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ISM CODE IMPLEMENTATION

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CHAPTER 1: INTRODUCTION

1.1 Shipping industry-Safety-Human Element-ISM Code

The shipping industry delivers goods from country to country and connects the whole world together. It is also a very important fundamental industry in the world economy. It offers cheap and fast transport service to the other industries to open more wide markets (**Stopford, 1997, p17**). Especially a fast, cheap and safe transport is a premise of today's "just in time" industry production process and market "globalization". However, the shipping industry is not safe enough, is always thought as one of the most dangerous industry. Just open any day's the marine newspaper Lloyds List; we can find that there is a huge number of marine accident news in *casualty report*. So, safety is still one of the main problems in the shipping industry.

Since the ship has first time used as a transport tool sailing at sea, people have tried to improve its safety. Many efforts have improved marine safety, but the rate of marine accidents is still unacceptably high today. The reason of such a high rate of marine accidents is that over 80% of marine accidents occurred by human errors. So, one of the best measures to reduce marine accident is to focus on human elements, recognize human errors and eliminate them (**Anderson, 1998, p15**). Unfortunately the human element is always ignored. Major maritime disasters caused the changes of the shipping industry. It was not realized that the key issue of marine safety is human element. Again, a measure to improve marine safety is to solve the problems of human element. It was not until the end of 1960's, that the importance of skills and knowledge of seafarers has been first recognized. (**Anderson, 1998, p15**) In the following years, the whole human element in marine accidents has gradually recognized. The human element in marine safety has been identified. Following the adoption of International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) in 1978, the International Safety Code (ISM) was adopted in 1993. These two regulations are main contribution to International Maritime Organization (IMO) which deals with human element. The ISM Code is the first standard of ship management, and the best measure to take into account the human element in marine accidents.

International Safety Management (ISM) Code is known as the International Management Code for the safe operation of ships and for pollution prevention and adopted by IMO resolution A.741 (18). When the ISM Code was adopted, there were many people doubt it, and thought is as “a piece of paper”, and “just can create a certificate printing industry”. (Cohen, Feb 1997, p45). In fact, ISM Code is focusing on the lack of safety management that may create major problems of human element, and is intended to improve the safety and reduce pollution from ships. The ISM Code has not introduced a new technology standard on safety, but it has a major impact on the way shipping companies are managed and operated. We can see that it brings a real safety revolution to the shipping industry. (<http://www.ismcode.net>, 18/07/2002).

In this thesis, firstly, there will be a discussion on the development of the shipping industry and why safety and pollution are always the main problems of the shipping industry. Following there will be a discussion on marine safety to understand some definitions, the main causes of marine accident, what role every participant act and what efforts have been done on improving marine safety. Then, it will be discuss on why we should focus on human element, which areas we should consider in human element study and from some cases to find the human element in marine accidents. The final discussion will be on why ISM Code was adopted, how to implement it, the problems in “paper chase” as well as the impacts in the shipping industry. Also in the final discussion conclusions that came up will be analyzed.

1.2 Rational and background

The development of the ISM code has its roots in the widespread belief that the best practice and formal management systems which were found in the best organized shipping companies were very different from practices of some owners who had abandoned any pretence at good operating standards (Kuo, 1998, p155).

The ISM Code is important because it stresses the responsibility of management for safety and spells out in considerable detail what that responsibility consists of. In the past some companies gave the impression that safety of ships was the responsibility of the

captain alone while the directors' functions were limited to the more understanding task of making a profit. **(Anderson, 1998, p32)**

The ISM Code also makes it clear that the "human element" (a phrase which has usually been interpreted as meaning the seafarers alone), also applies to those on shore. When an accident happens, the subsequent investigation often shows that mistakes have been made not only from those on board but also by the company operating the ship. That also shows as that the communication and co-operation between companies and seafarers weren't the best. The adoption of the Code as a mandatory instrument should enable some of those mistakes to be eliminated- and enable those responsible for making them to be held more accountable for their actions that they have been up until now. **(Sauders & Wheeler, 1991, p54)**

The Code itself is made up of eleven rules or requirements from which the company is required to develop policies and procedures for the shore based support of the shipping operation, and therefore to ensure compliance. These rules or requirements only cover those company developed processes to ensure that there is an adequate guidance to cover an emergency at sea as well as the proper execution of activities to mitigate against the loss of a ship, injury to people on board and pollution to the marine environment. **(Donaldson, 1994, p92).**

1.3 The reason of the survey

The intention of the proposed research will be to consider the perceived conflict between the requirements under the ISM Code to produce a wide range of documents and reports as a part of its SMS (Safety Management System) to make ships safer and seas cleaner.

Consideration will be given to the actual, and likely, consequences of not *complying v. complying*.

A consideration of what, if anything, should to be done to encourage compliance with the requirements of the ISM Code - from various perspectives. The intention of the proposed research is to consider a number of key questions linked to the compliance or otherwise, by Ship Operators and their staff with the requirements of Section 9. The basic questions can be stated as follows:

- Is the ISM Code working?
- If yes - how has this been achieved?
- If no - why not?
- What are the perceived problems?
- Are these perceived problems justified?
- What needs to be done to alleviate the problem?

Whilst there is a preconceived idea that much of the industry is not, or only partially, complying with the requirements of Section 9 - the research will in fact be looking for compliant companies in order to establish, through reflection on practice, what it is that they are doing which has achieved a successful compliance. So, is ISM Code just a set of rules or requirements legislated by the International Maritime Organization (IMO) or, is it an attempt to change through bureaucracy, the culture of the industry and encourage a discipline at all levels of the shipping operation which will lead to safer more accountable practices? Has ISM achieved its objectives?

There should be no doubt that the regulatory bodies of the international maritime community are despaired to stop the growing number of accidents, injuries and pollution violations committed by so called responsible shipping companies.

CHAPTER 2: MARINE SAFETY

2.1 The definition of marine safety and marine accident

Marine safety can be defined as the freedom from danger or unacceptable risk of harm to person, the environment, ships, cargo, or other property at sea (**D.T.Bryant, 1991: p3**).

Marine safety does not just happen; it is the reward of care and good organization on a ship. As with general product safety, when quality is inherent in a product and reliability is attained, marine safety will be possible provided human error is avoided. (**D.T.Bryant, 1991: p3**).

Marine safety is concerned with technology, standards and regulations, humans and involves ships' design, building and operation.

2.2 The causes of marine accidents

2.2.1 Human element

It is known that 80%-90% of all accidents are caused by “human error” today.

Human error more accurate to say is “human involvement”, because human involvement does not mean the same thing as human responsibility. People may be involved in an accident without being responsible for it (**Leadley, 06/03/2002**). We call the human involvement as human element. The human element dimensions include such general categories as knowledge, experience, judgment, communication, organization, role violation, use of equipment etc.

Human element will be more analyzed because of its importance in chapter 3.

2.2.2 Structure and equipment failure

A vessel, which has been badly constructed, with defects built into her, is a greater risk of becoming a casualty. The big ships that vanished with their crews offered nothing other than circumstantial evidence as to the reasons for their loss; other ships that crept into port with serious structural damage provided evidence that was badly needed (**Grey, 1991, Sept/Oct**). For example, one representative accident of this category was the 123,126 dwt Gallant Dragon. The vessel had a structural fault. And there were several holds flooded and shell plating missing, which gave valuable clues to the investigators. Poor design is a matter for naval architects to resolve, and it is to be expected that class surveyors will look closely at poorly designed areas of vessels whilst such vessels remain in service. To reduce accidents from structural failure, a ship owner and master should be informed when weaknesses have been identified and regularly monitor her condition. Proper maintenance and continuous monitoring of the vessel might be the best solution to prevent the accidents caused by equipment failure. (www.loydslist.com/, **Gallant Dragon, 29/07/2002**).

2.2.3 Age of the vessel

Metal failure and corrosion progressively weaken vessels, as vessels become older. And it is common knowledge that the most casualties relate to older vessels. Judgments vary as to the age at which vessels become significantly higher risks, but over 15 years is widely quoted. (**Isbester,1993, p288**). In the Lloyd's Register World Casualty Statistics 1997 report the 132 total loss vessels, 29 vessels were in 10-19 years old and 91 vessels were over 20 years old.

2.2.4 Heavy weather

In the world casualty statistics of the Lloyd's Register I appears a great deal of vessels have been lost because of heavy weather. A representative example of this cause is the super typhoon "Angela" which on 3rd of November in 1995 (www.Lloydslist.com, **Angela typhoon, 29/07/2002**) drove the vessel Queen Vicky into collision with another when initially the vessels are designed and built with the conditions to survive heavy weather should be consider. To reduce the marine accidents from heavy weather, it is useful to use a proper weather routing service, which can forecast the next 48 hours' weather conditions, and reduces a vessel speed in adverse weather. When the adverse weather causes a speed reduction of 25% with constant engine speed the RPM should substantially reduced to avoid damage from the weather (www.Lloydslist.com, **Angela typhoon 29/07/2002**).

In addition the geography factor it is also one of the causes of marine accidents. It is too often that the ship master and officer are not familiar with the local geography condition which can cause grounding and collision. When we study marine accidents we can find that it is too often these factors mixed together to cause an accident.

2.3 The participants of marine safety

The international shipping industry can be viewed from several perspectives. Firstly, the business of owning and operating vessels and moving freight together with associated activities of marine insurance, construction and maintenance. Secondly, the business of owning a vessel and chartering it out for other to operate. Third, the regulatory framework both at international and national level, dealing with the safety of life and property and protection of marine environment. (**Inquiry into ship safety, (1992), p9**). The participants in the shipping industry concerned with marine safety include international organizations, flag states, port states, classification societies, shipping companies (include ship owners, operators, charterers), insurance providers, crews.

2.3.1 International Maritime Organization (IMO)

The International Maritime Organization is the United Nations' specialized agency responsible for improving maritime safety and preventing pollution from ships. It also is involved in legal matters, including liability and compensation issues and the facilitation of international maritime traffic. Its governing body is the Assembly that is made up of all 157 Member States and meets normally once every 2 years. The Council acts as governing body in between Assembly sessions. The main technical work is carried out by the Marine Safety, Marine Environment Protection, Legal, Technical Co-operation and Facilitation Committees and a number of sub-committees. (www.imo.org, **about IMO, 30/07/2002**) .However, by the late 1970's, it had largely completed its developing regulations and legislation's work. After that IMO concentrated on keeping legislation up to date and to ensuring that it is ratified by as many countries as possible. This has been so successful that many Conventions now apply more than 98% of world merchant shipping tonnage. Currently the emphasis is on trying to ensure that those conventions and other treaties are properly implemented by the countries that have accepted them. (**FAQs about IMO, <http://www.imo.org>**).

2.3.2 Flag State

Flag State is the country in which a ship is registered and which undertakes the responsibility for the implementation of international conventions relating to that ship. According to the *United Nations Convention on the Law of the Sea (UNCLOS)* (www.un.org, **28/07/2002**) article 91, 92, 94, every ship sailing on the sea should fly the flag of the country where she is registered and obeys the administration and laws of that country. The flag state should effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag.

The traditional register Flag States, such as Australia, UK, USA, China, Japan, have very strict nationality rules. However, the register of many states, for example Cyprus, Liberia, Panama, Malta, are now open to a wide variety of ships and nationality link is tenuous.

The terms “open register” and “flag of convenience” (FOC) refer to such arrangements. (www.imo.org, safety, 30/07/2002)

The growing use of these registers led some traditional maritime countries to develop second registers. These registers are generally meant to be available only to ships involved in international trade, the intended purpose of a second register is to relieve ship owners of some financial requirements associated with full national shipping, but maintain effective oversight of safety standards. An example of such a register is the Norwegian International Ship register. (www.imo.org, safety, 30/07/2002).

2.3.3 Port State

The term of Port State is used to describe the country in which that port is located. Port State Control (PSC) empowers a port state, according to the requirements of international conventions and regulations, to inspect the conditions and acceptability of a foreign vessel; visit its port to see whether the foreign vessel complies with these instruments. The aim is to identify sub-standard ships and detain them until any safety or marine environment-related defects, whether operational or structural, are rectified either before the ship leaves, or by a specified date. PSC is regarded as measures complementary to the flag state control. (www.imo.org, safety, 30/07/2002).

Legitimacy for port state control inspections may be found in UNCLOS articles 25, 216, 218, 219 because it is usual for there to be an oil pollution threat, albeit only bunkers, from any unseaworthy ship. The only limitation is that the steps taken be reasonable, public, and not discriminatory.

2.3.4 Classification Societies

Classification Societies originally evolved to carry out surveys of ship's hulls on behalf of insurance underwriters. This role has changed and today classification societies carry out these responsibilities on behalf of owners and in some cases as agents for flag states. Classification societies involve approval of the ship's construction plans, testing of materials and survey during construction. Periodic surveys are a condition of maintaining a ship's classification. Commonly referred to as class, the Flag State accepts the responsibility that a ship complies with convention standard. The role of classification societies is to verify, on behalf of a ship owner, the construction and ongoing standard of the vessel. Classification societies may be authorized by some flag states to issue some or all international certificates on their behalf. (www.imo.org, safety, 30/07/2002)

2.3.5 Insurance providers

Insurance providers can be divided into 3 categories: hull underwriters, cargo insurers and Protection and Indemnity Clubs (P&I Clubs). Hull underwriters insure the ship's hull and many cover machinery. Cargo insurer underwrite the loss of cargo, they deal with cargo owners not the shipping company. Liability cover is known as protection and indemnity (P&I) and usually is provided by the P&I Club. The major areas of liability covered by the P&I club are: (www.imo.org, safety, 30/07/2002)

- Loss of life and personal injury claims
- Hospital, medical and funeral claims arising from inquiry claims
- Sickness and repatriation of distressed seamen
- Damage to piers, wharves and other stationary objects
- Environmental damage
- Claim in respect to the wrong delivery of cargo
- Cost of raising wrecks

2.3.6 Shipping Companies, officers and crew

“Shipping Company” means the owner of the ship or any other organization or person such as the manager, or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the ship owner. The Shipping Company is still regarded as having the prime responsibility for the safe operation of their ships. Today a ship manager carries out the traditional operational functions of a ship owner. However, ship management companies may not operate with the level of concern for a vessel as traditional owners, nor does the same rapport with the crew exist.

Charterers contract ships to carry particular cargoes. Several types of charter are commercially available, such as a single voyage or spot charter, time charter, and bareboat charter. The last two charters may respond to the operation of ships.

2.3.7 Other players

Other players who determine marine safety include some maritime assistance organizations, such as Coastguard, search and rescue helicopters, national maritime institutions, marine pollution control units, etc. These players all act themselves roles in shipping industry to improve marine safety.

2.4 The efforts on marine safety

2.4.1 The changes of ships design, construction and equipment

Enormous effort has been made this century to improve marine safety. It is the basic thought that people using technology, new equipment and new material, and improving ship design and construction to reduce the rate of accidents. Today the hull and structure of ship have been built stronger, new equipment has been used on board to improve the safety of the ship and also to reduce marine accidents. For example tankers' double hull structure is a good measure to prevent ship loss and pollution in collision and ground accident. A sounder is useful to measure the depth of water to avoid grounding. Radar can help to reduce collisions. The Global Maritime Distress and Safety System (GMDSS) is an international system which uses terrestrial and satellite technology and ship-board radio-systems to ensure rapid, automated, alerting of shore based communication and rescue authorities, in addition to ships in the immediate vicinity, in the event of a marine distress.

