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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**Development of Key Performance Indicators
(KPIs) for Imo Member States in the Context of
the IMO Member State Audit Scheme**

By

Sang Ho Kim
The Republic of Korea

A dissertation submitted to the World Maritime University in partial
Fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE
In
MARITIME AFFAIRS

(MARITIME SAFETY AND ENVIRONMENT ADMINISTRATION)

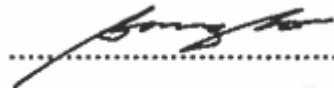
2017

DECLARATION

I certify that all the material in this dissertation 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 dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature):


.....

(Date):

19 Sep. 2017
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World Maritime University

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ABSTRACT

Title of Dissertation: **Development of Key Performance Indicators (KPIs) for IMO Member States in the context of IMO Member State Audit Scheme**

Degree: **MSc**

This dissertation aims to develop Key Performance Indicators for IMO Member States through application of CMO method to assist Member States to meet their obligations as stated in the III Code. As a pilot study to apply CMO method to the III Code, the method is only applied to flag States part of the III Code to verify its suitability for development of KPIs. Application of the CMO method could achieve the complete review of the requirements of the Code in terms of context, mechanism, and outcome.

By using the KPI work sheets, the author developed a total of 43 KPIs which covers all the requirements of the III Code. Furthermore, categorization of developed KPIs is performed to classify the roles of its KPIs.

From the validation process of developed KPIs by applying the data from the Republic of Korea, 43 KPIs from the KPI work sheets satisfied the full scope of the flag State performance and addressed limitations of previous studies by covering the full spectrum of flag State performance by using measurable KPIs and KPIs for the existence of procedures.

The most obvious finding to emerge from the analysis is that the Republic of Korea has a high level of performance in terms of flag State performance. However, the significant problem was identified through the trend analysis that the follow up for the PSC detention and the number of FSC inspections should be improved to increase the overall performance of Korea. Additionally, the result of this study indicates that the developed KPIs are enabled to monitor, evaluate, and continuous improvement for the performance of IMO Member States.

KEYWORDS: III Code, KPI, IMSAS, CMO, REALIST EVALUATION

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LIST OF ABBREVIATIONS

BGW	Black/Grey/White
BIMCO	Baltic and International Maritime Council
CMO	Context-Mechanism-Outcome
COLREG	International Regulations for Preventing Collisions at Sea
FSC	Flag State Control
FSI	Flag State Implementation
GBP	British Pound Sterling
GISIS	Global Integrated Shipping Information System
ICAO	International Civil Aviation Organisation
ICS	International Chamber of Shipping
III	IMO Instruments Implementation
IMO	International Maritime Organisation
IMSAS	IMO Member State Audit Scheme
INTERCARGO	International Association of Dry Cargo Ship Owners
INTERTANKO	International Association of Independent Tanker Owners
ISF	International Shipping Federation
ISM	International Safety Management
ISO	International Organisation for Standardization
ITOPF	International Tanker Owners Pollution Federation Limited
KCG	Korea Coast Guard
KIMFT	Korea Institute of Maritime and Fisheries Technology
KMOU	Korea Maritime University
KMST	Korea Maritime Safety Tribunal
KOEM	Korea Marine Environment Management Corporation
KOMDI	Korea Maritime Dangerous Goods Inspection Center
KPI	Key Performance Indicator
KR	Korea Register of Shipping
KST	Korea Ship Safety Technology Authority
KTC	Korea Testing Certification
LL	Load Line Convention
MARPOL	International Convention for the Prevention of Pollution from Ships
MOU	Memorandum of Understanding
NIFS	National Institute of Fisheries Science
NSKI	The National Strategy of Korea for IMSAS
MMU	Mokpo Maritime University
MOF	The Ministry of Oceans and Fisheries
PI	Performance Indicator
PSC	Port State Control
RO	Recognized Organisation
SAF	Self-Assessment Form
SOLAS	Safety of Life at Sea Convention
STCW	Standards of Training, Certification and Watchkeeping
TMSA	Tanker Management Self-Assessment

TONNAGE
UN
UNCLOS
VIMSAS

International Convention on Tonnage Measurement of Ships
United Nations
United Nations Convention on the Law of the Sea
Voluntary IMO Member State Audit Scheme

1. INTRODUCTION

1.1 Background

Since the establishment of the International Maritime Organization (IMO) in January 1958, the specialized agency of the United Nations (UN) has adopted and implemented a large number of international Conventions, Codes, and Resolutions to promote maritime safety and marine pollution prevention. As a result of these initiatives, the safety standards for maritime safety and protection of the marine environment on board vessels have improved substantially in the last decades (Lee and Park, 2013).

Despite the dedicated efforts of IMO and its 172 Member States to ensure safer and cleaner shipping, maritime accidents affecting to human life and the marine environment still occur with high frequency. There have been several large-scale maritime accidents resulting in severe environmental pollution, including *Torrey Canyon* (1967), *Argo Merchant* (1976), *Herald of Free Enterprise* (1987), *Exxon Valdez* (1989), *Estonia* (1994), *Erika* (1999), and *Prestige* (2002), which triggered major international Conventions (Schröder-Hinrichs et al, 2013). Such large-scale maritime accidents have occurred until recently causing serious damage to marine safety and the marine environment, and about 50 international Conventions have been developed by the IMO (Perepelkin et al., 2010). One of the reasons contributing to maritime accidents is considered by the IMO to be the lack of effective implementation of the Conventions by Contracting Parties, especially flag states, which are not discharging their responsibilities and obligations (Corres & Pallis, 2008;

Goodman, 2009; Kim, 2006; Mansell, 2009; Perepelkin et al., 2010; Takei, 2013).

From 1958, the IMO (formerly known as IMCO) commenced its work by adopting the 1960 Safety of Life at Sea Convention (SOLAS), which was an updated version of SOLAS 48, and the Load Lines Convention (LL) in 1966. The IMO gained pace from the capsizing of the *Torrey Canyon* in 1967 which triggered rapid adoption of international Conventions (Intervention Convention, 1969; Civil Liability Convention, 1969; International Convention for the Prevention of Pollution from Ships (MARPOL), 1973) (Schröder-Hinrichs et al, 2013). In the 1970s, the IMO mainly focused on pollution prevention since there were huge tanker disasters with 252 major oil spills, resulting in 3,142,000 tonnes of oil spilt (ITOPF, 2017). As a result, the IMO incorporated a wide range of work programmes to deal with preventive measures for collisions, groundings and operational activities, and continued its work in line with the United Nations Convention on the Law of the Sea (UNCLOS) III in this decade (Mansell, 2009). UNCLOS, as an international instrument to set the responsibilities of flag State jurisdiction, requires every State to take measures to secure safety at sea.

Article 91¹ of the United Nations Convention on the Law of the Sea (UNCLOS) states that there must exist a genuine link between the State and the ship. Moreover, Article 94² requires flag States to effectively exercise jurisdiction and control over the ships entitled to fly their flag which imposes flag State responsibilities for maritime safety based on the principle of genuine link, and the word “effectively” can be interpreted to the idea of flag State performance (Graziano, in press). However, one of the main issues is that the regulatory regime that is implemented and enforced is often inadequate (Mansell, 2009). It is believed that the under-performance of flag States is caused by the failure of IMO Member States to effectively comply with IMO Conventions (Kim, 2006; Mansell, 2009). Due to these concerns, for international organizations such as the IMO, it is fundamental that each Member State properly implement and enforce the legislative framework to which they are party rather than

¹ Article 91: Every State shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships shall have the nationality of the State whose flag they are entitled to fly. There must exist a genuine link between the State and the ship.

² Article 94: Every State shall effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.

adopting new conventions.

Therefore, to strengthen maritime safety and protection of the marine environment and assist Member States in terms of the implementation of IMO instruments, the IMO Assembly adopted the IMO instruments implementation Code (III Code) in December 2013 through Resolution A.1070(28)³ which entered into force on 1st January 2016.

As an 'Umbrella Code' underlying IMO's individual Conventions, one of the main objectives of the III Code is to assist Member States in adopting and implementing key IMO instruments and, as a consequence, enhancing maritime safety and environmental protection. The Code highlights three main aspects for a maritime administration, namely implementation, enforcement and review. According to the III Code, a Member State has to assess its performance periodically with regard to its responsibilities as a flag State, port State and coastal State and the level of implementation and enforcement of the IMO instruments to which it is a party.

Since the IMO's main goal is to ensure maritime safety and marine pollution prevention, implementation and enforcement of IMO instruments by IMO Member States is the key to assessing whether or not IMO's tasks are achieved (Barchue, 2009). The problem is that the Member State may not have a proper evaluation and review system to measure its performance (IMO, 2011). Developing countries might be especially in disadvantage in building a new evaluation system given human and financial resource constraints (IMO, 2013; IMO, 2014). Even though the Member States has their own evaluation system, the administration has to perform systematic analysis, evaluation and review of the maritime data for continuous improvement (IMO, 2007).

In addition, the final VIMSAS (now IMSAS) audit report of the Republic of Korea of VIMSAS (now IMSAS) has highlighted that the measurement of performance of the State is carried out by the ISO quality management system, but the analysis of the outcome as well as the effectiveness of its management system is insufficient. Consequently, to achieve the goal of the IMO, the development of performance measuring tools for the flag, port, and coastal States would be of great help for both

³ Resolution A.1070(28): IMO INSTRUMENTS IMPLEMENTATION CODE (III CODE)

IMO and the Member States.

In general, Key Performance Indicators (KPIs) are a type of performance measurement that evaluates the success of an organization, and facilitates the capture of performance trends as a quantitative measure of quality (HIQA, 2010). Therefore, KPIs can be a measuring tool to evaluate performance. It is the author's belief that the KPIs developed during this research endeavor may bring a positive effect to the flag States, which can lead to the achievement of IMO's goals. For all the reasons stated above, the development of KPIs will be meaningful to help the evaluation and review process, and determine the current performance of IMO Member States.

1.2 Objectives

Lack of effective implementation of Convention by flag States has become a serious obstacle to the achievement of the IMO's main goal of which is the "Safe, secure and efficient shipping on clean oceans". The starting point for this dissertation is the requirement of the III Code which asks flag States, port States and coastal States to review their performance periodically to improve their level of implementation with IMO Conventions. In order to improve the development of a performance management system for IMO Member States, this study aims at developing Key Performance Indicators (KPIs) by applying a context-mechanisms-outcome (CMO) to review the requirements of IMO Instruments Implementation Code (III Code). The CMO method aims at reviewing the policy programmes in different stages of their applicability (Valdez Banda, 2017).

This study will help Member States evaluate their performance from the perspective of implementation of administrative procedures and resources as required by the III Code to which they are party, and identify problem areas which have to be improved, and provide continuous improvement in terms of flag State performance . Therefore, this dissertation aims at:

- Developing Key Performance Indicators (KPIs) applying the CMO method suggested by Banda, O. A. V., Hänninen, M., Lappalainen, J., Kujala, P., & Goerlandt, F. (2016).
- Validating the KPIs by comparing with the National Strategy of Korea for IMSAS (NSKI) and applying the data from the Republic of Korea.
- Evaluating the current performance of the Republic of Korea through the developed KPIs.

1.3 Scope of the study

This dissertation is organized into 7 Chapters. Chapter 1 introduces the background, objectives and the scope of the study.

A literature review regarding the implications of flag State responsibilities and flag State performance is provided in Chapter 2. It outlines the different perspective of authors on determining flag State performance, as well as on the limits and benefits of each methodology. Furthermore, Chapter 2 discusses the necessity of Key Performance Indicators (KPIs) and their effectiveness to work as the monitoring function to measure the performance of flag, port, and coastal States.

Chapter 3 gives an overview of the III Code including the background, features, and legal implications. Specifically, Chapter 3 examines the duties and tasks required by the III Code under the review requirement. Moreover, the relationship with IMSAS regarding the flag State performance is examined to assist in understanding the importance of KPIs. In order to validate KPIs by using data from Korea, Chapter 3 describes the status of Korea in preparation for the IMSAS.

In Chapter 4, the methodology of the dissertation and the expected results from this study are introduced. In addition, the chapter explains the necessity of the KPIs in

relation to the measurement of performance in the maritime industry to prove the importance of this study.

Chapter 5 shows the result of the application of the CMO method to the III Code. One example of the application of the CMO method and the final set of KPIs from the KPI sheet are explained. Moreover, categorization of the developed KPIs are included in this chapter.

Chapter 6 describes the application of the KPIs to the Korean context in order to validate the developed KPIs. The validation process proceeds in two steps: 1. Conduct contrastive analysis with the NSKI. 2. Substitute data to KPIs to validate its measurability. Furthermore, the author performed a trend analysis for Korea to show the effectiveness of the developed KPIs in terms of their utility in identifying problem areas and trend fluctuations.

Finally, Chapter 7 summarizes the outcomes of the dissertation and concludes the issues that have been identified throughout the study. Limitations of this study and the need of further research are given to complement the developed KPIs.

2. LITERATURE REVIEW

This chapter presents previous studies on flag State responsibility and flag State performance regarding their benefits and limitations, and identifies current progress in the measurement of flag State performance from the perspective of developing KPIs using the III Code.

2.1 Flag State Responsibilities

Flag States have achieved the right to sail ships on the high seas and register ships under their flags through the Article 90⁴ and 91⁵ of UNCLOS. Moreover, as a counterpart, the flag State has the responsibility to exercise effective jurisdiction and control over administrative, technical, and social matters on its ships⁶. The list of responsibilities has grown significantly in areas such as safety standards, maritime security, pollution prevention, and training of seafarers (Kim, 2009; Mansell 2009). There still remain contentious issues regarding the effectiveness of flag State

4 Article 90: Every State, whether coastal or land-locked, has the right to sail ships flying its flag on the high seas.

5 Article 91: 1. Every State shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the State whose flag they are entitled to fly. There must exist a genuine link between the State and the ship. 2. Every State shall issue to ships to which it has granted the right to fly its flag documents to that effect.

6 UNCLOS, Article 94. See page 2.

responsibility as well as the ever-present debate on “open registries”⁷, and the role of the port State and the coastal State (Goodman, 2009; Hosanee, 2009; Mansell 2009). Moreover, much of the literature highlights the failure of flag States to fulfilling their responsibilities properly (Hosanee, 2009; Mansell, 2009; Perepelkin et al., 2010; Takei, 2013).

Mansell (2009) studied flag State responsibility from a historical perspective, including development of registration and control of ships, and major changes in the shipping industry to analyse the effectiveness of flag State performance. Mansell raised key issues related to flag State responsibilities, in particular, the performance of the flag State. In order to analyse the flag State responsibilities and their performance, Mansell pointed out the fact that the most of the flag States are not fulfilling their international obligations as they are required to do based on the international Conventions. Since industry stakeholders often seek to reduce operational costs and increase benefits, “open registers” have proliferated in recent years, allowing regulatory insufficient flag States to register ships without assurance.

Goodman (2009) also stressed that lack of enforcement by flag States, and delegation of the main responsibilities to Recognized Organizations, often Classification Societies, have undermined the effectiveness of the system. In addition, she acknowledged that the general inadequacy of flag State implementation and enforcement has been an ongoing issue which affects maritime safety and the preservation of the marine environment. Moreover, flag States do not always discharge their duties in a satisfactory manner. Zwinge (2011) conducted research on the obligations of flag States for implementation and enforcement of international standards, and concluded that enforcement of international standards and rules by third parties, especially through port State control is the most effective method to increase enforcement.

The importance of flag State performance is recognized because the effective implementation of international standards and regulations are connected to the willingness of flag States. Mansell (2009) has divided flag State performance into

⁷ Sturmeijer (1962) defined open registry as: the flag of any country which permits persons or companies, other than those with a genuine link with the country, to register their ship in its ports.

three categories, administrative, social, and technical to measure the performance of flag States and identify areas to be measured, as described in Table 1, to clarify flag States with poor performance,.

Table 1. Administrative, social, and technical performance of flag States

Administrative performance	<ul style="list-style-type: none"> • Ratification of IMO instruments • Delivery of mandatory reports required by the IMO
Social performance	<ul style="list-style-type: none"> • Ratification of ILO maritime labour standards • Analysis of measures used by the ITF • Port State control inspection results
Technical performance	<ul style="list-style-type: none"> • The safety records of ships by port State control inspections • Black/Grey/White lists of flag States • Combinations of causal factors in substandard ships • The performance of Recognized organizations

Source: Mansell (2009)

Detailed analysis using the indicators in Table 1 has confirmed that International and Pseudo-National⁸ flag States have lower performance than the majority of National flag States. Additionally, a correlation was found between flag State performance and the age of ships. Moreover, he concluded that the main problem in enforcement of international instruments is the insufficient oversight of IMO Member States and measurement of their performance, and recognized the importance of an auditing scheme for IMO Member States.

Tan (2005) has argued that the lack of effectiveness of flag State performance to comply with international regulations is due to a lack of reward to comply, and Anderson (1998) pointed out that effective enforcement of flag States to comply with international regulations is a challenging task. But from a business point of view, since poor flag State records result in vessels of the flag State being targeted for PSC inspections or even complete bans from EU ports, the performance of flag State has become an important topic for the industry as well (Corres and Pallis, 2008).

⁸ Mansell (2009) has classified flag States into four groups: National, Quasi-National, International, and Pseudo-National flag States.

2.2 Flag State Performance

The performance of flag States for implementation and enforcement of international regulations is a hotly debated topic addressed in international fora (Moen, 2008; Tan, 2005). The demand for new indicators to measure flag State performance has become important over the last decade (Graziano, in press). Before reviewing the literature focusing on flag State performance (FSP), it would be helpful to clarify the word “performance”. According to the Oxford Dictionary, performance means “the action or process of performing a task or function” which can be understood that the performance of a system is the action or process of performing the goal of the system. Graziano (in press) have identified two main areas characterizing the concept of flag State performance, efficiency and effectiveness, and explained that the evaluation of performance entails knowing “what a Flag State is supposed to do”, and evaluating “how well this is carried out”. In this regard, identifying possible indicators will be the first step in evaluating the performance of flag State. For that reason, a review of the academic literature dealing with the topic of flag State performance is performed in this section.

Takei (2013) examined flag State performance from a legal perspective, and stated that a lack of control by flag states over their ships is considered to be the main cause of the current crisis in maritime safety management in the world. He suggested that flag State performance should be based on the legal responsibilities of flag States which include exercising jurisdiction and control over administrative, social, and technical performance. Furthermore, he clarified the margin of discretion enjoyed by the flag State in the implementation of its duties, and pointed out that further development of flag State performance assessment is needed, especially, quantified measurement of flag State performance.

Alderton and Winchester (2002) developed the Flag State Conformance Index (FLASCI) which measures flag State performance in terms of the effectiveness of enactment and enforcement of international rules and standards based on performance indicators, as shown in Table 2. Table 2 presents performance indicators in seven categories of the FLASCI index which has been used to rank flag States by

considering the assigned scores on performance indicators.

Table 2. Flag State Conformance Index

Flag State fleet	<ul style="list-style-type: none"> • Port State control rates • Own-citizen beneficial ownership • Casualty rates • Pollution incidence • Abandonment of crews • Own-citizen labour force participation • Appearance in crew complaints DB
FS administrative capacity	<ul style="list-style-type: none"> • Death records • Casualty investigation capacity • Crew records of service • Statistics of ships, owners, and labour force • Health screening procedures and records • Certification of seafarers • Accessibility of consular services • Involvement in training and education • Enforcement of IMO and ILO conventions
FS maritime law	<ul style="list-style-type: none"> • Ratification of IMO and ILO conventions • Specialist law practitioners • Provisions of maritime legal code • Location of registry • Publication of relevant law reports • 'Ownership' of registry
Miscellaneous maritime	<ul style="list-style-type: none"> • Maritime welfare support and maritime charities • Government ministries with maritime remit • Stock exchange maritime listings • Maritime interest groups • State-owned shipping
Trade union law	<ul style="list-style-type: none"> • Legal rights for migrant labour • Provision for trade union recognition • Independent trade unions • Enforcement of trade union recognition procedures • Mediation/arbitration procedures
Corruption	<ul style="list-style-type: none"> • Probity of public officials • Integrity of political institutions and legal process • Misapplication of public funds • Corporate integrity
Corporate practice	<ul style="list-style-type: none"> • Regulation of financial institutions • Regulation of accounting standards • Regulation of non-resident companies • Legal definition of corporate public responsibility

Source: Alderton and Winchester (2002)

The FLASCI index identified Cambodia as the most unregulated flag State, which provides a regulatory free environment for ship owners (Alderton and Winchester, 2002). However, this index only focused on the ranking of flag States and most of the categories, such as Trade union law and Corruption, are not fit for the requirements of the III Code, which promotes the need for new evaluation tool to meet the obligations in III Code.

From an institutional perspective, the measurement of flag State performance was introduced in the Paris MOU in 1999 through the establishment of the Black/Grey/White (BGW) list. The BGW list measures the performance of flag states through their detention records. The Tokyo MOU also introduced a BGW list in 2002. The BGW list measures the performance of a flag state through its detention records and flag States are classified into black, grey, and white lists every three year. The grey list represents flags with an average performance; the black list represents flags that perform worse than average, and the white list represents flags that perform better than average. However, the measurement of flag State performance in the BGW list is mostly based on the records of inspections and detentions, and is subjective and inaccurate in its measurements (Mansell, 2009).

Therefore, Perepelkin et al. (2010) proposed a new methodology which applies new factors, such as deficiencies and casualties, to the BGW list to overcome the main drawbacks of the BGW list. But both the BGW list and the new method proposed by Perepelkin et al. (2010) focused mainly on the fleet performance of flag States, by which is not possible to measure the full spectrum of flag State performance for compliance with IMO instruments (Graziano, in press).

Corres and Pallis (2008) recognized that there is a need to clarify which flag States have poor performance records. To that end, they have examined flag State performance based on the flag State performance table developed by the International Chamber of Shipping (ICS). The table measures performance by evaluating PSC performance, ratification of major international conventions, use of recognized organizations, age of fleet, reporting requirements, and attendance of IMO meetings as described in Table 3.

Table 3. Shipping Industry Flag State Performance Table

PSC performance	<ul style="list-style-type: none"> • Not on Paris MOU White List • On Paris MOU Black List • Not in Tokyo MOU White List • On Tokyo MOU Black List • Not in USCG Qualship 21 List • On USCG Safety Target List
Ratification of major international conventions	<ul style="list-style-type: none"> • SOLAS 74 (and 88 Protocol) • MARPOL (incl. Annexes I&II) • MARPOL (Annexes III-VI) • LOADLINE 66 (plus 88 Protocol) • STCW 78 • ILO 147 • CLC/FUND 92
Reporting requirements	<ul style="list-style-type: none"> • STCW 95 White List • Completed ILO Reports
Other factors	<ul style="list-style-type: none"> • Use of recognized organizations complying with a.739 • Age of fleet • Attendance at IMO meetings

Source: ICS (2016)

The ICS Industry Flag State Performance table, which was developed by international institutions (BIMCO, Intertanko, Intercargo, ICS, and ISF) in 2006, produced a rough answers by indicating performance of flag States with green and red squares, and avoided giving conclusions on underperforming flag States. Consequently, Corres and Pallis (2008) added weighting factors in order to produce a quantitative assessment to draw specific conclusions on performance, resulting in 26 excellent, 34 good, 27 average, and 20 bad flag States. This study found that the gaps of national flags and international flags are becoming smaller in terms of flag State performance.

