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## The research on Chinese ocean-going seafarers' mental health and its impacts on navigation safety

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**WORLD MARITIME UNIVERSITY**

Dalian, China

**THE RESEARCH ON CHINESE OCEAN-GOING  
SEAFARERS' MENTAL HEALTH AND ITS  
IMPACTS ON NAVIGATION SAFETY**

By

**XIE WENQING**

**The People's Republic of China**

A research paper submitted to the World Maritime University in partial  
Fulfillment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**In**

**MARITIME SAFETY AND ENVIRONMENTAL MANAGEMENT**

2018

## **DECLARATION**

I certify that all the materials in this research paper that are not my own work have been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

Signature: Xie Wenqing

Date: 28th June 2018

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## ABSTRACT

Title of Dissertation: **The Research on Chinese Ocean-going Seafarers' Mental Health And Its Impacts on Navigation Safety**

Degree: **MSc**

Seafaring is related with special mental, psycho-social and physical stressors, which are quite different from those ashore. Mental health is an important part of a happy life, and also a prerequisite for fulfilling one's job. In order to address the issue of seafarers' well-being and particularly their mental health, the theme of the coming "Day of the Seafarer 2018" on 25<sup>th</sup> June is chosen as "seafarers' well-being" by IMO. One particular purpose for this campaign is to inform specific strategies to tackle stress and other issues affecting seafarers' mental conditions.

According to the Annual Report of China Seafarers' Development Report-2016 issued on 24<sup>th</sup> June, 2017 by the Ministry of Transport (MOT), China is the largest one in the world in terms of the seafarer quantity. However, as stated in the report, China has not upgraded to the strongest one in terms of seafarer's quality. Chinese seafarers are not as competitive as of those traditional shipping powers in terms of English communication ability, obedience, and mental health.

This paper expounds the mental characteristics of the seafarers, analyses the causes of mental problems and introduces the regulating measures with the aim to improve the overall mental health of Chinese seafarers and the safety level of marine navigation.

**KEY WORDS:** Seafarers, mental health, navigation safety, convention, regulation.

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## LIST OF ABBREVIATIONS

China MSA	Maritime Safety Administration of the People's Republic of China
CSU	Chinese Seaman's Union
DPI	Disposable Personal Income
ECDIS	Electronic Chart Display and Information System
EQ	Emotional Quotient
GMDSS	Global Maritime Distress and safety System
Hs	Hypochondriasis
ICESCR	International Covenant on Economic, Social and Cultural Rights
ILO	International Labour Organization
IMHA	International Maritime Health Association
IMO	International Maritime Organization
ISM Code	International Safety Management Code
MLC	Maritime Labour Convention
MOT	Ministry of Transport
MMPI	Minnesota Multiphasic Personality Inventory
NBS	National Bureau of Statistics
NSM Code	National Safety Management Code
NM	Nautical Mile
OCD	Obsessive Compulsive Disorder
PSC	Port State Control
SCL-90	Symptom Check List 90
SI	Social Introversion
SMS	Safety Management System

## CHAPTER 1

### INTRODUCTION

#### **1.1 Mental Problems-An invisible killer of seafarers' health and navigation safety**

Seafaring is a dangerous working activity with particular characteristics and is performed in specific contexts from a physical and psycho-social point of view. Nowhere has this been better expressed than by the International Maritime Health Association when it says "It has been established that seafaring is one of the most physically demanding professions in one of the most dangerous work environments: the sea" (IMHA., 2012). It's no doubt that seafaring is really one of the most dangerous occupations in the world. However, if we could dig to the depth, we can find that seafaring is not only the most physically demanding profession as expressed by IMHA, but also the most psychologically demanding one (Robert, T. B., 2012).

Work-related stress affecting seafarers has particular characteristics often different from stress that can be experienced in other working activities. As seafarers live and work in the special environments of ships for a long time, the interaction of many complicated stressors weakens the mental quality of the ocean-going crew and leads to the frequent occurrence of the psychological problems of the crew. International Maritime Organization (IMO) statistics reveal that 80% of accidents onboard cargo ships are caused by the human factor. And these accidents caused by human factors are mainly triggered due to mental or physical problems of the seafarers. The environment of the ship has a great influence on the physical and psychological conditions of the seafarers. Highly stressful and exhausting working conditions on

ships can lead to depression, insomnia, various types of cancer, cardiovascular, communicable, blood-borne and sexually transmitted diseases. Seafarers have higher hospitalization and mortality rates than age-matched peers, due to exposure to unique occupational health risk factors (Andruskiene, J., Barseviciene, S., and Varoneckas, G., 2016).

In general, seafarers' mental problems have some typical features:

1. Patternized and programmed mental behavior. Since the rank, position and division of labor on board are fixed, once the position has been determined, the nature and scope of the work are also determined for the seafarers. Therefore, once the seafarers get onboard, they play almost the same role no matter when they are on-duty or off-duty. This makes their behavior being patternized and programmed and easily leads to psychological problems, which are contrary to the role change requirements advocated in psychological theory.

2. Stress syndrome and mental fatigue. Occupational factors, such as high work stress, job demand, and lack of support and physical hazards are related with severe and long term fatigue (Wadsworth, E., & Allen, P., etc. 2008). With the development of the ship in the direction of large-scale, modernized and highly automated, the manning level on board is reduced, seafarers have to face more workload and pressure than before. Also, they have to deal with all kinds of strict inspections, and sometimes they will encounter pirates and mechanical failures, accidents and other emergencies. All of these factors have kept seafarers in a state of psychological tension for a long time. In the long run, the seafarers are trapped in slow response, confusion, panic and other psychological disorders.

3. Frequent mood fluctuation. Most seafarers can keep stable mood state at their first three service months onboard. However, three months later, many of them will get into the so-called "ocean-going syndrome", which is featured with emotional instability, decreased physiological activity, irritability, sleep obstacles, decreased

ability, increased home-sick, and obvious sense of job burnout, etc.

The International Maritime Organization (IMO) has been working hard for the goal of "safer and cleaner shipping". Many international organizations and governments have also paid more and more attention to the role of human factors in maritime safety. As early as 2001, the representatives of United States submitted the proposal on the topic of how to perfect and guarantee the physical and mental health of the crew to IMO, they proved that one important invisible killer of navigation safety was the mental problems of the crew.

According to the Annual Report of China Seafarers Development Report-2016 issued on 24th June, 2017 by the Ministry of Transport (MOT), until the end of 2016, there were 1,392,751 registered seamen in China, including 672,961 ocean-going seafarers and 719,790 inland river ship crew, making China the biggest one in the world in terms of the seafarer quantity (MOT., 2017). But as stated in the report, China has not upgraded to the strongest shipping country in terms of seafarer's comprehensive qualities. Chinese seafarers are not as competitive as of those traditional shipping powers in terms of mental quality, obedience, and emergency response. In the analysis of 100 randomly selected ship accidents in 2009 and 2010, about 60% were caused by the low mood and low attention of the crew due to various mental and ideological problems (Zhou, J., 2010).

## **1.2 Objectives of the research**

Basically, there are 4 main purposes of this research. The first one is to illustrate the association between the mental health and navigation safety. This purpose will be demonstrated mainly via maritime accidents analysis. The second one is to explore the causes of mental problems. The exploration will focus on the special working and living environment of seafarers and some typical occupational risks in seafaring. The third one is to propose approaches and solutions to improve mental quality of Chinese seafarers. These proposals are presented from the angles of the seafarers themselves,

the shipping industry, the maritime administrating authorities and other interested parties. The last purpose is to draw the attention to the mental quality of seafarers.

### **1.3 Methodology**

In this essay, the paper mainly uses the case-study method to explain the typical mental problems of Chinese seafarers, the negative consequences of these problems and try to analyse the causes of these problems from the perspectives of psychology, economics and public administration. Also, in the essay, literature review method will be used to make an introduction of the IMO documents and China national instruments concerning the well-being of seafarers, and analyse the shortcomings of the existing laws and regulations framework in solving the problems, and to make a comparison on the practices of right protection of Chinese seafarers and other traditional powerful seagoing countries. Theoretical analysis also will be deployed in the process of proposing solutions.

### **1.4 Structure of dissertation**

This research paper consists of six chapters. Chapter one is the introduction of the whole paper, it introduces the core focuses of the paper and introduces the main objectives as well as the research methodology of the paper. Chapter two demonstrates the interrelationship between mental quality and navigation safety; analyses the causes of maritime accidents through case-study. Chapter three illustrates the mental quality condition of Chinese ocean-going seafarers through the PGWBI questionnaire, SCL-90 and MMPI tests, combs through the existing laws and regulations regarding the protection of the well-being of seafarers, points out the existing problems and deficiencies. Chapter four explores the causes of mental problems from subjective and objective points of view. Chapter five focuses on the solutions to improve the mental quality of Chinese seafarers from multiple dimensions, perspectives, and levels: the seafarers themselves, shipping industry, government bodies, IMO and other related Administrations. The last chapter gives the overall summaries and conclusions of the research paper.

## CHAPTER 2

### **Mental Quality and Navigation Safety-Closely Connected**

#### **2.1 Introductory Remarks**

How to prevent maritime traffic accidents has been an important issue for both the shipping industry and the maritime Administration for hundreds of years. Although all kinds of management systems and safety rules have been established, all kinds of inspections and supervisions are more and more strict, and all kinds of advanced navigation equipments have been developed and put into use, safety accidents still occur from time to time all around the world. Just in one year of 2016, there were 14 serious maritime accidents (  $\geq 5$  deaths/missing persons) took place in China, recording 126 deaths/missing persons. According to the accident investigation reports, 13 of the 14 accidents were caused due to human factors (China MSA, 2017). Although the proportion of maritime traffic accidents caused by human factors is changing every year, it is always ranking at the top in general. It has been commonly recognized that about 80% of the marine accidents are caused due to human factors. And as numerous researches revealed, mental problems of the seafarers take a key part of the human factors. It's justifiable to draw the conclusion that mental quality is closely connected with maritime traffic safety.

Marine environment has a great influence on the seafarers' physiology and psychology. The special working and living environment is a hard exercise and test for every crew member. In order to ensure the safe operation of the ship, it is vital to maintain a healthy body and mind for every seafarer. Because of the particularity of marine navigation, seafarers have to face all kinds of unpredictable complicated

situations and dangers in the course of navigation. In most cases, when there is an emergency or distress, they are required to respond and take the right measures within the shortest possible time. So, seafarers' capability and quality in dealing with emergent events is the "last line of defence" to ensure the safety of life and property at sea. In general, seafarer's capability and quality consists of vocational ability, professional ethic, mental quality, etc. And according to the modern psychological theory, mental quality is the comprehensive embodiment of personality, mental ability, mental motivation, mental health and psychogenic behavior of a person (Hu, D. L. & Xiao, Y. M., 2011).