2.4.2 The development of international regulations

Because shipping is an international industry, it has always been recognized that the best way of improving safety at sea is by developing international regulations that are followed by all shipping nations. So from the mid-19th century onwards a number of such treaties were adopted. Particularly after the Titanic disaster, people realized the importance and urgency to develop international regulations. So, the first version of the International Convention for the Safety of Life at Sea (SOLAS) was adopted in 1914. Other versions were drawn up in 1929 and 1948. In 1948 an international conference in Geneva adopted a convention formally establishing the International Maritime Organization (IMO). It entered in force in 1958 and the new organization met for the first time the following year (IMO, <http://www.imo.org>, SOLAS,15/07/2002). So from 1959, IMO was set up and carry out the developing international regulation and legislation work concerned with marine safety and prevent pollution. Since 1969 IMO has

promoted the adoption of some 40 conventions and protocols and adopted well over 700 codes and recommendations concerning maritime safety, the prevention of pollution and related matters. In addition, IMO has adopted some important recommendations. These recommendations have dealt with such matters as traffic separation schemes, the adoption of technical manuals, the IMO Search and Rescue Manual and the IMO Manual on Oil Pollution; crew training; performance standards for ship-borne equipment; and many other tasks. There are also guidelines to help the implementation of particular conventions and instruments. (IMO, <http://www.imo.org>, SOLAS,15/07/2002).

2.4.3 The marine safety institutional development

The growth of classification societies, professional institutes and seafaring unions is one area to improve marine safety. Especially classification societies have a very important role in marine safety. Classification societies have been increased from 3 in the last century to over 62 today. International Association of Classification Societies (IACS), as a non-governmental organization with 10 members and 3 associated members, was formed in 1968 to promote the highest standards in safety and pollution prevention and to consult and co-operate closely with the marine industry and its leading international organizations (www.iacs.org.uk, 30/07/2002). IACS make a special contribute to maritime safety through its members' work. Today classification embodies the technical rules, regulations, standards, guidelines and associated surveys and inspections covering the design, construction and through-life compliance of a ship's structure and essential engineering and electrical systems, especially increasing the certificate work for ships' safety management in recent years. Many training schools and maritime institutes also help to reduce the accidents in the shipping industry.

CHAPTER 3: FOCUSING ON HUMAN ELEMENT

3.1 Why focus on human element?

The safety of ships has to do with ships' designs, constructions, regulations, and operations. The weight of public opinion has also played its part in stimulating both the enactment of preventive legislation and the development of safer technology. Every major disaster, from Titanic to the Herald of Free Enterprise, Estonia, Sea Empress, has made its impact in bringing technical change. Such as the loss of the Derbyshire, people consider more from technology and standard of the ship, rather than the seamanship. That is why there is an argument that if there were a good seamanship manning on board Derbyshire, would not have lost in the Japanese sea in 1980 (**NUMAST Special report, August 1999, p24**).

Shipping casualties may never be completely eliminated and there is nevertheless a growing feeling that the present rates of shipping casualty are still unreasonably high. Today, it is believed that over 80% of marine accidents are caused by human errors. That is why we must focus on human element when we study on marine accidents. (**NUMAST Special report, August 1999, p24**).

3.2 The importance of human element in shipping casualties

The first research on human element in shipping casualties was from the Marine Division of the UK Department of Trade (now UK Marine Directorate of the Department of Transport). A pilot study was commissioned with the specific aim of assessing the extent of shipping casualties caused by human error, as well as assessing how the problem might be tackled in the beginning of 1980's. (**Bryant, HMSO, 1991,p2**).

The pilot study focused on quantitative aspect of casualties, showed that valuable information on human element could be extracted from the department's casualty records. The study also gives some indications of the nature of human involvement in casualties; the highlighted findings were that the human element was present to a very considerable extent. More specially, in those casualties where there was sufficient information to be present in

over 90 per cent of collisions and groundings, and in over 75% of contacts and fire/explosions. These results have largely been borne out by studies in other countries.

- 84 to 88 percent of tanker accidents
- 79 percent of towing vessel groundings
- 89 to 96 percent of collision
- 75 percent of fires and explosions (**Bryant, 1991, p65**);
- Figure 1 shows the result of UK and P&I Club study on human errors in shipping casualties.
- Figure 2 shows the result of a Japanese study on the human element in shipping casualties in Japanese water. (**UK P&I Club, July 1996**)

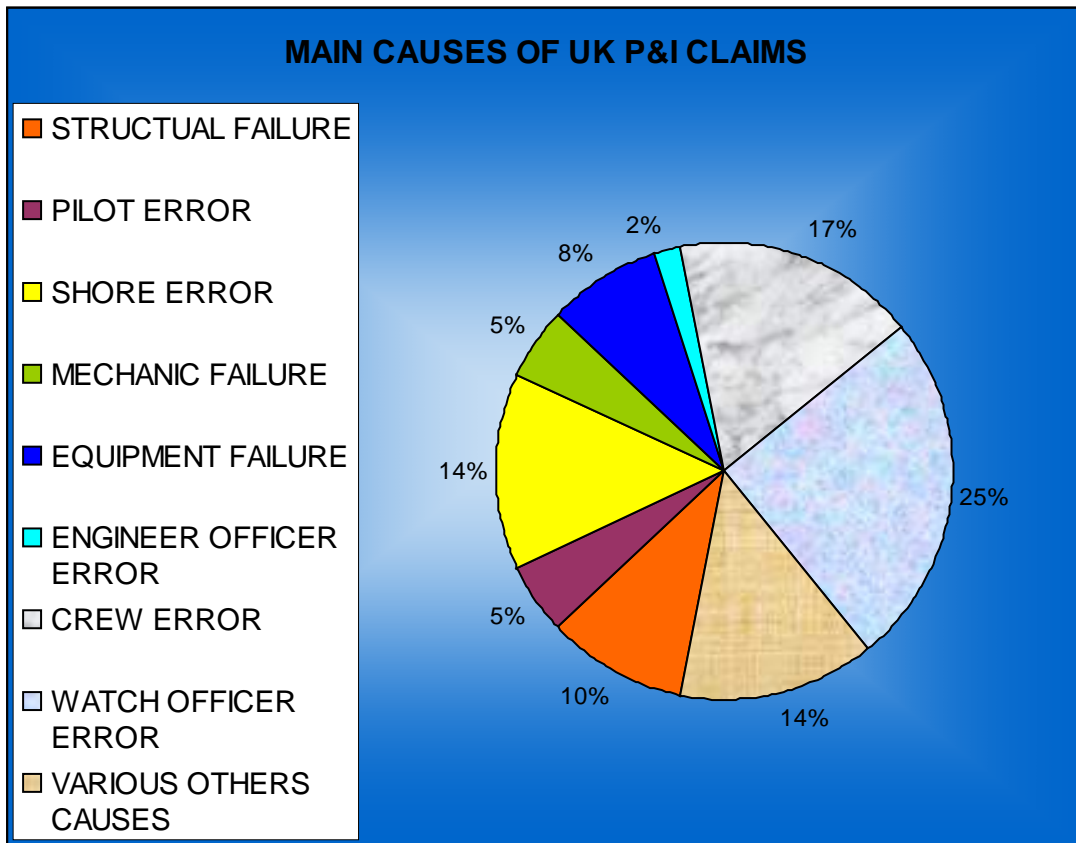


Figure 1: Main causes of UK P&I Claims

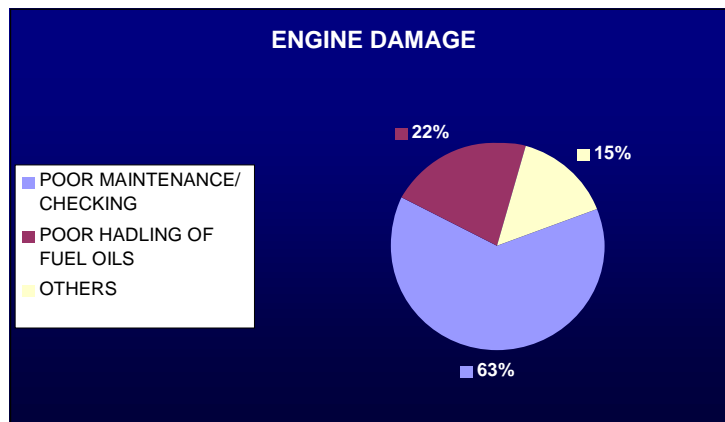
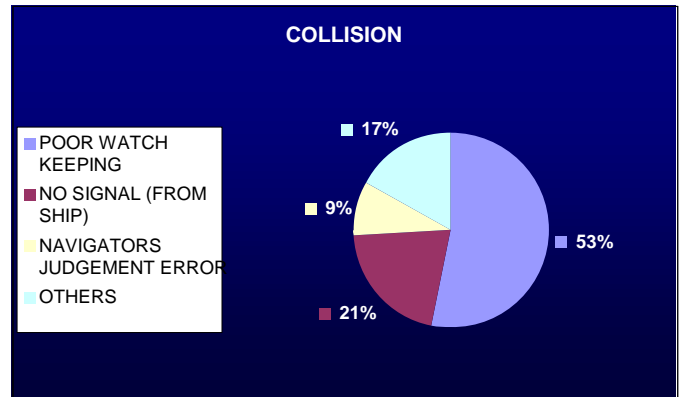
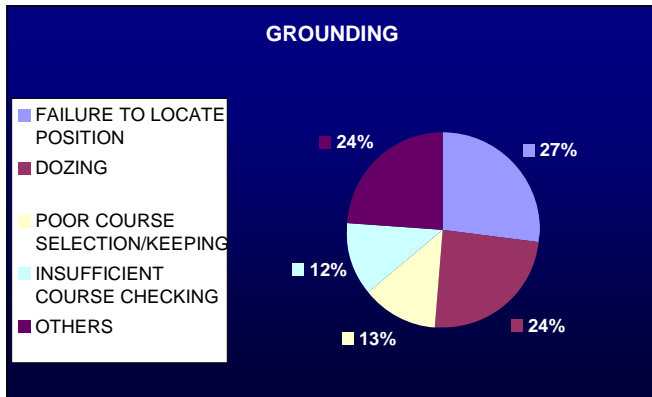
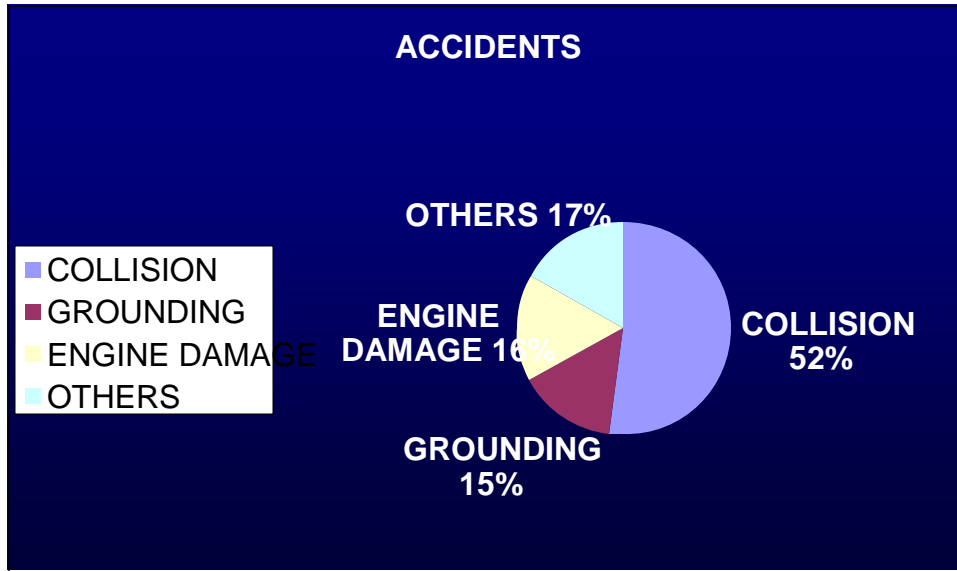


Figure 2: Breakdown of Marine Accidents Causes, Judgment in 1993 (Japanese Waters)

3.3 Understanding of “human error”, “human element”, “human factor”

3.3.1 “Human error”

3.3.1.1 The definition of human error

“As a human being, no one has ever made a mistake. The man who makes no mistakes does not usually make anything”. (William Conor Magee). Everyone made mistakes; we call these mistakes “human errors”. IMO has also given a definition of human error:

“A departure from acceptable or desirable practice on the part of an individual or group of individuals that can result in unacceptable or undesirable result.” (IMO, June 1997).

In here, we talk about human errors in shipping industry; these errors caused over 80% of all shipping casualties. These human errors do not include the human errors in design and construction; they are just the errors in a ships operation. **(Final Report on Main results, 1988, p:4)**

3.3.1.2 The causes of human error

In fact, the human error study is main part of human element. So, to identify the causes of human error will be very useful to delete human errors. We ordinary divided the main causes of human errors into 3 types **(Glendon, 1995, p248)**, and from these areas to consider the deleting errors.

- Skill-based: unconscious, automatic actions resulting in ships (observable-at action stage) and lapses (inferred-at storage stage, e.g. memory failures); many of these being monitoring failure-either inattention or over attention.
- Rule-based: following a series of steps and making a mistake-either applying good rules incorrectly or applying bad rules to a situation.
- Knowledge-based: learning from the first principles-mistakes made during problem solving, for example those subject to attribution biases.

3.3.1.3 Categories of human error

Human errors can be divided into bellow 6 categories:

- 1) Commission (adding or including something that should not be there)
- 2) Omission (missing something out, for example from a sequence of steps)
- 3) Selection (incorrect choice from a range of options)
- 4) Sequence (incorrect serial positioning of actions or events)
- 5) Time (too late or too early with an action)
- 6) Quantitative (not performing an action properly) (**Glendon, 1995 p340**),
(**National Academy of science, 1980, p8**).

3.3.2 “Human factor” and “Human element”

The causes of a marine accident are often very complex and often mix more factors such as technical factors, and environmental factors. It is not very accurate to use “human errors” to describe the human behaves in causing marine accidents, because human error is more the feeling of “mistake”. It is just like a sentence in P&I club’s advertisement: *“It may not be your fault but is still your liability.”* So more accurate to say, these human behaves should be human involvement in causing marine accidents. We use the term “human factor” or “human element” to call the human involvement in shipping accidents. “Human factor” or “human element” is more focusing on people in their working and living environments, their relationships with other people, and technology and procedures within their surrounding environment, rather than just mistakes. (**Bryant, 1991, p1**).

3.4 The areas “human element” includes

The human element is a complex multi-dimensional issue of that affects maritime safety and marine environmental protection. It involves the entire spectrum of human activities performed by ship’s crews, shore-based management, regulatory bodies, recognized organizations, shipyards, legislators, and other relevant parties. When we study the human element in shipping casualties, we should consider the difference of shipping industry with land industry. We should also have to consider the areas of culture, ability/situation awareness, social, legislation, ship conditions, and health onboard. **(IMO Feb 1995).**

3.4.1 Culture

Different countries have different religions, different customs, and different culture. These are different enterprise cultures in different companies. Culture is a complex area. Different culture means people may have different attitudes on the same thing, and may solve same problems in different ways. This may affect safety on a ship, especially on a ship with multinational crews. Flag of convenience is a fine example as we mentioned in previous chapter.

