

THE ANALYSIS OF COMMUNICATION PROVISION FOR THE PASSENGER SHIPS SAFETY

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Abstract: The aim of the paper is to analyze the factors, causing the accidents related to the passenger ships operation and to present the ways of their prevention. In order to reach the stated goal, we analyzed the chain of the passenger ships' accidents which significantly influenced upon the establishment and development of safety at sea. The conclusion of the first part contains the latest requirements of the SOLAS, 74 directly related to provision of the passenger ship safety. The second part of the analysis deals with research of the top mistakes done despite the latest safety requirements. Thus, third part of the paper, we present implementation of the series of trainings for a group of Batumi State Maritime Academy students to provide them with necessary communication skills.

Keywords: communication provision, passenger ship, safety, SOLAS, SMCP

Introduction

The goal of the research is to study the factors, which mainly cause the accidents onboard the passenger ships and to propose the ways of their prevention. Accordingly, the database of our research is presented by analysis of statistical data of the IMO, EMSA, USCG and Cruise Lines International Association resources.

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first part of the research, we analyzed the chain of the passenger ships' accidents which significantly influenced upon the establishment and development of safety at sea. The conclusion of the first part contains the latest requirements of the SOLAS, 74 directly related to provision of the passenger ship safety.

The second part of the analysis deals with identification of the top mistakes done despite the latest changes and amendments to the SOLAS, directly related to the passenger ship safety.

In the third part of the paper, as the method of prevention of such problems, backed by the results of conducted analysis we decided to implement the series of theoretical and practical trainings for a group of Batumi State Maritime Academy students (who will pass their onboard training on the passenger ships of TallinkGrupp) to provide them with necessary communication skills.

The novelty of the noted training is in involvement of the students (who also participated in research) into the teaching process in capacity of co-instructors of the trainings.

Accordingly, the trainings compiled the application of appropriate IMO SMCP use during the lifeboat drills.

Interrelation between Safety Measures Development and Passenger Ships Accidents

The safety of life at sea is IMO's principal goal. Accordingly, safety of the passenger ship as of the place where considerable amount of people accumulated has been under special interest and care of the IMO. Thus, passenger ships in operation today are subject to a vast array of regulations and standards covering every aspect of ship construction and operation. A number of incidents over the years have led to improvements in safety requirements, including those relating to fire safety measures - such as escape routes and fire protections systems for the large atrium typical of cruise ships - and life-saving appliances and arrangements.

As creation as well as the whole history of the SOLAS is directly related to notorious facts of cruise ships accidents. Accordingly, the first part of our analysis deals with the chain of the passenger ship accidents resulted in the creation and amendments to one of the most important conventions of the International Maritime Organization.

April 15, 1912 - RMS Titanic (1,517 dead) sunk after striking an iceberg carried only 20 lifeboats only sufficient to carry around half of those on board.

Subsequent safety initiatives: The International Convention for the Safety of Life at Sea (SOLAS) was established in 1914. The International Ice Patrol was established to monitor north

Atlantic icebergs. "Radar, as an anti-collision system was envisioned as a desirable tool especially after the successful use of radio communications in the Titanic disaster in 1912."

May 29, 1914 - RMS Empress of Ireland (1,012 dead) struck another vessel and sank.

Subsequent safety initiatives: The disaster led to changes to the design of ships' bows to reduce the amount of damage caused in the event of a collision. Designers began employing "raked" bows, still in use today, which lessen damage below the waterline.

September 8, 1934 – Fire on board SS Morro Castle (137 dead).

Subsequent safety initiatives: The Merchant Marine Act was passed in 1936 and the United States Merchant Marine Academy was established in 1942, both to improve the training of merchant marine officers (<http://www.telegraph.co.uk/travel/cruises/articles/Cruise-ship-safety-timeline-of-disasters-and-safety-regulations/>).

Series of fires, 1980s and 1990s:

- October 4, 1980 - MS Prinsendam - sunk following a fire, without loss of life;
- July 30, 1986 - Emerald Seas - 15 passengers and two crew member injured in a fire;
- April 7, 1990 - SS Scandinavian star - fire on board passenger ferry resulted in 159 deaths;
- November 30, 1994 - Achille Lauro - fire resulted in two deaths;
- July 22, 1995 - Regent Star - fire in two injuries (<http://www.telegraph.co.uk/travel/cruises/articles/Cruise-ship-safety-timeline-of-disasters-and-safety-regulations/>);

Subsequent safety initiatives: Since 1997, all new cruise ships must have all stairways enclosed in self-contained "fire zones". Smoke detectors and smoke alarms must be fitted in all passenger cabins and all public spaces; there must be low-level lighting to show routes of escape (such as in corridors and stairways); all fire doors throughout the ship should be controllable from the ship's navigation bridge, and emergency alarms must be audible in all cabins.