Graziano (in press) developed Table 4 by conducting two focus groups to ultimately answer the question of “how to measure flag State performance”. Flag State performance is classified into two main components, administration performance and fleet performance as shown in Table 4. The table shows the factors combining fleet and administration performance in order to figure out the overall performance of flag States. Graziano (in press) have successfully listed all the indicators to measure flag State performance; however, they pointed out that measurable performance indicators should be developed to calculate flag State performance which confirms

the objective of this dissertation which is the development of KPIs for IMO Member States.

Table 4. Summary of the affinity diagram

Category	Sub-Category	Element
Fleet performance	PSC performance	Number of deficiencies/inspections Number of Detentions/inspections
	FSC(flag state control)	Number of ISM deficiencies Number of Deficiencies
	Accidents	Number of accidents compared to the fleet
	Characteristics	Crewing considerations Nationality of the crew used on board General age of the fleet compared to the ship types General distribution of ship type Manning level
Administration performance	RO delegation & monitoring	Communication procedures with ROs Tools for RO monitoring Grade of delegation Number of authorized RO IACS ROs? Number of tasks delegated to the RO
	Ratification/Implementation/Enforcement	Ratification of IMO/ILO instruments Implementation of IMO/ILO/EU standards EU infringement procedures
	Quality System	Does the FS holds and implement quality management system for flag State activities?
	Staff	Selection criteria for staff personnel Training procedures for flag State staff Qualification for flag State staff Quality of staff
	Accidents	Implementation of safety recommendations from accident investigations Conduct accident investigations & follow-up
	Fleet Monitoring	Frequency of FS inspections Number of inspector compared to the size of the fleet ISM monitoring
	General	Active monitoring and certification of Maritime training Centers Criteria for selecting shipowners Size of the administration compared to the size of the fleet Transparent procedures to implement 'safety first' policies Number of equivalence of derogation Activities in international fora Owners nationality Clear organization profile and organigram Results of IMO audit

Source: Graziano (in press)

IMO has also developed a Strategic Plan for the organization, and a set of 42 performance indicators to measure the progress of 13 strategies as shown in Table 5. However, the current developed performance indicators cannot measure the individual flag States and this limits the IMO's capability to identify weakness in the system (Perepelkin et al, 2010). As far as the evaluation of flag State performance is concerned, developing of Key Performance Indicators for flag States is a crucial task to measure their performance and identify problem areas.

Table 5. Performance Indicators for 13 strategy

Category	Performance Indicators
Accession to Conventions	Percentage of IMO Member States that have ratified each IMO Convention and Protocol
Entry into force	Percentage and number of Conventions adopted but which have not entered into force
Implementation and compliance	(a) Number and percentage of Member States that have volunteered for audit. (b) Number and percentage of Member States that have been audited. (c) Number and percentage of Member States that have nominated auditors. (d) Number and percentage of nominated auditors that have carried out audits. (e) Number of technical assistance activities carried out following audits.
Lives lost	(a) Number of lives lost (seafarers, fishers and passengers) due to safety-related accidents and incidents on ships subject to IMO Conventions and other instruments. (b) Ratio of lives lost (seafarers, fishers and passengers) due to safety-related accidents and incidents on ships subject to IMO Conventions and other instruments, to total number of lives at risk.
Ships lost	(a) Number of ships subject to IMO Conventions lost for any safety-related reason other than those declared constructive total losses for insurance purposes. (b) Ratio of ships subject to IMO Conventions lost for any safety-related reason, other than those declared constructive total losses for insurance purposes, to total number of ships subject to IMO Conventions.
Security failures	Number of ships and lives lost due to security failures and number of terrorist incidents on ships subject to SOLAS chapter XI-2.
Piracy and armed robbery	Number of ships and lives lost due to piracy and armed robbery and number of such incidents against ships engaged on international voyages.
Ship-generated water pollution	(a) Tonnes of harmful substances discharged into the sea operationally or accidentally from ships subject to IMO instruments. (b) Number of spills occurring from ships subject to IMO instruments. (c) Ratio of oil (cargo and bunkers) discharged into the sea, to total quantities carried by sea.
Ship-generated air pollution and CO2 emissions	(a) 3-year rolling average of the sulphur content of fuel oil delivered to ships (b) Tonnes of NOx, SOx and CO2 released from ships subject to IMO instruments (c) Ratio of estimated tonnage of SOx, NOx and CO2 released annually per tonne-mile of cargo carried by sea.
Environmental conscience	(a) Mobilization by IMO of donor funds for environmental programmes. (b) Number of projects sponsored, initiated and funded by IMO. (c) Number of collaborative agreements with regional groups responding to pollution such as: REMPEC, ROCRAM, Barcelona Convention.
PSC detention rate	Port State control detention rates as analysed by the various bodies of the Organization on the basis of data submitted by Member States.
PSC non-compliance rate	Port State control non-compliance rates as analysed by the various bodies of the Organization on the basis of data submitted by Member States.
Fraudulent certificates	Number of fraudulent certificates and endorsements of any type reported to IMO
Delivery of technical assistance	(a) Percentage of planned activities delivered. (b) Activities delivered: number of advisory missions and number of training events. (c) Number of partnerships with governments, organizations and industry.
Sustainability of ITCP	Proportion of funding from donor sources and internal sources
Cycle time	Time taken to develop IMO conventions and other instruments compared to planned time
IMO's role	(a) Size of IMO membership compared to UN membership (b) Level of participation of IGOs and approved NGOs at IMO meetings
Goal-based standards	Progress towards the application of goal-based standards for maritime safety
Work of other UN bodies	(a) Incorporation of specific policy input provided by IMO organs within the policy and programme decisions of other UN bodies (i.e., in their treaty instruments, codes, resolutions, guidelines, etc., work programmes and technical activities) (b) Number of joint working groups established (c) Number of partnerships (MoUs or other agreements) established (d) Number of joint technical co-operation programmes.
Efficiency of shipping facilitation of international maritime Traffic	(a) Number and percentage of Member States that are party to the FAL Convention. (b) Number and percentage of Contracting Governments to the FAL Convention that have registered differences between their practices and the Standards of the FAL Convention. (c) Number and percentage of Contracting Governments to the FAL Convention that have notified that their practices are in accord with the Recommended Practices of the FAL Convention.

Source: IMO (2010b)

2.3 Key performance indicators in shipping industry

Drucker (1998) emphasized the importance of measuring performance through performance indicators, stating "If you can't measure it, you cannot manage it". KPI is an objective performance tool that helps organizations find deficiencies, benchmark improvements, and maintain self-improvement (Parmenter, 2015). Performance indicators are a key component as a measuring tool for organisations because it is not possible to determine the success or failure of a performance goal if the achievement is not accurately measured. KPI is commonly implemented to monitor and review performance in practice (Reiman and Pietikäinen, 2012).

Performance indicators are widely used in the shipping industry, such as shipping companies, ports, and administrations to measure performance for continuous improvement (Graziano, in press). Currently, the Shipping KPI Standard provided by BIMCO uses 64 performance indicators to compare different types of ships to identify improvements for the shipping industry as shown in Table 6. Moreover, it provides measurement proposals for the shipping industry to analyse several fields integrated in the industry (Valdez Banda et al., 2016). KPIs listed in the Shipping KPI Standard are possible to use as an indicator for measurement of flag State performance by using indicators such as, PI48 Number of PSC deficiencies or PI49 Number of PSC detentions, as shown in Table 6.

2.4 Summary

To summarise, much of the literature highlighted that flag States are not fulfilling their responsibilities well which triggered the need for measurement of flag State performance. Previous studies have developed indicators to measure flag State performance which are considered to be the proper way to evaluate performance. However, there are no specific KPIs developed in order to assess the effectiveness of flag States in meeting their obligations as required by the III Code, which promotes the need for a new evaluation tool.

Table 6. The Shipping KPI Standard.

PI001	Actual drydocking costs	PI033	Number of groundings
PI002	Actual drydocking duration	PI034	Number of health and safety related deficiencies
PI003	Actual unavailability	PI035	Number of HR related deficiencies
PI004	Agreed drydocking budget	PI036	Number of logged warnings
PI005	Agreed drydocking duration	PI037	Number of lost workday cases
PI006	Average number of officers employed	PI038	Number of navigational related deficiencies
PI007	Emitted mass of CO ₂	PI039	Number of officer days onboard all ships under technical management (DOC)
PI008	Emitted mass of NO _x	PI040	Number of officer experience points
PI009	Emitted mass of SO _x	PI041	Number of officer terminations from whatever cause
PI010	Last year's AAE (Additional Authorized Expenses)	PI042	Number of officer trainee man days
PI011	Last year's actual running costs and accruals	PI043	Number of officers onboard
PI012	Last year's running cost budget	PI044	Number of operational related deficiencies
PI013	Number of absconded crew	PI045	Number of passengers injured
PI014	Number of allisions	PI046	Number of permanent partial disabilities
PI015	Number of ballast water management violations	PI047	Number of permanent total disabilities (PTD)
PI016	Number of beneficial officer terminations	PI048	Number of PSC deficiencies
PI017	Number of cadets under training with the ship manager	PI049	Number of PSC inspections
PI018	Number of cargo related incidents	PI050	Number of PSC detentions
PI019	Number of cases where a crew member is sick for more than 24 hours	PI051	Number of PSC inspections resulting in zero deficiencies
PI020	Number of cases where drugs or alcohol is abused	PI052	Number of recorded external inspections
PI021	Number of charges of criminal offences	PI053	Number of releases of solid substances to the environment
PI022	Number of collisions	PI054	Number of security related deficiencies
PI023	Number of conditions of class	PI055	Number of oil spills
PI024	Number of contained spills of liquid	PI056	Number of unavoidable officer terminations
PI025	Number of seafarers not relieved on time	PI057	Number of ships operated under DOC holder
PI026	Number of dismissed crew	PI058	Number of observations during commercial inspections
PI027	Number of environmental related deficiencies	PI059	Number of commercial inspections
PI028	Number of explosion incidents	PI060	Number of violations of rest hours
PI029	Number of failures of critical equipment and systems	PI061	Passenger exposure hours
PI030	Number of fatalities due to work injuries	PI062	Planned unavailability
PI031	Number of fatalities due to sickness	PI063	Total exposure hours
PI032	Number of fire incidents	PI064	Transport work

Source: BIMCO (2017)

3. IMPLEMENTATION OF IMO INSTRUMENTS

This chapter provides the historical development of IMSAS and overview of the III Code regarding its background and implications. Moreover, the current status of the Republic of Korea in preparation for IMSAS is described.

3.1 From VIMSAS to IMSAS

The International community has developed standards to secure the safety of shipping and prevention of pollution over the past half century as Churchill and Lowe (1999) stated:

“...most States are reluctant to impose stricter safety legislation on their shipowners than other States impose on theirs. For these reasons, therefore, the international community has developed a set of uniform standards to promote the safety of shipping.”

The current regulatory regime is adequate from a legal perspective; nevertheless, it is highly dependent on the will of flag States to follow the original intent of the regulatory regime. This has resulted customary practice of delegation of authority to private organisations and raised the contentious issue of allowing a flag State to authorize its obligations for survey, certification, and inspection to recognized organisations with insufficient capacity to carry out the duties of flag States (Mansell, 2009). Moreover, the lack of enforcement powers of IMO has hampered the effective implementation of IMO standards by flag States, and led to ineffective measurement and oversight of flag State performance (Mansell, 2009). The main reasons for the ineffective implementation and enforcement of IMO instruments by flag States were

the lack of political will and financial resources in most of the cases as stated in the summary by the International Commission on Shipping in 2000⁹.

In order to secure safety of shipping and pollution prevention, the international regulatory framework ratified by IMO and the effective implementation of IMO instruments are the major factors for the shipping industry. The IMO has the most important effect upon the law of the sea (Churchill and Lowe, 1999), and one of the important aspects of IMO regulations is that once a Convention is ratified and entered into force, it is automatically applied to ships all over the world through flag State control and port State control. Nevertheless, the Secretary General of the IMO¹⁰ in 2001 stressed that the implementation and enforcement of IMO instruments by flag States had failed and stronger measures were required for its Member States to carry out their obligations.

IMO took its first step by promoting the IMO Flag State Self-Assessment Form (SAF form) in 2001. This was intended to enable flag States to assess their own performance and capability by completing a questionnaire through which they could identify their weak points requiring additional effort. However, about 17% of the IMO Member States did not submit the SAF form since it was an entirely voluntary methodology. Therefore, as a next step, a proposal was raised, at the eleventh session of Flag State Implementation (FSI) in 2003, to counteract ineffective flag State implementation and enforcement of mandatory IMO instruments by amending Resolution A.847(20)¹¹, and introducing a Voluntary flag State Audit Scheme

⁹ "...Major reasons stated for the failure to implement the necessary measures were the lack of competent personnel and financial resources, and a lack of political will in many cases...There was a widespread view throughout the Commission's inquiry that the IMO's work on flag State performance has been largely ineffective". (International Commission on Shipping, 2000)

¹⁰ "... I believe that the problems perceived today do not lie basically with shipping's regulatory framework or with the mechanism by which that framework is constructed, but with its implementation. Inherent in a system based on international consensus such as that which is developed through IMO are both rights and responsibilities. All IMO Members have the right to a voice in defining standards and regulations that will be applied to international shipping and that right is equal for all regardless of the size of their fleets, the strength of their economies or the depth of their maritime traditions. But the rights bring with them responsibilities and accountabilities that are commensurate with the rights." (Mansell, 2009)

¹¹ Resolution A.847(20). Guidelines to assist flag States in the implementation of IMO instruments.

(VIMSAS)¹². VIMSAS benchmarked the audit programme of the International Civil Aviation Organization (ICAO) to monitor the performance of each Member States to improve its performance, in November 2003 at the twenty-third session of the IMO Assembly. To provide the audit standard and procedures for the upcoming Member State audit, Resolution A.973(24)¹³ and A.974(24)¹⁴ were adopted at the twenty-fourth IMO Assembly in November-December 2004.

VIMSAS has been acknowledged as the most successful tool for measurement of flag State performance in terms of jurisdiction and control, and it is believed that there should be mandatory standards for the performance of flag States as well as ROs (Mansell, 2009). Moreover, the round table of international shipping association (Consists of BIMCO, ICS, INTERTANKO, and INTERCARGO) reaffirmed its intention to strongly support the VIMSAS in November 2005 and decided that the results of IMO audits should be the targeting factor of the port state control, and the factor to identify areas that need to be improved for the safety of the shipping (Kim, 2006).

The IMO Assembly, in December 2013, decided to make the Member State Audit Scheme mandatory as an important step towards the effective oversight of flag State performance to secure the safety of shipping and prevention of pollution from substandard ships, by adopting Resolution A.1068(28)¹⁵ and Resolution A.1070(28)¹⁶, which will underpin the mandatory audit scheme. On 1 January 2016, IMSAS and a majority of the necessary amendments to IMO instruments became mandatory. A total of 9 instruments are included in the scope of the scheme:

¹² Resolution A.946(23). Voluntary flag State Audit Scheme (VIMSAS).

¹³ Resolution A.973(24). Code for the implement of mandatory IMO instruments.

¹⁴ Resolution A.974(24). Framework and Procedures for the Voluntary IMO Member State audit scheme

¹⁵ Resolution A.1068(28). Transition from the voluntary member state audit scheme to the IMO Member State audit scheme.

¹⁶ Resolution A.1070(28). IMO Instrument Implementation (III) Code.

- SOLAS 1974
- SOLAS PROTOCOL 1988
- MARPOL 73/78
- MARPOL PROTOCOL 1997
- STCW 1978
- LOAD LINES 1966 (LL66)
- LL 66 PROTOCOL 1988
- TONNAGE 1969
- COLREG 1972

It took almost 13 years for the IMSAS to become mandatory. During the VIMSAS phase, only 14 States volunteered for audits up to March 31 2006, and a total of 75 member states have undertaken voluntary audits to date (IMO, 2017). The IMO has provided an audit summary report with a total of 59 audits.

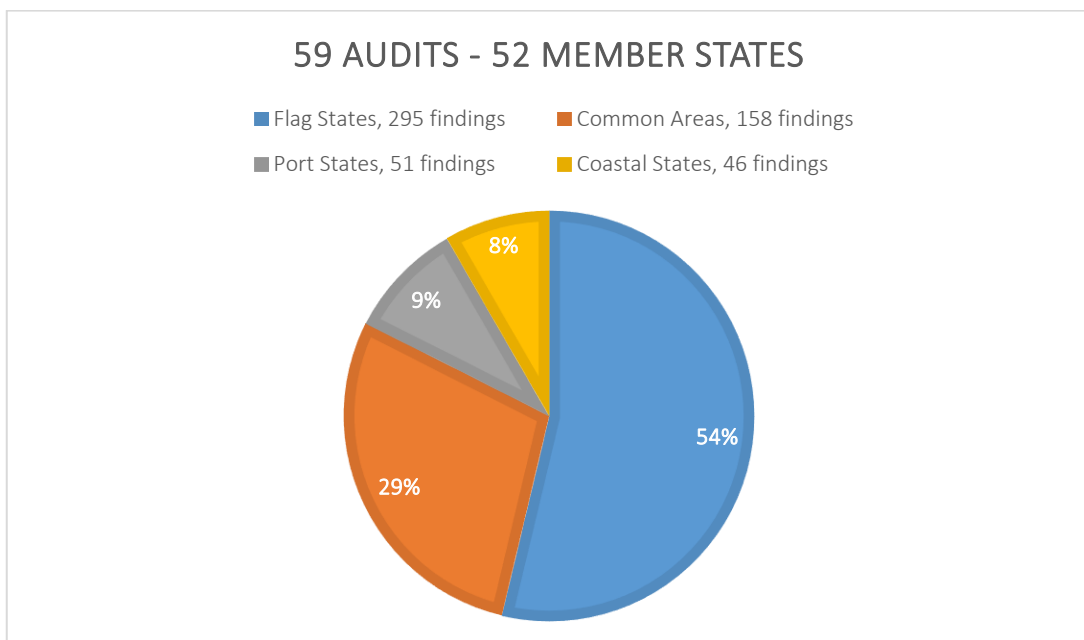


Figure 1. Percentage and numbers of findings according to the parts of the Code.

The audit summary report as described in Figure 1 shows that most of the findings in the audits pertained to the flag State responsibilities and obligations area which accounts for about 53.6%, followed by the Common Areas (28.7%), Port States (9.2%), and Coastal States (8.3%). In detail, the number of findings in the implementation of IMO instruments by flag States was the highest in the audits among all the factors, as seen in Figure 2.

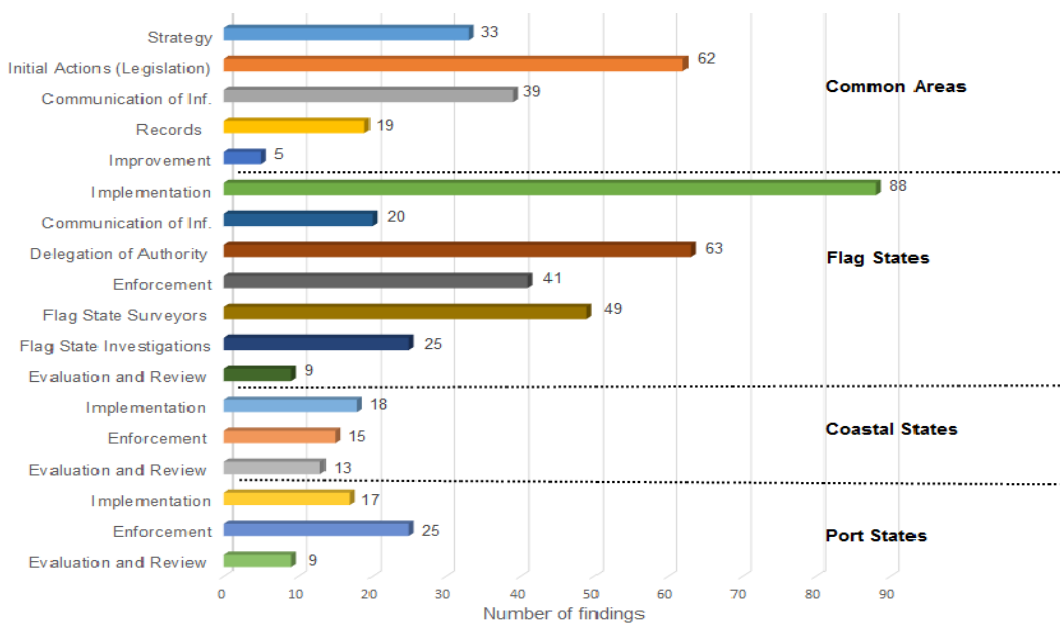


Figure 2. Analysis of audit results by parts of the Code. IMO (2014b).

It is obvious that the performance of flag State is the main problem of the implementation and enforcement of IMO instruments as shown in Figure 1 and Figure 2. A review of consolidated audit summary reports revealed that the major causes of ineffective implementation of IMO instruments by the audited States were the lack of procedures and processes; lack of national provisions; lack of national resources; lack of coordination with other entities; and lack of training programmes (IMO, 2014b).

There are some practical issues that remains for IMSAS such as training a sufficient number of auditors and scheduling the audits (Jessen and Zhu, 2016). Moreover, the average cost for each audit is about GBP 11,000, according to the IMO Council document (IMO, 2010a). IMO is planning to audit all the Member States that have not participated in the VIMSAS first, and complete the audit cycle on a seven year interval. IMSAS does not impose a rating on the audited country but if it is discovered that

there is a problem with the maritime administration, it is expected that several disadvantages will be imposed on the audited country such as increase in insurance premiums, exclusion of charters, and strengthening of PSC inspection (Kim, 2006). It is clear that there are difficulties for IMO to proceed with the IMSAS, however, it is expected to ultimately reduce the gap between implementation and enforcement of IMO instruments (Jessen and Zhu, 2016).

3.2 IMO Instruments Implementation Code

The objective of the III Code is to strengthen the role of IMO Member States in their functions as flag States, port States, and coastal States to enhance the safety of shipping and protection of the marine environment, and enable the IMO to better evaluate the performance of the IMO Member States as the international maritime standard setting organization (NIA, 2015).

Overall, the overarching objective of the III Code is to assist IMO Member States in the implementation of IMO instruments which represents the IMO's key objective (Jessen and Zhu, 2016). Since the IMSAS became mandatory as well as the III Code, it is clear that the IMO Member States should understand and comply well with the III Code.

The III Code is comprised of four parts which are common areas, flag States, coastal States and port States as presented in Figure 3. The III Code highlights three aspects of a maritime administration, which are implementation, enforcement and review. Those three aspects are addressed in the common areas¹⁷ of the Code wherein a member State must have an available methodology to evaluate the performance of

¹⁷ III Code Paragraph 3: "In order to meet the objectives of this code a state is recommended to;

1. Develop an overall strategy to ensure its international obligations and responsibilities as a flag, port and coastal state are met,

2. Establish a methodology to monitor and assess that the strategy ensures effective implementation and enforcement of relevant international mandatory instruments, and

3. Continuously review the strategy to achieve, maintain and improve the overall performance and capability as a flag, port and coastal state."

its ships, seafarers, and the effectiveness of its enforcement of the mandatory Conventions.

Moreover, the member States should review trends and formulate strategy based on the data from the performance evaluation. The III Code specifically requires Member States to establish a strategies which covers “implementation and enforcement of IMO instruments; adherence to international recommendations; continuous review and verification of the effectiveness of the State to meet is international obligations; and achieve, maintain and improve overall organizational performance and capabilities” (IMO, 2013b).

