THE SAFETY GAP

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Summary

The safety gap is the difference between adequate safety and mandated safety levels that are actually achieved. It comprises the sum of the standards safety gap and the compliance safety gap. The standards safety gap is the difference between adequate safety and a required standard. The compliance safety gap is the difference between the required standard and the standard actually achieved.

This paper looks at meaning of adequate safety and minimum required standards. The different types of safety gap are described and discussed. Occupational Health and Safety, and Pro-active Certification of Vessels are considered within a framework that promotes complimentary function and avoids duplication. Specific issues pertaining to the standards and compliance safety gaps are discussed, highlighting the work of the NMSC where relevant.

INTRODUCTION

As part of their right to peace and happiness, most people believe that they have a right to be safe within society. To this end, society empowers governments to set and enforce rules that promote and enforce safety within society.

While the concept sounds simple, there are many issues to be considered in its execution. Perhaps one of the most important is the issue of balance. A balance needs to be achieved between the benefits of safety and the costs of achieving that level of safety to the society. Those costs may be economic, or they may be losses of personal freedom or some other cost.

This balance between conflicting needs of stakeholders and the costs and benefits of safety is the starting point for our discussion on the safety gap.

THE CONCEPT OF ADEQUATE SAFETY

Safety is defined in the Macquarie Dictionary[i] as

1. the state of being safe; freedom from injury or danger.

2. the quality of insuring against hurt, injury, danger or risk.

From the definition, one can see that safety is not absolute. Safety is something that is relative. One state or quality is more or less safe relative to another. No state or quality should be considered to provide absolute safety.

Recognizing that safety is relative, one must still differentiate when the level of safety is acceptable and when it is unacceptable. Acceptable safety is safety that meets certain specified criteria, normally measured in terms of relative freedom from specific risks.

The criteria for acceptable safety may differ, depending upon the perspective of different stakeholders. Consider the following examples.

a) Acceptable safety under legislation is effectively compliance with the law and depends upon the content of that law. Under Occupational Health and Safety Law, there is a broad obligation to identify hazards, assess risks, control unacceptable risks, confer with employees, etc. Under marine safety law, there is frequently a requirement to meet certain specified prescriptive standards, as well as broad

obligations not to operate an unsafe vessel and not to operate a vessel in a manner that would be unsafe.

b) Acceptable safety for an owner/operator finds a balance between the risks associated with operating a vessel with the other risks associated with operating a business, including trading disruptions and insolvency.

c) Acceptable safety for an insurer focuses on the risks that are to be insured, which may include loss of life, injury, damage to property and economic loss.

d) Acceptable safety within the common law takes into account issues pertaining to liability. To avoid liability for negligence, for example, a stakeholder must identify any relevant duty of care and take appropriate steps to discharge that duty of care to a relevant standard.

It is clear that the scope and level of safety required to achieve acceptable safety will differ depending upon the point of view of the particular stakeholder. Given the potential variations in what is considered acceptable safety, which are the criteria that take precedence?

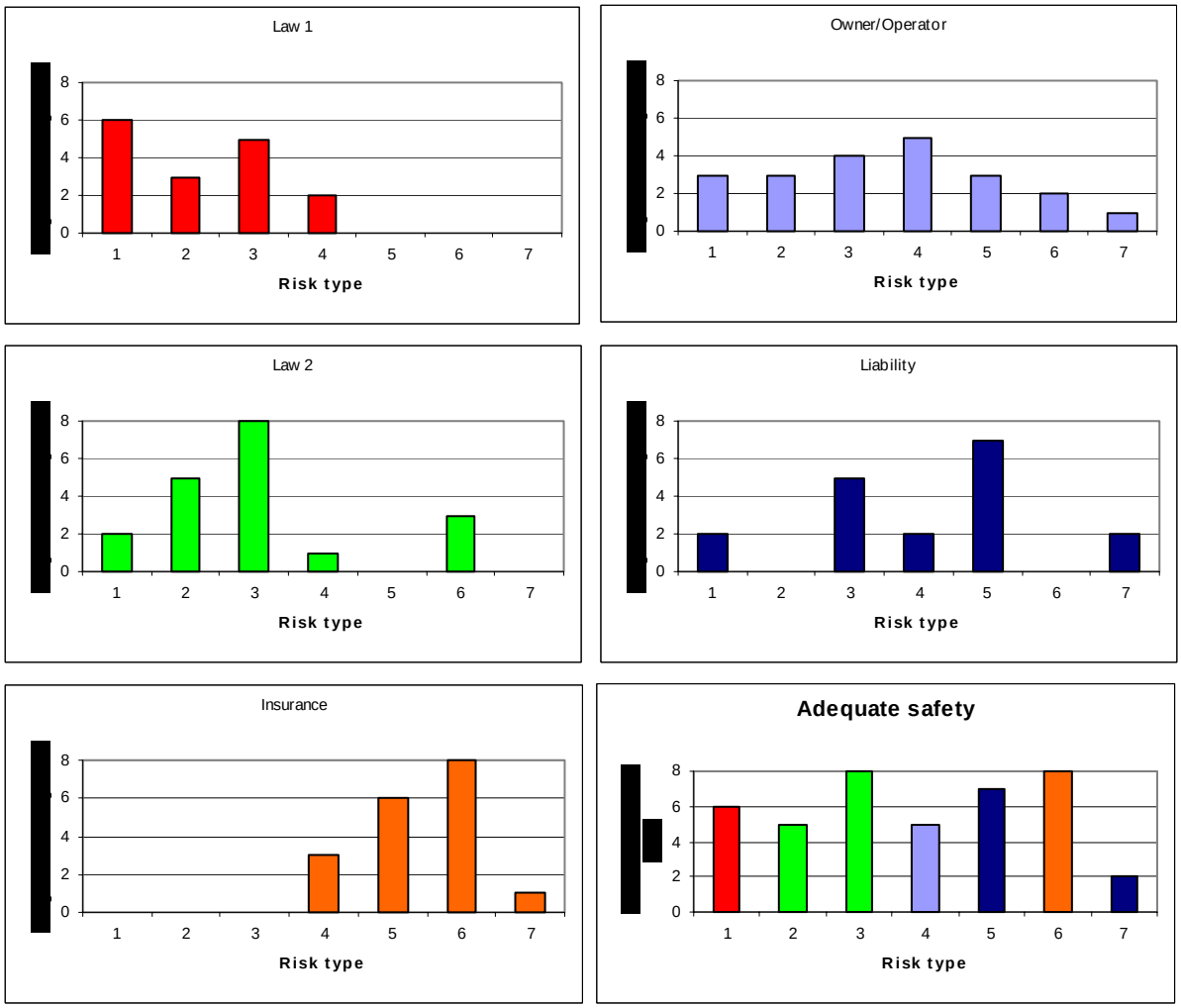

Figure 1—Notional example of adequate safety being a composite of highest mandatory acceptable safety criteria from key stakeholders

