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WORLD MARITIME UNIVERSITY

Dalian, China

**Assessment on PSC Inspection during MIMSAS
on Implementation of MARPOL 73/78**

By

Zheng Yuxin

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

(MARITIME SAFETY AND ENVIRONMENTAL MANAGEMENT)

2014

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Declaration

I certify that all the material in this research paper that is not my own work has 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: Zheng Yuxin

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Professor of Dalian Maritime University

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Acknowledgments

This thesis was the research paper for master degree of my studies submitted to the WMU and DMU. This thesis would not have been completed without the generous support of the joint project of WMU and DMU, the government of Ministry of Transport, my paper supervisor, MSEM faculties, classmates, colleagues and family members to whom I would express my sincere thanks.

Firstly, I would be so proud to be one of the MSEM students in the joint project of WMU and DMU, which offers me a good opportunity to grasp the latest technological, instrumental and management information.

Secondly, I would like to express my appreciation to the Ministry of Transport of P.R.China, China MSA, Guangdong MSA and Zhanjiang MSA, which offered me this great opportunity get access to this brilliant learning program.

Thirdly, hearty gratitude of mine would be given to my erudite research paper supervisor, Professor Dang Kun, whose rigorous attitude, erudite knowledge, professional recommendations and inspiring encouragement guided me to overcome difficulties during my preparation for the thesis.

Meanwhile, I would express my sincere gratitude to all the MSEM faculties, who devote themselves in the program to give fabulous lectures and assistance. I am particularly grateful to Professor Rasmussen, who provides a comprehensive and unique lecture on IMSAS, which is of great value to my studies. Appreciation also goes to vice president of WMU, Professor Ma, Mrs. Wang and Mr. Bao, who spend so much time and efforts on the program.

Especially, I would like to say thanks to all the classmates and colleagues, who give me assistance, support and care for my studies, namely, Mr. Wang Jin, Mr. Zheng Jinming, Mr. Chen Peiwei and Mr. Lu Jinguo from Zhanjing MSA, Ms. You Jie from Foshan MSA, Mr. Liu Bin from Huizhou MSA and Mr. Li Pengju from MSEM program.

Last but not least, the ultimate thanks go to my grandmother, my parents, my uncle and all my family members, who give me love, encouragement and support.

Abstract

**Title: Assessment on PSC inspection during MIMSAS
 on implementation of MARPOL 73/78**

Degree: MSc

This Research paper is a study of the assessment on PSC inspection in mandatory IMO member state audit scheme on implementation of MARPOL 73/78 and relative analyses are carried out. The thesis contains the historic stages of development of IMSAS, assessment factors of PSC inspection in MIMSAS on implementation of MARPOL 73/78 and proposes corresponding recommendations.

MIMSAS is necessary because it is a “sharp tooth” to achieve the goal of IMO to ensure the compliance with IMO regulations by member states. As for port state control, MIMSAS is helpful to encourage initiative of port states to ensure their standards of effective implementation to fulfill their obligations.

However, the current situation of implementation of MIMSAS is not optimistic. Certain member states are unable to fully implement the obligations due to political, economic, cultural and technical reasons.

With regard to carrying out IMSAS, the major issue and the member states’ implementation problem are the same— how to implement and how to assess the state members of IMSAS, especially for the port state obligations, as there have been no instruments promulgated as guidelines for its implementation and assessment on port state members.

More specifically, the assessment on PSC inspection on implementation of MARPOL 73/78 convention, which would be mandatory in the year of 2015, it would enhance the PSC inspection performance by establishing guidelines for standardized assessment system and dynamic evaluation mechanism. Unfortunately, there have been no such guidelines to assess PSC inspection in MIMSAS on the implementation of MARPOL 73/78.

Therefore, corresponding suggestions and recommendations are provided. This research paper focuses on setting up standardized assessment system and dynamic evaluation mechanism by instruments regulating requirements and criteria for implementation and assessment.

KEYWORDS: audit, MARPOL Convention, PSC, assessment, implementation

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List of Abbreviations

BIMCO	Baltic and International Maritime Conference
DMU	Dalian Maritime University
FSC	Flag State Control
ICAO	International Civil Aviation Organization
ICS	International Chamber of Shipping
III CODE	IMO Instruments Implementation Code
ILO	International Labour Organization
IMO	International Maritime Organization
IMSAS	IMO Member State Audit Scheme
ISF	International Shipping Federation
ISM CODE	International Management Code for the Safe Operation of ship and for pollution prevention
ISO	International Standard Organization
JWG	Joint Working Group
MARPOL	International Convention for the Prevention of Pollution from ships
MEPC	Marine Environment Protection Committee
MIMSAS	Mandatory IMO Member State Audit Scheme
MLC	Maritime Labor Convention
MOU	Memorandum of Understanding
MSA	Maritime Safety Administration
MSC	Maritime Safety Committee
PEST	Political, Economic, Social, and Technological
PSC	Port State Control
PSCO	Port State Control Officer
RO	Recognized Organization
SOLAS	International Convention for the Safety of Life at Sea
STCW	Standards of Training, Certification and Watch Keeping

TCC	Technical Co-operation Committee
UN	United Nations
UNCLOS	United Nations Conference on the Law of Sea
VIMSAS	Voluntary IMO Member State Audit Scheme

Chapter 1 Introduction

1.1 Research objectives

Originated from the quality management system standards raised from International Standard Organization (ISO), the implementation of IMSAS among IMO Member States has undergone fast development, due to coordinated efforts by several international organizations, namely IMO, ILO, ICS/ISF, since 2002.

The development of IMSAS has undergone three stages: pre-VIMSAS stage (2001-2006), VIMSAS Stage (2006-2012) and MIMSA stage (2012 until now). For pre-VIMSAS stage (2001-2006), it is a revolution of putting the idea of audit originating from quality management system standards raised by ISO to reality. There are two achievements during the period. The first is setting up documentary guidelines of IMSAS and the second is the proposal of the idea. For VIMSAS Stage (2006-2012), it is the milestone of IMSAS implementation, as several member states of IMO carried out the IMSAS voluntarily. For MIMSA stage (2012 until now), it is the milestone which totally achieves the goal of promotion of the IMSAS, as the member states shall carry out IMSAS mandatory.

However, questions still emerge to both IMO and member states, on how to carry out the VIMSAS in practice. There have been not adequate documentations and a certain number of the mandatory documents are not been practical enough.

To be more precise, the Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments, regulates general port state obligations at the year of 2011. Unfortunately, there has been no guideline for assessment on PSC inspection, notwithstanding on the implementation of MARPOL 73/78.

Based on the above situations, the thesis focuses on trying to solve the problem of assessment on PSC inspection in MIMSAS on the implementation of MARPOL 73/78.

1.2 Preview on previous studies

The topic of IMSAS has drawn attention from international organizations, governments and experts. Numerous studies and achievements have been made in three aspects, namely the development of IMSAS, the implementation of IMSAS and the assessment on IMSAS.

For the development of IMSAS, several articles have explored the history of IMSAS and relevant documents. Barchue, who was an officer of IMO in charge of the relevant issues, published a number of articles, such as “making a case for the voluntary IMO member state audit scheme” (Barchue, 2006) and “issues of contemporary interest. The voluntary IMO member state audit scheme” (Barchue, 2009). He discussed what may have precipitated the development of IMSAS and talked on the genesis of promotion of IMSAS from the IMO’s view. Clay (2009) collected the instruments on audit scheme before 2009 to offer a model of collection

documents on the issue. Sha (2009) did some discussion on the influences to Chinese government as a member state of IMSAS.

However, the researches on the development of IMSAS are not optimistic for assessment on the implementation of the subject. For one part, there has been no article to contain the entire development schemes from 2002 until now. For the other part, no one has got a clear picture on the developments of IMSAS from historical views, on which the author of the thesis has researched.

For implementation of IMSAS, several articles have mentioned the necessity of implementation of IMSAS. The Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments, regulates general port state obligations. You J. (2013) talks about the influences of evolution of IMSAS to the implementation level. Zuo B.T. (2013) makes a research on the relationship between government and RO for implementation of IMSAS.

However, the researches on the implementations of IMSAS are far from being enough. Most of the researches focus on the necessity of IMSAS, but they are relatively weak on how to implement at particle level, in which the author of the thesis would like to do research.

For the assessment on IMSAS, ICS/ISF had published a flag state performance for shipping industry to assess the flag states performance. In the publication, the flag state performance table was set up as “Possible negative performance indicators are shown as black ‘blobs’. Like all statistics, the data need to be used with caution and individual indicators may provide an unreliable measurement of performance” (Rasmussen, 2013).

However, the researches on the implementation of IMSAS are not enough. ICS/ISF just focuses on the evaluation of flag states themselves, but it is weak on setting up a

standard to assess flag states. Besides, there has no guideline of assessment on port states, on which the thesis would like to do research.

1.3 Organization of the thesis

The thesis consists of five chapters.

Chapter 1 briefly explains the reasons research were carried out in this thesis, namely the purpose, pervious studies, and organization of the thesis.

Chapter 2 generally introduces what the current situation is of the issue which has been noted. The background of MARPOL 73/78, the development of PSC and the history of MIMSAS have been presented. What is more, the three stages history of MIMSAS has been introduced.

Chapter 3 is the core of the thesis, and how to solve the problems which have been put forward. For the assessment point of view, criteria were discussed and analyzed, which are (1) legislation, (2) personnel arrangements, (3) facilities, (4) response mechanisms, (5) procedures and (6) evaluation.

Chapter 4 gives suggestions on key aspects, which are standardized assessment system and dynamic evaluation mechanism.

Chapter 5 summarizes the conclusions.

CHAPTER 2 Backgrounds

This chapter mainly contains three parts and elaborates on the development of IMSAS by IMO, the introduction of MARPOL Convention and related issues of Port State respectively.

2.1 The development of IMSAS by IMO

2.1.1 Relevant definitions

● Audit

The general definition of an audit is “a planned and documented activity performed by qualified personnel to determine by investigation, examination, or evaluation of objective evidence, the adequacy and compliance with established procedures, or applicable documents, and the effectiveness of implementation”. (D. H. Stamatis, 2002).

The ISO 9000 first standardized the audit and relevant issues in 1987. The audit means “a systematic, independent and documented process for obtaining audit evidence and

evaluating it objectively to determine the extent to which audit criteria are fulfilled”.
(ISO 9000, 1987)

The ISO 19011, “guidelines for auditing management systems” (ISO 19011, 2011) consists of seven chapters and two informative annexes to regulate the general audit management.