PART 1: COMMON AREAS	Objective	PART 2: FLAG STATES	Implementation
	Strategy		Delegation of authority
	General		Enforcement
	Scope		Flag State surveyors
	Initial actions		Flag State investigations
	Communication of information		Evaluation and review
	Records		
	Improvement		
PART 3: COASTAL STATES	Implementation	PART 4: PORT STATES	Implementation
	Enforcement		Enforcement
	Evaluation and review		Evaluation and review

Figure 3. Composition of the III Code

The strategy of the Member States entails an important mechanism for the State to assess its performance in meeting its obligations, and should include procedures for all the stakeholders in the State's maritime activities to establish competence and areas of responsibility, and an evaluation system to monitor, evaluate, and enhance the performance of the Member State (Schröder-Hinrichs, 2017).

Furthermore, communication of information, records, and improvements are included in the common areas indicating that the IMO Member States should establish and maintain records to demonstrate their effective compliance. In addition, all Member States should encourage a culture that provides opportunities for performance improvement regarding maritime safety and environmental protection, and identify the causes of non-conformities and implement corrective action through review and analysis of their performance to prevent recurrence of problems (IMO, 2013b).

The III Code was amended twice to cover the amendments that occurred between 2007 and 2011. In 2011, the IMO was requested to incorporate a process of periodic review of flag State performance in order to help IMO Member States comply with their obligations (Jessen and Zhu, 2016). In this regard, the Code has stated the duties of flag States pertaining to the evaluation and review in paragraphs 42, 43, and 44¹⁸ wherein a flag State should evaluate its performance periodically with the performance indicators given in the paragraphs. Port States and coastal States are also required to evaluate their performance according to the part 3 and 4 of the III Code.

As a result, maritime administrations must collect a wide range of data to create comparative statistics which covers the data from the PSC, accident, reports, exemptions issued and all the factors that provide the performance of ships entitled to fly their flag.

¹⁸ Paragraph 42: A flag State should evaluate its performance periodically with respect to the implementation of administrative processes, procedures and resources necessary to meet its obligations. Measures to evaluate the current performance of flag States should include port State control detention rates, flag State inspection results, casualty statistics, communication and information processes, annual loss statistics (excluding constructive total losses) and other performance indicators as may be appropriate, in order to determine whether staffing, resources and administrative procedures are adequate to meet its flag State obligations.

It is important to monitor the performance as required by the III Code, and it is significantly dependent on the Port State Control (PSC) inspection due to its role as a powerful criterion for any flag State assessment (Corres and Pallis, 2008). Nonetheless, a considerable number of Member States, especially developing countries, have not enough manpower for PSC, Vessel Traffic Service (VTS) center, and accident investigation centers (MOF, 2006). The III Code stipulates the continual review and verification of the performance of the State, and it expects performance indicators to show certain data to review its performance. The whole scope of the III Code requires the collection and analysis of a wide range of data, which is the objective of this thesis through the development of KPIs to analyse the performance of IMO Member States.

As mentioned above, most of the findings in the VIMSAS were from the flag States part of the III Code. It is notable that the requirements of the III Code are mainly focused on the obligations of the flag States as shown in Table 6. About 77% of the obligations required in the III Code are for flag States which indicates that the role of flag States is the most important aspect of compliance with the III Code, and once again highlights the importance of flag State performance. Therefore, this dissertation will focus on the development of KPIs for the flag States part of the III Code as a basic study for quantification of the performance of IMO Member States.

Table 6. The number of requirements of the III Code for each responsible entity

Responsible State	Obligation of government in the III Code
Total	700
Contracting Party	95 (13%)
Flag State	544 (77%)
Coastal State	6 (1%)
Port State	55 (9%)

Source: Kim (2006)

3.3 The context of the Republic of Korea

Korea has achieved a high level of maritime safety through its efforts in the development of marine safety along with the growth of maritime forces which have enabled Korea to be a Category “A” Member of IMO five times consecutively. However, there are many administrative tasks that have not been enacted, and which make it difficult to ensure that the current maritime safety administration in Korea is operating in accordance with international requirements (MOF, 2017). Therefore, it is necessary to investigate the actual situation of safety management in Korea, centered on the obligations of the flag states, the port states, and the coastal states specified in the III Code in order to prepare for the IMSAS.

From January 2016, IMO has planned to audit 25 Member States each year and Korea is expected to be audited in 2020. In 2007, Korea successfully completed a VIMSAS with only three findings. Nevertheless, there is a need for sufficient preparation for the IMSAS since a number of significant maritime accidents¹⁹ have occurred since the VIMSAS and the safety organization system²⁰ has changed several times. In addition, thorough precautionary measures and preparations are necessary for economic loss prevention and maintaining the status of Category “A” in IMO. Therefore, Korea has set a strategic plan with high level objectives and strategies with regard to its maritime policy as required in paragraph 3²¹ of the III Code. The strategic objectives are:

¹⁹ *Hebei Spirit* (2007), *Sewol* (2014)

²⁰ Ministry of Land, Transport and Maritime Affairs (2008) changed to Ministry of Oceans and Fisheries (2013). Disband Korea Coast Guard in 2014 and reorganized in 2017.

²¹ Paragraph 3: In order to meet the objective of this Code, a State is recommended to:

.1 develop an overall strategy to ensure that its international obligations and responsibilities as a flag, port and coastal State are met;

.2 establish a methodology to monitor and assess that the strategy ensures effective implementation and enforcement of relevant international mandatory instruments; and

.3 continuously review the strategy to achieve, maintain and improve the overall organizational performance and capability as a flag, port and coastal State.

- Enhancement of Maritime Safety Management System
- Build governance
- Strengthen human capacity

In Korea, most of the policies for the implementation of the III Code are developed by the Maritime Affairs and Safety Policy Bureau, and Ministry of Oceans and Fisheries (MOF) has delegated seven areas of its work: ship inspection, prevention of marine pollution, management of examination for qualification of seafarers, education, ISM and ISPS inspection and certification, inspection of dangerous goods, and consignment of accommodation facility to Korea Ship Safety Technology Authority (KST), Korean Register (KR), National Institute of Fisheries Science (NIFS), Maritime Universities (KMOU and MMU), Korea Institute of Maritime and Fisheries Technology (KIMFT), Korea Testing Certification (KTC), Korea Marine Environment Management Corporation (KOEM), and Korea Maritime Dangerous Goods Inspection Center (KOMDI). Among them, the ROs that are subject to IMSAS are KST, KR, and KIMFT.

Moreover, accident investigation is divided into marine accident and marine pollution accident investigation. In case of marine accidents, Korea Maritime Safety Tribunal (KMST) investigates the causes of accidents and Korea Coast Guard (KCG) is in charge of the investigation regarding judicial procedure. When a pollution accident occurs, the investigation function is diverted and it is anticipated that many inconveniences are expected due to duplicate investigations.

The biggest problems that have arisen for the IMSAS are mostly the lack of human resources, lack of education and training, lack of documented work procedures, and overlapping of similar tasks between departments (MOF, 2017). Therefore, it is clear that the evaluation of Korea's performance regarding the III Code is important for the preparation for IMSAS and the safety of shipping.

3.4 Summary

To summarise, IMSAS has become mandatory, which requiring IMO Member States to meet their obligations as required by the III Code. However, it is difficult for all the Member States to comply with the III Code due to lack of resources, personnel, and procedures. In addition, Korea accomplished VIMSAS successfully in 2007 with three findings and is preparing for the upcoming IMSAS in 2020. It is clear that a new evaluation tool is needed to measure the effectiveness of Member States' performance in order to identify problem areas and implement corrective action. In the following chapter, the methodology for the development of KPIs will be presented.

4. CONTEXT-MECHANISM-OUTCOME METHOD TO DEVELOP KPIS

This chapter introduces the benefits and limitations of the realist evaluation, and the procedure for applying the CMO method to the III Code.

4.1 Introduction of the realist evaluation

The realist evaluation, formerly known as realistic evaluation, was first proposed by Pawson and Tilley (1997). It provides a structured review of policy programmes. The purpose of a realistic evaluation is to identify and reveal the nature of programmes, and it ultimately asks “what works for whom in what circumstances and in what respects, and how?” by using four key concepts: “mechanism”, “context”, “outcome”, and “context-mechanism-outcome (CMO) pattern configuration” (Pawson and Tilley, 2004). Moreover, the CMO method explains how the programme caused the expected change and identify underlying theories in the particular programme (Gill and Spriggs, 2009).

Just like science solves intricate problems by using an analytic method to separate systems into a number of main components, realist evaluation uses CMO to explain and understand policy programmes (Gill and Spriggs, 2009). As a first step in a realist evaluation, the researcher analyses the mechanism which is related to the programmes that bring effects. The mechanism of the policy programme is directly linked to the resources, procedures and applications that enable the programme to work (Pawson and Tilley, 2004).

The second step is to identify the context of the policy programme, and it shows what the characteristics of the conditions in the programmes are. The next step is outcome patterns. The outcomes of programmes have intended and unintended results from different mechanisms in different contexts, and this allows for a more comprehensive evaluation of complex programmes. For the final step, context-mechanism-outcome pattern configurations (CMOCs) indicates how the programmes use mechanisms under various conditions (Pawson and Tilley, 2004).

Although few studies using this method yet, and it requires a number of refinements due to the lack of elaborate and universal principles on how to apply it, the CMO method is very helpful in terms of analyzing the effectiveness of certain policy programmes (Westhorp, 2014). The CMO method is probably the best way to analyse particular programmes, and it can be carried out by a researcher if no survey or interviews can be done. However, there are several challenges involved in applying the realist evaluation. The application of CMO to the programme largely depends on the researcher and requires a great deal of skill. The researcher should identify the correct context and deduce how the intervention interacts with the context to make an outcome (Gill and Spriggs, 2009).

Valdez Banda et al. (2016) have developed a set of KPIs for safety management by applying a realist evaluation proposed by Pawson and Tilley (2004). The realist evaluation was applied by Valdez Banda et al. (2017) to evaluate two maritime safety management Codes which are the International Safety Management Code (ISM Code) and the Tanker Management Self-Assessment (TMSA) Code. A set of safety management indicators was identified by applying the CMO method, and this method provided guidance to acknowledge the actual objective and function of the KPIs and norms (Valdez Banda, 2017). Valdez Banda et al. (2016) used the context-mechanism-outcome (CMO) method to review the ISM Code and the TMSA Code in different levels of their applicability, including conceptualization, adaptation, and application, and creating a reasoned basis for representing the complete aspects of the Codes that are behind the reported output of each KPI as described in below:

“Context: assess the form the requirement and guidelines included in the applied safety management norms are subjected to the reasoning and environment of the affected organization.

Mechanisms: assess the use of resources to make the system functional and supportive to achieve the planned objectives through the implementation of the applied safety management norms.

Outcome: assess the possible consequences arising from the application of these safety management norms, and how to adapt these to the plans and procedures of the system.” (Valdez Banda, 2017)

It is notable that the CMO method allows the researcher to identify “what works for whom in what circumstances” (Tilley, 2000), and what aspects of an intervention make the policy programme effective or ineffective (Stuart et al., 2015).

Meanwhile, effective KPIs help to define “the what – are we doing the right things? What is our outcome in terms of impact and accomplishments? The how – are we doing things right? Do we have the right inputs in terms of resources and processes?” as mentioned in the previous chapter (Bruce, 2007). The author believes these questions can be answered by applying the realist evaluation, and the CMO method is exactly in line with the purpose of this study. Therefore, development of KPIs starts with applying the CMO method to the III Code to find out what performance indicators are needed to measure the performance of each IMO Member States.

4.2 Applying CMO method to the III Code

In order to develop KPIs, Figure 4 demonstrates the process of this study step by step. It is essential to define the objective of the measurement and the reasons for the measurement as a first step. Since the goal of the development of the KPIs is to measure the performance of IMO Member States, the III Code is selected to achieve the aim of this study because of its role as a compulsory guidance for the IMSAS. The one of the objectives of this study is to evaluate the performance of the IMO Member States regarding their implementation of administrative processes, procedures and resources as required by the III Code, and identify those factors which have to be improved by a performance evaluation tool.

The nature of the III Code was analysed through the CMO methodology to understand the requirements of the III Code and determine the mechanism needed to satisfy the requirements. As a result, the CMO method developed by Valdez Banda et al. (2016) is applied to the flag States part of the III Code to achieve the objective of this thesis.

The application of the realist evaluation to the III Code provides the fundamental point for identifying and developing the KPIs, and it is focused on identifying not only the outcomes produced by interventions, but also the procedures to achieve the outcomes from the requirements of the III Code.

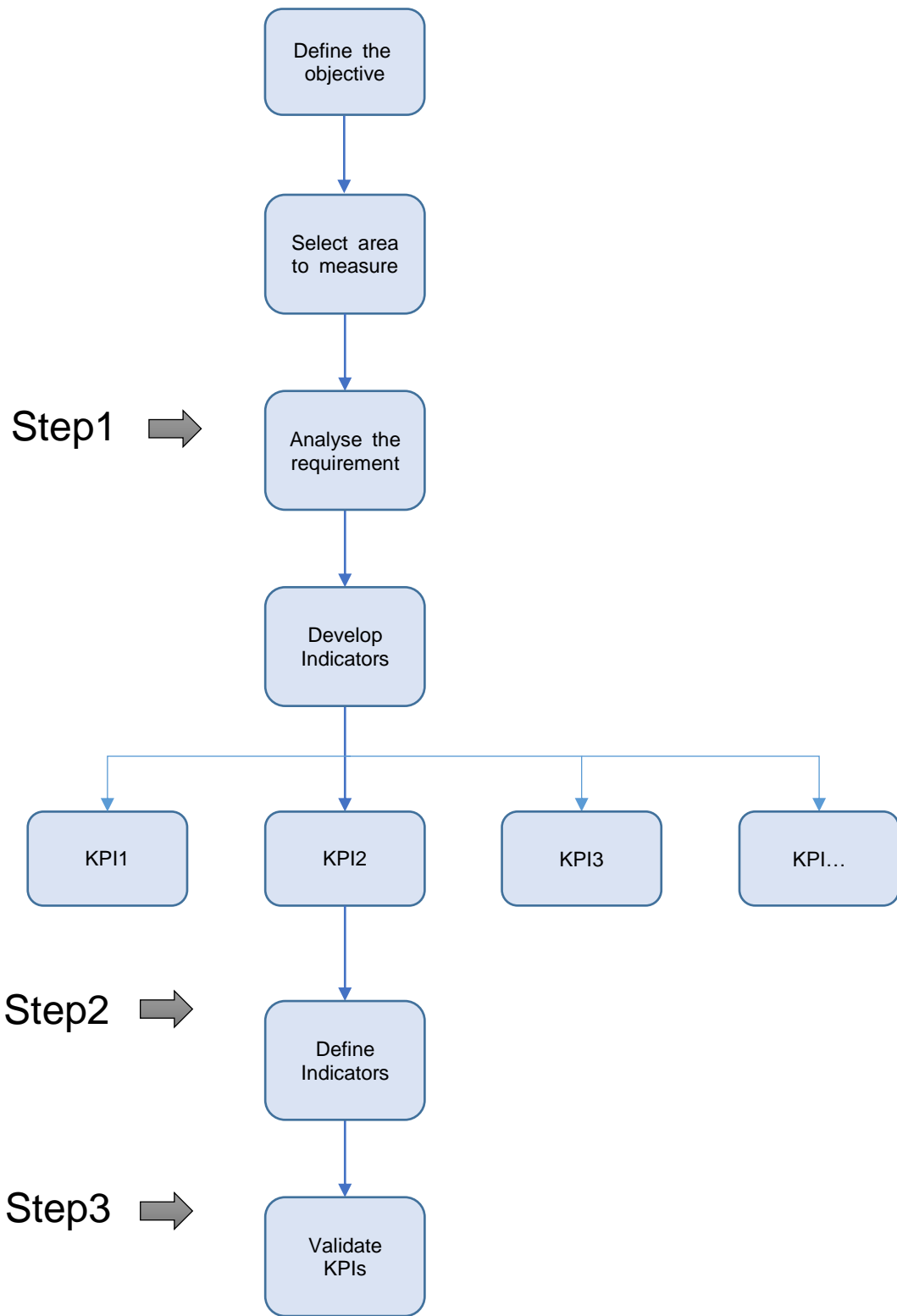


Figure 4. KPI development process

As a pilot study to apply a realist evaluation to the III Code, the CMO questions are applied only to flag States part of the III Code to verify the suitability of the CMO method for development of KPIs. For the reasons mentioned above, the CMO questions are applied to paragraphs 15-44²² of the III Code, and are intended identify and develop the KPIs by conducting a three step process as below:

1. Applying the CMO questions to the flag States part of the III Code. Then, selecting and developing of KPIs through the CMO questions conducted.
2. Provide definitions and categorization for each developed KPI in order to clarify its representativeness, suitability, and relevance to the III Code.
3. Apply the developed KPIs to the Republic of Korea to verify its validity, compatibility, and reliability.

The CMO method, is largely divided into context, mechanism, and outcome with 14 questions, as shown in Table 7. Questions in the context part require the author to provide information regarding the organizational aspect, current task developed, organizational conditions likely to be influenced, responsible body, and links with other implemented norms. The mechanism part requires the author to answer how to achieve the requirements from the III Code, and the outcome part shows the expected results when the flag State implements the requirements as required by the III Code. It is a structured method that helps to focus on context, mechanism, and outcome of the III Code, but it is also a subjective method whereby different teams can come to different results.

²² Refer to Figure 3 in page 24

Table 7. CMO questions

Realist evaluation	Aspects to assess in the norm's requirement
Context	<p>What is (are) the main organizational aspect(s) analysed by the requirement?</p> <p>Which is (are) the current task(s) developed in the organization linked to the requirement?</p> <p>What is the status of the organizational conditions influenced by the requirement?</p> <p>What and who are responsible for ensuring the requirement implementation and its maintenance?</p> <p>What is the current link of the requirement with similar requirement(s) in other implemented norms?</p>
Mechanism	<p>Which are the main organization's means for the implementation?</p> <p>How is the requirement currently communicated inside and outside of the organization?</p> <p>How is the organization able of ensuring the understanding of the importance of the requirement?</p> <p>How are the skills and capabilities of the responsible person(s) evaluated?</p> <p>How is the organization able of ensuring the link of the requirement with other implemented norms and regulations?</p>
Outcome	<p>What is the current level of fulfilment of the requirement?</p> <p>What are the expected results derived from the application of the requirement?</p> <p>What are the possible negative aspects (internal and external) that could affect before the implementation of the requirement?</p> <p>What kind of improvement can be obtained after implementing the requirement?</p>

Source: Valdez Banda et al. (2016)

4.3 Summary

The realist evaluation proposed by Pawson and Tilley (1997) provides a structured review of policy programmes, but this evaluation is subjective and depends greatly on the researcher. Furthermore, Valdez Banda et al. (2016) has successfully applied the CMO method of realist evaluation to the ISM Code and TMSA Code by using the questions in Table 7. Therefore, this study implements the CMO method to the III Code to identify the context, mechanism, and outcome of the Code and develop a set of KPIs to cover all the requirements of the III Code.

5. APPLICATION OF CMO METHOD ON THE III CODE

This chapter provides the results of the application of the CMO method on the III Code. The procedure to apply the CMO is introduced and the KPIs developed from the CMO method as well as the categorization of KPIs are presented.

5.1 KPIs developed through the CMO method

This part of the thesis presents examples of how the CMO questions were applied to the III Code and of the KPIs developed from the CMO questions. The questions in Table 7 evaluated the context, mechanism, and the outcome of the III Code and identified not only what the III Code requires, but how it works in various circumstances. Every requirement of the flag States part of the III Code was assessed with the questions, and it provided the response and the justification for the KPIs for the corresponding requirements.

The flag States part of the III Code, to which the CMO method was applied, consists of 30 paragraphs which are divided into Implementation, delegation of authority, enforcement, flag State surveyors, flag State investigations, and evaluation and review as described in Table 8. The performance indicators found in the literature review were considered during the development of KPIs, and the final set of developed KPIs along with the development procedure are described in the following chapter.

Table 8. Part 2: Flag States.

III Code (Flag States)	1.Implementation
	2.Delegation of authority
	3.Enforcement
	4.Flag State surveyors
	5.Flag State investigations
	6.Evaluation and review

In order to apply the CMO method to the III Code, initial discussions were held between the author and experts, including a Professor. This was followed by a formal completion of the KPI work sheets, as shown in **Appendix 1**, and the results were reviewed by the Professor and selected experts. Finally, a table of KPIs was developed to meet the requirements of the III Code.

Table 9 presents the KPI sheet, which shows the response to the CMO questions, and shows the link between the performance indicators and the requirement. Paragraph 15 of the III Code was assessed with questions to identify the requirement, and the mechanism to implement that requirement, as well as the expected outcome for the flag State to achieve, as shown in Table 9.

First of all, color coding was conducted to understand the context, mechanism, and outcome of each paragraph. Context is colored in green, mechanism in red, and outcome in blue. As a result, paragraph 15.1 of the III Code requires flag States to implement policies by using the mechanism of issuing national legislation and guidance which will assist in the implementation and enforcement as an expected outcome.

Table 9. KPI sheet for III Code requirement.

KPI Sheet for III Code Requirement (15.1)

III Code – Part 2 Flag State – Implementation

Paragraph 15: In order to effectively discharge their responsibilities and obligations, flag States should:

.1 **implement policies** through **issuing national legislation and guidance**, which will assist in the **implementation and enforcement** of the requirements of all safety and pollution prevention conventions and protocols to which they are parties; and

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To assist implementation and enforcement	(1) An indicator about the fleet performance in terms of Port State Control, accident numbers etc.
	Which is the current task developed in the organization linked to the requirement?	Issue national legislation and guidance	(2) An indicator about the guidance for the different IMO conventions (SOLAS, LOAD LINE, TONNAGE etc.) that are covered by policies and guidelines.
	What is the status of the organizational conditions influenced by the requirement?	This is a question that may not be adequate in the context of the III Code. The requirement influences the fleet performance, but is not linked to the organizational performance of an administration. The absence of policies required by this paragraph of the III Code could be an indicator for a low organizational performance of an administration.	(3) An indicator covering the number of policies and documents issued as guidance to administrations, ship-owners and other maritime stakeholders.
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	(4) An indicator about the availability of an administration to deal with this requirement.
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2) above
Mechanism	Which are the main organizations' means for the implementation?	Issue national legislation and provide sufficient resources	Covered by (2), (3) and (4)

	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders, regular seminars to highlight new requirements.	(5) An indicator for the quantity and quality of information disseminated to stakeholders.
	How is the organization able of ensuring the understanding of the importance of the requirement?	There are two ways of ensuring the importance is understood – specific enforcement measures, such as targeted flag State inspection programs or specific information sessions, such as workshops, circulars etc.	(6) An indicator for targeted flag State inspection programs The communication aspect is covered by (5)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	(7) An indicator for qualification and training of maritime administrative personnel
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	(8) An indicator for regular reviews of the technical regulations in terms of consistency with other national instruments and in terms of gaps that may still be existing.
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance and of the level of compliance with international regulations.	(9) An indicator for regular review of the level of compliance with international obligations.
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1) above
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	(10) An indicator about customer satisfaction with the administration The fleet performance is covered by (1) above

Color coding in the III Code	Requirement	Mechanism	Intended outcome
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Secondly, factors to be considered regarding paragraph 15.1 were identified after applying the CMO questions. They are effectiveness of enactment and amendment procedures of relevant national laws and regulations, the level of policy development and update for implemented policies, the adequacy of development and dissemination of commentary on regulations, appropriateness of establishing administrative guidelines necessary for the implementation of international regulations, and appropriateness of the international Convention conformance check system.

