STUDY ON THE IMPROVEMENT OF MARITIME TRANSPORT SAFETY IN THE ESCAP REGION
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INTRODUCTION

1. Background

Maritime transport is a key player in the economic and social development of Economic and Social Commission for Asia and the Pacific (ESCAP) member countries. Around 80 per cent of global trade by volume and over 70 per cent of global trade by value are carried by sea. These shares are even higher in the case of most developing countries. Maritime transport in the ESCAP region has grown remarkably during 2000s and it is expected to increase further in the future as the rapid growth in maritime transport is connected with economic growth in the ESCAP region.

Many countries of the ESCAP region rely on maritime transport as a primary mode of transportation for transfer of people and goods at sea and inland waterway. In some countries, local population relies heavily on short sea shipping or ferry services for their daily mobility needs. While this is obviously the case for archipelagic countries and the norm for Pacific Island countries, it is also a common occurrence in other coastal countries.

At the same time, maritime safety has become a serious issue due to the increase in the number of ships traversing the seas of the ESCAP region. According to the research of Worldwide Ferry Safety Association published in 2016, 164 passenger ship accidents occurred for the past 15 years in 40 countries taking 17,000 lives and 95 per cent of the accidents happened in developing countries. In particular, 10 per cent of the countries, four countries, accounted for 95 per cent of the accidents and three of them are located in the ESCAP region.
Several of the accidents involved situations that could have been avoided, such as vessel overloading, the absence of life-saving equipment on board, invalid cargo and passenger management, violation of various safety regulations with customary and poorly maintained vessels. Especially, ESCAP member countries face difficulty in acquisition of ships, insufficient port facility, old ships, and imbalances of cargo transportation between regions despite the importance of coastal shipping and their potential development. In addition, they have high risk of marine accident due to old ships, insufficient vessel traffic control facility and overload.

In view of the above and given the increasing importance and expected future development of transport on the region’s seas and rivers, there is an urgent need to identify areas of causing accidents to prevent the recurrence of past critical maritime accidents, improve the safety of ferries and vessels for crews, passengers and cargo, and address the issue of compliance through the development of ad hoc policies. This is because the number of marine accidents in the Asian and Pacific region is the highest records in the world and the marine accidents take significant numbers of lives and cause environmental pollution and property loss.

The United Nations General Assembly recognizes importance of safety in the field of all transport modes and underlines that international transport corridors should be identified, designed and developed, keeping in mind the safety and protection of transport users and the competitive advantages of each mode of transport through Resolution 70/197 on “Towards comprehensive cooperation among all modes of transport for promoting sustainable multimodal transit corridors”. ESCAP also highlighted that maritime transport is an essential factor in supporting the post-2015 development agenda through Resolution 71/6 on “Maritime transport connectivity for sustainable development”. It means that maritime transport is not only a matter of developing transport infrastructure and services, but rather the ease of reaching destination in terms of proximity, convenience and safety.

In order to address these issues, the ESCAP secretariat undertook a project on the improvement of maritime transport safety in the ESCAP region with financial support of the Korea Maritime Institute (KMI).

2. Purpose and scope of the study

The purpose of this study is to address challenges and issues ESCAP member States face in improving safety of maritime transport and propose recommendations to policy makers of ESCAP member States, thereby reducing the maritime transport accidents which have been causing the huge damage to people, property and the environment.
The study consists of a literature review on trends of shipping industry and maritime safety, and survey research made with maritime officials and experts of the selected member States. This study is not including security issue such as piracy, armed robbery and other unlawful acts.

The study focuses on the safety issues of passenger and cargo vessels drawing attention to domestic ferry which is more vulnerable to factors affecting maritime safety. Factors influencing maritime safety could be divided into internal and external factors. Internal factors are related to the condition of a ship and equipment and the competence of the personnel on board. External factors include, for example, the condition of waterways and maritime safety devices, the quality of vessel traffic services and available information on weather conditions and water levels.

The study takes a comprehensive approach to maritime transport safety in the ESCAP region. Accordingly, the study also deals with issues related to the post-accident operations and accident investigation in addition to preventive measures and policies for improvement of maritime transport safety.

3. Methodology

This study is based on a literature review and survey research. The some member countries which have coastlines in the ESCAP region were selected for the study. In the initial stage, the study focused on only 10 countries, but the number of target countries was expanded to 18 given the importance of marine safety as the number of passengers of passenger ship and related passenger ship accident are increasing in the ESCAP region.

As part of implementing the methodology for the study, a survey was launched to identify maritime accident types and assess existing regulations, risk management and, rule and standards compliance in the region. Especially, the focus of the survey is on many issues across a wide spectrum of technical areas such as the design, operation and maintenance of vessels and port infrastructure, definition of and compliance with policies and regulations, law enforcement, recruitment and training of officers and crew, organization and management of rescue services, risk assessment and safety audit. In order to gain comprehensive understanding of the current state of maritime transport safety in the region, a detailed questionnaire touching upon all the above issues was sent to 18 selected member States representing a good cross-selection of relevant issues related to the subject in terms of passenger and cargo movements as well as short-range river transport, island-to-island services or long-distance shipping.
It was most difficult to get a response from member States. A major reason for difficulty of getting feedback on time was that responsibilities for the above areas were spread over different agencies, sometimes placed under the authority of different ministries. This complicated coordination for the related inputs in the countries selected to participate in the survey. 10 of the 18 countries contacted replied, representing a good cross-section of the issues related to maritime safety.

In September 2016, in partnership with KMI, ESCAP organized an expert group meeting on improving maritime transport safety in the ESCAP region to collect additional information and create a networking environment among relevant officials of the region. This meeting was followed, in December 2016, by a regional seminar at which the preliminary findings and recommendations of the study were presented and discussed.

4. Study structure

This report is organized in six chapters including this introductory chapter. In the chapter 1, the background and purpose of the study including research scope related to maritime safety are introduced.

Chapter 2 provides the backdrop for an analysis of the trends of maritime transport in the ESCAP region, beginning with a description of the stream of passenger ship industry in Asia and the Pacific region and the current status of coastal passenger ship industry.

Chapter 3 reviews the maritime transport safety, particularly focusing on the current status of passenger ships, and the trends of passenger ships safety in Asia and the Pacific region as well as estimated reasons of ferry accidents.

Chapter 4 shows the result of survey and analysis on the maritime safety status of the selected countries, which could be an indicator for maritime safety based on the questionnaire survey result. Special attention has been given to the following issues:

a. General status of maritime traffic
b. Safety management administration
c. Passenger ship safety management system
d. Maritime casualties
e. Investigation of maritime accidents
f. Search and rescue
Chapter 5 provides with the best practice on passenger ship safety of the developed countries such as the United States of America, the European Union, Japan and Republic of Korea.

Last chapter draws together the main conclusions made in this research and the recommendation is proposed in the light of the review and analysis presented in chapter 4 and good cases introduced in chapter 5 for deployment of good policies for maritime safety.
2

TRENDS OF PASSENGER SHIPPING INDUSTRY IN ASIA-PACIFIC REGION

1. Growth of Asia-Pacific cruise and ferry market

1.1. Growth of Asia-Pacific cruise market

Cruise Lines International Association (CLIA) reported that the number of cruises in Asia increased by 40 per cent from 43 ship in 2013 to 60 ship in 2016 and the number of voyages increased by 81 per cent from 861 voyages in 2013 to 1,560 voyages in 2016. Furthermore, the number of operating days of cruise ship increased by 84 per cent from 4,307 days in 2013 to 7,918 days in 2016 and passenger capacity increased by 105 per cent from 1.51 million in 2013 to 3.1 million in 2016.¹

Asia has seen rapid increase in the number of passenger ship and the number of voyages and in the next ten to thirty years, Asia is probably the only continent in which the size of the middle class will expand dramatically.

China estimated the second largest global cruise market by 2017. There is a great potential for cruise operators to grow their business both in China and Europe. China demands for more offerings of Europe cruise tours and China’s cruise industry is set to grow faster in the next

decade. The total number of Chinese home-port cruise ship travelers reached 2.22 million passenger trips in 2015, China’s cruise capacity to grow 80 per cent in 2016 projected.

**Figure 1.** 2016 Big picture in a Asia cruise industry

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<th>2016</th>
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<tr>
<td>Number of Cruise Ships in Asia</td>
<td>43</td>
</tr>
<tr>
<td>Number of Cruises &amp; Voyages</td>
<td>2,900</td>
</tr>
<tr>
<td>Number of Operating Days</td>
<td>10,900</td>
</tr>
<tr>
<td>Passenger Capacity (millions)</td>
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*Source: http://www.cruising.org/docs/, No signs of slowing down*

The 2016 Asia Cruise Trends study by CLIA shows Asia as the world’s fastest growing source of cruise passengers, with an unprecedented 24 per cent increase in numbers last year. Figure 2 illustrates which countries take up an attractive key place hosting port calls in the cruise and ferry market of Asia.

**Figure 2.** Top 10 destinations by total calls, 2016 picture

- Japan: 1526
- China: 850
- Rep. Korea: 745
- Viet Nam: 466
- Malaysia: 422
- Singapore: 391
- Thailand: 291
- Taiwan: 234
- Hong Kong: 185
- Indonesia: 172
In 2016, the number of calls increased by 880 ships in Japan from 646 to 1,526, 550 ships in China from 300 to 850 and 368 ships in Republic of Korea from 377 to 745 as well as 150 ships in Viet Nam from 316 to 466 in Southeast countries compared to 2015. The Asian countries which attracted more than 300 ships include China, Japan, Malaysia, Republic of Korea, Singapore, and Viet Nam.

1.2. Growth of Asia-Pacific cruise passenger

Cruise industry has been developed and grown globally with increase of passengers. Cruise Industry Overview 2017 says that 24.2 million passengers cruised globally in 2016, which is 4 per cent increase over 2015’s 23.2 million passengers. This passenger growth would be estimated to be continued due to the demand outpacing supply. Figure 3 shows the growth of cruise passengers carried worldwide from 1999 to 2019. The size of the global cruise passengers doubles about every 10 years, which represents an annual growth rate of about 7%.

Worldwide sourcing passengers are expected to account for 58.6 per cent in the North America followed by Europe (25.9 per cent), Asia (8.5 per cent) and Australia (4.3 per cent) in 2015.
Recent the number of cruise passengers carried Asia-Pacific region is dramatically increased by 13.5 per cent in 2015 compared with nearly 1.4 million Asian vacationers in 2014. The growth of Asia-Pacific cruise market represents a 34 per cent compound annual growth rate since 2012 (See figure 4).

CLIA’s survey result also shows that the number of cruise passengers coming to Asian port in 2016 was 3.2 million and among them the number of passengers passing the ports was 124,360. The number of cruise passengers increased by 54 per cent more than in 2015 and shows rapid growth rate of 29 per cent over the past 3 years since 2013 in terms of compound annual growth rate.

As of 2016, the number of passengers who stayed in Asian countries was 10.9 million, which is increased by 55 per cent from 7 million in 2015. By the country Japan has the highest number of passengers at 2.9 million followed by 2 million in China and 1.99 million in Korea, making the three countries account for 63.2 per cent of the total.
2. Domestic passenger shipping

While international passengers mainly take cruise ships or large ferry vessels, domestic passengers mostly take small passenger ships. Even though passenger traffic between islands or an island and a mainland with large populations is often operated by large ferry or big passenger ships, mostly small passenger ships are being used in the areas where operating distance is short and demand is low.

There are various types of vessels operating in domestic passenger market. They include dinner and excursion vessels, ferry vessels; both public and private, overnight cruise vessels, casino vessels, whale watch vessels, private charter boats, etc. Especially, a ferry vessel is drawing an attention as an attractive and competent mode with relation to capacity of traffic volume as well as frequency of operation.

Ferry ships are very useful for providing rapidly and efficiently logistics services as they can carry passengers as well as various cargoes at the same time. Since a large number of fatalities occur mainly in ferry vessels, the focus of the domestic passenger shipping will be on ferry vessels and related trends.

Figure 5. Picture of a typical car ferry

Source: https://www.naver.com/
2.1. Domestic ferry market

Ferry, in particular Roll-on Roll-off (Ro-Ro) ferry, is regarded as one of the most useful maritime transport modes in the world due to its service reliability, transport capacity and flexibility in operation. Ferry plays a bridging role in connecting between islands, and an island and a land. It is very effective transport mode that can transfer people and freight timely at a lower cost. ShipPax research report shows that there are approximately 1,300 ferry ships above 1,000 gross registered tons (GRT) transporting globally more than 2 billion passengers, 251 million vehicles and 32 million trailers.

There is high operational risk of domestic ferry market even though there are many advantages in operating of ferry. Due to its characteristics of transporting freight such as vehicles and people together, a ferry accident could lead to massive amount of human casualties once an accident occurs.