## **2.2 Requirements on the Mental Quality of Seafarers**

Among different activities and vocations, seafaring is characterized by particularly high levels of stress. Seafarers are exposed to stressful conditions, some inevitably related to their activity like noise, vibrations, interrupted sleep, etc, and other more subjective (individual capacity to endure loneliness, attitude to resilience, etc). Both the objective and subjective aspects may impact their capacity to cope with work and may lead to mental problems. Therefore, being a qualified seafarer, he should persist in good mental quality and capacity in following 3 aspects.

### **2.2.1 Requirements on emotional quality**

Seafarers should have healthy emotions. They should be able to correctly understand and treat themselves, environment and society. They must adapt to the complex environment on board, and keep appropriate emotional reactions and fluctuations. They should maintain a stable state of mind and be optimistic and cheerful when facing difficulties. Seafarers should be flexible, responsive, adaptable, confident and sociable when dealing with complex environments and relationships. In conclusion, good emotional quality is helpful for seafarers to cope with complex and special environment, improve work efficiency and ensure navigation safety.

### **2.2.2 Requirements on intellectual quality**

In the event of an emergent situation, seafarers, especially the officers (captain, chief officer, chief engineer, etc.), need to have accurate predictive ability, keen observation, concentration, flexible and quick thinking, logical reasoning and fast operation ability, scientific decision making and correct commanding ability.

### **2.2.3 Requirements on volition quality**

Volition (e.g. consciousness, decisiveness, tenacity, self-control capacity, etc.) is very important for seafarers to remove external spiritual interference, and to deal with the complicated environment and unexpected situations in time and decisively. Consciousness is a sense of responsibility and being able to keep an eye on all situations within the scope of one's duties. Decisiveness is to deal with problems boldly. In the face of complex sailing environment and ship accidents, seafarers on duty need to seize the opportunity and make up their minds so as to eliminate the danger in the most efficient way. The tenacity of crew members is the determination and perseverance to overcome all kinds of difficulties, and the tenacious spirit of daring to break through difficulties and obstacles. Self-control capacity is the ability of which seafarers, especially officers should always maintain to make the right decision when facing confusion and interference caused by complex factors.

## **2.3 Maritime Traffic Accidents Caused by Typical Mental Problems**

### **2.3.1 Fluke mind**

Fluke mind here refers to the subjective judgment that the seafarers believe that adverse consequences will not occur when an operation can lead to both positive and negative consequences. That is to say, any seafarer who knows that the operation is dangerous, but still takes risks, can be regarded as having a fluke mind. Risky behavior driven by fluke mind usually results in accidents or other unexpected emergency. Fluke mind usually gives seafarers the wrong direction to violate rules and regulations. Although it may be successful, accidents and dangers can not be avoided in long run. For example, on June 28, 2002, the British passenger ship "M/V

Pride of the Dart” carrying 27 passengers and crew left Port Torbay and travelled to Port Dartmouth. The off-course captain approached the Mew Stone rocks, about 1.5 chains off shore, and decided to pass between the shore and the rocks so that passengers could see the roaring seal on the rocks. The captain was aware of the danger of hitting the rocks, but thought he could make it. After approaching the rocks, the captain realized that the tide was too high, and the rocks were down, passengers could not see the seal. So he intended to turn to port to go to the seaward side of the rocks. But due to malfunction of the steering, the captain was unable to turn to port, he reverted to his original intention to travel through the narrow passage between the rocks and the mainland. A few minutes later, “M/V Pride of the Dart” grounded the rocks. In this accident, the captain knew that there was a danger of grounding when moving too close to the rocks, but he still took risks under the driving of fluke mind (MAIB, UK, 2003).

### **2.3.2 Over-confidence and carelessness**

Over-confident seafarers usually think the job is too simple and there will be no danger. Over-confidence is often associated with carelessness. Under this kind of mind state, seafarers will go into absent-minded state, and carry out their duties against to their experiences and habits but not the procedures and guidelines. Usually, they will not be aware of the abnormal situation. When there is a sudden change in the normal conditions, because of no psychological preparation, they are quite likely to be panic-stricken and unable to take effective measures to counter down the emergency and finally cause an accident. For example, on April 1, 2017, “M/V Wu Hu X<sup>1</sup>” ran into the lower-grade waterway by mistake on her way from Foshan, Guangdong, to Qinglan, Hainan. The bow mast and the third floor of the bridge subsequently collided the Lianxi bridge across the waterway. Lianxi bridge and the ship’s bridge were damaged and 1 seafarer was seriously injured in this accident. The total direct economic loss was about 30 million RMB. China MSA efficiently completed the

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<sup>1</sup> In order not to disclose the company’s information, “MV Wu Hu X” is not the real name of the concerned accident.

investigation of this accident in following days. As the report of investigation revealed, the captain of “M/V Wu Hu X” confessed he was familiar with the waterway, and he had rich experience of navigation from Foshan, Guangdong, to Qinglan, Hainan. So, there were no plans for navigation in advance, the captain claimed he had checked the track of the electronic chart the day before the voyage. And the captain believed that the waterway was straight and there were few ships around, no problem would happen. So, the captain ordered to proceed at full speed and did not often check ship’s position to keep her on a scheduled course until the accident took place.

### **2.3.3 Psychological subjection and herd mentality**

The psychological subjection is mostly formed under the pressure of some kind of power or higher level. Subordinates are likely to compromise or give up principles before power or higher level officers. Herd mentality refers to a person who is influenced by the behavior of others and who behaves in accordance with public opinion or the majority of people without his own perception, judgment, or understanding (Zheng, S. F., 2010). These two similar mental problems have certain infectivity among the seafarers, which may seriously threaten the safety of navigation if no one follows the professional judgement but only follows like sheep. For example, on January 22, 2012, “M/V YB<sup>2</sup>” (a RO-RO passenger ship) was on her way to Qingdao Port at dead slow ahead. At 1025, after passing by the Buoy No. 1, the visibility was poor, there were many small boats on the waterway, and the captain neglected to control the ship's position in the course of avoiding small boats. At 1040, one cadet 3/O checked the vessel at position (true bearing of Tuandao at 127, distance 1.2 nm). Three minutes later, another 3/O checked the ship's position (true bearing of Tuandao at 127, distance 1.43 nm). Although the two positions confirmed each other, the captain, relying on his familiarity with Qingdao Port and the illusion of his position after avoiding the small boats, subjectively thought that the positioning of the two 3/Os were wrong. The captain asked the two 3/Os not to bother him, and even not

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<sup>2</sup> In order not to disclose the company’s information, “MV YB” is not the real name of the concerned accident.

double checked the ECDIS, but kept on the wrong course. The two 3/Os, knowing the captain was wrong, but gave up their correct judgement. 30 minutes later, “M/V YB” grounded at the shoal near the main waterway of Qingdao Port with bottom hull damaged.

#### **2.3.4 Excessive tension and stress**

When an emergency or an unconventional state of the ship occurs, the workload increases suddenly, which will cause great mental pressure on the crew, make their brain overloaded, and will reduce seafarers’ emergency handling capacity significantly. Seafarers under excessive tension and stress are more likely to make mistakes or even lead to maritime accidents. For example, on December 31, 1998, M/V Columbus Canada sailed outward from the Galveston Bay entrance channel and M/V Black Sheep entered the channel sailing inward, the two ships were heading in opposite directions on the same channel. At that time, there was fog at sea and the visibility was poor. As the two ships approached each other, the captain of the M/V Black Sheep observed the course of M/V Columbus Canada on radar and became over-sensitive because of excessive tension, feeling that M/V Columbus Canada was turning port to his course. In order to prevent the illusory collision, the captain of the M/V Black Sheep ordered turn to port. Soon later, the two ships collided near the No.3 Buoy of the channel. The accident investigation finally confirmed that M/V Columbus Canada did not turn to port and was still on the right side of its waterway, the feelings of the captain of M/V Black Sheep were completely illusory because of tension and stress, which eventually led to the accident (USCG, 1999).

#### **2.3.5 Relying and depending psychology**

Relying and depending psychology is another commonly seen mental problem of seafarers, especially among ratings. The problem could be reflected in such a way onboard: for some junior seafarers or ratings, when there is a second person around them, they are usually used to relying on him to do things or make decisions, and they blindly think that the people around them should help them solve the problem rather

than do it themselves. One typical case is that when there are several seafarers on duty for look out, seafarers with relying and depending psychology may expect others to maintain a good look out and neglect their own responsibility. For example, on December 11, 2004, “M/V Yellow River X<sup>3</sup>” bounded to Philippines after loading at Zhenjiang, China. After leaving Yangtze River Estuary at noon the next day, “M/V Yellow River X” changed to heading 180 degrees south, at the speed of 13 knots. At that time the weather was fine, visibility was good, rare ships nearby. At about 1300 pm, the on-duty sailor, after obtaining permission from the duty officer, went to the compass deck to perform maintenance work with four other sailors, leaving the officer on duty. At about 1330, the on duty officer found a container ship (M/V J<sup>4</sup>) would be caught up at about 60 degrees from the port side, about 5 nautical miles away. According to radar plotting, the course of “M/V J” was about 210 degrees and the speed was 15 knots, and the on duty officer thought that “M/V J” would keep away from him when overtaking. So the on duty officer decided not to pay attention to the ship “M/V J” and thought that if “M/V J” approached, the sailor working on the compass deck would find and tell him. After that, the on duty officer entered the chart room to modify the chart, occasionally looking up and looking ahead until about 1530, when “M/V J” caught up and collided with “M/V Yellow River X” on the fifth cargo hole. In this accident, the on duty officer first relied on the overtaken “M/V J” to take action to avoid collision, and then depended on the sailor who had no duty of look out to remind him. When these "dependencies" failed, so did the accident happen.

### **2.3.6 Other psychological problems**

Besides those above-mentioned problems, there are some other typical mental problems which could be found among some seafarers, e.g. insomnia, anxiety, depression, home-sick and inter-personnel obstacle, etc.

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<sup>3</sup> In order not to disclose the company’s information, “M/V Yellow River X” is not the real name of the concerned accident.

<sup>4</sup> In order not to disclose the company’s information, “M/V J” is not the real name of the concerned accident.

