A Study on the “Future Global Supply and Demand for Seafarers and Possible Measures to Facilitate Stakeholders to Secure a Quantity of Quality Seafarers”

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Japan International Transport Institute and The Nippon Foundation
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1 Introduction

1.1 The background and purpose of this study

The growing shortage of seafarers has become an issue of global concern. This is especially evident in light of the recent rapid growth of the maritime industry. According to the influential BIMCO/ISF Manpower Update 2005 an anticipated shortage of some 27,000 maritime officers worldwide is forecasted by the year 2015. Various factors have been observed in the world economy between 2005-2010, which have influenced the future supply of seafarers. One is the increase in the number of ships needed to handle the increased global cargo movement due to new emerging economies, such as China and India. During this same time period we have also seen an easing up in the supply-demand situation due to such factors as cancellation of shipbuilding contracts and acceleration of ship scrapping following the Lehman economic shock in 2008. To better understand the prospects of the future demand/supply of seafarers there is a need for a more detailed study of how the various changes in world economy influence the maritime industry.

Due to the aforementioned circumstances, it has become a global agenda to tackle the problem of global shortage of seafarers so that maritime stakeholders can better secure the necessary quantity of high caliber young seafarers. The International Maritime Organization has already launched the “Go to Sea Campaign!” since 2008 in cooperation with some key members of maritime stakeholders as part of this agenda.

In the “Go to Sea Campaign!” it is pointed out that fewer young people are attracted to the seafaring profession and young seafarers want to move on to land-based jobs. The potential for greater female participation in the maritime business and the role of Corporate Social Responsibility are addressed as potential countermeasures.

In these circumstances, from the viewpoint of contributing toward sound development of the world shipping industry, we conducted a study on future global supply and demand for seafarers and possible measures to facilitate stakeholders to secure a quantity of quality seafarers.

1.2 How to steer the study

A committee was established for steering a study on future global supply and demand for seafarers and possible measures to facilitate stakeholders to secure a quantity of quality seafarers. This committee consists of the following members of Japanese experts from shipping industry, academic community and government:

(Chair) **M. WASHIZU**, President, Japan International Transport Institute (JITI)

(Academic community)

**Captain M. TSUGANE**, Professor, Department of Navigation, Tokai University

**S. YONEZAWA**, Professor, College of Economics, Nihon University

**S. SAKAMOTO**, Professor of International Law, School of Law, Kobe University
1.3 Records of the activities of the committee

The study was completed through the following three sessions of the committee:

<table>
<thead>
<tr>
<th>Session No. (Date)</th>
<th>Discussed agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st session (2 Dec. 2009)</td>
<td>How to put forward the study;</td>
</tr>
<tr>
<td>2nd session (11 March 2010)</td>
<td>Intermediate reporting;</td>
</tr>
<tr>
<td>3rd session (29 March 2010)</td>
<td>Final reporting.</td>
</tr>
</tbody>
</table>
2  Prospect for future global Demand/Supply of seafarers

2.1  Present situations around the world commercial fleets

Since 2002, the world economy had been grown rapidly. In particular, new emerging countries in economy such as BRICs had achieved outstanding economic growth. (See Fig 1) This great economic growth of the world had led to large expansion of world maritime cargo movement and eventually the total number of world commercial fleets had been enlarged. (See Fig 2 & 3) At the same time, a lack of seafarers, especially officers with competence certificates for commercial fleets, became significant and their wages also had gone up significantly. As a result, the lack of supply of seafarers in the short term market had become a serious concern. (Fig 4)

In such market conditions, suddenly the world financial crisis, the so called Lehman economic shock, occurred in September 2008 and the world economy fell down sharply.

(Note: Estimated figures are used after 2008.)

(Review 2008, Fearnleys)
Even after the financial crisis in 2008, the economic condition of new emerging countries has recovered smoothly and it is expected that the world economy will quickly recover to the level of that just before the Lehman economic shock.

On the other hand, although the shipping industry was affected by the financial crisis, the total number of completed shipbuilding projects in the world had a tendency to increase until around 2009 because of the time lag between order and completion. (See Fig 5)
Therefore the total amount of the world commercial fleets has expanded successively from 2005 to 2010, although certain shipping companies took actions such as cancellations of new ships (primarily on ships completed on and after 2011), acceleration of scrapping aged ships, lay-up, low speed operation, etc, responding to the crisis.

According to Lloyd’s Register-Fairplay, the number of ships as of January 2010 is 35,623. (Note: Size: 2000GT or greater, Ship types: Tanker, Bulk carrier and Dry Cargo/Passenger, excluding ships completed before 1950 and ships whose completion date are unknown.) (See Table 1)

Table 1  The number of ships by ship size(GT) and ship type

<table>
<thead>
<tr>
<th>GT</th>
<th>Tanker</th>
<th>Bulk Carrier</th>
<th>Dry Cargo/Passenger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000-4,999</td>
<td>2,432</td>
<td>367</td>
<td>6,185</td>
<td>8,984</td>
</tr>
<tr>
<td>5,000-9,999</td>
<td>1,454</td>
<td>374</td>
<td>4,206</td>
<td>6,034</td>
</tr>
<tr>
<td>10,000-49,999</td>
<td>3,444</td>
<td>6,249</td>
<td>5,976</td>
<td>15,669</td>
</tr>
<tr>
<td>50,000-99,999</td>
<td>1,436</td>
<td>981</td>
<td>1,461</td>
<td>3,878</td>
</tr>
<tr>
<td>100,000-149,999</td>
<td>248</td>
<td>145</td>
<td>104</td>
<td>497</td>
</tr>
<tr>
<td>150,000-199,999</td>
<td>499</td>
<td>37</td>
<td>20</td>
<td>556</td>
</tr>
<tr>
<td>200,000 and over</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>9,517</td>
<td>8,153</td>
<td>17,953</td>
<td>35,623</td>
</tr>
</tbody>
</table>

(Source: Lloyd’s Register – Fairplay, Oct. 2009)
2.2 Estimation on the demand for seafarers

2.2.1 Calculation on the demand for seafarers on 2010

If we calculate the demand for seafarers in 2010 with parameters set in Table 2 as assuming empirically that a back-up ratio is 50 %, the demand for seafarers in 2010 is estimated as shown in Table 3. It indicates that the demand for officers is 445,055 and 648,914 for ratings.