In the author’s point of view, the important aspects illustrated by the ISO 19011 are practical for several factors. Firstly, it defines the application scope of audit. Secondly, it gives clear definitions on the issues related to audit. Thirdly, it illustrates the purposes and principles of audit, such as internal and external audits. Most importantly, it gives guidance for the establishment, implementation and conduct of audit. Last but not least, it provides guidance for evaluations.

2.1.2 Development of IMSAS

The development of IMSAS can be divided into three stages: pre-VIMSAS stage (2001-2006), VIMSAS Stage (2006-2012) and MIMSA stage (2012 until now).

A. Pre-VIMSAS stage (2001-2006)

Step 1 Proposals

● policy making (2001)

To enhance the implementation of conventions, IMO complied with the concept of audit from the ISO to promote the VIMSAS. The attempts were the adoption of the Resolution of A. 909 (22) (IMO, 2001, a) , (IMO, 2001,b) and (IMO, 2001, c) on

November 2001, the purpose of which is to make policy and objectives together with assessment for the VIMSAS.

● Joint Working Group (JWG) (2002-2003)

In November 2002, “the Maritime Safety Committee, the Marine Environment Protection Committee and the Technical Co-operation Committee (TCC) considered the desirability of holding a joint working group (JWG) to develop the documentation for the Audit Scheme. Having agreed to the request of the Council, the JWG was established and it met for the first time during MSC 77 in June 2003.”(Barchue, 2006) The JWG played a positive role as it makes the group to work together as a whole.

● Model scheme (2003)

With the help of “the model derived from “the ICAO Universal Safety Oversight Audit Programme” (Barchue, 2006), The IMO Council, at its eighty-eighth session held in June 2002, considered and approved, in principle, a proposal by nineteen Member States on the development of an IMO Model Audit Scheme. (ibid)

Step 2 Adoptions (2003-2005)

The first mile stone of IMSAS history was the adoption of the Resolution of A. 946(23) (IMO, 2003) on November 2003, the voluntary IMO audit scheme. It is the first attempt to set up an audit scheme, with two years hard work. Although it is just voluntary, the achievement can not be disregarded, as Mr. L. D. Barchue, Sr., Head of Member State Audit and Internal Oversight Section of IMO noted,

“With the foregoing in view, the Council, in June 2003, took a number of important decisions, amongst which were the following:

- .1 approval of the objectives of the Scheme and that sovereignty and universality; consistency, fairness, objectivity and timeliness; transparency and disclosure; quality and inclusiveness; and continual improvement should be the principles of the Scheme;
 - .2 endorsement of the JWG’s decision that the scope should be comprised of sections on IMO instruments; obligations and responsibilities of a Member State;
 - .3 endorsements of the safety-and security-related areas and environmentally-critical areas for the Scheme;
 - .4 endorsement of the capacity-building and technical co-operation aspects of the Scheme...”
- (Barchue, 2006)

In addition, it took another two years to practice the audit scheme. In 2005, the framework and procedure for audit scheme was adopted in the Resolution of A. 974(24) (IMO, 2005, a). As You J. noted, “the adoption of the framework and procedures for the scheme harmonized and consistent global implement of IMO standards, which is key to realizing the IMO objectives of safe, secure and efficient shipping on clean oceans”(You, 2013). Furthermore, the Resolution of A. 975(24) reviewed “the future feasibility to develop suitable provisions for the possible future inclusion” (IMO, 2005, b). The commencement of VIMSAS was drawing near. Figure 1 is to show all the relevant resolutions adopted by IMO at this stage.

Figure 1-resolutions of IMO relevant instruments with VIMSAS at pre-VIMSAS stage

RESOLUTIONS

<u>A.22/Res.909</u>	Policy making in IMO : Setting the Organization's policies and objectives. Adopted on 29 November 2001
<u>A 22/Res.912</u>	Self-assessment of flag state performance. Adopted on 29 November 2001.
<u>A 22/Res.914</u>	Measures to further strengthen flag state implementation. Adopted on 29 November 2001
<u>A 23/Res.946</u>	Voluntary IMO Member State Audit Scheme. Adopted on 27 November 2003
<u>A 24/Res.974</u>	Framework and procedure for the Voluntary IMO Member State Audit Scheme. Adopted on 1 December 2005
<u>A 24/Res.975</u>	Future development of the Voluntary IMO Member State Audit Scheme. Adopted on 1 December 2005

Source: Maritime knowledge center. (2011). Information resources on the VIMSAS. London: author.

B. VIMSAS stage (2006-2012)

● Promotion of VIMSAS (2006-2009)

The IMO played a positive role to promote the VIMSAS. As the Resolution of A. 1018 (26) noted, “since the audit scheme commenced its operation in 2006, several member states have volunteered to be audited and the experience gained by such states and the audit reports issued in relation to them have confirmed the positive influence of the scheme in enhancing effective implementation of the provisions...” (IMO, 2010, a)

Due to the hard work by the IMO, the three years and a half witnessed a success of promotion, with “more than 40 member states” (Zhou and Sha, 2011) and “more than 85% tonnage of world fleet” (Zhu, 2011) applied the audit scheme. So it was time for institutionalization of IMO audit scheme.

● Institutionalization (2009-2012)

In November, 2009, the Resolution of A. 1018 (26) replaced Resolution of A. 974(24) and the Resolution of A. 975(24). The aim of it is “to take appropriate action to develop and establish the IMO member state audit scheme in its institutionalized form within the established time frame”. (IMO, 2010, a) Resolution of A. 1018 (26) made the time frame and schedule of activities to institutionalize the IMSAS, as shown in Table 1.

Table 1- the time frame and schedule of activities to institutionalize the IMSAS

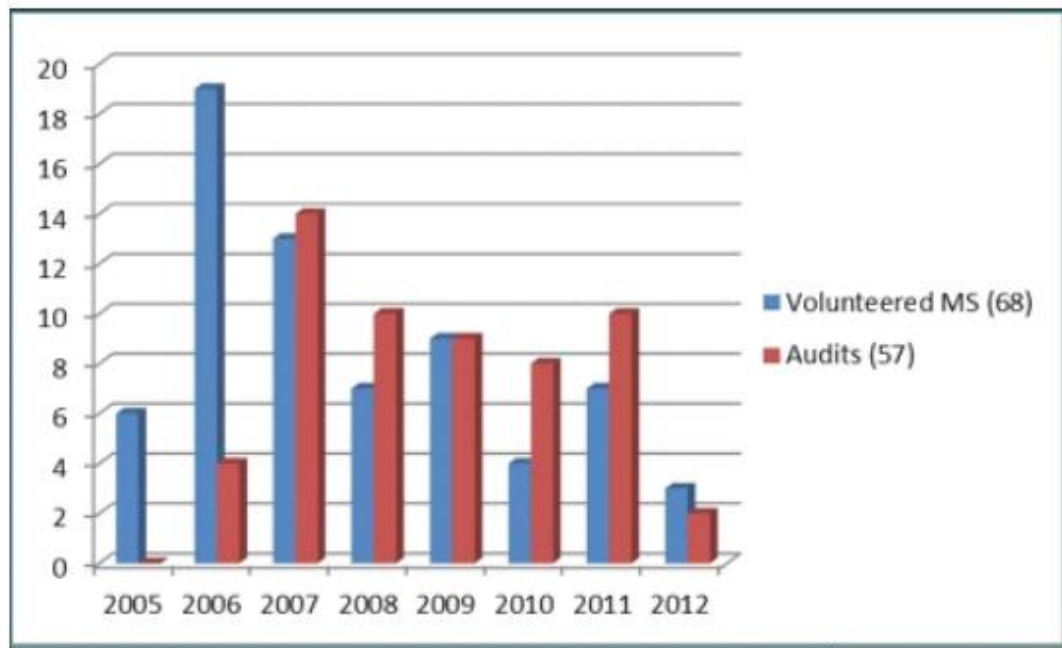
The time frame and schedule of activities to institutionalize the IMSAS		
IMO	Timing	Actions
MSC and MEPC	First half of 2010	Consider how to make the code for the implementation of mandatory IMO instruments mandatory, including provisions for auditing
MSC and MEPC	Second half of 2010	Identify mandatory IMO instruments through which the Code and auditing should be made mandatory
Council	End of 2010	Establish JWG of MEC, MEPC, FAL and TCC to review the framework and procedures for the Scheme
MSC and MEPC	2011 and 2012	Develop provisions to make the Code mandatory through the identified mandatory IMO instruments
Council	Second half of 2011	Approve a progress report for submission to A. 27
Assembly 27	2011,11	Receive a progress report and decide as appropriate

JWG	2011 and 2012	Receive the framework and procedures for the scheme
JWG	2013	Finalize the framework and procedures, taking in to account the finished product of the code and the related amendments to mandatory IMO instruments
Council	First half of 2013	Approve the framework and procedures for the scheme, for submission to A. 28 for adoption
Committees	2013	Adopt amendments to the mandatory IMO instruments concerned for entry in to force on 1,1, 2015
Assembly 28	2013,11	Adopt resolution on the framework and procedures for the scheme and amendments to those mandatory instruments under the purview of the assembly
Council, committees and secretariat	2014	Preparatory work for the commencement of an institutionalized audit scheme

Source: compiled by the author based on IMO (2012). Flag state implementation. Time frame to make III code and auditing mandatory. Note by the secretariat (MSC 91/10/1) London: author.

Up till the beginning of 2012, there had been 57 member states complying with VIMSAS, as illustrated by Figure 2. Since the VIMSAS proved to be successful, it was the right time to turn VIMSAS to MIMSAS.

Figure 2-voluntary states complying with VIMSAS



Source: Krilic, T. (2012).IMO Member State Audi Scheme. IMO presentation handout, International Maritime Organization, the United Kingdom, London.

C. MIMSA stage (2012 until now).

● Adoption (2012)

The year 2012 is a very important year to witness the development of IMSAS, which is the mile stone of MIMSAS. There are two documents, the Resolution of A. 1054(27) (code for the implementation of mandatory IMO instruments) (IMO, 2011, c), and the IMO Instruments Implementation Code (III Code) (IMO, 2012, a). For the Resolution of A. 1054(27), it was the first resolution of MIMSAS. For the IMO Instruments Implementation Code, it made the time frame to make III Code and auditing mandatory, as illustrated in Table 2.