As a rule, the criteria that determine whether the overall level of safety is “adequate” are a composite of the highest criteria from each of the various stakeholder interpretations for “acceptable safety” that are considered mandatory. Figure 1 illustrates the concept. Thus, clearly, the criteria for acceptable safety contained within legislation must be met. Where there are different laws applicable to a vessel having differing levels of safety, the highest level applies in every case. Similarly, safety criteria set for insurance must be met. If those insurance criteria are higher than those for legislation, then they set the standard for adequate safety. For example, an owner/operator may have special safety needs due to contractual obligations that impose significant economic loss on disruption. Likewise, the risks associated with potential accident claims may drive the levels of safety that determine “adequate safety”.

MINIMUM REQUIRED STANDARDS

The above analysis gives an insight into one reason why it is very difficult to prescribe standards that will provide adequate safety in every circumstance. Circumstances differ; the types and needs of stakeholders differ and the options for potential solutions differ. Some risks may be insured against, others may be eliminated or controlled in various ways, while still others may be accepted. To attempt to devise a standard that takes into account all possible permutations would be far too cumbersome, would place an intolerable burden on any user and at the end of the day, would probably not give a workable result.

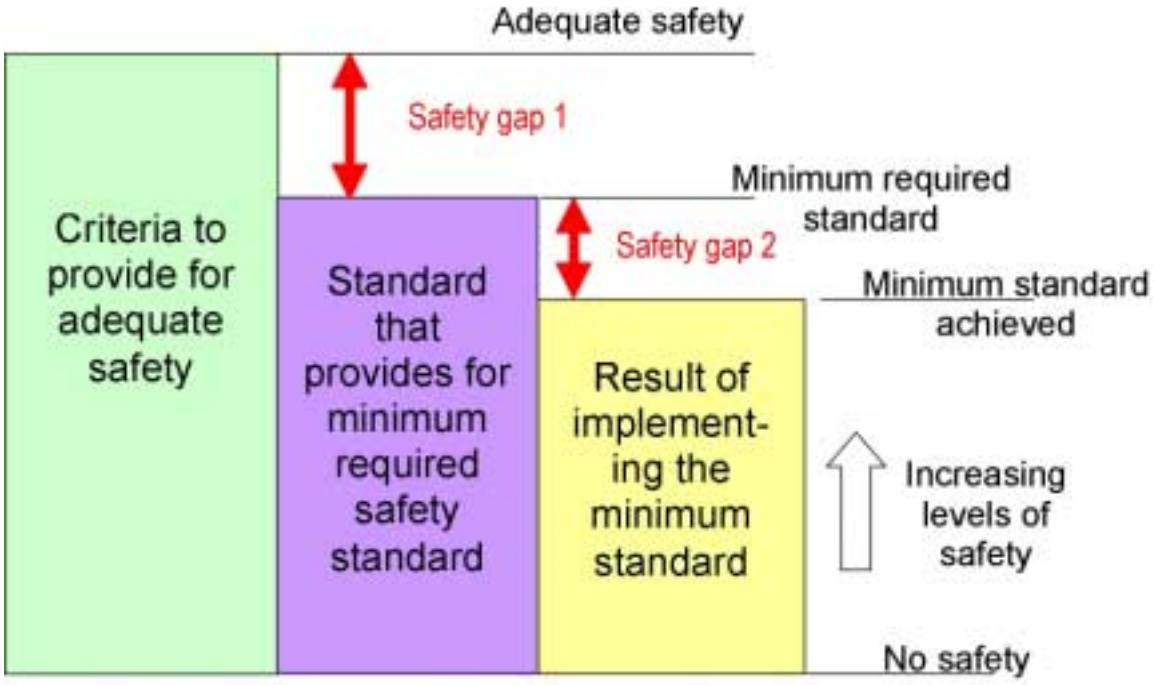

Figure 2—The standards safety gap

A better way of looking at a standard is that it provides a safety net below which the level of safety becomes unacceptable for the purposes of the application of that standard. In effect, it is a minimum required standard that aims to provide for compliance to a level of safety prescribed by the standard, see Figure 2. As we shall see later, the standard alone cannot ensure that safety does not fall below the minimum required level. That depends on a will and ability to implement the standard.

As already indicated, the level of safety within a standard does not provide adequate safety in every circumstance. The level of safety to which a standard is pitched is a compromise between conflicting constraints. On one hand, there is the cost of implementing safety controls. On the other hand, there is the cost of losses that may be incurred from not implementing safety controls. Factors that influence the balance include the nature and frequency of past accidents, perceptions of the value of life at a given time in history, the intended method of implementation, constraints on government expenditure, the economic viability of the industry and other political considerations.

A useful concept is the Paredo principle that states that 80% of the benefit is usually achieved by the first 20% of effort. This principle provides a clue as to a cost effective approach to the setting of minimum required standards. A significant result can be provided at relatively modest cost by pitching the standard at a level that captures about 80% of relevant risks, those risks being of the most major and generic types.

Thus, there is usually a gap between the minimum required standard and adequate safety. This is marked as Safety Gap 1 in Figure 2. For the purposes of this paper, we shall refer to this safety gap as the standards safety gap.

As already indicated, there is more to safety than just a standard. Implementation is also a vital factor. Implementation determines the minimum safety standard that is actually achieved. In a perfect world, that would lie at the same level as the minimum required safety standard. However, in reality it may lie significantly below that of the minimum required, depending upon the method of implementation, see Figure 2.