Consequently, a total of 10 groups of indicators were selected to satisfy the identified factors in the requirement of paragraph 15.1. Selected indicators are connected to the response to each question and justify what kind of KPIs can cover the response to each question, as described in Table 9. The 10 selected indicators are listed below:

- (1) An indicator about fleet performance in terms of Port State Control, and accident numbers.
- (2) An indicator about the guidance for different IMO conventions (SOLAS, LOAD LINE, TONNAGE etc.) that are covered by policies and guidelines
- (3) An indicator covering the number of policies and documents issued as guidance to administrations, ship-owners and other maritime stakeholders
- (4) An indicator about the availability of an administration to deal with this requirement
- (5) An indicator for the quantity and quality of information disseminated to stakeholders
- (6) An indicator for targeted flag State inspection programs
- (7) An indicator for qualification and training of maritime administrative personnel

- (8) An indicator for regular reviews of the technical regulations in terms of consistency with other national instruments and in terms of gaps that may still exist
- (9) An indicator for regular review of the level of compliance with international obligations
- (10) An indicator about customer satisfaction with the administration

Finally, the 10 groups of indicators identified what has to be measured to satisfy the requirement and resulted in 18 KPIs to cover the context, mechanism, and outcome of paragraph 15.1.

The rest of the paragraphs of the III Code were assessed in the same way, and the results from the CMO questions in the KPI sheets are attached in **Appendix 1** since it is not possible to describe all of the realist evaluations performed.

The application of the CMO method to the III Code resulted in 43 KPIs for assessing the performance of the flag State as required by the III Code. The 43 KPIs are listed according to their corresponding requirements in the III Code as shown in Table 10.

Table 10. Developed KPIs through the CMO method.

Suggested KPIs		No.	Developed KPIs
(1)	An indicator about the fleet performance in terms of Port State Control, accident numbers etc.	KPI1	Port State Control detention follow up
		KPI2	Port State Control deficiency follow up
		KPI3	Fleet loss ratio
		KPI4	Accident follow up
		KPI5	Flag State Control follow up
(2)	An indicator about the guidance for the different IMO conventions (SOLAS, LOAD LINE, TONNAGE etc.) that are covered by policies and guidelines.	KPI6	Policy Implementation ratio
		KPI7	Legislation ratio
(3)	An indicator covering the number of policies and documents issued as guidance to administrations, ship-owners and other maritime stakeholders.	KPI8	Commentary regulation published
		KPI9	Administrative guidance published
(4)	An indicator about the availability of an administration to deal with assigning responsibilities.	KPI10	Assign responsibilities of Administration
(5)	An indicator for the quantity and quality of information disseminated to stakeholders.	KPI11	Communication quantity
(6)	An indicator for targeted flag State inspection programs	KPI12	FSC inspection rate
(7)	An indicator for qualification and training	KPI13	Procedures for checking credential of

	of maritime administrative personnel		administrative personnel
		KPI14	Training Standards for administrative personnel
(8)	An indicator for regular reviews of the technical regulations in terms of consistency with other national instruments and in terms of gaps that may still be existing.	KPI15	Validation of national legislation
(9)	An indicator for regular review of the level of compliance with international obligations.	KPI16	Periodical evaluation of the III Code
		KPI17	Follow up for nonconformities from periodical evaluation
(10)	An indicator about customer satisfaction with the administration	KPI18	Customer satisfaction
(11)	An indicator about documentation of the responsibilities in the administration (Duty segregation table of each department)	KPI19	Assigning responsibilities of personnel
		KPI20	Assigning responsibilities of maritime organizations
(12)	An indicator covering the procedures for flag State inspection.	KPI21	FSC inspection procedure
(13)	An indicator about the administrative personnel who are available to carry out Flag State Inspections.	KPI22	Qualification of flag State surveyors
(14)	An indicator covering the level of training for competence of seafarers which is in compliance with the STCW requirements.	KPI23	The level of training of seafarers
(15)	An indicator which verifies the standards for assessment of seafarers' competence which is in compliance with the STCW requirements.	KPI24	Standards for qualifications of seafarers
(16)	An indicator covering the standards for issuing certificates and endorsements for seafarers (including external verification)	KPI25	Standards for issuing certificates for seafarers
(17)	An indicator about the procedures of withdrawal, suspension or cancellation of certificates or endorsements issued.	KPI26	Procedures of withdrawal/suspension /cancellation of certificates.
(18)	An indicator covering the procedures for impartial accident investigation by investigators.	KPI27	Procedures of accident investigation
(19)	An indicator covering the appropriateness and promptness of the marine accident investigation	KPI28	Marine accident investigation
(20)	An indicator covering the appropriateness and promptness of the countermeasures for substandard ships.	KPI29	Countermeasures for substandard ships
(21)	An indicator which shows current manning level of ships entitled to fly its flag, and compliance with the Principles of Safe Manning.	KPI30	Manning level
(22)	An indicator about the administration performance in terms of RO delegation & monitoring.	KPI31	RO delegation & monitoring
(23)	An indicator about the communication between ROs and administration	KPI32	Communication with ROs
(24)	An indicator about supplementary surveys for flagged ships in order to oversight ROs.	KPI33	Supplementary surveys for flagged ships
(25)	An indicator about the presence of formal written agreement between the Administration and the ROs.	KPI34	Agreement conclusion with ROs
(26)	An indicator about the instructions detailing actions to be followed by ROs for substandard ships.	KPI35	Instruction for ROs
(27)	An indicator about the penalty regulation for substandard ships and individuals who violated international rules.	KPI36	Penalty regulation for substandard ships and individuals
(28)	An indicator for instituting proceedings against substandard ships and individuals	KPI37	Instituting proceedings against substandard ships and individuals

	who violated international rules.		
(29)	An indicator about the number of investigation report which have reported to the IMO	KPI38	Reporting to IMO
(30)	An indicator about the appropriateness of the providing statistical data and trend analysis.	KPI39	Providing statistical data
(31)	An indicator which verifies the control and monitoring program for responding to deficiencies and alleged pollution incidents.	KPI40	Responding to deficiencies and pollution accident
(32)	An indicator for qualification and training of flag State investigators.	KPI41	Qualification and training of flag State investigators.
(33)	An indicator covering the procedures for training program provided to flag State surveyors.	KPI42	Training program for flag State surveyors
(34)	An indicator covering the procedures for training program provided to flag State investigators.	KPI43	Training program for flag State investigators

There are 34 group of indicators found which show how the requirement of the III Code are covered by the KPIs, and a total of 43 KPIs are developed by analysing those groups of indicators. The development of KPIs mainly focused on the quantification of flag State performance to assist Member States to measure their performance and identify problem areas through trend analysis.

For the measurable KPIs, performance indicators such as PSC detention rate or accident rate in the Shipping KPI Standard are selected, but the number of follow ups for the PSC, FSC detentions and accidents are also included to measure the willingness of the flag State to carry out corrective actions.

Since the KPIs for administrative performance such as oversight ROs or qualification of administrative personnel are much more than the KPIs for fleet performance, which has already developed in the other studies, the most of the KPIs are newly developed to cover the requirements of the III Code. In addition to the measurable KPIs, developed KPIs include the KPIs that ask for the existence of specific procedures to satisfy the requirements of the III Code. Further details of KPIs and definitions for each developed KPI are attached in **Appendix 2**.

5.2 Categorization of developed KPIs

It was possible to understand the objective of the III Code by applying the CMO method, and the author identified main components of paragraphs 15 to 44. The realist evaluation enabled the author to categorize developed KPIs into the main components of the III Code. The flag States part of the Code are divided into Implementation, Delegation of authority, Enforcement, Organization system and Human resources after analysing every requirement of the Code, as shown in Figure 5. Classification of KPIs can help users not only identify the problem areas but also understand the immediate need to address problem areas. Although proposed categories are not the only way to divide the flag States part into smaller groups, but this method of categorization could be a step toward broader study.

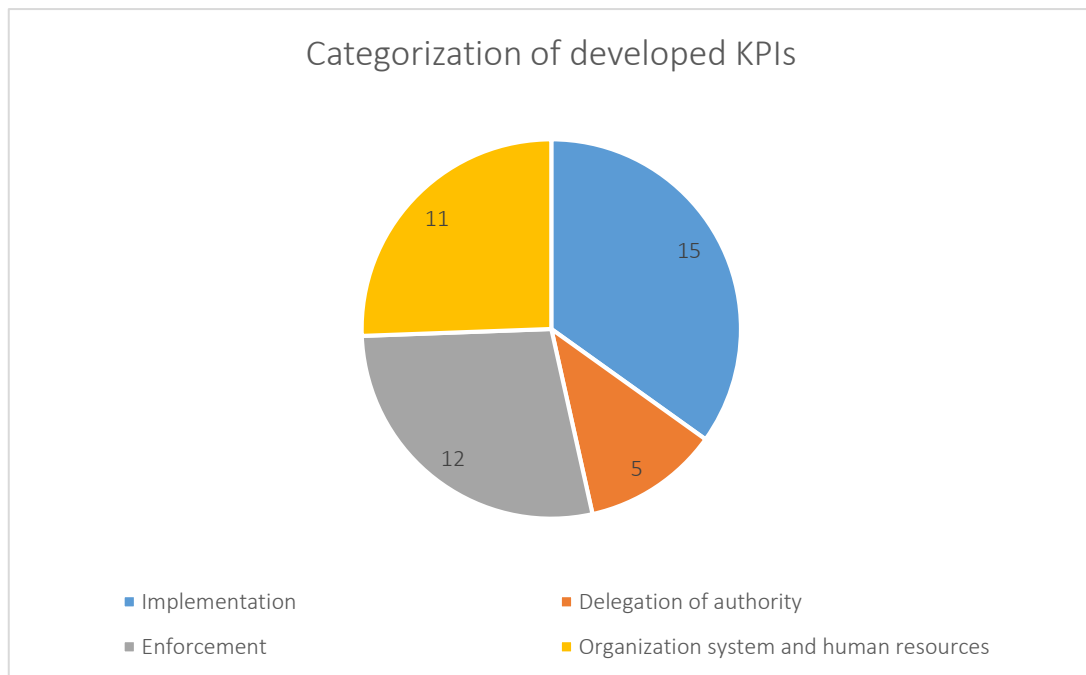


Figure 5. Pie chart for developed KPIs

Implementation

Implementation consists of procedures for issuing national legislation, in compliance with STCW Convention, procedures for marine accident investigation, flag State inspection, and verification of national legislation as shown in Table 11 with 15 KPIs.

Table 11. Categorization of KPIs - Implementation

Procedures for issuing national legislation	<ul style="list-style-type: none"> • KPI6 Policy Implementation ratio • KPI7 Legislation ratio • KPI8 Commentary regulation published • KPI9 Administrative guidance published
In compliance with STCW Convention	<ul style="list-style-type: none"> • KPI23 The level of training of seafarers • KPI24 Standards for qualifications of seafarers • KPI25 Standards for issuing certificates for seafarers • KPI30 Manning level
Procedures for marine accident investigation	<ul style="list-style-type: none"> • KPI27 Procedures of accident investigation • KPI28 Marine accident investigation
Flag State inspection	<ul style="list-style-type: none"> • KPI12 FSC inspection rate • KPI21 FSC inspection procedure
Verification of national legislation	<ul style="list-style-type: none"> • KPI15 Validation of national legislation • KPI16 Periodical evaluation of the III Code • KPI17 Follow up for nonconformities from periodical evaluation

Delegation of authority

Delegation of authority consists of RO selection, providing instructions for RO, and oversight ROs with 5 KPIs, as shown in Table 12.

Table 12. Categorization of KPIs - Delegation of authority

RO selection	<ul style="list-style-type: none"> • KPI31 RO delegation & monitoring • KPI34 Agreement conclusion with ROs
Providing instructions for RO	<ul style="list-style-type: none"> • KPI32 Communication with ROs • KPI35 Instruction for ROs
Oversight ROs	<ul style="list-style-type: none"> • KPI33 Supplementary surveys for flagged ships

Enforcement

Enforcement consists of control over substandard ships, oversight programme, and fraudulent certificates with 12 KPIs as shown in Table 13.

Table 13. Categorization of KPIs - Enforcement

Control over substandard ships	<ul style="list-style-type: none"> • KPI1 Port State Control detention follow up • KPI2 Port State Control deficiency follow up • KPI3 Fleet loss ratio • KPI4 Accident follow up • KPI5 Flag State Control follow up • KPI29 Countermeasures for substandard ships • KPI36 Penalty regulation for substandard ships and individuals • KPI37 Instituting proceedings against substandard ships and individuals
Oversight programme	<ul style="list-style-type: none"> • KPI38 Reporting to IMO • KPI39 Providing statistical data • KPI40 Responding to deficiencies and pollution accident
Fraudulent certificates	<ul style="list-style-type: none"> • KPI26 Procedures of withdrawal/suspension/cancellation of certificates.

Organization system and human resources

Organization system and human resources consist of organization system, qualification of personnel, and training of personnel with 11 KPIs as shown in Table 14.

Table 14. Categorization of KPIs - Organization system and human resources

Organization system	<ul style="list-style-type: none"> • KPI10 Assign responsibilities of Administration • KPI11 Communication performance • KPI18 Customer satisfaction • KPI20 Assigning responsibilities between maritime organizations
Qualification of personnel	<ul style="list-style-type: none"> • KPI13 Procedures for checking credential of administrative personnel • KPI19 Assigning responsibilities of personnel • KPI22 Qualification of flag State surveyors • KPI41 Qualification and training of flag State investigators.
Training of personnel	<ul style="list-style-type: none"> • KPI14 Training Standards for administrative personnel • KPI42 Training program for flag State surveyors • KPI43 Training program for flag State investigators

5.3 Summary

This chapter presented an example of the application of the CMO method to the III Code. This was followed by a formal completion of the KPI work sheets with a Professor and selected experts. The author was able to develop a total of 43 KPIs from the KPI work sheets, categorized into 4 groups: Implementation, Delegation of authority, Enforcement, Organisation system and human resources.

6. APPLICATION OF KPIS: THE CONTEXT OF KOREA

This chapter presented the validation process for developed KPIS by applying to the Republic of Korea. The contrastive analysis with the National Strategy of Korea for IMSAS has conducted to validate the KPIS, and substituted maritime data of Korea to analyse the measurability of KPIS and current performance of Korea.

6.1 Validation of developed KPIS

Due to data accessibility, the datasets were collected from the Ministry of Oceans and Fisheries (MOF) of the Republic of Korea which is the responsible administration for flag State performance.

The datasets were collected to validate the KPIS which were developed through the CMO method. Statistical data including the number of Korean flagged ships, registered vessels, deficiency and detention rate of the Port State Control, number of marine accidents and investigations, and number of punishments of licenses, was gathered from the statistical year book of the MOF, 2015 FSC report, and the MOF web page.

Validation of the developed KPIS has performed by using contrastive analysis with the National Strategy of Korea for IMSAS (hereinafter NSKI). NSKI, developed by MOF, has specified procedures to prepare for the IMSAS, and stated requirements to comply with the III Code. Korea successfully completed its VIMSAS in 2007 by using the procedures in the NSKI, and was highly rated in the VIMSAS for the safety management system of MOF, which has proven its capability and suitability for the III Code. Therefore, this chapter will validate the KPIS by identifying the links with each requirement in the NSKI, and verify the practicality of the KPIS as well as their

suitability for the requirements.

For more empirical verification, the developed KPIs are validated by substituting data from the Republic of Korea to confirm the measurability of KPIs. However, it was not possible to validate all the KPIs due to the confidentiality and sensitivity of the data, so only some of the developed KPIs were validated using data from Korea. Validation has proceeded in order of categorization of KPIs found in the previous Chapter (Refer to Table 11, 12, 13, and 14). In addition, the NSKI consists of the obligations of the flag State, the port State, and the coastal State, as well as the requirements and preparations for IMSAS, and further detail can be found in **Appendix 3**.

In the verification process of this study, each KPI was analysed and verified using the relevant items on those of flag State in the NSKI. This section is divided into four categories: Implementation, Delegation of authority, Enforcement, and Organization system and human resources. Moreover, tables in each category list the corresponding entries of the NSKI for each KPI, and the KPIs are measured using the maritime data from Korea to validate their measurability

Implementation

As shown in Table 15, a total of 11 out of 15 KPIs were found to have a link with the requirements of NSKI. There was no specific paragraph that pointed out the relationship with the STCW Convention (KPI23, 24, 25, and 30), but it was possible to know the conformance of KPIs regarding STCW Convention through the KPI16 “periodical evaluation of the III Code” (Para. 1.10.2 and 1.10.6).

Table 15. Implementation - link with NSKI

	Developed KPIs	Covered area in NSKI by KPIs
Procedures of issuing national legislation	KPI6 Policy Implementation ratio	Para. 1.2.3.2 Legislated and amended IMO instruments to national legislation
	KPI7 Legislation ratio	Para. 1.2.1 Status of ratification of IMO instruments.
	KPI8 Commentary regulation published	Para. 1.2.3.2 Legislated and amended IMO instruments to national legislation
	KPI9 Administrative guidance published	Para. 1.2.3.2 Legislated and amended IMO instruments to national legislation
In compliance with STCW Convention	KPI23 The level of training of seafarers	N/A
	KPI24 Standards for qualifications of seafarers	N/A
	KPI25 Standards for issuing certificates for seafarers	N/A
	KPI30 Manning level	N/A
Procedures of marine accident investigation	KPI27 Procedures of accident investigation	Para 1.6.1 National legal system for accident investigation
	KPI28 Marine accident investigation	Para. 1.3.3 Statistical data to identify problem area of flagged ships.
Flag State inspection	KPI12 FSC inspection rate	Para 1.3.3 Statistical data to identify problem area of flagged ships.
	KPI21 FSC inspection procedure	Para. 1.3.1 Procedures of enforcement measure to comply III Code.
Verification of national legislation	KPI15 Validation of national legislation	Para. 1.2.2 Procedures of issuing national legislation.
	KPI16 Periodical evaluation of the III Code	Para. 1.10.6 Periodical evaluation of performance
	KPI17 Follow up for nonconformities from periodical evaluation	Para. 1.10.2 Corrective action for the result of periodical evaluation.

For an empirical verification, 8 KPIs in Table 15 were validated by using actual data from Korea, and the validation focused on the measurability of KPIs as below:

- KPI7 Legislation ratio

Indicator A: the number of the obligations of administration which are completely issued as national legislation

Indicator B: the number of obligations of administration in ratified IMO Conventions

Application case: (A = 462, B = 700)

$$KPI7 = A/B = 462/700 = 66\%.$$

Data for indicators A and B was found in the study of Kim (2006). This KPI7 shows that Korea has issued, as national legislation, 66% of ratified IMO instruments.

- KPI27 Procedures of accident investigation

Indicator A: Existence of procedures to maintain impartiality of flag State investigators

Performance indicator A can be found in “the Act on the Investigation of and Inquiry into Marine Accident” which proves the existence of the procedure. As a result, the author could achieve KPI27 = 100%, and it shows that Korea has proper procedures for qualification of flag State investigators.

- KPI28 Marine accident investigation

Indicator A: The number of investigations conducted / fleet

Indicator B: Average time from the accident reported to the investigation conducted

Application case: (A= 2438/9831 = 24.7%, B= 152hrs)

KPI28 = 24.7%, 152hrs

Data for the indicators A and B was found in the 2015 statistic year book of the MOF. Currently, the Korean Maritime Safety Tribunal (KMST) conduct accident investigation and the KPI28 shows the performance of accident investigation.

- KPI12 FSC inspection rate

Indicator A: The number of flag State inspections conducted / fleet.

Application case: (A= 64/9831 = 0.6%)

KPI12 = 0.6%

Data for indicator A was found in the report of 2015 FSC analysis published by MOF. This KPI shows how many Korean flagged vessels were inspected by flag States, and only 0.6% of the Korean flagged vessels were inspected in 2015.

- KPI21 FSC inspection procedure

Indicator A: Existence of procedures for FSC inspection

Since the PSC officer is delegated as FSC officer in Korea, flag State inspection procedure follows the same procedure as PSC and it can be found in paragraph 69 of the Ship Safety Act and paragraph 56 of Maritime Safety Act.

- KPI15 Validation of national legislation

Indicator A: Existence of procedures for managing amendment record for implemented Conventions

Indicator B: Existence of validating procedures for the national legislation

Application case: (A= 1, B=1)

KPI15 = 100%

Currently, Maritime Affairs and the Safety Policy Bureau (MASPB) in MOF is in charge of amendments to MO instruments and validation of Korean national legislation, and MASPB has its own instructions for validating national legislation according to the MOF. Therefore, it shows Korea has procedures for amendment record and KPI15 is 100%.

- KPI16 Periodical evaluation of the III Code

Indicator A: The number of reviews to the III Code (plan vs real)

Application case: (A= 1/1 = 100%)

KPI16 = 100%

According to the 2016 quality management system review result published by MOF, MOF conducted one review according to its plan in 2016. Consequently, KPI16 is 100%.

- KPI17 Nonconformities from periodical evaluation

Indicator A: The number of nonconformities from periodical evaluation

Indicator B: The number of corrective actions for nonconformities

Application case: (A= 4/4 = 100%)

$$\text{KPI17} = 100\%$$

According to the 2016 quality management system review result published by MOF, MOF found 4 non conformities with 4 corrective action. Therefore, KPI17 equals 4/4 = 100%.

Delegation of authority

As Table 16 shows, all the KPIs for the delegation of authority are linked to the NSKI. It is notable that KPI 32, 33, and 35 are all linked to paragraph 3.1.2 of NSKI because paragraph 3.1.2 specifies detailed requirements for ROs, which include maintaining documents, communication between Administration, and oversight programme for ROs. In addition, KPI31 and KPI34, shown in Table 16, were validated by using actual data from Korea, and the validation focused on the measurability of KPIs as below:

Table 16. Delegation of authority - link with NSKI

Developed KPIs		Covered area by KPIs
RO selection	KPI31 RO delegation & monitoring	Para. 1.5.4 Oversight and verification of ROs. Para. 1.5.2 Formal written agreement with ROs.
	KPI34 Agreement conclusion with ROs	Para. 3.1.1 Contents of formal written agreement with ROs
Providing instructions for RO	KPI32 Communication with ROs	Para. 3.1.2 Requirement for ROs.
	KPI35 Instruction for ROs	Para. 3.1.2 Requirement for ROs.
Oversight ROs	KPI33 Supplementary surveys for flagged ships	Para. 3.1.2 Requirement for ROs.

- KPI31 RO delegation & monitoring requires

Indicator A: The number of RO audit performed (plan vs real)

Indicator B: Existence of the procedures of oversight ROs

Indicator C: The review cycle of procedures of oversight ROs

Indicator D: The number of deficiencies from the RO audit (per audit)

Application case: (A= 1/1 = 100%, B =1, C= 1yr, D = 17)

KPI31 = 100%, 100%, 1yr, 17

According to the 2015 RO audit result published by MOF, RO audit was performed once for all the ROs in Korea as planned, with a total of 17 deficiencies. Procedures for oversight of ROs are stated in the formal written agreement between the administration and ROs in Korea.

- KPI34 Agreement conclusion with ROs

Indicator A: The number of formal written agreement between administration and ROs

Indicator B: The number of ROs

Application case: (A= 16, B =16)

KPI31 = A/B = 16/16 = 100%

Currently, MOF has delegated its work to 16 ROs²³ regarding the III Code and signed formal written agreement with all ROs.

Enforcement

Table 17 shows that 11 out of 12 KPIs had the same requirements as the NSKI. Only KPI40 could not be linked with NSKI since there was no paragraph specifically requiring the measurement of number of oil spills or the amount of oil spilled. However this requirements can be covered in the KPI39, providing statistical data, even though there is no specific requirement for the “KPI40 Responding to deficiencies and pollution accident”. Furthermore, some of the KPIs in the Table 17 could validated by using actual data from Korea, and the validation focused on the measurability of KPIs as below:

²³ Name of ROs: KR, KIMFT, KST, KMST, KHOA, KMOU, MMU, BV, BPA, ICPA, INMHS, MHS, KOEM, KCG, KOMDIC, KMPRC.

