The Prominence of Organisation Factors in the Causes of Maritime Accidents in North America (1996-2003)

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Introduction

The authors of this paper were recently in the audience at an international conference when one of the keynote speakers opened their address with the assertion that 'As we all know, human error is the leading cause of accidents and incidents in the aviation industry'. Elsewhere, authors have variously asserted that operator failure plays a part in the causes of between 60-80% of all adverse events (Johnson, 2003). Such assertions have profound implications. For instance, several national research programmes have been established with the explicit aim of reducing the number of accidents by reducing the opportunity for human error through automation. This paper stems from recent work to validate assertions about the distribution of causes in adverse events. The results of an initial investigation into the causes of all major accidents and incidents in North American aviation (1996-2003) undermined claims about the prominence of human error. This paper reports on our most recent work to replicate the previous study and identify the proportion of causes and contributory factors associated with human error in the North American maritime industries.

As mentioned, our initial work focused on the distribution of causal factors identified in aviation accident and incident reports. This decision was justified by the prominence of claims about human error in this industry. The first study focussed on all major adverse event reports issues by the US National Transportation Safety Board (NTSB) and the Canadian Transportation Safety Board (TSB) between 1996 and 2003 (Holloway and Johnson, 2003). This yielded a total of 26 US aviation and 27 Canadian investigations. Later sections will discuss the methods used in more detail. For now it is sufficient to observe that two analysts went through each of these reports developing their own independent classification scheme to distinguish between broad categories of causal and contributory factors. This identified approximately 40 causes and 53 contributory factors in the NTSB dataset and 50 causes with 53 contributory factors for the TSB. The subsequent classifications showed that only 37% of causal factors in the NTSB study related to human error. In contrast, 48% of causes and contributory factors can be categorized as organizational. 12% related to equipment. 'Other' causes accounted for 3%. In contrast, for the TSB 50% of the causes and contributory factors were related to individual error, 22% to organizational issues, 20% to equipment and 8% to 'other' factors. Figure 1 provides an overview of the results from the previous study. Although human error remains a significant factor in many of these accident reports, it is not true to say that these investigatory agencies ignore the organizational issues that create the context for adverse events. It is also apparent from our study that the differences between the NTSB and the TSB reflect important differences in the types of accidents that occur in US and Canadian air space (Johnson and Holloway, 2003). The Canadian datasets contain far more incidents involving general aviation, i.e., private pilots and small aircraft. In these incidents, there is less involvement of high technology systems. There are also correspondingly fewer opportunities for organizational issues to intervene in these incidents where single individuals will be performing most of the operations.