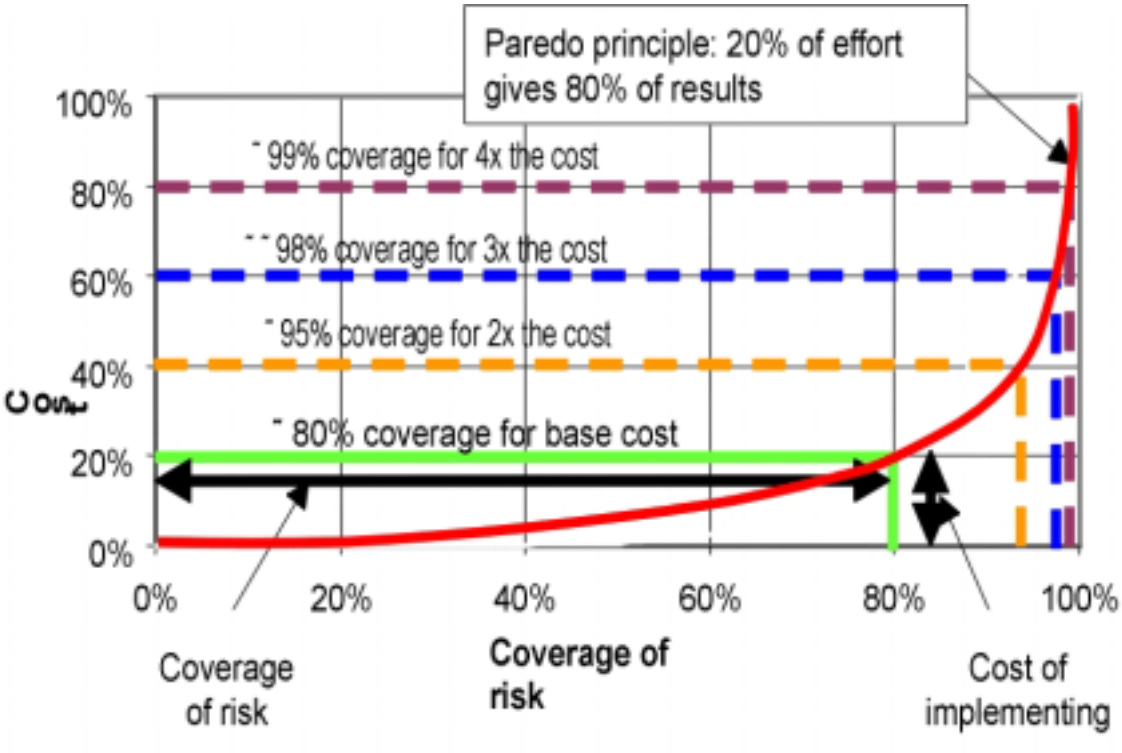

Figure 3—Paredo principle

The gap between the minimum achieved safety standard and the minimum required safety standard (marked as Safety gap 2 in Figure 2) is another form of safety gap. This safety gap is referred to as the compliance safety gap.

The method of implementation may be reactive or pro-active or a combination of both. Reactive implementation is where the threat of sanctions for non-compliance is the main incentive for compliance. Compliance with the standard is only verified in response to a random event, be it an audit, accident or a complaint. The main incentive for achieving the standard is fear of the potential consequences should an audit, incidents or complaints occur. Pro-active implementation is where there are positive incentives for compliance including the issue of licenses to operate. Pro-active implementation either promotes or mandates solutions be put in place. The incentive for achieving the standard may include a licence to operate as a prerequisite to lawful operation. Generally, standards that are pro-actively verified have a better chance of being achieved than standards that are not pro-actively verified. At the same time standards that are pro-actively verified tend to have comparatively higher implementation costs, firstly, because a third party is sometimes involved and secondly, because the measures are in fact being implemented by all.

In between the two extremes of reactive and pro-active implementation are other implementation regimes using various combinations of both types of implementation in lesser and larger amounts. Relying on reactive or pro-active measures alone is usually not enough. A composite sanctions-push solutions-pull approach tends to provide a more balanced and cost-effective approach. The composite approach is applied to the safety of commercial vessels and will be discussed further later in this paper.