## **2.4 Concluding Remarks**

Seafaring is an activity with particular characteristics and is performed in specific contexts from a physical and psycho-social point of view (Anna, C. & Ivana. M. & Angiola, M. 2012). International Maritime Health Association (IMHA) described seafaring as one of the most physically demanding professions in one of the most dangerous work environments: the sea (IMHA, 2012). Working in such a challenging environment, the quality of life, their well-being as well as the mental quality of seafarers may be affected in a negative way. As the navigation of a ship and the mental health of seafarers working on the ship are closely related, if mental problems are not well addressed and tackled, they will threaten the safety of navigation in turn. In the following chapter three, I will focus on the research of the general condition of Chinese seafarers, explore their mental problems and introduce related IMO instruments and Chinese domestic regulations on the preservation of seafarers' mental quality.

## CHAPTER 3

### Mental Quality of Chinese Seafarers-Not Optimistic

#### 3.1 Introductory remarks

According to the statistics of the Annual Report of China Seafarer's Development Report-2016 released by the Minister of Transport of China, there were 1392751 registered crew in China as of December 2016, among which, ocean-going seafarers were 672961, inland river crew were 719790, making China the biggest country in the world in terms of the quantity of seafarers (MOT., 2017).

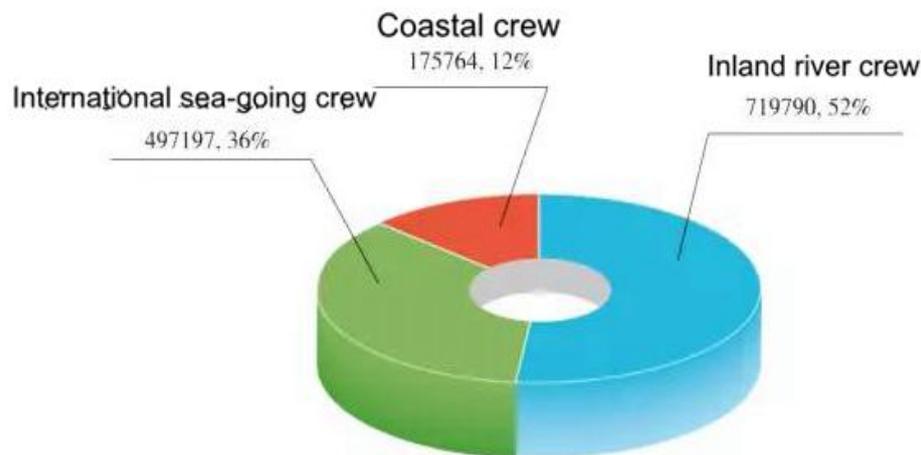


Figure 1- The Registered Chinese Seafarers in Categories

Source: MOT. (2017). Annual Report of China Seafarer's Development Report-2016. P3.

From 2012 to 2016, the registered international ocean-going crew numbers recorded a steady increase (see figure 2). As of 2016, China had a total of 497197 registered international ocean-going crew, took about 36% of the total crew number.

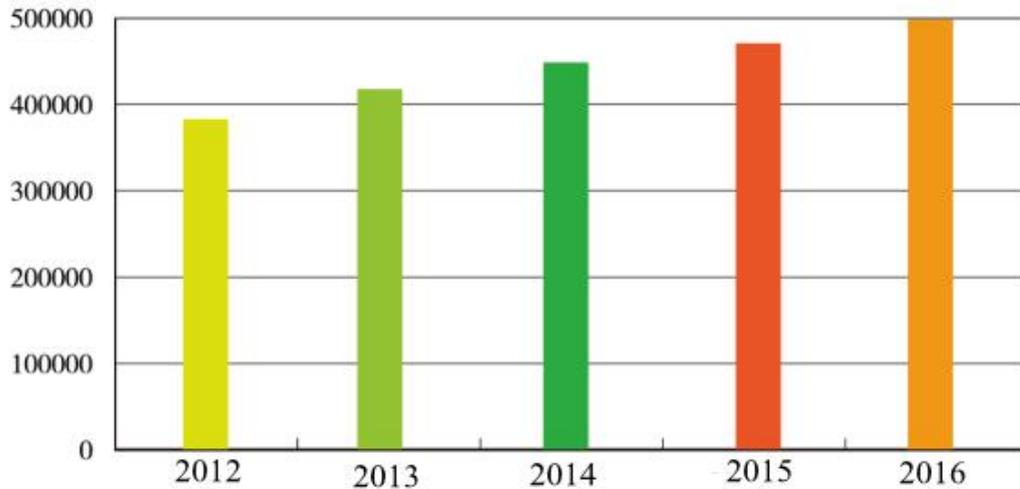


Figure 2- Registered International ocean-going Crew Numbers

Source: MOT. (2017). Annual Report of China Seafarer's Development Report-2016. P4.

Due to the fact that the cardinal number is too large, it is unrealistic to study all the crew as a sample. So, in this research paper, only some of the registered seafarers, who are engaged in international shipping - the ocean-going seafarers are taken as the study sample for following considerations:

Firstly, as a special and independent social and professional group, the ocean-going seafarers work and live in a special environment at sea for a long time, they are obviously affected by the typical working environment, and their psychological characteristics are more stable than that of other kinds of seafarers, so their mental characteristics are more representative.

Secondly, taking into consideration the biological rhythm, the influence of psychological pressure on ocean-going seafarers is much greater than that of other kinds of seafarers, so the research value is more significant.

Thirdly, from the economic point of view, international shipping fleet plays an important role in the world seaborne trade, and studying the psychological influence of ocean-going transportation is helpful to improve the navigation safety and efficiency of the international shipping as a whole.

## **3.2 The Mental States of Chinese Ocean-going Seafarers**

On the basis of consulting and collecting a great deal of data, this chapter, combined with the special mental condition of ocean-going seafarers and the influence of psychological factors on navigation operation, applies to the Psychological General Well-Being Index (PGWBI, details see Appendix A) to investigate the stress level of Chinese seafarers, and the Symptom Check List 90 (SCL-90, details see Appendix B) and the Minnesota Multiphasic Personality Inventory (MMPI, details see Appendix C) to evaluate the mental quality conditions of the ocean-going seafarers in China. The data resources are mainly from the public research papers and other unpublished research reports completed by China MSA, Chinese Seaman's Union (CSU) and COSCO Shipping Ltd. in recent years. Those objects of research are mainly chosen from the international ocean-going seafarers of some giant state-owned shipping companies.

### **3.2.1 PGWBI**

The PGWBI questionnaire has 22 items. It's used to measure the stress level of the seafarers by self-perceived evaluation. There are 6 core domains (for the short form) in the questionnaire: anxiety, depressed mood, positive well-being, self-control, general health and vitality (Anna. C., Angiola, M. and etc. 2013). In 2015, a giant state-owned shipping company “XXX Ltd<sup>5</sup>” had this test for its crew members on container ships, the questionnaire was made on board with remote assistance from the professional psychologists employed by the company. A total of 162 seafarers from several container ships participated in the test, details see Table 1. And the test result is shown below in figure 3.

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<sup>5</sup> In order not to disclose the company's information, ““XXX Ltd” is not the real name of the concerned company.

Table 1- Details of the Subjects

Group	Number of subjects	Mean age (SD)	Marital status
Deck officers	39	32.12 (11.3)	Single 43%
Engine officers	33	35.65 (10.2)	Single 27%
Deck crew	40	31.67 (11.7)	Single 51%
Engine crew	35	41.27 (11.1)	Single 65%
Chief stewards/catering staff	15	38.6 (10.66)	Single 18%

Source:XXX Ltd. & China MSA. (2016). The Psychological General Well-Being Index Test on Seafarers of Container Ships. The Internet Report of Joint Research Project.

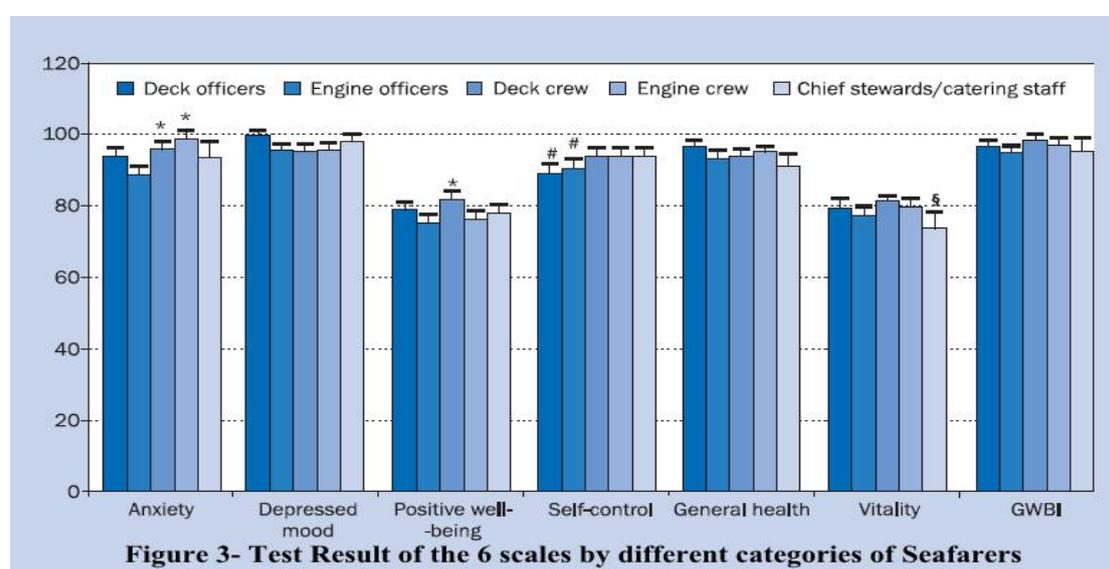


Figure 3- Test Result of the 6 Scales by Different Categories of Seafarers

Source:XXX Ltd. & China MSA. (2016). The Psychological General Well-Being Index Test on Seafarers of Container Ships. The Internet Report of Joint Research Project held by XXX Ltd. & China MSA in 2016.

Learned from the test: For anxiety, engine officers had the lowest scores, it means they had more anxiety. While the deck crew and engine crew have higher scores (less anxiety) than other groups. For depression, highest depression level was observed in deck crew, and the deck officers almost had no depression. For positive well-being result, deck crew showed the highest scores, while engine officers showed the lowest scores. However, in general, there was no big difference between them. For self-control ability, lowest scores in self-control (less self-control) were obtained by deck and engine crews. For general health, there was little difference between the

seafarers. For vitality, the lowest vitality was found in chief stewards/catering staff, and the highest ones in the deck crew. For GWBI, the overall comparison result was no big difference. Further study of this test also revealed that 13% of deck/engine officers and ratings were in an obvious state of distress, and 21% of chief stewards and catering staff had a condition of moderate distress. The overall stress level of the crew members was not so good. And stress, as a cause of mental problems of seafarers, should be followed up carefully and some interventions should be undertaken.