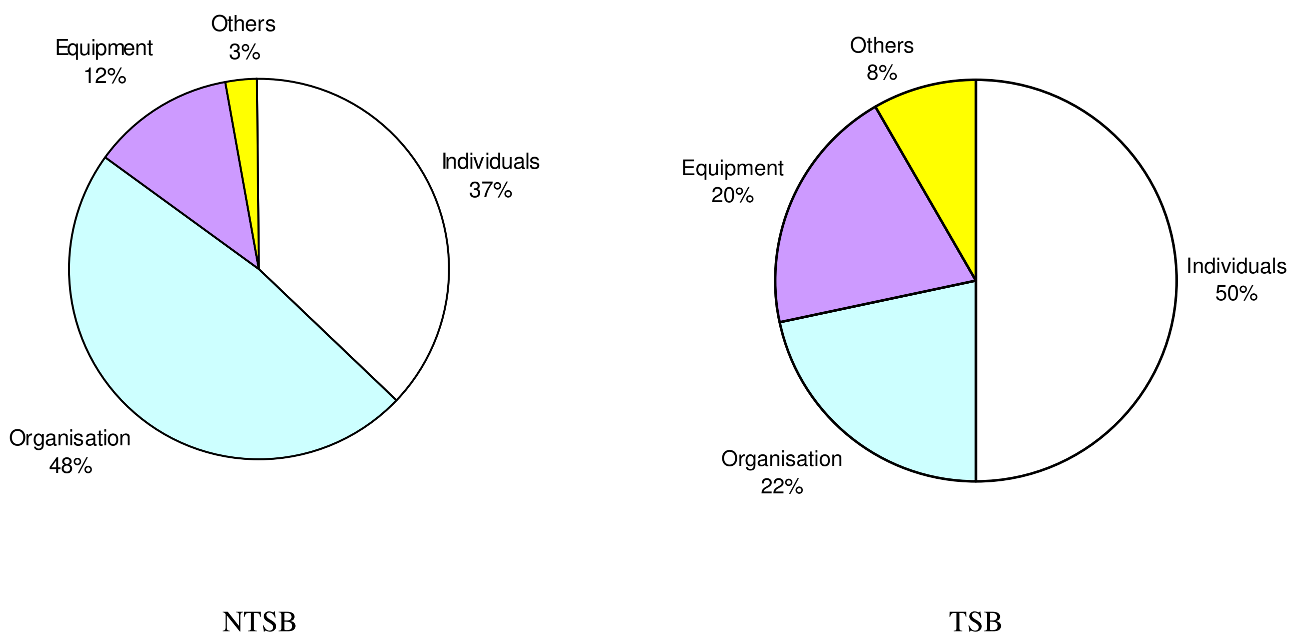

Figure 1: Categorisation of Causal and Contributory Factors in NTSB and TSB Aviation Data

It is important to emphasise that we wanted to derive results that could be replicated and that were based on a transparent method, discussed below. Others have recently repeated our analysis with broadly similar results as they probe behind some of the claims that are made about the role of human error in the causes of adverse events. However, a number of criticisms can be made about our work. In particular, it has been argued that aviation is atypical. The relatively high training levels and regulatory control make it likely that organisational issues would be more prominent than human error compared to other industries. It is for this reason that we have begun to replicate our work for the North American maritime industries. A further motivation is that there continue to be a large and rising number of adverse events within both commercial and leisure operations. For instance, a recent Parliamentary report revealed that the number of fatalities in and around UK coastal waters rose by almost a third to 300 in the four years after 1998. Between 1998 and 2002, the number of incidents requiring Coast Guard attention rose from 11,553 to 13,395, representing a 15.9% increase. The total number of accidents increased by 17.3% from 6,480 to 7,604. The increase in deaths from 249 to 319 represented a 28.1% rise. This rise has been partly blamed on under-manning in Coast Guard centres. However, the rising number of incidents also motivates a more detailed study of the causal factors in maritime accidents and incidents.

Method

As mentioned, we were concerned to develop results that could be challenged or replicated by other researchers. The intention was that future claims about the role of human error and systems failure could be validated and justified. All of the materials used in this study are available on-line and can be accessed by contacting the first author. The method involved each of the co-authors performing an independent analysis of all of the major maritime accident reports published between 1996 and 2003 by the US NTSB and the Canadian TSB. The investigators each had more than a decade's experience in the development and analysis of safety-critical systems. However, each had radically different backgrounds as can be seen from our affiliations. The start date was determined by pragmatism. It was felt that this provided a sufficiently large sample to support our analysis within the time available for our study. This timeframe also mirrored the period used for the previous aviation study. The sample yielded a total of 16 accident reports from the NTSB and 149 from the TSB. This imbalance partly reflects the relative prominence of the Canadian maritime industries. It also reflects the way in which the TSB group major and minor incidents within a single reporting framework. In contrast, the NTSB separates more major reports from their accident briefs, which were excluded from our study. Rather than impose our own arbitrary distinctions about the seriousness of each adverse event, we chose to analyse all of the TSB reports presented within the period of our study. The reports ranged from high profile, multiple fatality accidents such as the Fire on Board the Panamanian passenger ship Universe Explorer through to less severe grounding incidents.

The analysis progressed by extracting the causal and contributory factors that were identified in the aftermath of each investigation. This preprocessing stage was necessary to insure that each of the analysts focused on the same source, given that many of the documents were dozens of pages in length. The identification of all relevant sections in each report was performed as a collaborative activity between two of the three analysts. The NTSB provide a summary that groups probable causes and contributory factors in the following way:

> "The National Transportation Safety Board determines that the probable cause of the collision between the Coast Guard patrol boat CG242513 and the small passenger vessel Bayside Blaster was the failure of the coxswain of the Coast Guard patrol boat to operate his vessel at a safe speed in a restricted-speed area frequented by small passenger vessels and in conditions of limited visibility due to darkness and background lighting. Contributing to the cause of the accident was the lack of adequate Coast Guard oversight of non-standard boat operations.". (NTSB MAR-02/05)