Table 2 Setting of standard manning numbers by ship type and size

<table>
<thead>
<tr>
<th>Ship Type</th>
<th>Officer Deck</th>
<th>Engine</th>
<th>Rating Deck</th>
<th>Engine</th>
<th>Catering</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000 – 7,999GT</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>VLCC</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>LNG Tanker</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>LPG/Chemical/Product Tanker</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Other Tanker</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Bulk Carrier</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Container</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Other Dry Cargo</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 3 An estimated demand for seafarers of the world commercial fleets in 2010

<table>
<thead>
<tr>
<th></th>
<th>2,000-7,999G T</th>
<th>8,000GT and over</th>
<th>Subtotal</th>
<th>Backup (50%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officer</td>
<td>103,192</td>
<td>193,511</td>
<td>296,703</td>
<td>148,352</td>
<td>445,055</td>
</tr>
<tr>
<td>Rating</td>
<td>128,990</td>
<td>303,619</td>
<td>432,609</td>
<td>216,305</td>
<td>648,914</td>
</tr>
<tr>
<td>Total</td>
<td>232,182</td>
<td>497,130</td>
<td>729,312</td>
<td>364,656</td>
<td>1,093,968</td>
</tr>
</tbody>
</table>

2.2.2 Prospects for the demand towards 2020

The transition of real GDPs from 2002 to 2010 (including estimated GDPs) is published by IMF. When we compare the annually averaged figures of real GDPs between the first half and second half of the decade from 2001 to 2010, we see a 14 % of decrease of annual GDP in five years’ average is found. On the other hand, the five-years’ averaged growth rate in number of the world fleet from the end of 2000 to 2004 is 0.8%. Taking into account both facts, we predicted that this figure 0.8% will also go down to the extent of the decrease in real GDP in a long term perspective. Therefore the annual average growth rate in number of the world fleet between 2010 and 2020 was set at 0.7%. With this figure, the number of the world fleet in 2020 was calculated. Then the demand for seafarers in 2020 was calculated by using this additional figure as empirically supposing the necessary number of seafarers by each ship type and size (See Table 2) and a back up ratio of 50%.(See Table 4).
Table 4  The predicted demand for seafarers in 2020

<table>
<thead>
<tr>
<th></th>
<th>2,000-7,999GT</th>
<th>8,000GT and over</th>
<th>Subtotal</th>
<th>Backup (50%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officer</td>
<td>110,647</td>
<td>207,492</td>
<td>318,139</td>
<td>159,069</td>
<td>477,208</td>
</tr>
<tr>
<td>Rating</td>
<td>138,309</td>
<td>325,554</td>
<td>463,864</td>
<td>231,932</td>
<td>695,795</td>
</tr>
<tr>
<td>Total</td>
<td>248,956</td>
<td>533,046</td>
<td>782,002</td>
<td>391,001</td>
<td>1,173,004</td>
</tr>
</tbody>
</table>

It was also evaluated to what extent the financial crisis occurred in 2008 affected the transition of the world commercial fleets. It was considered that following five elements could influence the transition and they were looked into respectively. As a result of this evaluation, it was evaluated that the influence by the financial crisis to the transition of the world commercial fleets was slight as a whole for a few years.

(1) Ship scrapping

- Usually the number of scrapped ships in annual is around 200 to 400 (See Table 5) and it relies on the market conditions largely.
- Scrapped ships are primarily aged ones and they are replaced with newly built ships.
- In 2009, following the financial crisis, the number of scrapped ships reached 947, but this number is just one third of the number of ships newly put into the market in 2009. (See Fig 5)
- The world economy is rapidly recovering (See Fig 1) so that it is expected the number of scrapped ships will decrease in near future and settle down to the usual range of the number between 200 and 400.
- Therefore the influence of the number of ship scrapping for a few years’ term just after the crisis to the number of the world commercial fleets is not large.

Table 5  Actual numbers of ship scrapping by ship type(2007 to 2009)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanker</td>
<td>132</td>
<td>123</td>
<td>173</td>
<td>428</td>
</tr>
<tr>
<td>Bulk Carrier</td>
<td>16</td>
<td>107</td>
<td>255</td>
<td>378</td>
</tr>
<tr>
<td>Dry Cargo/Passenger</td>
<td>84</td>
<td>165</td>
<td>519</td>
<td>768</td>
</tr>
<tr>
<td>Total</td>
<td>232</td>
<td>395</td>
<td>947</td>
<td>1,574</td>
</tr>
</tbody>
</table>

(Source: World Shipyard Monitor, Clarkson)
(Note: including ships of 2,000GT or less)

(2) Cancellation of orders of new shipbuildings

- Recently increasing cancellation is happening on ships which will be completed on
and after 2011. Therefore its influence has not appeared yet in the market.

- A large portion of the cancellation is related to ships of provisional holding which does not affect the actual trend in number of the world commercial fleets. (Usually shipowners would hesitate to cancel formal shipbuilding contracts because such cancellation could cause a big penalty on shipowner sides which costs almost as same as a the price of new ship and/or make the relationship with shipbuilders worse.)

- Therefore the influence of cancellation for a few years' term just after the crisis to the number of the world commercial fleets is not large.

(3) Change in ship type

- There are cases of changing in ship type, however, It does not affect a total number of ships completed.
- Therefore the influence of changing in ship type for a few years' term just after the crisis to the number of the world commercial fleets is not large.

