

IMPROVING SAFETY CULTURE – THE REPORTING ELEMENT

Introduction

The importance of having the right culture for safety is an oft discussed topic with a variety of views held on what such a culture should look like and how to achieve it. That said, there does seem to be majority agreement that there are five key elements that promote the right culture:

- Just
- Reporting
- Flexible
- Questioning
- Learning

This Insight article looks at how the Royal Navy is developing the Reporting element by providing some context about the current reporting landscape and showing how our reports are analysed. We then share two case studies that provide examples of how safety can be improved directly as a result of reporting.

Context

The Royal Navy employs an occurrence reporting tool known as the Navy Lessons and Information Management System (NLIMS). This tool has been in use since 2013 and so is now starting to provide a statistically credible source of data. Reports are submitted in an Excel spreadsheet form sent by e-mail to be quality checked by a team of data inputters prior to entry into the database (not far different from CHIRP). This quality check is an essential part of ensuring the reports move up the DIKW pyramid¹; often reporters miss out key parts of the metadata needed to turn the raw data of a report into information that can then be analysed.

In 2018 there were 4165 reports received into the NLIMS system of which 1139 were directly attributable to occurrences on Royal Navy surface ships². Of these, 129 covered injuries classed as Serious or above, where Serious covers injuries leading to no more than 24 hours in hospital but greater than 7 days off work.

Near Misses

Encouragingly 560 of the 1139 (49%) are Near Miss reports. Encouraging because these reports are not mandatory, which must mean that sailors recognise the value in submitting these reports or else they might not bother. This provides a warm feeling that the Navy's culture does encourage reporting of occurrences but, as ever, there is always more we can do.

Analysis

The treasure trove of information contained within NLIMS could become a little overwhelming and so we break down our analysis into three distinct groups, focussed on the needs of those requiring the analysis.

a. **Weekly Summary.** Those in the shore organisations closest to the delivery of shipping operations receive a summary of reports received in the last 7 days. This fulfils two key functions, firstly it ensures that they are able to react to any occurrences of concern and direct further investigation if required, and secondly it provides a regular rhythm of reporting against which trends or patterns can be spotted. A trend might be receiving reports of sailors falling down the same ladder (is it too steep, too narrow, is it exposed to weather and needs non-slip treads?) whilst a pattern might be an increase in heat related injuries amongst ships undergoing an annual exercise. An example of the weekly summary is at Figure 1.

¹ DIKW = Data-Information-Knowledge-Wisdom: a hierarchy consisting of data at the bottom rising through information and knowledge to gain wisdom (or insights) at the top level.

² The Royal Navy is active in three domains, maritime (surface and sub-surface), air and land, hence the high total of reports received beyond surface ships.



Figure 1: Weekly LfE / NLIMS Summary (indicative figures for illustrative purposes only)

b. **Monthly Deep Dive.** Having spotted a trend or pattern, the monthly deep dive provides a way for managers to direct a much more thorough analysis. This deep dive might look back over a number of years, or across a range of different organisations. It aims to provide evidence for decision making by those controlling the resources used to control risks. Recent issues examined include: a comparison of occurrence frequency during maintenance periods compared to operating at sea; identification of the activities that cause the most harm thus need greater control; and analysis of occurrences across each ship type/class to ensure that we are not unduly exposing a particular population of sailors to risk.

c. **Governance Performance.** The most senior leaders in the Royal Navy are very mindful of their duties and accountability for safety. They therefore demand safety performance management information at their regular governance meetings to allow them to review the safety management system in order to identify shortfalls and direct action for continuous improvement. The dashboard (Figure 2) produced for these meetings covers a range of leading and lagging indicators but draws heavily on the information contained in NLIMS.

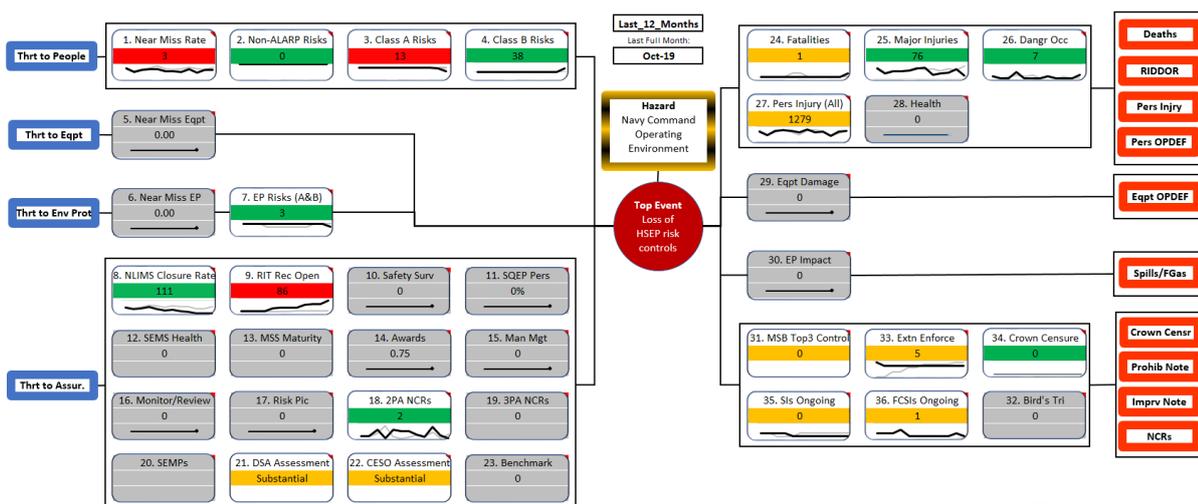


Figure 2: Safety Performance Management Dashboard (indicative figures for illustrative purposes only)

Case Studies

The provision of information as described above is all very well but unless it provides the information managers and commanders require to take decisions then the effort is worthless, and in time those making the reports will lose interest. Demonstrable learning and the improvements that it drives is critical to the

success of reporting. Here are two case studies that show tangible improvements made as a direct result of reports raised by individual sailors or ships.