Canadian TSB reports contain a section entitled 'Findings As To Causes and Contributing Factors'. The analysis was less straightforward, however, because these documents did not distinguish between causes and contributing factors:

> "This incident occurred because the pilot of the "MAGDELAN SEA" did not hear the departure broadcast by the "WOODSIDE I" as he was assuming multiple responsibilities and had not maximized the deployment of officers and crew available to him. The fact that the master of the "MAGDELAN SEA" did not alert the pilot to the VHF R/T departure message from the "WOODSIDE I" contributed to this occurrence. A further contributing factor was that the "WOODSIDE I" did not make her intentions clear by calling the "MAGDELAN SEA" on VHF channel 12 after departing the berth, and assumed that any action necessary would be taken by the "MAGDELAN SEA". (Canadian TSB M96M0038)

The identification of probable causes from contributory factors in TSB reports was performed independently by each of three analysts so that some comparison could be made with the findings listed by the NTSB. All subsequent stages were also performed in isolation until the results were available for comparison. We assigned each probable cause and contributory factor to a number of common categories. We did not use a pre-defined taxonomy. Each analyst created their own classification as they progressed through the incidents. However, it is important to mention that two of the analysts had worked on the previous classification of the NTSB and TSB aviation incidents. The third analyst had also seen a presentation on this previous work. Having raised this caveat, it is important to stress that no attempts were made to propagate the same taxonomy from the aviation work into the maritime domain. As before, everyone involved in the project could assign any labels that they chose. The classification process raised several practical problems. For example, the following section is taken from an NTSB maritime report:

> "Contributing to the amount of property damage and the number and types of injuries sustained during the accident was the failure of the U.S. Coast Guard, the Board of Commissioners of the Port of New Orleans, and International RiverCenter to adequately assess, manage, or mitigate the risks associated with locating unprotected commercial enterprises in areas vulnerable to vessel strikes" (US NTSB MAR-98/01)

This passage could yield three contributory factors; one associated with the U.S. Coast Guard, another with the Board of Commissioners of the Port of New Orleans and one with the International RiverCenter. Another analyst might identify three factors associated with a failure to adequately assess, manage, or mitigate the risks of vessel strikes. Conversely, this passage could yield the cross product of nine contributory factors where each agency failed in each of these three ways. As in the previous study, we imposed no constraints on this issue except to agree that compound statements could be interpreted to yield several individual causes or contributory factors. It was left up to the reasoned judgement of each analyst on a case-by-case basis. The results of this process were then collated. There were some obvious differences in the terms used but there were also strong similarities. For instance, one analyst identified 'weather' as a contributory factor while another identified the 'environment' and so on. Where such disagreements occurred we used a process of discussion to agree on a common term to support comparisons between the classifications. Distinctions were preserved between different terms where no agreement could be reached between the analysts.

	Analyst C			**Analyst I**			**Analyst M**	
P – Probable, C - Contributory	**P**	**C**		**P**	**C**		**P**	**C**
Design	1	6		0	7		1	9
Human Error	8	4		10	0		8	4
Maintenance	2	1		3	0		1	0
Organisational	11	3		9	13		12	5
Regulatory	3	8		0	7		3	8
Weather	1	0		0	2		2	0
Equipment	0	1		1	0		0	1
Physical Structure	0	0		1	0		0	0
Industry	0	0		0	0		0	1
Unknown	0	0		0	1		0	0
Total	26	23		23	30		27	27

Figure 2: Causal Information in the NTSB Maritime Dataset

US NTSB Results

Figures 2 and 3 summarize the results of this classification process for both the probable causes and the contributory factors in the NTSB reports. The 16 incidents yielded a total of 26, 23 and 27 probable causes for the three analysts. This gave a mean of 25 with a standard deviation of 2. There were 23, 30 and 27 contributory causes with a mean of 27 and a standard deviation of 3.5.