3.4.2 Ability-Awareness

This area includes the qualifications, knowledge, education, communication, training and skills of the seafarers. These all affect safety onboard ship. In 1978 IMO has adopted the first convention on seafarers’ training, certification and watch keeping, International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 (STCW 78). The Convention was the first attempt to establish global minimum professional standards for seafarers. The Convention entered into on 28 April 1984, and has been accepted by 133 States with fleets aggregating 98.11% of the world merchant shipping tonnage **(IMO 30 June 2002, <http://www.imo.org>)**.

Due to the shortcomings of STCW 78, especially in the lack of seafarers' competency, different standards between states, and the development of shipping industry, the convention was amended in 1995. The 1995 amendments entered into force under this procedure on 1 February 1997 (**STCW, 1978 IMO February 1996**). Although STCW '95 has given some minimum professional standards, and solved the STCW 78 problems, it is still not completely solved all the problems of seafarers' (ability/situation awareness), but also we should consider the other personnel's (ability/situation awareness), and last but more important the managers' (ability/situation awareness).

3.4.3 Social

In fact, seafarer job is special occupation. It is not only need professional knowledge and skills, but also needs to co-ordinate with others for a better result. That is the reason why it is always thought as a kind of technical occupation. Crew work and live in the same environment of ship, the social relations between them becomes very important, especially when these relations act in a marine accident. So, when we study human element in shipping casualty, we must consider the social factors on board ship because are important causes of marine accidents in many cases. The social factor study should include things such as: the working condition on board ship, interaction, morale of whole personnel both on board ship and shore, leadership/support between crew members and shipboard crew with shore personnel, teamwork, and confidence of crew members. (**IMO February 1995**).

3.4.4 Legislation

A good legislation system will help to eliminate the human error. This area includes the legislation of IMO, flag state, port state, and professional union's legislation. IMO, as the main body of international legislation deals with maritime fairs, and has helped to make the industry safer.

Port state control entitles a port state to investigate the foreign ships which calling at its ports to ensure that its marine environment has been protected as well as the ships' safety is checked. So, port state should make legislation, which concern port state control. Port state control as a supplementary of flag state control ensures ships to comply with the international conventions, regulations and legislations, especially when dealing with human element.

Flag state is very important to implement the international legislation. The legislation of flag state does not only concern the technology of its ships, but also concerns with other social and administrative matters, especially safety. The legislation includes the safety of ships the manning levels of ships, the crew's qualification standards and certificate. There are different ship register systems in the world; different register countries have different legislation. The rates of marine accident in different countries are different. Why is it like that? It directly concerns these countries' legislation. So, the flag state legislation is very important part for human element studies. In addition, the legislation of the professional unions should also be considered when we study the human element. It plays a very important role in improving the skills of the seafarers (www.imo.org, Safety section, 30/06/2002).

3.4.5 Ship condition

Ship casualties happened and too often are related with the ship conditions. There are obvious differences between working on a good condition ships and bad condition ships. Firstly, the new high design/ built quality ships compare with old low quality ship, the quality of seafarers work is fewer, and the stress of the seafarers is less. That is why there are more accidents happen in old low quality ships. Secondly, marine safety is also concern with technology application on board ships. But at the same time the requirement of seafarer knowledge and skills has been increased. In addition, the maintenance and verification of a ship are the essential factors of marine safety. All of these are related the ship onboard crews and ship owner manager. So, study the ship condition is also an important part of human element studies.

3.4.6 Health

The physical and mental health of crew obviously affects a ship's safety. Ship is a very small and most of the times bad environment for people to work and live in; there are not more space and there is too much noise, oil and sometimes high temperature. In this situation, health should be paid more attention, because the health of a ship's on board personnel plays a very important element in marine safety. It is too often reported that a health problem can cause a marine accident. So the health of ship on board personnel is also one of the main parts of human element studies. We study the health of ship on board personnel that is only the physical health, the mental health also need to be mentioned. Normally we should study areas such as: strengths, fatigue, job content/ stress, food of seafarers and accommodation as well as manning level on board.

CHAPTER 4: THE CONCEPT OF THE ISM CODE

4.1 ISM Code becomes mandatory

The ISM Code itself was adopted as a recommendation in 1993. After several years of practical experience, it was felt that the Code was so important that it should be mandatory. The best way of achieving this would be through the International Convention for the Safety of Life at Sea, 1974 (SOLAS). This was done by means of amendments adopted on 24 May 1994, which added a new Chapter IX to the Convention entitled Management for the safe operation of ships (**International Command Seminar, 1997, p19**) The Code itself is not actually included in the Convention, but is made mandatory by means of a reference in Chapter IX. By adding the ISM Code to SOLAS it is intended to provide an international standard for the safe management of ships and for pollution prevention. The Chapter entered into force under the tacit acceptance procedure on 1st July 1998. It applied to passenger ships, oil and chemical tankers, bulk carriers, gas carriers and cargo high speed craft of 500 gross tonnage and above. On the 1st of July 2002 ISM Code applied to other cargo ships and mobile offshore drilling units of 500 gross tonnage and above. (www.imo.org, 28/06/2002)

4.2 Understanding the ISM Code

4.2.1 ISM Code and Management

Company management is responsible for developing, implementing and maintaining an effective safety management system, onshore and on board its ships.

The aspects of the ISM Code that relate to management are:

- The development of company policy in relation to safety and the protection of the environment
- The written definition of the responsibilities and authority of each person onshore and on board ship, with regard to safety and environmental policy. A designated person, acting directly for the general management of the company, must supervise implementation and maintenance of this policy
- The preparation, distribution and periodic updating of a documentary system, in the form of procedures, plans and instructions. Accessible to all company personnel
- The periodic review of the effective operation of the implemented system. This enables the identification of non-conformities followed by necessary corrective action to maintain a desirable level of safety on-shore and on the ship.
- The monitoring of the actions implemented in order to improve safety in the company, on the basis of actual experiences (**Chauvel, 1997, p8**).

4.2.2 ISM Code and People

People as mentioned are the key to the system. The human element is also mentioned in previous chapter.

The points of the ISM Code that relate to people are:

- Qualifications because, with a reduced crew and increasingly sophisticated equipment, each action is important. Greater and recognized autonomy may be a question of survival for other members of the crew
- Communication between crew members because it is necessary to issue work orders without involuntary omissions, to ensure the continuity of safety and to avoid any fatal breakdown
- Provision of information to seafarers on their work and responsibility to carry out the master's wishes and crew tasks in a safe environment
- Training of crew and on shore personnel to prevent errors and non-conformities which may be a fatal at sea. This training also includes drills and exercises to simulate emergencies
- Motivation for all personnel (**Chauvel, 1997, p9**)

4.2.3 ISM Code and Ship and equipment

While the seafarer presents the behavioral element at the heart of the system, the ship and its equipment represent the "hardware".

It is essential to get the relationship between ship and seafarer right. It is vital for the seafarer to understand both his job and his working environment. People, the way they work, and the environment in which they work in must be taken in to account as mentioned in previous chapter. The essential points of the ISM Code referring to the ship and its equipment are:

- Development of a preventive maintenance program to minimize risks of breakdowns and accidents, but also to give the seafarer the possibility of controlling his work environment.
- Identification and periodical inspection of all the equipment and systems considered as critical for the safe and effective operations of the ship
- Necessary inspection and control of the instruments and materials which provide information on the operational condition of the ship. If operational and calibration procedures are drafted in the form of a program, this will prevent omissions and will contribute to the creation of a safety-conscious environment for the whole crew. **(Chauvel, 1997, p10)**

4.2.4 ISM Code and Procedures

Procedures are not an end in themselves but a means of transmitting the expertise necessary in order to make progress. The essential reason for writing them down is to enrich them with acquired experiences but also to avoid recurring errors.

“Procedure” is a word most often used in the ISM Code. This shows the importance given to the change from an oral tradition to a written one. Speech is always be a carrier for daily activity. Written forms of expression are intended to record data essential to the proper functioning of the ship, and to ensure the exchange of information between the crews.

A new balance between oral and written traditions is being asked for. Good written documentation, and well drafted visual procedures, may become excellent tools for the training of the personnel. **(Seaways, 2001, p:5).**

The essential points of the ISM Code relating to procedures are:

- Drafting all the operational procedures for the ship to perform its mission, within the context of the company's policy for safety and environmental protection
- Preparation and maintenance of operational action plans which enable personnel to face and manage for all foreseeable situations which may effect the safety of personnel or result in a pollution risk
- Regular training of crews in emergency exercises and practices in order to prepare them for all eventualities
- Systematic organization of documental internal audits on the application of procedures recommended by the company, and the follow up of any corrective measures in line with the ISM Code.
- Analysis and handling of non-conformities(**Chauvel, 1997, p11**)

4.3 Objectives of the Code

The objectives of the ISM Code are to ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular, to marine environment, and to property. The ISM Code establishes safety management objectives are:

- To provide for safe practices in ship operation and a safe working environment;
- To establish safeguards against all identified risks;
- To continuously improve safety management skills of personnel, including preparing for emergencies. (**Guidelines on the Implementation of the ISM Code, 1997, p4**)

4.4 The importance of the role of management

When an accident happened, people very often ask why it happened. Nowadays the technology has been developed on board ship; the seafarers have been certificate according to STCW; various regulations have been adopted by international organizations and flag states. The problem is that people always pay more attention on ship hardware such as the age, the condition and technology of ship to prevent accidents, have ignored “management” which is the most effective measure for preventing human error and accidents. Although sometimes it seems that the main causes of marine accidents are human error, the environment factors, the technical factors, fundamental problem. In the background of every disaster, there must be the lack of management. For example, the inquiry into the Herald of Free Enterprise disaster concluded that the “underlying or cardinal faults lay higher up in the company... the board directors did not appreciate their responsibility for the safe management of the ships” (**Department of Transport, 14/07/2002**). It is too often that ship owners and managers have acted as though their responsibility for the ship and its crew ended once in the it left port, and it is though that the accidents are inevitable, and therefore not worth trying to prevent. In fact, great improvements can be made, as the oil company Shell has proved. After a series of accidents and incidents involving crew safety ion 1981- 1982, the company carried out a major review of its procedures and introduced an Enhanced Safety Management Program. Over the following years, safety improved by thirty times and the time lost through injuries was cut by nearly 90%. (**World Maritime Day 1997, www.imo.org, 01/08/2002**).

4.5 Safety Management Systems (SMS)

The ISM Code requires a safety management system (SMS) to be established by “the company”, which is defined as the ship owner or any person, such as the manager or bareboat charterer, who has assumed responsibility for operating the ship. This system should be designed to ensure compliance with all mandatory regulations and that codes, guidelines and standards recommended by IMO and others are taken into account.

When developing their SMS, the companies may need to address the following elements of safety mentioned in the Code (**The Nautical Institute, 1998, p106**)

- Create a safety and environmental policy for the company and ensure that it is implemented and maintained ;
- Define and document the responsibility, authorities and interrelations of key personnel showing the clear lines of interpretation;
- Appoint one or more designed person to ensure that the SMS is working properly controlled and administered and to provide a link to provide a link between the Company and those on board ships;
- Define the responsibilities and the authority of the Master as to safety and environmental protection and their implementation onboard ensure adequate resources are available to support the SMS;
- Develop plans for the shipboard operations concerning the safety of the ship and pollution prevention with particular emphasis on preventive actions for special and critical shipboard operations;
- Create procedures to identify, describe and response to emergency shipboard situations such as hazards, accidents and failures. Contingency planning will include program for drills and exercises to prepare for such situation;
- Report and analyze of non-conformances, accidents, hazardous occurrences and near misses;
- Establish procedures for preventive maintenance of ship and equipment, the sudden failure of which may result in a hazardous situation. These procedures must provide for adequate inspections and tests use;

- Control with regard to development; distribution, amendment and disposal, documentation and data necessary for maintenance of the SMS;
- Verify review and evaluate the SMS by means of internal safety audits to monitor its effectiveness. (**Guidelines on the Implementation of the ISM Code, 1997, Article 2-12 p15**).

From the above requirements of SMS, we can see that the SMS is just designed for human elements in marine accidents. These human elements includes such as fatigue, the ability and equipment familiar of seafarers, communication problems, working and living condition problems, low morale on board ship, and organizing failure, etc. SMS, according to these problems, has made the safety and environmental protect policy, defined levels of responsibilities and authority, appointed designed persons to respond the safety. It also has developed plans for shipboard operations, created various safety procedures which includes training, communication, emergency etc. and established a record and report system. The importance is that SMS has set up a self-regulation , verify review and evaluation system to keep the SMS efficiently and eliminate the influence of the human element in marine accidents.

4.6 The Issuance of DOC and SMC

After a month or more of implementation of SMS, it has to be audited both ashore and on board the ship to ascertain if the policies or procedures are actually effective. When the qualified auditor (classification societies) is satisfied, a Document of Compliance (DOC hereafter) is issued to the Company and a copy of such document should be placed on board in order the Master may produce the verification of the Administration or organizations recognized by it. At the same time a Safety Management Certificate (SMC) is issued to the ship (**Guidelines on the Implementation of the ISM Code, 1997, Article 13 p25**).

The DOC and the SMC are valid for a period of five years, and is verified annually. An interim SMC, valid for no more than 12 month, may be issued to facilitate initial

implementation of the ISM Code and implementation where a company is newly established or where a new ship types are added to an existing DOC. An interim SMC, valid for not more than six months, may be issued to new ships on delivery, and when a Company takes on the responsibility for the management of a ship which is new to the Company. In special cases the Administration may extend the validity of the interim SMC for a further six months. (**Guidelines on the Implementation of the ISM Code, 1997, Article 13 p25**).

CHAPTER 5: IMPLEMENTATION OF THE ISM CODE

5.1 Practical means of implementation

Shipping industry is one of the most regulative industries. There are already too much regulations and rules. And there were many people doubt the necessity and the effect of the ISM Code. They thought that the implementations of the ISM Code are just “political slogans”, especially to facing the “poor performance of maritime sector in the way of safety” it only can increase “a new industry of certificate printing” (Cohen , 1997, p7). So a great deal work has been done by IMO, flag states and port states to ensure the implementation of ISM Code, and bring a safety revolution in shipping industry.

5.2 Safety culture or paper chase?

The ISM Code it is designed to create a system where by everyone both aboard ship and on shore is accountable. The drafters of the Code early intended to create accountability by creating a paper-driven safety regime. According to a commentary on the ISM Code, the goal is “say what you”, “do what you write,” ”record it”. In this manner, each shipping company must develop a Safety Management System (SMS) whereby extensive documentation of all aspects of shipboard and shore-based operations are kept. “Deficiencies” and “non-conformities” are recorded and an extensive internal auditing system is put in place. Much of the information generated in the SMS is reported to the highest levels of management by the “designated person ashore” (DPA).

Will this document-driven safety system function as planned? In a perfect world, such a system would create an environment where everyone is protected-everything is written down neatly, deficiencies and non-conformities are honestly addressed and alleviated-and therefore no one involved has anything to fear from the documents themselves. In

this manner, assuming the Code functions as designed, everyone is accountable and the deniability of undocumented, unfavorable facts will be a thing of the past.