(4) Lay up

- Lay up in the initial stage of falling down of the market climates is not a cold lay up, but primarily a hot lay up with seafarers on board.
- Therefore the influence of the number of lay up for a few years' term just after the crisis to the number of seafarers manned on the world commercial fleets is not large.
- And although the number of ships in lay up is usually around 200 and has increased up to 1,500 since the middle of 2009, the market conditions are rapidly recovering (See Fig 2) so that the number of ships in lay up will decrease and approach to the usual number in future.

(5) Low speed operation

- Low speed operation could cause the decrease in efficiency of operation, but the number of ships in operation is not changed by this substantially.
- Therefore the influence of introducing low speed operation to the number of seafarers manned on the world commercial fleets is not large.

As results of consideration in the previous paragraphs, it was estimated that the number of the world commercial fleets would increase up to 38,197 in 2020 (an increase of 2,574 to the number in 2010). (See Fig 6) As for the the demand of seafarers in 2020 corresponding to the above number of fleets, an additional 32,153 of officers and 46,881 of ratings would be necessary to the number of the demand in 2010. (See Table 4)

(Note: The demand in 2010 is 445,055 for officer and 648,914 for ratings.)
(Source of the data in 2010: Lloyd’s Register – Fairplay, Oct. 2009)

Fig 6  Prospects for future number of the world fleets until 2020
based on the actual number of the world commercial fleets in 2010

(Note1: Including ships of 2000GT and greater)
(Note 2: It is supposed that the number of the fleets would increase at the rate of 0.7% annually after 2010.)
2.3 Prospects for supply of seafarers

2.3.1 The balance on Demand/Supply from the viewpoint of wages

As aforementioned in paragraph 2.1, the lack of supply of seafarers in the short term market in 2010 had become a serious concern because the world commercial fleets were rapidly expanded since 2002, due to the outstanding increase in world cargo movement related to new emerging countries in economy such as BRICs. In such market conditions, suddenly the world financial crisis occurred in September 2008 and the world economy fell down sharply. As we look into the transition of wages of seafarers, the continued increase in seafarers’ wages was rapidly increasing from 2002 to 2008, suddenly turned down in 2009 and they seems going up again very slightly in 2010.

This means that the Demand/Supply gap was reduced temporarily in 2009, but this trend has not continued and appears to be broadening again very slightly. This indicates that supply and demand are sufficiently balanced for the immediate future. (See Fig 4)

2.3.2 The results of a questionnaire to and interview with maritime institutes regarding future supply of seafarers

In this study, an investigation by a questionnaire to and interview with maritime institutes (7 institutes) of the world (5 countries) regarding future supply of seafarers toward 2020 was conducted. (See Appendix 1)

Following institutes were selected as samples for investigation taking into account that these institutes are located in countries supplying seafarers or shipping countries.

- India: Tolani Maritime Institute (Private)
  Training Ship Chanakya, India Maritime University (Public, nautical course only)
- Philippines: NYK-TDG Maritime Academy (Private)
- Croatia: University of Split (Public)
- Republic of Korea: Korea Maritime University (Public)
- Japan: Tokai University (Private, nautical course only)
  Toba National Colledge of Maritime Technology (Public)

This investigation resulted in following knowledge:

(1) Attraction of seafarers

As for the ratio that students hope to be employed by international shipping companies as seafarers, the ratio in major countries supplying seafarers is greatly higher than those in shipping countries regardless of gender. And as regards the number of the entrants to each maritime institute, it is increasing in major countries supplying seafarers (i.e. Philippines) although it is decreasing in traditional shipping countries, in particular, Japan. Therefore it is possible to say that the attraction of seafarers as a vocation is higher
in major countries supplying seafarers and falling down in traditional shipping countries.

(2) Potential on supply of seafarers

As aforementioned in the above paragraph, the attraction of seafarers is kept higher in countries supplying seafarers compared with the other vocations. It is also clarified that maritime institutes could increase up their capacity of students in order to respond to a possible increase in the demand for seafarers as necessary. Furthermore, at the seventh "Japan Maritime Forum" held on 4th February 2010 by Japan Maritime Center, a representative from the government of the Philippines mentioned that his country could supply more seafarers to shipping industries in capacity toward future needs.

(3) Characteristics in supply of seafarers

Supply of seafarers is tightly associated with the scale of the world fleets which is linked with world economy’s climates. And it is very difficult to anticipate that the supply will get over the demand unless rapid diminution in scale of world commercial fleets continues for several years. This is caused by a time lag between a transition of the supply and that of other elements such as the world economy and the scale of world economy. Therefore it is considered that the supply of seafarers usually follows changes in demand and will be adjusted gradually. In case that the world economy continues to grow rapidly, there is a concern that shipping industries be faced with a lack of officers for dangerous goods carriers of large size.

(4) Situations around the supply of seafarers

Every year many students intending to become seafarers graduate from maritime institutes. However, at present, they need to be employed as cadets and get on board experience in order to take on a carrier-path for becoming officers. Here the capacity of cadets in the world relies on each shipping company’s strategy on human resource management and there is a large gap between both numbers of employed cadets and graduates from maritime institutes. In case that the graduates are not employed as cadets (for example, in Philippines), many of them firstly get on board as ratings through manning companies and wait for the promotion to officers as piling up the on board experience.

