Safety Management in Ships

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In shipping worldwide, especially in the Bulk carrier/Tanker sector, too many casualties have occurred causing loss of lives and property and contributing towards environmental pollution. The administration has been greatly concerned and had gone far too deep inside the cause/s to develop and implement many regulations and mandatory systems like ISM. Enhanced surveys and control with the only intention in mind, that is to reduce and finally prevent such casualties in future. Materials, Machinery, System operation and Control of HRD – all were given attention towards improvement. All said and done even with the best-updated machinery and systems, casualties may still occur unless the human psychology is motivated towards correct operation and control of ships. STCW 95 is expected to create new generation seafarers, ship managers, trainers and assessors to a higher level of competence, but until and unless real motivation is achieved nothing will be fruitful. Regulations are certainly necessary, strictness to comply with regulations is also very much appreciable — but all these will turn out to the successful only when training of seafarers are done and implemented effectively with correct spirit of skill, knowledge to obtain desired attitude for the specified objective of safe shipping.

Keywords : Shipping; Safety regulations; Safety management system

INTRODUCTION

Worldwide shipping over last few decades suffered too many casualties, which include loss of lives and property and contribution towards environmental pollution. By late eighties, the International Maritime Organization (IMO) was growing increasingly concerned about the evidence of poor Management for safety and pollution prevention in global scenario of shipping. Therefore the belt needed to be tightened for making up the loose corners. Ships fitted with modern machinery and equipment are manned with qualified officers and crew - yet casualties did not reduce to the extent expected. Regulations are being enforced in all sectors of shipping ever since Administrative and Technical bodies of IMO were set up. This lapse is perhaps because in an endeavor to improve hardware part of ships and management the net result did not improve unless the software part is nurtured.

ISM CODE

Therefore the attention has been diverted towards growing consciousness in safety management and effective utilization of seafarers in correct pace and time. In 1987 the Assembly of IMO adopted a resolution calling on the maritime safety committee (MSC) to develop guidelines concerning shipboard and shore based management and these were adopted in 1991. International Safety Management code, based on above guidelines was adopted in 1993 and was included in SOLAS as Chapter IX (1994 amendments). The code is to be enforced globally in all ships (including mobile offshore drilling units) latest by 1st July 2002. The idea is safe management in ship's operation, maintenance and pollution prevention by

(1) establishment of safe practices in ship operation and a safe working environment;

(2) prevention of injury and loss of lives;

(3) avoidance of damage to the environment and to property;

(4) emergency preparedness against all identified and probabilistic risks;

(5) proper maintenance of the ship and its equipment;

(6) efficient communication; and

(7) training of seafarers to cope up with correct attitude, skill and knowledge requirements in present day technological advancement.

The legislative impact of ISM is expected to ensure that ships without compliance of code can not be allowed to trade at all after the deadline date. This is applicable to all merchant ships above 500 gross tonnage. ISM code basically follows the guidelines of SOLAS Chapter IX and functionally almost same, in line with ISO 9000 series of quality management applicable to industry.

The ship owner/operator will select Designated Person/s having access to highest management level to act as a link between ship and shore with respect to verification and monitoring of Safety Management System (SMS).

SMS AND ITS LEGAL IMPLICATIONS

Safety Management System means a structured and documented system enabling company personnel to effectively implement the company's safety and environmental protection policy. Company should establish procedure to identify, describe and respond to potential emergency shipboard situations. Shore and shipboard contingency planning is primarily to be consistent and appropriately integrated. Contingency plans should describe in a crystal clear format how to deal with emergency situations related to damage, fire, pollution, personnel, security, cargo etc.

Actions to deal with potential emergency situations should be practiced in drills. The company should establish procedure for ship's master to report accidents, non-conformities, and hazardous occurrences to the designated person/s ashore. These reports should be reviewed and evaluated by the management to

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find suitable corrective actions to rectify non-conformities and avoid future recurrences with a proper evidence, of course for future auditing.