2.2. Needs for domestic ferry

The ferry is in operation in many parts of the world. In the developed countries, ferry is considered one of the safest and often a discretionary mode of transport. On the contrary, in developing countries, the ferry plays the role of backbone in the national economic activities. In those countries, the most common type of ferry is a Ro-Ro ferry that provides the space for carrying people, vehicles and freight at the same time. ESCAP member countries that are surrounded by many islands understand well the importance of maritime transport to support every aspect of the country’s development and play a significant role in maintaining the country’s integrity.

In the meantime, the domestic ferry keeps value of territorial expansion by linking islands for countries that cannot construct bridges and maintain the overall national economic activities. Therefore, its service needs to be fast, reliable, structurally robust and intact, and punctual in operation, while at the same time, providing a sufficient level of safety. In particular, ships capability of transporting vehicles and passengers at the same time is able to be used effectively in the island or in developing countries with poor port facilities.

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In addition, the ferry is recognized as a means with a potential to avoid and reduce congestion and emissions. As maritime transport is very environmentally friendly compared to road transport, it is known well that it emits a small amount of CO$_2$, as shown in the below figure.

**Figure 6.** Comparison of CO$_2$ emissions between modes of transport

![Comparison of CO$_2$ emissions between modes of transport](image)

Source: Second IMO GHG study (*AP Meller-Maersk, 2014)

### 2.3. Recent cruise and ferry market trend

**Travel by own car is on trend**

More and more people are on vacation to the sea to avoid hassles at the airport and are increasingly embarking on board with their vehicles for convenience and flexibility in islands and destinations. As described above, maritime transport is not complete in transport, so it must be replaced by new means of transport such as buses, trains and passenger cars. However, if passengers bring their own car, passengers will be immediately sightseeing or work without any inconvenience, so the tendency to board their own vehicles is increasing.

Also, in cargo transportation, in general, it is necessary to load cargo from a ship to a destination in cargo trucks or trains, which requires additional waiting time and cost for cargo loading. However, when we use Ro-Ro vessels, we can carry the cargo to its final destination immediately without additional work or waiting. For the same reason that passengers bring their own car, the cargo is also increasingly using ferry ships.
Emergence of long-distance ferry

Operation of long-distance ferry has been expanded due to the following advantages.
- Maritime transport, which has great advantages in both bulk and long haul transport, has been evaluated as useful in addressing the shortage of drivers and labor costs faced by land transportation;
- Transportation time can be reduced by avoiding congested road and reasonable distribution is possible thanks to accuracy of operation time;
- Roll-on Roll-off cargo handling of ferry vessels reduces cargo damage, cargo handling costs and time;

Strengthening inspection on ferry

If an accident occurs, the scale of casualty increases due to easily loss of stability given the characteristics of a ferry that carries both people and vehicles. Therefore, inspection standards on a Ro-Ro ferry are strengthening internationally. It is a fact that there are many accidents that caused relatively large human accidents on Ro-Ro ships. This is because despite the many advantages of the Ro-Ro ship there is a risk of flooding through the vehicle ramp and the stability of the ship is lower than other ship types. Therefore, rigorous ship inspection and safety regulations are required to ensure the safety of Ro-Ro vessels, and also shipping companies are voluntarily taking measures to ensure a higher level of safety operation.

River cruising continues to expand

River cruising industry growth is impressive as both number of passengers and yields, the unquestioned river vacation travel market’s leader. River cruise ticket sales are growing faster compared to ocean-going ship vacations.

River cruises is active in China, Southeast and South Asia subregions, and is centered along with rivers that are rich in precipitation and maintain the necessary facilities and depth to navigate. On the China’s Yangtse River, the number of international passengers is nearly 150,000, with new operators, and new and bigger river ships being built each year. River cruising, whose service coverage varies depending on the rainy season and the monsoon season, is expected to continue to grow as the number of passengers preferring new services increases.

Rise in small-ship cruising
The newest large cruise ships might get the most press, but small-ship cruising is on the rise, too. As small ship cruises are able to maneuver in small coves and channels, they can dock at more intimate ports, making for a fascinating travel experience. With cruise passengers demanding more choices, the popularity of small ships will continue to grow.

Small ship cruising centered on specific sea areas based on beautiful scenery and unique programme are also increasing steadily. For example, sightseeing in the Ha Long Bay area of Viet Nam using a small cruise ship is recognized as a very attractive service. The ESCAP region has many ocean tourism services and goods with excellent scenery and a unique culture. Cruise using small ships in these areas will attract more tourists in the future.

**Figure 7. Small ships cruising in Ha Long Bay**

Source: https://www.google.com/

*Short cruises are on the rise*

Many cruise lines have added more short cruises to their schedules for 2014 and are actually using bigger, refurbished vessels for the routes. If the itineraries prove popular, cruise lines will expand their short cruising options.
One of the important reasons for the increase in short-term cruise services is related to the increase in customers in Asia. It is common for people in most ESCAP regions to have shorter leave periods than people in the US or Europe who have 2-3 or more weeks off. Short-term cruise services can be enjoyed during a relatively short vacation period, and the cost is cheaper than a long-term, luxurious cruise, therefore the demand for short-term cruise is steadily increasing recently, especially in the ESCAP region.

*Asia is one of the hot destinations*

With the popularity of river cruising on the rise, it's the fastest growing type of cruise lines are continuing to add more ships to meet the increased demand. Generally speaking, every destination in Asia outside of Japan will be cheap for most travellers. It’s also worth mentioning that finding good and cheap hotels in Asia tends to be less straightforward than in most of the rest of the world.

Asia is emerging as the blue ocean of the cruise market compared to Europe, the Mediterranean and the Caribbean. This is because the growth of the traditional cruise market is low, while demand for Asia, including China, is steadily increasing. In order to cope with the increase in demand in Asia and to create new markets, world-class cruise lines such as Royal Caribbean, Carnival Cruise Line, Star Cruises and etc. are greatly expanding their Asian destinations and are strengthening their investments by establishing joint-venture companies.

*Extreme weather will increasingly affect cruise*

Whether it's a sign of global warming or not, it's clear that weather patterns are changing, bringing larger, more destructive storms. Changing weather patterns will cancel or delay the cruise schedule.

In the ESCAP region, especially in the summer, large-scale typhoons are frequent, and the damage caused by them is also increasing. In addition, heavy fog and local weather changes are affecting sailing schedules and operations. Particularly, small cruise ships or ferries operating in domestic areas without engaging in international voyages may be careless trips to bad weather or fail to comply with safety regulations. Therefore, small or vulnerable vessels for safety should pay more attention to weather changes.
1. Cruise and ferry safety

1.1. Cruise and ferry safety trend

Maritime transport is considered to be safer than other transport modes. In particular, the fact that cruise ships are one of the safest transport modes is evident in comparison with statistics data of other modes of transport. As shown in figure 8, the fatality rate per one billion people among six transportation modes is the highest for motorcycles (212.8) and the lowest for passenger ship (0.15).

As the cruise industry has grown, its already impressive safety record has continued to improve. Even though cruise ships are very safe compared to other modes of transport, people are perceived as not so much due to the relatively large scale of accidents, and they are constantly released through news and media.

Despite some high-profile incidents, overall cruise ship operational incidents declined by 15 per cent between 2009 and 2014. From 2009–2014, the industry’s capacity grew from 349,900 to 428,700 lower berths (bed spaces), an increase of 22.5 per cent. During the same time, the overall number of operational incidents declined by 15 per cent according to the data collected (See figure 9).
The cruise travel is decidedly safer than most modes of transportation. According to CLIA, the cruise industry has a lower operational fatality rate than other modes of common transportation.
1.2. Ferry accidents

According to Worldwide Ferry Safety Association, 163 ferry accidents occurred over 14 years from 2000 to 2014 in the world and lost more than 17,000 lives in about 40 countries. Among them 95 per cent of accidents occurred in developing countries and 4 countries of Bangladesh, Indonesia, the Philippines and China, which accounts for 10 per cent of total countries that experience ferry accidents, accounts for 50 per cent of all ferry accidents.

Worldwide Ferry Safety Association released the study entitled “the Trends, Causal Analysis, and Recommendations from 14 Years of Ferry Accidents in 2016”. This study records the details of 232 ferry accidents over the 14-year period from 2000 to 2014. By a conservative tally based on news reports, 21,574 lives were lost, an average of 130 deaths per incident and 1,541 deaths per year.

The accidents included accidents occurred in 43 different countries around the world, with three countries—Bangladesh, Indonesia, and the Philippines—responsible for almost 52 per cent of all accidents (Figure 10). Even more striking, the five countries of Bangladesh, Tanzania, Indonesia, Senegal, and the Philippines were responsible for almost two-thirds of all fatalities in the 14-year period (Figure 11). Bangladesh alone had 20% of all accidents in the time period and 23 per cent of all fatalities. Overall, 94 per cent of all accidents and 97 per cent of all fatalities occurred in developing countries.
1.3. Dead & missing record by country

The study of “Ferry Fatalities: Statistics and Causation of Major Accidents 2000-2014” conducted by Worldwide Ferry Safety Association, detailed about 160 ferry accidents over the 14-year period. In total, a conservative estimate of 16,880 lives was lost in these accidents, an average of 106 deaths per incident. Both confirmed deaths and those listed as missing were included in the estimate.

Figure 11. Proportion of ferry fatalities occurring in top 5 countries

Source: Abigail Golden, Worldwide Ferry Safety Association

Figure 12. Dead and missing 2000-2012
The accidents included here occurred in 39 different countries around the world, with Bangladesh possessing the highest number of incidents (40 cases) followed by Indonesia (27 cases) and the Philippines (19 cases).

### 1.4. Dead & missing record by sea/region

Domestic ferry accidents during 2000-2012 accounts for 93 per cent (14,683 persons) and international passenger ships are only 7 per cent (1,080 persons).

The cruises which are operated in international voyage secure safety as building and inspection are conducted in accordance with international requirements. However, most of the accidents occur in domestic ferries with significant human casualties, actions to improve safety of domestic ferries are required.

![Figure 13. Dead and missing record by Sea/region (2002-2012)]

Figure 13 and Table 1 illustrate the dead and missing record by international/domestic ferry. During the same period, 116 persons (less than 1 per cent) of developed countries are dead and missing, and almost all of lives belonged to the developing countries.

This is because, in the case of international ferries, the Port Safety Control (PSC) and high safety standard are strictly applied set by the International Maritime Organization (IMO), while the domestic ferries are often subject to apply insufficient regulations. In developing countries, there are many incidents due to the high number of vessels in operation, as well as being in an environment where it is difficult to observe the ship safety inspection and related regulations properly.
Table 1.  Dead and missing record by Sea/region (2002-2012)

<table>
<thead>
<tr>
<th>Sea</th>
<th>Dead</th>
<th>Missing</th>
<th>Dead &amp; Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>6,923</td>
<td>7,760</td>
<td>14,683</td>
</tr>
<tr>
<td>International</td>
<td>185</td>
<td>895</td>
<td>1,080</td>
</tr>
<tr>
<td>All</td>
<td>7,108</td>
<td>8,655</td>
<td>15,763</td>
</tr>
</tbody>
</table>

2. Cruise and ferry safety trends in ESCAP region

2.1. IMO’s Global Integrated Shipping Information System data

So far there has been no official statistics on passenger ship accidents for 53 ESCAP member States. However, on its homepage, IMO runs the Global Integrated Shipping Information System (GISIS), which shows maritime accident statistics of each country.\(^3\) IMO’s GISIS came from IMO’s International Ship Information Data (ISID) and Equasis which is an online database which helps in promoting exchange of information and transparency in the shipping industry.

The IMO GISIS casualty module database contains two categories of information collected on ship casualties. The first category of information consists of factual data collected from various sources and the second category of data consists of more elaborated information based on the reports of investigations into casualties received at IMO. In the Marine Casualties and Incidents section, maritime accidents are introduced under four categories of "Very serious casualties," "Serious casualties," "Less serious casualties" and "Marine incidents."

When retrieving the IMO’s GISIS data for some ESCAP target countries over the past 10 years, China, Republic of Korea and Japan show a relatively high number of accidents. GISIS is voluntary database inputted from external IMO member countries and cannot be identified unless specific countries enter accident data. However, at present, it is used as comparative data for each country because it is the only official ship accident data.

\(^3\) https://gisis.imo.org/Public/Default.aspx
2.2. **Country report**

The number of accidents for the past 5 years in countries which submitted survey on the current status is shown in Table 2. The number of ship accidents shows significant difference among countries. Republic of Korea and the Philippines showed the high number of accidents at 570 and 562 accidents on annual average while Cambodia has very low number of accidents at 0.6 accidents.