Table 17. Enforcement - link with NSKI

Developed KPIs		Covered area by KPIs
Control over the substandard ships	KPI1 Port State Control detention follow up	Para. 1.3.3 Statistical data to identify problem area of flagged ships. Para. 1.3.4 Procedures for detained flagged ships by port States. Para. 1.10.1 Records for PSC detention rate.
	KPI2 Port State Control deficiency follow up	Para. 1.3.3 Statistical data to identify problem area of flagged ships.
	KPI3 Fleet loss ratio	Para. 1.3.3 Statistical data to identify problem area of flagged ships.
	KPI4 Accident follow up	Para. 1.3.3 Statistical data to identify problem area of flagged ships. Para. 1.10.3 Records of accident rate.
	KPI5 Flag State Control follow up	Para. 1.3.2 Records of enforcement measure for substandard ships and individuals. Para. 1.10.2 Records of flag State control.
	KPI29 Countermeasures for substandard ships	Para. 1.3.1 Procedures of enforcement measure to comply III Code. Para. 1.3.4 Procedures for detained flagged ships by port States. Para. 1.10.1 Records for PSC detention rate.
	KPI36 Penalty regulation for substandard ships and individuals	Para. 1.3.1 Procedures of enforcement measure to comply III Code. Para. 1.3.2 Records of enforcement measure for substandard ships and individuals Para 1.3.3 Statistical data to identify problem area of flagged ships.
Oversight programme	KPI37 Instituting proceedings against substandard ships and individuals	Para. 1.3.1 Procedures of enforcement measure to comply III Code. Para. 1.3.2 Records of enforcement measure for substandard ships and individuals Para 1.3.3 Statistical data to identify problem area of flagged ships.
	KPI38 Reporting to IMO	Para. 1.2.3.4 Reporting to IMO regarding issued national legislation. Para. 1.6.4 Reporting to IMO regarding accident investigation
	KPI39 Providing statistical data	Para. 1.3.3 Statistical data to identify problem area of flagged ships.
Fraudulent certificates	KPI40 Responding to deficiencies and pollution accident	N/A
	KPI26 Procedures of withdrawal/suspension /cancellation of certificates.	Para. 1.3.2 Records of enforcement measure for substandard ships and individuals

- KPI1 Port State Control detention follow up

Indicator A: The number of PSC inspections resulting in detention (vs total)

Indicator B: The number of follow-ups to detained ships

Application case: (A= 0.67%, B =100%)

KPI31 = 0.67%, 100%

Port State control detention rate is 0.67% and the MOF had monitored all the detained ships and taken measures for them according to the 2015 Flagged ship report.

- KPI4 Accident follow up

Indicator A: The number of accidents of flagged vessels (per fleet) (without fishing vessel)

Indicator B: The number of follow-ups to accidents

Indicator C: lives lost

Application case: (A= 741/9,831 = 7.5%, B =100%, C= 395)

KPI4 = 7.5%, 100%, 395

Data for KPI4 was found in the 2015 statistical year book of MOF. 7.5% of Korean flagged vessel experienced accidents in 2015.

- KPI5 Flag State Control follow up

Indicator A: The number of FSC deficiencies (vs total)

Indicator B: The number of follow-up to FSC deficiencies

Application case: (A= 93.7%, B =100%)

KPI5 = 93.7%, 100%

The number of flag State control inspections was 64 and a total of 60 ships were found to have deficiencies in the inspections. In addition, MOF followed up on all of the inspected flagged ships, according to the 2015 Flagged ship report.

- KPI29 Countermeasures for substandard ships

Indicator A: Existence of procedures to take measures against substandard ships

Procedures were found in the "Implementation procedures of PSC and FSC" which is used in Korea.

- KPI36 Penalty regulation for substandard ships and individuals

Indicator A: Existence of national penalty regulation

Penalty regulation is stated in the Ship Safety Act and Maritime Safety Act.

- KPI38 Reporting to IMO

Indicator A: The number of investigation reports which have been reported to the
IMO

Application case: (A= 2)

KPI38 = 2

Data was found in the IMO webpage²⁴, which revealed only 2 cases in 2015.

- KPI40 Responding to deficiencies and pollution accident

Indicator A: Tonnes of harmful substances discharged into the sea operationally
or accidentally from ships subject to IMO instruments.

Indicator B: Number of spills occurring from ships subject to IMO instruments.

Application case: (A= 464 KL, B= 250)

KPI40 = 464KL, 250

Data for KPI40 was found on the MOF webpage²⁵.

²⁴ <https://gisis.imo.org/Public/MCI/>

²⁵ http://www.index.go.kr/potal/main/EachDtIPageDetail.do?idx_cd=1626

- KPI26 Procedures for withdrawal/suspension/cancellation of certificates

Indicator A: Existence of procedures for withdrawal/suspension/cancellation of certificates

Indicator B: The number of withdrawals/suspensions/cancellations of certificates

Indicator C: Year on year rate of withdrawal/suspension/cancellation of certificates

Application case: (A= 1, B= 131, C= 152/131 = 16%)

KPI40 = 100%, 131, 16%

The procedure for A was found in the instructions for handling seafarers using in the MOF.

Organization system and human resources

As Table 18 shows, KPI11, KPI13, KPI14, and KPI18 could not be found in the NSKI, which indicates that there is no specific requirement in the NSKI for the qualification and training of administrative personnel. Furthermore, some of the KPIs in Table 18 were validated by using the data from Korea, and the validation focused on the measurability of KPIs as below:

Table 18. Organization system and human resources - link with NSKI

	Developed KPIs	Covered area by KPIs
Organization system	KPI10 Assign responsibilities of Administration	Para. 1.2.3.1 Responsibilities and authority of concerned administration.
	KPI11 Communication performance	N/A
	KPI18 Customer satisfaction	N/A
	KPI20 Assigning responsibilities between maritime organizations	Para. 1.5.1 Status of ROs. Para. 1.6.2 Responsible organization for accident investigation.
Qualification of personnel	KPI13 Procedures for checking credential of administrative personnel	N/A
	KPI19 Assigning responsibilities of personnel	Para. 1.4.3 Responsibilities and authority of administrative personnel. Para. 1.4.4 Designation criteria for line managers of flag State surveyors.
	KPI22 Qualification of flag State surveyors	Para. 1.4.1 Qualification requirements for flag State surveyors. Para. 2.2.1 Detailed requirements for flag State surveyors
	KPI41 Qualification of flag State investigators.	Para. 2.5.1 Qualification requirements for flag State investigators.
Training of personnel	KPI14 Training Standards for administrative personnel	N/A
	KPI42 Training program for flag State surveyors	Para. 1.4.2 Documented training program for flag State surveyors. Para. 2.2.3 Training requirements for flag State surveyors
	KPI43 Training program for flag State investigators	Para. 2.5.2 Training requirements for flag State investigators.

- KPI10, Assign responsibilities of Administration; KPI19, Assigning responsibilities of personnel; and KPI20, Assigning responsibilities between maritime organizations were found in the administrative procedure of MOF and the organigram on the MOF web page²⁶.

- KPI22 Qualification of flag State surveyors

Indicator A: Existence of qualification requirement in accordance with the international standards for flag State surveyors

Requirements for KPI22 were found in the Regulation for qualification requirement for flag State surveyor. However, the author could find that current qualification requirement is not complying with the international standards due to the difference of classification system of Korea and IMO. Currently, Korea divide qualification for seafarers into 6 level while the IMO is only 2 level.

- KPI41 Qualification of flag State investigators

Indicator A: Existence of oversight procedures for flag State investigators

These procedures were found in the Act on the Investigation and Inquiry into Marine Accidents. Currently, Korea has 25 qualified flag State investigators

- Training standards for flag State surveyors and investigators of KPI42 and KPI43 are stated in the Regulation for Qualification Requirement for flag State surveyor and the Act on the Investigation and Inquiry into Marine Accidents.

²⁶ <http://www.mof.go.kr/content/view.do?menuKey=630&contentKey=6>

From the analysis above, the author verified that the developed KPIs through the CMO method satisfy 27 requirements out of 30 requirements regarding flag States obligations of the NSKI, which is about 90%. Three requirements that were not covered by developed KPIs are paragraph 1.2.3.3 procedures to delegate authority to other contracting parties, paragraph 1.5.5 records for deploy personnel to oversight ROs, and paragraph 1.6.3 procedures for analysing human factors to improve the safety of shipping and pollution prevention.

Contrastive analysis with NSKI shows that the developed KPIs do not include the indicators related to records for personnel to oversight of ROs and data for human factor analysis of marine accidents. In addition, Korea does not comply with paragraph 1.2.3.3 since Korea has not delegated its task to other contracting parties. To recap, KPIs cover every requirement of the NSKI and a total of 24 KPIs proved its measurability by using data from Korea. It was not possible to prove the measurability of all KPIs by using published data from MOF; however, it was possible to determine that most of the developed KPIs are measurable and data for performance indicators is obtainable from this validation process.

6.2 Response to the findings of the VIMSAS

The author identified that Korea has sufficient procedures to meet its obligations as stated in the III Code through validation process for KPIs, and examined the corrective action by Korea to follow up three findings in the VIMSAS. Three findings and their contents are listed below:

➤ 1. The transposition of SOLAS into national law

It is not easy to follow the SOLAS Convention due to the fact that the provisions are separated in 27 kinds of laws and regulations in Korea.

➤ 2. Recruitment and training of seafarers

Different qualification requirement for flag State surveyors.

➤ 3. Flag State enforcement

There are insufficient follow up for ships in relation to the inspection of the selected Korean flagged vessel conducted during the sample audit

According to the report of MOF, the first finding has not corrected until now due to the difficulty of changing the whole legal structure of Korea, but the administration has done the corrective action for that selected flagged vessel in the third finding according to the MOF (MOF, 2017). Since the first and the third finding cannot draw a conclusion by using the KPIs, the author focused on the second finding by using KPI22.

As mentioned above, the existence of qualification requirement has proved by KPI22, but the qualification requirement is not complying with the international standards because of the difference of qualification system for seafarers between Korea and IMO. In Korea, the person holding a 3rd class certificate of competence or upward are permitted to work as a flag State surveyor while the IMO requires a certified person by STCW II/2 and III/2.

Therefore, the author could find that the first and second finding in VIMSAS has not corrected yet, which will be pointed out in the 2020 IMSAS if Korea does not do any corrective action for those findings. Although Korea is performing very well in terms of flag State performance, it is recommended to carry out corrective action for the findings for the upcoming IMSAS.

6.3 Trend analysis using KPIs

Developed KPIs (Appendix 1) proved their utility in that current requirements for preparing IMSAS in Korea can be covered by the KPIs. Moreover, the great advantage of the KPIs is that the KPIs can evaluate the performance of the flag State and identify problem areas. That is, trend analysis of flag State performance can be accomplished by using the KPIs.

Maritime data such as the number of Korean vessels detained in foreign ports, government follow up on detentions, and information regarding flag State Inspection from 2011 to 2016 was collected, and a trend analysis was carried out based on the developed KPIs.

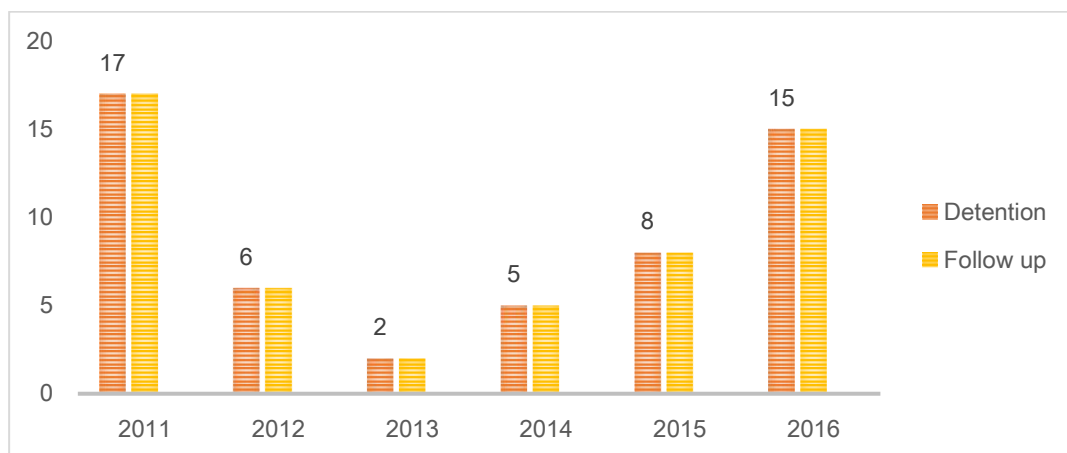


Figure 6. Trend analysis using KPI1

(Unit: number)

Figure 6 shows the number of detentions of Korean flagged ships from 2011 to 2016 using the KPI1. From 2011 to 2013, the number of detained flagged ships dropped sharply from 17 to 2 with 100% follow up by the MOF. Nevertheless, detention number went up again and reached 15 in 2016 even though the follow up to detentions was 100% every year. Moreover, Paris MoU announced that Korea moved from the “white list” to the “grey list” in 2016, which was a shock to the MOF as a Category “A”²⁷

²⁷ Category (a) 10 States with the largest interest in providing international shipping services: China, Greece, Italy, Japan, Norway, Panama, Republic of Korea, Russian Federation, United Kingdom, United States.

member State of IMO. This indicates that the actions of the Korean Government following detentions did not have any positive impact on Korean flagged ships to prevent further detention. Through the trend analysis using KPI1, it can be seen that KPI1 can monitor performance for maritime safety.

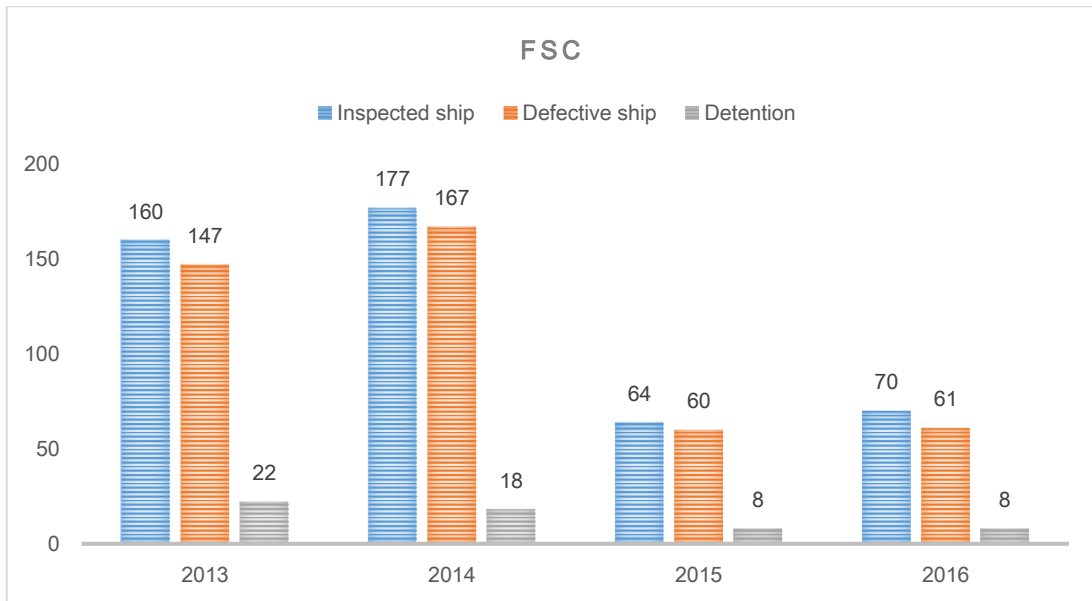


Figure 7. Trend analysis using KPI5

(Unit: number)

Figure 7 shows the result of flag State inspections in Korean ports. It shows that there has been a sharp drop in the number of flag State inspections. According to the report of MOF, the reason for the decreased number of inspections is the conclusion of MOF in 2015 that the safety of flagged ships had reached a high level. However, in 2015 and 2016, the number of detained ships in foreign port States increased significantly as shown in Figure 7. Regarding the increased number of detentions described in Figure 7, the decreased number of flag State inspections is inferred to be one reason, and follow up on detentions was also found to be ineffective by implementing a trend analysis based on KPI1 and KPI5.

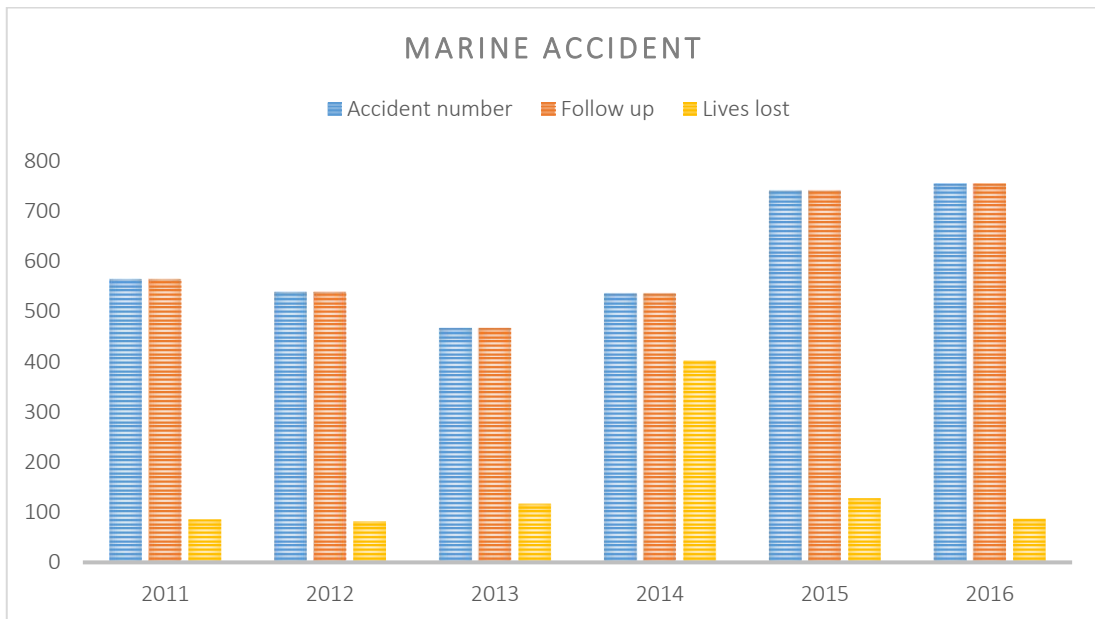


Figure 8. Trend analysis using KPI4

(Unit: number)

Figure 8 presents the results using KPI4. In Figure 8 there is a clear trend of increasing number of accidents from 2014. What is striking about the figures is that Figures 6, 7, and 8 all illustrate the low fleet performance of the flag State from 2015. A possible explanation for these results may be a lack of flag State inspections which started in 2015.

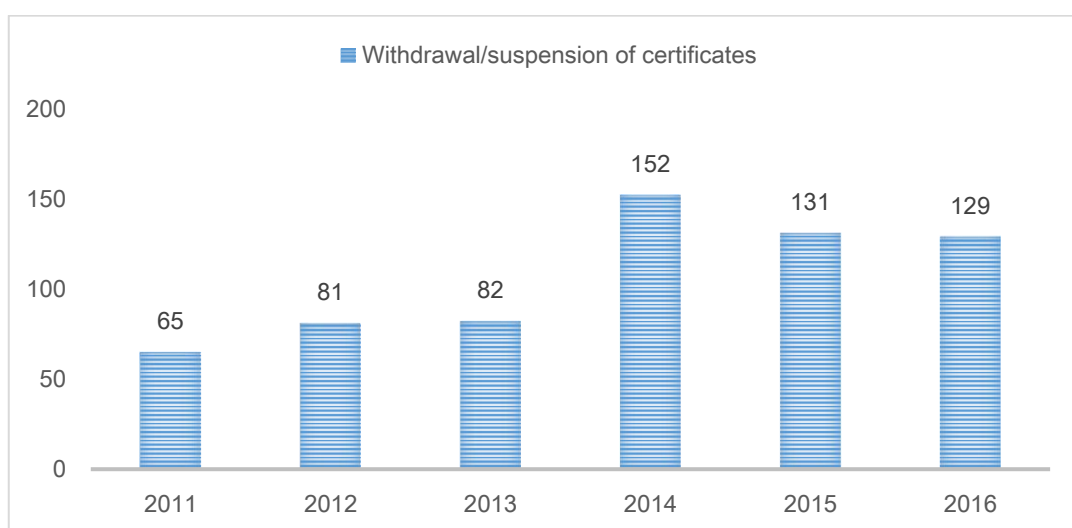


Figure 9. Trend analysis using KPI26

(Unit: number)

As shown in the Figure 9, a trend analysis for the number of withdrawal and suspension of certificates has been conducted. The bar graph shows that there has been a marked rise from 2014, which was the year with the highest number of lives lost. It was possible to determine the trend concerning the number of withdrawal and suspension of certificates, but it will be better for the flag State to set a target number for comparison. Notwithstanding the relatively limited sample, this work offers valuable insights into the flag State performance.

6.4 Discussion

This chapter has described the methods used in the validation of developed KPIs by applying them to the Korean context. The NSKI is used in Korea as an instruction for the IMSAS, and the KPIs proved their utility to cover the requirements of the III Code by comparing the requirements with the NSKI. As a result of the verification using the NSKI and maritime data from Korea, KPIs meet the requirements of the III Code, and can appropriately measure the performance of flag States. It also confirmed that KPIs could help to identify areas of concern after performance measurement.

The current study found that the NSKI has no specific requirements for qualification and training of the administrative personnel excluding flag State surveyors and investigators. However, the III Code requires qualification and training of flag State personnel, as stated in paragraph 24.2²⁸ and paragraph 33²⁹ of the Code which indicates that the NSKI should be improved to cover the requirements. One unanticipated finding was that the developed KPIs have no specific indicator regarding the personnel for oversight of ROs and human factor analysis. But the requirement for the personnel to oversee ROs can be interpreted as part of administrative personnel, which is covered by the developed KPIs. For the human

28 .2 provide an appropriate number of qualified personnel to implement and enforce the national legislation referred to in subparagraph 15.1, including personnel for performing investigations and surveys;

29 Other personnel assisting in the performance of such work should have education, training and supervision commensurate with the tasks they are authorized to perform

factor analysis requirements, since the III Code has no specific paragraph requiring the needs of human factor analysis, it is considered to be acceptable to exclude.

Regarding the review of the trend analysis in Korea, overall flag State performance has declined due to the decreased number of flag State inspection and ineffective follow up by the MOF. Consequently, it is important for Korea to keep track of the identified problems and monitor the performance as required in the III Code by using the KPIs. To develop a full picture of trend analysis, additional studies will be required to set target value for each KPIs to achieve the high performance of Korea.

This study has revealed that KPIs can be used as an evaluation tool for flag States to satisfy the III Code and for their performance. Moreover, understanding of trends through the KPIs assists flag States in identifying problem areas to concern. The results developed through the CMO method may vary depending on the researchers and their approach to analysing the III Code. Nevertheless, the result should not have much difference because the requirements of the III Code are specific, and the requirements in the flag States are managed according to similar procedures. Lastly, if the requirements of the III Code are amended, the developed KPIs and their categorization could be updated with the CMO method.

7. SUMMARY AND CONCLUSION

7.1 Summary and conclusion

The aim of this study was to develop evaluation tools for the IMO Member States to satisfy the requirements of the III Code, and monitor their performance. In order to achieve the objectives, the dissertation has analysed previous studies on flag State responsibility and performance, the contents of VIMSAS, IMSAS, and the III Code, and the current status of Korea.