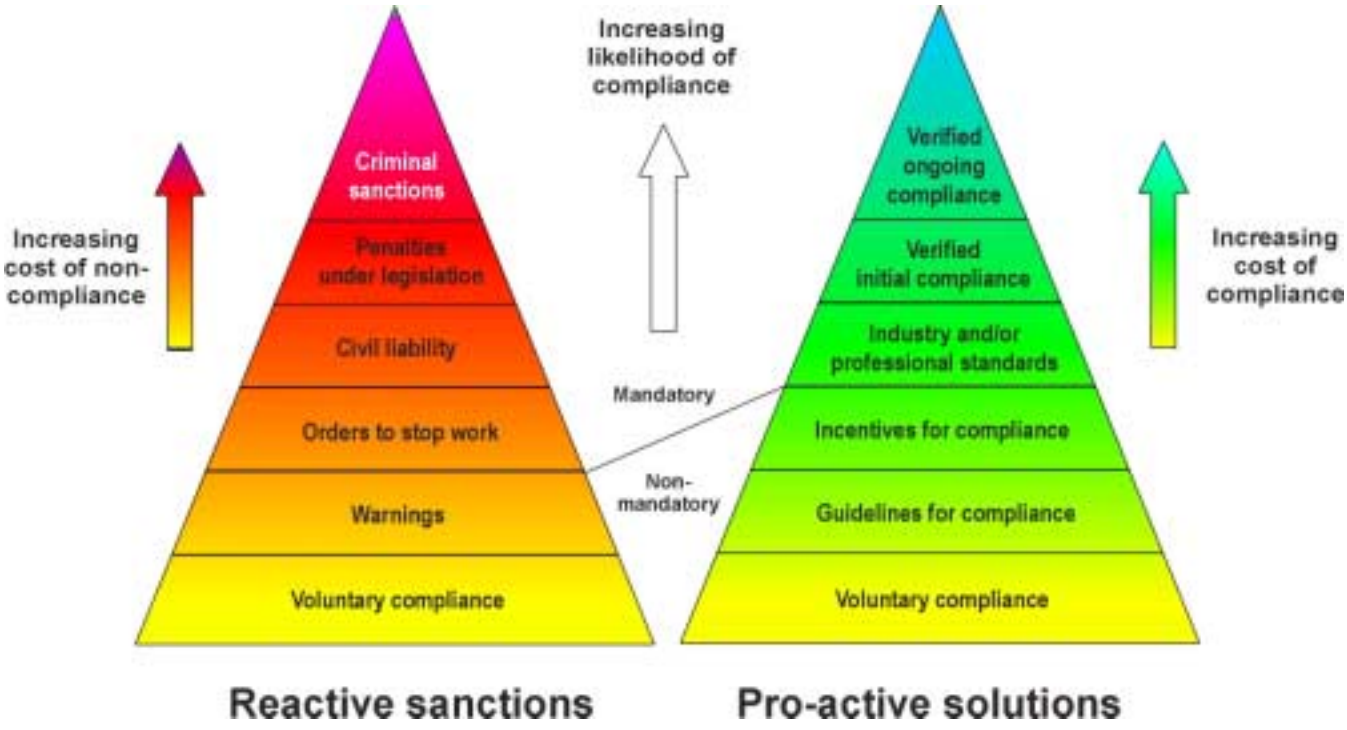

Figure 4—Elements of regimes for implementation

OCCUPATIONAL HEALTH AND SAFETY

Modern OH&S law tends to be performance-based in nature. It arose out of a realization that it was impracticable and economically inefficient to attempt to establish a regime that provides prescriptive solutions to address every hazard and risk that might be in the workplace; i.e., to provide for something close to adequate safety. Instead, the legislation places a general obligation for safety on persons who have control over safety in a workplace. That general obligation requires such persons to identify hazards, analyse the risk of these hazards and control the risks to ensure they don't exceed acceptable levels,

at least to the extent of their control. Persons who have control over the safety of a commercial vessel not only include operators, but also the designers, builders, equipment suppliers and owners.

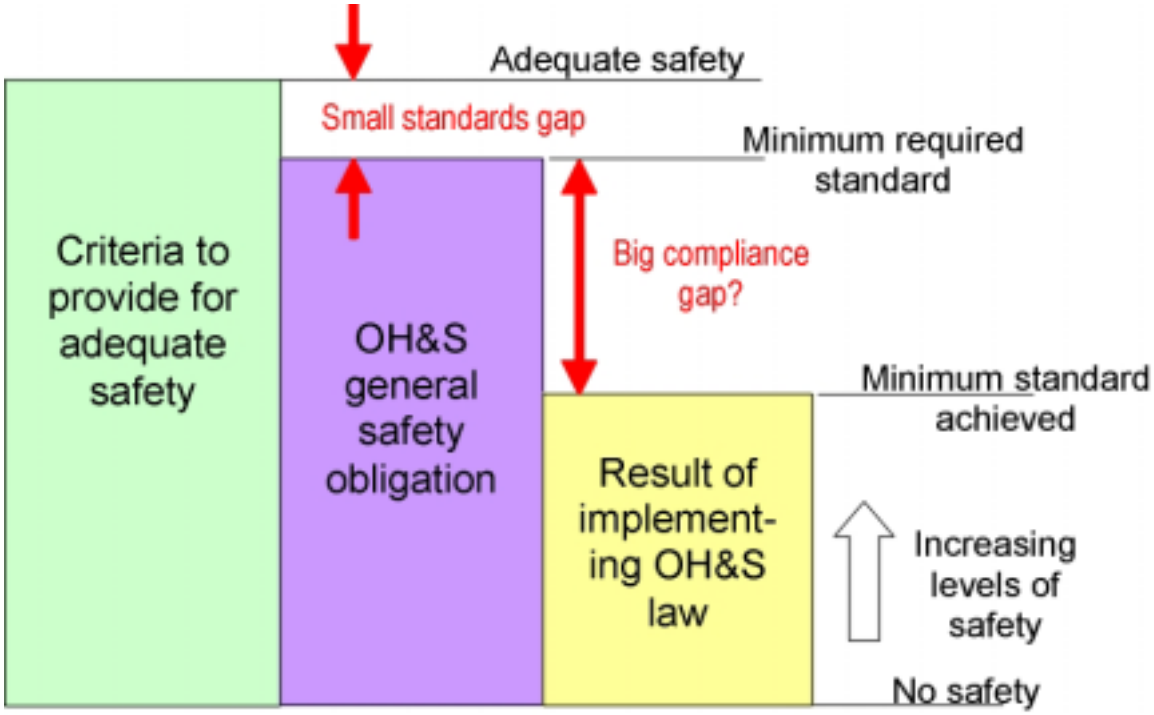

Figure 5—Occupational Health and Safety model

OH&S law requires that risks are managed, i.e. hazards are identified, risks arising from those hazards are assessed, and measures implemented to eliminate or control risks that would otherwise be unacceptable. There are provisions requiring appropriate training, instruction and supervision of personel and consultation between employers and employees on matters of safety. Proof of compliance includes a documented risk assessment. Inspectors have the power to view the documentation. Apart from certain higher risk activities that require pro-active certification, the legislation is generally administered reactively by means of post-incident or post-complaint inspections. There is also a system of audit.

Figure 5 illustrates the author's view of the Occupational Health and Safety model. The general safety obligation reduces the standards safety gap between adequate safety and minimum required standard. This gap can be reduced as the cost of implementation is kept under control by the standard being performance-based and the fact that it is largely applied reactively. However, in the reactive approach, there is considerable potential for a large safety gap in compliance. Without pro-active measures to promote or mandate compliance, the extent and nature of compliance is effectively left to the designer, builder, supplier, owner or operator, to be balanced as one of a number of risks of the relevant stakeholder's business. Inevitably, compliance will depend to some extent on the stakeholder's perception of the likelihood of being caught out for non-compliance and the consequences of non-compliance.

