

Enhancing Implementation Capability of National Maritime Administration for Preventing Marine Pollution

이 상 집*

海洋汚染防止를 위한 行政力量 提高

Sang-Jib Lee *

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요 약

IMO는 회원국의 海洋行政力量 제고를 위하여 行政모델을 제시하고 그 수용을 권장하여야 한다. 선박안

* Lee Sang-jib, Ph.D. is the president of the Society of Maritime Safety. As a former dean of Maritime Science College, he has suggested the integration of maritime government functions submitting The Letter of Recommendation to the President Kim Young-sam of Korea for Reformation of Maritime Administration, 1993. Korea Maritime University, Youndo-ku, Pusan, Korea, Fax.51 404-4944.

전과 海洋環境保全是 기술제도 법령과 같은 외적인 요소와 해당 규정을 충실히 준수하게 하는 각국 정부의 施行力量 등과 같은 내적인 요소의 상호작용에 의하여 좌우된다. 그러나 IMO는 협약제정과 기술지원과 같은 외적인 사업에만 치중한 반면 각 정부의 協約施行力量 문제는 주권관련 사항이라는 이유로 방관해왔다. 그 결과 수많은 국제협약과 準則이 개발되어 있음에도 불구하고 오늘날 대형 海洋慘事가 도처에서 반복되고 있고 아직도 海洋汚染의 24%는 선박운항에서 기인되는 것으로 추정되고 있으며 각종 유해 물질 운반으로 인한 海洋環境 피해는 심각한 것으로 알려져 있다.

해운산업이 다국적 기업형태로 무한 국제경쟁에 맡겨져 있는 한 기준 미달인 선주, 운항자, 관리자, 선급협회, 보험업자 등이 서로 결탁하여 위장, 허위, 불법 운항을 감행하려는 유혹은 항상 있을 수 있고 이에 대한 대응 제도를 개발하더라도 좀처럼 근절될 수는 없다고 보아야 할 것이다. 예를 들면, 화물을 가득 채운 선박의 경우에는 PSC 검사요원이 임검하더라도 화물창내의 상태를 검사할 수가 없어 서류검사로 대체할 수밖에 없고, ISM Code를 수용한다 하더라도 본선에 재량권을 이양하여 안전중심으로 선박을 운항하면 경쟁력을 상실한다는 우려가 팽배되고 있는 한 이러한 제도의 효과는 한계에 부딪힐 수 밖에 없기 때문이다.

즉, 아무리 좋은 제도와 규정이 마련된다 할지라도 그 施行을 기피하려는 자에게는 법망을 피해 나가는 길은 있게 마련이다. 따라서 동일한 협약이라 할지라도 각국의 協約施行充實度에 따라 그 효과는 천차만별이 될 수 밖에 없다. 그 대표적인 사례로서 선박의 全損率과 PSC검사에 의한 선박 扣留率 등과 같은 指標가 나라에 따라 그 정도가 크다는 점을 들 수 있다. 新興海洋國과 先進海洋國간에 수 십배로 되어 있는 이들 指標差는 좀처럼 좁혀질 기미가 보이지 않는다.

그러므로 IMO는 각국이 어떠한 조직으로 국제협약을 施行하는가에 관심을 가져야 하며 海洋行政 모형과 行政力量의 최소 기준을 제시하여 각국이 효과적인 行政組織을 갖추도록 권고할 필요가 있다. 선원의 자격훈련 근무요건에 관하여 STCW 협약으로 표준화운동을 전개해 온 것과 같이 각국의 協約施行力量 제고를 위하여 海洋行政體系의 표준화 운동을 전개해야 할 것이다.

비효율적이고 전문성이 낮은 조직을 가진 정부는 국제협약을 수용하더라도 그 효과는 기대에 미치지 못한다는 것이 드러난 이상 IMO는 이것을 방관하지 말고 적극적으로 관여하여야 하며 UN海洋法協約이 발효된 시점에서 IMO의 기본임무로 인식하여야 할 것이다.

IMO가 제시하는 海洋行政모형에는 行政의 전문성과 생산성 그리고 기민성 제고를 위하여 적어도 다음과 같은 기본요건이 명시되어야 할 것이다

첫째, 유능한 인체가 海洋行政分野로 진출하려고 하는 조직문화가 정착되도록 전문가에게 책임과 권한이 일임되어야 한다.

둘째, 海洋行政의 공백을 최소화하고 行政船活를 극대화하기 위하여 海洋行政을 현장업무 중심으로 일원화하고 현장요원을 多重任務制(multi-mission)로 운영할 수 있어야 한다.

셋째, 비상시에는 범국가적으로 行政力을 신속히 동원할 수 있도록 매트릭스 조직 기능이 발휘될 수 있어야 한다.

Abstract

Almost of all the impediments to enhancing ship safety and preventing vessel-source marine pollution arise from the interaction between direct and indirect factors. The direct factors come from human errors and failure in compliance with the international convention standards for the operation of vessels. The indirect factors derive from the will and attitudes of the countries taking little responsibilities with appropriate seriousness for policing their fleets.