March 23, 2006 - A fire on board Star Princess killing one passenger and injuring 13 others.

Subsequent safety initiatives: The ship's owners installed sprinklers to all the ship's balconies and replaced plastic furniture with non-combustible alternatives. SOLAS regulations, introduced in 2010, prohibit the use of combustible materials in new cruise ships.

November 23, 2007 - MS Explorer sank near the South Shetland Islands after striking an iceberg. All 154 people on board were evacuated.

Subsequent safety initiatives: Regulations in 2011 banned ships from carrying heavy fuel oil in the Antarctic to protect the environment in the event of a fuel leak.

July 2010 - Pacific Sun: at least 42 passengers were hurt after it was struck by huge waves. Injuries included cuts and broken bones - many of which were caused by unsecured furniture and gambling machines.

Subsequent safety initiatives: All tables and furniture on the ship was secured to its walls and floors (<http://www.telegraph.co.uk/travel/cruises/articles/Cruise-ship-safety-timeline-of-disasters-and-safety-regulations/>).

Other incidents:

- August 4, 1991 - MTS Oceanos sank in 1991 off the coast of South Africa.
- August 23, 1992 - Royal Pacific - sank in the Straits of Malacca after colliding with a Taiwanese fishing vessel, resulting in two deaths.
- April 16, 2005 - Norwegian Dawn struck by three 70ft waves, smashing windows and injuring four passengers.
- March 3, 2010 - Louis Majesty - rogue waves killed two passengers on a 12-day Mediterranean cruise (<http://www.telegraph.co.uk/travel/cruises/articles/Cruise-ship-safety-timeline-of-disasters-and-safety-regulations/>).

Other safety initiatives:

Since 2002, ocean-going cruise ships on international voyages have also had to carry VDRs. Crew members attend frequent emergency drills, lifeboat equipment is regularly tested, and fire-detecting devices, systems and alarms are checked, and simulated fires are set.

In 2010, a package of SOLAS amendments adopted in 2006 entered into force, affecting passenger ships built after 1 July 2010. The amendments were the result of a comprehensive review of above mentioned passenger ships accidents. Increased emphasis is placed on reducing the chances of accidents occurring and on improved survivability, embracing the concept of the ship "as its own best lifeboat" (<http://www.telegraph.co.uk/travel/cruises/articles/Cruise-ship-safety-timeline-of-disasters-and-safety-regulations/>).

Therefore, under SOLAS 2006 concept the following guiding philosophy is agreed:

The regulatory framework should place more emphasis on the prevention of a casualty;

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.

Passenger ships should be crewed, equipped and have arrangements to ensure the safety of persons on board for survival in the area of operation, taking into account climatic conditions and the availability of SAR functions.

Passenger ships should be crewed and equipped to ensure the health-safety, medical care and security of persons on board until more specialized assistance is available.

But despite 100 years of the efforts aimed at provision of safety of life, tragedy of Costa Concordia resulted in loss of 32 lives in 2012. Therefore, from 1 January 2015, passengers must undergo safety drills, including mustering at the lifeboat stations, before the ship departs or immediately on departure.

Passenger muster: The amended regulation III/19 in the International Convention for the Safety of Life at Sea was adopted in 2013 in the wake of the Costa Concordia incident, to ensure that passengers undergo safety drills, including mustering at the lifeboat stations, before the ship departs or immediately on departure.

Enclosed-space entry and rescue drills: An amendment to SOLAS regulation III/19, on emergency training and drills, makes mandatory the carrying out of enclosed-space entry and rescue drills, which will require crew members with enclosed-space entry or rescue responsibilities to participate in an enclosed-space entry and rescue drill at least once every two months.

Analysis of the most often deficiencies happened on board the passenger ships

Having studied the above mentioned cases, and taking into consideration the sinking of the MV Sewol occurred on 16 April, 2014 (297 dead), we directed the second part of our research to detection of the most often deficiencies happened on board the passenger ships despite all noted above.

In order to research the problems related to the passenger ship safety, still happening at sea, we studied the cases of the passenger ship accidents:

- Drills and Crew Training Issues: various deficiencies were issued for problems associated with crew training and drills. The deficiencies included crews' inability to communicate effectively during fire and abandon ship drills. There were also deficiencies written for crews that did not have the required STCW training for Crowd Control Management and Crisis Management.

- Problems with Lifeboats and Rescue Boats;
- Improper Utilization of Categorized Spaces;
- Problems with Fire Detection systems/Smoke Detection;
- Fire Suppression Systems;
- Issues with Pollution Prevention Equipment;
- Emergency Lighting Issues;
- Fuel and oil leaks (United States Coast Guard Top Cruise Ship Deficiencies of 2014).