From a litigation point of view, however, this system may create problems for even the most honest, above-board shipping company. Obviously, documents concerning prior defects and non-conformities, even if they are later alleviated, provide an opportunity for the opposition to place the ship owner in a bad light. Without the ISM Code documentation, the prior deficiencies may never come in to light at all. **(Seaways Dec1997, p3-4).**

From a safety sense, deniability is probably to deny a bad thing. In a lawsuit, however, the ability to deny a fact not proved by the opposition can be central to an effective defense. Further, although lawsuits involve law, in general it is the facts, not the law, that determine who wins and who loses. Skilled lawyers may be able to obfuscate or twist the facts so as to make the opposition look bad. The documents and the oral testimony presented at trial are where this occurs.

The ISM Code will play a major role because the fewer documents produced by a party in the litigation, the fewer opportunities a skilled questioner will have to make a witness stumble on cross-examination. Again if every fact documented pursuant to an SMS was perfect, honest and precisely drafted, and if every employee, from the lowest seafarer through the master, was a perfect witness whose testimony would exactly track the documents created pursuant to the SMS, then, perhaps, there would be no dangers lurking within the SMS documentation.

However, there will necessarily be inconsistencies in the documents. Some documents will be inadequate, others will be overly detailed. Human nature being what it is, results will be fudged or made to look better than they really are. Others may be thoroughly honest- but present a bleak picture. Accordingly, ISM documentation will provide rich fodder for any skilled cross-examiner to make the most upright ship's officer appear dishonest. Inconsistencies and inadequacies, discovered by a diligent attorney during the discovery process, will give rise to credibility questions. Numerous inconsistencies, which may be inevitable, may sink an entire case. **(Seaways Dec1997, p3-4).**

5.3 International Maritime Organization (IMO)

Since ISM Code was adopted by IMO, IMO and its sub-committees have done a great progress on the implementation of the ISM Code. A very important part of them is the Maritime Safety Committee and the Maritime Environmental Protection Committee draft the guideline for the implementation of the ISM Code. In order to assist flag states and shipping companies to implement ISM Code, the Guidelines were adopted by the assembly in November 1995 by means of resolution A788(19) (**ISM Code,1997, p13**). It recognizes:

- That an administration, in establishing that safety standards are being maintained, has a responsibility to ensure that documents of Compliance have been issued in accordance with the guidelines,

- That there may be a need for Administrations and have two main purposes. There are to verify that the Safety Management System (SMS) complies with the ISM Code to assist the issue of periodical verification of the DOC and SMC. The Guidelines are divided into four sections. The first deal with the scope and application of the Code. The second gives guidance on verifying compliance with the Code and is particularly concerned with the company SMSs. These should meet general safety objectives and also the specific requirements of safety and pollution prevention. The SMS has to be approved by the Administration and can also be audited to ensure that compliance is maintained.

These audits can be extended to matters that are not subject to statutory or classification surveys, such as the condition of the vessel between surveys and certain operational requirements. In such cases, the Guidelines say, “specific arrangements may be required...such as document procedures and instructions”. (**ISM Code, 1997, p14**).

The third section deals with the issuance and validity of the DOC and SMC and the fourth with the certification process. This includes initial, periodic and renewal verification and guidance is given on how to prepare and carry out safety management audits.

There are two appendices to the Guidelines. The first deal with definitions used in the Code and the second one contains examples of model forms. (**ISM Code, 1997, p14**).

5.4 Flag State and Classification Society

IMO was established to adopt legislation. Flag States are responsible for implementing it. When a flag State accepts an IMO Convention it agrees to make it part of its own national law and to enforce it just like any other law. So, the implementation of the ISM Code is responded by flag states, and it is a part of flag state's administration. The flag state control is the most effective measure to implement ISM Code (www.imo.org, 28/07/2002).

Classification Societies are authorized to develop standards according to statutory international and national regulations, undertake these regulations compliance surveys, and to issue the necessary certification on behalf of flag states. It is their responsibility to carry out ISM audits and to issue the DOCs and SMCs to the complied companies and ships on behalf of flag states. IACS, as an international association of classification societies, in order to meet the challenge of ISM Code implementation, has taken the initiative by developing procedural guidelines and unified interpretations of the ISM Code, together with related requirements for the training and qualification of compliance auditors (www.imo.org, 28/07/2002).

5.5 Port State

Port state control is a good measure for the implementation of the ISM Code as well. After entering into force on 1st of July 1998 (ISM Code), in the light of predictions that a substantial number of ships would not be able to meet the deadline for compliance, the Paris MOU port state control Committee decided to mount a Concentrated Inspection Campaign of ISM compliance. In the event the predictions of wide scale non-compliance did not materialize. During a 3-month period nearly 1600 eligible ships were inspected of which 81 ships were detained for major non-conformities. (**Paris MOU Annual report 1998, p1**)

However, an owner who did not obtain the necessary certification could become unable to operate their ships because no port would accept them without documentation showing that ISM Code has been implemented. But port state control, due to its limitations, can never be able to identify all ships which do not meet international standards.

5.6 How to implement ISM Code

The ISM Code is formulated in general terms so that it can be widely applied. The purpose of this chapter is to describe its implementation, step by step. The method proposed takes account of the requirements of the Code along with management elements of the programme the 10 steps in this programme are:

- Initial assessment
- Strategic planning
- Safety and environmental protection policy
- Responsibilities and authority
- Project team
- Company procedures
- Shipboard procedures
- Measurement and reporting
- Personnel training
- Final assessment
- Certification (**Chauvel, 1997, ch4, p29**).

The word 'procedure' appears twice in the steps of the programme, for 2 reasons:

- It is the key word most frequently mentioned in the Code. This clearly demonstrates the importance of procedures in the documentary system which must be created by the company;
- The procedures necessary on shore and on board a ship are not the same. They are specific to each ship, depending on the tasks carried out by the ship, and additional to the company procedures.

Apart from this, the other steps concern management practices for the programme. Each is presented in an identical way. The figure 3 (**source: Chauvel, 1997**) below presents the general schedule for the implementation of the ISM Code.

5.6.1 Initial assessment

Objective: Define the required performance on shore and on board ship, in relation to the system, in order to conform to the ISM Code. This first step consists of:

- evaluating the current practices of the company in relation to the requirements of the Code;
- Identifying the deviations in relation to each chapter of the Code;
- Presenting the deviating observed to the company's general management and the sectors where improvements are desirable to obtain ISM certification.

The initial assessment relates to all the activities on shore and on board the ships concerned by certification. During this assessment, not all ships are seen, but at least one ship per specific activity, so the assessment can indicate any weaknesses in the current system. The results of the initial assessment should be used as a reference to measure progress as the project is realized. **(Chauvel, 1997, ch4, p30)**

This step may be regarded as a snapshot of the safety management system currently in place in the company.

The initial assessment requires the participation of each company manager. This is a project based on team work, even if the task is assigned to someone outside the company.

The working plan is the same for certification:

- Review of the documentary system
- Audit of the practices on shore and onboard several ships.

Each manager must list supportive documentary evidence used in his department or on board his ship, and indicate existing gaps in these. This assessment is even more important since it shapes the action plan for obtaining the certification necessary to ships, so that they can continue to carry out their tasks without breaking any regulations.

The initial review of the system is carried out according to the following model, figure 4 below, **(source: Chauvel, 1997)**:

0 per cent: No evidence of written procedures.

25 per cent: Existence of written procedures covering part of the requirements of the Code.

50 per cent: All the procedures are written and adequately cover the requirements of the Code

100 per cent: An audit confirms that the procedures are being enforced

5.6.2 Strategic planning

Objective: Achieve implementation of the ISM Code at shore-based centers and on board ships, in due time and at reasonable cost.

Based on the deviations observed during the initial assessment, a program must be prepared with the aim of obtaining ISN Code certification within an acceptable period of time. This second step consists of:

- Creating the action plans, sequence, on shore and on board the ships
- Defining and selecting realistic dates for each action
- Identifying the resources required for implementation of the program within the agreed periods

Following the report obtained from the initial assessment, it is necessary to plan the action to be undertaken in the time given. Implementation may take between 16 and 24 months.

A project of this size cannot be carried out blindly. The plan has an impact on the motivation of the participants. Sometimes it is necessary to be reminded of the three elements that for the objective:

- Realistic in terms of methods and time allowed
- Measurable in terms of comparison
- Controllable in terms of responsibility

If the company resources are insufficient; it should use external skills.

Not all of the points of passage proposed below have to be taken into consideration, but the fact of asking these questions may avoid forgetting something important. (**Chauvel, 1997, ch4, p32**).

Initial assessment of the system

Operational planning at head office, onshore centers and standard ships

Documentary review of the existing system at head office

Audit of the on shore-based system

Audit of the system on board the ships selected

Preparation of the assessment report

Presentation of the report to the company management

Strategic planning

Management seminar on the ISM Code

Definition of priorities trends and objectives

Preparation of the action plan

Approval of the action plan

Safety and environmental policy

Development of the policy draft

Final review of policy

Commitment of general management

Formalization of the policy

Internal/external communication plan

Presentation to personnel

Implementation

Responsibilities and authority

Company flowcharts

Definition of responsibilities, authority and operational links

Head office and on shore-based centers

Designated person(s)

Master and officers on board ship

Project team

Definition of the task

Selection of members

Definition of responsibilities, authority and operational links

Training in project and team work

Providing information to personnel

Launching of the project

Company procedures

Development of the documentary structure

Detailed review of existing procedures

Identification of documentary requirements

Planning of the preparation of documents

Drafting of documents

Approval of documents

Implementation of documents

Shipboard procedures

Identification of the requirements specific to each type of ship
Development of the documentary structure specific to each ship
Detailed review of existing procedures
Implementation of documentary requirements
Planning and preparation of documents
Drafting documents
Approval of documents
Publishing of documents
Implementing documents

Measuring and reporting

Content, form and frequency of report
Responsibility for preparation
Role of general management

Personnel training

Identification of requirements
Preparation of the training program
Approval of the training program
Training management
Training personnel
Internal auditors
Appraisal of training courses

Final assessment

Planning the audits

Designation of the audits

Realization of the audits

Presentation of the report to the general management of the company

Implementation of corrective actions, if necessary

Preparation of the certification request file

The initial strategic planning will probably be reviewed, after several months, to become more realistic. The advantage is in having prepared it, and knowing what is to be modified, and why will determine impact on the expected result. (**Chauvel, 1997, ch4, p33**)

5.6.3 Safety and environmental protection policy

Objective: make all the aware of the company policy selected and the commitment of the management to ensure the success of the project.

At this stage the company has a program for implementing the ISM Code on shore and board ship. The project must be legitimized. The third step consists of:

- Drafting the company's safety and environment protection policy
- Informing all of the personnel of the importance of importance of the project for the company, of its content and the planned process of implementation
- Communicating the safety and environmental protection policy and also explaining it point by point, so that everyone can understand how they are directly affected by its implementation.

By informing all the personnel before launching the program, the management shows its commitment to the project and its determination for it to succeed in the time allocated.

It is also necessary to remember that safety and environmental protection policy is one of the requirements of the ISM Code. This is the keystone of the program and the first commitment of the project. It can only be devised and drafted by the general management of the company. If drafted by the safety manager alone, it risks being seen as his policy and not that of the company. **(Chauvel, 1997, ch4, p35).**

A good policy must be:

- Sufficiently wide reaching to resist the erosion of time, so that each person can find improvement projects within it
- Oriented towards the human element, so that this can be identified in the company policy
- Comprehensible to everyone, showing the goal to achieved
- Show the unconditional commitment of the general management

5.6.4 Responsibilities and authority

Objective: to ensure that everyone concerned in the certification project knows what management expects from them.

When the policy is drafted, it is vital to define the role of everyone to implement and maintain the policy over time. This fourth step consists of:

- Defining responsibilities and authority at all levels of the organization
- Establishing operational links, as clearly and as simple as possible between company departments
- Documenting the responsibilities and authority of the departments and the operational links between the departments

These documents are part of the company's safety and environmental protection manual. They must be present permanently in the on shore-based centers and on the ships.

Responsibilities and authority are part of a process of delegation based on the objectives to be reached. Apart from responsibility for the action and the authority on the action, delegation relates to the skills of the function and responsibility of its result.

Responsibilities and authority for each function must be drafted clearly and concisely. They must not form a succession of interminable litanies which are never understood and difficult to update. The company flowchart is the point of departure to clarify who does what, and who is responsible for what. Each function can only have one responsible. **(Chauvel, 1997, ch4, p36)**

5.6.5 Project team

Purpose: develop and carry out all necessary actions within the context of the selected program, and to resolve any problems which may have adverse consequences on the success of the project.

In order to succeed, the company management must be involved in the project: but it is also necessary to rely on a team which is responsible for carrying it out. This fifth consists of:

- Appointing the members of the team changed with concluding the project
- Designating the members of the team who coordinates all the activities necessary to achieving the objective
- Defining the responsibilities of each member within the team charged with the project
- Carrying out the actions according to the program and the responsibilities allocated to each member of the team. **(Chauvel, 1997, ch4, p37).**

The project manager should report directly to the company manager in relation to this project. The team members coordinate all necessary activities in their sector of competence.

Implementation of activities is the responsibility of each manager within his department. The person designated under the safety and environmental policy should also assume coordination of the project.