The above discussion helps explain why in theory, performance-based OH&S legislation should be the only legislation required for safety, but in practice this is not the case. There is a community expectation that government will have a more pro-active role in ensuring safety in certain potentially higher risk activities, including notably the safety of transport. That pro-active role normally involves requiring specific activities to be pro-actively certified to specified prescriptive minimum required standards prior to commissioning and on a periodic basis.

REVIEW OF STANDARDS FOR THE CERTIFICATION OF VESSELS

The Uniform Shipping Laws Code was originally formulated in the 1970's, before the introduction of modern Occupational Health and Safety Law. While the concepts of performance-based occupational health and safety law have been on the agenda since the 1980's, it is only since the 1990's that they have been incorporated into the law of the States and Territories of Australia. In NSW, the legislation was promulgated in September 2000. After a two-year implementation period, the law will be fully enforced for small businesses from September 2003. How does the new legislation impact on the revision of standards for domestic commercial vessels in Australia?

In 1997, the Australian Transport Council approved a National Marine Safety Strategy to shape the reform of marine safety administration in Australia. That strategy identified a series of strategic actions to be followed in revising standards applicable to commercial vessels, which included:

a) Incorporate recognized and relevant national and international standards

b) Encourage professional competence

c) Incorporate a performance-based approach

d) Facilitate approval of new technologies

e) Incorporate OH&S principles

f) Encourage recognition of duty of care

The incorporation of Occupational Health and Safety principles is specifically listed in action e). A number of the other actions also have relevance to the OH&S regime including the adoption of performance-based approaches, recognition of duty of care and the encouragement of professional competence.

The approach adopted by the National Marine Safety Committee has not been to duplicate OH&S law in the marine safety legislation and standards of the jurisdictions. Rather it has been to modify marine safety standards to complement the new OH&S law. The new standards have been written to focus on the safety outcomes rather than specific solutions. Specific deemed-to-satisfy solutions are specified in the standard that represent a consensus on good practise for meeting safety outcomes. Guidance is given on applicable hazards and risks that are being addressed by the standard. Most importantly, the presence of modern OH&S legislation has allowed a crystallization of the role and limitations of the framework for the issue of certificates of compliance.

To illustrate this last point, consider Figure 6 which shows the relative functions of the pro-active certification of vessels and OH&S within the overall concept of adequate safety. In the past, the meaning of a certificate of compliance for vessels was unclear. Some believed that it meant a vessel was "safe" or "seaworthy", others that the vessel met specified standards. This uncertainty was reflected in differing requirements for the issue

of a Certificate of Survey within the legislation of the various jurisdictions. There is now agreement that a Certificate of Survey will be issued when a vessel meets certain minimum required standards specified within the legislation, that standard for new vessels being the new National Standard for Commercial Vessels (NSCV). The NSCV contains prescriptive deemed-to-satisfy solutions to control major and generic risks against which compliance is measured. To the extent of the matters covered by the standard as required by legislation for the issue of a certificate of compliance, compliance will be pro-actively verified. For those aspects of safety that fall outside pro-active verification (i.e., within the safety gap), some will fall within the application of general OH&S obligations that apply to the vessel as a workplace under the OH&S legislation. Thus, the administration of commercial vessel safety is by means of a composite approach using pro-active minimum required standards and reactively applied general safety obligations.

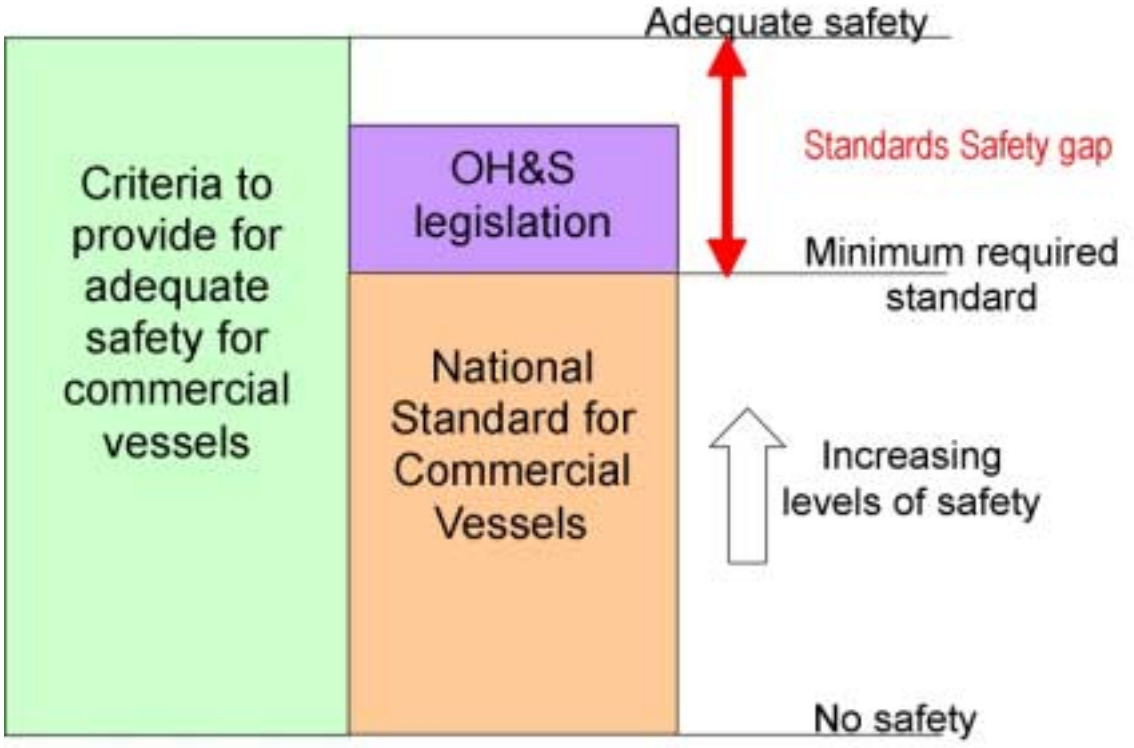

Figure 6—Combined approach to the safety of commercial vessels

In the past, many in the maritime industry had the perception that once the vessel acquired a Certificate of Survey, a relevant stakeholder (be it designer, builder, owner, etc) had discharged their full obligation for safety. The new composite framework clearly shows that this is not the case. OH&S legislation fills part of the safety gap not covered by the Certificate of Compliance. Likewise the Certificate of Compliance goes a long way toward fulfilling safety obligations under OH&S legislation.

