

# ISM – What has been learned from marine accident investigation?

Mr J Stuart Withington, BSc, BA, MIMarEST, MIMechE, C.Eng  
Principal Inspector, Marine Accident Investigation Branch

*The opinions expressed in this paper are those of the author*

## SYNOPSIS

Good operational management can reduce shipping accidents. But serious operational failings continue to contribute to a majority of accidents.

One benefit of the Code is that it enables us to focus on problem areas and helps us identify root cause of incidents, so that appropriate safety actions are more readily identified.

Nevertheless, accident investigation has exposed some specific problem areas. The industry's blame culture inhibits acceptance of responsibility for safety failures. Some crews believe that the ISM Code imposes an unnecessary burden of paper work, together with a lack of confidence among individuals that the system can do something for them.

Audits do not highlight the negative and positive aspects of managements' safety culture. However 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.

There are differing values within the industry as to what historical shipboard data, defects and incidents need to be fed up the management chain to enable a reasonable assessment for safety changes.

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- Stuart Withington was a chief engineer in the Merchant Navy, a ship yard manager and surveyor in the UK's Department of Transport.
  - He assisted the Egyptian Government with an IMO programme of training of Merchant Navy Officers.
  - Stuart is a founder member of the UK's Marine Accident Investigation Branch, and is an experienced marine accident investigator.
  - He co-ordinates IMO's correspondence group on casualty analysis and lectures internationally on human factor causation of accident.

## **BACKGROUND**

The international Management Code for the Safe Operation of Ships and for Pollution Prevention, (ISM Code), provides an international standard for safe management and operation of ships and for pollution prevention. It addresses the need for commitment to safety management from the highest level of the organisation.

A key part of the ISM Code philosophy is the safety management system, (SMS). 690 accidents have been reported to MAIB with vessels operating the Code's Safety Management System, (SMS). MAIB inspectors investigated 169 of these accidents.<sup>3</sup>

The SMS provides a model (annex) for marine accident investigators to facilitate a structured approach to accident investigation.

The model helps investigators focus on problem areas in management which underpin the actions of people involved in the events leading to the accidents. By addressing these problems, the reason for safety failures can be found and recommendations made to prevent similar accidents in future.

### **Safety Culture**

Success or failure of the SMS is dependent on the safety culture of the shipping company. Professor Jim Reason defined safety culture as “a way we do things around here”<sup>1</sup>.

According to the UK's Health and Safety Executive, (HSE)<sup>2</sup>, the safety culture of an organisation is a product of individual and group values, attitudes, competencies and patterns of behaviour that determine style and proficiency of the organisations safety programs.

The shared perception of the importance of safety, confidence that safety measures are experienced at all levels of the organisation, and sense of personal responsibility for safety are measures of an organisation's safety culture.

The ISM Code can foster these values among shore and sea staff. The concept of shared responsibility is particularly encouraging, as it can bring

with it a greater awareness of how an individual fits into a particular situation and how his/her actions can influence the final outcome.

With the trend towards minimalist crewing levels, and the increasing use of multinational crews, a sense of personal responsibility can be effective in minimising the likelihood of an accident occurring.

However, society's blame culture instils into managers and seafarers a fear of blame and criminalisation. It encourages mistrust, preventing them from being open and honest, by covering up mistakes when things have gone wrong. Further, it can give a sense of anxiety to individuals who think that by taking personal responsibility, they may be held responsible for an accident simply by following the dictates of the ISM Code.

Also, the Code has many generalisations, all of which are open to differing interpretations, making managers slightly cautious when developing procedures to satisfy the Code.

The influence of this blame culture, with its consumer driven desire for personal accountability, punishment and compensation, hinders the chances of universal success for the ISM Code.

When accidents happen, rather than learning the lessons, the probability of blame inhibits effective safety action to prevent similar accidents in future.

HSE list six factors that create a positive safety culture within an organisation. These are:

- Leadership and the commitment of the chief executive
- A good line management system for managing safety
- The involvement of all employees
- Effective communications and understood/agreed goals
- Good organisational learning/responsive to change
- Manifest attention to workplace safety and health
- A questioning attitude and rigorous approach by all individuals

Accident investigation has found that if one or more of these factors is lacking, the organisation is prone to corner cutting, poor safety monitoring and poor awareness of safety issues.

## **Effectiveness of the ISM Code**

### Reporting non-conformities and defects

Section 10.2.2 of the ISM Code requires the company to ensure that any non-conformity is reported with possible cause, if known.

Although the safety management system may have a system of reporting incidents and defects, views on what ought to be reported as a non-conformity can differ within the same Company.

Management can have conflicting views on what defects critical to safe operation ought to be reported. For example, one management department considered that violations, such as smoking in the laundry and action to prevent recurrence had to be reported to the “Designated Person”. Yet, another department considered that defective and seized safety valves subject to routine maintenance on board, need not be reported up the management chain.