By focusing on these aspects, this paper reviews the effectiveness of existing countermeasures adopted by IMO and intends to propose a new paradigm to improve the implementation capability of each nation by suggesting frameworks of maritime administration models.

I. Introduction

It is widely known that considerable progress has been made in reducing vessel-source marine pollution due to the adoption and ratification of international conventions pertaining to both ship safety and marine pollution prevention. However, the relative contribution of the oil entering the sea from marine transportation activities reportedly amounts to 24% of total discharges into the world's oceans.¹⁾ In addition, pollutions by chemicals and the disposal of wastes at sea are becoming serious issues. As the reduction in accident rate has slowed and even reversed, the sea is still being contaminated by catastrophic oil spill disasters and operational pollutions.

Such a state of marine environment is caused mainly by the gap between the incentive and capability of national maritime administration in implementing all the international measures, not by the lack of international legislation for ship safety and marine pollution prevention.

This paper perceives realities that the above mentioned gap can be an indicator of the implementation capability of a national maritime administration and the size of that gap in turn is determined by the combination of quantitative and qualitative components; the former derive from technological measures and human resources, while the latter depend on the social context and organizational culture of each nation's maritime administration.

By focusing on these aspects, this paper intends to propose a new paradigm for ship safety and pollution prevention which has to be

adopted by IMO to upgrade implementation capability of maritime administration for its member governments.

And also this paper deals with the state of vessel-source marine pollution and its countermeasures, an analysis of the current situation of shipping contributions to the marine pollution, and recommendations for resolving the issues.

II. State of vessel-source marine pollution

1. Pollution by tanker accidents

The estimate of oil entering the sea from marine transportation activities has been reduced from 1.47 million tons in 1981 to 0.57 million tons in 1989(in table 1), due to the development of improved standards, navigational aids, training and watchkeeping, and traffic separation schemes. But this does not necessarily mean that the fight against marine pollution is over. The amount of oil entering the sea from the marine transportation sources can be subdivided as shown in table 2.²⁾

Although the oil pollution arising from tanker accidents contributes a comparatively small percentage of the total oil entering the sea in a year, the consequences can be disastrous to the immediate area. In addition, volumes spilled annually from tankers are highly variable, making trends difficult to predict accurately. Tanker accidents are infrequent, unexpected, and are potentially very damaging ; their negative consequences often persist for more than 10 years.³⁾

Table 1. Estimated inputs of petroleum hydro transportation activities

	1981		1989	
	(million tonnes)	%	(million tonnes)	%
Tanker operations	0.7	47.6	0.159	27.9
Tanker accidents	0.4	27.2	0.114	20.4
Bilge and Fuel oil discharge	0.3	20.4	0.253	44.4
Dry-docking	0.03	2	0.004	0.7
Marine terminals (including bunkering operation)	0.022	1.4	0.03	5.3
Non-tanker accidents	0.02	1.4	0.007	1.2
Scrapping of ships	-	-	0.003	0.5
Total	1.47	100	0.57	100

Table 2. Estimated inputs of petroleum hydro transportation activities

	1985 (%)	1990 (%)
Natural sources	8	11
Offshore production	2	2
Maritime transportation	45	24
Atmosphere	10	43
Land-based discharges and run-off	34	50
- refineries		
- municipal waste water		
- industrial waste water		
- urban run off		
- rivers		
Dumping at sea	1	0
Total	100	100

Sources : GESAMP Reports and studies No.50, 1993, pp.24-25, 27.

2. Pollution by tanker operations

Another problem which no nation will be able to ignore is the marine pollution by the oil discharged or spilt from ships and terminals in the course of their normal operations other than tanker accidents. Actually, a much greater quantity of oil enters the seas as a result of normal tanker operations, usually associated with the cleaning of cargo residues which takes place when the ship is returning from the port

of discharge to take on another cargo of oil. In 1985 the US National Academy of Science estimated that 48.5% of oil pollution resulted from transportation and terminal operations, of this only 12.5% came from tanker accidents, while 21% was the result of tanker operations and 11% stemmed from non-tanker shipping.⁴⁾

The effect of operational pollution may seem less dramatic because it is spread throughout the oceans of the world. However, the heavy concentrations of such pollution in port and harbour areas, and other coastal areas where wind and tide tend to concentrate such matters give rise to a number of chronic pollution problems.

3. Pollution by chemicals

Pollution by chemicals at sea is also becoming a serious issue. The carriage of dangerous, hazardous, and noxious substances by sea is not a new phenomenon. But today, the product, be it a hydrocarbon, a highly toxic weed-killer, or radioactive waste, is perhaps more dangerous. Many of the chemicals carried by sea are far more dangerous to the marine environment than the oil. Some of them are so poisonous that even a tiny amount measured in parts per million can kill fish and other marine life and pose serious health risks for those who come in contact with them. They can build up in the food chain until they are present in large enough quantities to present a danger to human health. Some of them are so persistent that they can last for tens or even hundreds of years. The United States Coast Guard has reported that chemical spill cleanups may be five times as lengthy and up to ten times as costly as the cleanups of an equivalent volume of oil.⁵⁾

4. Pollution by garbage and sewage

The oceans are also polluted by garbage and sewage. Persistent forms of garbage, in particular, plastics including synthetic ropes, fishing nets, and plastic bags are now widely recognized as posing a severe threat to the marine environment and, in particular, to marine mammals.