### 3.2.2 SCL-90 result

There are 90 items in the SCL-90, containing a wide range of psychiatric symptoms like feeling, thinking, consciousness, living habits, interpersonal relationships, eating and sleeping, etc. 10 factors are used to reflect the psychological symptoms of 10 aspects respectively. In 2015, more than 1200 international ocean-going seafarers participated in the test. The result is shown in table 2.

Table 2-Test Results of Ocean-going Seafarers Compared with Normal Population

<b>Test Results of Ocean-going Seafarers Compared with Normal Population</b>			
Symptom factor	SCL-90 Test Results		
	Ocean-going Seafarers (n=1246)	Normal Population (n=47354)	t
somatization	1.77±0.71	1.48±0.54	18.60**
Obsessive-compulsive Disorder (OCD)	1.93±0.71	1.83±0.64	5.99**
Interpersonal Sensitivity	1.81±0.69	1.79±0.65	1.61
Depression	1.82±0.69	1.70±0.65	6.45**
Anxiety	1.67±0.66	1.55±0.55	8.21**
Hositive	1.70±0.71	1.64±0.63	3.87**
Horror	1.37±0.54	1.40±0.50	-1.40
Paranoia	1.63±0.66	1.69±0.62	-3.38**
Psychotism	1.65±0.0	1.48±0.54	18.60**

Source: China MSA & Chinese Seaman's Union. (2015). Report on the Research of Chinese Seafarer Quality Development

As shown in table 2, according to the SCL-90 test results, we can get the following conclusion: the mean and standard deviation of the scores of factors of somatization, compulsion, depression, anxiety, hostility and psychosis are significantly higher than those of normal population. And according to the “psychological evaluation and intervention test” jointly held by Qingdao Ocean Shipping Mariners College and China Ocean Shipping Group, the average positive rate of psychological symptoms of ocean-going seafarers is 55.5%, which is much higher than that of the general population. And the abnormal rate of somatization, OCD, interpersonal sensitivity, depression, anxiety, hostile, horror, paranoia and psychotism is 31.1%, 41.1%, 33.8%, 34.4%, 27.2%, 28.4%, 11.0%, 21.5% and 24.6% respectively (Shi, C. L., Wang, H. R. & Dai, J. J., 2012). These figures indicate Chinese ocean-going seafarers’ mental problems are more serious than that of the normal population, and their level of mental health is lower than the average level of the normal adults (Zhu, G. F. & He, C. D., 2002).

### **3.2.3 MMPI result**

MMPI is an authoritative paper-pen personality test widely used. The questionnaire is designed to predict the normal and mental problems to determine which items have significantly different response patterns, so the test was most commonly used to identify mental illness. Although it was originally compiled on the basis of clinical practice in psychiatry, it is used not only in psychiatric clinical and research work, but also in other medical disciplines, as well as in areas such as human behavior studies, judicial trials, crime investigations, education and career choices. A comprehensive evaluation of mental health of seafarers was held by China Ocean Shipping Group. a total of 2735 questionnaires were distributed and recovered, of which 2272 were valid, the basic information of the 2272 subjects was as follows: ①male, mean age:  $38.7 \pm 10.5$ ; ②mean sea age:  $17.0 \pm 10.1$  年; ③Officers above operating: 1175 persons; Support rating :1097 persons (Zhang, X, & Ma, Y. Q., etc., 2006). Test results are shown in Table 3 below.

**Table3. - MMPI Comparison Between Seafarers and Normal Population**

Multiphasic personality	Ocean-going Seafarers (n=2272)	Normal Population (n=1553)	t
Hypochondriasis (Hs)	11.40±5.82	8.78±4.75	14.70**
Depression	26.54±5.48	26.16±4.97	2.19*
Hysteria	23.52±6.08	22.07±5.36	7.59**
Metaphrenia	19.35±4.87	18.98±4.36	2.41*
Paranoia	13.37±4.42	12.84±3.92	3.81**
Psychasthenia	18.41±8.76	17.86±7.93	1.98*
Schizophrenia	23.79±11.76	23.01±10.15	2.13*
Hypomania	19.18±4.90	18.48±5.26	4.21**
Social Introversion (SI)	32.96±7.20	34.51±6.88	-6.65**

Source: China MSA & Chinese Seaman's Union. (2015). Report on the Research of Chinese Seafarer Quality Development

Based on the MMPI results above, the following conclusions can be obtained: the average value and the standard deviation of the Chinese ocean-going seafarers are obviously higher than that of the national normal population at four aspects: Hypochondriasis, hysteria, paranoia, hypomania. Also the value of depression, metaphrenia, psychasthenia, schizophrenia of Chinese ocean-going seafarers are also higher than the average national norm. The results indicate that ocean-going seafarers are more likely to have psychological abnormalities than the general population, and are also more likely to have clinical mental illness or psychological disorders than the general population. Further study of the MMPI results also reveals that the average value of MMPI test for seafarers who can not adapt to seafaring life style is much higher than that for seafarers who are very adapted to that kind of life, and the failure to adapt to the life style often has a certain relationship with seafarers' personality traits, and the personality traits are not easy to change. So special attentions should be paid to the mental health of those ocean-going seafarers who can't adapt to the ocean-going life.

### **3.3 Loopholes in Laws and Regulations to Prevent Mental Problems**

There is no doubt that the psychological problems of the crew are a great threat to all aspects. Firstly, the individual seafarers are tortured by the problems or illness, which impacts their work motivation. Secondly, serious mental problems will impair the safety of navigation, and even lead to criminal violence, threatening the safety of the lives of the people and the property carried on board. Thirdly, mental problems will affect the enthusiasm of crew members, restrict the supplement and renewal of the fresh blood of shipping labor force. Moreover, mental problems directly affect the development of the whole shipping industry, and then affect the overall development of the national economy. Therefore, this situation can not be ignored and needs to be changed. But in reality, there are serious deficiencies in our China's current system and legislation to protect the mental health of the seafarers.

### **3.3.1 Legislation on the protection of seafarer's mental health needs to be strengthened.**

The International Maritime Labour Convention 2006 (MLC 2006), adopted by the International Labor Organization (ILO), is the highest standard in international conventions to protect the rights and interests of seafarers. The MLC 2006 entered into force on 20 August 2013, China submitted ratification of MLC 2006 on 12 November 2015, the MLC 2006 applies to China on 12 November 2016.. However, at present, China does not have a specialized "Law of Seafarers" to protect the interests of seafarers, but only has the "Regulations of the People's Republic of China on Seafarers" and some administrative rules formulated by the MOT and its subordinate departments like China MSA. Compared with laws, the legal status of these regulations and rules are lower and less mandatory. In addition, most of these regulations and rules are regulating the management of seafarers and adjusting the labor relations, few of them are for protecting the working conditions of crew members. Moreover, the existing regulations and rules focus on the administration of crew members and the regulation of crew skills. They do not take into account the professional nature of crew members and the particularity of their working environment, thus neglecting the concern of human nature. So, the existing

regulations and rules are unable to play the role of preventing and controlling the factors leading to the seafarers' psychological problem. It can be concluded that the rights of seafarers and their mental health cannot be well guaranteed by the existing regulations and rule.

### **3.3.2 Mental Health damage is not categorized into the scope of occupational injury.**

Although the mental illness of seafarer is a chronic disease caused by the work environment, it is not clear whether the mental illness is included in the category of occupational disease or work-related injury in China's law systems and judicial practice. In China, the "Regulation of Employment Injury Insurance of P.R.C." is an important legal basis for work-related injury identification and resolution of work-related injury disputes. Article 1 of the Regulation clearly applies to workers who suffer from accidents or occupational diseases at work. The causes of psychological illness of seafarers include injuries caused by accidents at sea and particularity of working environment onboard. However, whether psychological illness is included in the category of work-related injury/disease is not clearly stipulated in the Regulation at present. Moreover, the mental disease is different from the physical function injury, which has the clear identification standard, the appraisal method and the degree definition. The "Chinese Appraisal of the Degree of Invalidity Caused by Work-related Injury and Occupational Diseases" covers almost all basic aspects of physical impairment, but does not include the assessment of mental health damage (Wang, Z. L., 2014). Therefore, we can conclude that the principle and grading standard of work-related injury and occupational disability recognition do not take into account the mental illness caused by working environment in China.

### **3.3.3 The remedy mechanism for mental problems of seafarers is absent.**

Seafarers, suffering from psychological diseases or mental problems, usually bear a series of burdens such as economic loss, health cost, etc. by themselves, due to the absence of effective remedy mechanism in China. According to the "Chinese General

Principles of the Civil Law”, compensation for spiritual damages is defined as: compensation for spiritual damages is a civil subject whose personal rights have been unlawfully infringed upon, resulting in the injury or suffering of his personal and identity interests. The civil legal system that requires the infringer to remedy and protect by means of property compensation (Supreme People's Court, 2001). That is to say, the premise of compensation for mental damage is the existence of tort, but the emergence of psychological illness or mental problems of seafarers mainly come from the particularity of the working environment onboard, so it is not applicable in the “Chinese General Principles of the Civil Law” or other remedy mechanism. The right to health is a fundamental right recognized in many international conventions, e.g. , according to the provision of the International Covenant on Economic, Social and Cultural Rights (ICESCR), the right to health is defined as “everyone has the right to the enjoyment of the highest attainable standard of physical and mental health”. In other words, the right to health includes the right to physical and mental health. However, in China at present, the definition of the right to health is mainly inclined to the aspect of the right to physical health, and the protection of the right to mental health is often ignored, both in theory and in practice. In conclusion, in China at present, the seafarers suffering from psychological problems, are not feasible to obtain compensation through existing remedy mechanism.

#### **3.3.4 Seafarers can not get the psychological guidance.**

At present, due to the fact that the current law of China does not make mandatory requirements on the proportion of seafarers' psychiatrists, so the employers are reluctant to invest in this area for cost considerations, there is a serious shortage of high-quality psychiatrists, who can provide professional services for the seafarers in China.

### **3.4 Concluding Remarks**

Although China is the largest country in the world in terms of seafarer’s quantity, the

overall mental health condition of the seafarer is not optimistic. Scientific surveys and psychological studies like the SCL-90 and MMPI tests have proved that the mental quality of Chinese ocean-going seafarers is worse than that of the general population, and the positive rate of psychological symptoms is much higher than that of the general population. If it is not possible to carry out mental health education for ocean-going crew members frequently and effectively, and provide them with necessary care and intervention, the sub-mental health of seafarers may develop into mental disorders or mental illness, which could impair the safety of navigation (Zhang, X., & Gao, Y. D. & Zhou, Y., L. 2005).