2.4 Prospects for world future Demand/Supply of seafarer toward 2020

Taking into account the consideration in the above paragraph 2.1 to 2.3, we reached the following conclusion:
“It would be necessary that an additional 32,153 of officers and 46,881 of ratings would be supplied from 2010 toward 2020.” (This is corresponding to about the increase of 7.2% to the supply of seafarers on 2010.) (See Fig 7)

Fig 7  Prospect for necessary global supply of seafarers to meet future estimated demand by 2020
3 Possible measures to facilitate stakeholders to secure a quantity of quality seafarers

In order to secure a quantity of quality seafarers stably for future, it is expected that greater young people than before will enter and work for shipping industry. Then we conducted an investigation by a questionnaire to students of maritime institutes and tried to grasp image and attraction of seafarers, which they would feel. The purpose of this investigation is to find the base of making it clear necessary and effective measures to attract young entrants into shipping industries. In addition to this investigation, we also focus on females as a potential source of supply of seafarers and investigated actual situations around females seafarers in shipping industry.

3.1 A result of investigation by the questionnaire to students of maritime institutes on attraction of seafarers

In this study, an investigation by a questionnaire to students of maritime institutes (12 institutes) of the world (6 countries) regarding attraction of seafarers as a vocation was conducted. (See Appendix 2)

The following institutes were selected as objects of investigation taking into account that these institutes are located in countries supplying seafarers or shipping countries.

In this investigation, the total number of students was 1,026. (See Fig 8)

- India: Tolani Maritime Institute (Private)
  - Training Ship Chanakya, India Maritime University (Public, nautical course only)
- Philippines: NYK-TDG Maritime Academy (Private)
- Croatia: University of Split (Public)
- Norway: Hofskolen Vestfold University College (Public)
  - Bergen Maritime VG Skole (Public)
  - Høgskolen Ålesund (Public)
  - Bodin Nautical College (Public)
- Republic of Korea: Korea Maritime University (Public)
- Japan: Tokyo University of Marine Science & Technology (Public);
  - Kobe University (Public);
  - Tokai University (Private, nautical course only)
<table>
<thead>
<tr>
<th>No. of students</th>
<th>Course of students</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPN, 369</td>
<td>No Response, 61</td>
<td>Female, 105</td>
</tr>
<tr>
<td>IND, 239</td>
<td>Engineer, 441</td>
<td>Male, 917</td>
</tr>
<tr>
<td>PHL, 117</td>
<td>Nautical, 524</td>
<td></td>
</tr>
<tr>
<td>KOR, 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRO, 34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOR, 67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 8  Profiles of the students

Through this investigation, the following knowledge was obtained:

(1) It is broadly said that promoting the importance and attraction of seafaring life and shipping from a young age is effective. However, a result of the questionnaire shows that the ratio of students who have had knowledge of seafarers and shipping prior to entering their institutes is only 32.7%. With this result and the fact that more than half the students made decisions on their entering their institutes by themselves, it can be said that there is a need to make further efforts in promoting seafaring life and shipping among children.

(2) A majority (72.6%) of students seemed to hope to become seafarers before entering their institutes (in high school days), however a certain portion of them (20.3%) changed their minds after they entered the institutes. This indicates the necessity of a certain maritime promotion on attraction of seafarers and shipping among students even after they have entered maritime training institutes.

(3) A majority of students from major countries supplying seafarers have a hope to be employed by shipping companies (in particular international shipping) or related companies. Their motives are not only to earn a living, but also to obtain good working conditions and the high status of the shipping industry. Therefore it is said that the attraction to become a seafarer as a vocation is high.

(4) Regarding the positive images of seafarers, they answered it is possible to obtain high wages, gain responsibility and satisfaction. On the other hand, as for the negative images, they pointed out the inconvenience peculiar to on board work such as lack of freedom and taking holidays.

(5) There were many opinions from students of major countries supplying seafarers that they do not recommend female junior students to enter maritime institutes because of lack of job opportunities, severe working conditions on board and a long term of duty on board.

(6) Even among the students hoping to become seafarers, about a half of students hoped
to move to a land based work in future. The reason behind this is “a life with family”. Therefore it seems that improvement in working style and conditions could lead to reduction in the ratio of drop outs from the seafaring vocation even among male seafarers. 

(7) Many students proposed improvement in working conditions as possible measures to increase seafarers. Improvements in image of seafarers and support to seafarers on land such as sufficient welfare and medical service including their family were also raised.

(8) Among issues for the shipping industry to improve, there were requests from the students to improve working conditions including wages as well as to enhance actions to lift up the level of perception of seafarers and shipping among the public.

3.2 Actual situations around female seafarers in shipping industry

Since the latter half of 1990s, shipping companies have been expanding employment of female seafarers although it had been considered previously that the ship was a males’ place to work. However according to the results of a survey on female seafarers conducted by ILO in 2003, a major ship type in which female seafarers worked was “ferry” and its ratio was 68 %. Following this, the ratio of “cruise ship” was 26%. Both ship types account for about 94 % and this means that the ratio of females in charge of maritime cargo transportation was merely 6%. Here, if we compare the ratio of officers and ratings between all genders and female only, the ratio of female officers is just 7% although the ratio of male officers is 42%. These facts means that the working places on board for female seafarers are still very limited relatively.

The International Transport Workers’ Federation (ITF) held the ”ITF Women Seafarers’ Meeting” in April 2005 in Barzil and the participants discussed the obstacles when women work on board as seafarers. At the meeting, it was reported that there were only 23,177 female members (5.8%) among 397,698 members registered in ITF at that time. Among these 23,177 female members, there were 345 officers and 1,398 ratings (including about 800 caterings) reported. As for the nationalities of the above 23,177 female members, Scandinavian countries of Finland, Sweden and Norway took up about 10,000. It was said many of them were working primarily on ferry boats.

In that meeting, problems for female seafarers working on board were also discussed and the following four points were raised up:

- Job opportunities, promotional prospects and discrimination of Women Seafarers;
- Harassment and Bullying;
- Family friendly policies, Maternity and Reproductive Health;
- Occupational health and safety.

In light with the problem of sex discrimination, we conducted interviews with female ex-seafarers who changed their job or resigned for a short term just after their employment. As a
result, it was pointed out that a big gap tends to occur between female seafarers’ dedication to work and actual duties entrusted by male seafarers because male seafarers became too much conscious and careful about female seafarers.