Table 2- time frame to make III Code and auditing mandatory

Time frame to make III Code and auditing mandatory				
	Approval	Adoption	Acceptance	Entry into force
III Code	MSC 91 (11/2012) MEPC 64 (10/2012)	A. 28 (11/2013)		
SOLAS 1974	MSC 91 (11/2012)	MSC 93 (05/2014)	1/7/2015	1/1/2016
MARPOL and Annexes	MEPC 64 (10/2012)	MEPC 66 (03/2014)	1/2/2015	1/1/2016
LL 1966	MSC 91 (11/2012)	A. 28 (11/2013)	Unanimous Acceptance (3 years) e.g. 10/2016 explicit acceptance	12 months
LL PROT 1988	MSC 91 (11/2012)	MSC 93 (05/2014)	1/7/2015	1/1/2016
COLREG 1972	MSC 91 (11/2012)	A. 28 (11/2013)	Tacit acceptance at a date decided by assembly	Date decided by the assembly
TONNAGE 1969	MSC 91 (11/2012)	A. 28 (11/2013)	Unanimous Acceptance (2 years) e.g. 10/2015 explicit acceptance	12 month
STCW	MSC 92 (06/2013)	MSC 93	1/7/2015	1/1/2016

		(05/2014)		
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Source: compiled by the author based on IMO (2013). Voluntary IMO member state audit scheme. Implementation of the global programme on VIMSAS. Note by the secretariat. London: author.

● Implementation (2013 until now)

The Resolution 1054 (27), Code for the implementation of the mandatory IMO instruments adopted on December, 2011, was another important regulation for the IMSAS, (IMO, 2011, c) as it established a general guideline for requirements, duties, implementation and relevant issues to flag states, port states and coastal states.

The MIMSAS is the trend of IMSAS. However, it is a big issue for all the member states-what they can do and how to do it. The member state are preparing for the MIMSAS in practical level. It is obvious that the trend and efforts would contribute to the improvement of implementation.

At the end of the introduction, a table is used to show the adopted resolutions and codes relevant to development of IMSAS, as illustrated in Table 3 and make a map of the historical events, as illustrated in Figure 3.

Table 3- the adopted regulations relevant to development of IMSAS

The adopted regulations relevant to development of IMSAS		
NO.	TIME	TITLE
Res. 909 (22)	2001.11	Setting the organization's policies and objectives
Res. 912 (22)	2001.11	Self-assessment of flag state performance
Res. 914 (22)	2001.11	Measures to further strengthen flag state implementation
Res. 946 (23)	2003.11	Voluntary IMO Member State Audit Scheme

Res. 974 (24)	2005.12	Framework and procedure for the voluntary IMO member state audit scheme
Res. 975 (24)	2005.12	Future development of the voluntary IMO member state audit scheme
Res. 1018 (26)	2010.01	Future development of the voluntary IMO member state audit scheme
Res. 1054 (27)	2011.12	Code for the implementation of the mandatory IMO instruments
MSC. 91/10/1	2012.09	Flag state implementation. Time frame to make III code and auditing mandatory
TC 63/7	2013.05	Voluntary IMO member state audit scheme. Implementation of the global programme on Voluntary IMSAS.
Assembly 28	2013.11	Adoption of resolution on the framework and procedures for the scheme and amendments to those mandatory instruments under the purview of the Assembly 28
On schedule	2014	Preparatory work for the commencement of an institutionalized audit scheme council, committees and secretariat
commence	2015	Commencement firstly from MAPPOL 73/78 and STCW, SOLAS

Source: compiled by the author based on IMO resolutions and Zhang B. (2013). PEST Approach: A study on the general impacts of implementing mandatory member states audit system for China MSA and countermeasures. Dalian Maritime University, Dalian, China.

2.2 Introduction of MARPOL 73/78 Convention

The MARPOL 73/78 Convention, which is short for the International Convention for the Prevention of Pollution from ships, as modified by the Protocol of 1978 relating thereto, is one of the three pillars (the other two are SOLAS and STCW) among the IMO conventions.

“The MARPOL Convention is the main international convention dealing with prevention of pollution of the marine environment by ships. It is a combination of two treaties adopted in 1973 and 1978”. (Dang, 2013) MARPOL Convention consists of 1973 convention, 1978 protocol respectively, and 6 annexes, which are Annex I (the prevention of pollution by oil), Annex II (control of pollution by noxious liquid substances), Annex III (prevention of pollution by harmful substances in packaged form), Annex IV (prevention of pollution by sewage from ships), Annex V (prevention of pollution by garbage from ships) and Annex VI (prevention of air pollution from ships), as illustrated by Table 4.

Table 4- structure of MARPOL Convention

Structure of MARPOL Convention		
Item	Content	Time into force and latest revised time
1973 convention	International Convention for the Prevention of Pollution from ships	1973
1978 protocol	the Protocol of 1978 relating thereto	1978
Annex I	the prevention of pollution by oil	Came into force on 1983; Revised in January, 2007
Annex II	control of pollution by noxious liquid substances	Came into force in 1987; Revised in January, 2007

Annex III	prevention of pollution by harmful substances in packaged form	Came into force o in January,2014
Annex IV	prevention of pollution by sewage from ships	Came into force in September,2003
Annex V	prevention of pollution by garbage from ships	Came into force in January,2013
Annex VI	prevention of air pollution from ships	Came into force in July, 2010
	ship energy efficiency management	Came into force in July, 2011

Source: complied by the author based on MARPOL Convention

For MARPOL Convention, it is necessary to be assessed for two reasons. On the one hand, it is one of the three Convention pillars and one of the most practical conventions to carry on PSC inspections. What is more, as the time frame of MIMSAS was illustrated in Table 2, MARPOL Convention is the earliest one of the conventions to be audited among the series of conventions developed by IMO.

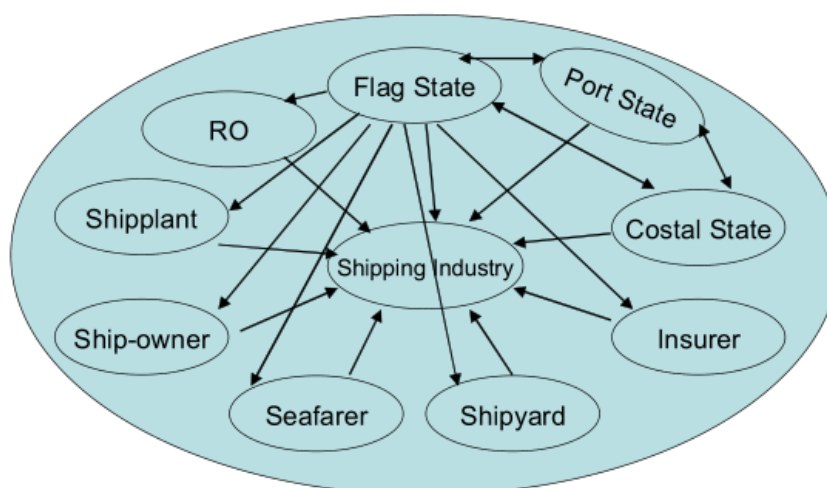
2.3 Port state and relevant issues

2.3.1 Port state

There is clear evidence that the IMSAS has relationships with port state. As the Resolution A.1054 (27) - CODE FOR THE IMPLEMENTATION OF MANDATORY IMO INSTRUMENTS, which adopted on 30 November 2011 noted, “Port States have certain rights and obligations under various mandatory IMO instruments.” and “can play an integral role in the achievement of maritime safety and environmental

protection, including pollution prevention. The role and responsibilities of the port State with respect to maritime safety and environmental protection is derived from a combination of international treaties, conventions, national laws, as well as in some instances, bilateral and multilateral agreements.” (IMO, 2011, c) and “There are five principal actors when it comes to regulatory and enforcement paradigm of international shipping, namely, IMO, Governments, Recognized Organizations (RO), Ship owners/Shipping Companies, and Seafarers” (You, 2013, p22). Under the regime of IMO, “the comprehensive responsibility chain includes the stakeholders not only the principal actors mentioned above but other players”. (Yu, 2009, p. 43) Figure 4 shows the responsibility chain under IMO regime,

Figure 3 - Responsibility Chain under IMO Regime



Resource: Yu, Q. W. (2009). Discussion on enhancing the efficiency of the Flag State Control in China.China MSA, (Maritime Workshop), 43-45.

Besides, there is clear evidence that the IMSAS are closely related to MARPOL Convention and port state. As the Resolution A.1054 (27) noted, “SOLAS, as modified by its 1988 Protocol, MARPOL and STCW also contain provisions that obligate port States to treat non-Parties to those conventions no more favorably than those that are Parties. This means that port States are obliged to impose the conditions of the conventions on Parties as well as on non-Parties.” (IMO, 2011, c)

In conclusion, “Port States should periodically evaluate their performance in respect of exercising their rights and meeting their obligations under mandatory IMO instruments.” (IMO, 2011, c) and “port states should periodically evaluate their performance in respect of exercising their rights and meeting their obligations under mandatory IMO instruments.” (Rasmussen, 2013)

2.3.2 Port state control (PSC)

Port states control (PSC), is “the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment complies with the requirements of international regulations and that the ship is manned and operated in compliance with these rules.” (IMO, 2013)

For the origin of PSC, “it can be traced back to 1978, in according with rules under ILO, but it is widely accepted that contemporary PSC regime derived from the establishment of the Paris Memorandum of Understanding on PSC (Paris MOU)”. (Xu, 2013)

There are two points should be considered. Firstly, “PSC should not be considered as a substitute for a FSC.” (Rasmussen, 2013) Secondly, “a FSC regime is a prerequisite for the PSC to make use of the right to carry out inspections on foreign ships”. (Rasmussen, 2013)

2.3.3 Port state control officer (PSCO)

Port state control officer (PSCO), is a person “duly authorized by the competent authority of a party to a relevant convention to carry out PSC inspections, and responsible exclusively to that party”. (IMO, 2011, d)

According to the Resolution A.1054 (27), “Port State control should be carried out only by authorized and qualified port State control officers in accordance with the relevant procedures adopted by the Organization.” So what is a qualified PSCO? Procedures for port state control regulates,

- “
- (1)The PSCOs should have no commercial interest, either in the port of inspection or the ships inspected, nor should the port State control officers be employed by or undertake work on behalf of recognized organizations.
 - (2)The PSCO should be able to communicate in English with the key crew.
 - (3)Training should be provided for PSCOs to give the necessary knowledge of the provisions of the applicable conventions which are relevant to the conduct of PSC, taking in to account the latest IMO model courses for PSC.
 - (4)PSCOs carrying out inspections of operational requirements should be qualified as a master or chief engineer and have appropriate seagoing experience, or have qualifications from an institution recognized by the administration in a maritime related field and have specialized training to ensure adequate competence and skill, or be a qualified officer of the administration with an equivalent level of experience and training, for performing inspections of the relevant operational requirements.”