Due to the absence of legislation on the protection of seafarers' mental health, Chinese seafarers are not likely to get remedy for the mental health damages. Under the background of China's strategy of building a strong maritime power, it is an important task for the whole society to pay special attention to seafarers' psychological problems and the co-related social impacts.

## CHAPTER 4

### The Causes of Seafarers' Mental Problems

#### 4.1 Introductory remarks

Mental quality is an important part of the comprehensive quality of seafarers. In the previous chapters, I have explained the correlation between mental quality and navigation safety, and illustrated the overall mental quality condition of Chinese ocean-going seafarers through the SCL-90 and MMPI tests. There are many reasons and causes leading to the low level of mental health condition of Chinese ocean-going seafarers, which can be divided into the following 4 categories: **Working and living environment factors, personal factors, company factors and social factors.** This chapter will elaborate on the causes one by one according to their different natures from the subjective and objective aspects.

#### 4.2 Causes of Four Categories

##### 4.2.1 Working and living environment factors: vibration, noise, climate, isolated space.

Compare to the work ashore, working onboard is extremely hard and bitter. The difficult living environment makes the crew's psychology fluctuate and hard to stabilize, which may result in nervous, impatient, hesitant and other temperament changes. For example, ships often encounter bad weather at sea, which often causes vibration for the seafarers. Besides vibration, the noise produced by the engines

continuously impacts the seafarers. High noise may damage the hearing ability of the crew, and the low frequency noise can also reduce the crew's adaptability and coordination ability. In the questionnaire survey, 47.8% and 42.0% of ocean-going crew members thought that the sea waves and ship noise were one of the main causes of their emotional instability (Zhang, X., & Gao, Y. D. & Zhou, Y., L. 2005).

The ships often sail across the time zones, which may affect the bio-clock of the crew and leads to the endocrine disorder of the crew. It's quite usual that a ship may experience four seasons just in one voyage, the sudden changed temperature and the humidity may cause the ocean-going seafarers mental burnout and physical fatigue. What's more, poor living conditions, such as a monotonous diet and a lack of fresh vegetables and fruits, can also affect the crew's mental quality and health.

Another aspect of the harsh working condition is related with the isolated space of the ship. The ocean-going seafarers, living in the cramped and relatively isolated environment for months, also due to the strict hierarchies and working shifts, usually they can only associate with some fixed personnel. Long time living in a closed, monotonous environment, seafarers could be induced a variety of psychological disorders. Some dangerous operations on the ship also have negative effects on the mental quality of the seafarers. These operations include engaging in high altitude and outboard operations, entering a closed cabin, and getting into the shaft. And these operations could make some of the seafarers nervous, fearful, and uneasy according to the questionnaire conducted in 2016 by Qingdao Ocean Shipping Ltd. In the questionnaire survey, 35.4% of the seafarers expressed fear of climbing the mast, 24.7% said they were afraid to go down the deep cargo hold, and 21.5% were afraid of entering the shaft tunnel (Wang, Z. B., 2013).

#### **4.2.2 Personal factors: excessive workload, post-traumatic stress, homesick, expatriates experience.**

Seafaring is well-recognized as a high-pressure profession, and every individual

seafarer in this industry is under a lot of pressure. Take the ocean-going seafarers as the example, their pressures may come from the numerous inspections and supervisions like port State control, flag State inspection, shipping company safety self-inspection, self-inspection of Safety Management System (SMS) and International Ship and Port Facility Security (ISPS) ship security system, and internal and external audits, etc. In order to pass these evaluations and inspections, seafarers are required to work with extreme carefulness. Any mistake made by the seafarers may result in very serious punishment by the company or the Authority. These pressures are likely to make a considerable number of seafarers in the face of unease, tension and anxiety. In my interview with some seafarers who are working on the aged vessels, due to the fact that there is a big gap between the requirements of various inspections and the ship conditions, it is difficult for these ships to pass all kinds of inspections. However, the shipping company usually fails to provide the necessary shore-based support, but instead hand over the difficulties and responsibilities to the seafarers, which make seafarers, especially those officers mentally stressed, and thus produces resistance and grievance. In addition, modern ocean-going vessels have put forward very high requirements for ship management, especially for ships carrying high risk cargoes, such as oil tankers, chemicals, etc. A little carelessness will result in serious consequences and may cause huge economic losses and social impact. Therefore, the need to be cautious in work has also brought great mental pressure to ocean-going seafarers, and as a result, produces psychological symptoms and somatization.

Casualty and accident is also an important source of pressure to individual seafarer. After the accidents, if the psychology can not be adjusted in time and effectively, seafarers may get psychological injury. Whether it is an average accident, an engine accident, a damage accident, or a ship pollution accident, there will be a long period of negative emotional experience for those responsible seafarers. They will experience low spirits, such as self-blame, guilt, depression, grievance, resentment and fear, etc. Some seafarers may constantly recall the accident, recall the details, it is difficult to

quickly extricate themselves from the shadow of the accident. They fear that the accident will damage their reputation, that they will no longer be trusted, that promotions will be affected, and that they will suffer financial losses. These worries will finally hurt their mental quality in long run.

Homesick is another source of seafarer's mental problem. Ocean-going seafarers, sailing on the vast ocean, are far away from their home and relatives. A typical cross-ocean voyage usually takes more than two months or even more than five months. It means that their normal contact with their families and spouses will be suspended, and their emotional rights and sexual rights are temporarily deprived. According to information, if a Chinese ocean-going seafarer marries at the age of 25 and retires at the age of 55, the actual harmonious husband and wife life can only count for 5 to 7 years. Ocean-going seafarers live in a special group without heterogeneity for a long time, a few of them will appear abnormal sexual psychology, such as sexual anxiety, sex-starvation, restlessness, irascibility, etc., which aggravate the sense of boredom to the profession of seafaring.

Special attention should also be paid to the psychological problems of expatriated seafarers. Under expatriation, the working and living environment of the ocean-going expatriates is even more special and challenging. Because of the difference in management mode, some Chinese expatriated seafarers, who are accustomed to the domestic ship management mode, find it difficult to adapt to the foreign management mode, so they feel very depressed and anxious. At the same time, because of the different languages and cultural background of other crew members on the same ship, the communication is difficult for some Chinese expatriated seafarers, so the feeling of loneliness, sensitivity and depression is more easily generated among them.

#### **4.2.3 Company factors: excessive workload, neglected training, management model.**

In order to maximize the profit, shipowners tend to build bigger ships with less

manning. And as the speed of loading and unloading in modern ports is quickened, the berthing time is shorter, and the ships are sailing at sea for most of the time, which requires the seafarers to be in a tense working state all times. In addition, the shipping companies are paying more and more attention to international conventions and regulations, and all kinds of inspection are becoming more and more stringent, the items of self-repair of machinery and equipment have been greatly expanded, and the heavy workload and tasks make the crew exhausted and seriously threaten their physical and mental health. Crew members are prone to fatigue, un-exuberant, irritability, etc.

In the management of crew, most shipping companies attach importance to the professional competence and professional technology of the crew, but neglect the comprehensive investigation of the crew members' personal character, temperament type, emotional type and psychological quality and so on. In addition, the training of seafarers by shipping companies is mainly focused on practice-oriented training such as professional manipulation techniques, neglecting the mental quality training, and failing to provide them with good psychological guidance knowledge. For some Chinese state-owned shipping companies, although there is a political commissar, who is responsible for ideological and political work and cultural work on every big vessel, they're not professionals, they have limited effect in dealing with psychological counseling. Most of the crew's psychological problems tend to depend on self-regulation and guidance. In this way, it is easy to cause the seafarers to get into psychological problems under pressures.

The current management model of Chinese state-owned ocean-going ships weakens the centralism of democracy. High-pressure management makes the seafarers feel depressed and stressed which could lead to depression, suspicion, anxiety and hostility easily. The distribution system has also made some seafarers feel unfair because of the greater gap in salary and welfare between seafarers and the personnel ashore, especially the gap in the welfare benefits such as housing distribution, housing

provident fund, medical insurance and so on. Usually personnel ashore of the state-owned shipping companies have better salary and welfare compared with those seafarers working onboard. In order to save costs, some small and medium sized shipping companies do not want to invest in the ship's cultural and recreational facilities, such as the internet service, fitness equipment, books and other entertainment equipment. All above factors also make many crew members feel resentful and unsatisfied.

#### **4.2.4 Social factors: inadequate social support, income decrease, inspections and piracy.**

Ocean-going seafarers usually leave their family and society for months in a year, which makes it difficult for them to get effective social support. Although the ship-shore communication technology has developed rapidly, the communication between crew and family and friends is still difficult and expensive. The crew can only obtain some social information through television and network, which causes the so-called “information isolated island” for most of the seafarers. Because of the lack of necessary social support and information, once the crew members encounter psychological problems, it is very difficult to cushion them through social support. Under this circumstance, some seafarers, especially those young seafarers are prone to emotional fluctuations, emotional loss of control, psychological disturbance and even reactive mental disorder (Ge. Y. Q. & Sun, X. M., 2013).

With the development of China’s economy and the improvement of Chinese residents' income, the superiority of the income and welfare of seafarers in the past has changed, and their social status has also declined. The difference between today's land and sea wages is significantly narrowed compared with that of the 80s and 90s of last century, and the income level of the ratings is almost the same as that of the common worker on land (see table 4<sup>6</sup>). From table 4, we can find that the average salary for most

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<sup>6</sup> Figures are calculated based on the information released by the China Shipping Information Net at <http://www.cnhangyun.cn/>.

officers, except the captain and the c/o, is decreased significantly. But during the same period from 2011 to 2016, the average DPI (Disposable Personal Income) of Chinese workers have been increased by 54% from 2011 to 2016, details are shown in figure 4. Compared table 4 with figure 4, it can be concluded that seafaring, which used to be a high-paid profession, is not so attractive today, due to the gloom prospect in terms of the income growth rate. The huge gap caused by income decrease leads to psychological imbalance for some seafarers. If this kind of psychology phenomenon is not promptly adjusted, seafarers will easily complain about their work, and will not be willing to get onboard to work, or even have the mentality of loathing and fear when they work. Even if they reluctantly accept the task of going to sea, they will have a weak sense of responsibility in their work, and quite possibly, they will work with carelessness and violate rules and regulations, etc.

**Table 4 - The Salary Changes of Officers on Bulk Carrier 2010-2017**

<b>Position</b>	<b>Ocean-going Bulk Carrier</b>	<b>Coastal Bulk Carrier</b>
<b>Capt.</b>	24%	6%
<b>C/O</b>	54%	-4%
<b>2/O</b>	-17%	-51%
<b>3/O</b>	-39%	-52%

Source: Navigation Education Research Branch of China Transport Education Research Institute. (2017). The Development Status, Problems And Countermeasures of Chinese Seafarers.