The team should be made up of people who already have management responsibilities within the company, because once the project is concluded, they will have to continue to assume responsibility for maintenance of the policy within the department. The elementary process for realization of the project is as follows:

SAFETY MANAGEMENT SYSTEM 1- PLAN	GENERAL MANAGER	DESIGNATED PERSON(S)	ISM TEAM	HEADS OF DEPARTMENT	MASTERS	OFFICERS ENGINEERS	PERSONNEL & CREW
1-INITIAL PRE - ASSESSMENT OF SMS	R						
2-TRAIN HEADS OF DEPARTMENT & MASTERS	R	T		T	T		
3-DEFINE ACHIEVEMENTS REQUIRED TO OBTAIN THE CERTIFICATION	R			P	P		
4-DESIGNATED PERSON IN CHARGE	R	D		MC	MC		
5-TRAIN ISM TEAM		R	R				
6-REVIEW SMS DOCUMENTATION		P	P	P	P		
7-PREPARE ISM ACTION PLAN		R	P	MC	MC		
8-APPROVE ISM ACTION PLAN	R		P	P	P		

Figure 5: Defining the objectives (source: (Chauvel, 1997))

SAFETY MANAGEMENT SYSTEM DO 2-	GENERAL MANAGER	DESIGNATED PERSON(S)	ISM TEAM	HEADS OF DEPARTMENT	MASTERS	OFFICERS ENGINEERS	PERSONNEL & CREW
1-PREPARE S&EP POLICY AND COMPANY COMMITMENT	R	P					
2-INFORM PERSONNEL ON PROJECT			MC	R1	R2	I	I
3-ASSIGN RESPONSIBILITIES ASHORE AND ON BOARD SHIP	I	P		R1	R2	I	
4-IMPLEMENT SMS ASHORE			P	R			
5-TRAIN PERSONNEL ASHORE AND OFFICERS		R	P	P	P	T	T
6-IMPLEMENT SMS ON BOARD SHIP			P		R	P	
7-TRAIN CREWS ON BOARD SHIP					R	T	D
8-CO-ORDINATE ISM ACTION PLAN	I	R	P	I	I		

Figure 6: Implementing the system (source: (Chauvel, 1997))

SAFETY MANAGEMENT SYSTEM 3- CHECK	GENERAL MANAGER	DESIGNATED PERSON(S)	ISM TEAM	HEADS OF DEPARTMENT	MASTERS	OFFICERS ENGINEERS	PERSONNEL & CREW
1-MEASURE PROGRESS ACCORDING TO ISM ACTION PLAN			R				
2-PREPARE MONTHLY ACTIVITIES REPORT		R	P				
3-PRESENT ACTIVITIES REPORT TO GENERAL MANAGER	I	R		P	P		
4-REVIEW AND APPROVE REPORT	R	P		P	P		
5-INFORM HEADS OF DEPARTMENT AND MASTERS		R	MC	I	I		
6-INFORM PERSONNEL ABOUT PROGRESS				R1	R2	I	I
7-MAKE FINAL ASSESSMENT OF SMS		R		P	P	MC	
8-ADJUST SMS IF NECESSARY				R1	R2	P	

Figure 7: Carrying out the final assessment (source: (Chauvel, 1997))

SAFETY MANAGEMENT SYSTEM 4- ACT	GENERAL MANAGER	DESIGNATED PERSON(S)	ISM TEAM	HEADS OF DEPARTMENT	MASTERS	OFFICERS ENGINEERS	PERSONNEL & CREW
1-PREPARE SCHEDULE FOR VERIFICATION	I	R	I	P	P		
2-PREPARE FILES FOR CERTIFICATION		R	P	I	I		
3-OBTAIN DOCUMENT OF COMPLIANCE FOR SHORE-BASED OPERATION		R	I	P			
4-OBTAIN SAFETY MANAGEMENT CERTIFICATE FOR SHIPS		R	I		P		
5-INFORM PERSONNEL ON OBTAINING THE CERTIFICATES	R	I	I	I	I	I	I
6-RECOGNIZE PEOPLE FOR OUTSTANDING EFFORTS AND CONTRIBUTIONS	R	P		P	P		
7-PREPARE SAFETY IMPROVEMENT PLAN FOR THE COMING YEAR	R	R	MC	P	P		
8-PLAN DATE FOR SMS REVIEW	I	R	I	I	I		

Figure 8: Obtaining certification (source: (Chauvel, 1997))

- Define achievement
- Implement SMS
- Make final assessment
- Obtain SMS certification

Each step of the process must clearly identify the sequence of actions to be undertaken and the consequent responsibilities. By way of example, figures 5,6,7,8 show the

sequence of actions to be taken and the responsibilities for each stage of implementation of the action plan.

Where: R=responsibility, R1=on shore based, R2=on board ship, P=participation

I= for information, MC=May contribute, T= training required

Each company, depending on its organizational structure, should define its own process within the context of its project.

5.6.6 Company procedures

Objective: describe as clearly as possible all of the activities which contribute maintenance of the safety and environmental protection policy of the company. The first activities to undertake are generally in relation to the shore-based centers, in order to manage the ISM system Code. The sixth step consists of:

- Listing the existing documentary system in each sector of the company
- Analyzing each existing procedure in terms of conformity to the ISM Code
- Identifying any elements missing from the system
- Draft missing or obsolete procedures
- Create the company's documentary system in accordance with the requirements of the Code (**Chauvel, 1997, ch4, p41**).

Responsibility for the system documentation (procedures, instructions and other documents) should fall on each department manager.

All the documentation necessary to conform to the requirements of the ISM Code makes up the 'safety and protection of the environment' procedures manual. The procedures constitute the backbone of the documentary system. Without these it would not be possible to carry out an audit of the system implemented by the company.

Reflections on the structure of the documentary system are essential because there are no formal rules. Depending on the size of the company, it may be preferable to have one single manual including all the procedures, or to create several manuals.

Whatever model is used, the procedures must be written in the working language of the personnel. They must be drafted clearly and concisely.

The documentary system relies on a classic current model:

- Policies and responsibilities
- General procedures for onshore-based operations, common to all ships
- Procedures specific to a type of ship
- Work instructions when necessary

5.6.7 Shipboard procedures

Objective: describe as clearly and simply as possible all specific activities necessary on each ship and their interfaces with on shore-based centers, to ensure maintenance of the company policy wherever the ship is located.

As the documentary system is created on shore, it is necessary to think about the direct implications and the necessary interfaces with the ships for the system to become operational. This seventh step consists of:

- Listing the documentary system existing on board each type of ship
- Analyzing each existing procedure in terms of its conformity with the requirements of the ISM Code
- Identifying the elements missing for each ship
- Drafting any missing or obsolete procedures
- Creating the documentary system for each ship in accordance with the on shore documentary system and in relation to the requirements of the ISM Code

Responsibility for system documentation (procedures, instructions and other documents), should call to each departmental manager. (**Chauvel, 1997, ch4, p42**).

There is only one policy, that of the company. This is the same on shore and on board ship. The sections constituting the policies manual, the general procedures manual and the procedures specific to the ship concerned should be available on board each ship. All this documentation required by the ISM Code constitutes the safety and environmental protection manual specific to the ship.

Even well drafted, a procedure may not be sufficient in itself especially in the case of multinational crews. It may then be necessary to have recourse to work instructions specific to several posts on board ship. This responsibility falls to the master and his officers.

A work instruction is the application of part of a procedure. If it has to be translated into work instructions, there may be a problem in drafting. Instructions must never become permanent substitutes for gaps in the way people responsible have drafted the procedures. They are aids and not obligations.

A work instruction may be a drawing, numbered pictograms or a simple text of stages to follow, drafted in the spirit of the procedure.

All the procedures, for the company and its ships, are part of the documentary system which permits demonstration of the effectiveness of the company policy in relation to the requirements of the ISM Code.

5.6.8 Measurement and reporting

Objective: enable the general management of the company to follow the progress of the project and to act when the situation requires this.

The time required for complete implementation of the system depends on a number of criteria (size of the company, nature and number of ships, available internal resources etc). it may be several months before the objective is reached.

Preoccupied by daily activities, the parties involved in the project may put off the measures undertaken and the time frame will never be adhered to. This eighth step consists of:

- Drafting, at the beginning of the programme, schedule of meetings to review the progress of the project
- Creating a system for monitoring the project, placed directly under the responsibility of the project manager
- Identifying the deviations and their causes
- Taking necessary corrective actions in order to keep to the time scales or, as a last resort, modifying the program of activities. (**Chauvel, 1997, ch4, p43**).

The presence and direct involvement of the general management of the company during these meetings is essential. It confirms its wish to see the program succeed and contributes to the motivation of the team charged with concluding the program. Formalizing the monitoring of the project is not a luxury but simply good management practice.

The certification process should not be perceived as an expense because it is becoming compulsory. It must be considered as an investment, the return from which does not depend solely on the initial expenditure, but on research into the sufficiency of the actions undertaken. As stated earlier, it is necessary to define at the beginning of the program the content but also the form and the frequency of reports and reviews.

During these reviews it will be possible to modify the programme, if the situation demands, taking account of the impact of these decisions. In the case of delay, the important thing is to understand the reason and to take all necessary measures to maintain the final objectives.

5.6.9 Personnel training

Objective: develop and improve the skills of personnel on shore and on board ships with regard to application of the company policy relating to safety and protection of the environment. Even the most complete documentary system only has a chance of obtaining a concrete result if the personnel alone have access to the information. It must also understand and contain this information. The ninth step consists of:

- Preparing a cycle of training for all the managers involved in the implementation of the new system
- Setting up the mechanisms and the means to multiply awareness of the system implemented on shore as well as on the ships
- Arrange for the training of new employees in order to keep the system operational
- Arrange the necessary training when modifications are made to the system
- Train the personnel according to the training cycle selected. **(Chauvel, 1997, ch4, p44)**

It is not necessary to create a training manual. The best manual for management and personnel is the procedures manual if it has been properly drafted. Videocassettes may cover specific technical aspects. Imagination is required to maintain the level of personnel skills.

Procedures are the first support to use during training. A simple principle exists: a procedure without training is a useless document. Training is an integral part of the implementation of a procedure. It is necessary to specify at each publication of a procedure the training of those who are concerned with its daily implementation.

Training in procedures must be accompanied with practical exercises, in particular for emergency situations. The managers responsible for the sectors concerned, and be the subject of an appraisal should carry it out in cascades.

The training program may include:

- Familiarization with the ISM Code
- Implementation of the ISM Code
- Drafting procedures
- Internal audit
- Problem solving etc.

The form depends on the exercises already acquired by the company and the equipment it possesses on shore and on board ships: formal courses, syndicate work session, individual training, using material and equipment such as videocassettes, slides, overhead transparencies or exercises.

Training should be a continuous process aiming to improve personnel skills, and to integrate new employees into the operating teams.

5.6.10 Final assessment

Objective: prove that the system implemented will enable the company to obtain ISM Code certification.

This is the culmination of the project for certification of the system in relation to the requirements of the Code. Between the initial assessment and this step, several months will have passed with highs and lows. Is the company finally ready for certification? This tenth step consists of:

- Checking the key points of the system implemented last time
- If necessary, adjusting the details which might delay certification
- Preparing the certification audit for each ship. (**Chauvel, 1997, ch4, p45**).

This last step before the certification process is crucial both for the general management of the company, and the personnel who have invested their time and their efforts to obtain certification. They would find it hard to accept safety and the protection of the

environment are values shared by everyone. And human beings have a need for challenges and winning in order to be motivated.

5.6.11 Certification

Certification of a system is a binary approach: to be certified or not.

The initial assessment indicates deviations from the requirements of the ISM Code. The final assessment must conclude that the system implemented meets all the requirements for certification. In other words the recommended approach for the final assessment must indicate a score of 100 per cent for each requirement of the ISM Code after the initial assessment has been carried out.

It is desirable to instruct an external auditor, who has not participated in the implementation of the system, to carry out the final assessment. Objective and neutral, the auditor can quickly detect a weak point or an omission, which might hinder certification. The corrective action undertaken, as a result of this report, will enable those involved to present the certification dossier in complete confidence for:

- Shore based operations
- Shipboard (**DETR, 1999, Ch 3, p1-2**)

The subject developed in this chapter is based on a logical approach accompanied with practical advice. This is the basis of the project which will enable the company to obtain its certification.

Certification is not an end-goal, but a point of passage from progressing and improving company performance by preventing risks and not by corrective actions which mobilize personnel without any real value.

In addition to implementing this project, the approach has significant advantages in relation to personnel and costs:

- Improvement of personnel skills with regard to safety
- Creation of a company culture motivated around the theme of safety and the environment
- Improvement of the risks of conditioned reflex that can prevent a catastrophe or improve the system
- Reduction of risks of failure, and therefore useless costs(**DETR, 1999, Ch 3, p2**).

If these elements can contribute to an overall improvement of the social climate in the company, then can also contribute to better commercial relations. Safety and protection of the environment are essential criteria in keeping with the logic of quality development.

CHAPTER 6: THE SURVEY - ANALYSIS

6.1 The analysis of the Survey and the key findings

By conducting interviews to designated persons, ISM auditors, owners, seafarers, persons related with ship safety in the shipping companies, was the best way to get the whole picture of the ISM Code perspective of those people. Safety-related personnel in major shipping companies was more than happy to answer the simple questions which mentioned in chapter 1, regarded ISM Code implementation. The actual interviews took place in Piraeus, Greece.

The semi-structured questionnaire aimed to accomplish the two main objectives: To determine how successful the ISM Code is in maintaining safety through the different perception between the shipping companies and seafarers as well as to evaluate through the interviews with both shipping companies and seafarers the importance of the ISM code on board. The questions are simple in order to help the respondents to be more comfortable when answering the questions and to make the meeting look more like a discussion rather than an interview.

The part that is more interesting is when the same questions are answered not only by the shore-based personnel but also from seafarers. There are shipping companies and individual seafarers from whom ISM Code is the greatest blessing ever bestowed upon the shipping industry -and that is because those people saw efficiency and profits increase and claims reduced- which they directly link to their ISM Code implementation. At the other end of the scale there are certainly those who clearly feel that ISM Code is the greatest curse ever inflicted in the industry- many apparently believing some sort of conspiracy that the ship operators have used ISM Code as an excuse to shift all responsibility and liability from the office ashore onto the ship. A seafarer (2nd officer) from a well-known major shipping company in Greece stated: *“ISM Code is just for seafarers to wash the “laundry” of those responsible in the shipping company”*. (5)

The majority of the respondents fall between these extreme views and it is the purpose of this survey to try to understand why different individuals and companies appear to have different points on the compliance scale.

6.1 Problems on implementation- an international “view”

6.1.1 The multi-flagged fleet

A number of companies are operating multi flagged fleets in the world shipping industry now. At this point it must be mentioned the fact that all of the shore-based staff as well as all of the seafarers were working in multi-flagged companies. According to the requirements of the International Safety Management (ISM) Code, such companies need to have two or more Documents of Compliance (DOC's), issued by the different Administration. Different administrations have different views on the degree to which audit and certification should be delegated to class or to others in some cases. So these companies face the necessary multi verification, which is heavy burden. In fact, no matter how many types of flags in a multi-flagged fleet, the company carries out its management only according to one safety management system established by this company, there needs to be negotiation regarding the verification and certification among the administrations of parties involving in a company with a multi-flagged fleet. A director from Golden Union S.A. based in Piraeus, Greece stated: *“multi-flagged fleets will always be a problem in the shipping industry despite the fact that facilitates and reduces the expenses of the shipping companies”*. In other words: *“we are doing our job in a cheaper “way” even though we know its not the best way to do it”* (6).

6.1.2 The guideline for Port State Control

For port state control, there are no guidelines to govern the inspection of implementing the ISM Code. As a result, there are two possibilities in this regard. One is only check the DOC and Safety Management Certificate (SMC). Another one is to make more inquiries, examine the document of the SMS, or carry out the operational inspection. For the latter, the problem of language used in the document of Safety Management System (SMS) could be involved. (Baochen, 1996, p361).

6.1.3 The ISM “cheats”

In the first page of Lloyd’s List on 29 March 1999, there was news about “ISM cheats using temporary crews” (www.Lloydslist.com, 27/07/2002). We were told that there were two cheating cases had been reported by ISM auditors in European port, with number of similar unconfirmed cases. So we are facing question that how to completely prevent this kind ISM cheat. Another problem is how a surveyor of classification society surveys ISM implementation. Different classification societies have different ways. Just using checklist to finish paper documents’ check and asking crew questions are not enough, such as Lloyd’s Register of Shipping. The fact that this kind of “show me safety” check is not enough, and the reason is that there may be cheats. Although the surveyors just in short time survey a ship and one of the most efficient ways is check all documents, but practical situation on board ship should be checked as well, particularly the organization, safety procedures and operation skills of seafarers on board ship.

6.3 The impacts of the ISM Code

6.3.1 Expand the safety responsibility

The ISM Code is the first to clearly define “company” as the person who has assumed the responsibility for operating the ship. This means all the persons who respond to operate ships should respond for their operating ships’ safety. A seafarer believes that: “*good operational management can reduce shipping accidents...*” and continues “... *but serious operational failings continue to contribute to a major of accidents*”. In other words “*don’t blame as (the seafarers) for the accidents, personnel operating the ship has a responsibility too*”. (7). So the safety of ships is not only the ship owner or manager responsibility, but also the responsibility of all persons involved the ship operation, such as bareboat charterer, etc. in fact, these persons act very important roles in marine safety, it will improve the safety on board ship due to the ISM Code expand the safety responsibility to these persons.