Finally we focused on answers from the female students (55 persons) among all answers to a questionnaire for the students and the following knowledge are found:

(1) About a half of female students hope to be employed by shipping (in particular international shipping) companies. Among them, 80% of female students intend to become seafarers. Therefore the potential that female students in maritime institutes become a source of supply of seafarers is considerably high and is expected that shipping companies expand employment of female students.

(2) More than 80% of female students having hoped to become seafarers are willing to move to a land-based work in the future. This figure is almost double to that of male students. By this fact, it shows the necessity to consider and to take certain measures in order that female seafarers are likely to wish to continue on board work.

(3) As for images on international shipping companies, there were unnegligible 20% of difference in the ratio of students who answered “Yes” to the questions on “Attractive life style” and ”Status is high” between a group of all genders and female. Namely the females’ ratio of answering “Yes” on these two questions items is about 20% lower than a group of all genders. This implies that it would be effective to improve their quality of life (such as working conditions and life style) in order to get female seafarers to work on board as long as possible. (Fig 9)

![Fig 9 Comparison of images to international shipping companies between all seafarers and women](Left: all seafarers(Men and Wemen), Right: Women only)
4 Conclusion

In this study, the demand for the world commercial fleets in 2020 was predicted by looking over the world economy in recent years and the number of seafarers in 2020 required for their operation was calculated as the demand for seafarers in 2020. As a result, we reached the following conclusion:

“It would be necessary that an additional 32,153 officers and 46,881 ratings would be supplied from 2010 toward 2020.” (This is corresponding to the increase of 7.2% to the supply of seafarers on 2010.) (See Fig 7)

Furthermore, in order to clarify and put in order possible measure to facilitate stakeholders to secure a quantity of high caliber seafarers, we conducted investigation by questionnaires to students and maritime institutes and by an interview to maritime institutes. As a result, possible measures were classified into following four subjects (i) to (iv):

(i) Improvement in attraction of seafarers;
(ii) Education, training and support to seafarers;
(iii) Greater female participation;
(iv) Policy making and dissemination of information.

We present a proposal on the possible measures to facilitate stakeholders to secure a quantity of high caliber seafarers as shown in Table 6. This table provides ten measures with some examples respectively.
Table 6 Possible measures to facilitate stakeholders to secure a quantity of quality seafarers

<table>
<thead>
<tr>
<th>Subject</th>
<th>Measures</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Improvement in attraction of seafarers</td>
<td>① Improvement in attraction of shipping industries</td>
<td>- Expansion of public relations activities by industry, government and NGOs; - Announcement of importance of shipping industry from primary education period; - improvement of the status of the shipping industry through CSR.</td>
</tr>
<tr>
<td></td>
<td>② Maintenance of working conditions of seafarers</td>
<td>- Ship’s accommodations; - Working style such as intervals of being on board.</td>
</tr>
<tr>
<td>(2) Education, training and support to seafarers</td>
<td>③ Maintenance of infrastructure/equipment in maritime institutes</td>
<td>- Introduction of various simulators for training.</td>
</tr>
<tr>
<td></td>
<td>④ Facilitation of collaboration between industry and maritime institutes</td>
<td>- Allocation to training institutes of staff with sufficient experience on board.</td>
</tr>
<tr>
<td></td>
<td>⑤ Establishment/expansion of financial support to maritime students</td>
<td>- Introduction of scholarship and student-loan.</td>
</tr>
<tr>
<td></td>
<td>⑥ Increase in opportunities for graduates from maritime institutes</td>
<td>- Introduction of training ships; - Expansion of a Cadet system.</td>
</tr>
<tr>
<td>(3) Greater female participation</td>
<td>⑦ Improvement of working situation for female seafarers</td>
<td>- Shortening of a term on board; - Manning to the types of ships other than ferry and passenger ships.</td>
</tr>
<tr>
<td></td>
<td>⑧ Introduction of a support system for female seafarers</td>
<td>- Support system for family during duty on board; - Addressing issue of loneliness on board due to low numbers of other females.</td>
</tr>
<tr>
<td>(4) Policy making and dissemination of information</td>
<td>⑨ Strategic consideration on dissemination of information</td>
<td>- Avoiding unnecessary fanning up of negative information for seafarers such as piracy and accidents; - Enhancement of dissemination of positive information such as good market conditions.</td>
</tr>
<tr>
<td></td>
<td>⑩ Making a clear national policy on seafarers and sharing information</td>
<td>- Successive implementation of a large scale of study on demand/supply of seafarers</td>
</tr>
</tbody>
</table>
Appendix 1

A template of questions to maritime institutes

In order to collect information on supply of seafarers for future, investigations by interviews and questionnaires with President/faculty staff in charge of employment of 7 maritime institutes of the 5 countries (India, Philippines, Croatia, ROK and Japan) were conducted. Followings are Items of questions by interviews and questionnaires:

.1 Items of questions by a questionnaire to maritime training institutes

Question 1. Describe your institute.
   (1) Provide us with the institute's name, and departments and courses of study for educating/training seafarers (Navigation/Engineering). In addition, give information on postgraduate courses of study, if such are provided.

<table>
<thead>
<tr>
<th>Name of institute:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Navigation course:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engineering course:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

(2) When was it founded?
   (        ) year

(3) How many students are there in each year of study at present?

<table>
<thead>
<tr>
<th>No. of students</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Question 2 Please provide us with information on the quotas of your institute.
   (1) What is the present quota?
(2) Have there been any changes during the post-establishment period of your institute?
1. Yes 2. No

(3) If you answered "1. Yes" in the above question (2), when and how were the latest changes made? What were the reasons?