It is judged that this phenomenon is not only influenced by frequency of accident but also by accident reporting and accident data gathering method. For example, Republic of Korea witnessed 2,362 accidents in total in 2015 but 69 per cent of accidents occurred in fishing boats while 741 accidents occurred in non-fishing vessels. In particular, the figure increased significantly in 2015 because the number of vessels which were towed due to failure of ship was counted as accident, which used to be not included in the accident before 2015.
The number of accidents at the country level does not have a significant meaning in terms of comparison as the reporting of accident investigation and compiling accident record are different but trend of annual accident in a country could serve as criteria on determining the efficiency of safety administration.

The trend of maritime accidents for the past 5 years showed that the Philippines and Bangladesh showed similar trend, Republic of Korea and Cambodia showed gradual increasing trend while DPRK, India, Myanmar and Viet Nam showed gradual decreasing trend (refer to figure 15).
The analysis on ship accident rate based on the number of ships that were in accidents and total number of ships operated for the past 5 years based on the data submitted by 7 countries showed that the rate is 3.2 per cent on average. There is a limitation to the reliability of data submitted by each country, but the accident rate is the highest in Viet Nam and the lowest in Bangladesh. The record from the Philippines was not comparable as there is no record for the number of registered ship.

Table 3. Maritime transport accident rate

<table>
<thead>
<tr>
<th></th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>DPRK</th>
<th>India</th>
<th>Republic of Korea</th>
<th>Myanmar</th>
<th>Viet Nam</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average accident</td>
<td>17.2</td>
<td>0.6</td>
<td>17.2</td>
<td>22.0</td>
<td>1.581</td>
<td>15.6</td>
<td>32.8</td>
<td>57.3</td>
</tr>
<tr>
<td>Total ship</td>
<td>4,203</td>
<td>118</td>
<td>650</td>
<td>1,298</td>
<td>80,874</td>
<td>3,501</td>
<td>1,892</td>
<td>2,152</td>
</tr>
<tr>
<td>Accident rate</td>
<td>0.41%</td>
<td>0.51%</td>
<td>2.65%</td>
<td>1.69%</td>
<td>2.22%</td>
<td>0.45%</td>
<td>1.73%</td>
<td>3.15%</td>
</tr>
</tbody>
</table>

*Note: The accident rate of the Republic of Korea is quoted from the number of marine casualties compared to the total number of vessels including fishing vessel by Korea Maritime Safety Tribunal.*

Figure 16. Maritime transport accident rate
3. Estimated reason of ferry accidents

3.1. Human error

Human error (operator error) is recognized as a major cause of accidents and mishaps. Golden and Weisbrod surveyed 232 ferry accidents over 14 years from 2000 to 2014. Table 4 is a summary of results of the accident analysis of 147 ferry accidents worldwide to determine what proportion of accidents are caused by human error.

61 to 85 per cent of accidents are caused by human error by total known cases and 53 to 73 per cent of accidents by total cases. Here, ‘Total cases’ refers to all cases included in the dataset, including those in which no cause could be assigned. ‘Total known’ refers to only those cases in which a cause (human error/no human error) was assigned.

<table>
<thead>
<tr>
<th></th>
<th>Conservative</th>
<th>Liberal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Accidents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Human error by total known cases</td>
<td>61</td>
<td>85</td>
</tr>
<tr>
<td>% Human error by total cases; known &amp; unknown</td>
<td>53</td>
<td>73</td>
</tr>
<tr>
<td>% unknown</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Fatalities (dead and missing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. fatalities caused by human error</td>
<td>15,156</td>
<td>18,595</td>
</tr>
<tr>
<td>% fatalities caused by human error by total known cases</td>
<td>75</td>
<td>92</td>
</tr>
<tr>
<td>% fatalities caused by human error by total case, known &amp; unknown</td>
<td>70</td>
<td>86</td>
</tr>
</tbody>
</table>

Sources: Summary of Results of Human Error—Abigail Golden, Ferry Fatalities: Statistics and Causation of Major Accidents 2000-2014, Columbia University

In case of fatalities, human error increased to 75 to 92 per cent by total known cases and 70 to 86 per cent by total cases. Here, conservative means human error includes only those errors that led directly to the incident in question and liberal means criteria are as broad as possible. Factors like misjudgment of the weather and vessel disrepair qualify as human error under this analysis. Most of human errors are influenced by complex factors, such as inadequate working
of seaman, carelessness, drowsiness, drinking, fatigue and negligence. There are some obvious reasons such as drunken operation, but in most cases it is due to negligence or carelessness during duty, so it is sometimes difficult to know the cause of negligence or carelessness clearly.

3.2. Weather

Southeast Asia has tropical climate with high temperature throughout the year as it is located in equator. Most of the Southeast Asian region has high precipitation except for dry season influenced by monsoon. Summer seasonal wind that comes with high temperature and humidity is advantageous for rice growing but tropical low atmospheric pressure including cyclone comes with local torrential rain.

Encountering storms and unsafe weather conditions will always pose an unavoidable risk when travelling by water. Weather implicated in more than 50% of accidents. Seasonal weather conditions such as monsoon season or tropical storm season may affect seasonally higher rates of accidents in regions like Southeast Asia. Although weather forecasting technology has been developed and weather services are provided in a timely manner, small vessels are often unable to use them, and local weather is difficult to predict and efficient control of ship operations is often difficult.

At the ESCAP Expert Group Meeting held in Sep. 2016 in Bangkok and seminar held in Dec. 2016, representatives of each country also pointed out that bad weather, visited by several typhoons or cyclones per year affect ferry accidents.

3.3. Overloading and overcrowding

Intensive labor is required in the process of producing groups in many Southeastern countries where agriculture is developed. Most of the countries have the primary industry oriented industrial structure such as agriculture, forestry and fisheries. Population is relatively big as many people live in rural area and the population size is growing rapidly due to industrialization based on abundant resources and cheap labor after the 1980s.

In the meantime, major transportation means in the region where there are lots of islands and delta region with no developed inland transportation means is a ferry. Small ferry operators which do not have sufficient capital carries more passengers than the capacity of ship in many cases, and controlling and monitoring safe operation of ship are not sufficient due to lack of safety management system.
Overloading and overcrowding have been recognized as the most severe and rampant cause of capsizing the ship by loss of stability of the ship, accounting for 43% of total ferry accidents. Overloading and overcrowding are not usually fatal per se, but makes vessels more vulnerable to other threats.

**Figure 17. Picture of a overcrowding ferry**

![Overcrowded ferry]

*Source: Mirza Saifur Rahma, Seminar on improving maritime transport safety, Peoples’s Republic of Bangladesh, 2016.*

The one of the difficulties of an overload accident is that if the ship loses its balance or loses its stability, it will not be able to have enough time to secure search and rescue because the accident process takes place very quickly. In certain areas or routes, overloading is taking place because demand exceeds supply happened often as well as it is difficult to find alternative transport means. However, overloading is a serious detriment to the safety of the ship, so strict safety management is required.

### 3.4. Poor quality of crew

If crewmembers are inadequately trained, they are uncertain of how to respond in the event of a disaster, exacerbating these problems.

Some ESCAP countries do not have well-established crew training system making it hard to develop qualified crews and motivation of crews for safe operation is weak due to low wage of the crews. Unexperienced and low waged crews do not implement the provisions of maritime law strictly.
At the above EGM and seminar, representatives of each country asserted that following causes also affected the ferry accidents; the crews did not implement the provisions of maritime law strictly, lack of carefulness as well as unwillingness towards compliance of maritime rules and regulations, policies, guidelines, circulars etc., violation of rules / procedures, master’s inefficiency in taking decision on emergency situations, no formal training in vessel operations, the difficulties in recruiting qualified and experienced crews due to low paid in crews wages, and lack of qualified personnel for maritime safety management.

It is not a direct cause of an accident, but it can be a problem in an emergency situation where quick response is required due to fatigue caused by a decrease in physical strength and deterioration of agility. Also, due to the lack of skilled crews that are constantly being raised, there are cases in which proper crew can’t be boarded, which also adds to the difficulty of safety operation.

As of the end of 2015, Current officer supply is in the order of 615,000, and there is shortage of 15,000 qualified and well trained officers, besides the new incoming officers by 2019.

The main reason for the worsening of the shortage of officers is due to the isolation from family and society at work, the poor working environment, and the narrowing wage gap comparing with inland jobs. Also in some countries, it is characteristic that aging of the crewmen is rapidly proceeding because young people are often refraining from becoming a crewman. Thus, in many countries, the crewmen have avoided boarding, hiring crews from developing countries to supplement their scarce manpower. In case of the flag of convenience vessel, since it is relatively free from the supply and demand of crewmen, the crewmen from the 3rd countries are on board.

While the supply of the well-trained crewmen, especially the officers, is in shortage compared to the demand, the competences of ratings and international norms are being strengthened since the adoption of the MLC (Maritime Labor Convention) by the International Labor Organization (ILO) calls for the improvement of welfare and working conditions for crewmen. However, many small shipping companies still fail to comply with the international standards and have problems such as hiring unskilled crews or failing to satisfy the legitimate number of boarding crews, etc.

### 3.5. Old vessel

Some domestic ferry operators in some ESCAP countries operate aged(old) ship from overseas countries at low price rather than building a new ship due to lack of capital.
The imported old ships are sometimes re-purposed to operate in waterways for which they were not designed. Old ships used in developed countries including Japan and Europe are often exported to Southeast Asian region and these vessels are often difficult to obtain adequate maintenance. In addition, timely maintenance of the ship is not conducted in many cases because ship owners want to save repair cost even though failure of the old ship occurs frequently. In addition, it is hard to maintain seaworthiness of ship due to lack of inspection system.

At the above EGM and seminar, representatives of each country also pointed out that poor quality of the vessel, fault design and construction, sketchy design of the vessel, lacking in checking and verification of the design, lack of safety equipment (Life saving apparatus and Fire fighting apparatus) and marine traffic management, standard fitness of the vessel does not maintain by the owner/master all the year round, poor maintenance, non-convention size ships and aged vessel fleet, mostly acquired and operated ships are second-hand vessels operating domestic routes, vessels plying without registration will affect ferry accidents.

3.6. Lack of administrative capacity

In the EGM and seminar held twice in 2016, representatives of each country mentioned the lack of administrative capacity as one of causes of ferry accidents. This again can be divided into budget shortage and lack of management.

Due to the lack of budget, it is difficult to set up the maintenance of aid to navigation and dredging navigation channels, inadequate maritime safety infrastructure, lack of Vessel Traffic Service (VTS) centers, inadequate maritime Aids To Navigation (ATON) and maritime communications system, need investment to establish shipyard / shipping business / maritime training center. And also budget problem makes difficult for country to develop marine channels to catch-up with the increase of maritime transportation, infrastructural facilities like jetties and gangways which are in poor condition.

The lack of management ability pointed out to the lack of control on vessel traffic, jetty collapse, rush hours and others, the overlapping function between government offices, absence of inland traffic management agency, lack of qualitative analysis for the river boat accidents, difficulties in implementation of new conventions. Others are absence of passenger awareness, lack of accountability on passengers.
1. **Survey**

To help understand the status of maritime safety in the region, a questionnaire was developed with assistance of KMI and sent to ESCAP member countries. The purpose of the questionnaire was to assess policies on administrative organization, safety management system and safety management facilities.

The questionnaire was made with reference to information on maritime safety related to the audit scheme of member countries developed by the IMO and included the following key issues:

- a) General status of maritime traffic
- b) Safety management administration
- c) Passenger ship safety management system
- d) Maritime casualties
- e) Maritime accidents investigation
- f) Search and rescue

The survey attached to this document as an appendix was sent in two stages by the ESCAP secretariat to 18 member States in June and October 2016 and 10 responses were received from August and November 2016. Some countries omitted data sets or provided unclear information in the returned questionnaire.

Responses were received from the following countries:
a) Bangladesh  
b) Cambodia  
c) DPRK  
d) India  
e) Myanmar  
f) Pakistan  
g) Philippines  
h) Republic of Korea  
i) Sri Lanka  
j) Viet Nam  

The number of population may be a good basis for predicting the trends of demand in ferry industry. Among the participating countries, the countries which population is over 100 million are Bangladesh, India, Pakistan and the Philippines.

**Figure 18. Population (Unit: 1,000 persons)**

It is also worthwhile to consider the region’s inland waterways, as the length of inland waterway of a country means that demand for ferry is high and ferry may play a critical role as a local major transport mode.

In many cases the length of waterway is different between dry season and monsoon season in Southeast Asian countries where precipitation is high. For example, the annual precipitation in Bangladesh is 2,300mm but the length of waterway in more than 700 rivers is 4,000km in dry
season and it becomes more than 6,000km in monsoon season. Viet Nam has very long waterway compared to other countries.