The remainder of this paper makes some observations about the safety gap, both the standard safety gap and the compliance safety gap.

STANDARDS SAFETY GAP

Occupational Health and Safety

As already indicated, occupational health and safety matters not addressed or sufficiently covered by the minimum standards contained in the NSCV for commerical vessels fall within the standards safety gap. Part A of the NSCV contains guidance on safety

obligations, expressed in terms relevant to the marine industry to assist stakeholders in understanding their obligations under OH&S legislation. Part A is not mandatory and does not replace OH&S legislation. However, it alerts the user to these obligations that exist over and above compliance with the minimum standards contained in the NSCV. In particular, it is important for stakeholders to note that OH&S obligations apply to designers, builders and suppliers as well as owners and operators.

Protection of property and against economic loss

The objectives of the NSCV include the protection of life and the protection of the environment but do not include the protection of property or control of economic loss. While the latter two may be afforded by the provisions of the NSCV, that is only incidental to the provisions intended for the protection of the life and the environment. Circumstances may arise where additional criteria for the protection of property or against economic loss are specified by key stakeholders as part of the standards safety gap. These key stakeholders may be the owners of cargoes or the insurers of cargoes or the vessel itself. It is interesting to note that, on land, certain cored materials accepted for building construction under the Building Code of Australia are not permitted by some insurers[ii]. The reason is apparently that, while the materials meet fire safety standards for the protection of life, they result in considerable property damage after exposure to the fire.

Protection of the environment

While the objectives of the NSCV include the protection of the environment, this aspect of the standard is relatively minor. The main source of criteria for environmental protection is the relevant environmental legislation of the States and Territories. Hence, these requirements fall into the safety gap. At this stage, the environmental requirements applicable to domestic commercial vessels may differ significantly between jurisdictions, particularly with respect to the holding and treatment of sewage.

Liability

A significant component of the safety gap concerns the issue of liability. For many years the Courts have recognized that compliance with a minimum standard is not necessarily a sufficient defence to avoid liability.

In an Australian case[iii], the owner of a charter vessel was held to be potentially liable for having stairs on the vessel that were too steep. The defence that the stairs met the requirements of the Uniform Shipping Laws Code was rejected on the basis that the Code was a minimum standard and not necessarily an adequate standard taking into account the demographic characteristics of persons likely to use the stairs. A stairway constructed to the minimum standard for commercial vessels would not have been permitted under building standards ashore.

It is important to understand that compliance with minimum standards does not necessarily absolve persons from their duty of care under the tort of negligence. Potential liability issues must be considered for each vessel in the context of its intended operation.

Grandfathering

One of the more surprising matters in the standards safety gap is the issue of grandfathering of vessels. When a safety standard is changed, a vexing question that often arises is whether the new standard should be applied retrospectively to the existing fleet. On one hand, there may be a good safety reason why the standard has been

changed. On the other hand, there is the possibility that altering an existing vessel to comply with a new standard may be expensive if not impossible. The frequent response by Marine Authorities has been to “grandfather” old vessels on the basis that they met the applicable standards that were in force at the time of their construction; i.e.; to allow continued operation under a certificate of survey that attests to compliance with standards that were in force at the time of initial survey. There are many domestic vessels operating in Australian waters under such arrangements.

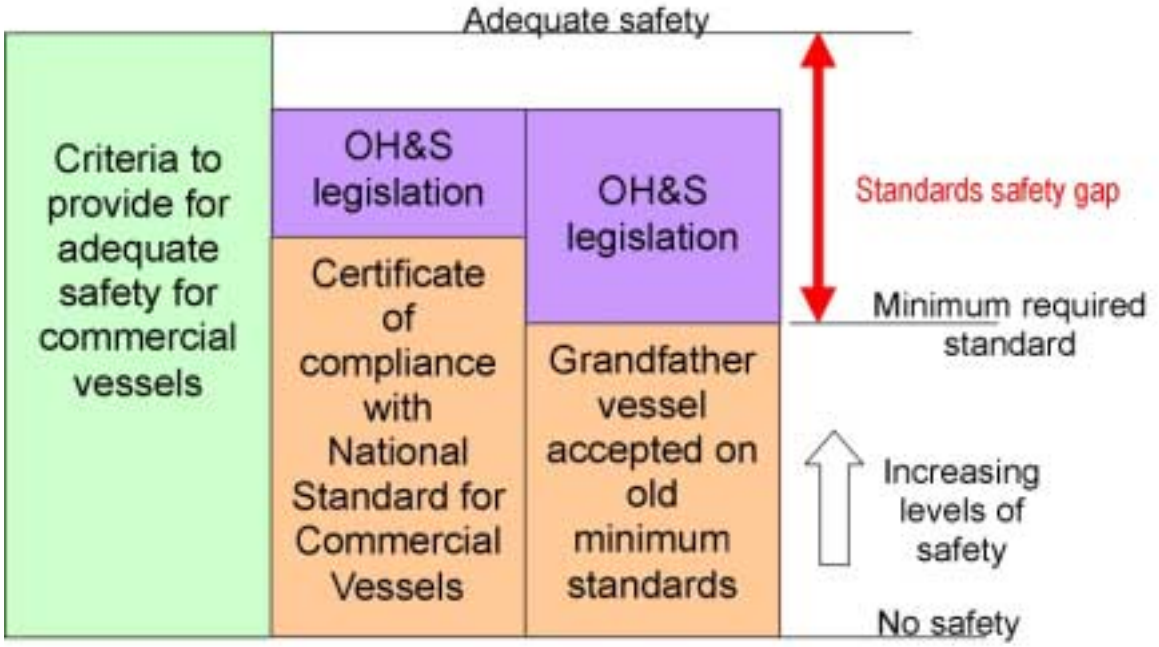

Figure 7—Grandfathering of vessels

How does grandfathering find its way as an issue in the safety gap? This can be illustrated by the case of a schoolboy who fell through a plate glass door in his school cafeteria[iv]. The student sued the school for negligence. The school defended the action saying that the building pre-dated standards for safety glass doors and that the ACT building code only required buildings to comply with standards applicable at the time of construction. Judgement went against the school on the basis that the school had been negligent. Whatever the standard had been in 1966 when the building had been erected, since 1972 when the new standard had been introduced into the ACT, it was both “practicable and affordable” for the glass to be replaced. As well as being found negligent for not replacing the class, the school was held to have failed in its duty for not removing a tripping hazard.