(IMO, 2011, c)

In conclusion, it is very important to remember that port State control should not be considered as a substitute for a proper Flag State control. A proper Port State control

regime is a prerequisite for the port State to make use of the right to carry out inspections on foreign ships. As for establishing a port State control regime, the port State should consider the best possible use of the resources available to the Maritime Administration. (Rasmussen, 2013)

CHAPTER 3 Analysis on assessment factors

The Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments, regulates specific port state obligations under MARPOL 73/78, as illustrated by Table 5- specific port state obligations under MARPOL 73/78.

Table 5- specific port state obligations under MARPOL 73/78

Specific port state obligations under MARPOL 73/78	
Source	Summary descriptions
Art. 5(2)	Certificates and special rules on inspection of ships – Port State Control
Art. 5(3)	Certificates and special rules on inspection of ships – denial of entry
Art. 6(2)	Detection of violations and enforcement of the Convention – inspection
Art. 6(5)	Detection of violations and enforcement of the Convention – inspection upon request – reporting
Annex I	
Reg. 2.6.2	Application—an oil tanker delivered on or before 1 June 1982 engaged in specific trades: agreement with Flag States
Reg. 2.6.3	Application—an oil tanker delivered on or before 1 June 1982 engaged in specific trades: agreement with Oort States
Reg. 11	Port State control on operational requirements

Reg. 17.7	Oil Record Book, Part I – inspection without undue delay
Reg. 18.10.1.2	Segregated ballast tanks – oil tanker delivered on or before 1 June 1982 having special ballast arrangements: agreement with flag States
Reg. 20.8.2	Denial of entry – communication to IMO
Reg. 21.8.2	Denial of entry – communication to IMO
Reg. 36.8	Oil Record Book, Part II – inspection without undue delay
Reg. 38.1, 38.2 and 38.3	Reception facilities outside special areas
Reg. 38.4 and 38.5	Reception facilities within special areas
Reg. 38.6	Reception facilities within special areas – notification to IMO
Reg. 38.7.1	Reception facilities within special areas: "Antarctic area"
Annex II	
Reg. 4.3.3	Exemptions – approval of adequacy of reception facilities
Reg. 13.6.1	Control of discharges of residues – endorsement of cargo record book
Reg. 15.6	Cargo record book – inspection without undue delay
Reg. 16.1	Measures of control
Reg. 16.6 and 16.7	Measures of control – exemption granted (endorsement of cargo record book)
Reg. 16.9	Port State control on operational requirement
Reg. 18.1 and 18.2	Reception facilities and cargo unloading terminal arrangements
Reg. 18.4	Cargo unloading terminal arrangements
Annex III	
Reg. 8	Port State control on operational requirements
Annex IV	
Reg.12(1)	Provision of reception facilities

Reg. 13	Port State control on operational requirements
Annex V	
Reg. 5(4)	Reception facilities within special areas
Reg. 5(5)(a)	Provision of reception facilities – Antarctic area
Reg. 7(1)	Reception facilities
Reg. 8	Port State control on operational requirements
Reg. 9(5)	Inspection of Garbage Record Book
Revised Annex VI	
Reg. 5.3.3	Necessary assistance to the surveyor as referred to in the paragraph
Reg. 10	Port State control on operational requirements
Reg. 15.2 and 15.3	Volatile organic compounds – approvals of vapour emission control systems and notification to IMO
Reg. 17.2	Reception facilities as referred to in the paragraph – communication to IMO
Reg. 18.10	Fuel oil quality – Communication to Party or non-Parties and remedial action

Source: compiled by the author based on IMO (2011). CODE FOR THE IMPLEMENTATION OF MANDATORY IMO INSTRUMENTS. London: author.

Note: the resolution was published before the ship energy efficiency management was revoked, so the relevant specific port state obligations were not included.

There are six assessment factors-(1)legislation, (2)personnel arrangements, (3)facilities, (4)response mechanisms, (5)procedures, (6) evaluation, which can be extracted from Table 5 to be considered as the assessment factors.

3.1 Legislation

Legislation could be defined differently under different law systems, but the main meaning of legislation is more or less the same, as wikipedia noted, “legislation (or "statutory law") is law which has been promulgated (or "enacted") by a legislature or other governing body, or the process of making it, (wikipedia, 2014) as <http://www.vocabulary.com/dictionary/legislation> noted, “The noun legislation refers to the actual law enacted by a legislative body at the national, state, or local level.” (<http://www.vocabulary.com/dictionary/legislation>, 2014), as oxford dictionary noted, it is “The process of making or enacting laws” (<http://www.oxforddictionaries.com/definition/english/legislation>, 2014).

3.1.1 Domestic legislations

The aspect of domestic legislation is a decisive factor in the assessment of PSC inspection during MISAS on implementation of MARPOL 73/78. For one reason, legislation is the guideline for PSC inspection during MISAS on the implementation of MARPOL 73/78. Without legislation, there is no possibility to implement any IMSAS. That is why the IMO and relevant associations have adopted and promoted a big number of relevant files as listed in Table 5. For another part, the core of legislation is nationalization, or domestic enacting. One reason is that legislation must be fulfilled by the actual law enacted within the state in terms of definition. The other reason is that different member states have different situations in terms of respective status quo. Variations could exist in term of civil law system, hardware, software or even weather conditions. So the domestic legislation is a decisive factor in the assessment of PSC inspection during MISAS on implementation of MARPOL 73/78.

3.1.2 Legislation procedure

The aspect of legislation procedure is a decisive factor in assessment of PSC inspection during MISAS on the implementation of MARPOL 73/78. For one part, only by legislation procedures can domestic legislations be adopted. For the other part, the domestic legislations shall be compatible to procedures as international practice required. The theme of the assessment of maritime states promoted by international management standards is the PDCA (PLAN-DO-CHECK-ACT) cycle, which illustrated in Figure 6- PDCA cycle.

Figure 6- PDCA cycle.



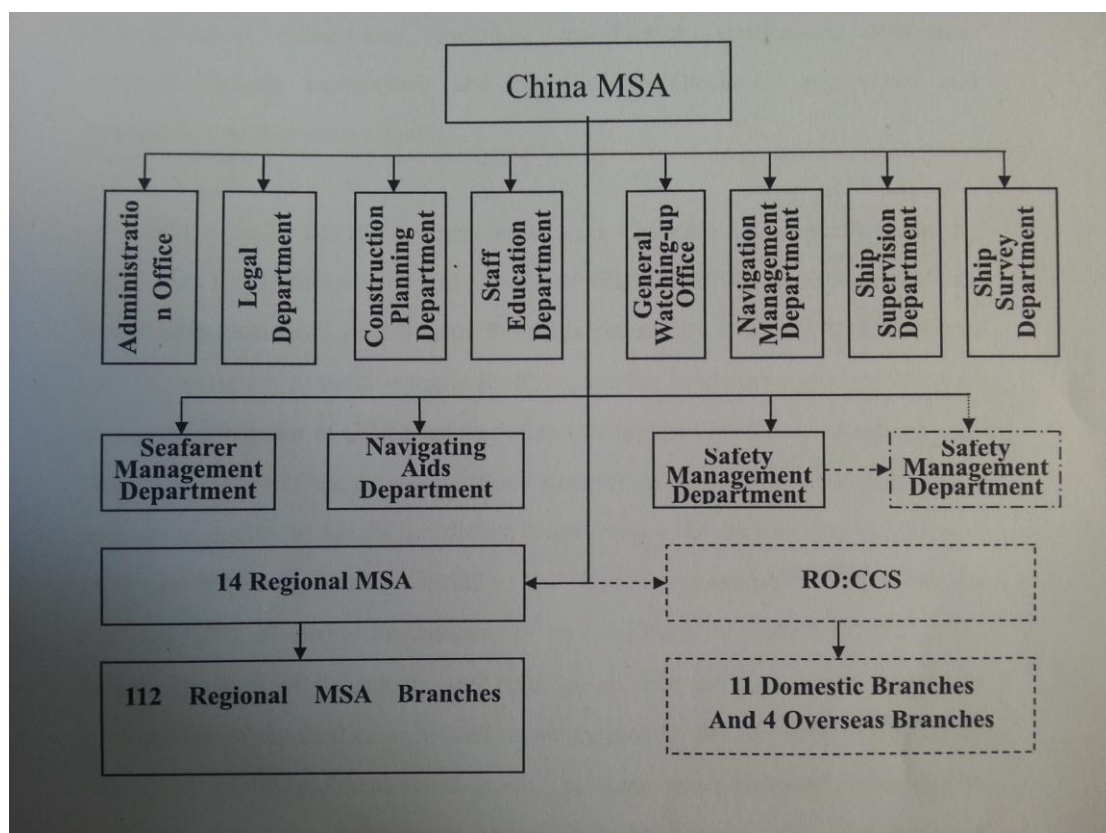
Source: Rasmussen (2013). Maritime governance and control. Unpublished lecture handout. World maritime university: Dalian.

Another aspect for assessment of legislation procedure is whether it coordinates well with the PSC procedures. The IMO has clearly regulated such issues within the *procedures for port state control*. (IMO, 2011, d)

3.1.3 Department(s) in charge of implementation

Department(s) in charge of implementation is a decisive factor in the assessment of PSC inspection during MISAS on implementation of MARPOL 73/78. For one part, the implementation department(s) is a decisive factor in implementation of legislation in theory. More importantly, “under the framework of IMASA, convention implementation is a very complicated project as many organizations or interested parties are involved.” (Zuo, 2013) Figure 7 illustrates Chinese MSA organizational chart for convention implementation as an example.

Figure 5- Chinese MSA organizational chart for convention implementation



Source: China MSA (2009). Summary report on convention-implementation of China MSA, Beijing: Author.

One point should be noted is that despite there is implementation department(s), the member states should implement the rights and duties as a whole, rather than one or two separate departments or agencies. This means that the department is just a

department to fulfill the obligation of member state. It is the member state that legislates and enacts the role of IMSAS.

3.1.4 Regulation scope and contents

Regulation scope is another decisive factor in the assessment of PSC inspection during MISAS on implementation of MARPOL 73/78. No matter how many levels of civil laws and regulations are adopted, the regulation scope of PSC inspection during MISAS on implementation of MARPOL 73/78 is definite and fixed. It contains three main parts: the national regulation on MISAS, the national regulation on implementation of MARPOL 73/78 and national regulation on PSC inspection.