III. Regulatory regime for ship safety and vessel-source marine pollution prevention

The fight against vessel-source marine pollution is inextricably linked to the prevention of accidents at sea, because safety at sea and vessel-source marine pollution are closely-related, and safe ships are less likely to be involved in marine pollution.

Therefore, to achieve the reduction of vessel-source marine pollution, comprehensive efforts have to be made in the areas of ship safety assurance, casualty prevention, incident response, and claim compensation. The main conventions and treaties related therewith are as follows :

1. Regime for ship safety

One of the most important of all international treaties concerning the safety of merchant ships is the International Convention for the Safety of Life at Sea(SOLAS), which deals with the measures involving such matters as construction, equipment, navigational procedures, communications, and crew standards.

Beside the defect of equipment and design, human error has become one of the large contributors to marine accidents. Ships carrying hazardous and noxious cargoes with complex

and sophisticated equipment on board require highly-trained and skilled personnel. These situations resulted in establishment of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 1978), which deals with the global standards for maritime training.

2. Regime for vessel-source marine pollution prevention

1) Regulatory regime for combating pollution from ship operation

The keystone of marine environment protection regulatory structure is the International Convention for the Prevention of Pollution from Ships(MARPOL 73/78) and its related Protocol. It deals not only with oil but also noxious liquid substances carried in bulk, hazardous chemicals, harmful substances carried in packages, and sewage and garbage.⁶⁾

2) Responding to pollution

In the case of oil pollution accidents on the high seas, the coastal state has to take such measures as may be necessary to prevent, mitigate or eliminate danger to its coast line or related interests from pollution by oil or threat thereof. For this purpose, Intervention on the high seas in cases of oil pollution casualties, 1969 Convention(Intervention) entered into force 1975; it empowers coastal government, assuming certain established criteria are met, to direct or to give orders to those involved, be they owners, masters, or salvors.⁷⁾

To establish an international system for responding to major oil spills, International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990('90 OPRC) was established. Although not yet in force, it covers the

contingency planning and response requirements of the shipping industry, the offshore industry, harbor, port and terminals and a co-ordinating governmental body.⁸⁾

3) Regulating dumping

In an effort to regulate deliberate dumping into the sea of land-generated wastes, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (the London Dumping Convention or LDC) was adopted in 1972. It provides effective guidance to Contract Parties concerning the selection of dumping sites, dumping techniques, and monitoring programmes. This convention has been effective in promoting the control of all sources of marine pollution and value of a comprehensive waste management approach.

4) Liability and compensating for pollution :

The cost of cleaning up oil spills and the economic losses can run into billions of dollars. For Example, as mentioned previously, the cost of the Exxon Valdez case exceeded 3.4 billion dollars.

In response to the economic impact of major oil spills, the Civil Liability Convention(CLC) was adopted in 1969. This treaty establishes strict liability for pollution damage for the owner of seagoing vessel actually carrying oil in bulk as cargo.

But sometimes the financial burden of paying compensation have to be borne partly by the oil cargo interest, for example, oil importers. This resulted in the establishment of the International Oil Pollution Compensation Fund(IOPC Fund) in 1978. The IOPC gives supplementary compensation to persons who cannot receive full compensation under the CLC.

IV. Cause analysis of current vessel-source pollution

From the standpoints of international shipping the causes of contemporary vessel-source pollution are analyzed as follows :

1. Diversity of interested parties of shipping

The owner/operator of ship is globally diversified. Water knows no bounds, and as a result shipping tends to be a global industry not restricted by jurisdictional ties in the same way as land-based industries. The owner, operator, manager, underwriter, and classification society for a ship is multinational. Such global diversity tends to be the norm in the shipping industry rather than the exception. Because of such a multinational interested parties, sometimes it is difficult to establish liability for compensation for the spill accidents.

2. Fierce international competition of shipping

Shipping has been left to the mechanism of fierce international competition. The blind pursuit of cheaper and cheaper freight rates cannot be avoided in the name of international competitiveness. Limitless commercial pressure has driven freight rates lower and lower to the point where owners and operators buy the cheapest crews possible and avoid essential maintenance of the ships and of their life-saving equipment.

Some of the shipowners/managers are reluctant to pay attention to the essential ship safety issues, due to the commercial pressure. This in turn has led to a decline in the quality and standards of ship management. This decline has

been exacerbated by the failure of many ship owners including managers, and classification societies to observe convention standards. Consequently, the progress of ship safety is likely to be impeded by the vicious circle of following substandard interested parties :

① Substandard owners who are reluctant to invest money for the building of new ships or even for the maintenance of existing ships, exposing ships to the risk of loss.