6.3.2 Improve the compliance of international and national regulations

Shipping industry is a dangerous industry. In order to improving the safety, there are a number of regulations and rules that have been made from the lessons of marine accidents. That is why the shipping industry is also the most regulative industry. However, the poor compliance of these regulations and rules is still the big problem of the shipping industry. One of the objectives of the ISM Code is to improve the compliance of national and international regulations. As implementing ISM Code, it will improve the compliance of these regulations and rules

6.3.3 Improve management and increase competition of company

ISM Code is the first time of International Maritime Organization (IMO) to adopt a management standard in the shipping industry. It requires companies to set up an effective, self-regulating, safety management system. Just like The International Association of Independent Tanker Owners (INTERTANKO), the organization of independent tanker owners, has for instance described the Code as “*one of the most important safety initiatives ever investigated by the marine community. Compliance with its provision entails a top-down company wide commitment*”. For a company the impacts of the implementation of ISM Code can be described as:

(Bramsen, <http://home3.inet.tele.dk/>, 05/08/2002)

- An improvement in the safety consciousness of the company, which made the safety management more scientific
- An improvement in safety management skill of personnel both aboard and ashore, which can efficiently to eliminate the accidents happen
- The establishment of a safety culture that encourages continuous improvement in safety and environment protection
- Improved company morale and clear the relationships and authorities both ashore and aboard
- Reduced accidents and great confidence on the part of clients and insurance underwriters. Det norske Veritas, the Norwegian Classification Society (DNV) surveys of companies that have implemented Safety Management Systems show substantial saving are possible

1. 6% to 10% reduction in P&I premiums
2. 10% to 15% reduction in the cost of hull and machinery insurance
3. 15% to 25% reduction in hospital hours
4. 25% to 35% reduction in lost man hours

5. 35% to 45% reduction in sick leave
 6. 50% to 90% reduction in cargo damage
- Cost savings resulting from improved efficiency and productivity
(Bramsen,<http://home3.inet.tele.dk/>, 05/08/2002)

6.3.4 Develop a safety culture across the whole shipping industry

As implementing the ISM Code, a safety culture is developed across the whole shipping industry, and impacts all participants of the shipping industry. The regulations and conventions such as Safety of Life At Sea Convention (SOLAS), International Convention for the Prevention of Marine Pollution for Ships (MARPOL), International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 (STCW), Collision Regulations (COLREG), International Maritime Dangerous Goods Code (IMDG Code), etc. which adopted by IMO, can be implemented and complied very well. For flag state, the administrations have been improved, like the training, certification of seafarers, the safety standards of ships, etc. Especially for the safety standards Flag of Convenience have been improved. It is the first time classification societies have been involved into a non-technical area. They have to make safety management standards, survey, class and certificate ships and companies. For the ship insurance underwriters, they will get benefit from the implementation of the ISM Code, and they may change the rules of insurance, and refuse to insure the ships that company does not comply with ISM Code. For port states, due to the implementation of the ISM Code, shipping company will implement the ISM Code as well as improve management and get great benefits. *“It is still early days in the implementation and development of the ISM Code in the establishment of a safety culture across the shipping company...”* and continues *“... nevertheless, the considerable effort expended so far by*

shipping companies towards compliance has shown benefits". In other words "we saw the implementation of the ISM Code in phase 1, lets see how phase 2 will be implemented and then we can draw our conclusions. You can't have safety culture throughout the whole shipping industry in just 4 years time!" This stated by a Captain from East Mediterranean Limited and shows the holistic approach of the implementation part of the ISM Code. Its another point of view that we should look at. (4)

CHAPTER 7: CONCLUSIONS

7.1 Best measure against human element in marine accidents

In shipping industry, management plays a very important role, especially to improving marine safety the major problems of human element in marine accidents are always concern with management, such as manning level, seafarer training on board, the duty arrangement, stress, organizing on board ship, etc. So safety management can be best measure to take account human element. The ISM Code has set up a standard of safety management, and requires company to set up a safety management system (SMS). The SMS is designed for the human elements in marine accidents and improving the lack of safety management. So, ISM Code has been regarded as the most important single development in marine safety. It has brought a safety revolution across the whole of the shipping industry. It is believed that if the ISM Code had been adopted just a few years early, the whole shipping industry would be safer today.

7.2 Effective implementation? How?

7.2.1 Auditing

One of the best measures for better implementation of the Code is the audits. Audits may be classified into three different types, depending upon the relationship between the auditor and the auditee. The type of audit may influence some of the generally accepted protocols employed in the audit process. Examples could include such areas as how much 'advice' an auditor should be expected or encouraged to give to the auditee.

1. A first party audit (An internal audit): carried out by an organization on itself, using one of their own staff or a specialist and qualified sub-contractor as the appointed auditor: in simple terms, US-ON-US.
2. A second party audit (An external audit): carried out by, or on behalf of a customer, or possibly, a sub-contractor on another sub-contractor or potential sub-contractor for the supply of goods or services. Again, simply put, US-ON-THEM.
3. A third party audit (An external audit): normally carried out by a certification body, statutory body or suitably independent body for the purpose of some form of approval or endorsement. Usually authorized or accredited, without any commercial interest in the auditee. In this case, THEM-ON-US.

It is interesting the answer from a safety training officer in a question of how is auditing contributes in marine safety: *"It is now proved that well experienced internal auditors and well trained officers together can give multiply benefits to their shipping company as well as improving the safety, and provide a link between safety on shore and safety on board"*(4). More interesting though is the opinion of a Captain who is more than 5 years in the same shipping company! : *"Audits do not spot light the negative and positive aspects of managements' safety culture. However the accident investigation allows investigators to home in on weaknesses of the system to a degree which is impossible for an auditor to identify in the limited time available to him!"*(10).

It is obvious that those 2 opinions are conflicting! There were two more shipping companies in which shore-based staff and seafarers were interviewed but there were no conflicting opinions. Conflicting opinions show that the communication between shore and ship is in low level. Consequently how this company, (for various reasons it is not mentioned in the main body but in Appendix 4), will improve safety on board ship if it can't yet communicate? This is one of the main problems that must be eliminated in every shipping company before start thinking of improving safety.

7.2.2 Commitment from the top

“Ship owners nowadays have understand that owning a shipping company its not only the profit that you have to have in mind. Safety culture derives from the ship owner. Off course time is money but company without safety might cost not only money but lives as well”(11). This is a seafarer's opinion when he was asked what did he think that ship owners are having in mind. As mentioned the fact that there were shore-based staff and seafarers interviewees from the same shipping companies was interesting. What is more interesting is the fact that none of them did not want to express his opinion about the ship owner!

7.2.3 Continuous improvement- Management review

“While many senior managers recognize the long-term benefits associated with an effective safety management system, the inclusion of system goals is rarely included in a company's strategic plan.” DPA's opinion from CERES shipping about continuous improvement and management review (9). To simplify that: *“By integrating Management Review and strategic planning, a company can maximize cost- benefits and overall company performance”*. For instance, savings can be achieved by eliminating duplicate meetings that requires the attendance of senior. Further savings can be gained when the brightest minds in the company begin to examine system performance.

7.2.4 Training

When we are talking about training we are not only talking training on board but also on shore training. The reason of training on both 'sides' is to inspired the necessity for ISM Code. What does the word 'training' include? Training on board ship has a lot of meanings: bridge resource management, safety matters such as enclosed space entry, English language, ship handling etc.

“The standard of safety can, to a large extent, be improved through education and training” (8). While these terms are familiar to everyone it is difficult to know what is involved in each, because their close inter-relation. Some believe that education is theory and training is practice while others regard education and training as teaching respectively the 'why' and 'how' of a task. It would be therefore useful to consider their similarities and differences.

7.2.5 Computerized plan system

The American Bureau of Shipping has developed a computer database system (*SafeNet*) that was originally designed for tracking survey information. The system has now evolved into a fully capable tool for maintaining a safety management system. It also allows a company to pursue the holy grail of a "paperless" system. *SafeNet* has a modular design and a company can pick and choose different modules to suit its needs. The complete suite of *SafeNet* modules handles nearly every aspect of operational management, and also includes a payroll module. Fully integrated, the modules eliminate the need for repetitive data entry, share information between modules, and allow the user to move rapidly from one module to another.

The following *SafeNet* modules have direct or indirect applicability to a Safety Management System:

- **Survey Status** contains complete information on the status of all class and statutory surveys for a company's entire fleet, even if the vessels are not classed by ABS.
- **Marine Information** provides a library of relevant publications and listings of type-approved equipment, and recognized suppliers from the *Fairplay* Shipyard Directory.
- **Crew Management** records and maintains data pertaining to onboard personnel, both actively and previously employed.
- **Hull Maintenance** provides a sophisticated management and information system covering the structure of the vessel throughout its service life.
- **Maintenance & Repair** records all maintenance work performed on a vessel by the crew or outside contractors. It provides a complete, planned machinery and vessel compartment maintenance history.
- **Purchasing & Inventory Control** provides a two-step process for ordering materials and supplies. Requisitions are issued to record material orders by a vessel and Purchase Orders are used to place material orders with vendors. Inventory Control tracks equipment parts and consumable items at various sites, including onboard each vessel within a fleet and at shore-side facilities.
- **Code Compliance** is designed to simplify the storage, tracking and recall of incidents and documents required by the ISM Code and the STCW Convention.
- **Vessel Drawings** allows the user to electronically retain a lifecycle suite of drawings within *SafeNet*. The system offers extensive search capability. Drawings can be made available in the office, onboard the vessel or in the repair yard. Users can view details of the drawings, including drawing description and number, that relate to any time point in the vessel's history.

In area of change, the Internet has hit the economy of North America and much of the world like a tidal wave. New concepts such as the free distribution of information and products in order to gain market share, and e-commerce have tilted conventional thinking on its ear. Central to what many are now calling the "New Economy" is the Network Effect - also known as Metcalf's Law. The network effect is a simple mathematical

formula: the sum of a network increases as the square of the number of members. Or, as members join a network arithmetically, the value of the network increases exponentially. As bandwidth increases and satellite communications costs decrease, it will soon be economical to equip vessel with access to the Internet. When this change occurs, companies will become more network oriented. This includes leveraging Intranet technology because of its compatibility with the Internet. *“E-mail will be come the primary means of communication between company shore facilities and vessels”*(4). Stated by a seafarer (2nd officer) of a major shipping company. Company vessels will also be able to pass on lessons-learned, and mariners will be able to collaborate on various processes. Of course, this implies further training. However, as various technologies are linked, increased productivity will allow for further crew reductions.

In the not to distant future, other advanced technologies and services such as GPS, ECDIS, and *SafeNet* will be linked to the Internet. This will allow for constant tracking by management and regulatory agencies. Ships will be provided with constantly updated weather routing information, port information, tides and currents, access to technical drawings, medical advisory services, database and search procedures and a whole host of other information technology (IT) products. The efficiency of the electronic marketplace should be the salvation of the smaller shipping companies. Increased use of e-commerce will allow for the inexpensive out-sourcing of virtual management systems via centralized computing.

7.3 ISM Code: Phase 1 complete – Phase 2 started

Phase 1:

The International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) became mandatory for most ships trading internationally on 1 July 2002. Compliance with the Code has been mandatory for tankers, passenger ships and bulk carriers since July 1998, under the first phase of ISM implementation, and now all other vessels covered by the SOLAS Convention, which includes all but the smallest internationally-trading vessels, must comply. (www.mpa.gov.sg, 27/04/2002).

“This is important, because we know that human factors account for most accidents at sea - and that many of them can ultimately be traced to management. The Code is helping to raise management standards and practices and thereby reduce accidents and save lives” experienced crew manager stated (12).

In looking at the Phase 2 implementation of the ISM Code, it is useful to look at some of the issues that arose during the implementation of the ISM Code Phase 1. Based on feedback gathered from the classification societies, the following are some of the major lessons learnt from ISM Phase 1:

Application for shipboard audits:

As mentioned earlier, there were a large number of companies trying to implement the Code at the last minute and this led to a sharp increase in application for shipboard audits close to deadline. This creates a backlog of work for the Classification Societies, and companies run the risk of not being able to obtain ISM certification in time. This could result in the company having to stop operations and lead to a loss of revenue. Companies are therefore advised to start implementing ISM Phase 2 early to avoid such a situation.

Need for commitment :

During Phase 1 of the ISM Code, many shipping companies were either not aware of the ISM Code, thought that the ISM Code would not actually come into force or that the deadline for compliance would be extended. From the experience in Phase 1, we know that the deadline will not be extended and the ISM Code is definitely here to stay. It is therefore best for companies to take the ISM Code and its deadline for compliance seriously, and to look at how to effectively implement the Code.

Safety Management Systems:

Many companies had put too much detail in their SMS when a simple SMS covering all the necessary areas would have been sufficient. Such companies have the mentality that “more means better”, which is not always true. Interesting statement from a shipbroker who is 30 years in this job: “ *Shipping companies should develop a system that covers all the necessary aspects but is not unduly complicated for implementation*”. (13).

Phase 2:

The Secretary-General of the International Maritime Organization (IMO), Mr. William A. O'Neil, has welcomed the publication of the results of a new study carried out by The Swedish Club confirming that ship owners implementing the ISM Code can expect to achieve a reduction in hull claims of 30 per cent or better, together with a similar improvement in the incidence of P&I claims. (www.imo.org, 02/08/2002). The study followed one carried out in 1999 which had reviewed claim trends in the three years to 30 June 1999 indicating that the claims development during the period was 30 per cent better for those ships for which 1 July 1998 was the implementation date - the phase 1 ships. (www.imo.org, 02/08/2002).

Recalling the increased safety awareness and environmental consciousness that effective implementation of safety management systems can bring, Mr. O'Neil notes the beneficial impact on safety and environment as well as the benefits to be gained by the shipping industry in meeting the ISM Code's objectives. The reduction of accidents and incidents following ISM Code implementation reported by some companies and the encouraging results reported by port State control authorities with respect to ISM Code implementation on the phase 1 ships, both point to the positive effect of the Code on operational standards. (www.imo.org, 02/08/2002).

With an estimated 13,000 ships requiring certification by the second deadline of 1 July 2002, and IACS reports of around 6,000 ships certificated to date, there is clearly no room for complacency and urges those shipping companies that have yet to start implementing their safety management systems to do so without further delay. (www.imo.org, 02/08/2002)

7.4 The importance of motivation ($A = (K+S) \times M$)

In previous chapters it is mentioned briefly the importance of motivation. In this chapter motivation and its importance will be analyzed.

