia (2017). *SMS Fürst Bismarck*. Available at [https://en.wikipedia.org/wiki/SMS\\_F%C3%BCrst\\_Bismarck](https://en.wikipedia.org/wiki/SMS_F%C3%BCrst_Bismarck) [accessed 13 June 2017].

Wikipedia (2017). *MS Norman Atlantic*. Available at [https://en.wikipedia.org/wiki/MS\\_Norman\\_Atlantic#Incident](https://en.wikipedia.org/wiki/MS_Norman_Atlantic#Incident) [accessed 14 June 2017].

World Shipping Organization (2015). *Safety and Shipping Review 2015, Allianz Global Corporate & Specialty*. Available at [http://www.worldshipping.org/industry-issues/safety/Safety\\_of\\_Ships\\_Shipping-Review-2015.pdf](http://www.worldshipping.org/industry-issues/safety/Safety_of_Ships_Shipping-Review-2015.pdf) [accessed 4 June 2017].