**Figure 19. Total waterways (km)**

Source: The World Factbook, CIA, USA, 2016

2. **Survey results**

The results of the questionnaire are presented in this section. This section is divided to the sub-chapters according to the themes which were addressed in the questionnaire: maritime traffic and accidents, safety management policy instruments and regulatory bodies, investigation of maritime accidents and search and rescue.

2.1. **General status of maritime traffic**

2.1.1. **Passenger shipping company and vessels**

The number of passenger shipping companies which own and operate passenger ships like cruise ships, cargo-passenger ships and ferries, shows capacity of passenger shipping industry of each country. As seen in the table 5, most of responding countries do not have any ocean-going passenger shipping company.

Compared to the number of domestic passenger ships in the figure 20, the number of domestic passenger shipping companies is relatively small. Bangladesh has an excessive number of
domestic passenger shipping companies. One passenger shipping company has only 1.7 vessels in average.

Table 5. Number of passenger shipping company and ships (2015)

<table>
<thead>
<tr>
<th>Company</th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>DPRK</th>
<th>India</th>
<th>Republic of Korea</th>
<th>Myanmar</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean</td>
<td>0</td>
<td>N/A</td>
<td>1</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Domestic</td>
<td>695</td>
<td>N/A</td>
<td>33</td>
<td>5+</td>
<td>58</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Ships</td>
<td>Ocean</td>
<td>0</td>
<td>N/A</td>
<td>1</td>
<td>5</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Domestic</td>
<td>1,174</td>
<td>82</td>
<td>47</td>
<td>73</td>
<td>169</td>
<td>944</td>
<td>42</td>
</tr>
</tbody>
</table>

The number of passenger ships shows generally capacity of passenger transportation. Considering the scale of passenger shipping companies, the responded countries have small passenger lines in general, e.g. 1.7 in Bangladesh, 1.4 in DPRK, 14.6 in India, 2.9 in the Republic of Korea and 2.8 in Viet Nam.

In addition, in comparison with coastline length of country, the ratio of domestic passenger ship to 10,000 km of coastline is diverse among the selected countries from 0.1 in India and Viet Nam to 20.2 in Bangladesh.

Figure 20. Domestic passenger shipping company and ships (2015)
2.1.2. Status of passenger service

In terms of routes of passenger ships, there are a small number of countries which have ocean-going passenger ship routes. Meanwhile, considering correlation between number of domestic passenger ships (table 5) and number of routes of domestic passenger ships (table 6), it can be expected that Bangladesh, Cambodia and Republic of Korea are experiencing some severe traffic issue in some specific route.

### Table 6. Number of routes of passenger ship (2015)

<table>
<thead>
<tr>
<th>Route</th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>DPRK</th>
<th>Republic of Korea</th>
<th>Myanmar</th>
<th>Philippines</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of route</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ocean</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>23</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Domestic</td>
<td>222</td>
<td>6</td>
<td>47</td>
<td>112</td>
<td>1,590</td>
<td>1,776</td>
<td>32</td>
</tr>
<tr>
<td>No. of passenger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ocean (1,000)</td>
<td>0</td>
<td>43.5</td>
<td>0</td>
<td>2,646</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Domestic (million)</td>
<td>20</td>
<td>N/A</td>
<td>1.5</td>
<td>14.2</td>
<td>3.1</td>
<td>N/A</td>
<td>1.9</td>
</tr>
</tbody>
</table>

The majority of the responded countries have few numbers of ocean-going passengers since they do not have ocean-going passenger routes. The number of domestic passengers shows country’s needs of domestic ferry transportation. For example, Republic of Korea has only 169 domestic passenger ships, but a number of passengers using domestic passenger ships are more than 14 million. Numerically one passenger ship carried average 85,000 people per year. This figure nearly doubles compared to Viet Nam and 28 times than Myanmar.

2.1.3. Seafares

The number of ship officers indicates potential for development of shipping industry as well as manpower of current shipping industry as the number of ship officers is one of core three elements in the maritime shipping industry; ships, crew and cargos.

According to the figure 21, India and Myanmar have more officers in comparison with the number of national shipping lines and vessels than others. These countries play as a supplier of ocean-going officers in the global maritime labor market. Meanwhile, Bangladesh and Viet Nam have a big pool of domestic officers who have potential to turn into ocean-going officers.
In many countries, there is no special license required to be a crew member. Accordingly, in case of analyzing the manpower, proportion of crew members go over officers in general. Taking into consideration numbers of ratings and officers, Bangladesh, Cambodia and Republic of Korea have less number of ratings than officers, which means that they are in short supply of the ship ratings. Especially, the number of foreign crews increase cover shortage of ratings in the Republic of Korea.

*Note: The Philippines is the sum of ocean going officers and domestic officers*
2.2. Safety management administration

2.2.1. National maritime safety policy

Participating countries were asked whether there is a country-wide maritime safety policy including implementing time table and budget and in case there is, participating countries were asked to mention the cycle to update or set up policies. The results show that there are not a few countries which do not have a maritime transport policy to deal with maritime transport policy in the national level.

Table 7. Establishment of national maritime safety policy

<table>
<thead>
<tr>
<th></th>
<th>DPRK</th>
<th>India</th>
<th>Republic of Korea</th>
<th>Pakistan</th>
<th>Philippines</th>
<th>Sri Lanka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy set up</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Renewal duration</td>
<td>5years</td>
<td>Non-periodic</td>
<td>5years</td>
<td>5years</td>
<td>6years</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The countries that cited existence of national policy on maritime safety are: DPRK, India, Pakistan, Philippines and Republic of Korea. They also cited that the national policy is updated at the interval of 5 to 6 years. The countries that cited absence of national policy on maritime safety are: Bangladesh, Cambodia, Myanmar, Sri Lanka and Viet Nam.

2.2.2. Maritime safety organization

Type of maritime safety administration

There are two categories of organizations dealing with maritime safety administrations in a country. One is an organization charged in a country’s safety administration which is positioned as an independent body apart from the central government, and the other is an organization set up as a department within central government.

In case of Republic of Korea, while Maritime Affairs and Safety Policy Bureau working on maritime safety are currently under the Ministry of Oceans and Fisheries, Korea Coast guard is under a different ministry, Ministry of Public Safety and Security. As function of developing policy (Maritime Affairs and Safety Policy Bureau) and enforcement (Korea Coast Guard) are dealt with separately by different ministries (Ministry of Oceans and Fisheries and Ministry of Public Safety and Security), greater cooperation between ministries should be promoted to implement maritime safety policy.
Typical example is Japan. Japan’s Maritime safety bureau and Japan Coast guard are under the Ministry of Land, Infrastructure, Transport and Tourism. Function of developing policy (Maritime Bureau) and enforcement (Japan Coast Guard) belongings in the same ministry, Ministry of Land, Infrastructure, Transport and Tourism.

**Organization by phase**

Disaster management aims to reduce or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The disaster management cycle which is called Prevention, Preparedness, Response and Recovery (PPRR) cycle, illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. Figure 25 shows PPRR cycle.
Participating countries were asked whether the government has a maritime safety organization and what is the name of the organization for prevention, preparedness, response and recovery in the four phases of disaster management cycle.

Some countries have a designated government agency that handles PPRR functions (Bangladesh, DPRK, Myanmar and the Philippines) while some countries have two or more agencies to deal with the functions (Cambodia, India, Pakistan, Republic of Korea and Viet Nam). In some countries like Philippines, Republic of Korea and Viet Nam, the coastguard is responsible for response to disasters. In Sri Lanka, however, the navy is in charge of disaster responses. Disaster management by different organizations and different ministry sometimes become an obstacle their efficient communication error or cooperation.

### Table 8. Maritime safety organizations

<table>
<thead>
<tr>
<th></th>
<th>Prevention</th>
<th>Prepare</th>
<th>Response</th>
<th>Recover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td></td>
<td>Ministry of communications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td></td>
<td>National Committee for Disaster Management</td>
<td>National Committee for Maritime Security</td>
<td>National Committee for Disaster Management</td>
</tr>
</tbody>
</table>
Relation with maritime coastguard (Police) organization

A maritime coastguard or police is an executive agency working to prevent the loss of lives and property at sea and is responsible for implementing national maritime safety policy. Its responsibilities also include search and rescue on the coastline and at sea, monitoring and preventing coastal water pollution.

The majority of selected countries have coastguard organizations, excluding DPRK which did not mention on its coastguard organization. In terms of relationship between a maritime safety organization and a maritime police (or coastguard) organization, the selected countries mentioned that maritime police is an independent organization under different ministry from a maritime safety organization in their countries; Bangladesh, Cambodia, India, Myanmar, Pakistan, Republic of Korea, Sri Lanka and Viet Nam. However, in the Philippines, a maritime policy organization and a coastguard are under the same ministry.

Authority to develop and deliver policy is spread among relevant organizations in a country, resulting in confusion of who has the responsibility. If the maritime safety policy-making department is independent from the safety enforcement department, it may cause difficulties in active cooperation and communication.
2.2.3. Vessel inspection organization

To improve maritime safety, it is crucial to maintain seaworthiness of ships through vessel inspection periodically. Vessel inspection is conducted by a ship classification society to encourage ship companies to maintain good conditions of ships and make sure the operational safety.

Most of the ship inspection organizations in the world are charged by civil society such as ship classification. A ship classification society is a non-governmental organization that develops technical standards for the design, construction and operation of ships. The society also validates that construction is according to these standards and carries out regular surveys in service to ensure compliance with the standards.

Table 9. Vessel inspection organizations

<table>
<thead>
<tr>
<th>Nation</th>
<th>Own classification society</th>
<th>Assigned recognized organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>No</td>
<td>GL, NV, LR, NKK, RINA, BV</td>
</tr>
<tr>
<td>Cambodia</td>
<td>No</td>
<td>ABS, BV, KR, GL, RINA, PRS, HRS, CCS, GMB, INSB, IRS, HRS, UBS, UMB, OMCS class, Turk Loydu, Inspeccion Clasificacion, Shipping Register of Ukraine</td>
</tr>
<tr>
<td>DPRK</td>
<td>Unknown</td>
<td>ABS, BV, DNV, KR, LRS, NKK, CCS, RINA, LR, RS</td>
</tr>
<tr>
<td>India</td>
<td>Indian Register of Shipping</td>
<td>BV, DNV, LRS, ABS</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Korean Register of Shipping, Korea Ship Safety Technology Authority</td>
<td>BV</td>
</tr>
<tr>
<td>Myanmar</td>
<td>No</td>
<td>LR, BV, NK, ABS, KR</td>
</tr>
<tr>
<td>Pakistan</td>
<td>No</td>
<td>LR, BV, NK, SGS</td>
</tr>
<tr>
<td>Philippines</td>
<td>Filipino Vessels Classification System Association, Inc. Ocean Register of Shipping, Inc. Orient Register of Shipping, Inc. Philippines Register of Shipping, Inc. Shipping Classification Standards of the Philippines, Inc.</td>
<td>ABS, BV, DNV, KR, LRS, NKK, CCS, RINA, LR, HRS, IRS</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>No</td>
<td>ABS, BV, DNV, KR, LRS, NKK, CCS, RINA, LR</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Viet Nam Register</td>
<td>International Asia Classification Society (IACS).</td>
</tr>
</tbody>
</table>

(a) ABS: American Bureau of Shipping
(b) BV: Bureau Veritas
(c) DNV: Det Norske Veritas
Participating countries were asked that they have an authorized ship classification society. Even though only half of the selected countries replied that there are national classification societies in their countries, all countries acknowledge an international Recognized Organization (RO) and approve many foreign classification societies as the RO. Number of assigned ROs reveals the flexibility of vessel inspection. Every target country approves foreign classification societies as a RO, in addition to domestic ones.

When it comes to passenger ships, Republic of Korea has a separate inspection organization. The Philippines has six separate passenger ship inspection organizations.

2.2.4. **Vessel Traffic Service**

Vessel Traffic Service (VTS) is very important function for a maritime regulatory body to monitor safe navigation of passenger ships. VTS deals with management of ship traffic on maritime routes, suggesting best routes for a ship and ensuring no two ships run into each other on congested routes.

The numbers of VTS sites and VTS officers (VTSO) show current monitoring capability of selected countries. In comparison with coastline length of country, the number of VTS per 1,000 km of coastline is diverse among the selected countries from 0.1 in the Philippines to 7.5 in Republic of Korea. In cases of Cambodia, Myanmar and Sri Lanka, they don’t have VTS but other monitoring system; VTMS (Cambodia), DOMA (Myanmar) and CG (Sri Lanka). Some country has additional long range vessel monitoring system. Republic of Korea operates General Information Center on Maritime Safety and Security (GICOMS) monitoring the Korean vessel globally by using a satellite.