If the same logic is applied to commercial vessels, then the owner of a vessel that predates, say, the current USL Code fire safety requirements may be liable should the vessel be consumed by a fire with attendant loss of life or injury or other loss.

Referring to Figure 7, the case of the school shows that, where a vessel is grandfathered, the requirements for adequate safety do not necessarily change. Grandfathering merely increases the safety gap that must be met above the minimum required standard. Moreover, it should be noted that the general safety obligation under OH&S law has no provision for grandfathering and so does not diminish, irrespective of the marine authority’s policy on grandfathered vessels.

Company directors and managers

The standards safety gap is an issue of importance for senior management of a company, be it a company of designers, builders, suppliers, owners or operators. There have been a number of reforms in OH&S legislation in Australia to lift the corporate veil that helps protect the senior management of a company from being personnally held accountable for the safety breaches of the company. Furthermore, there have been recent attempts to introduce corporate manslaughter as a specfic crime in the criminal code[v].

To date, convictions of company directors and managers under criminal law for failure to take appropriate steps to protect the health and safety of persons have been difficult. For instance, consider the capsize of the ferry Herald of Free Enterprise in 1987 that caused the death of 192 persons. An attempt to prosecute two directors of P&O Ferries for manslaughter failed. The problem lay in establishing within the corporate structure who was the 'controlling mind' in the company responsible for the act or failure. Subsequent cases indicate that the smaller the company, the easier it is to prove direct responsibility of individual directors or managers[vi].

However, changes to OH&S legislation and continued pressure for changes to the criminal code are putting senior management on notice as to their responsibilities for managing the standards safety gap. For example, Section 26 of the NSW OH&S Act states—

> *26 Offences by corporations—liability of directors and managers*
>
> *(1) If a corporation contravenes, whether by act or omission, any provision of this Act or regulations, each director of the corporation, and each person concerned in the management of the corporation, is taken to have contravened the same provision unless the director or person satisfies the court that:*
>
> *(a) he or she was not in a position to influence the conduct of the corporation in relation to its contavention of the provisions, or*
>
> *(b) he or she, being in such a position, used all due diligence to prevent the contravention by the corporation.*

In relation to these defences, he Chief Industrial Magistrate in NSW has commented that it will be extremely difficult for an employer to establish a defence where it has not in place a comprehensive occupational health and safety program and risk management program which is applied to the given task[vii].

Guidance for navigating the standards safety gap

In addition to any applicable legislation, there are a number of publications that can assist stakeholders that have duties to provide for adequate safety that are not mandatory under the NSCV.

Firstly, there is the NSCV itself. As previously mentioned, Part A of the NSCV provides guidance on safety obligations within the context of the maritime industry. Annexures in Part B of the NSCV provide guidance on risk analysis and acceptable risk. The required outcomes listed within the NSCV indicate the types of hazards that are being addressed by the NSCV. Some of the notes within the various Parts and Sections of the NSCV contain non-mandatory information on hazards, risks and recommendations regarding solutions.

Under OH&S legislation, an industry code of practice is a formal document that provides practical guidance to employers and others who have duties under OH&S legislation for occupational health, safety and welfare. An industry code of practice has been developed

for the offshore industry that could have relevance for other sectors of the maritime industry. Other sectors of the industry may consider developing industry codes of practice with the relevant Workcover Authorities.

THE COMPLIANCE SAFETY GAP

A certificate of compliance attests to the fact that a vessel complies with specified minimum required standards. To that extent it contains an underlying promise to those who might rely upon it. As a general rule, the compliance safety gap is the responsibility of the authority that issues the certificate of compliance.

In theory a vessel that is issued a certificate of compliance should have no compliance safety gap. However, the reality is that human and other factors may result in a vessel being declared as meeting standards when that is not actually the case. An audit of almost any certified vessel would likely find at least one if not more features that fail to meet specified safety requirements. Why should this be so? The following matters consider the nature and extent of the compliance safety gap.

Form and content of standards and legislation

Different individuals will often interpret standards or legislation differently from one another. Even within the same Authority, the same requirement may be interpreted differently by individuals, let alone persons outside the organization having differing knowledge, competencies, objectives and responsibilities. The current standards and legislation applicable to commercial vessels contain many inconsistencies, discretionary clauses and vague criteria that cannot be quantified. The standards and legislation provide the benchmark against which compliance is verified. Unless the criteria for compliance are in a form that is clear, quantifiable and unambiguous, there can be no consistent interpretation of what is compliance.

The National Standard for Commercial Vessels is being revised in a style that, it is hoped, will improve its clarity to users. For the first time, the standard specifies safety objectives. Discretionary clauses are being removed from the standard and vague “motherhood” type clauses are being rewritten to provide quantifiable criteria. However, the transformation of the standard cannot happen all at once. Rather, it is an evolutionary process that needs continuing input by all stakeholders.

The relevant legislation applicable to commercial vessels varies significantly between jurisdictions. The differences in legislation are so significant that there is not even a common benchmark for minimum required standard accepted by all jurisdictions for the issue of a Certificate of Survey. Clearly, variations in the minimum required standard can have a profound effect on the existence or otherwise of a compliance safety gap. A project is currently underway to reduce variations between applicable legislation by inserting model clauses for key clauses having a consistent interpretation across all jurisdictions. Not only should this improve the reliability of outcomes, but also it will significantly enhance national consistency and mutual recognition between jurisdictions.