② Substandard classification societies, who readily accept changes in the class of vessels already rejected by the more reputable classification societies.⁹⁾

③ Substandard flag states, particularly flags of convenience, which fails to ensure that ships on their registers comply with IMO convention standards; this contributes to the increasing number of shipwrecks, scuttling of vessels, maritime fraud, and pollution incidents.¹⁰⁾

④ Substandard underwriters, who fail to differentiate between high and low quality tonnage realigning premiums to reflect the level of risk.

⑤ Substandard crew, who are lacking in training and experience, and come from less traditional maritime nations on very low wages.

3. Big difference in ship safety indicators by nations

A survey of average tonnage/loss ratio between 1985 and 1989 which could indicate relative degree of the safety records of flag state fleet is shown in table 3 and that in 1994 in table 4. In both of the cases, some of the countries have large variation from average. For instance, they show some of the nations to have the worst record with an average loss ratio of 1.14% and UK to have the best one with that of 0.01%.¹¹⁾

Another safety record of the flag state fleet which could be represented by the survey of delays/detentions rate per flag state is shown in table 5. It is also the ship delays/detentions records by inspecting 20.6% of the vessels visiting ports of 14 MOU(Memorandum Of Understanding) countries in 1989. The report shows Honduras to have the worst delays/ detentions record, with more than one in five of its ships halted, because of deficiencies while the UK with a detection rate 3.794%.¹²⁾

In summary, the differences in both average loss ratios and delays/detentions rates of ships per flag state by nations are too big to be justified. The safety records of fleets from emerging maritime countries are generally worse than those of traditional maritime countries.

4. Limitation of enforcing on pollution law offenders

Detection and prosecution for spill activities are sometimes difficult to enforce because of the follows :

① A very small chance that vessels involved in illegal discharges will be detected.

② If a vessel is detected there is an extremely small chance that this detection will be followed by prosecution.

③ If a vessel's owner is prosecuted there is only a small chance of ultimate success since the burden of proof is on the prosecuting authorities and in many cases proof is considered insufficient.

④ When a judge does impose a fine, these fines generally appear to be very low in comparison to the price the vessel would have to pay for using port reception facilities.¹³⁾