This study has identified that Member States have difficulty complying with the III Code due to monetary cost, resources, and personnel to carry out the delegated tasks. Moreover, previous studies on flag State performance did not cover all the requirements of the III Code. In order to satisfy the requirements of the III Code, the author applied the CMO method developed by Valdez Banda et al. (2016) to the III Code.

Application of the realist evaluation achieved a complete review of the requirements of the III Code. This is the first study to implement the realist evaluation to the III Code, and the utilization of the CMO method helped the author to determine the accurate interpretation of the requirements. Moreover, it helped to understand what requirements are needed by flag States, how the requirements are implemented, and the responsible bodies as well as possible outcomes from the requirements. The response to the CMO questions in the KPI sheet provided a link to the necessity of KPIs to satisfy the requirements of the III Code. The process to determine KPIs was based on the requirements and considered KPIs found in the literature review.

Development of KPIs mainly focused on the quantification of the indicators to develop measurable performance indicators, and the final set of KPIs covered all the requirements of the flag State part of the III Code.

The final set of KPIs cover most of the indicators found in the studies of Mansell (2009), Alderton and Winchester (2002), and Graziano (in press). Furthermore, 43 KPIs from the KPI work sheets satisfied the complete scope of the flag State performance and addressed limitations of previous studies by covering the full spectrum of flag State performance by using measurable KPIs and KPIs for existence of procedures.

Categorization of the 43 KPIs was performed in order to maximize the ability of KPIs regarding trend analysis and identification of problem areas. As a next step, developed KPIs were validated by comparing the requirements of the NSKI with the KPIs. Over 90% of the requirements of the NSKI were covered by the KPIs and the measurability of the KPIs was validated by using data from Korea. Therefore, KPIs proved their utility to satisfy all the requirements of the III Code, and its measurability to evaluate flag State performance.

From the validation of KPIs by comparing with NSKI, the most obvious finding to emerge from the analysis is that the Korea has a high level of performance in terms of flag State performance. The author identified that the two findings in the VIMSAS have not rectified, and it is recommended to carry out corrective action for the identified problems for preparation of IMSAS.

Moreover, some of the KPIs were used to perform a trend analysis for Korea to measure its performance. Although the trend analysis was based on a small sample of KPIs, the most important relevant finding was that Korea has to increase the number of flag State inspections and the quality of follow up on detentions to secure safety of shipping and pollution prevention as a Category “A” Member in IMO.

Developed KPIs could be a milestone for IMO Member States to satisfy the requirements of the III Code in order to prepare for upcoming IMSAS, and help IMO auditors to assess Member States in compliance with IMO instruments in a limited time period. Moreover, the Member States can prioritize the importance of each KPIs and categorization of KPIs.

7.2 Limitations and further research

In this study, KPIs were developed for flag State performance as a pilot study. However the III Code applies not only to the flag States, but also to port States and coastal States. Therefore, further study should be done to develop KPIs for part 3 and part 4 of the III Code through application of the CMO method for making the KPIs perfect to cover all the requirements in the Code.

Moreover, categorization was carried out by the author after development of KPIs. Categorization of KPIs could be the foundation for the classification of KPIs into leading and lagging indicators, and division into drive, monitor, and outcome indicators as proposed in Reiman and Pietikäinen (2012). Such classification would achieve the evaluation system as a performance management system for IMO Member States.

KPIs were developed for the IMO Member States to measure the flag State performance, and the performance was calculated using the maritime data of a flag State. But, the targeting value or level for each KPI is needed to utilize KPIs for managing performance. In future studies, the setting of target values or levels for each KPIs should be considered. It is recommended

For effective management of maritime safety, it is necessary to prioritize the developed KPIs for different flag States since each flag States has different circumstances with different levels of resources, procedures, and human resources. Therefore, it is necessary to prioritize the KPIs by using Analytic Hierarchy Process (AHP), and carry out corrective action in order of importance of problem areas for improvement of flag State performance.

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Appendix 1

KPI Sheet for III Code Requirement (15.1)

III Code – Part 2 Flag State – Implementation

Paragraph 15: In order to effectively discharge their responsibilities and obligations, flag States should:

.1 implement policies through **issuing national legislation and guidance**, which will assist in the **implementation and enforcement** of the requirements of all safety and pollution prevention conventions and protocols to which they are parties; and

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To assist implementation and enforcement	(1) An indicator about the fleet performance in terms of Port State Control, accident numbers etc.
	Which is the current task developed in the organization linked to the requirement?	Issue national legislation and guidance	(2) An indicator about the guidance for the different IMO conventions (SOLAS, LOAD LINE, TONNAGE etc.) that are covered by policies and guidelines.
	What is the status of the organizational conditions influenced by the requirement?	This is a question that may not be adequate in the context of the III Code. The requirement influences the fleet performance, but is not linked to the organizational performance of an administration. The absence of policies required by this paragraph of the III Code could be an indicator for a low organizational performance of an administration.	(3) An indicator covering the number of policies and documents issued as guidance to administrations, ship-owners and other maritime stakeholders.
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	(4) An indicator about the availability of an administration to deal with this requirement.
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2) above
Mechanism	Which are the main organizations' means for the implementation?	Issue national legislation and provide sufficient resources	Covered by (2), (3) and (4)

	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders, regular seminars to highlight new requirements.	(5) An indicator for the quantity and quality of information disseminated to stakeholders.
	How is the organization able of ensuring the understanding of the importance of the requirement?	There are two ways of ensuring the importance is understood – specific enforcement measures, such as targeted flag State inspection programs or specific information sessions, such as workshops, circulars etc.	(6) An indicator for targeted flag State inspection programs The communication aspect is covered by (5)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	(7) An indicator for qualification and training of maritime administrative personnel
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	(8) An indicator for regular reviews of the technical regulations in terms of consistency with other national instruments and in terms of gaps that may still be existing.
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance and of the level of compliance with international regulations.	(9) An indicator for regular review of the level of compliance with international obligations.
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1) above
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	(10) An indicator about customer satisfaction with the administration The fleet performance is covered by (1) above

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (15.2)

III Code – Part 2 Flag State – Implementation

Paragraph 15: In order to effectively discharge their responsibilities and obligations, flag States should:

.2 assign responsibilities within their Administrations to **update and revise any relevant policies** adopted, as necessary.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To make sure that there are clear responsibilities assigned in an administration in respect to IMO obligations	(1) This indicator already exists
	Which is the current task developed in the organization linked to the requirement?	Administration should document responsibilities of each department in accordance with the requirements of the International Conventions.	(11) An indicator about documentation of the responsibilities in the administration (Duty segregation table of each department)
	What is the status of the organizational conditions influenced by the requirement?	The absence of updated policies required by this paragraph of the III Code could be an indicator for a low organizational performance of an administration.	(3) This indicator already exists
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues. Within the administration there should be somebody who can carry out this task.	(4) This indicator already exists
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action, Implementation.	(5) This indicator already exists
Mechanism	Which are the main organizations' means for the implementation?	Documents responsibilities in the Administration and provide sufficient resources	Covered by (2), (3), (4) and (5)
	How the requirement is currently communicated inside and outside of the organization?	Organograms, position descriptions, procedures in an administration.	(6) This indicator already exists

	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review and follow-up.	(7) This indicator already exists The communication aspect is covered by (6)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	(8) This indicator already exists
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	(9) This indicator already exists
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance and of the level of compliance with international regulations.	(10) This indicator already exists
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1) above
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	(11) This indicator already exists The fleet performance is covered by (1) above

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (16.1)

III Code – Part 2 Flag State – Implementation

Paragraph 16: A flag State should establish **resources and processes** capable of **administering a safety and environmental protection programme**, which, as a minimum, should consist of the following:

.1 administrative instructions to **implement applicable international rules and regulations** as well as developing and disseminating any **interpretative national regulations** that may be needed including **certificates issued by a classification society**, which is recognized by the flag State in accordance with the provisions of SOLAS regulation XI-1/1, and which certificate is required by the flag State to demonstrate **compliance with structural, mechanical, electrical, and/or other requirements** of an international convention to which the flag State is a party or **compliance with a requirement of the flag State's national regulations**;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To implement applicable international rules and regulations effectively	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Developing and disseminating interpretative national regulations, and establish administrative instructions.	(12) An indicator about the number of interpretative national regulations and administrative instructions published.
	What is the status of the organizational conditions influenced by the requirement?	The absence of administrative instructions and interpretative national regulations could be an indicator for lack of resources and processes of an administration.	Covered by (12) above
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Legislate administrative instructions and interpretative national regulations.	Covered by (12) above
	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders	Covered by (5)

KPI Sheet for III Code Requirement (16.1)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review and follow-up.	Covered by (6)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance of developing and disseminating interpretative national regulations, and administrative instructions.	Covered by (12) above
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	Covered by (10) The fleet performance is covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (16.2)

III Code – Part 2 Flag State – Implementation

Paragraph 16: A flag State should establish **resources and processes** capable of administering a safety and environmental protection programme, which, as a minimum, should consist of the following:

.2 compliance with the requirements of the applicable international instruments, using an **audit and inspection programme**, independent of any administrative bodies issuing the required certificates and relevant documentation and/or of any entity which has been delegated authority by the State to issue the required certificates and relevant documentation;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To comply with the requirements of the applicable international instruments	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	The requirement is to control the work of the Recognized Organizations by having an own inspection and audit program - Flag State Inspections. The administration therefore needs procedures to establish such program and to have sufficiently qualified persons to carry out such inspections.	(13) An indicator covering the procedures for flag State inspection. Covered by (22)
	What is the status of the organizational conditions influenced by the requirement?	The absence of audit and inspection programme could be an indicator for lack of resources and processes of an administration which lower the organizational performance.	Covered by (13), (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation. Apart from the III Code, no other instrument requires such verification.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Using an audit and inspection programme to verify compliance with the requirements of	Covered by (13) above

KPI Sheet for III Code Requirement (16.2)

		the applicable international instruments and the quality of work of ROs involved in surveys and certification.	
	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management reviews with the objective to make sure that there is sufficient and qualified personnel for flag State inspections	Covered by (13)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel who are responsible for the audit and the flag State inspections.	(14) An indicator about the administrative personnel who are available to carry out Flag State Inspections.
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	Regular management review of PSC statistics and flag State inspection results to determine the fleet performance.	Covered by (13) above
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	Covered by (10) The fleet performance is covered by (1)

Suggested KPIs

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (16.3)

III Code – Part 2 Flag State – Implementation

Paragraph 16: A flag State should establish **resources and processes** capable of administering a safety and environmental protection programme, which, as a minimum, should consist of the following:

.3 compliance with the requirements related to international standards of training, certification and watchkeeping of seafarers. This includes, inter alia:

1. **training, assessment** of competence and **certification** of seafarers;
2. **certificates and endorsements** that accurately reflect the competencies of the seafarers, using the appropriate terminology as well as terms that are identical to those used in any safe manning document issued to the ship;
3. **impartial investigation** to be held of any reported failure, whether by act or omission that may pose a direct threat to safety of life or property at sea or to the marine environment, by the holders of certificates or endorsements issued by the State;
4. **arrangements for the withdrawal, suspension or cancellation** of certificates or endorsements issued by the State when warranted and when necessary to prevent fraud; and
5. **administrative arrangements**, including those involving training, assessment and certification activities conducted under the purview of another State, which are such that the flag State accepts its responsibility for ensuring the competence of masters, officers and other seafarers serving on ships entitled to fly its flag;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To comply with the requirements of the international standards of training, certification and watch-keeping of seafarers (STCW).	<p>(15) An indicator covering the level of training for competence of seafarers which is in compliance with the STCW requirements.</p> <p>(16) An indicator which verifies the standards for assessment of seafarers' competence which is in compliance with the STCW requirements.</p> <p>(17) An indicator covering the standards for issuing certificates and endorsements for seafarers (including external verification)</p>

			(18) An indicator about the procedures of withdrawal, suspension or cancellation of certificates or endorsements issued. (19) An indicator covering the procedures for impartial accident investigation by investigators.
	Which is the current task developed in the organization linked to the requirement?	Concerned administration should manage the certificates and qualifications of seafarers in accordance with the STCW requirements, and establish procedures to systematically manage the certificates issued by the administration bodies/delegated authorities, and endorsements for foreign seafarers.	Covered by (15),(16),(17),(18),(19)
	What is the status of the organizational conditions influenced by the requirement?	This is a question that may not be adequate in the context of the III Code. The requirement influences the fleet performance, but is not linked to the organizational performance of an administration. The absence of policies required by this paragraph of the III Code could be an indicator for a low organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the STCW Convention and the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish procedures to systematically manage the certificates issued by the	Covered by (15),(16),(17),(18),(19)

		administration bodies/delegated authorities, and endorsements for foreign seafarers.	
	How the requirement is currently communicated inside and outside of the organization?	Procedures in an administration, website, circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection, or periodical audit of administrative bodies and delegated authorities.	Covered by (6),(15),(16),(17),(18),(19)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel who are responsible for the audit.	Covered by (14)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance and of the level of compliance with STCW.	Covered by (9) above
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	Covered by (10) The fleet performance is covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (16.4)

III Code – Part 2 Flag State – Implementation

Paragraph 16: A flag State should establish **resources and processes** capable of administering a safety and environmental protection programme, which, as a minimum, should consist of the following:

.4 the conduct of investigations into casualties and adequate and timely handling of cases involving ships with identified deficiencies;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To establish processes to investigate casualties and take appropriate measures for the substandard ships.	(20) An indicator covering the appropriateness and promptness of the marine accident investigation (21) An indicator covering the appropriateness and promptness of the countermeasures for substandard ships.
	Which is the current task developed in the organization linked to the requirement?	Flag State should conduct accident investigation and take appropriate measures to substandard ships.	Covered by (20),(21) above
	What is the status of the organizational conditions influenced by the requirement?	The absence of policies required by this paragraph of the III Code could be an indicator for a low organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the main conventions, the IMO Casualty Investigation Code and Common Areas of the III Code, such as Initial Action, as well as Flag State Investigations.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish procedures to investigate casualties and take appropriate measures for the substandard ships.	Covered by (20), (21)

KPI Sheet for III Code Requirement (16.4)

	How the requirement is currently communicated inside and outside of the organization?	By website, circulars within the Administration, and also communication with Port States and Coastal States in case of involved in marine accident.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	By conducting investigation and take appropriate measures to substandard ships promptly.	Covered by (20), (21)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for accident investigators.	(22) An indicator about qualification and training of flag State surveyors.
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the appropriateness and promptness of the marine accident investigation and countermeasures for substandard ships.	Covered by (20), (21)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of accident investigation and substandard ships.	Covered by (20), (21)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of accident investigation and substandard ships.	Covered by (20), (21)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of accident investigation and substandard ships.	Covered by (20), (21)

Color coding in the III Code	Requirement	Mechanism	Intended outcome
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KPI Sheet for III Code Requirement (16.5)

III Code – Part 2 Flag State – Implementation

Paragraph 16: A flag State should establish **resources and processes** capable of administering a safety and environmental protection programme, which, as a minimum, should consist of the following:

.5 the development, documentation and provision of guidance concerning those requirements found in the relevant international instruments that are **to the satisfaction of the Administration**.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Development, documentation, and provision of guidance that the Administration has implemented.	Covered by (12)
	Which is the current task developed in the organization linked to the requirement?	To establish a system (list) to cover all elements in international conventions that need to be specified by the administrations (to the satisfaction of the administration).	(23) An indicator about the verification procedures for flag State is in compliance with international Conventions.
	What is the status of the organizational conditions influenced by the requirement?	The absence of instructions in that area leads to PSC deficiencies and low performance.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to all main IMO conventions.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish procedures to identify all areas that need to be specified and to find input for the specification.	Covered by (12), (23)
	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders, regular seminars to highlight new guidance.	Covered by (5)

KPI Sheet for III Code Requirement (16.5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures, such as targeted flag State inspection programs or specific information sessions, such as workshops, circulars etc.	Covered by (6)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance and of the level of compliance with international regulations.	Covered by (9)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (17)

III Code – Part 2 Flag State – Implementation

Paragraph 17: A flag State should ensure that ships entitled to fly its flag are **sufficiently and efficiently manned**, taking into account relevant and existing measures such as **the Principles of Safe Manning** adopted by the Organization.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are sufficiently and efficiently manned in accordance with the Principles of Safe Manning.	(24) An indicator which shows current manning level of ships entitled to fly its flag, and compliance with the Principles of Safe Manning
	Which is the current task developed in the organization linked to the requirement?	The government should legislate standards for the minimum number of seafarers (legal basis) on board the ship in accordance with the Principles of Safe Manning, and monitor its compliance.	Covered by (24)
	What is the status of the organizational conditions influenced by the requirement?	This is a question that may not be adequate in the context of the III Code. The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Legislate standards for the minimum number of seafarers on board the ship in accordance with the Principles of Safe Manning, and monitor its compliance.	Covered by (24)
	How the requirement is currently communicated inside and outside of the organization?	There are different ways of communication – a website as a simple tool, circulars distributed to stakeholders.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection.	Covered by (6)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	There should be regular reviews of performance by flag State inspection.	Covered by (6), (24)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code Requirement Mechanism Intended outcome

KPI Sheet for III Code Requirement (18.1)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 18: With regard only to ships entitled to fly its flag a flag State **authorizing a recognized organization** to act on its behalf, in conducting the surveys, inspections and audits, issuing of certificates and documents, marking of ships and other statutory work required under the conventions of the Organization or under its national legislation, should **regulate such authorization(s)** in accordance with the applicable requirements of the international mandatory instruments to:

.1 determine that the recognized organization **has adequate resources** in terms of **technical, managerial and research capabilities to accomplish the tasks being assigned**, in accordance with the required standards for recognized organizations acting on behalf of the Administration set out in the relevant instruments of the Organization

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure Recognized Organizations (ROs) have capabilities as required in the Guidelines for the authorization of organizations acting on behalf of the Administration (Res. A 739(18)).	(25) An indicator about the administration performance in terms of RO delegation & monitoring.
	Which is the current task developed in the organization linked to the requirement?	Flag State should legislate standards for the ROs in accordance with the Res. A 739(18), and procedures to supervise ROs.	Covered by (25) above
	What is the status of the organizational conditions influenced by the requirement?	The absence of monitoring procedures for ROs will significantly lower the organizational performance of flag State.	Covered by (25) above
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Audit ROs according to the audit regulation and administrative instructions.	Covered by (25) above

	How the requirement is currently communicated inside and outside of the organization?	There are different type of communication between ROs and administration - Periodical report, regular seminars, and circulars.	(26) An indicator about the communication between ROs and administration Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection, and supplementary surveys for flagged ships.	(27) An indicator about supplementary surveys for flagged ships in order to oversight ROs. Covered by (6)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The result of the RO audit presents the current level of fulfilment of the requirement.	Covered by (25), (27)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (18.2)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 18: With regard only to ships entitled to fly its flag a flag State **authorizing a recognized organization** to act on its behalf, in conducting the surveys, inspections and audits, issuing of certificates and documents, marking of ships and other statutory work required under the conventions of the Organization or under its national legislation, should **regulate such authorization(s)** in accordance with the applicable requirements of the international mandatory instruments to:

.2 have as its basis **a formal written agreement between the Administration and the recognized organization** which, as a minimum, includes the elements set out in the relevant instruments of the Organization, or equivalent legal arrangements, and which may be based on the model agreement for the authorization of recognized organizations acting on behalf of the Administration;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure Recognized Organizations (ROs) have capabilities as required in the Guidelines for the authorization of organizations acting on behalf of the Administration (Res. A 739(18)).	Covered by (25)
	Which is the current task developed in the organization linked to the requirement?	Administration and ROs should have a formal written agreement in accordance with Res. A 739(18).	(28) An indicator about the presence of formal written agreement between the Administration and the ROs.
	What is the status of the organizational conditions influenced by the requirement?	The absence of formal written agreement cannot ensure the capabilities of ROs take account of delegated tasks.	Covered by (28) above
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	To sign a formal written agreement between the Administration and the ROs in accordance with the Res. A 739(18).	Covered by (28) above

	How the requirement is currently communicated inside and outside of the organization?	There are different type of communication between ROs and administration - Periodical report, regular seminars, and circulars.	Covered by (5),(26)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection, and supplementary surveys for flagged ships.	Covered by (6), (27)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel who are responsible for the audit.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The result of the RO audit presents the current level of fulfilment of the requirement.	Covered by (25), (26)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (18.3)




III Code – Part 2 Flag State – Delegation of authority

Paragraph 18: With regard only to ships entitled to fly its flag a flag State **authorizing a recognized organization** to act on its behalf, in conducting the surveys, inspections and audits, issuing of certificates and documents, marking of ships and other statutory work required under the conventions of the Organization or under its national legislation, should **regulate such authorization(s)** in accordance with the applicable requirements of the international mandatory instruments to:

.3 issue specific instructions detailing actions to be followed in the event that a ship is found unfit to proceed to sea without danger to the ship or persons on board, or is found to present an unreasonable threat of harm to the marine environment;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Issue specific instructions detailing actions to be followed by ROs for substandard ships.	(29) An indicator about the instructions detailing actions to be followed by ROs for substandard ships.
	Which is the current task developed in the organization linked to the requirement?	Issue specific instructions detailing actions to be followed by ROs for substandard ships.	Covered by (29) above
	What is the status of the organizational conditions influenced by the requirement?	The absence of specific instructions could influence the fleet performance such as accident number.	Covered by (1)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Issue specific instructions detailing actions to be followed in contingency situation.	Covered by (29) above
	How the requirement is currently communicated inside and outside of the organization?	Issued instructions can be communicated through web site, seminar, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection.	Covered by (6)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of specific instructions published by Administration could be the level of fulfilment of the requirement.	Covered by (29) above
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above and may be more customer satisfaction among stakeholders in the country.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (18.4)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 18: With regard only to ships entitled to fly its flag a flag State **authorizing a recognized organization** to act on its behalf, in conducting the surveys, inspections and audits, issuing of certificates and documents, marking of ships and other statutory work required under the conventions of the Organization or under its national legislation, should **regulate such authorization(s)** in accordance with the applicable requirements of the international mandatory instruments to:

.4 provide the recognized organization with **all appropriate instruments of national law and interpretations thereof** giving effect to the provisions of the conventions and specify, only for application to ships entitled to fly its flag, whether any additional standards of the Administration go beyond convention requirements in any respect;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure Recognized Organizations (ROs) have capabilities to do delegated tasks.	Covered by (25)
	Which is the current task developed in the organization linked to the requirement?	Provide interpretation of appropriate instruments of national law to the ROs.	(30) An indicator about the interpretation of appropriate instruments of national law to the ROs.
	What is the status of the organizational conditions influenced by the requirement?	The absence of interpretation of appropriate instruments of national law to the ROs could influence the Administration performance.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Provide interpretation of appropriate instruments of national law to the ROs.	Covered by (30) above
	How the requirement is currently communicated inside and outside of the organization?	Issued interpretation of national law can be communicated through web site, seminar, and circulars.	Covered by (5), (26)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as RO audit.	Covered by (25)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of interpretation of appropriate instruments of national law to the ROs.	Covered by (30) above
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (18.5)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 18: With regard only to ships entitled to fly its flag a flag State **authorizing a recognized organization** to act on its behalf, in conducting the surveys, inspections and audits, issuing of certificates and documents, marking of ships and other statutory work required under the conventions of the Organization or under its national legislation, should **regulate such authorization(s)** in accordance with the applicable requirements of the international mandatory instruments to:

.5 require that **the recognized organization maintain records**, which will provide the Administration with data to **assist in interpretation of requirements** contained in the applicable international instruments.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To assist in interpretation of requirements contained in the applicable international instruments.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	RO should maintain records	Covered by (25)
	What is the status of the organizational conditions influenced by the requirement?	The absence of exchange of information between RO and the Administration could influence the Administration performance.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	RO should maintain records	Covered by (25)
	How the requirement is currently communicated inside and outside of the organization?	There are different type of communication between ROs and administration - Periodical report, regular seminars, and circulars.	Covered by (26)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as RO audit.	Covered by (25)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	It is evaluated by the RO audit to check regarding maintaining records which will provide the Administration with data to assist in interpretation of requirements.	Covered by (25)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (19)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 19: **No flag State should mandate its recognized organizations** to apply to ships, other than those entitled to fly its flag, any requirement pertaining to their classification rules, requirements, procedures or performance of other statutory certification processes, beyond convention requirements and the mandatory instruments of the Organization.