Capability and professionalism of officers working for VTS is important to enhance safety level of maritime transport in the field. Comparing with the number of VTS sites, the average number of officers (VTSO) does not look enough to conduct VTS. Understanding nature and working of vessel traffic system would be of importance to officers. However, 7 countries don’t have officers took training courses required by International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) which is a non-profit organization to provide nautical expertise and advice for development of navigation services. Only 4 countries (DPRK, India, the Philippines and Republic of Korea) operate required curriculum.
Table 10. Status of Vessel traffic service (VTS)

<table>
<thead>
<tr>
<th></th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>DPRK</th>
<th>India</th>
<th>Republic of Korea</th>
<th>Myanmar</th>
<th>Pakistan</th>
<th>Philippines</th>
<th>Sri Lanka</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of VTS</td>
<td>1</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>18</td>
<td>0</td>
<td>3</td>
<td>4 (+4)**</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>No. of VTSO</td>
<td>7</td>
<td>0</td>
<td>38</td>
<td>175*</td>
<td>336</td>
<td>0</td>
<td>10</td>
<td>30</td>
<td>0</td>
<td>57</td>
</tr>
<tr>
<td>VTOSO Training course</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Other organization***</td>
<td>No</td>
<td>VTMS</td>
<td>MRCC</td>
<td>No</td>
<td>GICOMS</td>
<td>DOMA</td>
<td>No</td>
<td>NCWS</td>
<td>CG</td>
<td>No</td>
</tr>
</tbody>
</table>

* India reported 15 to 20 VTSO at each VTS center, therefore it is calculated as 175 VTSO in 10 VTS centers.
** The Philippines Ports Authority is planning to put up VTMS in four more of its ports.
*** Full name of other organization
1) VTMS : Vessel Traffic Monitoring System in Sihanoukville Autonomous Port
2) MRCC : Maritime Rescue Coordination Center of the DPRK
3) GICOMS : General Information Center on Maritime Safety and Security
4) DOMA : Department of Marine Administration in Myanmar
5) NCWS : National Coast Watch System in Philippines
6) CG : Coast Guard in Sri Lanka

2.3. Passenger ship safety management system

2.3.1. Safety management system

The International Safety Management (ISM) Code provides an international standard for the safe management and operation of ships at sea. The Code establishes safety-management objectives and requires a safety management system (SMS) to be applied by "the Company", which is defined as the ship-owner or any person, such as the manager or bareboat charterer, who has assumed responsibility for operating the ship. Since the International Convention for the Safety of Life at Sea adopted the ISM code in 1994, the Code has been applied to ocean-going vessels.

Questionnaire participants were asked to identify whether the ISM Code or similar SMS is applied to domestic cargo and passenger ships in their country. DPRK, India, Philippines and Republic of Korea apply the SMS to domestic cargo ships and passenger ships, while Myanmar and Sri Lanka apply the SMS to only domestic passenger ships and domestic cargo ships respectively.
2.3.2. Passenger ship inspection

Ship inspection is the backbone of maritime safety programme and is instructive for all safety, security and environmental protection activities. To estimate the seaworthiness of passenger ships, relevant authorized national organizations conduct inspection on passenger ships.

In the majority of selected countries, the inspection on domestic ships is conducted by government while classification society inspects domestic cargo ships in Cambodia and both cargo and passenger ships in Republic of Korea. To inspect domestic vessels, Republic of Korea established a separate government agency called Korea Ship Safety Technology Authority (KST).

![Table 11. Inspection organizations of domestic ships](image)

<table>
<thead>
<tr>
<th></th>
<th>Government</th>
<th>Classification society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo ship</td>
<td>Bangladesh, DPRK, India, Philippines, Sri Lanka, Viet Nam</td>
<td>Cambodia, Republic of Korea</td>
</tr>
<tr>
<td>Passenger ship</td>
<td>Bangladesh, Cambodia, DPRK, India, Myanmar, Philippines, Sri Lanka, Viet Nam</td>
<td>Republic of Korea</td>
</tr>
</tbody>
</table>

* Korea Ship Safety Technology Authority (KST)

2.3.3. Passenger ship crew

Certificate of competency

International Convention on Standards of Training, Certification and Watch-keeping for Seafares (STCW) was adopted in 1978 by IMO’s Maritime Safety Committee to promote safety of life and property at sea and the protection of the marine environment.

The STCW convention categorizes the Certificate of Competency (COC) into three stages depending on navigation area and size of vessels. According to the COC of the STCW convention, Deck Officer is for vessels <500GT, 500–3,000GT, and ≤ 3,000GT. Engineer Officer is for vessels <750kW, 750–3,000kW and ≤3,000kW. Stages of COC are diverse from 2 to 6 in the selected countries; 2 stages in Myanmar, 3 stages in India, Sri Lanka and Viet Nam, 5 stages in Bangladesh, 6 stages in DPRK and Republic of Korea.

The STCW convention does not distinguish COC between officers of general vessels and those of passenger ships. However, as passenger ships are more complex, officers of passenger ships...
need to get additional training and qualifications. In the majority of the ESCAP target countries, officers for passenger and general vessels are not distinguished from other types of COCs. Viet Nam has a separate COC system for an officer of passenger ships.

Training course for passenger ship officers

It is very important to provide appropriate sufficient training programmes for passenger ship officers. In accordance with the requirements under the STCW convention, the IMO training model requires a 2 day-long basic training course and a 3 day-long advanced training course for passenger ship officers. However, selected countries have different period of training courses from IMO model depending on their circumstance excluding Republic of Korea.

Table 12. Training course for passenger ship officers

<table>
<thead>
<tr>
<th>Passenger ship Course period (day)</th>
<th>Bangladesh</th>
<th>DPRK</th>
<th>India</th>
<th>Republic of Korea</th>
<th>Myanmar</th>
<th>Sri Lanka</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Course</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Advance Course</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Leadership &amp; teamwork for a passenger ship officer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

In addition, since the 1st of January 2017, officers for international voyaging ships are required to have mandatory leadership and teamwork training course under the STWC convention. However, among selected countries, only six countries like Bangladesh, DPRK, India, Republic of Korea, Sri Lanka and Viet Nam provide leadership and teamwork training courses to passenger ship officers according to the STCW convention.

Qualification of passenger crew

It cannot be overemphasized that quality of a crew is one of the important factors to prevent passenger ship accident. When the participating countries were asked about the satisfaction on the qualification and capacity of passenger ship crew, only 4 countries such as DPRK, India, Sri Lanka and Viet Nam assessed qualification and competency of domestic passenger crew as satisfactory.
Table 13. Qualification of passenger crew

<table>
<thead>
<tr>
<th>Qualification and capacity of crew</th>
<th>Satisfy</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country replied</td>
<td>DPRK, India, Sri Lanka, Viet Nam</td>
<td>Bangladesh, Cambodia, Myanmar, Republic of Korea</td>
</tr>
</tbody>
</table>

2.4. Maritime casualties

2.4.1. Passenger ship accidents

Except for the Republic of Korea, the majority of countries reported very few of passenger ship accidents. Republic of Korea reported 66 accidents of domestic passenger ship during last 5 years, while Bangladesh, Cambodia and Myanmar reported only 5, 2 and 2 respectively. Moreover, there were no passenger ship accidents reported by India and Viet Nam. It is suspected that these countries collect statistics for only serious passenger ship accidents.

2.4.2. Statistics of casualties

There is a stark difference in the statistics of casualties across countries responding. The figures 26 shows that the Philippines, Bangladesh, Republic of Korea and Myanmar have higher number of casualties than others. It is believed that other countries don’t have a proper system to collect and manage statistics of casualties.

Figure 26. Number of death and injury
2.4.3. Cause of accidents

Among the participating countries, only 4 countries provided their inputs about cause of maritime accidents during last 5 years, even though the collected data has a limited number of cases. Human factor is a major cause of accidents accounting for 82 per cent and 50 per cent of maritime accidents occurred in the Republic of Korea and Bangladesh respectively, while weather and overcrowding is critical causes in Cambodia and Myanmar respectively.

![Figure 27. Reasons of passenger ship accidents](image)

2.5. Investigation of maritime accidents

2.5.1. Maritime accident investigation organization

**Name of organization**

There are two types with relation to organizations conducting maritime accident investigation. One is that a maritime accident investigation organization belongs to an integrated type which includes other modes of transport (multi-mode), and another type is a single stand-alone organization which focuses on maritime transport excluding other modes (mono-mode). The
majority of target countries have the mono-mode type with an exception of Viet Nam which uses the multi-mode.

- Bangladesh: Department of Shipping
- Cambodia: National Committee for Disaster Management
- DPRK: Maritime Administration
- India: Indian Maritime Administration
- Republic of Korea: Korea Maritime Safety Tribunal
- Myanmar: Ministry of Transport and Communication
- Pakistan: Marine Mercantile Department
- Sri Lanka: Merchant Shipping Secretariat
- Viet Nam: Viet Nam Maritime Administration, Ministry of Transport

**Division of seriousness and non-seriousness**

The investigation is conducted into all serious situations which include the accident that more than 10 persons are dead or injured, or heavy oil pollution are occurred by ship, and non-serious accidents. The majority of target countries categorize accidents into serious and non-serious ones when investigating accidents to pay more attention to serious accidents.

### 2.5.2. Maritime accident investigation process

**Notification body of accidents**

When a maritime accident occurs, it is reported to a single organization in Bangladesh, DPRK, India, Myanmar, Pakistan, Sri Lanka and Viet Nam. Meanwhile, a maritime accident is reported to multiple organizations in Cambodia (National Disaster Management Committee, Department of Aero-nautical and Maritime Search and Rescue and National Committee for Maritime Security) and in Republic of Korea (Korea Maritime Safety Tribunal and Korea Coast Guard). In majority of countries, a maritime accident is reported to an organization at the 3rd stage of the disaster management cycle relating to emergency responses.

**Apply of IMO Investigation code**
According to the Casualty Investigation Code adopted in IMO and entered into force from 2010, it has been recommended to conduct objective marine safety investigations for the benefit of flag States, coastal States, the Organization and the shipping industry in general.

Among the selected countries, only four countries such as DPRK, India, Republic of Korea and Viet Nam have ratified the IMO casualty investigation code.

### 2.5.3. Maritime accident investigator

If a maritime accident organization has a sufficient number of qualified accident investigators, cause analysis of accidents could be carried out more systematically and efficiently for the prevention of maritime accidents. The result of the shortage of investigators is that investigation is not being conducted appropriately.

#### Figure 28. Number of accident investigators

*Note: India reported at least one person at each allied office and it is calculated as 13 people in 13 local ports.*

Most selected countries, except for Viet Nam do not have a sufficient number of qualified investigators. In terms of qualifications of maritime accident investigators, most questionnaire participants evaluated their investigators as qualified to conduct maritime accident investigation. In addition they mentioned that investigators share information and cooperate with other foreign investigators appropriately when a national flagged vessel is involved in maritime accident with a foreign vessel.
2.5.4. Disciplinary acts against people responsible

The purpose of maritime accident investigation is the prevention of accidents. It is not the purpose of maritime accident investigation or investigation report to attribute blame or to assign responsibility.

The International Convention for the Safety of Life at Sea (SOLAS) which came into force on 25 May 1980 requires that member States should not use the causality information to fix or imply responsibility upon any ships or person. The Casualty Investigation Code also requires that marine safety investigations should not seek to apportion blame or determine liability.

Table 14. Disciplinary acts against offender

<table>
<thead>
<tr>
<th>Nation</th>
<th>Separation of discipline and investigation</th>
<th>Name of criminal justice agency</th>
<th>Disciplinary action(2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Separated</td>
<td>Marine court</td>
<td>5</td>
</tr>
<tr>
<td>DPRK</td>
<td>Separated</td>
<td>Judicial organization</td>
<td>N/A</td>
</tr>
<tr>
<td>India</td>
<td>Separated</td>
<td>Branch dealing with crew affairs in the Directorate</td>
<td>2</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Non-Separated</td>
<td>Korea Maritime Safety Tribunal</td>
<td>335</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Separated</td>
<td>Police force</td>
<td>3</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Separated</td>
<td>Ministry of Port and Shipping through Marine mercantile department</td>
<td>0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Separated</td>
<td>Law enforcement agency</td>
<td>0</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Separated</td>
<td>Maritime Administration or Maritime Inspection or Local people’s committee (Depending on level of each accident).</td>
<td>15</td>
</tr>
</tbody>
</table>

In the majority of the selected countries, disciplinary action and investigations on maritime accidents are carried out separately, excluding Republic of Korea.

Criminal justice agencies are in charge of disciplinary acts against people responsible for maritime accidents. However, the investigation is conducted by the disciplinary agency in some countries (such as Republic of Korea).