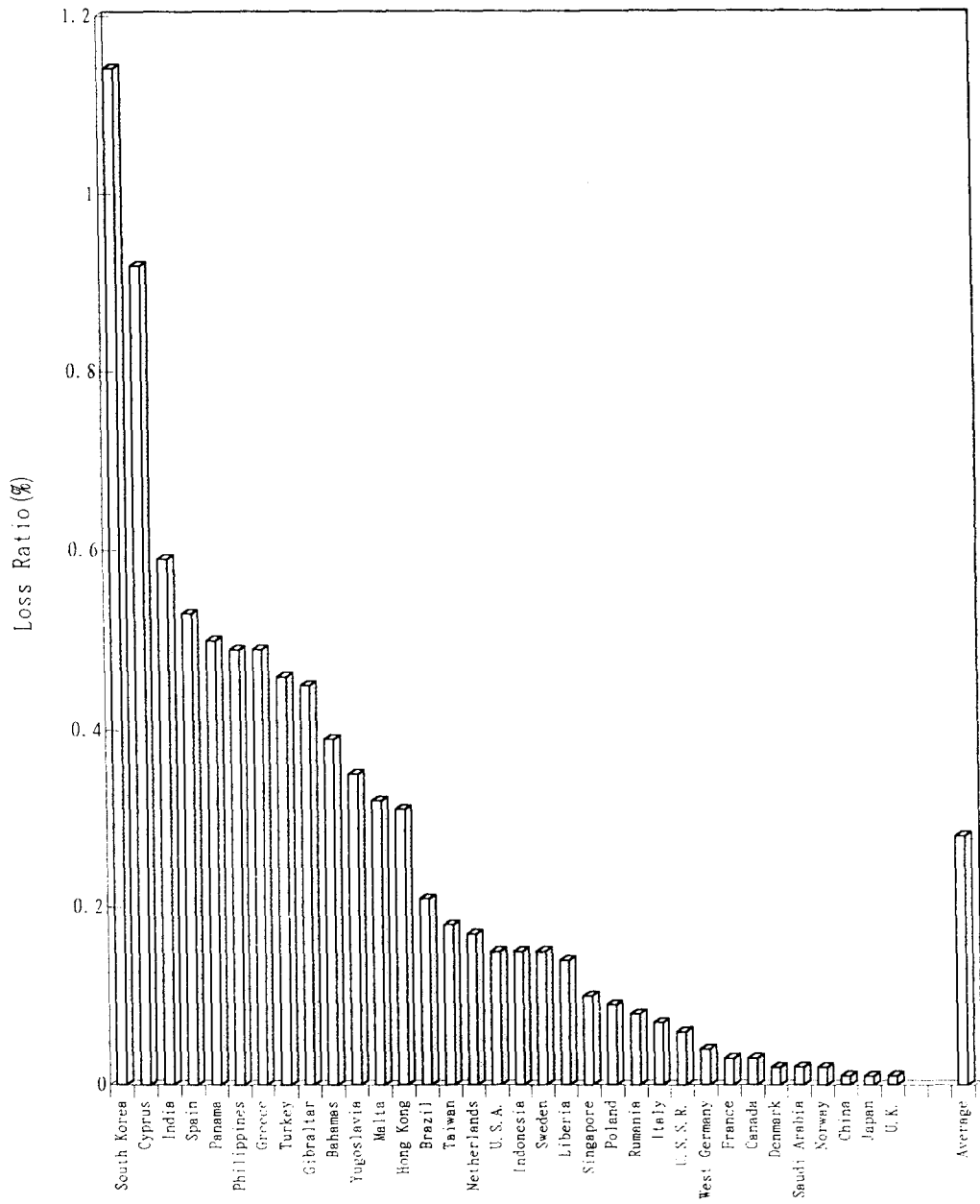


Table 3. Fleets by Flag of Million Gross Tons and Over(in 1989) (Source : The Institute of London Underwriters)

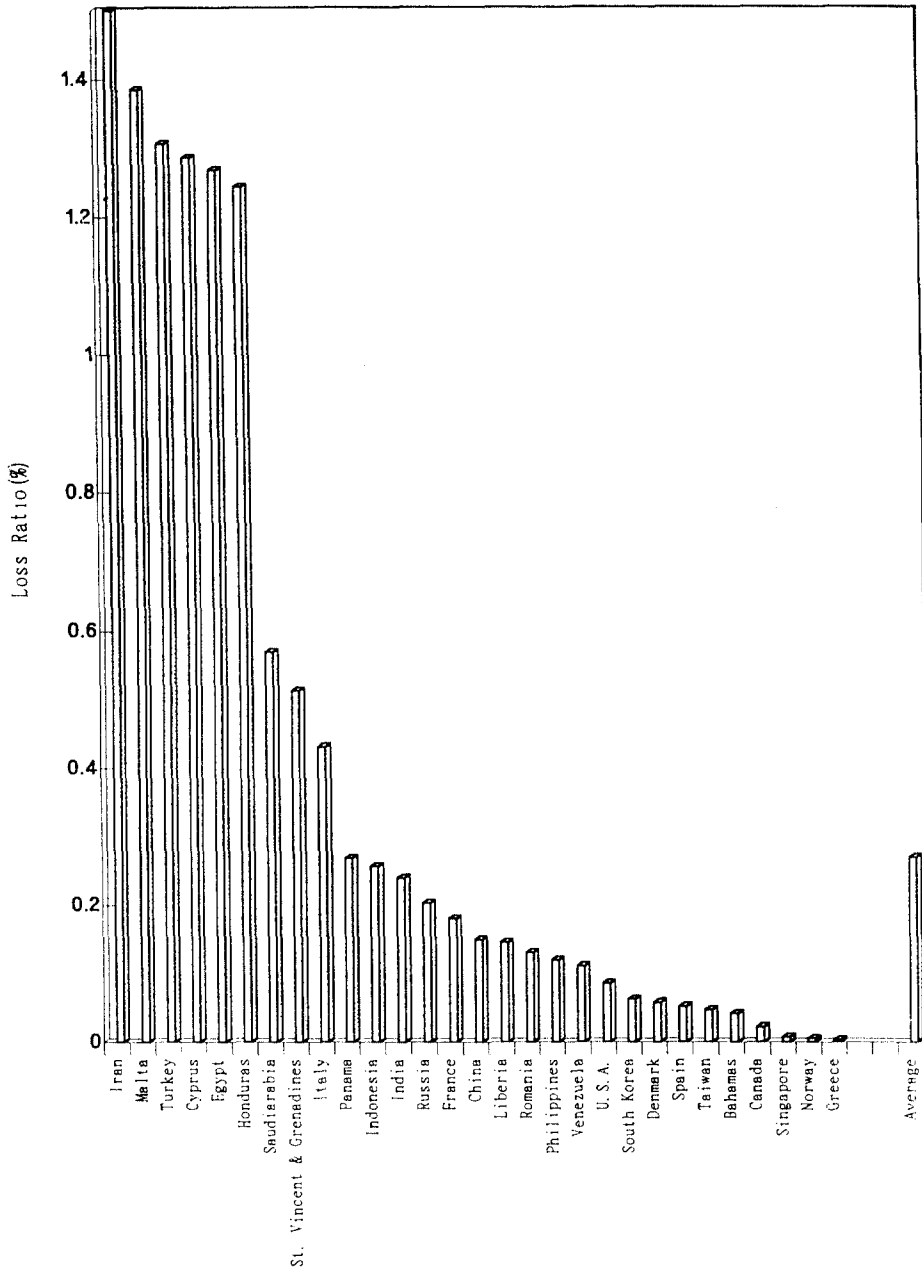


Table 4. Total Losses by Flag 1994(Source : The Institute of London Underwriters)