Management’s acceptance of not reporting such safety critical items inhibits correct and timely safety action, and crew awareness of its responsibilities to ensure equipment is maintained in good condition.

Often consistent reporting of non-conformities is dependent on trust between ship’s crew and the different levels and disciplines within of the management organisation. Defects or incidents caused by poor maintenance and supervision are not reported to higher level of management, often because of fear of blame or criticism. Such a situation fosters a negative perception among ship staff of management’s commitment to safety.

If management is unaware of defects and incidents, it is unable to properly identify and evaluate risk so that suitable controls are not put in place to manage the risk.

### Operational requirements

Masters and crew are not always convinced of the value of the ISM Code. The reason for this view is not based just on the perception that application of the Code makes for more paperwork. Often it is because of short-comings in their understanding of the aims of the system.

Crew fail to realise that the ISM Code not only gives them clear authority, but it also allows them to share responsibility for a vessel's safety with shore management.

In one case investigated, a master felt obliged to carry out a hazardous operation at sea, requiring hatch covers to be removed, because that had become company practice. He did not consider voicing his concerns or discussing alternatives with management.

Investigators have found that companies do not encourage such a questioning attitude. Individuals who have questioned the operational safety have sometimes been rebuffed and intimidated. Some leave the company because of this treatment, while others stay on subdued and discouraged.

This situation does not support and encourage the commitment to values and beliefs which the ISM Code is meant to foster.

### **Monitoring effectiveness**

The view of some management is that because STCW certificated officers should have sufficient knowledge and experience to know how to operate a vessel safely, they alone are responsible for on-board supervision and operations. Consequently, management discharges its obligation to ensure that operation and maintenance of the vessel is properly supervised and executed. Such a view inhibits management to ensure that proper and relevant documented procedures and guidance are available on board and that crew training needs are properly assessed.

Although officers are expected to have a detailed knowledge of good operational practice, they may not have specific knowledge of particular makes of systems and components. Inadequate instructions and guidance, or lack of them, have led to inconsistent and unsafe maintenance and operation, inaccurate fault finding and accidents.

Having instruction and guidance in place does not of course guarantee that seafarers will follow them. Often they are unable to do so because manuals have not been translated into the working language of the crew, which has changed with vessel ownership and registration.

Also, instructions have been found to be unclear and/or relate to equipment not fitted on board the vessel. Management rely too heavily on instruction

and guidance manuals provided by equipment manufacturers and suppliers without properly assessing their relevance to the operation of their ship.

Instructions and guidance manuals, relevant and clearly expressed, provide a statement to crew, managers and auditors of the company standard of how things should be done safely and consistently on board ship

The absence of a company standard leads to inconsistent and unsafe operation and short cuts. Moreover, seafarers not having a common understanding what the standard ought to be leads to inadequate assessment of what defect or unsafe operation should be reported. This leads to management unawareness of how the vessel is being operated, so is less likely to properly assess safety of operation.

Above all, the effectiveness of the SMS is dependent on the conviction and enthusiasm of senior staff, particularly the “Designated Person, the vessel’s master and the chief engineer. Without their understanding of the philosophy and objectives of the ISM Code and the associated SMS, the SMS will only exist as a pile of worthless paper. Training alone cannot bring this about; a process of education is required.

### **Change of crews and ownership**

The risk of an accident during a crew change over-period can be high when the crew is unfamiliar with the ship. The risk is compounded when change of ownership takes place at the same time.

In two separate instances of change of crew and ownership, after having been given only a few minutes to familiarise themselves with the ship’s lifeboat launching and recovery equipment, the launching crew lowered then recovered the lifeboats. In both cases the lifeboats inadvertently released from their lifting hooks and fell into the sea injuring crewmen.

Often there is an urgency to complete the change of ownership and registry within one or two days of the arrival of new crews. Not all management considers properly the risks arising from such an action. Consequently, crew do take operational short cuts.

During lifeboat drills for instance, life jackets have not been worn because they were ashore having the ship’s new name printed on them. Flag State

and classification society surveyors and managers alike witnessed the drills content that crew operate the launching equipment without them.

On the day of these accidents, flag State and classification society surveyors, as well as the master and crew were under time pressures to complete a multitude of tasks necessary to enable the vessels to sail. Consequently an effective programme of familiarisation, risk assessment and planning was ignored.

Change of ownership can bring on other problems. There is no requirement that ISM Code documentation, such as maintenance records and defect and non-conformance reports, stay with the vessel once the vessel has changed owners. Consequently without this documentation at hand over, the new owners are unaware of the vessel's safety and maintenance history.