This requirement does not lead to an appropriate performance indicator, as the requirement is more or less a clarification of the authority of a flag State and underlines certain limits of the rights of a flag State in respect to vessels flying foreign flags.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Flag State should not mandate ROs any requirements beyond convention requirements and the mandatory instruments of the Organization.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Internal assessment of Administration by periodical review of the III Code.	Covered by (9)
	What is the status of the organizational conditions influenced by the requirement?	Mandate ROs could influence the Administration performance.	Covered by (25)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Internal assessment of Administration by periodical review of the III Code.	Covered by (9)
	How the requirement is currently communicated inside and outside of the organization?	There are different type of communication between ROs and administration - Periodical report, regular seminars, and circulars.	Covered by (26)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as RO audit and internal assessment.	Covered by (9), (25)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	It is evaluated by the internal assessment of Administration by periodical review of the III Code.	Covered by (9), (25)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (20)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 20: The flag State should establish or participate in **an oversight programme** with adequate resources for monitoring of, and communication with, its recognized organization(s) in order to **ensure that its international obligations are fully met**, by:

.1 exercising its authority to **conduct supplementary surveys** to ensure that ships entitled to fly its flag **effectively comply with the requirements of the applicable international instruments**;

.2 conducting supplementary surveys as it deems necessary to ensure that ships entitled to fly its flag **comply with national requirements**, which supplement the international mandatory requirements; and

.3 providing staff who have a good knowledge of the rules and regulations of the flag State and those of the recognized organizations and who are available to carry out **effective oversight of the recognized organizations**.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ROs are fully met with the international obligations. - Flag State inspection.	Covered by (13), (22), (25)
	Which is the current task developed in the organization linked to the requirement?	Establish an own inspection and oversight programme - Flag State inspection. The administration therefore needs procedures to establish such program and to have sufficiently qualified persons to carry out such inspections.	Covered by (13),(22), (25)
	What is the status of the organizational conditions influenced by the requirement?	The absence of the oversight programme could lower the Administration performance.	Covered by (13),(22), (25)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)

Mechanism	Which are the main organizations' means for the implementation?	Conduct supplementary surveys to ensure that ships entitled to fly its flag are complying with the international and national requirements, and provide sufficient number of qualified personnel to oversight ROs.	Covered by (14), (23)
	How the requirement is currently communicated inside and outside of the organization?	There are different type of communication between ROs and administration - Periodical report, regular seminars, and circulars.	Covered by (26)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection and RO audit.	Covered by (6), (25)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel to oversight ROs.	Covered by (14)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	It is evaluated through the periodical supplementary surveys to oversight ROs to ensure that its international obligations are fully met.	Covered by (14),(27)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (25)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (21)

III Code – Part 2 Flag State – Delegation of authority

Paragraph 21: A flag State nominating surveyor(s) for the purpose of carrying out surveys, audits and inspections on its behalf should **regulate such nominations**, as appropriate, **in accordance with the guidance** provided in paragraph 18, in particular subparagraphs .3 and .4.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure flag State surveyors obey the guidance provided in paragraph 18.3 and 18.4.	Covered by (18)
	Which is the current task developed in the organization linked to the requirement?	Following the guidance when carrying out surveys, audits and inspections.	Covered by (18)
	What is the status of the organizational conditions influenced by the requirement?	The absence of the procedures of following guidance could lower the Administration performance.	Covered by (18)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Training of flag State surveyors for the purpose of surveys, audits, and inspections.	Covered by (18)
	How the requirement is currently communicated inside and outside of the organization?	Training record and circulars.	Covered by (18)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as regular review of the III Code.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State administration personnel.	Covered by (18)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	It is evaluated through the qualification of surveyors.	Covered by (18)
	What are the expected results derived from the application of the requirement?	A good performance of the flag State in terms of RO delegation & monitoring.	Covered by (21)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the flag State in terms of RO delegation & monitoring.	Covered by (21)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the flag State in terms of RO delegation & monitoring.	Covered by (21)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.1)




III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.1 prohibiting ships entitled to fly its flag from sailing until such ships can proceed to sea in compliance with the requirements of international rules and standards;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are complying with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Detain substandard ships until they are in compliance with the requirements of international rules and standards.	(31) An indicator about the procedures to control over the substandard ships. Covered by (1)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Detain substandard ships through flag State control or after unsuccessful regular inspections or after an unsuccessful Port State Control Inspection.	Covered by (1)

	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as regular review of the III Code.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (18)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	Detention rate and average time of the detention presents the current level of fulfilment of the requirement.	Covered by (1)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (18)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of flag State inspection and its year on year rate could be the performance of this requirement.	Covered by (1)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.2)

III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.2 the periodic inspection of ships entitled to fly its flag to verify that the actual condition of the **ship and its crew is in conformity** with the certificates it carries;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are complying with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Periodic flag State inspection of ships entitled to fly its flag.	Covered by (1)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Periodic flag State inspection of ships entitled to fly its flag.	Covered by (1)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (18)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of flag State inspection and its year on year rate could be the performance of this requirement.	Covered by (1)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.3)

III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.3 the surveyor to ensure, during the periodic inspection referred to in subparagraph .2, that seafarers assigned to the ships are familiar with:

1. **their specific duties; and**
2. **ship arrangements, installations, equipment and procedures;**

This can be identical with the flag State inspections as this only highlights specific aspects of the flag State inspection program.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure seafarers are familiar with their specific duties, ship arrangements, installations, equipment, and procedures.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Flag State inspection of ships entitled to fly its flag.	Covered by (1)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Flag State inspection by qualified flag State surveyors who can assess seafarers.	Covered by (1), (22)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (22)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of deficiencies in the flag State inspection regarding seafarers shows the current level of fulfilment of the requirement.	Covered by (1)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.4)

III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.4 ensuring that the ship's complement, as a whole, **can effectively coordinate activities in an emergency situation** and in the performance of functions vital to safety or to the prevention or mitigation of pollution;

This can be identical with the flag State inspections as this only highlights specific aspects of the flag State inspection program.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure seafarers are familiar with their specific duties, ship arrangements, installations, equipment, and procedures.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Flag State inspection of ships entitled to fly its flag.	Covered by (1),(13),(22)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Flag State inspection by qualified flag State surveyors who can assess seafarers.	Covered by (1), (22)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (22)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of deficiencies in the flag State inspection regarding seafarers shows the current level of fulfilment of the requirement.	Covered by (1)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.5)

III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.5 providing, in national laws and regulations, for **penalties of adequate severity to discourage violation of international rules and standards** by ships entitled to fly its flag;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Legislate penalties in national laws and regulations for substandard ships. Apply the regulations and collect penalties.	(32) An indicator about the penalty regulation for substandard ships and individuals who violated international rules.
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Legislate penalties in national laws and regulations for substandard ships.	Covered by (32)

	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review .	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (22)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of the penalties imposed to substandard ships and individual could be the indicator for this requirement.	Covered by (32)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.6)

III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.6 instituting proceedings, after an investigation has been conducted, against ships entitled to fly its flag, which have violated international rules and standards, irrespective of where the violation has occurred;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Instituting proceedings for substandard ships.	(33) An indicator for instituting proceedings against substandard ships and individuals who violated international rules.
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Instituting proceedings for substandard ships.	Covered by (33)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (22)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of instituting proceedings against substandard ships.	Covered by (33)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.7)


III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.7 providing, in national laws and regulations, for **penalties of adequate severity to discourage violations of international rules and standards** by individuals issued with certificates or endorsements under its authority;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Legislate penalties in national laws and regulations for individuals who violated international rules.	Covered by (32)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Legislate penalties in national laws and regulations for individuals who violated international rules.	Covered by (32)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (22)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The level/amount of individual penalties imposed to substandard ships and professionals could be the indicator for this requirement.	Covered by (32)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (22.8)




III Code – Part 2 Flag State – Enforcement

Paragraph 22: A flag State should take all necessary measures to **secure observance of international rules and standards** by ships entitled to fly its flag and by entities and persons under its jurisdiction so as to ensure compliance with its international obligations. Such measures should include, inter alia:

.8 instituting proceedings, after an investigation has been conducted, against individuals holding certificates or endorsements who have violated international rules and standards, irrespective of where the violation has occurred.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Instituting proceedings against individuals who have violated international rules and standards.	Covered by (33)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Instituting proceedings against individuals who have violated international rules and standards.	Covered by (33)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)

	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors.	Covered by (18)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of instituting proceedings against individuals who have violated international rules and standards.	Covered by (33)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (23.1)

III Code – Part 2 Flag State – Enforcement

Paragraph 23: A flag State should **develop and implement a control and monitoring programme**, as appropriate, in order to:

.1 provide for prompt and thorough **casualty investigations, with reporting to the Organization** as appropriate;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To develop and implement a control and monitoring programme	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Conduct casualty investigations and report to the IMO if necessary.	(34) An indicator about the number of investigation report which have reported to the IMO For accident investigation, covered by (20)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Conduct casualty investigations and report to the IMO if necessary.	Covered by (20), (34)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The effectiveness of the casualty investigation and the number of reported investigation report to the IMO could be the indicator for this requirement.	Covered by (34)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (23.2)

III Code – Part 2 Flag State – Enforcement

Paragraph 23: A flag State should **develop and implement a control and monitoring programme**, as appropriate, in order to:

.2 provide for the **collection of statistical data**, so that trend analyses can be conducted to **identify problem areas**;

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To develop and implement a control and monitoring programme	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Collect statistical data and conduct trend analysis to identify problem areas.	(35) An indicator about the appropriateness of the providing statistical data and trend analysis. Covered by (1)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Collect statistical data and conduct trend analysis to identify problem areas.	Covered by (1), (35)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of statistical data could be the indicator for this requirement.	Covered by (35)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	Requirement	Mechanism	Intended outcome
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KPI Sheet for III Code Requirement (23.3)

III Code – Part 2 Flag State – Enforcement

Paragraph 23: A flag State should **develop and implement a control and monitoring programme**, as appropriate, in order to:
 .3 provide for a **timely response to deficiencies and alleged pollution incidents** reported by port or coastal States.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To develop and implement a control and monitoring programme	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Timely response to deficiencies and alleged pollution incidents by using control and monitoring program.	(36) An indicator which verifies the control and monitoring program for responding to deficiencies and alleged pollution incidents.
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Timely response to deficiencies and alleged pollution incidents by using control and monitoring program.	Covered by (36)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Conduct corrective measures for the deficiencies and alleged pollution incidents.	Covered by (36)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The actual number of response to deficiencies and pollution accident could be the indicator for this requirement.	Covered by (36)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	Requirement	Mechanism	Intended outcome
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KPI Sheet for III Code Requirement (24)




III Code – Part 2 Flag State – Enforcement

Paragraph 24: Furthermore, the flag State should:

- .1 ensure **compliance with the applicable international instruments through national legislation;**
- .2 provide **an appropriate number of qualified personnel** to implement and enforce the national legislation referred to in subparagraph 15.1, including personnel for performing investigations and surveys;
- .3 provide **a sufficient number of qualified flag State personnel** to investigate incidents where ships entitled to fly its flag have been detained by port States;
- .4 provide **a sufficient number of qualified flag State personnel** to investigate incidents where the validity of a certificate or endorsement or of the competence of individuals holding certificates or endorsements issued under its authority are questioned by port States; and
- .5 ensure the **training and oversight of the activities of flag State surveyors and investigators.**

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure compliance with the applicable international instruments through national legislation, and provide sufficient number of qualified personnel to do the delegated tasks.	Covered by (1), (7), (22)
	Which is the current task developed in the organization linked to the requirement?	Provide sufficient number of qualified personnel to implement and enforce the national legislation, and investigate substandard ships and individuals. Moreover, the Administration should train and oversight of flag State surveyors and investigators.	(37) An indicator for qualification and training of flag State investigators. Covered by (7),(22)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and flag State surveyors and investigations.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Provide sufficient number of qualified personnel to implement and enforce the national	Covered by (7), (22), (37)

		legislation, and investigate substandard ships and individuals. Moreover, the Administration should train and oversight of flag State surveyors and investigators.	
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel, flag State surveyors and investigators.	Covered by (7),(22),(37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of administrative personnel, flag State surveyors/investigators could be the indicator for this requirement.	Covered by (7),(22),(37)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (25)

III Code – Part 2 Flag State – Enforcement

Paragraph 25: When a flag State is informed that a ship entitled to fly its flag has been detained by a port State, the flag State should **oversee that appropriate corrective measures are taken** to bring the ship in question into immediate **compliance with the applicable international instruments**.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with the applicable international instruments.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Establish national system to take corrective measures when the flagged ship is detained by a Port State.	Covered by (21)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish national system to take corrective measures when the flagged ship is detained by a Port State.	Covered by (21)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection for the detained ships by a port State.	Covered by (9)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State surveyors and investigators.	Covered by (22),(37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	Necessary time to take action for defective vessel report and the total time of detention could be the indicator for this requirement.	Covered by (20),(21)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (26)

III Code – Part 2 Flag State – Enforcement

Paragraph 26: A flag State, or a recognized organization acting on its behalf, should only **issue or endorse an international certificate to a ship** after it has determined that the ship meets all applicable requirements.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Establish system to issue or endorse an international certificate to a ship.	Covered by (18)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish system to issue or endorse an international certificate to a ship.	Covered by (18)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of certificates that had withdrawal, suspension, and cancellation could be the indicator for this requirement.	Covered by (18)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (27)

III Code – Part 2 Flag State – Enforcement

Paragraph 27: A flag State should only **issue an international certificate of competency or endorsement to a person** after it has determined that the person meets all applicable requirements.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure ships entitled to fly its flag are in compliance with international rules and standards.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Establish system to issue or endorse an international certificate to a person who meets all applicable requirements.	Covered by (18)
	What is the status of the organizational conditions influenced by the requirement?	The requirement influences the fleet performance, but is not linked to the organizational performance of an administration.	Covered by (3)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish system to issue or endorse an international certificate to a person who meets all applicable requirements.	Covered by (18)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The number of certificates that had withdrawal, suspension, and cancellation could be the indicator for this requirement.	Covered by (18)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (28)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 28: The flag State should **define and document the responsibilities, authority and interrelation of all personnel** who manage, perform and verify work relating to and affecting safety and pollution prevention.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	The government should document responsibilities of all the personnel in concerned administration.	Covered by (11)
	Which is the current task developed in the organization linked to the requirement?	Documents responsibilities and authority of all personnel with clear organigram.	Covered by (11)
	What is the status of the organizational conditions influenced by the requirement?	The absence of documents regarding this requirement lower the organizational performance of flag State.	Covered by (11)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Documents responsibilities and authority of all personnel with clear organigram.	Covered by (11)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Management reviews.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)

KPI Sheet for III Code Requirement (28)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	Percentage of the documentation for the clear organigram could be the indicator for this requirement.	Covered by (11)
	What are the expected results derived from the application of the requirement?	A good performance of the organizational performance in terms of documentation.	Covered by (11)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the organizational performance in terms of documentation.	Covered by (11)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the organizational performance in terms of documentation.	Covered by (11)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (29),(30),(31),(32)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 29: **Personnel responsible for**, or performing surveys, inspections and audits on ships and companies covered by the relevant international mandatory instruments **should have as a minimum the following:**

.1 appropriate qualifications from a marine or nautical institution and relevant seagoing experience as a certificated ship's officer holding or having held a valid management level certificate of competency and having maintained their technical knowledge of ships and their operation since gaining their certificate of competency; or

.2 a degree or equivalent from a tertiary institution within a relevant field of engineering or science recognized by the flag State; or

.3 accreditation as a surveyor through a formalized training programme that leads to the same standard of surveyor's experience and competency as that required in paragraphs 29.1, 29.2 and 32.

Paragraph 30: Personnel qualified under paragraph 29.1 should have **served for a period of not less than three years at sea** as an officer in the deck or engine department.

Paragraph 31: Personnel qualified under paragraph 29.2 **should have worked in a relevant capacity for at least three years.**

Paragraph 32: In addition, such personnel should have **appropriate practical and theoretical knowledge of ships, their operation and the provisions of the relevant national and international instruments** necessary to perform their duties as flag State surveyors obtained through **documented training programmes.**

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Regulates the minimum requirement for the personnel responsible for surveys, inspections, and audits.	Covered by (22)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection	Covered by (22)

		which lead to low organizational performance.	
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and Implementation.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Regulates the minimum requirement for the personnel responsible for surveys, inspections, and audits.	Covered by (22)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The qualification and training of flag State surveyors presents current level of fulfilment of the requirement.	Covered by (22)
	What are the expected results derived from the application of the requirement?	A good performance of the organization.	Covered by (22)
	What are the possible negative aspects that could affect before the implementation of the requirement?	No good performance of the organization.	Covered by (22)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the organization.	Covered by (22)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (33)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 33: Other personnel assisting in the performance of such work should have **education, training and supervision commensurate with the tasks** they are authorized to perform.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Establish documented training programs to person who assists flag State surveyors.	Covered by (22)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection which lead to low organizational performance.	Covered by (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Establish documented training programs to person who assists flag State surveyors.	Covered by (22)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The qualification and training of flag State surveyors presents current level of fulfilment of the requirement.	Covered by (22)
	What are the expected results derived from the application of the requirement?	A good performance of the organizational performance.	Covered by (22)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A good performance of the organizational performance.	Covered by (22)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the organizational performance.	Covered by (22)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (34)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 34: Previous relevant experience in the field of expertise is recommended to be considered an advantage; in case of no previous experience, the Administration should **provide appropriate field training.**

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Training should be provided to flag State surveyors who are lack of experience.	(38) An indicator covering the procedures for training program provided to flag State surveyors.
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection which lead to low organizational performance.	Covered by (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Training should be provided to flag State surveyors who are lack of experience.	Covered by (22)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)

	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The qualification and training of flag State surveyors presents current level of fulfilment of the requirement.	Covered by (22)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (35)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 35: The flag State should **implement a documented system** for qualification of personnel and continuous updating of their knowledge as appropriate to the tasks they are authorized to undertake.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Implement a documented training system	Covered by (38)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection which lead to low organizational performance.	Covered by (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Implement a documented training system	Covered by (38)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The qualification and training of flag State surveyors presents current level of fulfilment of the requirement.	Covered by (22)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (36)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 36: Depending on the function(s) to be performed, **the qualifications should encompass:**

- .1 **knowledge** of applicable, international and national, rules and regulations for ships, their companies, their crew, their cargo and their operation;
- .2 **knowledge of the procedures** to be applied in survey, certification, control, investigative and oversight functions;
- .3 **understanding of the goals and objectives of the international and national instruments** dealing with maritime safety and protection of the marine environment, and of related programmes;
- .4 **understanding of the processes** both on board and ashore, internal as well as external;
- .5 **possession of professional competency** necessary to perform the given tasks effectively and efficiently;
- .6 **full safety awareness** in all circumstances, also for one's own safety; and
- .7 **training or experience in the various tasks** to be performed and preferably also in the functions to be assessed.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Implement a documented training system	Covered by (38)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection which lead to low organizational performance.	Covered by (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)

	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Implement a documented training system	Covered by (38)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	The qualification and training of flag State surveyors presents current level of fulfilment of the requirement.	Covered by (22)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (37)

III Code – Part 2 Flag State – Flag State surveyors

Paragraph 37: The flag State should **issue an identification document** for the surveyor to carry when performing his/her tasks.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	Personnel responsible for the surveys, inspections, and audit should be qualified to ensure compliance with the international rules.	Covered by (22)
	Which is the current task developed in the organization linked to the requirement?	Issue an identification document for the surveyors.	Covered by (11)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State inspection which lead to low organizational performance.	Covered by (22)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Issue an identification document for the surveyors.	Covered by (38)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Specific enforcement measures such as targeted flag State inspection.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for Administration personnel.	Covered by (7)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	Issuing an identification document is linked to clear organigram.	Covered by (11)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (38)

III Code – Part 2 Flag State – Flag State investigations

Paragraph 38: **Marine safety investigations** should be conducted by **impartial and objective investigators**, who are suitably qualified and knowledgeable in matters relating to the casualty. Subject to any agreement on which State or States will be the marine safety investigating State(s), the flag State should **provide qualified investigators** for this purpose, irrespective of the location of the casualty or incident.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure safety of shipping and pollution prevention through marine safety investigations and prevent future accidents.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Conduct marine safety investigations by impartial and objective investigators.	Covered by (19),(20),(37)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State to conduct accident investigation which lower the organizational performance.	Covered by (19),(20),(37)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	There are enforcement and safety aspects of an investigation. For the enforcement part, appropriate authorities have to be nominated, e.g. coast guards, police or the maritime administration. For the safety aspects, an independent body outside the maritime administration need to be set up.	Covered by (4) Covered by (11)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and IMO Casualty Investigation Code.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Conduct marine safety investigations and investigations as part of the enforcement regime of a member state by impartial and objective investigators.	Covered by (19),(20),(37)

	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State investigators.	Covered by (37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the appropriateness and promptness of the marine accident investigation and countermeasures for substandard ships as well as the number of qualified investigators.	Covered by (19),(20),(37)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (39)

III Code – Part 2 Flag State – Flag State investigations

Paragraph 39: The flag State is recommended to ensure that **individual investigators have working knowledge and practical experience** in those subject areas pertaining to their normal duties. Additionally, in order to assist individual investigators in performing duties outside their normal assignments, the flag State is recommended to ensure **ready access to expertise in the following areas**, as necessary:

- .1 navigation and the Collision Regulations;
- .2 flag State regulations on certificates of competency;
- .3 causes of marine pollution;
- .4 interviewing techniques;
- .5 evidence gathering; and
- .6 evaluation of the effects of the human element.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To secure qualification and training of flag State investigators.	Covered by (37)
	Which is the current task developed in the organization linked to the requirement?	Provide documented training program for flag State investigators.	(39) An indicator covering the procedures for training program provided to flag State investigators. Covered by (37)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State to conduct accident investigation which lower the organizational performance.	Covered by (19),(20),(37)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)

	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and IMO Casualty Investigation Code.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Provide documented training program for flag State investigators.	Covered by (19),(20),(37)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State investigators.	Covered by (37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the appropriateness and promptness of the marine accident investigation and countermeasures for substandard ships as well as the number of qualified investigators.	Covered by (19),(20),(37),(39)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (40)

III Code – Part 2 Flag State – Flag State investigations

Paragraph 40: It is recommended that any accident involving personal injury necessitating absence from **duty of three days or more and any deaths resulting from occupational accidents and casualties** to ships of the flag State should be **investigated, and the results of such investigations made public.**

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure safety of shipping and pollution prevention through marine safety investigations and prevent future accidents.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Conduct marine safety investigations by impartial and objective investigators, and made investigation report public.	Covered by (19),(20),(37)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State to conduct accident investigation which lower the organizational performance.	Covered by (19),(20),(37)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	There are enforcement and safety aspects of an investigation. For the enforcement part, appropriate authorities have to be nominated, e.g. coast guards, police or the maritime administration. For the safety aspects, an independent body outside the maritime administration need to be set up.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and IMO Casualty Investigation Code.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Conduct marine safety investigations by impartial and objective investigators, and make investigation report public.	Covered by (19),(20),(37)

	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State investigators.	Covered by (37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the appropriateness and promptness of the marine accident investigation and countermeasures for substandard ships as well as the number of qualified investigators.	Covered by (19),(20),(37),(39)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	■ Requirement	■ Mechanism	■ Intended outcome
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KPI Sheet for III Code Requirement (41)

III Code – Part 2 Flag State – Flag State investigations

Paragraph 41: Ship casualties should be **investigated and reported in accordance with the relevant international instruments**, taking into account the Casualty Investigation Code, as may be amended, and guidelines developed by the Organization. The report on the investigation should be **forwarded to the Organization together with the flag State's observations**, in accordance with the guidelines referred to above.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To ensure safety of shipping and pollution prevention through marine safety investigations and prevent future accidents.	Covered by (1)
	Which is the current task developed in the organization linked to the requirement?	Conduct marine safety investigations by impartial and objective investigators in accordance with the IMO Casualty investigation Code, and report to IMO.	Covered by (19),(20),(37)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lead to lack of reliability of flag State to conduct accident investigation which lower the organizational performance.	Covered by (19),(20),(37)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	There are enforcement and safety aspects of an investigation. For the enforcement part, appropriate authorities have to be nominated, e.g. coast guards, police or the maritime administration. For the safety aspects, an independent body outside the maritime administration need to be set up.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action and IMO Casualty Investigation Code.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Conduct marine safety investigations by impartial and objective investigators in accordance with the IMO Casualty investigation Code.	Covered by (19),(20),(37)

	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for flag State investigators.	Covered by (37)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the appropriateness and promptness of the marine accident investigation and countermeasures for substandard ships, and the number of investigation reported to the IMO.	Covered by (19),(20),(34),(37)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (42)

III Code – Part 2 Flag State – Evaluation and review

Paragraph 42: A flag State should, on a periodic basis, **evaluate its performance** with respect to the implementation of administrative processes, procedures and resources necessary to meet its obligations as required by the international instruments to which it is a party.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To identify problem areas through the periodic evaluation of its performance regarding implementation of administrative processes, procedures and resources.	Covered by (8),(9),(35)
	Which is the current task developed in the organization linked to the requirement?	Evaluate its performance periodically to meet its obligations as required by the international instruments.	Covered by (8),(9),(35)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lower the organizational performance.	Covered by (8),(9),(35)
	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Evaluate its performance periodically to meet its obligations as required by the international instruments.	Covered by (8),(9),(35)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for administrative personnel.	Covered by (7)

	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the level of compliance with international obligations.	Covered by (8),(9),(35)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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KPI Sheet for III Code Requirement (43),(44)

III Code – Part 2 Flag State – Evaluation and review

Paragraph 43: Measures to evaluate the performance of flag States should include, inter alia, port State control detention rates, flag State inspection results, casualty statistics, communication and information processes, annual loss statistics (excluding constructive total losses (CTLs)) and other performance indicators as may be appropriate, in order to determine whether staffing, resources and administrative procedures are adequate to meet its flag State obligations.