Regulation content is a decisive factor in assessment of PSC inspection during MISAS on implementation and enforcement of MARPOL 73/78. The Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments regulates that,

For implementation-

“Port States have certain rights and obligations under various mandatory IMO instruments. When exercising their rights under the instruments, Port States incur additional obligations.

Port States can play an integral role in the achievement of maritime safety and environmental protection, including pollution prevention.....”

For enforcement-

“Port States should take all necessary measures to ensure their observance of international rules when exercising their rights and fulfilling their obligations.

Several IMO conventions contain specific provisions that permit Port State control.

In this respect, SOLAS, as modified by its 1988 Protocol, MARPOL and STCW also contain provisions that obligate Port States to treat non-Parties to those conventions no more favorably than those that are Parties. This means that port States are obliged to impose the conditions of the conventions on Parties as well as on non-Parties.

When exercising their right to carry out Port State control, a Port State should establish processes to administer a Port State control programme consistent with the relevant resolution adopted by the Organization.....”

(IMO, 2011, d)

3.1.5 Feedback and modification

Feedback and ratification is a decisive factor in the assessment of PSC inspection during MISAS on implementation of MARPOL 73/78. The Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments regulates that feedback and ratification must be contained, “Port States should periodically evaluate their performance in respect of exercising their rights and meeting their obligations under mandatory IMO instruments”. (IMO, 2011, c)

One important aspect is audit, including internal audit and external audit. The IMO may conduct member state audit. The main items are non-conformities, observations and other problems. Here is an example illustrated in Table 6-problems listed in 2009 IMO voluntary member state audit of China related to R.O. (Zuo, 2013)

Table 6-problems listed in 2009 IMO voluntary member state audit of China related to R.O.

Problems listed in 2009 IMO voluntary member state audit of China related to R.O.	
Items	Specific contents
Non-conformity	The agreement with RO is not fully in compliance with the IMO model agreement, as issuing and approval of all the statutory certificates and documents delegated to RO have not been included in the annexes to the RO agreement.
observations	No clear criteria for dispatch of its own surveyors overseas to carry out supplement surveys
	No objective evidence that China MSA has full ready access to the reports on surveys carried out on board ships flying the P.R.C flag, by the RO
Other problems	No evidence that China MSA has notified IMO of the specific responsibilities and conditions of authority delegated to its RO and there is no information provided on the GISIS
	The agreement with RO is not in line with the model agreement related to exclusive surveyors and auditors use of another organization
	There may be a remote possibility of China MSA intervention on the function of the RO since both parties are organizations functioning under the same ministry
	The internal process for monitoring the validity of certificates issued solely by the administration for ships flying the PRC flag engaged on international voyages is insufficient
	China MSA could not demonstrate how it verifies the expiry date of these certificates or due dates for annual/periodical audits/surveys

Source: Zuo B.T. (2013) Research on the relationship between China MSA and RO for implementing IMO member state audit scheme and relative path choice. World maritime university

3.2 Personnel arrangements

Personnel arrangements are a relatively important factor of implementation of IMSAS. PSCO, which is the personnel arrangements of port state control inspection, and it is the one pillar of hardware in port state. As the Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments, states that “Port State control should be carried out only by authorized and qualified port State control officers in accordance with the relevant procedures adopted by the Organization”. (IMO, 2011, c)

Numerous regulations have been published to control the quality of PSCO:

--For IMO regulations, the resolution A. 1052 (27), procedures for port state control clearly sets out a comprehensive guideline for PSC, including the definition, rights and duties, procedures, inspections, detentions and also the basic quality requirements for PSCO. Still, IMO conventions, such as SOLAS, MARPOL, STCW, LL 1966, TONNAGE 1969 also have content on the rights and obligations for PSCO.

--For ILO regulations, The ILO Maritime Labour Convention (MLC) 2006 also contains provisions for port State control in Regulation 5.2.1. Still, ILO has issued Guidelines for port State control officers under the MLC 2006.

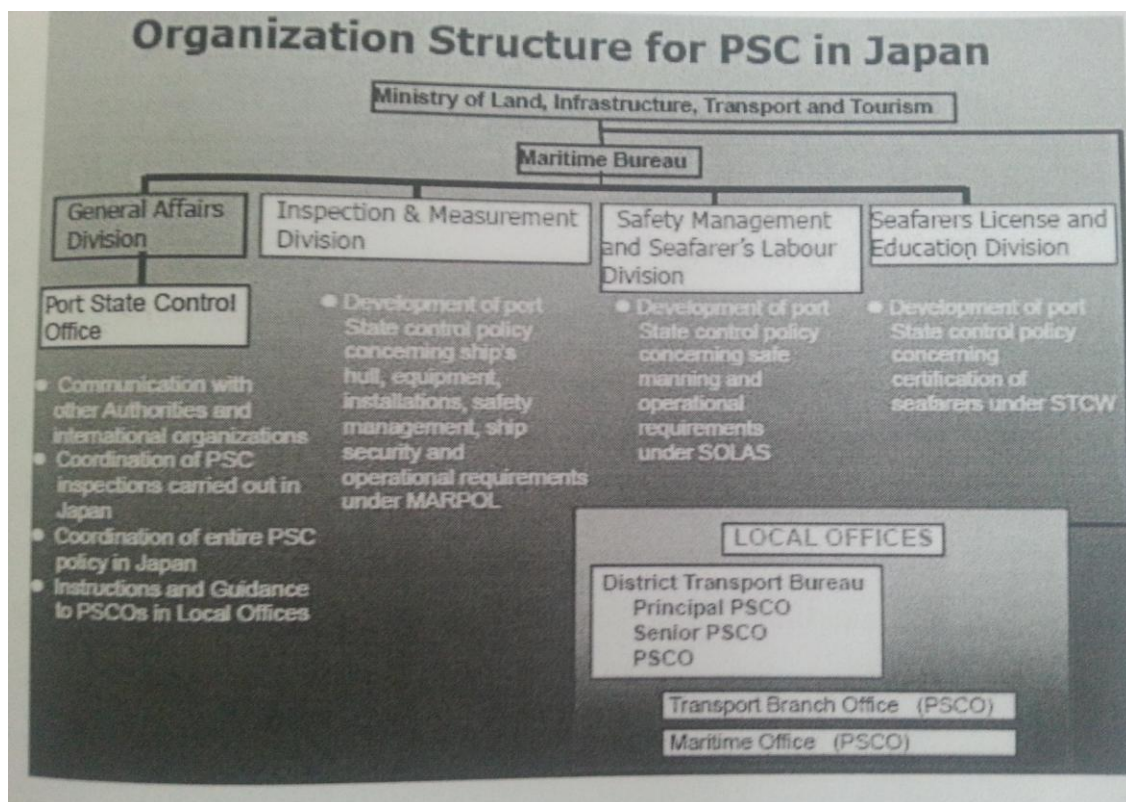
3.2.1 Quality assessment of personnel arrangements

- Training system

“Training system is very essential for PSCO in whatever a port state where the authority determines to carry out state control foreign ships visiting their national ports.” (Xu, 2013, p24)

Under the requirements of IMO resolutions, port states carry out their own training systems. For United States Coast Guard (USCG), there are three levels of PSCOS, the ordinary PSCO, the experienced PSCO and the principal PSCO. For member states of Tokyo MOU, Paris MOU, there are two kinds of training, which are training for new entrant PSCOS and training for existing PSCOS. Figure 8 illustrates the organization structure for PSC training system in Japan as an example.

Figure 6-the organization structure for PSC training system in Japan



Source: Xu D. (2013). Study on measures to optimize the training system for PSCOS in China. World Maritime University

- Personnel quality

--no commercial interest

As the Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments, notes that “Port State control officers and persons assisting them should have no commercial interest, either in the port of inspection or the ships inspected, nor should the port State control officers be employed by or undertake work on behalf of recognized organizations or classification societies.” (IMO, 2011, c)

--communication

Procedures for port state control 2011 state in regulation 1.8 that “the PSCO should be able to communicate in English with key crew” (IMO, 2011, d) the requirements for communications under resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments relates communication obligations of port state obligations under MARPOL 73/78, as Table 8 illustrates.

Table 7- communication obligations of port state obligations under MARPOL 73/78

Communication obligations of port state obligations under MARPOL 73/78	
Sources	Summary descriptions
Annex I	
Reg. 20.8.2	Denial of entry – communication to IMO
Reg. 21.8.2	Denial of entry – communication to IMO
Revised Annex VI	
Reg. 17.2	Reception facilities as referred to in the paragraph – communication to IMO
Reg. 18.10	Fuel oil quality – Communication to Party or non-Parties and

	remedial action
--	-----------------

Source: compiled by author based on IMO (2011, c). CODE FOR THE IMPLEMENTATION OF MANDATORY IMO INSTRUMENTS. London: author.

--familiar with MARPOL 73/78 convention

“It is obvious that the PSCO must have in depth knowledge of the conventions applied during port State control. The ordinary Master or Chief Engineer does not necessarily possess that knowledge. A comprehensive training programme should be established.” (Rasmussen, 2013)

“Besides the professional requirements to a PSCO it is imperative that the personal integrity of the PSCO cannot be questioned. The PSCO’s judgement should not be influenced by parameters which are not relevant i.e. flag of the ship, ownership, classification society or nationality of the crew. Any unethical conduct will reflect not only upon its own Administration but also on the whole port State control regime as such.” (Rasmussen, 2013)

--inspection of certificates

One duty for PSCO is inspection of certificates. The requirements for certificates under the Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments concerning certificates requirements of port state obligations under MARPOL 73/78, as Table 9 illustrates.

Table 8- certificates requirements of port state obligations under MARPOL 73/78

Certificates requirements of port state obligations under MARPOL 73/78	
Sources	Summary
Art. 5(2)	Certificates and special rules on inspection of ships – port State control

Art. 5(3)	Certificates and special rules on inspection of ships – denial of entry
Annex I	
Reg. 17.7	Oil Record Book, Part I – inspection without undue delay
Reg. 36.8	Oil Record Book, Part II – inspection without undue delay
Annex II	
Reg. 15.6	Cargo record book – inspection without undue delay
Annex V	
Reg. 9(5)	Inspection of Garbage Record Book

Source: compiled by author based on IMO (2011, c). CODE FOR THE IMPLEMENTATION OF MANDATORY IMO INSTRUMENTS. London: author.

