## **RISK MANAGEMENT**

# Managing risk... really?

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odern western society is a curious dream world — a place in L which government is expected to observe, legislate, protect and even compensate for all sorts of risks, while at the same time leaving citizens free to indulge in any manner of hazardous activity they choose for themselves personally. So, naturally, there is much to debate when one talks about "managing risk in the marine environment." Who is doing the managing, of what risk, for whose profit (or protection), and with what degree of certainty? That this risk management (RM) may take place in a domain that is, by turns, a medium of livelihood (for people as well as marine animals) or a highway for commerce (another type of livelihood) means that the subject is well-charged with stronglyheld positions.

This multifaceted issue thus provides ample scope for an interesting and spirited professional conference. Such will be the case indeed from May 10 to 12, 2017, when the Nautical Institute BC Branch (NIBC) hosts their biannual conference on the theme: *"Managing Marine Risks in the Pacific Northwest."* The purpose of this article is to preview some of the issues and to stimulate interest in this complex subject.

#### What is it all about?

Everyone has some picture of risk. This often takes the form of a wellknown undesirable outcome. Indeed, the notion of risk is so well connected with disaster that the names of spectacular failures become synonymous in the public mind with, and a type of shorthand for, the risks of entire industry segments — think: "*Titanic*," "*Exxon Valdez*," and "*Deepwater Horizon*."

This common misperception of risk makes the mistake of accepting, as a virtual certainty, the worst possible outcome. In fact, the taking of "risk" is not a choice between certainties, but a choice between uncertainties. To take a risk is not to accept fate, but rather to tempt it. In fact, the English word derives from the Italian risicare, which is "to dare." Daring is very personal and circumstantial. It occurs, therefore, that people who may be daring in their personal lives, for example when contemplating the momentary thrill of the drop on a bungee-jump, could also be quite risk-adverse when the "dare" is too complex to comprehend directly and/or the pay-off more remote.

Where one sits with respect to any particular risk is largely based on what one stands to gain or lose in the dare. Some organizations must take risks to prosper. This is especially so in the field of commercial enterprise where innovation and development must explore unknown territory to create and dominate new markets for significant gain. Other organizations, conversely, may have a more well-developed sense of what they have to lose. Governments are among the latter; while they consider themselves responsible for innovation and job stimulation, they know that public failures are not so easily "written-off" as will be a poor investment.



The public, if they are not intimately familiar with a given object of risk appreciation, may be challenged to find their place on this spectrum of risk-tolerance. What is the appropriate balance between profitability and avoidance of harm?

Often, the test is not just "balance of probability" as in a favourable outcome of investment (more profit than loss), but very high confidence that no harm will come to oneself or others. In the extreme position, this could amount to insistence on a virtual guarantee of no harm. This is called the Precautionary Principle, which is often used in policy decisions where extensive scientific knowledge may be lacking — it places the onus on the risk-taker that *no significant harm* will result, regardless of gains associated with the risk.

Although the Precautionary Principle approach may be appropriate in various risk applications, it is a very difficult standard to implement practically. It is especially so in a complex economic, industrial, environmental and socially relevant enterprise such as shipping. However, perception is reality: even if there is just a widespread perception of harm, this must be mitigated and public confidence raised to an agreed level. This is as much about improving confidence through knowledge as it is about diminishing risk. This is why the NIBC conference topic is relevant today, and will continue to be so.

#### Who takes the risk?

The process of risk management has become highly systematized in the last 50 years. Increasing mechanization of public transport since the 1800s undoubtedly had an impact on this evolution. The

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science of risk grew with the development of operations research in the Second World War, in which scarce military assets could be deployed (weighted) for the best effect against uncertain (unseen) adversaries. Later, refinements in the insurance industry in the period 1955-1964 also drove development of RM. On the scientific side, the technical innovations of the nuclear power industry and the space race also demanded appropriate recognition and handling of new and largely unknown risks.