Most of target countries reported very few cases of disciplines taken against people responsible for maritime accidents (with an exception of Republic of Korea).
2.6. Search and Rescue

2.6.1. Search and rescue organization

Name of SAR organization

Search and Rescue (SAR) organizations play a critical role in the stage of “Response” in the disaster management cycle. Mostly, a coastguard or a navy organization conducts the role of SAR in a country.

Among the ESCAP target countries, the oil pollution response is included in the function of the SAR organizations of 6 countries; Cambodia, India, Pakistan, Philippines, Republic of Korea and Sri Lanka. Meanwhile, the pollution prevention is separately dealt with under a different agency in Bangladesh, DPRK and Myanmar.

Table 15. Search and Rescue (SAR) organizations

<table>
<thead>
<tr>
<th>Nation</th>
<th>Name of SAR organization</th>
<th>Pollution response function is included in SAR organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Bangladesh Navy</td>
<td>No</td>
</tr>
<tr>
<td>Cambodia</td>
<td>National Committee for Maritime Security</td>
<td>Yes</td>
</tr>
<tr>
<td>DPRK</td>
<td>Maritime Rescue Coordination Center</td>
<td>No</td>
</tr>
<tr>
<td>India</td>
<td>India Coast Guard</td>
<td>Yes</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Korea Coast Guard</td>
<td>Yes</td>
</tr>
<tr>
<td>Myanmar</td>
<td>National SAR Committee</td>
<td>No</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Pakistan Maritime Security Agency</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippines Coast Guard</td>
<td>Yes</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Sri Lanka Navy</td>
<td>Yes</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Search and Rescue Center</td>
<td>No</td>
</tr>
</tbody>
</table>
SAR capacity

The number of SAR operation personnel, vessels and aircrafts show the capability of a SAR organization for search and rescue. It means that prompt actions for the search and rescue could be affected depending on the possession of vehicles in a country.

In comparison with coastline length of country, the ratio of SAR ship to 100 km of coastline is diverse among the selected countries from 0.02 in Philippines to 4.48 in Sri Lanka; 0.02 Philippines, 0.16 DPRK, 0.20 Viet Nam, 0.26 Myanmar, 0.48 Pakistan, 0.69 Bangladesh, 2.29 India, 2.98 Republic of Korea and 4.48 Sri Lanka.

With relation to aircrafts that could be useful for swift rescue activity in case of a disaster, Only 4 countries like India, Pakistan, Philippines and Republic of Korea have their dedicated aircrafts.

2.6.2 Statistic of rescued vessels and people

Most of these target countries reported a small number of rescued cargo and passenger ships. It is believed that they have statistics focusing on a large-scale SAR cases. The Philippines shows a higher number of rescued vessels compared to its SAR capacity.
Besides the Philippines, Republic of Korea and Viet Nam, the rest of participating countries reported a relatively small number of rescued persons.

As questionnaire participants that reported a small number of rescued persons also mentioned a small number of maritime accidents, it is estimated that they do not have an appropriate system to report and collect statistics on the maritime accidents.
3. Chapter conclusion

The previous analysis shows the status of marine safety for domestic passenger ships in the 10 participating countries. Although it is difficult to understand the maritime situation of some countries due to insufficient data and information, the following conclusions could be drawn based on the collected data.

Given that the number of domestic passenger shipping companies is relatively small compared to the number of domestic passenger ships, the majority of participating countries have a lot of domestic passenger ship routes and domestic passengers. Accordingly, it is assessed that domestic passenger ships have an importance of role in domestic traffic in participating countries.

With relation to maritime safety administration organizations, relevant organizations can be different depending on the culture and environment of a country. In case departments dealing with the disaster management are separated into two or more organizations, it is necessary to establish and strengthen cooperative relationship between the relevant organizations in the process of disaster management.

A master plan for national maritime safety could be a good guideline in setting goals of marine safety and policy priorities, securing budgets and resource. However, some participating countries do not have a master plan for maritime safety. In addition, the number of countries that apply safety management systems to domestic cargo or passenger ships is only half of the countries surveyed. Therefore, countries should draw more attention to establishment of a safety management system for domestic vessels to improve vessel safety.

Ship inspection is essential for securing the ship's seaworthiness. Most participating countries have commissioned ship inspection to classification society or recognized organizations, however, inspection for domestic passenger ships, except for some countries, were conducted directly by the relevant government. It is desirable for the government to carry out inspections of passenger ships on its own responsibility in case that the government has sufficient qualified personnel resource.

On the other hand, in the majority of participating countries, officers for passenger ship and general cargo ships are not differentiated with relation to types of Certificate of Competences (COCs). Most of the participating countries provide training courses for passenger ship crew. Meanwhile, some countries provide the leadership and teamwork training course designed for international voyaging ships to crew of domestic vessels, too. However, the need to make labour
conditions better was also addressed for preventive measures to improve maritime safety. The job satisfaction of navigators was not high, which could hinder safe operation of the ship. Out of 10 target countries, four countries assessed qualification and capabilities of domestic passenger ship crew as satisfactory while other four nations assessed them as average level.

In terms of maritime accidents, the number of maritime accidents involving passenger ships in the participating countries was not large and in discord with the results in other previous studies. The reason may be that the accident investigation of a country is not sufficiently systematized and (or) that reporting and categorizing of passenger ship accidents is not implemented efficiently. Meanwhile, it is very important to identify the cause of the accidents to take preventive measures. The previous survey results, however, showed that most countries don’t have a clear distinction between causes of accidents. As the accident investigation is one of the most cost effective measures for accident prevention, member States need to systematize accident reporting, categorizing of accidents and cause analysis of marine accidents.

The majority of participating countries have a mono-mode type investigation organization which means that the investigation organization conducts only maritime accident investigation. Among the participating countries, only four countries have ratified the IMO Casualty Investigation Code which requires that marine safety investigations do not seek to apportion blame or determine liability. In some countries, an investigation agency plays the role of a disciplinary agency at the same time. Meanwhile, a small number of rescued cargo and passenger ships were reported by the participating countries. It is believed that they have statistics focusing on major accidents of bigger-scale salvage cases including some with significant loss of life.

This conclusion is based on the analysis of survey results returned from participating countries under the project. As there could be a mistake in interpreting the submitted data, it is necessary to accurately review this results relating to the maritime safety phenomenon of participating countries.
BEST PRACTICE FOR DOMESTIC FERRY SAFETY OF MAJOR SHIPPING COUNTRIES

1. United States of America

There are more than 5,000 United States Coast Guard (USCG) which is in charge of certificating passenger vessels in the United States of America (U.S.A.) and these vessels are present in most every port and navigable waterway in the country. The domestic passenger vessel industry is one of the most regulated segments of the maritime transportation system in U.S.A.

According to the report by Passenger Vessel Association of U.S.A. (PVA), the passenger vessels carry more than 200 million passengers each year and transport more than 130 million passengers and commuters in nearly every major port in the country.

The ferry industry takes a systematic approach such as safe operations and a strict adherence to risk management practices. Considering pertinent organizational, procedural and personnel aspects of vessel safety, ferry operators put their emphasis on securing passenger and crew safety by implementing programmes and practices to prevent accidents. Owing to the endeavor of ferry industry, there has been an average of fewer than two fatalities per year nationwide due to ferry vessel operations from 2000 to 2010.4

According to the PVA, in a recent report to Congress, the Coast Guard noted that the small passenger vessel segment of the U.S.A.-flagged fleet has an “excellent safety record.” In a

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4 pva-industry-fact-sheet USA
typical year, vessel-related fatalities in the domestic passenger vessel industry are in the single digits. The majority of incidents relate to minor slips, trips and falls.

1.1. Ferry inspection

Regulations cover vessel design, construction, repair, manning and inspection throughout a vessel’s operating history. Any alterations or modifications must be approved in advance by the USCG.

Regulations require an annual examination and inspection that includes the vessel, its equipment and crew competency through emergency drills. Inspection involves stability, hulls, propulsion and other machinery, electrical systems, lifesaving appliances and arrangements, fire prevention and firefighting systems, navigation instruments, etc.

Annual inspection actually is conducted at the minimum level of requirement for passenger ships safety. On the other hand, many larger vessels are visited and checked by the USCG quarterly. In addition, each vessel in freshwater service is dry-docked at least once during each five-year period to inspect comprehensive condition of vessels. Vessels in saltwater service should be in dry dock at least twice during a five year period.

1.2. Drug and alcohol control

On October 20, 1976, the George Prince Ferry collided with the Frosta, a 22,000-ton Norwegian tanker in the Mississippi River, causing fatality of 77 passengers with survival of only 18 of the 97 passengers. The accident of George Prince Ferry was the single worst ferry disaster in the history of the U.S.A.

That accident triggered a major change in the maritime law that resulted in large ships on the river always having right of way, and random drug and alcohol testing became standard for all vessel employees. All vessel crew members must go through pre-employment drug testing and subsequently are subject to random drug testing. In the event of a marine incident or accident, all crew are tested for presence of drugs and alcohol.

1.3. Domestic safety management system

The U.S.A does not apply the ISM Code established by IMO to domestic ferry vessels. Alternatively, PVA has introduced and developed a Safety Management System entitled “Flagship” for use by U.S.A. passenger vessel operators. Flagship has been designed by
passenger vessel operators and is specifically tailored for passenger vessel operators to allow them to easily take their organizations to the next level in terms of safety management. Flagship is actually scalable to meet the needs of passenger vessel operators of all sizes and types. Flagship has undergone at least a year’s worth of testing in the field by nine PVA member companies.\(^5\)

In the case of leisure boats controlled by the USCG, through various recreational boating safety programs such as the establishment of USCG boat manufacturing standards, enacting new intoxicated boating (boating under the influence) laws, mandatory education requirements, mandatory life jacket wear requirements for certain boat types (e.g., personal watercraft) and for children of designated ages, the number of fatalities fell from 1,754 in 1973 to 610 in 2014.\(^6\)

2. European Union

In 2013, the total number of passengers in transit in European Union (EU) ports was 400 million. EU maritime passengers are mainly carried by domestic or intra-EU ferry services and around 58 per cent of maritime passengers are transported between ports within the same country.\(^7\)

In Europe, passenger ferries are concentrated in three regions that generate an important share of global traffic, namely the Baltic, the North Sea and the Mediterranean. Within the EU, more than half of the routes are operated in the Mediterranean.

Over the last two decades, i.e. from 1996 to 2016, 43 ferry accidents have been identified in total in the EU. The four main events took place in the Mediterranean region; the Superfast 3 in 1999, the Express Samina in 2000, the Norman Atlantic in 2014, and the Baltic Sea in 1999 involving the Sleipner accident. Out of 127 deaths related to ferry accidents during the 20-year period, these four main incidents were responsible for 97 per cent of these deaths (123 people).

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7 Eurostat, 2015
Fire was the main cause of incidents (i.e., 18 cases or 42 per cent), 8 of which started on the cargo deck.\(^8\)

### 2.1. National subsidy

Where revenues of ferry operating are insufficient to make the services economically viable, operators may receive government subsidies. Tendering procedures have been introduced to promote efficiency and reduce costly subsidies.

Individual governments subsidize some ferry service routes to develop and improve connections with island regions. Services are contracted to operators (private or publicly owned), which may be non-exclusive, and the authorities are also able to procure other services on the same routes.

### 2.2. Coastal monitoring - EMSA’s SafeSeaNet

SafeSeaNet is a vessel traffic monitoring and information system which was established in order to enhance maritime safety by European Maritime Safety Agency (EMSA).

Staff involved in monitoring the coastlines of Member States, such as those in coastal and port VTSs. They can also access to the full suite of information in SafeSeaNet to carry out their work. For example, they can see exactly where ships are located on the map and all their associated information before entering their waters. Accordingly access to SafeSeaNet makes the works of those involved in coastal monitoring easier and more effective.

### 2.3. Domestic safety management system

Even though the ISM code has played critical role in improving the safety of international ships globally, Europe countries still does not apply the ISM Code to domestic passenger ships. However, individual countries are implementing safety management system for improvement of their domestic ferry safety alternatively.

The United Kingdom of Great Britain and Northern Ireland introduced Merchant Shipping which is called Domestic Passenger Ships Safety Management (DSM) Code, to give statutory force to the Safety Management Code for domestic passenger ships. The Code has been revised

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\(^8\) Policy Development Structural and Cohesion polices B
and contributed to strengthening function of audits and inspection for the safety of passenger ships. The Code is applied to small passenger ships engaged in domestic trade only. The Code is not applied to domestic operators who have achieved voluntary compliance with the ISM Code against which they shall be allowed to maintain their certification if they so wish.

3. Japan

Most passenger ship routes of Japan play the bridging role to supplement roads or railways on the land. As of 2007, 964 companies have operated 2,385 passenger ships on 1,659 routes in Japan and carried more than 100 million passengers. Since the 1970s, especially independent long-distance operation has been increased due to the avoidance of traffic congestion on the road. The recorded distance reached 3.133 million km covered by 44 long-distance ferries on 12 routes as of 2007.

