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# A coherent approach to safety and performance in maritime industries: the importance of near misses

by Prof Andy Smith — March 16, 2022 in Opinions, Safety



Safety and performance are often perceived as conflicting aspects of shipping. In the aftermath of an untoward event, typical safety interventions or fixes bring about more stringent procedures or more procedures, retraining, replacement of people, and changes to work conditions, argue Professor Andy Smith, School of Psychology, Cardiff University, and Dr Romanas Puisa, Thales Group.

**T**hese changes are not necessarily for the better. Consequently, the interventions can be postponed, amended or waived. Neither ‘just culture’ nor retributions—i.e. carrot or stick—seem adequate. Fortunately, there have been significant advances to resolve this conflict to a win-win situation. Early safety integration through systems engineering practices and system safety allows for safer designs at a lower cost.

In turn, onboard safety management can benefit from the ideas of resilience engineering and the positive view on safety management (aka [Safety II](#)). The assumption here is that failure is the flip side of success, and hence constraining work to improve safety inevitably inhibits performance. Instead, we have to learn how people effectively work at the fringes of safety and performance and yet manage to avoid accidents. “Near misses”, which are specific instances of successful accident prevention, represent the ultimate source of knowledge for future success.

The [International Safety Management \(ISM\) Code](#) requires reporting and analysing near misses, incidents, and accidents, identifying risks, and developing safeguards. The Code reasons that “it makes good business and economic sense because it can improve vessel and crew performance and, in many cases, reduce cost”. A near miss is defined as a sequence of events and/or conditions that could have resulted in an accident without timely and effective recovery. Hence, a near-miss is safety management at work. The Code contains a separate chapter on near-miss reporting and investigation.

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Strangely, near misses are often perceived as close calls, symptoms of poor safety management and, hence, as highly undesirable. This negative connotation has roots in the accident pyramid (aka Bird’s triangle), familiar to safety professionals. The pyramid is commonly misinterpreted as suggesting more incidents for every significant accident and

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Although it may have been reasonable for occupational accidents in the 1930s, it is inappropriate today. There is no systematic relationship between small and big failures with pre and post-incident events in modern socio-technical systems such as large passenger and cargo ships and oil platforms. When it comes to near misses, the situation is notably different. Near misses have no consequences and represent normal safety management activities.

Near misses are normal because safety hazards are normal, especially when performance is at its maximum (e.g., moving through a highly congested waterway such as the Dover Strait). This profile is apparent because current maritime systems are so complex that design errors are frequent, and procedures are often underspecified. Also, the operational environment changes constantly (technology ages, undergoes upgrades, people come and go, the market transforms and requires adjustment), adequate procedures can become inadequate, and investigation recommendations can become irrelevant.

Hence, near misses should mean that hazardous conditions were detected in time and effectively responded to, which makes near misses priceless for learning about accident prevention. There are many learning opportunities since near misses are typically considerably greater than the number of incidents and accidents.

Reclassifying near misses as successes of prevention will make it easy to encourage their reporting, which will change the current situation where near misses reporting has been seen as an unnecessary burden, and investigation recommendations as costly and introducing yet another set of procedures. Blaming human error as a root cause, which has aggravated the situation and led to cover-ups, will also become pointless.

However, mere reporting of near misses is not enough. The way near misses are described has to change, for the utility of current near misses descriptions is not conducive to learning from them. Descriptions focus on what happened and when and have little information on how hazards were detected, responded to, and the resources (time, skills, technology, communication, etc.) that proved vital.

A related question is what event should be considered a near miss in the first place. Many hazardous events are so frequent that they are considered normal and expected, and it is difficult to say if an event would have led to an accident if it had not been resolved. Hence, reporting near misses is inherently subjective, at least for now.

Turning the near-miss information into knowledge is the ultimate aim. That definitely should not be just another set of dos and don'ts. Instead, or in addition, the analysis should reveal the role of the overall safety management system (SMS) in accident prevention, highlighting good and bad features within the system so that the performance of the SMS as a whole can be better understood.

1. **What events should be considered as near misses?** Should they be all events that would lead to accidents if inadequately attended to or only those events that could be referred to as close calls?
2. **How can one effectively report near misses to become conducive to learning?** That is, how does one maximise the utility of near-miss analysis and uptake? Does it require developing a new taxonomy (to capture how hazards were detected, responded to, and what resources proved vital) or perhaps using a myriad of sensors and AI?
3. **How to map near-miss information to SMS, where people are just one part?** This may sound complex, but it does not need to be. There are examples in the research literature of how seemingly complex safety management systems are represented as simple hierarchical structures that are easy to understand and communicate. Thus, technology's contribution (or lack thereof), management and responsibility structures, communication with other vessels, and used regulations and rules need to be highlighted.

*The views presented hereabove are only those of the author and do not necessarily reflect those of SAFETY4SEA and are for information sharing and discussion purposes only.*



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