The analysis shows that the deficiencies related to crews' inability to communicate effectively during different onboard drills may be eradicated at the stage of education and training of the students of maritime specialties.

Maritime Education and Training as the Part of Accident Prevention

That is why we decided to conduct the series of theoretical and practical trainings for a group of BSMA students to provide them with necessary communication skills.

As the basis of the briefing and instruction we used the appropriate IMO SMCP which help the Masters, officers and crew members of passenger vessels and passenger ferries to inform passengers on safety aspects and to manage them in case of an emergency.

We provided the group with communications skills giving possibility to inform the passengers how they should conduct on board.

The novelty of the noted training is in involvement of the students (who also participated in research) into the teaching process in capacity of co-instructors of the trainings.



Figure 1. BSMA student acts as the co-teacher (the series of theoretical and practical trainings for a group of Batumi State Maritime Academy students (who will pass their onboard training on the passenger ships of Tallink Grupp) to provide them with necessary communication skills.)

We also provided them with the speech skills on briefing on prohibited areas, decks, and spaces and warned that safety regulations do not permit passengers to enter the following spaces:

- navigating bridge
- engine room
- manoeuvring areas at the front and back end of the vessel
- cargo rooms and compartments
- all areas and spaces marked "Crew only"
- all closed, sealed or roped off areas, spaces and rooms
- car decks when the vessel is at sea (IMO SMCP: IMO Standard Marine Communication Phrases, 2002, London: IMO).

Then they continued with the passenger care and provided instructions on how to embark and behave in lifeboats / liferafts



Figure 2. BSMA student acts as the co-teacher during the series of practical trainings for a group of Batumi State Maritime Academy students

We warned that the crew member should inform passengers that they should:

- Enter the lifeboat / liferaft only when ordered by an officer / lifeboatman.
- Clear the entrance of the lifeboat / liferaft immediately after entering.
- Not to push each other when entering the lifeboat / liferaft.
- Hold on to ropes or to their seat when lowering / hoisting.
- Keep their lifejackets on.
- Strictly obey all instructions given by the officer / lifeboatman.
- Remember that discipline in the lifeboat / liferaft is of vital importance (IMO SMCP: IMO Standard Marine Communication Phrases, 2002, London: IMO).

Then we continued with the passenger care and used the phrases which help Masters, officers and crew members of passenger vessels and passenger ferries to inform passengers on safety aspects and to manage them in case of an emergency.

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- Not to push each other when entering the lifeboat / liferaft.
- Hold on to ropes or to their seat when lowering / hoisting.
- Keep their lifejackets on.
- Know that provisions and drinking water will be distributed by an officer / lifeboatman only.
- Strictly obey all instructions given by the officer / lifeboatman.
- Remember that discipline in the lifeboat / liferaft is of vital importance (IMO SMCP: IMO Standard Marine Communication Phrases, 2002, London: IMO).

Then we delivered communication provision of instruction about the on scene measures and actions in lifeboats/liferafts for the passenger ship crew. Using appropriate SMCP they will be able to:

- Keep a sharp lookout for persons in the water.
- Be informed about the ration of provisions and water.
- Know about the danger related to drinking sea water (IMO SMCP: IMO Standard Marine Communication Phrases, 2002, London: IMO).

We also offered briefing on safety regulations, preventive measures and communications providing familiarization of the passengers with their assembly stations, life-saving equipment and emergency procedures.

Communication provision of:

- preventing and reporting fire
- Person overboard
- Protective measures for children

We also offered communication provision of Evacuation and Boat Drill when allocating / directing to assembly stations and describing how to escape (IMO SMCP: IMO Standard Marine Communication Phrases, 2002, London: IMO).

Conclusion

Using the provided communication skills it becomes possible to explain the passengers that in case of the general emergency alarm is sounded, which consists of seven short blasts and one prolonged blast, all passengers have to go to their assembly station, take their lifejackets and blankets with them, put on warm clothing, long trousers, long sleeved shirts / jackets, strong shoes and head covering. Taking into account the results of the conducted analysis and implemented training we want to pay special attention to the ways of the possible accident prevention: The crew of the passenger ship should be able to use the appropriate part of the IMO SMCP: “Passenger Care”. The onboard crew safety drills should be strictly implemented using the appropriate IMO phrases, giving possibility to train the multinational crew members to perform their duties without communication failure.

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European Maritime Safety Agency:

<http://www.emsa.europa.eu/implementation-tasks/accidentinvestigation.html>

Cruise Lines International Association: <https://www.cruising.org/>