Since the MARPOL 73/78 has been revised after resolution A.1054 (27), the new requirements of certificates are not included in resolution A.1054 (27). The required certificates under MARPOL 73/78 were renewed, as Table 10 illustrates.

Table 9- required certificates under MARPOL 73/78

Required certificates under MARPOL 73/78	
Sources	Summary
Art. 5(2)	Certificates and special rules on inspection of ships – port State control
Art. 5(3)	Certificates and special rules on inspection of ships – denial of entry
Annex I	
Reg.5(1)	Inspection of international sewage pollution prevention certificate
Reg. 17.7	Oil Record Book, Part I – inspection without undue delay
Reg. 36.8	Oil Record Book, Part II – inspection without undue delay
Annex II	
Reg. 15.6	Cargo record book – inspection without undue delay
IBC Code	New fitness certificate-Chemicals IBC Ch. 17 Category X,Y,Z

IBC Code	New fitness certificate-Vegetable oils IBC Ch. 17 Category Y
IBC Code	New NLS certificate-Chemicals IBC Ch. 18 Category Z
IGC Code	Fitness gas certificate-liquefied gas carrier
Annex III	
Reg. 4	Documentation
Annex IV	
Reg.4(1)	Inspection of international sewage pollution prevention certificate
Annex V	
Reg. 9(5)	Inspection of Garbage Record Book
Revised Annex VI	
Reg.6(1)	Inspection of international air pollution prevention certificate
MEPC 62	Documentation-the energy efficiency design index (EEDI)
MEPC 62	Documentation-ship energy efficiency management plan (SEEMP)

Source: compiled by author

3.2.2 Quantity assessment of personnel arrangements

To carry out port state regime, quantified resources for PSC inspection are necessary. They include funds, facilities and enough number of PSCOS.

●Funding

As Rasmussen noted, “the Administration should be aware that implementation of a proper port State control regime requires resources, i.e. funds. These resources should not be established through a reduction of the resources available for flag State control. (Rasmussen, 2013) But there are problems for funds of PSCO, as Rasmussen commented “with the focus on public expenditure in many countries, this may be a

hurdle that can be overcome only with strong arguments". (Rasmussen, 2013) The real situation for most port states is that there is no fund for PSCO at all. There is a long way to go in funding.

● facilities

In the resolution A. 1052 (27), procedures for port state control (IMO, 2011, d) the requirements of facilities for PSCO have been clearly stated, such as working suits, packages with notebook, a hammer, a torch and relevant tools, protection facilities, electronic devices such as computers, cameras and printers and inspection facilities.

The port state should establish a mechanism for facilities supplement. First of all, civil law or regulations should contain such rights for PSCO. Secondly, the mechanism should be connected with PSCO training system, once PSCO get the qualification, the PSCO should acquire facilities. Thirdly, the mechanism should contain a check in and out mechanism of facilities. Last but not least, a renewed timetable should be contained in the mechanism.

● Adequacy of PSCO

To make sure that the port state can effectively carry out its implementation, an adequate number of PSCOs are necessary. Two factors are sorted out according to my personnel experience as a PSCO, namely static index to make horizontal comparison and dynamic index to make vertical comparison.

-- Static index-percentage of PSCO on average

The calculations are as follows:

It can be assumed,

I_1 : numbers of PSC inspections for certain port state

I_2 : numbers of PSC inspections for all port states

S_1 : numbers of PSCOS for certain port state

S_2 : numbers of PSCOS for all port states

V_1 : Percentage of PSC inspections on average

V_2 : Percentage of PSCOS on average

Then we can get,

$$V_1 = I_1 / I_2$$

$$V_2 = S_1 / S_2$$

Then, there are three situations as follows

A. $V_1 > V_2$

The number of PSCOS is less than average, which means the port state should train more PSCOS.

B. $V_1 \cong V_2$

The number of PSCOS is on average, which means the port state should maintain training plans.

C. $V_1 < V_2$

The number of PSCOS is more than average, which means the port state should train less PSCOS and pay more attention to quality training for PSCOS.

--Dynamic index-inflow vs. outflow rate

It can be assumed,

F_1 : inflow number of PSCOS, mainly for PSCO who acquire qualification and who return to the duty of PSCO

F_2 : outflow number of PSCOS, mainly for PSCO who retired and who leave the duty of PSCO

Then, there are three situations as follows,

A. $F_1 > F_2$

The inflow number of PSCOS is more than the outflow number of PSCOS, which means the port state should train less PSCOS and pay more attention to quality training for PSCOS.

B. $F_1 \cong F_2$

The inflow number of PSCOS equals the outflow number of PSCOS, which means the port state should obtain training plans.

C. $F_1 < F_2$

The inflow number of PSCOS is less than the outflow number of PSCOS, which means the port state should train more PSCOS.

3.3 Reception facilities and inspection facilities

The reception facilities and inspection facilities are especially important for implementation of MARPOL 73/78 to prevent pollution. For reception facilities, it gives way for ships to release wastes which are harmful to the environment. For inspection facilities, it gives way for port state to control and inspect the ships entry in port of the state.

3.3.1 Reception facilities

One of the important factors for implementation MIMSAS of MARPOL 73/78 specially is reception facilities. As the reception facilities is one of the most practical measurements of capability to deal with pollution prevention. The Resolution A.1054 (27): Code for the implementation of the mandatory IMO instruments relates reception facilities requirements of port state obligations under MARPOL 73/78, as illustrated by Table 10.

Table 10- requirements for reception facilities of port state obligations under MARPOL 73/78

Requirements for reception facilities of port state obligations under MARPOL 73/78	
Annex I	
Reg. 38.1, 38.2 and 38.3	Reception facilities outside special areas
Reg. 38.4 and 38.5	Reception facilities within special areas
Reg. 38.6	Reception facilities within special areas – notification to IMO
Reg. 38.7.1	Reception facilities within special areas: "Antarctic area"
Annex II	
Reg. 4.3.3	Exemptions – approval of adequacy of reception facilities
Reg. 18.1 and 18.2	Reception facilities and cargo unloading terminal arrangements
Annex IV	
Reg.12(1)	Provision of reception facilities
Annex V	
Reg. 5(4)	Reception facilities within special areas
Reg. 5(5)(a)	Provision of reception facilities – Antarctic area

Reg. 7(1)	Reception facilities
Revised Annex VI	
Reg. 17.2	Reception facilities as referred to in the paragraph – communication to IMO
Reg. 18.10	Fuel oil quality – Communication to Party or non-Parties and remedial action

Source: compiled by author based on IMO (2011, c). CODE FOR THE IMPLEMENTATION OF MANDATORY IMO INSTRUMENTS. London: author.

Unfortunately, though the MARPOL 73/78 has regulated some requirements for reception facilities, “the government of each party to the present convention undertakes to ensure the provision at oil loading terminals, repair ports, and in other ports in which ships have oily residues to discharge, of facilities for the reception of such residues and oily mixtures as remain from oil tankers and other ships adequate to meet the needs of the ships using them without causing undue delay to ships. Each party shall notify the organization for transmission to the parties concerned of all cases where the facilities provided under this regulation are alleged to be inadequate”, but the regulations are not prescriptive and are not practical to carry out”. (IMO, 2011, e) As Rasmussen noted, “MARPOL does not set any prescriptive standards for port reception facilities, other than requiring that these are adequate”. (Rasmussen, 2013)

But, by what standards can we reach to the adequacy? The IMO gives the definition of adequate facilities in Resolution MEPC. 83 (40)-action plan on tackling the inadequacy of port reception facilities as,

- “1) Marine use;
- 2) Fully meet the needs of the ships regularly using them;
- 3) Do not provide mariners with a disincentive to use them; and

4) Contribute to the improvement of the marine environment.”

(IMO, 2012, c)

There are some problems for the implementation of issue of reception facilities:

- MARPOL does not set any prescriptive standards for port reception facilities, other than requiring that these are adequate
- the term “adequate” is defined in a qualitative manner in an MEPC resolution, which is not a mandatory instrument
- MARPOL does not set any certification requirements for port reception facilities
- MARPOL does not set any requirements for the environmentally sound management of any residues or garbage delivered to a port reception facility.

(Rasmussen, 2013)

In my opinion, there are some suggestions to solve the problems:

- it is suggested that IMO should set more detailed requirements for reception facilities at mandatory
- it is suggested that port states should establish their own civil laws and regulations above the standards given in IMO instruments
- for the sake of implementation, there should be some certifications for reception facilities
- in practice, port states should encourage the application of technology of reception facilities by funding and preferential policies
- port states are advised to cooperate to share information, technology and management policies

3.3.2 Inspection facilities-delegation

inspection facilities for MARPOL 73/78 used by port state are to make sure ships coming in the port of the port state are in line with the requirements of MARPOL 73/78. The inspection facilities are not always simply facilities that can carry away with PSCOS, for they could be very complex facilities and need technical skills. But unfortunately, there are no such regulations in any mandatory instruments.

In the author's point of view, it is favorable to deal with the problems to be solved by transferring delegation to RO.

Delegation is "the process of assigning responsibility and authority for accomplishing objectives". (Bossidy, 2001) For IMO, there are a series of resolutions regulating the rights and obligations on delegation from authority to RO. Thus, the following resolutions were adopted by IMO Assembly: the Resolution .739 (18) -Guidelines for the authorization of organizations acting on behalf of the administration and the Resolution A.789 (19) -Specifications on the survey and certification functions of recognized organizations acting on behalf of the administration. "Such a programme should be combined with the safety and environmental programme" and "could also form part of and thus be described in an internal management system. The document MSC/Circ. 710 – MEPC/Circ. 307 contains a model agreement which is considered to meet the minimum standard for a formal written agreement as set forth in resolution A. 739(18)". (Rasmussen, 2013)

As for the obligations of RO, they are regulated in the Resolution .739 (18) -Guidelines for the authorization of organizations acting on behalf of the administration that in general, there should be provisions under conventions and guidelines on control in assignment of authority to RO on capabilities, formal agreement, specific instructions, information to RO and records to be maintained and

submitted by RO. For verification and monitoring, there should be a system to ensure adequacy of work performed by RO on communication procedures, procedures for reporting and report processing, administration's additional inspections of ships, quality system of the RO and monitoring of class related items. Still, it is regulated that in the Resolution A.789 (19) -Specifications on the survey and certification functions of recognized organizations acting on behalf of the administration that minimum specifications for RO, in four elementary modules covering the management, technical appraisal, surveys and qualification and training of RO. For requirements of management functions, it is required of resource management, procedures and instructions, interpretation of instruments, support to field staff and review and feedback. For technical, there should be evaluations and calculations pertaining to hulls structure and machinery systems, stability and sub-division and requirements under various instruments. For performing surveys under controlled conditions, there should be internal quality system adequate geographical coverage and local representation. For minimum requirements for RO personnel, there should be general qualifications, radio survey qualifications and specifications pertaining to various certificates. (Rasmussen, 2013)

For the development of delegation to RO, “in 2013 the Marine Environment Protection Committee (MEPC 65) and the Maritime Safety Committee (MSC 92) adopted resolutions MEPC.237 (65) and MSC.349 (92) – Code for Recognized Organizations (RO Code) together with amendments to MARPOL 73/78, Annexes I and II, the 1974 SOLAS Convention and the 1988 Load Lines Protocol to make the RO Code (Parts 1 and 2) mandatory. Part 3 of the RO Code is recommendatory.” (Rasmussen, 2013)

In conclusion, there is a long way to go in terms of facilities. Port state members should keep in mind that there are two issues on reception facilities, not only the reception facilities, but also the and inspection criteria of reception facilities. For reception facilities, regulations are general, instead of being practical. For inspection

facilities, the port states are required to deal with their own problems by means of delegation to regulate to their own situations based on delegation.