<table>
<thead>
<tr>
<th>No. of quota</th>
<th>(   ) year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
</tr>
</tbody>
</table>

Reasons:

(4) Is it planned to change the quota in the future?
1. Yes 2. No

(5) If you answered "1. Yes" in the above question (4), when and how will changes be made? What are the reasons?

<table>
<thead>
<tr>
<th>No. of quota</th>
<th>(   ) year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
</tr>
</tbody>
</table>

Reasons:

Question 3. Please provide us with information on the number of applicants.

(1) How many applicants took recent entrance examinations (general entrance examination)?

<table>
<thead>
<tr>
<th>No. of applicants</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
</table>

(2) What do you think are the future trends of applicants taking the entrance examination (general entrance examination)?
1. The current trend will be maintained.
2. Increase.
3. Decrease.

(3) If you answered "2. Increase" in the above question (2), what is the reason behind your forecast of an "Increase". Please circle(s) the corresponding number(s). (Multiple answers allowed.)
1. Increasing international and national demand for seafarers.
2. National request (guidance).
3. Rising interest in seafaring profession within the nation.
4. Educational program more attractive that those of other educational institutes.
5. Better consolidation of educational/training facilities compared to other educational institutes.
6. Post-graduate prospects of employment are more attractive than those other educational institutes.
7. Others ( )

(4) If you answered "2. Decrease" in the above question (2), what is the reason behind your forecast of a "Decrease". Please circle(s) the corresponding number(s). (Multiple answers allowed.)
1. Decreasing international and national demand for seafarers.
2. National request (guidance).
3. Deteriorating interest in seafaring profession within the nation.
4. Educational program less attractive that those of other educational institutes.
5. Delayed consolidation of educational/training facilities compared to other educational institutes.
6. Post-graduate prospects of employment are less attractive than those other educational institutes.
7. Others ( )
Question 4. The following questions relate to the detailed teaching syllabus

(1) What aspects of education are stressed at present to foster officers and engineers? Please circle(s) the corresponding number(s). (Multiple answers allowed.)

<table>
<thead>
<tr>
<th>Detailed teaching syllabus</th>
<th>Officer</th>
<th>Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Liberal studies (Mathematics, English, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Navigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ship/cargo operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Laws and regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Safety management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Labor management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Training course using simulators, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Exercises and experiments, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Nothing in particular</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(2) If you answered "10. Others" in the above question (1), what is the detailed teaching syllabus in concrete terms?


(3) What detailed teaching syllabuses are to be stressed to foster officers or engineers in the future? Please circle(s) the corresponding number(s). (Multiple answers allowed.)

<table>
<thead>
<tr>
<th>Detailed teaching syllabus</th>
<th>Officer</th>
<th>Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Liberal studies (Mathematics, English, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Navigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ship/cargo operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Laws and regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Safety management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Labor management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Training course using simulators, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Exercises and experiments, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nothing in particular</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------</td>
<td>---</td>
</tr>
<tr>
<td>10</td>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>
(4) If you answered "10. Others" in the above question (3), what is the detailed teaching syllabus in concrete terms?

Question 5. The following questions relate to the careers of students who have graduated from the institute.

(1) Please provide us with the information available to you on students who graduated from the institute last year.

<table>
<thead>
<tr>
<th>Place of employment</th>
<th>Course at graduation</th>
<th>No. of male student</th>
<th>No. of female student</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. International Shipping Industry</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. Domestic Shipping Industry (Cargo carrier)</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Domestic Shipping Industry (Ferry)</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. Passenger Ship (International/Domestic)</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Off-shore installation such as rigs</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Others (Shipping companies)</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. Others (Other than Shipping companies)</td>
<td>Engineering</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
(2) What positive images of seafarers (Marine Technical Officers/Engineers) are held by students who graduated from the institute and who selected a seafaring job?
Please circle the corresponding number in each item from 1 to 7 respectively.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Not clear</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shipboard work gives greater responsibility and satisfaction</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Income is better than average</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Long vacations are available</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. International sense can be acquired</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. It is possible to go abroad</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Free from nuisances of shore work and life</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Because I have favorable impression of the sea</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

(3) What negative images of seafarers are held by students who graduated from the institute for seafaring education and training, and who decided to serve as shore-based office staff?
Please circle the corresponding number in each item from 1 to 7 respectively.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Not clear</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No freedom like that on land</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Physically heavier workload</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Difficulty to get married</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Difficulty to take holidays freely</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Difficulty to change to another job</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Poor treatment compared with heavy responsibilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Risk is involved at all times</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
What are the significant trends of students getting employment in ocean-going shipping companies in terms of type of employment from among those students having been employed in a seafaring profession? Please also advise the approximate proportion of such a group of graduates of the total?
1. Employment with a manning company on a contract basis.
2. Employment with a shipping company on a permanent basis.

<Proportion>
1. Contract basis (     ) %
2. Permanent basis (     ) %

Could you advise us of the main career plans of students having been employed in a seafaring profession? Please also advise the approximate proportion of such a group of graduates of the total?
1. In many cases they remain in a seafaring profession for a long period.
2. In many cases they tend to transfer to shore-based employment, after having served as seafarers for some time.

<Proportion>
1. Seafaring profession for a long time (     ) %
2. Transferring to shore-based employment (     ) %

What do you think is the reason why those graduates from the institute remain serving as seafarers for a long time? Please circle the corresponding number in each item from 1 to 6 respectively.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Yes</th>
<th>Not clear</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Responsibility and/or satisfaction</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. A relatively good salary</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Easy to take a long vacation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Acquisition of international sense</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Possible to go abroad</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Not annoyed by troublesome things of land</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Could you provide us with information on the major destinations of those graduates from the institute who took a seafaring job, and then transferred to shore-based employment.
1. Shore work in a shipping company
2. Shore work (manufacturers, underwriters, ship management companies, etc.)
3. Shore work in other industries
4. Others ( )

Question 6. What are the relationships with shipping companies?
(1) Are any classes (curricula) provided by a shipping company at its initiative?
1. Yes 2. No.