Figure 4- The DPI of Chinese Urban Residents 2011-2016

Source: National Bureau of Statistics, (2017). Economic operation data of 2017. www. ce. cn.

Other social factors like the foreign inspections, piracy and terrorism can also make troubles for seafarers' mental quality. For example, PSC inspection and the implementation inspection of other IMO instruments like the ISM Code, GMDSS and ISPS Code are becoming more and more strict, fail to satisfy the requirements of the Administration may result in penalties or even ship detention. And those responsible seafarers, esp. some senior officers will be blamed or punished by the company. According to my conversation with some seafarers, even the most experienced officers could feel the pressure when facing those inspections.

In addition, piracy and armed robbery are rampant in some seas around the world, and the means of piracy become more and more cruel. According to the statistics released by IMO, from January 2000 to December 2010, a total of 3991 cases of piracy and armed robbery at sea occurred worldwide, with an average of about 362 cases per year (IMO, 2011). Most hijackings have been reported in five major areas: South China Sea, East & West African seas, waters near the Somali Peninsula, Red Sea and Gulf of Aden, Bay of Bengal (see table 5). Unfortunately, these hot spots are the main sailing channels for most of Chinese ocean-going vessels. That means most of Chinese ocean-going seafarers may face piracy in their career. These factors all bring a lot of psychological problems to the seafarers, making them feel lack of security and

nervous easily.

Table 5 - Piracy and Armed Robbery Against Ships from Jan. 2000 to Dec. 2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Malacca	112	58	34	36	60	20	22	12	2	0	0	356
South China Sea	140	120	140	154	113	97	66	67	72	71	134	1174
India Ocean	109	86	66	96	41	51	53	40	26	27	78	673
Eastern Africa	29	22	23	22	13	49	31	60	134	222	169	774
Western Africa	33	58	47	67	57	23	31	60	50	46	48	520
Caribbean Sea	41	23	67	72	46	26	31	25	19	36	38	424
Mediterranean Sea	2	2	3	1	0	0	1	3	2	0	1	15
Others	5	1	3	4	0	0	5	15	1	4	17	55
Worldwide	471	370	383	452	330	266	240	282	306	406	485	3991

Source: IMO, (2011). Reports on Acts of Piracy and Armed Robbery Against Ships, 2000-2010

### 4.3 Concluding Remarks

As the result of individual differences, the symptoms of the seafarers' psychological problems are also diversified. When we explore further, the causes of these problems and diseases can be divided into four different categories: environmental factors, personal factors, company factors and social factors. On one side, all of these factors are independent of each other, however, on the other side, they are correlated with each other at the same time. If these issues can not be addressed properly and studied carefully, psychological problems will damage the mental health of the seafarers, impact their life and work onboard, and threaten the safety of navigation eventually. In following chapter five, some solutions and proposals for preventing and solving the mental problems of Chinese ocean-going seafarers will be expounded in-depth from many angles.

## CHAPTER 5

### Countermeasures for Improving Mental Quality of Chinese Seafarers

#### 5.1 Introductory remarks

Mr. E. Mitropoulos, the former Secretary-General of IMO, once stated that “Without the contribution of the crew, half the world will be frozen and the other half will starve”. The statement stands for the great significance of the crew to the world. As an important player of the shipping world, China has the largest number of crew in the world. The number of its ocean-going seafarers reached to 672,961 until the end of 2016<sup>7</sup>. And these seafarers are playing the key role in “The Strategy of Building a Strong Maritime Power” of China today. However, for many reasons, the mental health of Chinese seafarers, especially the ocean-going seafarers, has not been optimistic. Chinese ocean-going seafarers are exposed to many kinds of mental problems that should be accurately investigated, measured, followed up and countered. Also, as a contracting Party to the international conventions such as the Maritime Labour Convention 2006 (MLC-2006), China should fulfill its commitment and responsibility to protect the interests and rights of its seafarers.

In the previous chapters, the current status, the main mental problems, and the causes of these problems have been explored and discussed in details. So, in this chapter, the focus will be on proposing solutions and countermeasures for the problems and challenges from multiple dimensions, perspectives, and levels. For example,

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<sup>7</sup> Figures are quoted from the Annual Report of China Seafarer's Development Report-2016 released by the Minister of Transport of China.

propositions will be given to the central government for better implementation of the international conventions and perfect its legislation systems in order to safeguard the mental health of Chinese seafarers. And some practical suggestions will be initiated to relevant ministry and administrations like the Ministry of Labor and Social Security and China MSA for better inspection and administration. Also, advice will be put forward to the stakeholders, including the shipping industry, the shipping company, maritime colleges and training centers as well as the seafarers themselves.

## **5.2 Suggestions for Chinese Government**

### **5.2.1 Draw up seafarers law**

The International Maritime Labour Convention of 2006 (MLC-2006) adopted by the International Labour Organization (ILO) is the highest standard for the protection of the rights and interests of crew members in the international conventions. The MLC 2006 entered into force on 20 August 2013, and applies to China on 12 November, 2016. However, at present, there is not a centralized and unified special law on seafarers in China. Referring to the contents of China's laws and regulations concerning the protection of the rights and interests of seafarers, we find that a few provisions concerning seafarers' interests protection are scattered in several laws and regulations, e.g. the Maritime law of the People's Republic of China, The Regulation of the People's Republic of China on Seamen (Seamen Regulation), The Labor Law of the People's Republic of China, the Trade Union Law of the People's Republic of China, and etc. And what's more worse is that these provisions are not in consistent with each other, some of them even conflict with each other.

Although the current Regulation of the People's Republic of China on Seamen is the domestic regulation corresponding to the MLC-2006, still they are different from each other in terms of legislative objective. For MLC-2006, more emphasis on "crew protection", while for Seamen Regulation, focus on "crew Management", there is an

obvious difference between them. In addition, the Seamen Regulation has reservations about some practical problems which are closely related to the rights and interests of seafarers, and vaguely deal with some difficult practical problems. For example, those provisions concerning the regulating of the interests of shipowners, crew service agencies and the crew is always in a weak position, and the voice of the crew can not be properly expressed. In contrast, some developed countries such as the United States, Japan, the Republic of Korea and other countries have formulated special seafarers law to protect the rights and interests of crew members in detail. And for reality concern, as a special group, seafarers do need special laws and regulations to regulate and protect themselves. Therefore, the introduction of a special "seafarers law" is still a solution to safeguarding seafarers' rights and interests. The central government is strongly advised to work on this as soon as possible.

### **5.2.2 Establish mechanisms for compensation of mental damage**

According to the International Covenant on Economic, Social and Cultural Rights (ICESCR-1966), the right to health is the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. In other words, the right to health includes the right to physical and mental health. However, at present, the definition of the right to health is mainly inclined to the aspect of the right to physical health, and the protection of the right to mental health is often ignored in China. In practice, the compensation for post-injury after the crew suffered psychological problems is not recognized by the existing legislation, and there is also a lack of specific standards for mental damage of seafarers in China. According to the provisions of the Management methods for diagnosis and Identification of Occupational Diseases of People's Republic of China, the identification of occupational diseases is an enumerated legislative model. Only the diseases in the Occupational Diseases Classification and Catalogue of China can be remedied. For the classification of occupational diseases and the diseases outside the catalogue, the corresponding relief can not be obtained. And at present, mental problems or diseases of seafarers in China are not listed in the Occupational Diseases Classification and

Catalogue. Inadequate protection of the rights and interests of seafarers will greatly reduce the enthusiasm of their work. To solve this problem, the first step is to amend the existing Labor Law and the Management methods for diagnosis and Identification of Occupational Diseases of People's Republic of China. The newly amended law and regulation should clearly stipulate that the mental health is one of the basic right for every Chinese citizen, and the mental damage should be listed in the Occupational Diseases Classification and Catalogue of China. The second step is to work out the detailed assessment standards for mental damage of seafarers and set up a convenient channel for seafarers to report their mental problems and apply the remedy. This channel should be independent from the shipping company and under the supervision of the corresponding Administration. The third step is to establish a public welfare foundation for seafarer's claim of compensation due to mental damage aboard. As stipulated in the MLC-2006, if a crew member is injured while working onboard, the shipowner shall bear medical expenses, meals and accommodation for medical treatment, and in the event of disability caused by injury, compensation shall be paid in accordance with national laws or collective agreements. So, the compensation clause of this public welfare foundation should be in accordance with the provisions of MLC-2006 on the medical care. Those seafarers suffered from mental damages should not be charged for medical expense, and can apply for damage compensation from the fund.

### **5.3 Suggestions for Regulatory Authorities**

#### **5.3.1 Reform the law enforcement authority**

China Maritime Safety Administration (China MSA) is the competent authority of seafarers management in China. The functions of seafarers management mainly include seafarers training, examination, certification and the protection of their rights and interests. Being authorized by the Maritime Traffic Safety Law of the people's Republic of China, the Regulations of the People's Republic of China on Traffic

Safety in Inland Rivers, the Regulations of the people's Republic of China on crew, and other relevant international Conventions contracted by Chinese government, China MSA carries out the law enforcement concerning seafarers management. But such kind of authorization to China MSA is incomplete and sometimes conflicts with other regulatory authorities, due to intersection of power and responsibility among authorities. For example, for the protection of seafarers health rights, in the Regulations of the people's Republic of China on Seafarers, it provides that China MSA shall be responsible for the unified implementation of the crew management works. But, at the same time, the Regulation stipulates that the administrative department of labor and social security shall strengthen supervision and inspection of the compliance of the crew employing units. Therefore, the maritime administration agency is the management department of the crew, and the administrative department of labor security is the main body of the labor supervision. That means China MSA is the management department of the crew, and China Labor Supervision is the main body of the labor supervision of the crew. But in practice, China Labor Supervision does not perform its duty in view of the protection of crew's rights and interests. The reality is that China MSA has the professional skills to carry out overall supervision on seafarers, including the supervision on the protection of labor rights and health rights, but this kind of supervision has not been authorized to China MSA. On the contrary, China Labor Supervision has the authorization, but does not have the required professional skills for aboard supervision. Under such situation, the supervision on rights and interests protection of seafarers can not be truly implemented, mental health problems of seafarers may continuously be neglected. Therefore, it is necessary to clarify the functions of various authorities to reduce the intersection of functions and powers among authorities, so as to improve the supervising efficiency, and better protect the safety and health of seafarers. In this field, China should establish the similar authority of the developed countries, like the OSHA (Occupational Safety and Health Administration) of United States and the HSE (The Health and Safety Executive) of the United Kingdom, and the AMSA (Australia Maritime Safety Administration), which is delegated with the full authorization from

the government to implement the law enforcement on the occupation safety and health (including the physical and mental health) protection of the seafarers.