3.4 Response mechanisms

“Good prevention initiatives can go a long way to reduce the risk of pollution from ships. However, in spite of best efforts, spills will inevitably occur. When this happens, it is necessary to ensure that effective preparedness measures are in place that will ensure a timely and coordinated response to limit the adverse consequences of pollution incidents involving oil and hazardous and noxious substances” (Rasmussen, 2013) MARPOL, as the one of the three pillar to regulate environment protection issues, contains a oil pollution emergency plan in MARPOL 73/78 Annex I, regulation 26. There are three points should be noted according to MARPOL 73/78. Firstly, the port states have the right to inspect whether there is SOPEP on board and whether the crew members are familiar with it. Secondly, the port states have the right to inspect whether there is national land port contingency plan on board and thirdly, whether there are area plans involving different member states on board.

For the development of response mechanism, the earliest and most successful is oil pollution response, then the response to pollution incident by hazardous and noxious substances. There are two international instruments especially for the issue- the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 90), and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol).

In conclusion, as the environment is so important to human beings, governments that the public have taken actions to prevent pollution. It is rights for port state members

should set up regulations to prevent harmful pollution from ships coming in to the port state. Even though, the oil pollution emergency plans have become mandatory in the MAPPOL 73/78, the port state members may do more, such as setting up several levels of pollution response stations, as some port states have already done.

3.5 Procedures

The procedures for port state control have been developed to a relatively high level. In this respect, some important issues in terms of assessment on MARPOL 73/78 are highlighted, from my professional experience as a PSCO.

3.5.1 Ship inspection regime

It is understandable that there is no possibility and necessity to inspect every ship calling at ports of the member states. Instead, ship inspection regime is put into use. The IMO has set out general principles on the instrument of Procedures for port state control and Port state control based on aspects in which the inspection report of the ships, the age of ships, the type of ships, and the nationality of ships are the perimeters should be considered.

In doing this, the port member states should first establish their own nationalized ship selecting procedures in documents and member states then should establish a database system to calculate and share the information, not only at national level, but also open to the general public.

3.5.2 Inspection procedures

A specialized guideline for port state control on MAPOL 73/78 is 2009 GUIDELINES FOR PORT STATE CONTROL UNDER THE REVISED MARPOL

ANNEX VI (Resolution MEPC. 181 (59)), which was adopted on 17 July 2009. It also contains guidelines for port state control under the revised MARPOL Annex VI. It is very helpful for implementing PSC inspection under the port state obligations.

3.5.3 Detention procedures

There is also a guideline for the detention procedures as GUIDELINES FOR THE DETENTION REVIEW PANEL. It is very useful for implementing PSC inspection under the port state obligations, with code 10 indicating deficiency rectified, code 15 indicating rectified deficiency at next port, code 16 meaning for rectified deficiency within 14 days, code 17 as rectified deficiency before departure, code 18 as rectified deficiencies within 3 months, code 30 indicating detainable deficiencies and code 99 as others (specify). Figure 8 illustrates how the codes for deficiency action are replaced after re-inspections.

Table 11- Deficiency Action Code replacement values.

Deficiency	Next available deficiency action codes:						
Action code	10	15	16	17	18	30	99
10							
15	Y						
16	Y						
17	Y	Y	Y				Y
18	Y						
30	Y				Y		Y
99	Y						

Source: Tokyo MOU (2013). ASIA-PACIFIC PORT STATE CONTROL MANUAL.

Tokyo: author.

3.5.4 Report

After every port state control inspection, the PSCO shall give a report on the particulars of the vessel, the documentations and files mandatory and deficiencies of the vessel with signatures and decide whether to detain the ship or not. Besides, the PSCO also shall input the report to the database via the internet to make it available to public access.

The procedures are carried out for a relatively long period and generally operate well. Therefore, the paper will elaborate it.

3.6 Evaluations

3.6.1 Inspection evaluations

For port state control, evaluations are made on PSC inspections, including report for every inspection, report for detention, annual report for port state and annual report within the port state region such as Tokyo MOU and Paris MOU. The detentions are worth mentioning. Figure 9 is an example of as Tokyo MOU evaluation form from detention review penal.

Figure 7- Tokyo MOU detention review penal evaluation form.



Guidelines for the Detention Review Panel

Section 6-12

Appendix



Tokyo MOU Detention Review Panel Evaluation Form

Review case: Received/filed on:

Between and

1. Ship Particulars

Name of ship:		IMO number:	
Callsign:		Flag:	
Ship type:		Gross tonnage:	
Year keel laid:		Name and location of ISM company:	
Recognized organization(s) (RO(s)) and certificate(s) related:			

2. Inspection Particulars

Place of inspection:		Reporting Authority:	
Date of detention:		Date of release:	
Ground(s) for detention:			
RO responsible deficiency (if any):			

3. Reason(s) for requesting review

--



4. View(s) of the port State

Evaluated by:

5. OUTCOME OF REVIEW

Taking into account the Conventions and applicable IMO requirements, IMO Resolution A.1052(27) as amended and the Asia-Pacific Port State Control Manual, was the detention order appropriate/justified?

☐ Yes ☐ No (double click to activate the check box)

Please explain your decision (Enlarge the space as appropriate)

Should the Port State be advised to reconsider it's decision?

☐ Yes ☐ No (double click to activate the check box)

Please indicate the reason(s) (Enlarge the space as appropriate)

Source: Tokyo MOU (2013). ASIA-PACIFIC PORT STATE CONTROL MANUAL.

Tokyo: author.

3.6.2 Internal audit

Interim audit shall contain an executive summary, introduction on background, members of the audit team, officials involved from the Member State and acknowledgement, scope, objectives and activities of the audit, audit findings on areas of positive development, areas for further development, observations and non-conformities, possible recommendations for follow-up actions. (Rasmussen, 2013) it should be noted that (a) any disagreement by the Member State with the interim audit report (if not resolved during the closing meeting) may be recorded in writing and annexed to the interim report (b) very endeavor shall be made by the Member State and the audit team to avoid disagreement over audit findings and (c) the interim audit report is available only to the Member State, the Secretary-General and the audit team. (Rasmussen, 2013)

3.6.3 External audit

From the aspect of a port state is different from the external audit team itself. To the author's point of view, the external audit team should be assessed the port states by factors, including the how well the port state is cooperated with the audit team, whether the port state rectify the deficiencies and whether there are cheating or misleading of facts or corruptions among the port states.

To conclude the chapter, there have been no guidelines published on assessment of port state performance on MISAS so far, no matter mandatory or non mandatory. To the author's point of view, there are six groups of criteria advised for the purpose of assessment of port state audit as anglicizing above, including (1) legislation, (2) personnel arrangements, (3) facilities, (4) response mechanisms, (5) procedures and (6) evaluation.

Chapter 4 Recommendations

In chapter 1, the research purpose has been introduced. The necessity of assessment on PSC inspection during MISAS on the implementation of MARPOL 73/78 has been discussed, as for one reason, it is needed for the implementation under mandatory documentations and for another reason, and there have been no guidelines for the implementation on PSC inspection. In chapter 2, the current situation of the issue has been noted. The background of MARPOL 73/78, the development of PSC and the history of MISAS been presented. In addition, the history of MISAS has been introduced by the author. In chapter 3, suggestions on how to solve the problem have been proposed. In terms of assessment six criteria have been discussed and analyzed by the author, namely (1) legislation, (2) personnel arrangements, (3) facilities, (4) response mechanisms, (5) procedures and (6) evaluation.

Based on the above chapters, the recommendations put forward by the author are in two key aspects, standardized assessment system and dynamic evaluation mechanism.

4.1 Standardized assessment system

The most urgent matter in assessing PSC inspection during MISAS on the implementation of MARPOL 73/78 or any other convention is to set up standardized assessment system, as there have been no such guidelines in this field. An important

point of recommendations is setting up standardized assessment checklist, based on six criteria which have been analyzed in chapter 3, as illustrated in Table 12.

Table 12- standardized assessment checklist of PSC inspection during MISAS on the implementation of MARPOL 73/78

Standardized assessment checklist of PSC inspection during MISAS on the implementation of MARPOL 73/78			
Item	Title	ranks *	Notes
1	Legislation		
1-1	Domestic legislation		
1-2	Legislation procedures		
1-3	Implementation departments		
1-4	Regulation scope and contents		
1-5	Feedback and ratifications		
2	Personnel arrangements		
2-1	Quality assessment		
2-1-1	Training system		
2-1-2	Personal quality		
	A. no commercial interest		
	B. communication		
	C. familiar with conventions		
	D. certificates		
2-2	Quantity assessments		
2-2-1	Funds		
2-2-2	Facilities		
2-2-3	Number of PSCOS		
	A. static index *		
	B. dynamic index *		

3	Facilities		
3-1	Reception facilities		
3-2	Inspection facilities		
4	Response mechanism		
5	Procedures		
5-1	Ship selecting mechanism		
5-2	Inspection procedures		
5-3	Detention procedures		
5-4	Report		
6	evaluations		
6-1	Inspection evaluations		
6-2	Internal evaluations		
6-3	External evaluations		
Total scores			
Notes, evaluations and recommendations			
(signatures)			
<p>Notes: 1. Ranks can be marked as 0, 1, 2, 3, 4, and 5 from fail to excellent.</p> <p>2. Static index can be calculated as chapter 3-2-3 noted.</p> <p>3. Dynamic index can be calculated as chapter 3-2-3 noted.</p>			

Sources: complied by the author

In terms of the checklist, there are four advantages. First of all, the six criteria can be practical and easily operated in the general contents of the assessment on PSC inspection during MIMSAS on the implementation of MARPOL 73/78, which is convenient and standard. What is more, if there was whether any decisive item is missing or not carried out by the port state under mandatory regulations, it is easy to find out. Secondly, it is relatively precise to assess how well the port state implemented as the total scores give the average of the total assessment as to indicate the general level of the port state. Thirdly, it is possible to assess which parts of the port state implementations are weak and which parts of the port state implementations are well done by comparative ranks within the port states. Last but not least, the comparison between several ports states can indicate two aspects of important information in two aspects. For one part, it is possible to make comparisons among several port states to indicate which port states implemented better than the other port states. For the other part, it is possible to make a clue for the operation of certain aspects of the items to the general of all the port states as a whole by finding out the horizontal comparison within the ports states.