(2) If you answered "1. Yes" in the above question (1), what kinds of nation/area of the shipping company provided classes (curricula)?

<table>
<thead>
<tr>
<th>Location of shipping company</th>
<th>Asia</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td></td>
<td>EU</td>
</tr>
<tr>
<td>Other than Japan</td>
<td></td>
<td>Other than EU</td>
</tr>
</tbody>
</table>

No. of classes provided

(3) Could you advise if any students are receiving a scholarship from a shipping company?
1. Yes 2. No.

(4) If you answered "1. Yes" in the above question (3), what is the approximate number of students receiving a student loan in each school year?
About ( ) students

(5) Are there any graduates from the institute who are capable of boarding a ship as cadets?
1. Yes 2. No
(6) If you answered "1. Yes" in the above question (5), please advise the proportion of cadets allowed to come on board as cadets among the authorized number of students.
About (         ) %

Question 7. Could you provide us with your requests for the shipping industry and education and training for seafarers?

.2 Items of questions by an interview with President/faculty staff in charge of employment in maritime institute

(1) What is a future management plan including change of the capacity of your institute toward 2020?

(2) What are actual conditions around female students including the reason why female students or female seafarers are much less relatively?

(3) What are your measures to secure the entrants to your institute?

(4) What is the ideas/measures for securing young seafarers?

(5) What are the ideas/measures for securing female students?

(6) What is the request to your government?

(7) What is the request to IMO?
Appendix 2

A template of the questionnaire to students of maritime institutes

Question 1. Please fill in the following information.
(1) Name of your institute (      )
(2) Course name (                   )
(3) Year grade (   )th grade
(4) Year of age (   ) years old
(5) Gender ( Male Female )

Question 2. Please answer the questions below regarding your decision to enter your present institute.
(1) Did you have knowledge on seafarer's work, shipping companies before you entered your maritime institute?
   1. Yes  2. No

(2) Did you have experience with the ocean or ships before you entered the maritime institute?
   1. Yes  2. No

(3) If you answered "1. Yes" in the above question (2), what kind of concrete experience or knowledge did you have? Please answer in more detail.

Specimen answer: My father and some of my relatives were seafarers. In my childhood, I enjoyed playing onboard boats and yachts.

Question 3. What was your reason/motive for selecting your present institute?
(1) How did you first get knowledge of your present institute? Please circle(s) the corresponding number(s). (Multiple answers allowed.)
   1. I knew through my home-room teacher or tutor, etc.
   2. I heard from my parents or relatives.
3. I heard from senior students or friends.
4. I saw a website or pamphlet introducing the institute.
5. I attended my present institutes open campus.
6. I joined a seminar for choosing educational courses that introduced my institute.
7. I joined an open lecture or an experiential sea voyage.
8. I became interested by reading a book, a newspaper or magazine.
9. I lived near the institute and was attracted by its activities.
10. Others (  )

(2) When did you finally decide to take the entrance examination for the Institute? Please circle the only one corresponding number.
1. 1st grade of junior high school
2. 2nd grade of junior high school
3. 3rd grade of junior high school
4. 1st grade of high school
5. 2nd grade of high school
6. 3rd grade of high school
7. Others (  )

(3) When you decided to take the entrance examination of the present institute, whose opinions did you take as reference? Please circle(s) the corresponding number(s). (Multiple answers allowed.)
1. Parents
2. Brothers/sisters
3. School teachers
4. Friends and acquaintances
5. Decision was made by myself without referring to what others said.

(4) When you finally decided to enter the present institute, were you influenced by any advices by someone? Please circle the only one corresponding number.
1. Parents
2. Brothers/sisters
3. School teachers
4. Friends and acquaintances
5. Decision was made by myself without referring to what others said.

(5) Did you choose the present course in the present institute while intending to become a seafarer?
1. Yes
2. No.
(6) If you answered "1. Yes" in the above question (5), when did you decide in your mind to become a seafarer? Please circle the only one corresponding number.
1. 1st grade of junior high school
2. 2nd grade of junior high school
3. 3rd grade of junior high School
4. 1st grade of high school
5. 2nd grade of high school
6. 3rd grade of high school
7. Others ( )

(7) If you answered "2. No" in question (5), write the first reason why you chose the course of the institute which you belong at present.

Reasons:

Question 4. Regarding your student life.

(1) Are you satisfied with the institute itself overall? Please circle the only one corresponding number.

(2) If you answered "3. Not satisfied so much" in the above question (1), write the reason why you chose it.

Reasons:

(3) Would you recommend young persons to attend your present institute? Please circle the only one corresponding number, and state the reasons.
1. It is recommendable.
2. It is kind of recommendable.
3. Not recommendable so much.

Reasons:
Question 5. Plans for future employment.

(1) What is your purpose for getting a job? Please circle the only one number indicating the most important reason for you.
1. To make use of one's own knowledge and ability.
2. To earn a living.
3. To contribute to society.
4. Others ( )

(2) What kind of business/industry do you wish to choose for future employment? Please circle the only one corresponding number.
1. Shipping industry
2. A land-based company related to ships/shipping
3. Fishing industry
4. Shipbuilding/ship machinery industry
5. Manufacturers other than the above number 4
6. Information related industry
7. Finance company/ insurance office
8. Governmental office
9. Others ( )

(3) If you did not answer "1. Shipping industry" in the above question (2), what is the reason that you do not want to choose the shipping industry as your vocation? Please give a candid answer.