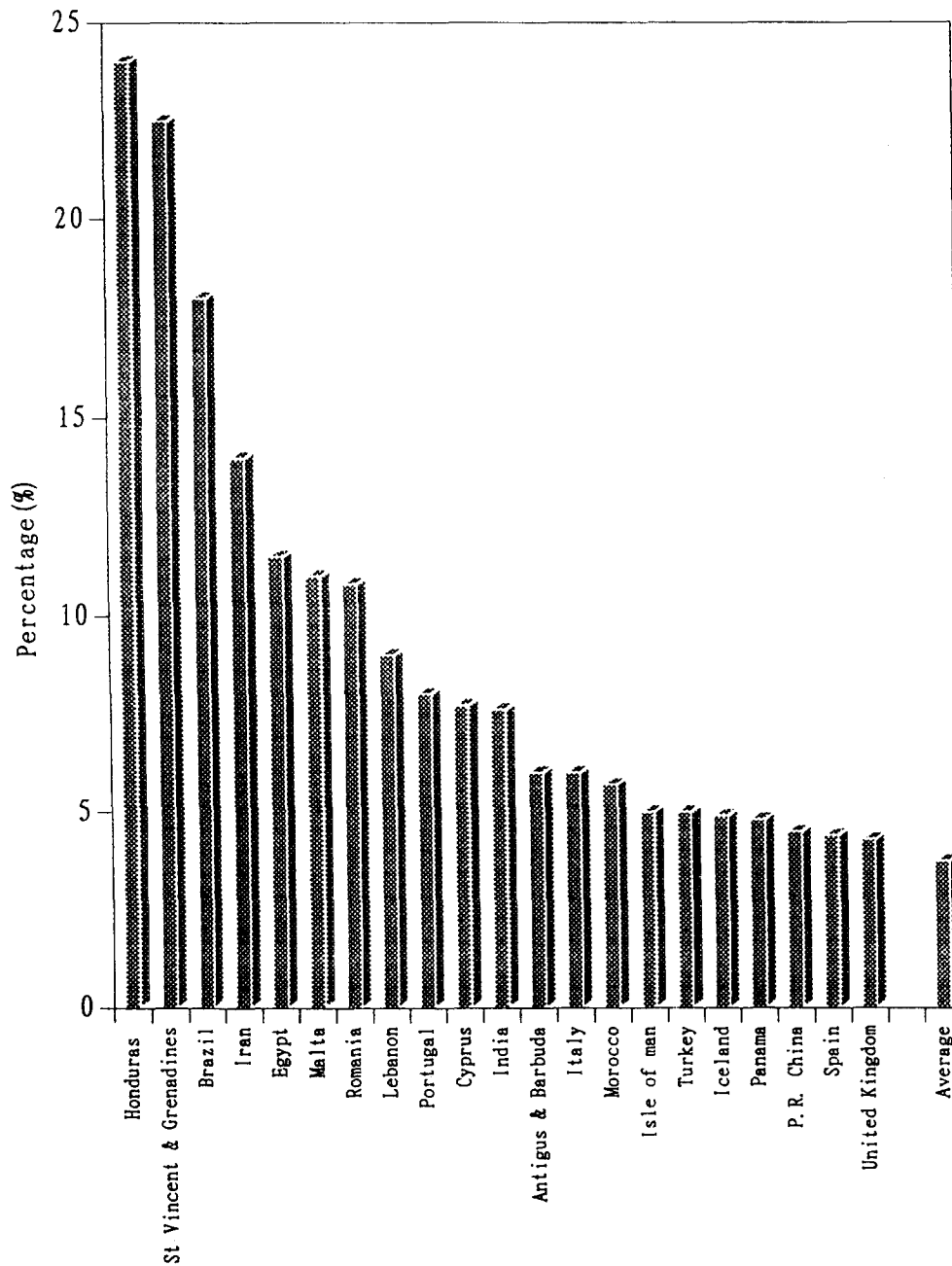


Table 5. Delays/Detentions per Flag State 1989(Source : The Institute of London Underwriters)

5. Limitation of the international counter-measures

Recently developed countermeasures for ship safety and pollution prevention have limitations as follows :

1) Limitation of the Port State Control(PSC)

Port State has no control over the standards of design, construction or equipment of the arrived ship, and the crews with already determined standards of training and qualification. Any deficiencies in these basic elements are very difficult for the port state to detect. And even if they can be detected, correction is not easy.¹⁴⁾ There were too many deficient vessels slipping the supervisory net, despite the commitment of the signatories to ensure that 25% of all ships were inspected, because of the limitation of the inspector's job; the fact that they were often unable to examine ships properly because of the cargo in holds and tanks and water in ballast tanks. Inspectors also wasted too much time examining the documents on well-found vessels, while vessels more deserving of the inspectors' attention escaped scrutiny.¹⁵⁾

2) The limitation of ISM Code(the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention)

The quality of safety management of both shore and shipboard sides could be enhanced by acceptance of ISM Code, which deals with management rather than technical issues.