As for the limits of the function of the checklist, it is necessary to note that the checklist is only a quick and general guideline for the assessment on PSC inspection during MISAS on implementation of MARPOL 73/78. It is impossible to contain all the contents of assessment as the assessment itself is complicated and dynamic. However, it is available to acquire the standardized assessment system on the whole, since there has not been a single guideline on the issue.

4.2 Dynamic evaluation mechanism

The goal of the assessment on PSC inspection during MISAS on the implementation of MARPOL 73/78 is to give the port state motivation to better implement the

obligations, besides assessments. To make sure that the goal has been achieved, there must a dynamic evaluation mechanism. The dynamic evaluation mechanism should consist of two functions. First, with the function of rectification, the shortcomings of a certain port state should be improved. Second, with the function of motivation, the well behaved port states should be encouraged while the badly behaved port states should be punished.

The international chamber of shipping/ international shipping federation (ICS/ISF) has made a try on evaluating on the flag states performance. The organization had published a flag state performance for shipping industry (ICS/ISF, 2013) “to address to shipping companies owning and operating merchant cargo or passenger ships trading internationally. Although developed for shipping companies, they should also be of interest to policy makers involved in maritime safety, and flag administrations themselves.” (Rasmussen, 2013) In the publication, the flag state performance table was set up that “Possible negative performance indicators are shown as black ‘blobs’. Like all statistics the data need to be used with care and individual indicators may provide an unreliable measurement of performance” (Rasmussen, 2013), as Figure 9 illustrates. The purpose and scope of flag state performance for shipping industry is that “there is nothing inherently unusual in an international ship registry system in which the owner of a ship may be located in a country other than the State whose flag the ship flies. However, a balance has to be struck between the commercial advantages of selecting a particular flag and the need to discourage the use of flags that do not meet their international obligations. ” (ICS/ISF, 2013) besides, the purpose of the guideline is twofold as for one part, “to encourage ship owners and operators to examine whether a flag State has sufficient substance before using it”, for the other part, “to encourage ship owners and operators to put pressure on their flag administrations to affect any improvements that might be necessary, especially in relation to safety of life at sea, the protection of the marine environment and the provision of decent working and living conditions for seafarers”. (ICS/ISF, 2013)

Figure 8-flag state performance table

GREEN SQUARES SUGGEST POSITIVE PERFORMANCE INDICATORS

* UK dependent territories

	PORT STATE CONTROL						RATIFICATION OF CONVENTIONS								A739	AGE	REPORTS		IMO
	PARIS MOU WHITE LIST	NOT ON PARIS MOU BLACK LIST	TOKYO MOU WHITE LIST	NOT ON TOKYO MOU BLACK LIST	USCG QUALSHIP 21	NOT ON USCG TARGET LIST (SAFETY)	SOLAS74 (AND 88 PROTOCOL)	MARPOL INCLUDING ANNEXES I - II	MARPOL ANNEXES III - VI	LL 66 (AND 88 PROTOCOL)	STCW 78	ILO MLC	CIC/FUND 92	RECOGNIZED ORGANIZATIONS	AGE (SHIP NUMBERS)	STCW 95 'WHITE LIST'	COMPLETED FULL ILO REPORTS	IMO MEETINGS ATTENDANCE	
ALBANIA														N/S					
ALGERIA																			
ANTIGUA & BARBUDA																			
ARGENTINA														N/S					
AUSTRALIA																			
BAHAMAS																			
BAHRAIN														N/S					
BANGLADESH																			
BARBADOS																			
BELGIUM																			
BELIZE																			
BERMUDA *							UK	UK	UK	UK	UK		UK			UK	UK	UK	
BOLIVIA																			
BRAZIL																			
BULGARIA																			
CAMBODIA																			
CANADA																			
CAYMAN ISLANDS *							UK	UK	UK	UK	UK		UK			UK	UK	UK	
CHILE																			
CHINA																			
COLOMBIA																			
COOK ISLANDS																			
COSTA RICA																			
COTE D'IVOIRE														N/S					
CROATIA																			
CUBA																			
CYPRUS																			
DEM. PEOPLE'S REP. KOREA																			
DEM. REP. OF THE CONGO														N/S					
DENMARK																			
DOMINICA																			
EGYPT																			
ESTONIA																			
FAROE ISLANDS																			
FINLAND																			
FRANCE																			
GEORGIA																			
GERMANY																			
GHANA														N/S					
GIBRALTAR *							UK	UK	UK	UK	UK	UK	UK			UK	UK	UK	
GREECE																			
HONDURAS																			
HONG KONG (CHINA)																			
ICELAND														N/S					
INDIA																			
INDONESIA																			
IRAN																			
IRELAND																			
ISLE OF MAN *							UK	UK	UK	UK	UK	UK	UK			UK	UK	UK	
ISRAEL																			
ITALY																			
JAMAICA																			
JAPAN																			
JORDAN																			
KENYA														N/S					
KUWAIT																			

UK – Indicates where a UK dependent territory's entry is based on the ratification, reporting or IMO meeting attendance of the UK 'mainland' flag.
 – Indicates where a flag administration suffered no detentions within the particular PSC region for the period, but did not meet the relevant minimum requirement of inspections/arrivals to be included in an MOU white list or the USCG Qualship 21 program.

Source: ICS/ISF. (2013). shipping industry flag state performance, 2013/2014.

London: author.

The introduction of white-list, grey-list and black-list of port states has been a revolution in the management and assessment of performance of port state. It is advised to promote the idea to the assessment on PSC inspection on MIMSAS on the implementation of MARPOL 73/78 and as the try of shipping industry flag state performance 2013/2014 carried out by ICS/ISF. The idea was illustrated in Table 13 designed by the author.

Table 13- table for port state performance

Table for port state performance				
Item	Title	Past rank	Present rank	fluctuation
1	Legislation			
1-1	Domestic legislation			
1-2	Legislation procedures			
1-3	Implementation departments			
1-4	Regulation scope and contents			
1-5	Feedback and ratifications			
2	Personnel arrangements			
2-1	Quality assessment			
2-1-1	Training system			
2-1-2	Personal quality			
	A. no commercial interest			
	B. communication			
	C. familiar with conventions			
	D. certificates			
2-2	Quantity assessments			
2-2-1	Funds			
2-2-2	Facilities			
2-2-3	Number of PSCOS			
	A. static index *			

	B. dynamic index *			
3	Facilities			
3-1	Reception facilities			
3-2	Inspection facilities			
4	Response mechanism			
5	Procedures			
5-1	Ship selecting mechanism			
5-2	Inspection procedures			
5-3	Detention procedures			
5-4	Report			
6	evaluations			
6-1	Inspection evaluations			
6-2	Internal evaluations			
6-3	External evaluations			
Total fluctuation				
Notes, evaluations and recommendations				

Source: compiled by the author

As for the use of the table, there are some advantages in achieving the goal of dynamic evaluation mechanism. First of all, for the first function of rectification, whether the shortcomings of a certain part of a port state have been improved or not can be easily seen. Secondly, for the other function of motivation, the well behaved port states should be encouraged while the bad behaved port states should be punished based on the total fluctuation which can be judged as the general rectifications.

As for the limitations of the table, the standards for the two assessments must be almost the same. Otherwise, the fluctuations would be meaningless. So it is advised that the assessment team should contain certain audit members from the previous team, and actually, it is the real case.

In conclusion, the suggestions for assessment are two key aspects, including (1) standardized assessment system and (2) dynamic evaluation mechanism. Besides, two possible methods have been proposed in standardized assessment checklist for PSC inspection during MIMSAS on the implementation of MARPOL 73/78 and table for port state performance.

Chapter 5 Conclusions

The maritime industry is featured by internationalization, as it deals with the maritime relationship between states as flag states, port states and coastal states respectively. To standardize the rules between states to avoid conflicts among relevant parties, international laws and regulations are needed. Mandatory instruments are implemented by state members to make sure the maritime industry is operating and manageable. To this point of view, the implementation of standardized conventions is the key for maritime industry supervision. Under such circumstances, the IMO tried to make IMSAS mandatory. Since the year of 2002, the twelve years have seen the development of IMSAS, from voluntary to mandatory. The first convention of MIMSAS is MARPOL 73/78, which shall become mandatory on June, 2015. However, what is urgent is that there has been no guideline for carrying out port state members assessment.

Based on the above circumstances, the thesis focuses on four issues, (1) researches purpose, (2) current situations of the relevant topic, (3) the criteria for assessment factors and (4) suggestions for the topic.

By analyzing of four chapters, four conclusions are arrived at:

- (1) It is urgent to set up an assessment on PSC inspection during MIMSAS on the implementation of MARPOL 73/78. As for the necessity to do the research, the

relevant situation shows that MIMSAS it can not be avoided both regulatory and environmentally. Due to the urgency of the topic, there has been no single guideline for the assessment on the topic.

- (2) As for the development of the topic, the theory of three-stages period is first put forward by the author, which are (a) pre-VIMSAS stage (2001-2006), (b) VIMSAS Stage (2006-2012) and (c) MIMSA stage (2012 until now).
- (3) As for the assessment on PSC inspection during MIMSAS on implementation of MARPOL 73/78, six criteria were analyzed in this thesis, which are (a) legislation, (b) personnel arrangements, (c) facilities, (d) response mechanisms, (e) procedures and (f) evaluation.
- (4) As for the assessment systems, suggestions are given as follows: a) standardized assessment system and (b) dynamic evaluation mechanism, together with model tables.

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