All these years many people tried to find measures for better safety on board ships and for environmental protection. Conclusions that made up were: in order to achieve a goal (in this case the goal is safety), ability is required. What ability means? A formula has been produced and tested by many shipping companies in order to give an explanation on what ability means. The formula is:

$$A = (K+S) \times M$$

A= ABILITY, K=KNOWLEDGE, S=SKILLS, M=MOTIVATION

We can easily see that in order to have ability knowledge, skills and more important motivation is required. But why do we add knowledge with skills and why we multiply motivation? The only way to understand the formula is by giving example:

ISM Code is a set of rules requirements and regulations. Measuring all the above (K,S,M) as % a fine example will be like this: Assuming that someone has the knowledge of all these rules and requirements of the ISM Code and lets assume that he or she has the skills as well to implement and apply those rules when needed. So, lets say 90%=K and 65%=S. initially the equation will be:

$$\mathbf{A = (90+65) \times M \Rightarrow A=155 \times M}$$

In this case there are two options:

a) if there is no motivation from the person who has the knowledge and the skills then motivation in the equation will be equal to 0. then the equation will be:

$$\mathbf{A=155 \times M \quad [M=0] \Rightarrow A=155 \times 0 \Rightarrow A=0}$$

b) on the other hand if the same person want to apply those rules correctly and have the motivation (e.g. M=10), then the equation will be like:

$$\mathbf{A=155 \times M \quad [M=10] \Rightarrow A=155 \times 10 \Rightarrow A=1550}$$

All these means that even though all these rules and regulations are well awarded from both seafarers and shore-based staff motivation is very important in order to improve ability. But why do we want to improve ability in the first place? The fact that ability can improve safety rises from the fact that motivation has proved to be the key word when we are talking about ship's safety, marine accidents and environmental protection.

Consequently ISM Code without motivation (commitment from the top, ship owner motivation, safety culture), will not have the same effectiveness and the same implementation. So, is ISM Code finally working? If yes how and under what circumstances? The progress that have been made in the past 20 years as far as safety is concerned, showed that rules are rising continuously but problems to implement them will always arise. ISM Code is working but on different levels of a scale, and this is because whilst ships to which the Code applies have been audited and are carrying the Safety Management Certificates, and likewise the companies managing them holding Documents of Compliance, ships are still being detained through Port State Control (PSC) inspections, maybe not through direct contraventions of the ISM Code but through other issues which a safety management system should be identified and corrected. Motivation as mentioned is the starting point when implementation of any code no just ISM Code, is taking place in shipping industry. A major benefit of the ISM Code is that it encourages lessons to be learned from incidents. Although these incidents may not be significant, they could, in other circumstances, have endangered life and the environment. By learning lessons, safety procedures can be reviewed and amended to reduce risk of occurrence. Global improvement in safety management as a result of ISM Code implementation is dependent on the willingness of flag States and companies to investigate incidents and share the safety lessons without looking for someone to blame. The sharing of responsibility between companies and interested states will increase the change that the thorough investigation is undertaken and effective safety action taken. Implementation of the ISM Code offers the opportunity for the industry to move away from a culture biased towards blame to one of shared sense of personal responsibility for safety throughout the organization. It is the shipping companies who can provide the driving force needed for this cultural change.

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- 1) 'IMO to promote safety seminars'. (IMO is hosting the first of a series of seminars on the ISM Code, to be held in Panama during the week starting February 24) - LLOYD'S LIST, 10 February 1997, p 3
- 2) 'You ready for this?'. (It can take up to 18 months to prepare for and gain certification to the ISM Code which comes into effect in less than 18 months' time. Ship operators that have not yet come to grips with what certification means may find it hard to meet the necessary standards in time) - HAZARDOUS CARGO BULLETIN, February 1997, pp 63,65
- 3) 'ISM Code "A business challenge"'. (Speaking at an LLP-organised conference entitled "Shipping Guidance through the Global Maze Conference", Achilles Vardakis, chairman and chief executive officer of Shipmanagement Expert Systems, said the code was a business approach which had played an important role in some companies' success) - LLOYD'S LIST, 22 February 1997, p 12
- 4) 'Ensuring that the certification process is entirely above board'. (One of the major concerns of Shipowners embarking on the road to International Safety Management Code accreditation is the need for total transparency of the system) - LLOYD'S LIST, 3 March 1997, p 8
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- 6) 'Owners set to miss ISM boat'. (Delays in preparing for the ISM Code are causing increasing worry to the UK Mutual Steam Ship Assurance Association) - TRADEWINDS, 14 March 1997, p 25
- 7) 'Potential legal implications of ISM Code'. (There has been considerable debate about the legal implications of the ISM Code, and in particular, the possible changes that the code may bring to a shipowner's liability) - INDIAN SHIPPING, Vol 48, No 12, pp 13-14
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- 9) 'Denholm head warns industry on lack of ISM Code progress'. (The "wider shipping industry" needs to wake up to the implications of the International Safety Management (ISM) Code, according to Denholm Ship Management) - LLOYD'S LIST, 27 March 1997, p. 3

- 10) 'ISM Code: will we get there in time?' - LLOYD'S LIST, 28 March 1997, p 5
- 11) 'Owners warned about ISM'. (Oil major Mobil warns owners that they face ruin if they don't get ISM Code certification by the July 1998 deadline) - TRADEWINDS, 27 March 1997, p 2
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- 14) 'The ISM Code: a progress report'. (Meeting hosted by The Nautical Institute to establish if there were a particular role for the Nautical Institute in helping implement the ISM Code and, if so, what this should be) - SEAWAYS, April 1997, pp 11-12
- 15) 'Harmony in safety'. (Ensuring ISM Code regulations do not vary state-to-state is vital if these regulations are to succeed globally. In response, IATCA (International Auditor and Training Certification Association) was formed in 1995) - HAZARDOUS CARGO BULLETIN, April 1997, p 70
- 16) 'Watching the clock'. (Many are already enjoying the benefits of ISM and quality assurance. Many aren't) - LLOYD'S LIST MARITIME ASIA, April 1997, pp 42-46
- 17) 'ISM the legal implications'. (Although the ISM Code is a set of guidelines and not, in itself, law, its terms carry considerable legal impact) - LLOYD'S LIST MARITIME ASIA, April 1997, p 47
- 18) 'Cultural revolution can bring new attitudes to maritime safety'. (ISM marks a shipping safety breakthrough on a par with the introduction of the Plimsoll Line 1876, seafarer trade unionists believe) - LLOYD'S LIST, 28 April 1997, p. 10
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- 20) 'Last chance safety code warning'. (J. Bell (IACS) quotes: "of 19,000 ships which would require documents training by July next year, only 1,561 have so far been certificated") - LLOYD'S LIST, 30 April 1997, pp 1,5
- 21) 'Slow owners running out of time on ISM deadline'. (Many Shipowners continue to ignore the implementation of a key piece of safety legislation, despite warnings

that ships will be banned from ports or detained when the new ISM Code comes into force next year) - TRADEWINDS, 1 May 1997, p 3

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- 26) 'Hong Kong owners move on ship safety'. (ISM Code compliance well advanced) - LLOYD'S LIST, 24 May 1997, p 10
- 27) 'USCG proposes regulations to implement ISM Code' - GOLOB'S OIL POLLUTION BULLETIN, 23 May 1997, pp 7-8
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- 40) 'Role of the human element in maritime casualties'. (Implementation of ISM Code submitted by the IACS) - HELLENIC CHAMBER OF SHIPPING, March/April 1997, pp 100-126
- 41) 'ISM defaulters face UK arrest'. (Ships face arrest at UK ports if they fail to comply with the ISM Code after the international deadline of July 1, 1998) - LLOYD'S LIST, 20 June 1997, p 1
- 42) 'Singapore pushes for ISM compliance'. (Only 20 per cent of the 990 Singapore-registered ships have obtained the safety management certificates that will be required under the new ISM Code) - TRADEWINDS, 20 June 1997, p 19
- 43) 'Underwriters in Norway start ISM Code list'. (Norwegian marine underwriters will start developing statistics on the ISM code status of all ships and companies underwritten in the Norwegian market) - LLOYD'S LIST, 23 June 1997, p 3
- 44) 'ISM raises P&I cover questions'. (Shipowners may find their protection and indemnity cover in jeopardy if they do not take speedy action to comply with the ISM Code) - TRADEWINDS, 27 June 1997, p 14
- 45) 'Maritime lawyer warns that ISM Code requirements could hurt shipowners in court'. (The extensive records that shipowners will require to keep under the ISM Code after the code enters into force next year could be used as evidence against the shipowners in US courts, particularly in any litigation arising from oil spills, according to Bruce Paulsen) - GOLOB'S OIL POLLUTION BULLETIN, 20 June 1997, pp 5-6

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- 48) 'Letters to the Editor: ISM Code "black hole" on arrested ships' - LLOYD'S LIST, 4 July 1997, p 5
- 49) 'ISM code will not be a UK Club cover condition' - LLOYD'S LIST, 18 July 1997, p 1
- 50) 'Non-compliance with ISM code may cause business losses for shipowners' - LLOYD'S CASUALTY WEEK, 27 June 1997, p ii
- 51) 'Ukmar earns ISM Code certificate'. (Ukrainian shipmanagement company Ukmar is the first in its country to obtain the ISM Code document of compliance for part of the fleet it manages) - LLOYD'S LIST, 24 July
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- 53) 'Gloomy statistics may hide a rosier ISM picture'. (The ISM Code, less than a year to come into force, is not being taken seriously enough and may be heading for a crisis) - TRADEWINDS, 25 July 1997, pp 16-17
- 54) 'Certification delays cast doubt on ISM'. (Slow response sparks fears over IMO deadline. Only around one in 10 of the 19,000 ships obliged to comply with the ISM Code by next July have so far been certified by leading classification societies, it emerged this week) - LLOYD'S LIST, 31 July 1997, p. 1
- 55) 'Editorial : Storm waiting'. (The Implementation of ISM Code) - LLOYD'S LIST, 1 August 1997, p. 5
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- 58) 'Template giving pattern for the future'. (Survey by UK P & I Club indicates that a fair number of ships obliged to comply the ISM by Next July will not met the deadline) - LLOYD'S LIST, 4 August 1997, p.5

- 59) 'Hungry ghosts'. (Chen Tze Penn, director general of the Maritime Port Authority of Singapore, reminded the participants of the seminar on the safety of crew and ships at sea, that the adoption of the ISM Code signifies the dawn of a new culture in the shipping industry) - FAIRPLAY, 7 August 1997, p 4
- 60) 'Class highlights transfer loophole to ISM deadline'. (Shipping companies in danger of failing to comply with the ISM Code by the July 1 1998 deadline could gain an extra year's grace period by transferring the management of their ships to a newly formed company) - TRADEWINDS, 8 August 1997, p 19
- 61) 'Ships face warning at ports'. (Vessels calling at port in Europe, Russia and Canada are to be served warning notices if it found that they are ignoring the new ISM Code) - TRADEWINDS, 8 August 1997, p 19
- 62) 'ISM Code will "increase legal burden"'. (A legal conference held in Kuala Lumpur has found that while the ISM Code may drive standards higher for those who participate, there may also be an operational and legal burden) - LLOYD'S LIST, 11 August 1997, p 8
- 63) 'On course for ISM'. (The ISM Code has inspired a host of training courses, software packages and guidance literature to help owners prepare for certification) - THE MOTOR SHIP, August 1997, p 43
- 64) 'Maritime safety - An update'. (ISM Code) - PARLIAMENTARY MARITIME REVIEW, No 29, 1997, pp 1-2
- 65) 'Is Solas now optional?'. (A UK shipping newspaper stated that the UK Club would not insist on compliance with the ISM Code as a condition of cover) - FAIRPLAY, 14 August 1997, p 3
- 66) 'US warns over ISM evasion'. (The US has warned the world's shipowners and operators that it will crack down hard on any vessels that try to enter the country's waters after July 1, 1998, without valid ISM Code certification) - LLOYD'S CASUALTY WEEK, 15 August 1997, p iii
- 67) 'P & I Clubs facing a difficult decision over the ISM Code' - LLOYD'S LIST, 27 August 1997, p. 8
- 68) 'Time wasters : O'Neil attacks ISM sloths'. (With less than a year to go before the ISM Code becomes mandatory, the secretary-general of the IMO, Bill O'Neil, has warned shipowners that missing the implementation date could have disastrous consequences for their companies) - FAIRPLAY, 28 August 1997, p. 3
- 69) 'Calamity beckons in ISM : Owners set steady course for disaster'. (Peering into the nebulous mists, James Bell, permanent secretary of the International

Association of Classification Societies, predicts that many shipowners will not have accreditation by the deadline) - FAIRPLAY, 28 August 1997, p. 21

- 70) 'O'Neil in ISM warning'. (Slow implementation of safety code "will hurt shipping lines") - LLOYD'S LIST, 4 September 1997, p 3
- 71) 'ISM Compliance'. (Special Report) - LLOYD'S LIST, 10 September 1997, pp 8-11
- 72) 'Slow progress causes concern at IMO'. (Rear Admiral Efthimios Mitropoulos, director of IMO's Maritime Safety Division, "expects" the ISM Code to become mandatory on July 1, 1998) - LLOYD'S LIST, 10 September 1997, p 11
- 73) 'International Safety Management (ISM) Code' - PARLIAMENTARY MARITIME REVIEW, No 30, 1997, pp 4-6
- 74) 'Comment: Hands-on review of ISM'. (It will be a poor reflection on the shipping industry if the ISM deadline cannot be met) - LLOYD'S SHIP MANAGER October 1997 , p 3
- 75) 'The whole picture'. (As the deadline for ISM compliance looms, sectors from all areas of the shipping industry are endeavouring to ensure they meet the target date. Special Report). - LLOYD'S SHIP MANAGER October 1997 , pp 53-62
- 76) 'Numast warning on ISM deadline'. (Numast is urging the UK government to take a tough line with shipowners who fail to comply with the ISM code) - TELEGRAPH October 1997 , p 2
- 77) 'Impose ISM calls to insurers'. (Amid continuing concerns over shipping safety, underwriters have been urged to boycott flags of bad repute) - TELEGRAPH October 1997 , p 10
- 78) 'TUMI misses ISM chance'. (At its annual conference in Paris last month, the International Union of Marine Insurance failed to put down a specific motion for its members stating that it would support the ISM Code by expressly not insuring those ships that, by next July, do not conform) - FAIRPLAY 16 October 1997 , pp 24-25
- 79) 'Intertanko claims 60 per cent ISM Code compliance'. - LLOYD'S LIST 17 October 1997 , p 1
- 80) 'MSA (Australia's Maritime Safety Authority) gets tough with ISM Code compliance'. - LLOYD'S CASUALTY WEEK 3 October 1997 , p i

- 82) 'Intertanko in ISM warning'. (Intertanko chairman Richard Du Moulin, speaking at the Bermuda International Shipping Association annual conference, said a substantial proportion of the world's fleet set to miss the ISM code's first-phase compliance deadline of July, 1998) - LLOYD'S CASUALTY WEEK 17 October 1997 , p iii
- 83) 'Standard warns on ISM criteria compliance'. (The Standard P&I Club has issued a stiff warning to its members about the need to comply with the statutory requirements of the ISM Code) - LLOYD'S LIST 23 October 1997 , p 6
- 84) 'Greece is warned on US zeal for ISM'. (The London office of the Greek Shipping Co-operation Committee has issued a letter of warning to members concerning USCG implementation procedures for the ISM Code) - LLOYD'S LIST 23 October 1997 , p 3
- 85) 'Intertanko presses on ISM'. (Intertanko chairman Richard Du Moulin has expressed concern at the current low levels of ISM code compliance and urged owners not to leave implementation to the last minute) - FAIRPLAY 23 October 1997 , p 9
- 86) 'ISM "will boost scrapping"'. (Between now and the end of 1998 the dry bulk market will see a significant number of vessels heading for breakers' yards, according to Esref Cerrahoglu, chairman of Turkish based Cerrahgil. The introduction of the ISM Code will be responsible for forcing many nits out of the market) - FAIRPLAY 23 October 1997 , p 49
- 87) 'UK Club backing code'. (ISM certification commitment ends months of speculation) - LLOYD'S LIST 30 October 1997 , p 1
- 88) 'IMO report set to dispel gloom over ISM code' . (Research findings from the IMO, due to be released shortly, are set to challenge gloomy industry assumptions about the rate of compliance with the ISM Code) - LLOYD'S LIST 24 October 1997 , p 1

APPENDIX 1:

DEFINITIONS ON THE ISM CODE

Definitions

1. "**International Safety Management (ISM) Code**" means the International Management Code for the Safe Operation of Ships and for Pollution Prevention as adopted by the Organization by resolution A.741(18), as may be amended by the Organization.
2. "**Company**" means the Owner of the ship or any other organization or person such as the Manager, or the Bareboat Charterer, who has assumed the responsibility for operation of the ship from the Shipowner and who on assuming such responsibility has agreed to take over all the duties and responsibilities imposed by the ISM Code.
3. "**Administration**" means the Government of the State whose flag the ship is entitled to fly.
4. "**Safety Management System**" (SMS) means a structured and documented system enabling Company personnel to effectively implement the Company Safety and Environmental Protection Policy.
5. "**Document of Compliance**" (DOC) means a document issued to a Company which complies with the requirements of the ISM Code.
6. "**Safety Management Certificate**" (SMC) means a document issued to a ship which signifies that the Company and its shipboard management operate in accordance with the approved SMS.
7. "**Safety management audit**" means a systematic and independent examination to determine whether the SMS activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.
8. "**Observation**" means a statement of fact made during a Safety Management Audit and substantiated by objective evidence.
9. "**Objective evidence**" means quantitative or qualitative information, records or statements of fact pertaining to safety or to the existence and implementation of a SMS element, which is based on observation, measurement or test and which can be verified.
10. "**Non conformity**" means an observed situation where objective evidence indicates the non fulfilment of a specified requirement.
11. "**Major non conformity**" means an identifiable deviation which poses a serious threat to personnel or ship safety or a serious risk to the environment and requires immediate corrective action; in addition the lack of effective and systematic implementation of a requirement of the ISM Code, is also considered as a major non conformity.