Preventive maintenance procedures need to be established for each ship with respect to its Hull, Machinery and all other equipment. Watch keeping of operational machinery and equipment must be carried out under strict principles on the basis of STCW code 1995. Compliance Audit of SMS needs to be carried out internally and documented at regular specified interval so that Certification Audit can be conducted smoothly.

A Company, which complies with the requirements of the code, is issued with document of compliance (DOC) by the administration. Similarly each ship under the company having DOC and complying with ISM requirements is issued with safety management certificate (SMC) both valid for five years subject to annual audits. On the other hand STCW code 1995 is expected to take care of training and certification of shipboard personnel is per norms required in safe manning of ship. Both ISM and STCW were implemented on first hand basis with effect from 1st July 1998, so that training sector and practical operation sector in shipping can be boosted up to the required demand of time in harmony.

Safety of life at sea and marine environment protection are becoming increasingly important to all ship owners and ship managers with crucial implications when breaches of the relevant statutory provisions occur. The code may also have an impact in cargo carrying fields as well. Ships are the carriers of cargo that is being traded between port/s of loading and discharging. Port State Inspection acts as police control over the ships in port, especially substandard ships and aged ships are to be inspected in unscheduled manner under protocol of 1978 and other statutory guidelines. Therefore strict control has been imposed upon shipping as a whole. However, expectations are mainly envisaged for a safe, seaworthy ship. Why was the Port State Control necessary in the first place?

Port State Control is not seen as an alternative to Flag State Control, but as means of compelling the owners of sub-standard ships either to scrap them or to bring them up to the required standard. The record of Indian Flag ships under Paris M O U port state control have made dismal reading, particularly when viewed in the context that Indian Flag is not a flag of convenience. It is indeed regrettable that a country with long and proud history of maritime tradition, high standard of training, maintenance and upkeep and high caliber of its officers and crew should come to such a pass. An analysis of deficiencies noted on 49 Indian flag ships in 1993 shows as follows :-

In the columns below left side shows deficiencies and right the corresponding percentage.

Life saving appliances	22%
Fire fighting appliances	17.5%
Navigational safety	10%
Load line items	6%
Machinery items	9%
Marine pollution	4%
Cargo and mooring equipment	3%
Accommodation	3%
Safety in general like crews not trained adequately	21%

Higher percentage of lapses shows towards lack of crew training in the purview of skill, knowledge and attitude.

The analysis in the years 1998 and 1999 showed some reduction in the figures stated above but ship's detention still persists. Who is responsible for such a callous situation ? Sadly the high detention percentage of Indian flag ships reflects adversely on all, the Flag state administration, delegated Classification societies. Ship owners and the ship's personnel. Whether one likes it or not. Port State Control is a reality and is likely to get stronger in the days to come. Everyone in shipping has to take stride of this. The will-force and determination of the whole maritime industry in India are to be strongly focussed to ensure that Indian vessels are removed from Paris MOU black list as early as possible. The ISM and STCW codes are expected to regenerate better and safer shipping in India.

ENHANCED SURVEY AND CONTROL

Enough Regulatory actions have been taken on liquid bulk ships (tankers) with regard to pollution prevention, constructional safety and safe maintenance procedures which include SMS and ESP (Enhanced Survey Program).

Regulation 2 of SOLAS Chapter XI requires that bulk carriers and tankers shall be subjected to Enhanced survey program (ESP) in accordance with guidelines adopted in 1993 by Assembly resolution A 744 (18). These strict measures resulted over the next few years, considerable decrease in tanker casualties in comparison with those in late seventies and even later. Similarly in dry bulk sector, high rate of ship losses was experienced till late eighties, sometimes even without a trace. Heavy loss of life and property recognized the urgent need to improve further the safety standards of ships carrying solid bulk cargo in all aspects of their design, equipment and operation to avoid the recurrence of such casualties. Bulk carrier losses also considerably reduced since IACS' Enhanced Survey Program started. International Association of Classification Societies (IACS) has been working closely with IMO to consider new safety measure and continuous monitoring. It is well accepted that the most important element in avoiding structural loss of bulk carrier is how to preserve the integrity of bull and batch covers which form primary watertight barrier. The research and case study of bulk carrier casualties reveal that nearly 50% of them involved water entry into number one bold. Additionally due to relatively high wave and inertial load, the structure of foremost hold is more susceptible to fatigue cracking and consequent damages. A new Chapter XII has been added to Solas 1974 titled Additional Safety Measures for Bulk Carriers. The rule requirements (Regulations 1 to 10) have been ratified internationally as per Tacit Acceptance procedure and must be complied with by Bulk Carriers in addition to all other applicable requirements of other chapters. For bulk carriers of 150 meter length and above