Paragraph 44: Areas recommended for regular review may include, inter alia:

- .1 fleet loss and accident ratios to identify trends over selected time periods;
- .2 the number of verified cases of detained ships in relation to the size of the fleet;
- .3 the number of verified cases of incompetence or wrongdoing by individuals holding certificates or endorsements issued under the flag State's authority;
- .4 responses to port State deficiency reports or interventions;
- .5 investigations into very serious and serious casualties and lessons learned from them;
- .6 technical and other resources committed;
- .7 results of inspections, surveys and controls of the ships in the fleet;
- .8 investigation of occupational accidents;
- .9 the number of incidents and violations that occur under the applicable international maritime pollution prevention regulations; and
- .10 the number of suspensions or withdrawals of certificates, endorsements, approvals, or similar.

CMO Element	Question	Response	If and how can this be covered by a KPI
Context	What is the main organizational aspect analysed by the requirement?	To identify problem areas through the periodic evaluation of its performance regarding implementation of administrative processes, procedures and resources.	Covered by (8),(9),(35)
	Which is the current task developed in the organization linked to the requirement?	Evaluate its performance periodically to meet its obligations as required by the international instruments.	Covered by (8),(9),(35)
	What is the status of the organizational conditions influenced by the requirement?	The absence of this requirement could lower the organizational performance.	Covered by (8),(9),(35)

	What and who are responsible for ensuring the requirement implementation and its maintenance?	Depending on the national system it is most likely a maritime administration as part of a ministry in charge of flag State issues.	Covered by (4)
	What is the current link of the requirement with similar requirement in other implemented norms?	There are links to the Common Areas of the III Code, such as Initial Action.	Covered by (2)
Mechanism	Which are the main organizations' means for the implementation?	Evaluate its performance periodically to meet its obligations as required by the international instruments.	Covered by (8),(9),(35)
	How the requirement is currently communicated inside and outside of the organization?	Notification, website, statistical data, and circulars.	Covered by (5)
	How is the organization able of ensuring the understanding of the importance of the requirement?	Regular management review.	Covered by (9)
	How are the skills and capabilities of the responsible persons evaluated?	There are qualification requirements in the III Code for administrative personnel.	Covered by (7)
	How the organization able of ensuring the link of the requirement with other implemented norms and regulations?	There should be regular reviews of performance and of the arrangements in a national register.	Covered by (8)
Outcome	What is the current level of fulfilment of the requirement?	By evaluating the level of compliance with international obligations.	Covered by (8),(9),(35)
	What are the expected results derived from the application of the requirement?	A good performance of the fleet in terms of flag State and port State control, as well as accident numbers.	Covered by (1)
	What are the possible negative aspects that could affect before the implementation of the requirement?	A low performance of the fleet in terms of items stated above.	Covered by (1)
	What kind of improvement can be obtained after implementing the requirement?	A better performance of the fleet in terms of items stated above.	Covered by (1)

Color coding in the III Code	 Requirement	 Mechanism	 Intended outcome
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Appendix 2

KPI1. Port State Control detention follow up

This KPI shows the ability of flagged vessel to complete PSC inspections without incurring a detention (Code 30), and the number of follow up by Administration to PSC detention which presents the performance of flag State to take action for detained ships by port States. Port State detention rate is a specific factor linked to the fleet performance of flag States which is used in Black-grey-white list and Shipping KPIs. Moreover, paragraph 43 of the III Code points out the port State detention rate as a factor to evaluate and review of performance of flag States. In order to measure this KPI, following performance indicators are developed:

A: The number of PSC inspection resulting detention (vs total)

B: The number of follow-up to detained ships

KPI2. Port State Control deficiency follow up

This KPI shows the ability of flagged vessel to avoid deficiency in PSC inspections, and the number of follow up by Administration to PSC deficiencies to PSC deficiencies which presents the performance of flag State to take action for defective ships. Port State control deficiency follow up is a specific factor linked to the fleet performance of flag States which is stated in the paragraph 43 of the III Code. In order to measure KPI2, following performance indicators are developed:

A: The number of PSC deficiencies (vs total)

B: The number of follow-up to PSC deficiencies

KPI3. Fleet loss ratio

This KPI shows the percentage of fleet loss of flagged vessel which indicates the fleet performance of flag States to collect statistical data as required by the paragraph 44 of the III Code. In order to measure KPI3, following performance indicators are developed:

A: The number of fleet lost

B: Total number of flagged vessel

KPI4. Accident follow up

This KPI shows the percentage of accident of flagged vessel which is an obvious data to show the fleet performance of flag State. Paragraph 44 also requires this indicator to be measured. In order to measure KPI4, following performance indicators are developed:

A: The number of accident of flagged vessel (per fleet) (without fishing vessel)

B: The number of follow-up to accident

C: lives lost

KPI5. Flag State Control follow up

This KPI shows the ability of flagged vessel to avoid deficiency in FSC inspections, and performance of flag States to deal with defective vessel. This KPI is required in the paragraph 43 as a measure to evaluate the performance of flag States. In order to measure KPI5, following performance indicators are developed:

A: The number of FSC deficiencies (vs total)

B: The number of follow-up to FSC deficiencies

KPI6. Policy Implementation ratio

This KPI is developed to show the flag State's ability of policy development and update level for implementation within the Administration. It is also linked to the procedures for issuing national legislation. In order to measure KPI6, following performance indicators are developed:

A: The number of implemented policy

B: The number of policy planned to implement

KPI7. Legislation ratio

This KPI express the flag State's ability of issuing national legislation and guidance, and the effectiveness of the procedures for implementation. In order to measure KPI7, following performance indicators are developed:

A: The number of the obligations of administration which has completely issued as national legislation

B: The number of obligations of administration in ratified IMO Convention

KPI8. Commentary regulation published

This KPI is developed to cover the number of policies and documents issued as guidance to administrations, ship-owners and other maritime stakeholders. This KPI express the ability of the flag State to develop and disseminate interpretative national regulations. In order to measure KPI8, following performance indicators are developed:

A: The number of commentary regulation published

B: The planned number of commentary regulation to publish

KPI9. Administrative guidance published

This KPI express the ability of the flag State to establish administrative instructions to implement applicable international rules. In order to measure KPI9, following performance indicators are developed:

A: The number of administrative instructions published

B: The planned number of administrative instructions to publish

KPI10. Assign responsibilities of Administration

This KPI verifies whether the responsibilities and authorities of concerned Administration is regulated. In order to measure KPI10, following performance indicators are developed:

A: Existence of regulation for the documentation of responsibilities and authorities of concerned Administration.

KPI11. Communication performance

Since the III Code requires Administration to disseminate sufficient information to stakeholders, this KPI is developed to indicate the ability of flag State to disseminate information. In order to measure KPI11, following performance indicators are developed:

A: The number of organization's means of communication

KPI12. FSC inspection rate

This KPI express the validity of ship inspection by flag State. Flag State control is a strong enforcement measure to oversight flagged vessel which is linked to the performance of flag States. In order to measure KPI12, following performance indicators are developed:

A: The number of flag State inspection conducted / fleet

KPI13. Procedures for checking credential of administrative personnel

It is important to ensure administrative personnel is qualified to accomplish delegated tasks. Therefore, this KPI express the appropriateness of the procedures for checking credential of administrative personnel. In order to measure KPI13, following performance indicators are developed:

A: Existence of procedures for checking credential of administrative personnel.

KPI14. Training Standards for administrative personnel

This KPI express the appropriateness of the training program for maritime administrative personnel, and check whether the training standards for maritime administrative personnel are satisfying the international standards. In order to measure KPI14, following performance indicators are developed:

A: Existence of training standards

B: Does training standard is in compliance with the international standards

C: The number of administrative person trained

D: Existence of education/training yearly plan

KPI15. Validation of national legislation

This KPI shows the appropriateness of the compliance validating procedures for the national legislation. It is an important factor to check performance of flag States to follow up for implemented international rules and standards. In order to measure KPI15, following performance indicators are developed:

A: Existence of the procedures for managing amendment record for implemented Convention

B: Existence of the validating procedures for the national legislation

KPI16. Periodical evaluation of the III Code

This KPI shows the number of assessment conducted to check compliance of the III Code which presents the overall performance of the flag State. It is considered as a most important factor to measure the performance of flag State which covers all the requirements of the III Code by periodical evaluation. In order to measure KPI16, following performance indicators are developed:

A: The number of reviews to the III Code (plan vs real)

KPI17. Nonconformities from periodical evaluation

This KPI shows the performance of flag State to follow up nonconformities from the periodical evaluation of the III Code which presents the will of flag State to implement IMO instruments. In order to measure KPI17, following performance indicators are developed:

A: The number of nonconformities from periodical evaluation

B: The number of corrective action for nonconformities

KPI18. Customer satisfaction

This KPI express the customer satisfaction with the Administration by conducting a survey of stakeholders. In order to measure KPI18, following performance indicators are developed:

A: Conduct a survey (scale 0-10) with 50 random ship owner regarding customer satisfaction.

KPI19. Assigning responsibilities of personnel

This KPI express the appropriateness of the assigning responsibilities and authority for administrative personnel within the administration. In order to measure KPI19, following performance indicators are developed:

A: Existence of the regulation for documentation of responsibilities and authority for administrative personnel.

B: The percentage of documentation for clear organigram

KPI20. Assigning responsibilities between maritime organizations

This KPI express the appropriateness of the assigning responsibilities and authority between the maritime organizations. In order to measure KPI20, following performance indicators are developed:

A: Existence of regulation for responsibilities and authority between maritime organizations

KPI21. FSC inspection procedure

This KPI express the validation of the FSC inspection. In order to conduct flag State inspection, it is essential to have procedures for inspection which is in compliance with the

international regulations. In order to measure KPI21, following performance indicators are developed:

A: Existence of the procedures for FSC inspection

KPI22. Qualification of flag State surveyors

This KPI shows the appropriateness of the setting of qualification requirement for flag State surveyors, and whether sufficient number of flag State surveyors are provided. In order to measure KPI22, following performance indicators are developed:

A: Existence of qualification requirement in accordance with the international standards for flag State surveyors.

B: The percentage of the qualified surveyors (vs total number)

C: Existence of procedures for oversight of flag State surveyors.

D: The number of flag State surveyors (per fleet)

E: Average number of inspection hours (per person per day)

KPI23. The level of training of seafarers

This KPI shows the level of compliance with the STCW requirements regarding the training of seafarers. In order to measure KPI23, following performance indicators are developed:

A: The number of seafarers trained (per year)

B: Year on year rate of trained seafarers

KPI24. Standards for qualifications of seafarers

This KPI express the level of compliance with the STCW requirements regarding the standards for qualification of seafarers. In order to measure KPI24, following performance indicators are developed:

A: The number of seafarers took the qualification exam (year)

B: Year on year rate of seafarers who took the exam

C: The number of nonconformities in the external assessment

D: The number of corrective action for the nonconformities in the external assessment.

KPI25. Standards for issuing certificates for seafarers

This KPI express the level of compliance with the STCW requirements regarding the standards for issuing certificates of seafarers. In order to measure KPI25, following performance indicators are developed:

A: The number of certificates issued

B: Year on year rate of certificates issued

C: The number of nonconformities in the external assessment

D: The number of corrective action for the nonconformities in the external assessment.

KPI26. Procedures for withdrawal/suspension/cancellation of certificates.

This KPI validates the procedures of withdrawal/suspension/cancellation of certificates issued. In order to measure KPI26, following performance indicators are developed:

- A: Existence of the procedures of withdrawal/suspension/cancellation of certificates
- B: The number of withdrawal/suspension/cancellation of certificates
- C: Year on year rate of withdrawal/suspension/cancellation of certificates

KPI27. Procedures for accident investigation

This KPI express the appropriateness of the accident investigation which could ensure proper accident investigation. In order to measure KPI27, following performance indicators are developed:

- A: Existence of the procedures to maintain impartial of flag State investigators

KPI28. Marine accident investigation

This KPI shows performance of flag States for the promptness and appropriateness of the accident investigation. In order to measure KPI28, following performance indicators are developed:

- A: The number of investigation conducted / fleet
- B: Average time from the accident reported to the investigation conducted

KPI29. Countermeasures for substandard ships

This KPI shows the performance of flag States for the promptness and appropriateness of the countermeasures for reported substandard ships. In order to measure KPI29, following performance indicators are developed:

- A: Existence of the procedures of take measures to substandard ships
- B: Average time from the substandard ships reported to take measures
- C: Total detained time of flagged ships per year

KPI30. Manning level

This KPI express the compliance with the Principles of Safe Manning by the number of deficiencies in the flag State inspection. In order to measure KPI30, following performance indicators are developed:

- A: The number of deficiencies from flag State inspection regarding safe manning
- B: Total number of flag State inspection

KPI31. RO delegation & monitoring

This KPI express the ability of flag State to control over ROs. Since RO delegation is the main factor which influences the performance of flag States, the number of RO audit and deficiencies are used to measure this KPI. In order to measure KPI31, following performance indicators are developed:

- A: The number of RO audit performed (plan vs real)
- B: Existence of the procedures of oversight ROs

C: The review cycle of procedures of oversight ROs

D: The number of deficiencies from the RO audit (per audit)

KPI32. Communication with ROs

This KPI shows the performance of flag State of communication between ROs and concerned Administration. In order to measure KPI32, following performance indicators are developed:

A: The number of meetings/circulars with ROs

KPI33. Supplementary surveys for flagged ships

This KPI express the validity of supplementary survey of ships entitled to fly its flag by measuring the number of supplementary survey. This KPI shows specific number of supplementary survey of flagged ships as required in the paragraph 20 of the Code. In order to measure KPI33, following performance indicators are developed:

A: The number of supplementary surveys of the flagged vessels by flag State (year on year rate)

KPI34. Agreement conclusion with ROs

This KPI express the appropriateness of the agreement conclusion between administration and ROs by signing formal written agreement as required in the paragraph 18 of the Code. In order to measure KPI34, following performance indicators are developed:

A: The number of formal written agreement between administration and ROs.

B: The number of ROs

KPI35. Instruction for ROs

This KPI shows the appropriateness of the Administration regarding the provision of detailed instructions for ROs. In order to measure KPI35, following performance indicators are developed:

A: The number of instructions provided to ROs

B: Review cycle of validation of instructions

KPI36. Penalty regulation for substandard ships and individuals

This KPI express the ability of flag State to impose penalty to substandard ships and individuals who have violated international rules. This KPI shows the existence of regulation for the penalty and the performance of flag States to impose adequate amount of penalties has been imposed. In order to measure KPI36, following performance indicators are developed:

A: Existence of national penalty regulation

B: The number of penalty imposed to substandard ships

C: Total amount of penalty imposed to substandard ships

D: The number of penalty imposed to individuals

E: Total amount of penalty imposed to individuals

KPI37. Instituting proceedings against substandard ships and individuals

This KPI express the performance of flag State to control over the substandard ships and individuals who are issued with certificates under its authority. In order to measure KPI37, following performance indicators are developed:

A: The number of instituting proceedings for substandard ships per year

B: The number of instituting proceedings for individuals per year

KPI38. Reporting to IMO

This KPI express the performance of flag State to secure reporting requirement to IMO as required by the III Code. Mansell (2009) also described this KPI as a factor to measure administrative performance of flag States. In order to measure KPI38, following performance indicators are developed:

A: The number of investigation report which have reported to the IMO

B: The number of investigation report published per year

C: Total number of report which have reported to the IMO (per year)

KPI39. Providing statistical data

This KPI shows the appropriateness of the trend analysis and provision of statistical data by Administration as required by paragraph 43 of the Code. In order to measure KPI39, following performance indicators are developed:

A: The number of different types of statistical data provided (yoy rate)

KPI40. Responding to deficiencies and pollution accident

This KPI express the ability of flag State to deal with defective vessel and pollution accidents to secure safety shipping and pollution prevention. This KPI is mentioned in the Shipping KPIs for the company's ability to avoid release of substances, and in the IMO strategic KPIs. In order to measure KPI40, following performance indicators are developed:

A: Tonnes of harmful substances discharged into the sea operationally or accidentally from ships subject to IMO instruments.

B: Number of spills occurring from ships subject to IMO instruments.

C: Ratio of oil (cargo and bunkers) discharged into the sea, to total quantities carried by sea.

D: Percentage of the reported corrective actions derived from deficiencies and pollution incidents reported by port or coastal States.

KPI41. Qualification of flag State investigators.

This KPI shows the validation of training/qualification procedures for flag State investigators, and whether sufficient number of flag State investigators are provided. In order to measure KPI41, following performance indicators are developed:

- A: Existence of oversight procedures for flag State investigators
- B: The number of flag State investigators (per total accident number per year)
- C: Average number of investigation hours (per person per day)
- D: The percentage of the qualified investigators (vs total number)

KPI42. Training program for flag State surveyors

This KPI express the appropriateness of the training program for the flag State surveyors who are lack of experience. In order to measure KPI42, following performance indicators are developed:

- A: Existence of procedures of field training for non-experienced personnel.
- B: The number of trained person regarding field training course
- C: Existence of training standards for flag State surveyors
- D: Does training standard is in compliance with the international standards
- E: The number of flag State surveyors trained per year

KPI43. Training program for flag State investigators

This KPI express the appropriateness of the training program for the flag State investigators. In order to measure KPI43, following performance indicators are developed:

- A: Existence of training standards
- B: Does training standard is in compliance with the international standards
- C: The number of flag State investigators trained per year
- D: Existence of education/training yearly plan

Appendix 3

National Strategy of Korea for IMSAS (translated by the author)

Para. 1.1	General requirements
Para. 1.2.1	Status of ratification of IMO instruments.
Para. 1.2.2	Procedures of issuing national legislation.
Para. 1.2.3.1	Responsibilities and authority of concerned administration.
Para. 1.2.3.2	Legislated and amended IMO instruments to national legislation
Para. 1.2.3.3	Procedures to delegate authority to other contracting party
Para. 1.2.3.4	Reporting to IMO regarding issued national legislation.
Para. 1.3.1	Procedures of enforcement measure to comply III Code.
Para. 1.3.2	Records of enforcement measure for substandard ships and individuals.
Para. 1.3.3	Statistical data to identify problem area of flagged ships.
Para. 1.3.4	Procedures for detained flagged ships by port States.
Para. 1.4.1	Qualification requirements for flag State surveyors.
Para. 1.4.2	Documented training program for flag State surveyors.
Para. 1.4.3	Responsibilities and authority of administrative personnel.
Para. 1.4.4	Designation criteria for line managers of flag State surveyors.
Para. 1.5.1	Status of ROs.
Para. 1.5.2	Formal written agreement with ROs.
Para. 1.5.3	Requirements of delegation (in case of no written agreement)
Para. 1.5.4	Oversight and verification of ROs.
Para. 1.5.5	Records for deploy personnel to oversight ROs
Para 1.6.1	National legal system for accident investigation
Para. 1.6.2	Responsible organization for accident investigation.
Para. 1.6.3	Procedures for analyse human factor to improve safety of shipping and pollution prevention
Para. 1.6.4	Reporting to IMO regarding accident investigation
Para. 1.7	Port State Control
Para. 1.8	Coastal State Control
Para. 1.9	Reporting
Para. 1.10.1.1	Records for PSC detention rate.
Para. 1.10.1.2	Corrective action for the result of periodical evaluation.
Para. 1.10.1.3	Records of accident rate.
Para. 1.10.1.4	Evaluation of communication process
Para. 1.10.1.5	Data for lives lost
Para. 1.10.1.6	Periodical evaluation of performance
Para. 1.11	Requirements for management
Para. 1.12	Scope of IMSAS
Para. 2.1	Standards for line manager of port State and flag State surveyors
Para. 2.2.1	Detailed requirements for flag State surveyors
Para. 2.2.2	Training standards for flag State surveyors
Para. 2.2.3	Training requirements for flag State surveyors
Para. 2.3	Port State Control officer
Para. 2.4	VTS officer
Para. 2.4.1	Requirement for VTS officer
Para. 2.4.2	Training standards for VTS officer
Para. 2.4.3	Training requirements for VTS officer
Para. 2.5	Flag State investigators.
Para. 2.5.1	Qualification requirements for flag State investigators.
Para. 2.5.2	Training standards for flag State investigators.
Para. 2.5.3	Training and qualification requirements for flag State investigators.
Para. 2.6	Navigation aids inspector
Para. 2.7	SAR personnel
Para. 2.8	RO inspector
Para. 2.9	Auditor
Para. 2.10	Educational institution teachers, supervisors and examiners
Para. 3.1.1	Contents of formal written agreement with ROs
Para. 3.1.2	Requirement for ROs.