### **5.3.2 Establish complaint/feedback mechanism**

According to the provisions of MLC-2006, member States should require ships flying their flag to have a fair, effective and expeditious on-board procedure for handling complaints from seafarers alleging violations of the requirements of this Convention. MLC-2006 further requires that each member State shall prohibit and punish any form of persecution of seafarers who lodge complaints. Although the ship Safety Inspection regulations of China has relevant provisions on the crew reporting to the maritime administrative department, the contents of the report are limited to the condition of the ship "which may affect the lives of people or defects and hidden dangers may impact property safety or likely to cause environmental pollution in waters ", which are very different from the complaints stipulated in MLC-2006 concerning the working conditions or the health of seafarers onboard ships." And in real practice, due to the unbalanced voice and control between the company and the seafarers, seafarers are usually at a weak position, and the insufficient commitment from the shipping company, seafarers' complaints are ignored often. As in some cases, when the company received the complaints from the seafarers for complaining the working environment causing their mental disease, quite possibly, the company will think that the seafarer is no longer a qualified crew member, because he can not get used to the working environment. Seldom, the company will introspect to improve the working condition or management of itself. In the long run, the low-level trust environment will be formed between the seafarers and the managers, and few seafarers will choose to lodge complaints due to the negative consequences. In order to change this situation, the Authorities- China MSA and China Labor Supervision are strongly suggested to establish an independent complaint/feedback mechanism to protect the rights of seafarers. The establishment of this mechanism should provide a convenient and unimpeded channel for seafarers to lodge complaints, the core of which is to resolve the problem at the lowest possible level and to help resolve the labor disputes

between the shipping company and the crew in a rational way. And the privacy should be well protected by this mechanism.

## **5.4 Proportions for Shipping Companies**

### **5.4.1 Improve working conditions**

Firstly, shipping companies should appropriately increase the salary of the seafarers in accordance with the hardship and speciality of seafaring and to promote the decent conditions of work as stipulated in the MLC-2006. The remuneration level of the seafarers should be enough to ensure them a superior living standard in the same area compared with other labor force. In this way, seafarers' professional identity and work enthusiasm could be maintained.

Secondly, in addition to caring for the crew, the shipping company and the crew union should do their best to help the crew to solve the practical problems in their family life, and to really solve the crew's worries, so that they can go to sea at ease. Also, shipping company should ensure the paid annual leave and the shore leave for the seafarers, and provide reasonable wages and welfare treatment to the seafarers on leave to be able to raise themselves or their families or dependents in accordance with the provisions of MLC-2006 and other related domestic regulations. In this way, seafarers will be released from the financial pressure and can focus more on their work on board.

Thirdly, the shipping company should increase its investment in cultural and recreational activities, such as the provision of internet service, satellite television, fitness equipment and books, etc. on board, so as to enrich the amateur cultural life of the seafarers. The shipping company is also suggested to regularly organize cultural and recreational activities which are suitable for seafarers to enjoy while sailing at sea. The shipping company should also provide good food and cater for the seafarers to

help them enhance the physique, reduce fatigue and improve the work efficiency.

#### **5.4.2 Set up the psychological counseling team**

In the past, shipping safety management was mainly based on the experience of problem solving, but modern ship safety management has evolved from problem solving to problem prevention. In order to nip the mental problems in the bud, shipping companies are suggested to take some preventive measures. The first step is to set up a special team in the company to handle psychological issues of its seafarers.

Firstly, the psychological team should record and update the psychological files of the seafarers. After comparing with the norm of mental health standard, the team experts should think about the possible psychological problems of each ocean-going crew, find out as early as possible and intervene in time to prevent the further deterioration of the psychological problems of crew members.

Secondly, psychological counselling team should grasp the time of psychological intervention. The sailing time of a single cross ocean voyage usually takes at least one month for the crew to return to land. It would be too late to have the desired effect if the team needs to wait the seafarers returning to shore for counseling service. It's quite necessary to provide them with convenient remote diagnosis and treatment for those seafarers in trouble. Also, it will be helpful to cultivate the political commissar with professional psychological counselling skills and knowledge to provide immediate mental intervention for ocean-going seafarers at sea.

Thirdly, psychological counseling team members should regularly popularize the relevant psychological professional knowledge to the seafarers. According to the survey, most ocean-going crew members have not received psychological knowledge training during school. Psychological counselling team members should help ocean-going seafarers (especially for those with more serious psychological problems) to change wrong mindset and relieve psychological pressure when facing challenges

onboard.

#### **5.4.3 Improve the management mechanism of crew health**

Firstly, shipping company should perfect crew recruitment and evaluation system, add psychological test on the basis of knowledge test, increase mental health examination content together with the physical health examination, and pay attention to the examination of mental health records while check the personnel files of seafarers before dispatch them aboard.

Secondly, shipping company should strengthen the medical examination of the crew, strictly enforce the health standard of the crew, increase the contents of the psychological examination of the crew while doing the physiological examination of the crew, and establish the communication mechanism between the hospital and the crew management department on the health status of the crew.

Thirdly, shipping company should pay attention to the performance evaluation of seafarers, carry out the evaluation on their working performance, physiological and mental health status. It is better to check the seafarers' psychological enduring capacity through the actual work. And shipping company should keep the attention to the crew's mood and thought changes, and carry out necessary psychological training to seafarers.

### **5.5 Suggestions for Maritime Education Institutes**

#### **5.5.1 Strengthen psychological education**

According to my investigation, most ocean-going seafarers in China have received maritime training and education from maritime academies and crew training institutions. It can be said that maritime education plays an important role in the process of crew growth. In order to ensure that the trained students are competent and able to engage in shipping work for a long time, these maritime academies and crew

training institutions need to attach importance to the mental health education of the students. Maritime academies and crew training institutions are suggested to offer compulsory courses such as shipping psychology, crew mental health education, etc., teachers or lecturers with good psychological background, who know psychological counseling and who have certain navigational qualifications, are preferred to teach the students or trainees such a course on seafarers' psychology. At the same time, it is important to strengthen the students' professional knowledge and technology, enhance the students' psychological quality and reduce the appearance of mental problems in the future.

### **5.5.2 Conduct simulation training**

Maritime academies and crew training institutions should set up simulation training centers to create an environment that can be as close as possible to the actual and unexpected situations of navigation, including fire, explosion, collision, abandonment of ships, and so on. The simulators should be able to create a state sufficient to cause tension, panic, excitement, vacillation, fear, or even near despair to the seafarers and trainees, and then try to guide them to conquer all these adverse factors effectively, to take all feasible measures to adapt to the real environment of navigation as soon as possible. Through the simulation training, the mental quality of the seafarers could be tested and improved, and their ability to correctly judge and deal with complicated situations will be improved accordingly.

### **5.5.3 Cultivate discipline consciousness**

In order to cultivate a good sense of discipline, professionalism and obedience consciousness, maritime academies and training institutions can adopt the method of quasi-militarization management to train students and trainees. Special attention should be paid to psychological education in quasi-militarization management, which helps students adjust their learning style, interpersonal communication, social competition and other aspects of discomfort, overcome psychological barriers. This is also helpful for students and trainees to experience the real working environment of

seafarers in advance, and help them get used to the hierarchical management model.

## **5.6 Suggestions for Seafarers Themselves**

The above measures are all related with external factors and objective causes. However, in order to effectively reduce the psychological problems of the ocean-going seafarers, the subjective factors, the seafarers themselves should also be taken into consideration. Seafarers should strengthen their psychological adjustment ability, form healthy and good working and living habits, learn self-motivation and cultivate good psychological adaptability and endurance to setbacks.

First of all, seafarers should keep optimistic, positive and cheerful attitude, actively face setbacks in work and life. They should proactively adapt to the ship environment, and establish a good interpersonal relationship with other seafarers. In this way, they can share something with others, so as to alleviate loneliness and helplessness.

Secondly, seafarers should cultivate broad and noble interests, so as to make the boring life rich and colorful. They should read more books, master certain psychological guidance knowledge and skills, rationally regulate their emotions, improve their health and good mentality and reduce the occurrence of psychological problems.

Last but not least, seafarers should face the mental illness with a correct attitude. Due to the long-period influence of a variety of traditional ideas in China, many people think that mental problems are equal to psychosis. Few people are willing to admit that they are suffering from mental illness, and even less people may actively seek help from psychiatrists. This kind of wrong understanding of mental problems makes many seafarers miss the best treatable opportunity. Therefore, when realizing the occurrences of mental illness, seafarers should be encouraged to face the psychological problems bravely and seek the professional therapies actively at the early possible time.

## **5.7 Other Suggestions**

### **5.7.1 Change the patternized working style**

The relatively fixed roles of seafarers in a long period of time are different from the requirements of role change advocated in psychological theory. This kind of patternized working and living style will cause monotony to seafarers' psychological activities and easily lead to mental problems. So, the shipping companies should carry out career planning education for the crew, and encourage seafarers to have the second vocational skill training, such as finance, computer, human resource management and so on, to help them develop skills besides navigation skills. In addition, during the annual leave or shore leave of the seafarers, with the personal wishes of the crew, shipping companies should allow their seafarers to perform auxiliary work on shore in the company, so as for them to avoid being bound to a single position for too long. This will provide more chances for them to change different roles and try different working styles, which will benefit their psychological quality.

### **5.7.2 Harmonize the man-machine relationship on board**

Scientific research has found that the color, material, shape of a machine will have an impact on people's psychology. Vision, hearing, touch, taste and so on all affect people's psychological feelings. Therefore, in the ergonomic design of the ship and ship's machine, we should pay attention to the psychological needs of the crew in these aspects. In order to make the crew use the machine pleasantly and relieve the working pressure, machinery and equipment on board must be ergonomically well-designed and helpful to reduce the fatigue of the human body, improve the efficiency, and meet the basic requirements of physical health and mental comfort.

### **5.7.3 Develop new tools to tackle mental problems**

At present, the psychological survey and assessment of seafarers' mental condition is basically dependent on foreign psychological assessment institutions and their scales.

There are several shortcomings for this traditional method, e.g. it is difficult to realize the long-term tracking and testing of the mental state and character of the crew; and due to great mental differences between Chinese and westerners, the scales and methods may not be suitable for Chinese seafarers. Therefore, with the progress of network communication and the gradual popularization of the mobile Internet, and on the base of the research of the psychological characteristics and changing trends of the Chinese crew, it's time to develop a self-evaluation and assessment program, which can be accessed conveniently via mobile app by every Chinese seafarer. With this new tool, the cost of psychological testing could be reduced, the efficiency of psychological counseling could be improved and the security of information could be enhanced.