Reasons:

(3) Regarding the above question (2), what is the reason of your selection? Please circle(s) up to three corresponding number(s). (Multiple answers allowed.)
1. Possible to make use of my specialized knowledge learned in the institute
2. Possible to make use of my qualifications
3. Suitable for my ability and/or aptitude
4. Better than other companies in terms of salary
5. Stable without a concern of unemployment or bankruptcy
6. It is possible to contribute to society.
7. It is good for me from the viewpoints of working hours, holidays and welfare.
8. It is a famous and big company.
9. There are lots of future possibilities in that industry;
10. Rapid promotion based on performance-based evaluation system of personnel
11. Specific working location near my historical community and no transference
12. A high status and good image of the company in society
13. Wishes of my family and relations
14. Others ( )

Question 6. The following questions are to be answered by those who selected "1. Shipping company" to Question 5 (2).

(1) Which type of shipping industry do you want to choose as your vocation? Select and circle only one number applicable, and state the reasons.
   1. International shipping for cargo transport
   2. Domestic shipping (Cargo carrier)
   3. Domestic shipping (Ferry)
   4. Passenger ship (International or domestic)

   Reasons:

(2) Which do you prefer as your vocation, a seafarer on board a vessel or an official on land?
   1. A seafarer on board a vessel  (Go to Q7.)
   2. An official on land  (Go to the next (3.).)

(3) This is the question only for the person who chose "2. An official on land" in the above question (2), What is the reason that you do not want to choose the work of seafarers despite that you choose a shipping company as your working place?

   Reasons:
Question 7  This is the question only for the person who chose "1. A seafarer on board a vessel" in Question 6 (2).

(1) Why did you choose "1. A seafarer on board a vessel"? Please circle(s) the corresponding number(s). (Multiple answers allowed.)
1. Because it’s my dream since my childhood.
2. Because I want to make use of knowledge and techniques learned in the institute.
3. Because I love the sea and ships.
4. Because the salary for seafarers is better than other businesses.
5. Because it is worthwhile work.
6. Others reasons (                )

(2) When did you decide to choose the work of seafarer, before or after entering your present seafaring institute?
1. Before entering my present institute
2. After entering my present institute

(3) If you answered "2. After entering my present institute" in the above question (2), why do you decide so after entering your present institute ?

Reasons:

(4) When do you intend to reach the following grades of officer in your future career? And how much is your expected annual income respectively?

Fulfill the following blanks.
➢ By (        ) years old, Second Officer/engineer, the expected annual income is US$ (      );
➢ By (        ) years old, First officer/engineer and the expected annual income is US$ (      );
➢ By (        ) years old, Captain/Chief engineer and the expected annual income is US$ (      );

(5) Are you thinking of transferring your sea-going profession to shore-based one in the future?
1. Yes  2. No
(6) The following questions are directed to those who selected "1. Yes" to above question (5). To what type of company/organization would you like to transfer in the future? Select only one question applicable and circle it.

1. Shipping industry
2. A land-based company related to ships/shipping
3. Fishing industry
4. Shipbuilding/ship machinery industry
5. Manufacturers other than the above number 4
6. Information related industry
7. Finance company/insurance office
8. Governmental office
9. Others (  )

(7) The following questions are directed to those who selected "1. Yes" to Above Question (5). At what rank would you like to transfer to other shore-based company/organization? Select and circle only one number applicable, and state the reasons.

1. Up to Second Officer/Engineer
2. Up to Chief Officer/Engineer
3. Master/Chief Engineer
4. Others (  )

Reasons:

Question 8. Regarding the image of shipping companies and seafaring.

(1) What is your image of shipping companies of your nation? Please circle the corresponding number in each item from 1 to 5 respectively.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Not clear</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attractive life style</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. High possibilities for self development</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Attractive conditions (good salary, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Contribution to society</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Status is high</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
(2) What is your image of shipping companies of foreign nation? Please circle the corresponding number in each item from 1 to 5 respectively.

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>1. Attractive life style</td>
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<tr>
<td>4. Contribution to society</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>5. Status is high</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

(3) What are the good images of seafarers? Please circle the corresponding number for each item from 1 to 6 respectively.

<table>
<thead>
<tr>
<th></th>
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<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Responsibility and/or satisfaction</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. A relatively good salary</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Easy to take a long vacation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Acquisition of international sense</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Possible to go abroad</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Not annoyed by troublesome things of land</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

(4) What are the negative images on seafarers you consider? Please circle the corresponding number for each item from 1 to 6 respectively.

<table>
<thead>
<tr>
<th></th>
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<th>Not clear</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No freedom like that on land</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Physically heavier workload</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Difficulty to get married</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Difficulty to take holidays freely</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Difficulty to change to another job</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Poor treatment compared with heavy responsibilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
(5) What do you feel about the circumstances of actual employment of your senior classmates who are graduating? Please circle on the corresponding number in each item from 1 to 5 respectively.

<table>
<thead>
<tr>
<th></th>
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<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lots of employment opportunities with favorable companies</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Lots of employment opportunities with a satisfactory salary level</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Many tentative decisions of employment are provided by shipping companies</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Many students are choosing to pursue advanced education</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Many seniors are changing jobs</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Question 9. The following questions relate to your wishes or opinions regarding the shipping industry and seafarers

(1) What information on the shipping industry and seafarers do you want to obtain in the course of job hunting? Please give concrete description.

Ex. employment system

(2) It is said that the key subject in world shipping industry is to secure a stable quality and quantity of seafarers in the long term perspective. What do you think about how the maritime field can increase the number of quality seafarers? Please circle(s) the corresponding number(s). 

(Multiple answers allowed.)
1. To increase employment opportunities in shipping companies
2. Further support by governments
3. To increase promotional campaigns to attract young people
4. Improvement of seafarers' lifestyle, such as offering a higher salary, and introduction of internet on board, etc.
5. Expanding the opportunities for seafarers to work on land during their career by making use of their specialized knowledge and experience
6. Increase the participation of woman in seafaring
7. Others (  )

(3) Do you have any comments on how to better secure a larger quantity of quality seafarers in your country and in the world?