of single side skin construction the applicable dates are phased out as follows :

(1) 20 years age and above on 1st July 1999 by the date of first intermediate survey or the first periodical survey after 1st July 1999 whichever come first.

(2) 15 years of age and above but less than 20 years on 1st July 1999, by the date of first periodical survey after 1st July 1999 but not later than 1st July 2002.

(3) less than 15 years old on 1st July 1999, by the date of first periodical survey after the date on which ship reaches 15 years of age but not later than the date on which ship reaches 17 years of age.

As per these safety measures, bulk carrier's bulkhead and double bottom strength standards were evaluated. That means standards for the evaluation of scantlings of transverse watertight vertically corrugated bulkhead between the two foremost cargo holds and for the evaluation of allowable hold loading of the foremost cargo hold. The damage stability criteria also need to be calculated under regulation 4 for various cargo densities, along with regulation 4 for various cargo densities, along with regulation 27 of International Load line convention 1966. Regulations 5 and 6 deal with structural strength and scantling requirements for carriage of solid bulk cargo. New and existing bulk carriers are identified as follows.

New Bulk Carrier

Bulk carriers built on or after 1st July 1999.

Allowable flooding of any one hold with cargo density 1000 kg/m^3 and above.

Existing Bulk Carrier

Bulk carriers built before 1st July, 1999.

Allowable flooding of foremost hold in any loading and ballast conditions with cargo density 1780 kg/m^3 and above.

To sum up all these, Bulk carriers of 150 meter and above of single side skin construction designed to carry solid bulk cargo having density 1000 kg/m^3 and above shall have sufficient strength to withstand flooding on any one cargo hold in all loading and ballast conditions. Obviously that points to strength of hold separation bulkhead/s and also takes into account dynamic effects resulting from the presence of water in the hold which points to strength of scantling in double bottom underneath as well as bulkhead interconnected. The existing Bulk carriers are subjected to stringent survey requirements once they are 10 years of age and above as per Enhanced program of inspections required by regulation XI/2. In case the surveys reveal non-conformity with the requirements the said carrier is not allowed to load solid bulk cargo unless the deficiencies are rectified permanently to the satisfaction of administration. Safety and seaworthiness is the main criteria under all circumstances.

A booklet is placed on board the ship, shall be endorsed by the Administration or on its behalf to indicate compliance of all requirements. Any restriction imposed on the carriage of solid bulk cargoes having density 1780 kg/m^3 and above shall be identified and recorded in the booklet referred to above.

Permanent marking need to be made on side shell amidships on port and starboard with a solid equilateral triangle having sides 500 mm and its apex 300 mm below the deck line, painted with color contrast to that of hull. The mark should be clear and easily identifiable from distance.

RELAXATION UNDER THE CONVENTION

For existing bulk carriers (built before 1st July 1999) which have been constructed with an insufficient number of transverse watertight bulkheads, the administration may allow relaxation provided they comply with following.

(1) For the foremost cargo hold, the inspections prescribed for the annual survey in the enhanced program of inspection shall be replaced by inspections prescribed for the intermediate survey of cargo holds (So every annual will be equivalent to intermediate in order to achieve stricter control).

(2) Are provided with bilge well high level alarm in all cargo holds or in cargo conveyor tunnels as appropriate, giving an audio/visual alarm on the navigating bridge (this is to alert ship's crew about flooding instantly).