## **CHAPTER 6**

### **SUMMARY and CONCLUSIONS**

With the acceleration of the world economic integration, the international shipping industry can not operate safely, environmentally sound and economically without seafarers' professional services and outstanding contributions. As one of the largest maritime trading countries in the world, ocean-going seafarers of China are of great significance not only to the development and progress of China, but also to the development of the whole world. However, all seafarers, regardless of their nationality, are destined to be tested by the hard and complex environments of working on board due to the inherent characteristics of seafaring. The mental quality of seafarers directly affects the performance of crew members and the safety of maritime transportation.

As a result of many subjective and objective factors, such as the harsh working environment at sea, the high risk of work on board, the imperfect laws and regulations, the backward management mode and the neglect of mental health, there are some problems such as excessive working pressure and prominent psychological problems in the large range of Chinese ocean-going seafarers today, which lead to a series of maritime traffic accidents at the same time. Therefore, all stakeholders should make joint efforts to formulate a sustainable development strategy for Chinese seafarers. The Chinese government should devote more effort to fulfilling its obligations under the related international Conventions and domestic laws and regulations, so as to safeguard the basic rights, interests and health of seafarers. For the administrative authorities, it's time to enhance the attention of all parties to the mental problems of

Chinese ocean-going seafarers through legislation, supervision, education and publicity, etc. For the shipping companies, in order to promote the healthy growth of seafarers and the development of shipping industry, they should improve the working conditions on ship and perfect the management level of seafarers and guarantee the right of seafarers to decent work. For the maritime education academies and training institutions, it's necessary to adjust their training courses now, they should not only provide the students and trainees with operating skills but also the practical methods to tackle mental challenges at sea. For the seafarers themselves, maintaining a positive attitude, establishing a good lifestyle and shaping a sound personality will help to avoid mental problems and depression. Finally, whenever faced with mental problems and unable to solve by themselves, seafarers should dare to face up to these problems and actively seek guidance and help from professionals or institutions.

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## Appendix A

### Psychological General Well-Being Index (PGWB)

(Enzo Grossi, Angelo Compare, Medical, Bracco, San Donato Milanese. Department of Human Sciences, University of Bergamo, Bergamo, Italy)

#### Definition

The Psychological General Well-Being Index (PGWBI) is a measure of the level of subjective psychological well-being. In detail, it assesses self-representations of intrapersonal affective or emotional states reflecting a sense of subjective well-being or distress and thus captures what we could call a subjective perception of well-being. Consisting of 22 standardized items (6 items for the short form), the tool produces a single measure of psychological well-being. The full measure also provides subscales to assess the following domains: anxiety, depression, positive well-being, self-control, general health, and vitality.

**Psychological General Well-Being Index (PGWB),  
Table 1** The six domains of the PGWBI

Domains	No. Items
Anxiety	5
Depression	3
Positive well-being	4
Self-control	3
General health	3
Vitality	4

#### Description

The original PGWBI consists of 22 self administered items, rated on a 6-point scale, which assess the psychological and general well-being of respondents in six HRQoL domains: ► anxiety, depression, positive wellbeing, self-control, general health, and

vitality. Each item has six possible scores (from 0 to 5), referring to the last 4 weeks of the subject's lifetime. Each domain is defined by a minimum of 3 to a maximum of 5 items. The scores for all domains can be summarized into a global summary score, which reaches a theoretical maximum of 110 points, representing the best achievable level of well-being (Dupuy, 1990), a sort of "state of bliss." The short form of the PGWBI (Grossi et al., 2006), subsequently developed, consists of a subset of six items that generally explain more than 92 % of the global variance of the full questionnaire.

## **Appendix B**

### **Introduction of Symptom Check List 90 (SCL-90)**

#### **Background**

Symptom Checklist 90 (SCL-90), also known as Hopkin's Symptom Checklist (HSCL), was firstly compiled by L.R.Derogatis in 1975. Symptom Checklist (SCL90) is one of the most famous mental health checklists in the world. It is the most widely used mental disorder and mental illness outpatient examination scale. It will help you to understand your mental health from ten aspects. This test applies to people over 16 years of age. The checklist has 90 items, covering a wide range of psychiatric symptoms, ranging from feeling, emotion, thought, consciousness, behavior to habits, relationships, diet, sleep, etc. 10 factors are used to reflect the psychological symptoms in 10 aspects.

#### **Particulars**

1. Each of its items is rated at level 1 or 5, as follows:

No: consciously there is no such problem (symptoms);

Very light: consciously there is this problem, but it does not occur frequently, serious;

Medium: consciously have this symptom, its severity is mild to moderate;

Serious: conscious often this symptom, its degree is medium to serious;

Very Serious: the frequency and intensity of the symptom are very serious.

As a self-rating scale, there is no need for rigid rules of the specific meaning of “light, medium, serious”, they should be understood by the evaluators themselves.

2. The Checklist can be used for the diagnosis of mental health , and also can be used for the research of psychiatry. It can be used for the evaluation of other persons and can be used for self-evaluation.

#### **Explication**

SCL-90 consists of nine factors, each of which reflects the symptoms of one aspect of the individual, and the distribution of symptoms can be understood by factor scores. Factor scores are equal to the total scores that make up a factor and the number of items that make up a factor. When the score of an individual in a certain factor is greater than 2, that is, the average score exceeds the normal, then the individual may have a mental health problem in this respect.

### **1. Somatization**

It mainly reflects physical discomfort, including cardiovascular, gastrointestinal, respiratory and other system discomfort, and headache, back pain, muscle soreness, and anxiety and other physical discomfort. The score of the component table is between 12 and 60. In general, the higher the score, the stronger the body's discomfort, and the lower the score, the less obvious the symptom experience.

### **2. Obsessive symptoms**

It mainly refers to the senseless thoughts impulses and behaviors which we know are unnecessary but unable to get rid of and some general behavioral signs of cognitive disorders are also reflected in this factor. The score of the component table is between 10-50 points. Scores above 30 points, obsessive-compulsive symptoms are more obvious. The score was below 20, and the obsessive symptoms were not obvious.

### **3. Interpersonal sensitivity**

It mainly refers to some interpersonal unease and inferiority complex, especially when compared with other people. The sense of inferiority, unease and unease in interpersonal communication, as well as bad self-suggestion in interpersonal communication, negative expectation and so on are the canonical causes of the symptoms.

### **4. Depression**

Melancholy emotion and mood are typical symptoms, but also characterized by loss of interest in life, lack of motivation, loss of vitality and so on. It also showed disappointment, pessimism, and cognitive and physical feelings associated with depression, as well as thoughts about death and suicides. The score of the component table is between 13 and 65. The scores above 39 indicate that individuals have a strong degree of depression, a lack of sufficient interest in life, a lack of motor activity and, in extreme cases, the possibility of thinking about death and suicide. The

scores below 26 points indicate that the individual depression degree is weak, the life attitude is optimistic and positive, full of vitality, happy state of mind. Overall, the higher the score, the greater the degree of depression, the lower the score, the less significant the degree of depression.

### **5. Anxiety**

Generally referred to as fidgety, restlessness, nervousness, tension, and the resulting physical signs, such as tremors, etc. The score of the component table is between 10-50 points. Scores above 30 indicate that individuals are more likely to be anxious, irritable, restless and neurotic, and can lead to panic attacks at the extreme. Score below 20 points, indicating that individuals are not easy to anxiety, easy to show a stable state. Overall, the higher the score, the more obvious the anxiety. The lower the score, the less anxiety.

### **6. Hostile**

It mainly has three aspects to reflect the manifestations of hostility: thought, feelings and behavior. Its projects include feelings of boredom, falling objects, arguments and uncontrollable tempers.

### **7. Horror/terrifying**

The feelings of horror/terrifying include the terror to travel, open spaces, crowds or public places and transportation. In addition, there is social terror. The score of the component table ranges from 7 to 35. The scores above 21 points indicate that the individual phobic symptom was obvious, and often showed social, square and crowd fear. The scores below 14 indicate that the individual phobic symptom is not obvious.

### **8. Paranoia**

It mainly refers to projective thinking, hostility, suspicion, delusion, passive experience and exaggeration.

### **9. Psychotism**

It reflects a wide range of acute symptoms and behaviors, that is, the symptomatic manifestations of a loosely defined psychotic process.

### **10. Other items (sleep, diet, etc.)**

To treat as an additional item or other, as a 10th factor, so that the sum of each factor is equal to the total score.

## Appendix C

### Introduction of Minnesota Multiphasic Personality Inventory (MMPI)

#### Background

Minnesota Multiphasic Personality Inventory (MMPI), developed in the 1940s by Professor S. R. Hathaway and Professor J. C. McKinley of the University of Minnesota, is a widely used and authoritative paper-pen personality test. The questionnaire was developed by forecasting normal people and mental patients to determine which items had significantly different response patterns, so the test was most commonly used to identify mental disorders. MMPI was introduced into China in the 1980s, and the Institute of Psychology of the Chinese Academy of Sciences organized the standardization revision work. MMPI has been widely used in China after decades of development and revision. In the course of revision, it was found that the T scores of D and Sc table of Chinese normal persons was significantly higher than that of western countries. But at the same time, the T scores except the D and Sc of western people were significantly higher than those of the Eastern countries. This result is very consistent with that of the Eastern countries, especially Japan. Therefore, according to the special conditions of the Oriental countries, the American standard of abnormal MMPI score (above 70 ) is revised to Chinese standards (above 60) of abnormal MMPI.

#### Explication

##### 10 scales

**Hs:** Hypochondriasis - An abnormal concern for one's health, worrying about one's illness or un-health

**D:** Depression - Depression is characterized by a lack of motivation, a lack of hope for the future, and a general dissatisfaction with one's life.

**Hy:** Hysteria - Dependence, infantility and narcissism, and lack of insight.

**Pd:** Psychopathic deviate - Morbid personality (antisocial, aggressive personality).

**Mf:** Masculinity-femininity- Men with high marks are sensitive, passive and feminine; women with high marks are seen as masculine, rude, aggressive, unemotional and

insensitive. Extremely high scores take into account homosexuality and homosexual behavior.

**Pa:** Paranoia - unshakable delusion, suspicion.

**Pt:** Psychasthenia - Nervousness, anxiety, compulsion

**Sc:** Schizophrenia - Confusion of mind, apathy of emotion, and strange behavior

**Ma:** Hypomania - Too many associations, ideas fluttering, exaggeration and emotional agitation, emotional variability

**Si:** Social introversion - Those with high scores are introverted, timid, cowardly, unsociable, yielding, nervous, stubborn and guilty; those with low scores are extroverted, sociable, expressive, aggressive, impulsive, wayward, pretentious, insincere in social relations.