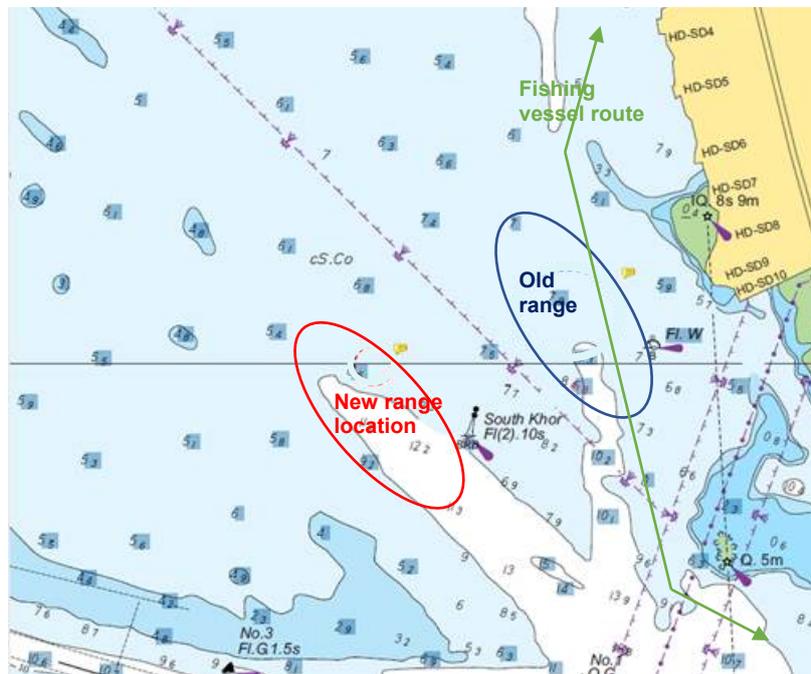
Case Study 1 - Repeated Navigational Near Misses

The Royal Navy has a requirement to understand the signatures of its ships and has, for many years, used fixed arrays on the seabed to measure this data either on an opportunity basis as ships operate in the vicinity or as part of a programmed trial.

For years a measurement range facility was used regularly but measurements were continually compromised by the presence of other traffic in the vicinity (predominantly small fishing vessels leaving and returning to harbour at the ends of the day). As the range was situated in relatively shallow water fairly close to the shore, on almost every occasion the Operating Authority had to be asked for dispensation to breach standard under keel clearance minima, and lateral separation requirements. Finally, ships were often programmed to conduct these trials overnight, however charting in the area was fairly poor and the main visual references used to keep the ship in safe water were unlit.

Near Miss reports associated with this activity were increasing, providing a growing body of evidence of close passes, interrupted measurements, and fatigue of a crew operating in a highly stimulated environment for many hours. Analysis of these reports and the investigation of resulting trends highlighted the wider issues that had not been evident when each incident was viewed in isolation.

Simple measures to improve the situation were implemented which included moving the range by a mere 200m which took it further off the coast, into deeper water and off the direct route between the local harbour and the fishing grounds. The UK Hydrographic Office was engaged to produce a new chart centred on the revised range position, including the major visual fixing marks. A formal Notice to Mariners was issued which resulted in reduced instances of craft inadvertently straying into the range when it was in use and the decision was taken to only use the range during daylight hours to reduce crew fatigue.



The cumulative effect of the control measures put in place reduced the overall risk of the task and has seen the number of Near Miss reports dropping to almost zero.

Case Study 2 – Upward Trend in Hydrogen Sulphide Reports

In the middle of 2018, weekly analysis of NLIMS Reports indicated an increasing number of Near Miss reports where sailors reported the unexpected presence of Hydrogen Sulphide (H_2S). H_2S is a colourless gas with the odour of rotten eggs but becomes odourless in higher concentrations. It is heavier than air, poisonous, corrosive, flammable and explosive. It can be found from a variety of natural sources, but specific

to our area of concern, it is produced as the by-product of the breakdown of organic matter in the absence of oxygen. As such it may be present in fridges, sewage treatment plants, contaminated bilges, black/grey water, fuel, sullage and contaminated oil tanks.

Further analysis of the reports indicated that nearly all incidents were related to the discharge of sullage³ tanks - on many occasions where the tank lid had been removed to allow a hose from a tanker or barge to be placed directly into the tank, rather than using the fixed discharge pump (i.e. a closed system). Personnel were not breaking any rules but the NLIMS reports had identified an unexpected exposure of personnel to a hazard.

Prompt reporting allowed a working group with appropriate expertise (ships engineering staff, port operations personnel, headquarters staff, and so on) to meet quickly and identify the key issues and how to stop them. It quickly became apparent that there was a gap in our procedures. We had policy for discharging sullage and entering confined spaces, but no policy for the removal of tank lids; we had not anticipated that sailors would need to remove tank lids unless they were preparing to enter the tank. The Royal Navy's procedure for quickly issuing safety related notices was put to good use and new instructions were issued to the Fleet and briefed by supervisors.

Since then the number of reports received concerning H₂S has halved, and trust between our ships and their support contractors has improved.

Conclusion

Reporting is a vital element in building a culture for safety but unless you take the data that those reports provide, turn it into information by the addition of metadata to allow it to be analysed and then use the knowledge the analysis provides to make decisions for demonstrable improvements in safety to encourage continued reporting, then your efforts will not be sustainable.

³ Sullage is a mixture of waste oil, water and greases which typically builds up in ships' bilges.