Nowadays, there is scarcely a field of human endeavour that is not required to have a Risk Management Plan/System. In many cases these take the form of a Safety Management System. This is explicitly so in the shipping industry with the requirement for all SOLAS ships (those sailing internationally) to comply with the International Safety Management Code (ISM Code). In Googling "x Risk Management," one quickly finds out how pervasively this term is used: "playground" substituted for "x" yields 1,230 hits, with "beach"=2,190, "driving"=12,300, and "home"=23,700. With the search terms defined more loosely (i.e., without the confining quotation marks), the search for Home Risk Management yields 204 million hits! Comparable searches for Ship RM yield 4,190 and 15.2 million hits respectively.

A very large number of companies now specialize in qualifying, quantifying and "managing" risk. This commoditization of the RM process tends to obscure the fact that risk taking is a natural human process. Many people pursue risk to generate a sense of fleeting danger, thrill and challenge. Gambling is the oldest example of this kind of risk-taking activity, either as a "game" or as a serious financial occupation. Taking it further in the financial domain, many investments may carry the connotation of a gamble, but with the element of chance eliminated by research and good judgement (at least, that is what the successful investors will tell us!)

Other risk takers, although perhaps not any more risk adverse, see the problem through the opposite lens: the issue is not how to maximize gains, but how to minimize losses. This may be so in military strategy (especially for inferior forces in a defensive position/situation), but is more particularly so for safety systems



Technical, procedural, regulatory and social mitigations go hand in hand...

engineering. An investment strategy that favours protection of capital and guaranteed returns, rather than high-yield (high risk) speculation also fits this mold.

Whether taking a high-risk/high-gain or low-risk/no-loss approach, a RM system may have to consider contributory factors in all the different dimensions of a given enterprise or activity. This may be operational/procedural, that is, having mitigations (means of limiting risk) in the "how" of which an activity is conducted (e.g., navigation as a human activity). Or, the dimension of risk could have technical, financial or legal elements of adverse consequence or limitation. And there may also be less tangible risks that attach to reputational risks, which result in losses in the social/political sphere (not always insignificant).

The shipping industry undertakes risk in all these domains. This is risk in which individual ships, shipping companies and associated industries all have a share. And so do we, who rely on the free flow of goods around the world, largely by sea.

#### How much can we stand?

As much as risk tolerance may be a personal issue, risk is not just a matter of "gut feel." In fact, just as the systems of risk management have become more developed, so also have the means of determining what is the risk that must be managed.



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Risk in a formal sense is usually conceived in the equation "risk = likelihood of occurrence x consequence." These two terms, likelihood and consequence, can be treated on a subjective, relative scale (say very low to very high in five steps) or subject to detailed scientific and statistical analysis to determine more precise and objective measures of risk. Statistical methods are favoured in applications where the contributing factors can be isolated for individual analysis, or when a single outcome can be forecast from a very large accumulation of evidence. An example of the latter is the case where different factors or conditions are attributed to similarly increased chance of death. For example: smoking 1.4 cigarettes, drinking a half-litre of wine, travelling 300 miles by car, or living within five miles of a nuclear reactor for 50 years all bear the same risk (one-in-one-million increased chance of death).

In most cases, however, the consequence will not be as easily identifiable or meaningful (to a human audience) as the stark measure of death, and will have quite different values to varied stakeholders. A very topical example illustrates this: a ship-sinking on the B.C. coast has very widely ranging values of impact in the human, operational, financial, legal, environmental, social and political domains. There is, in some cases, an effort to reconcile disparate consequences to a common yardstick, usually cost, but this is less than satisfactory when trying to compare human impacts with pure financial losses. The weighting of certain impacts can also be quite different depending on where one sits physically; the consequences of a spill (both immediate and long-term) look different to a coastal community close to the scene, than to a more remote community that depends on affordable coastal shipping for its sustenance, or to a well-supplied suburbanite in Vancouver who "values" a pristine coastal environment but is otherwise unaffected directly by either the spill or any resulting constraints/costs on the shipping industry.

