The involvement of human factors in maritime incidents

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In my previous article: Human Element?1, I indicated that at present there are no internationally recognised and accepted definitions for all of the various human factors that might be responsible for any particular incident. I proposed a number of defining human factors that might be used as a common starting point.

A consideration of the involvement of human factors in maritime incidents requires a three-stage approach – definition, measurement and analysis. By applying such a scientific approach, it is possible to determine from the analytical stage not only the causal factors in each incident but also, to apportion responsibility for the incident between those causal factors.

Having already considered definitions, I now want to turn to measurement. Unfortunately, significant problems also arise when considering the measurement stage of the process. Firstly human factors are, by their very nature, subjective rather than objective and so can be difficult to measure. Secondly, the threat of litigation prevents maritime authorities from apportioning blame to the various factors involved in any particular incident.

Looking at the question of subjective versus objective, it is true that it is possible to measure factors like the amount of alcohol or other substance in a person’s blood stream and it is also possible to make a reasonably accurate assessment of the influence of fatigue on a person’s ability to function. However, in an incident it is likely that a range of human factors were implicated in the outcome and therefore the question of the impact of each of those factors together with the effect of the interaction of the factors also needs to be measured.

The interaction of more than one factor in an incident may therefore be considered as being very difficult to determine. I would argue however that it is not as difficult as it might appear at first sight and I’ll come back to this point later.

Now to the second problem identified earlier – litigation. The Australian national regulator (AMSA) investigates maritime incidents, while the ATSB also conducts investigations of more serious incidents, such as those involving death. To avoid the possibility of involvement in litigation, the ATSB publicly declares that their function is not “to apportion blame or determine liability.” In the case of reports from both AMSA and the ATSB therefore there is no consideration of the impact of human factors in a way that would allow apportionment of responsibility for the incident.

While I have enumerated good reasons for NOT apportioning blame, nevertheless there are compelling reasons for doing so. The main benefit is to know exactly what factors were involved and the amount of responsibility of each of those factors. In this way, resources can be allocated appropriately to develop and implement strategies to reduce the influence of those factors in the future.

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How to do this and avoid investigators and regulators being involved in litigation? This can be achieved by simply not releasing the information in individual investigation reports publicly. I would argue that benefits can still be achieved if this data is released in an aggregated form, say on a yearly basis. Another benefit of aggregating the data is the possibility of detecting systemic problems that might not be apparent when considering the outcomes from individual incidents.

Analysis of the human factors measurement data should be the responsibility of the national regulator. Both the Navigation Act and the OH&S(MI) Act require that reports of injury/illness, dangerous occurrences, machinery and equipment failure, collision, grounding, close quarters etc. be provided to the national regulator. It is also a responsibility of the national regulator to investigate these incidents. Apart from identifying the role human factors have in causing incidents; the national regulator would also be able to detect increasing or reducing trends through the analysis stage. In this way it could be seen whether strategies were working or not and therefore the regulator would have the opportunity to redirect its resources more appropriately.

Let us return to the question of subjective rather than objective assessment. The persons conducting investigations are highly trained specialists with many years experience in the maritime industry and I believe there is no good reason not to be able to trust their judgement in making assessments as to the apportionment of blame in maritime incidents. It is true of course that investigators would need specialist human factors training to ensure that consistent meaningful findings were achieved from all investigators.

The IMO presently receives reports from jurisdictions that collate data from individual incident reports. Were those aggregated reports to include the apportionment of human factors’ responsibility in incidents, the IMO would be in a position to analyse the international data and make this available in an aggregated form publicly and this would give developing nations, where much of the death and injury toll from maritime incidents occurs, the opportunity to take appropriate remedial action without the need for significant expenditure of their own scarce resources.

Finally, I need to emphasise that responsibility for reducing the impact of maritime incidents, both in terms of the numbers of deaths and injuries and property loss and environmental damage does not rest solely with national regulators. Individual crew members, ships’ masters, owners, operators, agents and industry sectors have the primary role in reducing the number of maritime incidents.

I want now to discuss in more detail the role that national maritime regulators can play in reducing the impact of human factors in maritime incidents through the analysis of data in incident and investigation reports.

Serious accidents and incidents are thoroughly investigated and the accident investigation reports give us the why and how so that similar incidents might be avoided in the future. However, less serious incidents and “near misses” in most cases are not investigated, even though they are reported (or at least are required to be reported). Such incidents also have valuable lessons for the maritime community and because there is a requirement for them to be reported, can provide insights into trends that might be occurring.
A database of incident reports and “near misses” is a valuable resource that can be utilised to reduce the impact of human factors in future maritime incidents if the data is analysed and findings reported on a regular (say annual) basis. This of course assumes that the responsibility of the human factors involved in each incident has been apportioned. This will involve at least some investigation into each incident to determine the influence of the human factors contributing to the incident.

As indicated previously, the analysis should use aggregated data and not identify individual incidents. From data gathered over a period of time, say two to three years as a minimum, it is possible to observe if particular ships or operators or industry sectors have had incidents involving particular human factors, like say alcohol or drugs, over that period and devise strategies to minimise the impact of that factor in the future, through education, training and/or regulation. Obviously, the national database must be set up in such a way that such trends can be detected.

Just publishing the results of such analyses and ensuring that ship owners, masters and operators can access these results, will allow the industry itself to see areas of weakness and take steps to implement strategies to lessen the impact of these factors on their ships.

Trends identified might be increasing or reducing and will therefore be a valuable tool for the regulator in allowing scarce resources to be directed to the area of most need. It also allows the regulator to determine the success or otherwise of strategies that have been implemented to correct increasing trends detected in the past. Successful strategies can then be shared with other jurisdictions to assist them in reducing incidents.

Additionally, if national regulators provide the results of these annual analyses to the IMO, that august body would have the data to allow it to detect world-wide trends and be able to assist regulators in developing countries with the development and implementation of strategies to reduce the impact of human factors in incidents occurring in the waters over which they have control.