APPENDIX 2:

ISM CODE CERTIFICATES

Forms of the Document of Compliance, the Safety Management Certificate, the Interim Document of Compliance and the Interim Safety Management Certificate

DOCUMENT OF COMPLIANCE

(Official Seal)

(State)

Certificate No:

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended

Under the authority of the Government of.....
(name of the State)

by.....
(person or organization authorized)

name and address of the Company.....
(see paragraph 1.1.2 of the ISM Code)

THIS IS TO CERTIFY THAT the safety management system of the Company has been audited and that it complies with the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) for the types of ships listed below delete as appropriate)

- Passenger ship
- Passenger high-speed craft
- Cargo high speed craft
- Bulk carrier
- Oil Tanker
- Chemical tanker
- Gas carrier
- Mobile offshore drilling unit
- Other cargo ship

This Document of Compliance is valid untilsubject to periodical verifications.

Issued at
(place of issue of the document)

Date of issue.....

.....
(Signature of the authorized official issuing the document)

(Seal or stamp of issuing authority, as appropriate)

SAFETY MANAGEMENT CERTIFICATE

(Official seal)

(State)

Certificate No:

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended

Under the authority of the Government of.....
(name of the State)

by.....
(person or organization authorized)

Name of Ship.....
Distinctive Number or Letters.....
Port of Registry.....
Ship type *.....
Gross Tonnage.....
IMO Number.....
Name and address of Company.....

THIS IS TO CERTIFY THAT the safety management system of the ship has been audited and that it with the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) following verification that the Document of Compliance of the Company is relevant to that ship.

This Safety Management Certificate is valid until subject to periodical verification and the Document of Compliance remaining valid.

Issued at
(place of issue of the document)

Date of issue

.....
(Signature of the duly authorized official issuing the certificate)

(Seal or stamp of issuing authority, as appropriate)

*Insert the type of ship from among the following: Passenger ship; Passenger high-speed craft; Cargo high speed craft; Bulk carrier; Oil Tanker; Chemical tanker; Gas carrier; Mobile offshore drilling unit; Other cargo ship

INTERIM DOCUMENT OF COMPLIANCE

(State)

(Official seal)

Certificate No:

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended

Under the authority of the Government of.....
(name of the State)

by.....
(person or organization authorized)

name and address of the Company.....

.....
(see paragraph 1.1.2 of the ISM Code)

THIS IS TO CERTIFY THAT the safety management system of the Company has been recognized as meeting the objectives of paragraph 1.2.3 of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) for the type(s) of ships listed below (delete as appropriate)

- Passenger ship
- Passenger high-speed craft
- Cargo high speed craft
- Bulk carrier
- Oil Tanker
- Chemical tanker
- Gas carrier
- Mobile offshore drilling unit
- Other cargo ship

This Interim Document of Compliance is valid until

Issued at
(place of issue of the document)

Date of issue.....

.....

(Official seal)

(State)

Certificate No:

Issued under the provisions of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended

Under the authority of the Government of.....
(name of the State)

by.....
(person or organization authorized)

Name of Ship.....

Distinctive Number or Letters.....

Port of Registry.....

Ship type *.....

Gross Tonnage.....

IMO Number

Name and address of Company

THIS IS TO CERTIFY THAT the requirements of paragraph 14.4 of the ISM Code have been met and that the Document of Compliance of the Company is relevant to that ship.

This Interim Safety Management Certificate is valid until subject to the Document of Compliance / Interim Document of Compliance** remaining valid.

Issued at
(place of issue of the document)

Date of issue

.....
(Signature of the duly authorized official issuing the certificate)

(Seal or stamp of issuing authority, as appropriate)

The validity of this Interim Safety Management Certificate is extended to.....

Date of extension.....

.....
(Signature of the duly authorized official issuing the certificate)

(Seal or stamp of issuing authority, as appropriate)

*Insert the type of ship from among the following: Passenger ship; Passenger high-speed craft;
Cargo high speed craft: Bulk carrier; Oil Tanker; Chemical tanker; Gas carrier; Mobile offshore drilling unit; Other cargo ship

** delete as appropriate

APPENDIX 3:

ISM CODE REQUIREMENTS

ISM CODE REQUIREMENTS

Preamble

1 The purpose of this Code is to provide an international standard for the safe management and operation of ships and for pollution prevention.

2 The Assembly adopted resolution A.443(XI), by which it invited all Governments to take the necessary steps to safeguard the shipmaster in the proper discharge of his responsibilities with regard to maritime safety and the protection of the marine environment.

3 The Assembly also adopted resolution A.680(17), by which it further recognized the need for appropriate organization of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection.

4 Recognizing that no two shipping companies or ship owners are the same, and that ships operate under a wide range of different conditions, the Code is based on general principles and objectives.

5 The Code is expressed in broad terms so that it can have a widespread application. Clearly, different levels of management, whether shore-based or at sea, will require varying levels of knowledge and awareness of the items outlined.

6 The cornerstone of good safety management is commitment from the top. In matters of safety and pollution prevention it is the commitment, competence, attitudes and motivation of individuals at all levels that determines the end result.

1 GENERAL

1.1 Definitions

1.1.1 International Safety Management (ISM) Code means the International Management Code for the Safe Operation of Ships and for Pollution Prevention as adopted by the Assembly, as may be amended by the Organization.

1.1.2 Company means the owner of the ship or any other organization or person such as the manager, or the bareboat charterer, who has assumed the responsibility for operation of the ship from the ship owner and who, on assuming such responsibility, has agreed to take over all duties and responsibility imposed by the Code.

1.1.3 Administration means the Government of the State whose flag the ship is entitled to fly.

1.2 Objectives

1.2.1 The objectives of the Code are to ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular to the marine environment and to property.

1.2.2 Safety-management objectives of the Company should, inter alia:

- .1 provide for safe practices in ship operation and a safe working environment;
- .2 establish safeguards against all identified risks; and
- .3 continuously improve safety-management skills of personnel ashore and aboard ships, including preparing for emergencies related both to safety and environmental protection.

1.2.3 The safety-management system should ensure:

- .1 compliance with mandatory rules and regulations; and
- .2 that applicable codes, guidelines and standards recommended by the Organization, Administrations, classification societies and maritime industry organizations are taken into account.

1.3 Application

The requirements of this Code may be applied to all ships.

1.4 Functional requirements for a safety-management system

Every Company should develop, implement and maintain a safety-management system (SMS) which includes the following functional requirements:

- .1 a safety and environmental-protection policy;
- .2 instructions and procedures to ensure safe operation of ships and protection of the environment in compliance with relevant international and flag State legislation;
- .3 defined levels of authority and lines of communication between, and amongst, shore and shipboard personnel;
- .4 procedures for reporting accidents and non-conformities with the provisions of this Code;
- .5 procedures to prepare for and respond to emergency situations; and

.6 procedures for internal audits and management reviews.

2 SAFETY AND ENVIRONMENTAL-PROTECTION POLICY

2.1 The Company should establish a safety and environmental-protection policy which describes how the objectives given in paragraph 1.2 will be achieved.

2.2 The Company should ensure that the policy is implemented and maintained at all levels of the organization both, ship-based and shore-based.

3 COMPANY RESPONSIBILITIES AND AUTHORITY

3.1 If the entity who is responsible for the operation of the ship is other than the owner, the owner must report the full name and details of such entity to the Administration.

3.2 The Company should define and document the responsibility, authority and interrelation of all personnel who manage, perform and verify work relating to and affecting safety and pollution prevention.

3.3 The Company is responsible for ensuring that adequate resources and shore-based support are provided to enable the designated person or persons to carry out their functions.

4 DESIGNATED PERSON(S)

To ensure the safe operation of each ship and to provide a link between the Company and those on board, every Company, as appropriate, should designate a person or persons ashore having direct access to the highest level of management. The responsibility and authority of the designated person or persons should include monitoring the safety and pollution-prevention aspects of the operation of each ship and ensuring that adequate resources and shore-based support are applied, as required.

5 MASTER'S RESPONSIBILITY AND AUTHORITY

5.1 The Company should clearly define and document the master's responsibility with regard to:

.1 implementing the safety and environmental-protection policy of the Company;

.2 motivating the crew in the observation of that policy;

.3 issuing appropriate orders and instructions in a clear and simple manner;

.4 verifying that specified requirements are observed; and

.5 reviewing the SMS and reporting its deficiencies to the shore-based management.

5.2 The Company should ensure that the SMS operating on board the ship contains a clear statement emphasizing the master's authority. The Company should establish in the SMS that the master has the overriding authority and the responsibility to make decisions with respect to safety and pollution prevention and to request the Company's assistance as may be necessary.

6 RESOURCES AND PERSONNEL

6.1 The Company should ensure that the master is:

- .1 properly qualified for command;
- .2 fully conversant with the Company's SMS; and
- .3 given the necessary support so that the master's duties can be safely performed.

6.2 The Company should ensure that each ship is manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements.

6.3 The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety and protection of the environment are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, documented and given.

6.4 The Company should ensure that all personnel involved in the Company's SMS have an adequate understanding of relevant rules, regulations, codes and guidelines.

6.5 The Company should establish and maintain procedures for identifying any training which may be required in support of the SMS and ensure that such training is provided for all personnel concerned.

6.6 The Company should establish procedures by which the ship's personnel receive relevant information on the SMS in a working language or languages understood by them.

6.7 The Company should ensure that the ship's personnel are able to communicate effectively in the execution of their duties related to the SMS.

7 DEVELOPMENT OF PLANS FOR SHIPBOARD OPERATIONS

The Company should establish procedures for the preparation of plans and instructions for key shipboard operations concerning the safety of the ship and the prevention of pollution. The various tasks involved should be defined and assigned to qualified personnel.

8 EMERGENCY PREPAREDNESS

8.1 The Company should establish procedures to identify, describe and respond to potential emergency shipboard situations.

8.2 The Company should establish programmes for drills and exercises to prepare for emergency actions

. 8.3 The SMS should provide for measures ensuring that the Company's organization can respond at any time to hazards, accidents and emergency situations involving its ships.

9 REPORTS AND ANALYSIS OF NON-CONFORMITIES, ACCIDENTS AND HAZARDOUS OCCURRENCES

9.1 The SMS should include procedures ensuring that non-conformities, accidents and hazardous situations are reported to the Company, investigated and analysed with the objective of improving safety and pollution prevention.

9.2 The Company should establish procedures for the implementation of corrective action.

10 MAINTENANCE OF THE SHIP AND EQUIPMENT

10.1 The Company should establish procedures to ensure that the ship is maintained in conformity with the provisions of the relevant rules and regulations and with any additional requirements which may be established by the Company.

10.2 In meeting these requirements the Company should ensure that:

.1 inspections are held at appropriate intervals;

.2 any non-conformity is reported, with its possible cause, if known;

.3 appropriate corrective action is taken; and

.4 records of these activities are maintained.

10.3 The Company should establish procedures in its SMS to identify equipment and technical systems the sudden operational failure of which may result in hazardous situations. The SMS should provide for specific measures aimed at promoting the reliability of such equipment or systems. These measures should include the regular testing of stand-by arrangements and equipment or technical systems that are not in continuous use.

10.4 The inspections mentioned in 10.2 as well as the measures referred to in 10.3 should be integrated into the ship's operational maintenance routine.

11 DOCUMENTATION

11.1 The Company should establish and maintain procedures to control all documents and data which are relevant to the SMS.

11.2 The Company should ensure that:

- .1 valid documents are available at all relevant locations;
- .2 changes to documents are reviewed and approved by authorized personnel; and
- .3 obsolete documents are promptly removed.

11.3 The documents used to describe and implement the SMS may be referred to as the Safety Management Manual. Documentation should be kept in a form that the Company considers most effective. Each ship should carry on board all documentation relevant to that ship.

12 COMPANY VERIFICATION, REVIEW AND EVALUATION

12.1 The Company should carry out internal safety audits to verify whether safety and pollution-prevention activities comply with the SMS.

12.2 The Company should periodically evaluate the efficiency of and, when needed, review the SMS in accordance with procedures established by the Company.

12.3 The audits and possible corrective actions should be carried out in accordance with documented procedures.

12.4 Personnel carrying out audits should be independent of the areas being audited unless this is impracticable due to the size and the nature of the Company.

12.5 The results of the audits and reviews should be brought to the attention of all personnel having responsibility in the area involved.

12.6 The management personnel responsible for the area involved should take timely corrective action on deficiencies found.

13 CERTIFICATION, VERIFICATION AND CONTROL

13.1 The ship should be operated by a Company which is issued a document of compliance relevant to that ship.

13.2 A document of compliance should be issued for every Company complying with the requirements of the ISM Code by the Administration, by an organization recognized by the Administration or by the Government of the country, acting on behalf of the Administration in which the Company has chosen to conduct its business. This document should be accepted as evidence that the Company is capable of complying with the requirements of the Code.

13.3 A copy of such a document should be placed on board in order that the master, if so asked, may produce it for the verification of the Administration or organizations recognized by it.

13.4 A certificate, called a Safety Management Certificate, should be issued to a ship by the Administration or organization recognized by the Administration. The Administration should, when issuing the certificate, verify that the Company and its shipboard management operate in accordance with the approved SMS.

13.5 The Administration or an organization recognized by the Administration should periodically verify the proper functioning of the ship's SMS as approved.

APPENDIX 4

INTERVIEWERS