From 2008 to 2012, total 398 accidents of passenger ship accidents occurred. The number of passenger ship accidents occurred in 2012 was 75 and the ratio of accidents in passenger ship accounted for 5.3 per cent of total ship accidents.

The Japan government has taken diverse measures to prevent reoccurrence of critical maritime accidents. Especially, the focus of major policies related to maritime safety has been on changing behaviors of operators of vessels. New regulation and incentive programmes encouraged operators to comply with strict rules and guidelines, apply an audit system for efficient implementation of inspection.

3.1. Transport safety management system

As one of measures to secure the safety of maritime transport, the transport safety management system was introduced by the Japanese government in 2006. The system requires the transportation operators to voluntarily take relevant measures for transportation safety and establish the safety management system in accordance with Plan-Do-Check-Action (PDCA) cycle as a comprehensive approach for ensuring maritime safety.

The Japanese government conducts the evaluation on transport safety management to check the current status of safety management system of the transportation operators and provides advice through interviews with top management of each shipping operator. The evaluation results cannot be expressed in quantitative numbers. The aim of the evaluation is that top managers of passenger ship operators recognize safety as the first priority and improve the safety level of
maritime transport actively.

Moreover, in order to enhance the accurate implementation of the safety management system, the government implements the training aimed at improvement of quality of the inspectors of safety management and the training for the officer responsible for overall safety control of shipping operators.

The Japanese government also adopted incentives including providing citation to excellent shipping operators or recognition of a good ship to maintain voluntary safety management system and promote the installation of collision avoidance systems.

3.2. **Domestic passenger ship operation manager system**

The operation management system was established in Japan, focusing on domestic shipping operators including passenger shipping operators. All shipping companies should employ an operation manager who is responsible for overall safety-related matters except for issues related to directly the responsibility of a captain.

The operation manager is broadly involved in the day to day operations of the ship including navigational safety and inspections. Maintaining safety standards and procedures is also a key part of the responsibility of the operation manager. The operations manager provides advice to vessels and fleet management on safety issues as well as vessel stability and stress to maintain all statutory requirements for the vessel in this field.

The employment situation of operation manager hired by a shipping company should be reported to the government guaranteeing the status and position of the operation manager. In case there is poor supervision of the operation manager in dealing with safety issues, the manager could be dismissed through the government order.

3.3. **A licensing system to secure safe navigation**

Ship-owners should have ship officers on board, complying with shipping crew staffing standards based on the size of the ship, navigation area etc. As of the end of March, 2008, the total of those holding maritime technical officer's licenses numbered about 370,000.

The piloting system is a system that pinpoints spots where shipping traffic is congested, while dangerous paths of marine traffic are designated as pilotage zones (35 zones nationwide) and a
pilot licensed by the government must be on board any ship traversing any of such pilotage zones and guide the ship safely and smoothly.

By securing such a system to constantly provide the user with a piloting service, in which the efficiency and adequacy of the piloting operation is enhanced, the education for nurturing pilots is improved and reinforced thereby intending to further improve the safety of ship navigation.

4. Republic of Korea

The domestic passenger shipping of Republic of Korea carried 15.38 million passengers by 69 companies on 112 routes with 169 ships. Among the domestic passenger ship operators, 143 ships are in operation on 85 private passenger ship routes and 26 ships are in operation on 27 countries’ subsidy routes.

66 passenger ship faced accidents as of 2015 accounting for 2.8 per cent of all accidents. However, if the accidents of fishing vessels are excluded, the ratio would increase to 8.9 per cent. A total of 229 accidents occurred for domestic passenger ship for 8 years from 2005 to 2012 and among causes of the accident, 61 ship malfunction cases accounted for 26.6 per cent followed by 45 human casualty accidents accounting for 19.7 per cent. 83 passenger ship accidents or 36.2 per cent accidents occurred by human error followed by 59 equipment failure which accounts for 25.8 per cent.9

In particular, since the Sewol ferry accident occurred in April 2014 with victim of more than 300 people, the Korean government has taken comprehensive measures to enhance the safety standards of domestic ships, further develop awareness of maritime safety, and strengthen the foundation of maritime safety industry.

4.1. Adoption of Maritime Safety Supervisor system

Since the Ferry Sewol accident occurred in 2014, more efforts were made to strengthen a safety audit system for a domestic passenger ship. For taking full account of safety of a domestic ship, the Maritime Safety Supervisors (MSSs) who are technically skilled in the inspection of domestic ships were hired and deployed in the 11 regional offices of Ministry of Ocean and Fisheries in 2016. The MSS undertake an assessment of risks to the safety of ships and operators,

checking that proper measures are made for the ship to be adequately manned, equipped and maintained, relating to safety applicable to the ship.

The MSS is categorized into two types; one is the Operating Supervisor who conducts inspection on operation management and passenger management of a passenger ship and the other is the Seaworthiness Supervisor who is responsible for seaworthiness of a ship including a hull and machinery condition of the ship.

One of major roles of the MSS is to take a preventive action to control operation of an unqualified ship. They can make a ship operation suspended in case that the ship operators do not comply with the orders of MSSs. The deployment of the MSSs will consequently contribute to a significant improvement of a passenger ship safety.

4.2. Pursuing alternative building of new coastal passenger ship

The business condition of domestic ship operators who are medium and small-sized enterprises has been severe due to the decrease in the number of passengers and the increases in operating cost. Especially, they have a difficulty in modernizing and replacing aged ships which are very vulnerable to adverse weather and considered one of major reasons of accidents occurred in the coastal area.

To deal with the modernization of aged ships, the Korean government made efforts to promote modernization and replacement of aged ships by granting a subsidy to passenger ship operators. In case of construction of a new high-priced passenger ship including an ultra-speed vessel, the subsidy can covers up to 50 per cent of shipbuilding cost. The fund secured for subsidy in 2016 was 10 billion won (0.8 million USD) and will increase up to 100 billion won (8 million USD) by 2019.

In addition, in case of construction of a general passenger ship, a ship operator can take out a loan up 80 per cent of shipbuilding cost with a subsidy covering the equivalent amount to 2.5 per cent of interest rate. The loan is intended to finance shipbuilding of a domestic passenger ship by a medium and small-sized enterprise.

4.3. Domestic safety management system

With the aim of supporting and encouraging the development of a safety culture within the industry the Domestic Safety Management system (DSM) was produced in 2002. The DSM
Code was developed from the International Safety Management (ISM) Code with intention of providing specific guidance and interpretation to assist industry in consistent implementation.

The Code is applicable to small passenger ships engaged in domestic route. However, the Code is not be applied to domestic operators who have achieved voluntary compliance with the ISM Code against which they are allowed to maintain their certification if they so wish.

Since the Ferry Sewol accident occurred in April 2014, significant changes have been introduced to the DSM Code. One of changes was to separate operation managers from the Korean Shipping Association, a group of domestic ship owners and to place them under the Korea Ship Safety Technology Authority (KST), an executive agency of Ministry of Oceans and Fisheries to secure independency and strengthen expertise of an operation manager. The number of the operation manager hired by KST increased from 74 in 2014 to 106 in 2016, thereby improving an activity of the operation manager auditing the safety management of companies who operate domestic passenger ships.
6

RECOMMENDATION OF IMPROVEMENT OF REGIONAL PASSENGER SHIP MARITIME SAFETY

1. Conclusion

The purpose of this study is to establish the plan for the improvement of marine transportation system safety within the ESCAP region. Survey was conducted to identify the current status of maritime safety and implementation status of ESCAP countries. In addition to the survey, Expert Group Meeting and seminar was held on Sep. 2 in 2016 and Dec. 19 to 20 in 2016 respectively by ESCAP to exchange information and discuss ways for the improvement of maritime safety for countries in the ESCAP region.

The conclusion drawn from the survey and expert group meeting is summarized as follows;

1) Ferry is regarded as one of the most successful maritime transportation means in the world thanks to its service reliability, transport capacity, and flexible operation. There are high risks involving domestic ferries even though there are advantages of ferry. To sum up, concerning the significant role of the domestic ferry in every aspect of the country's development, there should be greater awareness to improve the level of safety of its operation.

2) Worldwide Ferry Safety Association reported that 94% of all accidents and 97% of all fatalities occurred in developing countries. The major cause of ferry accidents is human error and other major causes include bad weather, overloading and overcrowding, poor quality of crew and old vessels. So far there has been no official statistics on passenger ship for 53 ESCAP member countries. However, the number of accidents for the past 5 years of 7 countries which
submitted status survey statement showed that the ship accident rate based on average number of ship which faced accident compared to the number of total ship for the past 5 years was 2.3% on average.

3) Major maritime policies of the US, the EU, Japan and Republic of Korea were looked at to identify best practices on domestic passenger ship safety management of major shipping countries. Typical examples are “Flagship” of U.S.A., “SafeSeaNet” of EMSA, “transport safety management system” of Japan and “maritime safety supervisors system” of Republic of Korea.

4) The majority of ESCAP target countries reported that the number of domestic passenger shipping companies is relatively fewer compared to the number of domestic passenger ships. When analyzing the number of domestic passenger vessels, a single shipping company has around 2 vessels, which shows that most of domestic passenger shipping companies in the target countries are small in size. The research showed that the demand for shipping in the ESCAP region will increase in the future and in particular, for ferry coming in and going to domestic ports, the number of shipping companies is high compared to the number of ferries so it is necessary to enlarge the size of shipping companies.

5) There are no official statistics on passenger ship accidents for 53 ESCAP countries and the internationally collected and released data( IMO’s GISIS) and national data on the actual passenger ship accidents and damage show significant difference. This is believed that they don’t have a proper system to collect and manage the data for casualties.

6) The general causes of ferry accident are known to be human error, bad weather, overloading, overcrowding, poor quality of crew and old vessel. The ferry accidents in ESCAP countries are characterized by the highest portion of accidents caused by human error due to unqualified crew, significant change in weather condition due to tropical depression due to cyclone, overcrowding to increase profit by small domestic ferry companies which have few capital and lack of safety management system that makes control and oversight of safe operation of ship difficult. In many cases, old ship is not organized after purchasing and it is hard to maintain seaworthiness due to lack of inspection system, which have resulted in frequent ferry accidents.

7) Establishing national safety policy with regular interval represent government’s will conducting maritime safety policy, but around the half of target countries have no national safety plans. Safety management functions are divided into two or more agencies in some countries, the maritime safety function and the maritime coastguard function are divided across different ministries, some countries do not have the VTS center and a lot of countries faces lack
of VTSOs and do not have the training and education system required by the IALA. In conclusion, administrative organization and facility for safe management should be established appropriately to reduce maritime safety accident, but most ESCAP countries do not have sufficient administrative organization and local governments have few authority to control ship facing limitation to preventing maritime accident.

8) Currently, the International safety management(ISM) code is required to apply to international voyaging ships under the international convention, therefore only few countries have adopted ISM code to their domestic vessels. It is necessary for each country’s government to adopt safety management system for costal ships, which could lead to significant human casualty in case of accident, as a priority.

9) To maintain maritime accident investigation expertise, the majority of target countries have the mono-mode type. IMO’s Casualty investigation code requires marine safety investigations do not seek to apportion blame or determine liability. In the majority of target countries, disciplinary acts and investigations on maritime accidents are carried out separately.

10) The number of SAR personnel, vessels and aircrafts show a country’s capability for search and rescue operation. India and Republic of Korea have relatively larger SAR capacity compared to other countries. For some exceptions, countries in the ESCAP region face lack of rescue resources such as rescue ship, rescue aircraft, rescue personnel and water surface cleaner. It is necessary that SAR capacity should be expanded in proportion to the number of ship owned by a country and length of the country’s coastline. In particular, contamination control group should be organized properly to prevent pollution effectively in case of oil spill accident and the group’s activities should be coordinated with activities of search and rescue group.

2. Policy recommendation

As policy and organization of marine safety of each country is formed based on the characteristics and culture of the country, method of a country may not be effective for other countries. However, it can be said that countries with a less number of marine accidents have a better marine safety management system than those with a high number of accidents.

Based on the facts found from the questionnaire analysis and discussions at the seminar, the following recommendations are made to improve the maritime safety in the ESCAP region.
2.1. *Strict Enforcement of Safety Regulation*

Individual country is establishing maritime safety rules for safe operation of their own domestic passenger ships and other types of vessels. However, ship owners and crew members, especially small domestic shipping companies, do not keep the safety rules strictly. Therefore, maritime safety administrative organization needs to have strong administrative power to monitor and mandate the domestic shipping companies and vessels to comply with the maritime safety rules. In particular, countries where the volume of inland waterways passenger traffic is high, need dedicated department and regional office.