Unfortunately in developing such a safety culture with this code, questions are still to be remained about whether demands being placed upon shipmaster would be reasonable and whether masters would not be constrained by an owner insisting that a particular route or speed

should be maintained despite bad weather, thus risking safety. No one expects that an owner will not insist that a ship must arrive in port with clean ballast if there is no time to complete this operation or if there are inadequate facilities for it. Anyone cannot expect that living welfare and employment conditions will not fall below those needed to ensure good morale and motivation.

3) Limitation of Flag States Implementation Sub-committee

IMO established recently Flag State Implementation Subcommittee to assist administration to achieve a more appropriate level of compliance with the international legislation. And they concentrate on how the functions of flag state administration could be delegated to other bodies, which may be authorized to act on behalf of an administration.¹⁶⁾

Namely, it would appear that the agencies dealing with ship inspections such as classification societies will come under closer scrutiny and guidelines have been submitted on how to delegate powers to them and how to judge the good from the less effective.¹⁷⁾

They seem to concern heavily on the identification of needs of developing countries and on the making of proposal for technical assistance. But flag states compliance cannot be achieved merely by providing technical assistance to developing countries.¹⁸⁾

V. Summary, conclusions and recommendations

1. Summary

Enhancing both ship safety and vessel-source marine pollution prevention has confronted limitations, because existing countermeasures are not enough to regulate flag state's reluc-

tance in complying with international conventions due to the unique characteristics of shipping regime.

Shipping has been left to the limitless competition burdening with even operating cost pressure. This in turn brings about substandard owner, substandard operator, substandard manager, substandard underwriter and substandard classification societies. Such a state of shipping is worsen by open registries of ships.

Big differences of ship safety records by nation are enough to back up stories that some of the flag states lack national infrastructure to adequately police their fleets and that some of the port states are not able to take responsibility for enforcing treaty obligation. This could lead to the high potential of casualties at sea which contribute to the marine pollution.

2. Conclusions

IMO has developed more than thirty international treaties, several hundred codes, and numerous recommendations. But almost all of the IMO's efforts have focused on helping and cooperating in terms of scientific and technological measures and human resources but IMO has not concerned on the quality of member government's implementation capability of maritime administration.

This one-sided orientation of IMO has led to the large gap between law enactment and law enforcement for both ship safety and marine pollution prevention; that is one of the reasons why IMO has been powerless to ensure observance of its conventions particularly in some of the emerging maritime countries.

3. Recommendations

IMO has to make more aggressive efforts to maintain a high standard of implementation capable of complying with standards and conventions by introducing a new international paradigm to improve the productivity, readiness and expertness of maritime administration of each member government; several different types of maritime administration models have to be suggested so that one of them can be chosen by recipient governments depending on their cultural and social backgrounds. Any types of maritime administrations have to include the following factors :

① Maritime administration has to ensure the effective integration of various functions into a synergistic whole and the self-contained instrument capable of providing a full range of systematic maritime services such as waterway management, vessel traffic control, aids to navigation, marine inspection, oil spill response, and cleanup operations.¹⁹⁾

② Administrative blank in monitoring ships and oceans has to be minimized by establishing multi-mission service system for both fleets and shipboard personnels, ensuring nationally matrix organizational behaviour, removing barriers between divisions, and minimizing the vertical steps of bureaucracy.

Reasonable administration infrastructure with a culture attractive to competent young generation has to be maintained where experts can enjoy both rights and obligations in implementing convention standards.

③ Minimum requirements for the training and education of the administration staffs have to be specified in the same way as those of seafarers are stipulated in STCW convention.²⁰⁾

④ A quality assurance program for national maritime administration has to be adopted by self-testing and examining the implementation

capability of member governments in the same way as that for classification societies is examined by IACS to restore confidence in the classification system.²¹⁾

⑤ Standards and procedures for improving implementation capability of maritime administration have to be laid down in a similar way as those for enhancing safety management of ships are laid down in ISM Code.²²⁾

⑥ Principles of implementation have to be made to provide frameworks for vessel inspection, monitoring of shipping activities, responding of ocean management, traffic service, contingency plan, human resources trained, modernized facilities and equipment, quick communication system.

In short, IMO has to make a resolution to maintain a high quality of implementation capability of national maritime administration for ship safety and marine pollution prevention. IMO has to be ready to overcome problems and conflicts in dealing with domestic administration issues of member governments.