In one case a master who had taken over a vessel for new owners had problems associated with heaving of the anchor cable which led to grounding. Investigators found inherent problems with the ship which tended to ride up over the anchor. Consequently, the anchor became trapped in the angle between the bulbous bow and the sharp rake of the stem and the cable jammed preventing the windlass from heaving.

This knowledge was lost to the previous owner and master. Had the new master been fully aware of the inherent problem associated with heaving the anchor cable he might have acted differently to prevent the accident

The incident highlights the importance of recording such problems and passing them on to subsequent owners.

Removing maintenance and safety history record from the ship on change of ownership, has potentially serious consequences for the safety of the vessel. These records should remain on board for the duration of the ship's life, otherwise the owner has to develop its SMS from scratch every time it buys a second-hand ship.

## **Shared responsibility between master and owner**

The ISM Code is a tool for masters to ensure that management is aware of issues that could affect the safety of the vessel. The Code requires that if for any reason a vessel cannot comply with the Safety Management System, this must be reported to the company who should ensure corrective action.

This requirement does encourage some companies to ensure shared responsibility between management and vessel. In one case a faulty generator reduced the ship's electrical capacity. Despite the threat of loss of cruising time and compensation bills, shore management made it clear to the master that it would support his decision whether or not to sail.

However, anecdotal evidence suggests that management does not always give such positive support to the master when commercial and career threatening pressures have been brought to bare on him not to record and report non-conformities.

## **Measuring progress in the improvement of safety management**

Only when the ISM Code is well established and accident data-bases have been sufficiently populated, and the effect of new and incoming legislation accounted for, will it be possible to measure the Code's effect on global improvement in safety and reduction in pollution.

Although this global improvement cannot yet be measured, any company adopting the ISM Code has potential for improving its safety record. Different companies start from different base lines of experience of safety management, which will affect individual improvement rates.

Any improvement in the safety management system is more obvious with the least experienced companies, compared with companies having a safety management system in place long before ISM became mandatory.

Once a structured safety management system has been established, a company is in a better position to investigate incidents, identify weaknesses and risks in its operation and the root causes of incidents. In turn, this analysis helps the company develop safer working practices.

Effectiveness of the analysis is dependent on the:



- Quality of investigation of human factors and reporting of root cause of accidents;
- Expertise of accident investigators and auditors;
- Co-operation between seafarers and management;
- Making publicly available accident reports and databases of human factor causes
- Sharing of evidence with the flag State or other interested States investigating for the purpose of improving safety rather finding someone to blame

Global improvement in safety and environment prevention is dependent on shipping companies and States disseminating findings of investigations to industry, and the willingness of the industry to act on the lessons learned.

IMO, through the FSI and its Casualty Statistic working group, is actively analysing member State investigation reports for human factor causes of accidents. The IMO database is being populated with causal factors and conclusions of its analysis is being forwarded to IMO committees for further analysis. The information accumulating on the database will eventually be an invaluable resource for assessing ISM Code's effectiveness and its need for improvement.

IMO's Code for the Investigation of Marine Casualties and Incidents,<sup>4</sup> gives guidance on the principles for investigating to uncover root causes and for co-operation between interested States.

Although the Code is directed to interested States, its principles apply equally to a company or companies involved in incidents. There is room to amend this Code in recognition that a shipping company is an interested party to the investigation. This sharing of responsibility with the interested States would increase the chance that thorough investigation is undertaken and effective safety actions taken.

Including the shipping company on an investigating State's investigation team would help dilute the culture of blame, and ferment a positive safety culture within the industry.

## **Flag State responsibilities**

It is the flag State's responsibility to ensure that it is satisfied that companies operating under its flag is operating a SMS effectively. Flag State ISM Code audit is a means by which effectiveness can be measured.

How effective are these audits? From the investigators view point, not very good. Flag State auditors criticise in detail minor deficiencies found during the audit. Yet, auditors, as representatives of the certifying body, have credited vessels with full ISM Certification when essential systems have not been in place. In one example, routine safety critical maintenance on LSA, which was hazardous to personnel performing the work, had no plan or instructions prepared to ensure the work was carried out safely.

Auditors readiness to pick on the detail of minor deficiencies rather than examine the substance of the company's safety culture significantly hinders their ability to analyse the effectiveness of the SMS.

Some flag State auditors fail to examine company attitudes to the ISM Code, which can vary, not only between individuals, but also between departments within the same company.

The focal point for examination of company safety culture is the "Designated Person". His or her perceptions and views of the SMS is the benchmark against which auditors (and accident investigators) can measure the consistency of individual and departmental attitudes and perceptions, and make conclusions about a company's safety culture.

## **CONCLUSIONS**

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 chance that a 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 organisation. It is the shipping companies who can provide the driving force needed for this cultural change.

## **ACKNOWLEDGEMENTS**

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# SAFETY MANAGEMENT MODEL

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