#### What can we do about it?

In the end, it not just about how the risk is assessed, but what one does about it. Through whatever means is employed in determining the risk, whether qualitative-relative or scientifically precise, the agents "managing" the risk must answer three questions: (1) what can be changed? (2) how much will this affect the outcome? and (3) at what cost? Furthermore, these questions must be placed in the context of what is in that particular agent's power to change, and what are his or her incentives to act.

None of this is simple, and less of it is obvious. In an industry as well-established and regulated as shipping, the incentives for efficiency, reliability and self-sufficiency — while sometimes competing with each other — have assured that much "low-hanging fruit" of easily achieved safety and effectiveness improvement has already been plucked. Much of this has taken place under regulatory pressure arising from previous mistakes. But increasingly, companies are being pressed to demonstrate, through their own risk management programs, a proactive approach to identifying hazards and limiting exposure before accidents happen. The process of Pilotage Risk Management Methodology employed by Canada's Pilotage Authorities is just one example of this, in which contemplated changes to pilotage regulations or practices are subject to expert analysis to determine the net effect on the risk calculation.

Risk mitigation is complex in another way also: there is no "silver bullet" answer. Nor is there a single mitigation that will prevent reoccurrences of the accident one wishes to avoid. Or if there is, it comes at a known cost of significant expense, or an unknown cost of shifting the risk to another casual chain. Consider driving to the store to buy milk: "don't drive" may not be an option for everyone unless they are going to give up shopping altogether; "ride your bike" only substitutes one risk for another; "don't drink milk" only moves the risk into an entirely different risk category of nutritional alternatives; and so on. Similarly for the shipping industry ... a grasping of easy solutions ignores the complexity of the problem.

A diligent and effective search for risk mitigation must start with a comprehensive understanding of the dynamics of the system and comprehension of the related factors. Each one of these must be examined to determine how much it affects the

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outcome and what scope for improvement exists. It may be that a small improvement in several successive factors may compound the mitigation in a way far more significant than a large (and expensive) improvement in one more publicly visible factor.

Every instance of risk allows many approaches to the problem. In the same way that diversification of financial holdings protects against singular devastating losses, prudent risk management covers many options also. Apart from avoidance of risk (sometimes but not always an option), there are material, human factors and social dimensions of the risk-chain to be addressed. The material elements include all measures to ensure reliability, including redundancy of design and fail-safe modes of operation. The human factors comprise all aspects of manmachine interface, individual (intellectual and professional) competence and physiological capacity, including fatigue. And the social aspects could cover all the contributing pressures that incentivize risk-taking, which includes taking shortcuts, or liberties with established rules, over-valuing one's own skill, or just being ignorant to the risks one casually accepts for oneself, but also by extension, for others. Training for risk awareness and operational risk management (i.e., good and prudent decision-making under duress) is a very important aspect of this latter element.

#### After the event...

One final aspect of risk management is the consequence management — once "stuff happens," what can you do about it? This is the part that most people do get: the financial costs, the legal ramifications, the mutual recriminations in the press. But there is more to this than "punishing the guilty parties" or "making the story go away." Any realistic appraisal of risk has to recognize that there remains a finite probability of an adverse outcome, and we need to accept that as our part in the equation of risk and benefit, plan for it, deal with it without emotion or grandstanding, and move on then to further examine what can be improved. Even good risk management is not a zerorisk guarantee.

The BC Branch of the Nautical Institute particularly aims in its May conference on Managing Marine Risks in the Pacific Northwest to address this last issue: how do we improve the culture of mutual understanding and continuous improvement of risk in the maritime domain of B.C. and the neighbouring coastline? This is a subject of vital importance, not just for sailors and environmentalists, for ship owners, port operators and regulators, but for all those who live in B.C. and see our future prosperity linked to our province's privileged geographical position and its vibrant and competitive marine industries.

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**NIBC CONFERENCE 2017** Managing Marine Risks in the Pacific Northwest

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