Note and References

- 1) IMO, Impact of oil and related chemicals on the marine environment, GESAMP Reports and Studies No. 50, 1990, p. 25.
- 2) Ibid. pp. 25 and 64.
- 3) Wreck of Exxon Valdez: On March 24, 1989, the Exxon Valdez went aground in Prince William Sound, Alaska, and discharged 42 million liters of crude oil. Approximately 2 - 3,000 animals were killed outright. Tens of thousands of seabirds died, including 150 bald eagles. Clams, mussels and fish were contaminated. Cleanup costs and compensation amounted to more than 3.4 billion dollars (Ibid. of 1) p. 51. and US coast Guard, Proceedings of the Maritime Council, May-June 1992, p.3].
- 4) R. Hartley, Ships of the Shame (Inquiry into Ship Safety), Australian Government Pub., 1992, p. 45.
- 5) Simon Barker, Hazardous goods at sea: are safe ships and clean seas mutually exclusive? A Canadian perspective, Marine Policy, 1992, July p. 307.
- 6) The main elements of MARPOL 73/78 are as follows: ① Discharge into the sea of oil and chemicals, sewage and garbage necessary in the normal operation of ships strictly limited and prohibited in particularly environmentally-sensitive sea areas. ② Establishment of shore-based reception facilities for oil and chemical residues, garbage and sewage. ③ Strict ship construction and equipment standards which minimize to the extent practicable the release of oil and chemicals in case of an accident. ④ Mandatory provision for ship inspections and surveys to ensure compliance with international standards. ⑤ Incidents involving oil and other harmful substances must be reported without delay. ⑥ Cooperation between Governments in the detection of violations and enforcement of the rules (from IMO, Strategy for the

- Protection of the Marine Environment, 1989, 8, p. 13).
- 7) Michael L. Stacey, Legislation, Regulation and Government administration, Marine Police, 1994, 18(6), p. 503.
 - 8) S. Bonsall, Emergency Response to Protect the Marine Environment, Seaway 1994. 1. p. 12.
 - 9) The main reason why this phenomena could occur is that they are paid by the shipowner and they are in competition for the available business.
 - 10) Open registries now amount to one third of world tonnages, grown from 21.6% in 1970 to 34.1% in 1990(from C.C. Dayton, The Development of Port State Control for the Asia-Pacific Region, Proceeding of Maritime Technology 21st Century 1993 Conference).
 - 11) The Telegraph, Average Loss Ratios 1985 - 1989 for fleets by flag of 2 million gross tons and over in 1989, Nov. 1990. p. 19.
 - 12) The Telegraph, More Faulty Ships, Sept. 1990, p. 19.
 - 13) IMO, Cleaner oceans : the role of IMO in the 1990s, p. 13.
 - 14) D.Bell, Port State Control, versus flag state control: UK government position [Marine Policy, Sept. 1993, p. 367].
 - 15) Michael Grey, Safer Ships-Cleaner Seas, Nautical Year Book 1995, pp. 34, 36.
 - 16) The main subject to be dealt with by the FSI sub-committee are: ① Guidelines for delegation of authority to bodies acting on behalf of flag state. ② Minimum standards for bodies acting on behalf of flag states. ③ Guidelines to flag states on monitoring bodies acting on behalf of flag states. ④ minimum requirements of training and experience for staff assigned to the implementation of IMO instruments. ⑤ Availability of qualified staff to implement and monitor IMO instruments(from Shin Ho-Chul, Safety at Sea, New Prospect of Shipping in the Era of 2000, Asia Pacific Sea Transport Conference., 1993. And C.J. Parker, Port and Shipping Management: Work Shop Presentation, Marine Policy, Sept. 1993, p. 393).
 - 17) O.H.J. Dijkhoorn, Port and shipping Management : the Role of IMO. Marine Policy, Sept., 1993, p. 366].
 - 18) Andre Nollkaemper, Agenda 21 and Prevention of Sea-based Marine Pollution, Marine Policy Policy, Nov. 1993, p.552.
 - 19) To maintain the most effective maritime administration standard in a country, missions for ship safety and marine pollution prevention should be integrated into a single independent instrument with decision-making autonomy for both policy and on-the-spot implementation. On the contrary, if such missions are dispersed into several different departments and subordinated to economic oriented divisions, as in Korea, Blank of administration, overlapping of budgets, evading of obligations, shifting of responsibilities between divisions are likely to happen(Lee, Sang-jib, The Letter of Recommendations to the President Kim Youn-sam of Korea for the Reformation of Maritime Administration, June, 1993).
 - 20) To solve the issue with the safety and availability of seafarers, IMO has started to amend the convention on Standards of Training, Certification and Watchkeeping(STCW) so that it could be provide a achievable common international minimum standards of professional competence for

seafarers commensurate with the need to ensure safe of ship operation and protection of marine environment. It has also proposed that there be some form of international accreditation for the national training systems around the world[from Ibid. of 6) p. 85].

- 21) International Association of Classification of Societies[IACS] is currently implementing a quality assurance program with which members will have to comply if they are to remain members of the Association by establishing the Quality System Certification Scheme. The central objectives of it are to ensure that IACS members have their own internal quality systems, and that members conform with standards laid down by the IACS including the 'Code of Ethics'[from Ibid. of 6), pp. 66-68].

- 22) The fundamental requirement of the ISM Code is that a safety management system be in place in the company, including the follows : ① Safety and environmental protection policy. ② Instructions and procedures to ensure safe operation and protection of the environment. ③ Defining levels of authorities and lines of communication, between, and amongst, shore and ship-board personnel. ④ Procedures for reporting accidents and non-conformities. ⑤ Procedures to prepare for and respond to emergency situations. ⑥ Procedures for internal audits and management views(from Capt. M. Pickthorne, International Safety Management Code, Oct. 1994, Seaways p. 22).