2.2. *Introduction of Safety Management System to Non-Convention Vessel*

Ship’s SMS is to ensure safety at sea, to prevent human injury or loss of life and to avoid damage to the environment and to the ship. Most countries in the ESCAP region have small sized domestic shipping companies with limited capital and do not apply the SMS to domestic vessels. In addition, archipelagic countries or countries in delta regions need to establish an organization designated for the domestics and inland waterway, in order to establish independent maritime safety policies and inland waterway transport infrastructure. As we have seen, most catastrophic accidents occur mainly in ships operating on domestic and inland waterways that do not comply with IMO's strict safety regulations and do not conduct rigorous ship inspections. Therefore, in the ESCAP region where a large number of human casualties are occurring, a safety management policy that reflects the local situation is required for non-convention vessels.

2.3. *Strict Vessel Inspection and Monitoring*

To maintain a vessel’s seaworthiness, vessel inspection must be thoroughly carried out to suppress sub-standard vessels. When the government assigns vessel inspection to a Recognized Organization (RO), the government needs to monitor and supervise thoroughly to check if the RO has appropriate organization and manpower to provide quality inspections. It is also necessary to continuously monitor navigation of vessels, establish routes of passenger ships, by establishing the VTS or an e-Navigation System. In case of bad weather, departure of passenger ships must be controlled. If a vessel does not comply with the order, strong disciplinary measures need to be taken. In the ESCAP region, there are many cases where old vessels that are not properly maintained are operated, so it is necessary to carry out maintenances of these vessels, and appropriate control over overload and overcrowd is necessary.
2.4. **Training and Education of Qualified Persons**

Qualified crew can ensure safe navigation of a vessel and provide effective responses in emergency. Therefore, The countries need to establish qualified seafarers training schools and to provide training and education continuously to maintain highly qualified crew members. Besides maintaining qualified crew members, it is necessary to increase and enhance qualification of maritime safety-related government officials (staffs, VTSO and Coastguard officer, etc.) and vessel inspectors and surveyors.

Since most of the ocean accidents are caused by human errors, the training and education of seafarers is of the utmost importance. However, marine accidents cannot be left as a problem only for seafarers, and governance, management systems, laws and institutions, and safety culture should be reviewed comprehensively. Especially, shipowners need to enhance their safety awareness and improve the safety culture in the maritime field.

2.5. **Internal and External Cooperation**

Some countries have a single ministry that handles the maritime safety administration works. In others, the maritime safety administration functions are divided into multiple agencies. Through efficient communication and cooperation across the maritime safety-related administration organizations, it is necessary to maximize interaction among agencies for improved maritime safety. Through IMO, IALA, ASEAN and other related international organizations and their programs, international cooperation needs to be enhanced. Regional workshops and seminars will promote researches for maritime safety in the ESCAP region.

2.6. **Establishment of Funding Program for Maritime Safety**

To enhance maritime safety in an individual country, additional financing is needed for shipbuilding, support for the maritime shipping industry, establishment of seafarer training centres, dredging of waterways, development of aids to navigation, expansion of VTS, and enhancement of SAR facilities. However, most of the ESCAP target countries cannot make sufficient investment in these areas due to lack of budget. Overseas aids and financing may help these countries to make more investment for enhancement of domestic maritime safety. It is necessary to discuss how to raise funds for ESCAP regional maritime safety. In the meantime, each country should expand the subsidy on its domestic passenger ship industry.
2.7. *Effective Casualty Investigation and Search and Rescue*

Whatever efforts are made to prevent marine accident by each country, marine accident inevitably happens. To prevent reoccurrence of maritime accidents, a thorough investigation needs to be conducted to find lessons learned from the investigation result. Countries should have proper resources to rescue people. The first priority of maritime safety policy is prevention of marine accidents, and if the accident cannot be avoided, then the quickest search and rescue is the most important.
APPENDIX : UNESCO MARITIME TRANSPORT SAFETY QUESTIONNAIRE

In close collaboration with the Korea Maritime Institute, the Transport Division of UNESCO is implementing a project aiming at improving maritime transport safety in the ESCAP region. Under the project, a survey is being conducted to gather information about the current status and policy of maritime transport safety (passenger ship) in the selected member countries. The information collected through the survey will serve as the input towards the development of policy recommendation for the region.

Respondent’s Details

Country :

Name :

Title :

Organization :

Address :

Phone number :

e-mail :

Date of completing this questionnaire : ______________________ 2016

Please return the questionnaire by 22 July 2016 to Mr. Jeongsu Park, Transport Division, UNESCO
fax : +66-2-288-3050, email : park20@un.org

We thank you for your cooperation and contribution.
1. Information on the country’s maritime transport

1.1 Shipping company (As of 2015)

<table>
<thead>
<tr>
<th></th>
<th>Number of companies</th>
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<tbody>
<tr>
<td>1.1a. Cargo shipping</td>
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<tr>
<td>service</td>
<td>Ocean-going ( )</td>
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<tr>
<td></td>
<td>Domestics ( )</td>
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<tr>
<td>1.1b. Passenger shipping service</td>
<td>Ocean-going ( )</td>
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<td></td>
<td>Domestics ( )</td>
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1.2 Vessels (As of 2015)

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<td>Ocean-going ( )</td>
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<td></td>
<td>Domestics ( )</td>
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<td>1.2b. Passenger ship</td>
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<td>Ocean-going ( )</td>
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<td>Domestics ( )</td>
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1.3 Crew (As of 2015)

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<tr>
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<th>Number of crew</th>
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<td>1.3a. Officers</td>
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<td></td>
<td>Ocean-going ( )</td>
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<td>Domestics ( )</td>
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<td>1.3b. Ratings</td>
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<td>Ocean-going ( )</td>
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<td></td>
<td>Domestics ( )</td>
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<td>1.3c. Foreign crew</td>
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<td></td>
<td>Ocean-going ( )</td>
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<td>Domestics ( )</td>
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1.4 Routes of passenger ship (As of 2015)

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<tr>
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<th>Number of routes</th>
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<tr>
<td></td>
<td>Ocean-going ( )</td>
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<td></td>
<td>Domestics ( )</td>
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</table>

1.5 Passenger traffic (As of 2015)

|                        | Number of passengers |
|------------------------|                       |
|                        | Ocean-going ( )       |
|                        | Domestics ( )         |
2. Safety management administration

<table>
<thead>
<tr>
<th>2.1 National maritime safety policy</th>
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</thead>
<tbody>
<tr>
<td>2.1a. Does your nation set up a nation-wide maritime safety policy including implementing time table and budget?</td>
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<tr>
<td>☐ Yes ☐ No</td>
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2.1b. If you said ‘Yes,’ what’s the cycle to update/set up policies? (        ) years

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<thead>
<tr>
<th>2.2 Maritime safety organization in the government</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2a. Please describe your nation’s maritime safety-related organizations in the central and local governments. (If possible, please attach an organization chart)</td>
</tr>
<tr>
<td>- Name of the organization for <strong>prevention</strong> in the 4 phases of disaster management cycle: (                          )</td>
</tr>
<tr>
<td>- Name of the organization for <strong>preparedness</strong> in the 4 phases of disaster management cycle: (                          )</td>
</tr>
<tr>
<td>- Name of the organization for <strong>response</strong> in the 4 phases of disaster management cycle: (                          )</td>
</tr>
<tr>
<td>- Name of the organization for <strong>recovery</strong> in the 4 phases of disaster management cycle: (                          )</td>
</tr>
</tbody>
</table>

2.2b. Does your nation have a maritime police (or coastguard) organization?  
☐ Yes ☐ No

2.2c. If you said ‘Yes,’ what’s the relationship between the maritime safety organization and the maritime police (or coastguard) organization?  
☐ Under the same ministry  
☐ Independent organizations under the same ministry  
☐ Independent organizations under the different ministries
### 2.3 Vessel inspection organization

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3a. Does your nation have an authorized ship classification society (organization)?</td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>

2.3b. If your nation acknowledges a foreign international Recognized Organization (RO), specify the name of classification societies.

### 2.4 Vessel Traffic Service (VTS)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4a. How many places are VTS site in your nation?</td>
<td>( ) places</td>
</tr>
<tr>
<td>2.4b. How many Vessel Traffic Control Officers (VTSO)?</td>
<td>( ) persons</td>
</tr>
<tr>
<td>2.4c. Is a VTSO completed a VTSO training courses as required by IALA?</td>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>2.4d. Is there any organization to monitor navigation of passenger ship, besides VTS?</td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>

2.4e. If you said ‘Yes,’ please describe the monitoring organization.

( )

### 3. Passenger ship safety management system

#### 3.1 Safety management system

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1a. Is International Safety Management (ISM) Code or similar safety management system applied to domestic ships?</td>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>3.1b. Is International Safety Management (ISM) Code or similar safety management system applied to domestic passenger ship?</td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>
### 3.2 Passenger ship inspection

#### 3.2a. Who is responsible for inspection of passenger ships in international voyage?
- [ ] Government official
- [ ] Classification society’s inspector
- [ ] Others ( )

#### 3.2b. Who is responsible for inspection of passenger ships in domestic voyage?
- [ ] Government official
- [ ] Classification society’s inspector
- [ ] Others ( )

### 3.3 Passenger ship crew

#### 3.3a. How many stages are in your nation’s certificate of competency? ( ) stages

#### 3.3b. Is there any specialized certificate of competency for passenger ship officers?
- [ ] Yes
- [ ] No

#### 3.3c. How many days are required to complete passenger ship training courses?
( Basic course: ____ days / Advanced course: ____ days )

#### 3.3d. Are passenger ship crew required to receive “Leadership and Teamwork” training course as required by 2010 STCW convention?
- [ ] Yes
- [ ] No

#### 3.3e. Are domestic passenger ship crew satisfied with their sea career?
- [ ] Very satisfied
- [ ] Satisfied
- [ ] Average
- [ ] Not satisfied

#### 3.3f. Do you feel that the qualification and capacity of domestic passenger ship crew are adequate to fulfill safe operation in your country?
- [ ] Very satisfied
- [ ] Satisfied
- [ ] Average
- [ ] Not satisfied
4. Maritime casualties

### 4.1 Statistics of accidents in maritime shipping
(During the last 5 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean-going</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.2 Statistics of passenger ship accidents
(During the last 5 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean-going</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.3 Statistics of casualty (During the last 5 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.4 Cause of maritime accidents (Average in the last 5 years)

<table>
<thead>
<tr>
<th>Number of causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human factor</td>
</tr>
<tr>
<td>Defect</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>

5. Maritime accident investigation

#### 5.1 Maritime accident investigating organization

5.1a. Describe your nation’s maritime accident investigation organization in the government.

(Please attach an organization chart.)

5.1b. Does the maritime accident investigation organization belong to an integrated type which includes other road/aviation/railway investigation, or a single type which excludes others?

☐ Yes ☐ No
5.1c. Are the investigation organizations divided into investigate serious and non-serious accidents?
(Serious accident means the accident that more than 10 persons were dead or injured, or heavy oil pollution was occurred by ship.)

- Yes
- No

5.2 Maritime accident investigation process

5.2a. Please describe the name of organization to be notified when a maritime accident occurs in your country?

( )

5.2b. Has the IMO Casualty Investigation Code been applied to your national law?

- Yes
- No

5.3 Maritime accident investigator

5.3a. Number of maritime accident investigators: ( ) persons

5.3b. Are there set qualifications for a maritime accident investigator?

- Yes
- No

5.3c. Do maritime accident investigators share information and cooperate with other national organization when accident occurs with foreign vessel(s)?

- Yes
- No

5.4 Disciplinary acts against people responsible

5.4a. Is the maritime accident investigating organization separated from the disciplinary?

- Yes
- No
5.4b. Which organization is responsible for disciplinary actions against people responsible?

5.4c. How many times disciplinary actions have been taken out, compared with the total number of maritime accidents in 2015?

6. Search and rescue

6.1 Search and rescue organization

6.1a. Name of SAR (Search and rescue) organization in the government

6.1b. Is the oil pollution response organization included in the government SAR organization?

☐ Yes ☐ No

6.1c. Number of SAR teams: ( ) persons

6.1d. Number of SAR vessels: ( ) ships

6.1e. Number of SAR aircrafts: ( ) airplanes

6.2 Statistics of rescued vessels (During the last 5 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger ship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo ship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3 Statistics of rescued people (During the last 5 years)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crew</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Others

7.1 Please list the three main factors that you consider to be current obstacles to the safe operation of domestic passenger ships in your country.

1. 
2. 
3. 

7.2 If you have any other issues relating to the development of domestic passenger ships, please feel free to indicate them below;
REFERENCES


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Country report, each nation

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http://www.cruisemarketwatch.com/
http://data.worldbank.org/indicator/SP.POP.GROW