(3) Are provided with detailed information on specific cargo hold flooding scenarios. The information shall be accompanied by detailed instructions on evacuation preparedness under the provisions of section 8 of ISM code and be used as the basis of crew training and drills.

Bulk carriers while being loaded the Shippers are supposed to declare cargo density to ship's master and density range declared 1250 - 1780 kg/m^3 and above will be verified by an accredited testing organization in order to maintain correct and allowable stress levels in ship's structure.

A loading instrument calibrated and approved by the administration, capable of providing information on hull girder shear forces and bending moments must be placed on every bulk carrier regardless of their date of construction.

IACS and IMO brought our regulations with regard to construction, damage stability, safe operation, maintenance, monitoring and control for all kinds of ships viz. Enhanced Survey Program of Bulk Carriers along with ISM code implementation. The maintenance and upkeep standard is targeted to improve over the time. This will also compel the ship owners to ensure that bulk carriers are designed and built to the highest quality and standard to resist the vigour of their harsh operational requirements, charter party commitments and, of course under such developments bulk carrier casualties will diminish in future. This also posed and will pose problems to ship owners particularly to maintain their existing aging fleet.

Worldwide shipping is being governed by Stringent Statutory Regulations, surveys and port state control all in a tightrope schedule. No matter how tight the controls are much will depend on the way ships are managed and on the attitude, skill and competence of those who operate them sailing overseas. The responsibility of this software motivation and development rests

not only on training Institutions but also with ship owners/operators and above all crews themselves.

SUGGESTED MEASURES AND CONCLUSION

To succeed in coping up with stringent Port State Control and ship's detention the following minimum need to be considered.

(1) Strengthen and modernize marine administration.

(2) Make suitable provisions for enhanced fund so that additional responsibilities for port state control can be rightly discharged.

(3) Legal implications of port state control and their suitable inclusion in national status.

(4) Closer co-operation, free and frank dialogue between the marine administration, ship owners, classification societies and trade unions in order to find long term solution.

(5) Regular and active participation of Indian delegation in deliberations of IMO and other International organizations/forum at various levels.

(6) Safety is treated as attitude of mind. Investments in upkeep, maintenance of ship and training of personnel at all levels at all times are absolutely essential.

However the most important aspect in restoring safety and sea worthiness of ships is correct motivation of seafarers in attaining competency in shipboard performances. Probably the greatest change in STCW convention revision is the introduction of the concept of assessment of competence. It is more important that ship's staff is able to do the job proficiently than pass written examination in classrooms. Other important change is that all training, assessment of competence, certification, endorsement and revalidation activities are to be continuously monitored through a quality system standard to ensure that certain defined objectives particularly concerning the qualifications and experience of instructors and assessors are achieved (Training of Trainers and assessors). The revised STCW convention places much greater onus on the responsibility of shipping companies to develop their own shore based and onboard training structure as well as shipboard familiarization and emergency training procedures. This gives an ideal opportunity of senior officers to ratings to train onboard their juniors so that on-line progress is maintained in true spirit.

Undoubtedly STCW 95 revision is expected to produce far-reaching effect on the shipping industry. The biggest challenge facing the industry in ISM/STCW regime is the development of human resources a gigantic task indeed ! More people can be available by augmentation of education and training facilities, but to get people correctly motivated, committed, dedicated and trained to do their jobs in respective field is not so easy as it sounds. For this to happen, attitude of people in the board rooms has to change. This will happen when employees whether on board the ship or on shore are seen to be valuable, effective contributors in the venture and treated with respect.

This will happen when safety is viewed as an essential and integral part of the risky and hazardous shipping business.

This will happen when people in shore offices as well as those on board work as teams. This will happen when training is seen as an investment and not as a cost.

This will happen when management cares, demonstrates visible commitment and provides leadership.

If this happens, there will be substantial gain in shipping industry failing which the new codes and safety regulation standards will remain in the files as a few more certificates and paper stock that have somehow been managed.