Quality of verification processes

As with any other field of human endeavour, the quality of the verification process will depend upon the quality of the inputs and processes that were used to achieve the outcome. While a vessel may have a certificate of compliance that says it meets the required minimum standards, there is a chance that the vessel may contain non-conformities that may have been missed during the verification process. The quality of the verification process is a matter largely in control of the Authorities. It is a function of the

commitment of management, the resources available for carrying out verification, the competence and independence of assessors, the establishment of appropriate verification systems and processess, the monitoring of outputs and the willingness of management to improve systems on the results of feedback.

There are significant variations in the resources made available by the different jurisdictions for verification processes. This is not surprising given that, for example, NSW has a population over 30 times that of the Northern Territory. However, as well as differences in resources, the Authorities of the various jurisdictions within Australia have varying degrees of commitment to the quality of their processes. While the benefits and costs of uniform processes across jurisdictions can be argued, there can be no such argument regarding outcomes. The outcome of the various verification systems must have reasonable uniformity if the compliance safety gap is to be kept under control and national consistency achieved. All too often individuals in one Authority have identified anecdotal evidence of problems in the quality of verification by other Authorities. However, to date there has been no systematic study of the quality of verification processes for comparison between Authorities. The feedback component of quality management is still frequently missing from the process.

To help address the differences in the quality of verification outcomes between jurisdictions, the NMSC is currently considering a draft National Standard for the Administration of Marine Safety.

Compliance may change over time

An assumption that the safety characteristics of a vessel cannot change over time is unrealistic. A number of factors may reduce the level of safety of a vessel after it has been issued with a certificate of compliance. These include:

a) Wear and tear

b) In service damage

c) Unauthorized modification

An authority discharges responsibility for changes in the vessel's compliance after the date of issue of a certificate by clearly specifying within relevant legislation (and probably on the certificate of compliance) the time and other limitations on the validity of the certificate and the procedures that need to be followed in the event of potential changes to the vessel's level of safety after issue of the certificate.

Exemptions

Enabling legislation normally contains provisions that give the Authority the discretion to vary the minimum required standard for the issue of a certificate of compliance, both for vessels individually and for vessels as a class. Thus, an Authority may accept a lesser standard than that provided in the Standard, subject to any limitions on that discretion contained in the legislation. It is important that any person relying on the Certificate of Compliance can readily ascertain that the vessel has been exempted from aspects of compliance with the statutory standard.

Equivalents

Current standards and legislation permit the substitution of equivalent arrangements at the discretion of the Authority. Equivalent arrangements have been a significant potential

contributer to the compliance safety gap. There are a number of reasons why this is so including:

a) A failure to identify appropriate criteria upon which to determine equivalence.

b) A failure to properly verify compliance with the relevant criteria

c) The taking into account of factors that are local, and which are no longer relevant when a vessel moves to another locality or is used in another operation.

The National Standard for Commerical Vessels incorporates a structure that facilitates the consideration and verification of so-called “equivalent solutions”. Safety outcomes are expressed as “required outcomes” within the standard. Prescriptive “deemed-to-satisfy” solutions within the standard provide a benchmark against which the equivalence of equivalent solutions can be measured. Assessment techniques for equivalent solutions are specified in the standard and guidance is given on techniques for risk analysis and risk management.

The proposal of an equivalent solution places an increased burden on both the proponent and the Authority to avoid creating a compliance safety gap. A key requirement of the process is that equivalents should be based on objective data rather than subjective opinion.

The NSCV differentiates between generic and local equivalent solutions so that local factors that went into the decision-making process are revisited should the vessel move or change operation.

Liability

A certificate of compliance is in effect a declaration of compliance. Where a person relying on that declaration incurs loss due to a failure of the vessel to meet the promise implicit in the declaration, an issuing authority may be liable for the loss under the tort of negligence. The loss may be as a result of an incident, a failure by another jurisdiction to mutually recognise the vessel or it may be as a result from liabilities arising under a breach of contract. In relation to the last-named, the majority of contracts for the building of commerical vessels contains the expressed condition that the vessel shall meet the requirements for, say, USL Code Class 1D and have a valid survey certificate issued by such and such an authority. Other possible causes of action that may result from the compliance safety gap include breach of contract (if it can be shown that the Authority has been contracted to provide survey services) and breach of statutory duty. The position of a certifying Authority under OH&S law is not clear and deserves further investigation.

The potential for liability of issuing authorities can be reduced if the certificate of compliance contains information relevant to the nature and extent of the underlying promise. Matters such as the applicable standards, generic equivalence, local equivalence, exemptions and non-conformities need to be explicitly listed. Where non-conformities become apparent after the issue of a certificate of compliance, the issuing authority should either issue a formal declaration of exemption or it should list the non-conformities on the certificate of compliance. By doing so, the issuing authority may become exposed to claims for losses arising from the error and any measures needed to correct the error. However, it effectively alerts the owner and operator to review any safety issues by effectively transferring the issue to the standards safety gap, thus reducing the potential liability and exposure in the event of an incident.

CONCLUSION

The safety gap is not a new phenomenon. It is a reality that has been a part of the management and administration of safety for well over a century. Perhaps the best known example occurred with the loss of the Titanic in 1912. Though fitted with lifeboats that met minimum required standards of the British Board of Trade at that time, those involved in the design, construction, equipment supply, ownership and operation of the vessel soon realized that their obligations for safety went well beyond mere compliance with a minimum standard.

Much has happened since that fateful day in April 1912. Minimum required standards for the safety of ships have been progressively expanded and raised and the system of pro-active administration of safety strengthened. However, over the same period, the value that society places on life has increased enormously, at least in countries like Australia. Because of the finite resources available for administering safety, it is unlikely that pro-active standards will ever be formulated and implemented that completely achieve adequate safety and eliminate the standards safety gap. Likewise, even with the best will, it is difficult to eliminate entirely the compliance safety gap.

Thus, the safety gap will continue to be a reality. All stakeholders that have control over the safety of a commerical vessel have individual obligations that lie within the safety gap that cannot be ignored or abrogated. However, it is suggested that there are significant advantages to be gained by stakeholders collectively and pro-actively dealing with issues in the safety gap. An integrated approach needs to be taken with persons at each stage of the creation and operation of a commerical vessel from design to operation identifying and discharging their specific roles and responsibilities and passing on the relevant information to others that may depend upon it.

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