Across all incidents, there was a mean of 1.6 causes per incident with a mean of 1.6 contributory factors per incident. The classification in Figure 2 represents the product of an initial amalgamation, using the method described in the previous section. In contrast, Figure 3 uses an additional phase of generalisation that eases comparisons between the aviation data introduced in Figure 1 and the results of the maritime analysis, introduced in Figure 2. This generalisation groups together individual causes, such as human error and maintenance. It also collates equipment failures and design issues. Finally, this diagram also groups together regulatory issues, company specific factors and organisational issues. As can be seen, there are strong similarities both between the different analysts and between the NTSB maritime and aviation data sets. For example, the combine causal and contributory factors in the NTSB aviation study yielded 48% related to organisational factors, 37% to individual issues, 12% related to equipment and 3% to other factors.

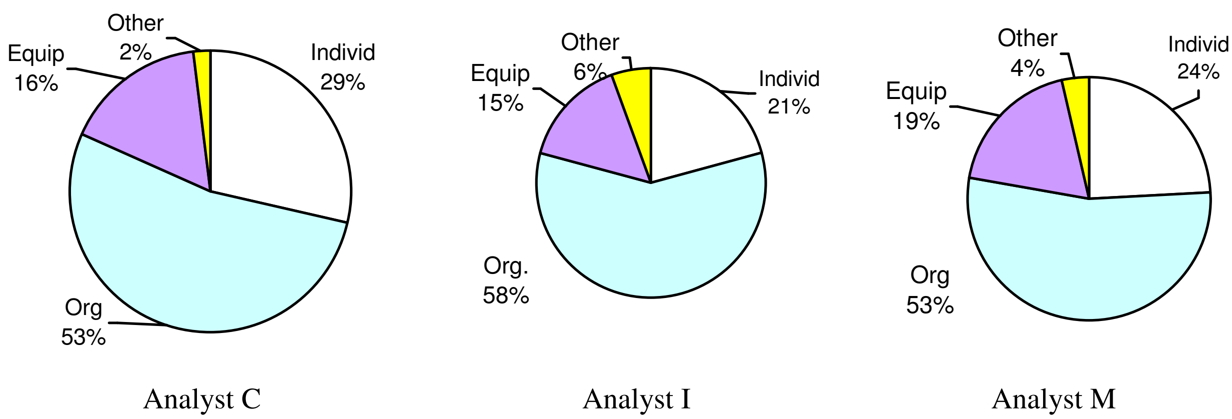

Figure 3: Categorisation of Causes and Contributory Factors in the NTSB Maritime Dataset

This slight disagreement over the total number of contributory causes between the investigators might appear to be confusing given that the NTSB explicitly labels probable and contributory causes. As mentioned, however, some probable causes described several different problems. For example, the report into a collision between a US Coast Guard vessel and a small passenger boat contains the following argument;

> "The National Transportation Safety Board determines that the probable cause of the collision between the Coast Guard patrol boat CG242513 and the small passenger vessel Bayside Blaster was the failure of the coxswain of the Coast Guard patrol boat to operate his vessel at a safe speed in a restricted-speed area frequented by small passenger vessels and in conditions of limited visibility due to darkness and background lighting. Contributing to the cause of the accident was the lack of adequate Coast Guard oversight of non-standard boat operations". (US NTSB MAR-02/05)

Analyst I identified a single cause of human error in this example. Analyst C classified the causes as human error and weather. Analyst M identified human error and the environment. The contributory causes were listed as 'organizational' by analyst C, as managerial oversight and environmental by Analyst I and regulatory by analyst M. As can be seen, this form of analysis depends upon a degree of subjective interpretation within the statements of probable cause and contributory factors. Hence Figures 2 and 3 indicate a surprising level of agreement between the analysts. Many NTSB reports yielded only a single probable cause. For instance, NTSB report MAR-02/03 contained the following summary:

> "The National Transportation Safety Board determines that the probable cause of the grounding of the Finest was the failure of the vessel master to use appropriate navigational procedures and equipment to determine the vessel's position while approaching the Shrewsbury River channel. Contributing to the cause of the grounding was the lack of readily visible fixed navigational aids. Also contributing to the cause of the grounding was the failure of New York Fast Ferry to require the use of installed navigation equipment and to set guidelines for operations in adverse environmental conditions". (US NTSB MAR-02/03)

All of the analysts identified the single probable cause as an instance of human error. In contrast, our analysis identified a small number of incidents that proved to be extremely complex at least in terms of the number of causes and contributory factors. For instance, the NTSB report into the ramming of the Eads Bridge by barges in the Admiral St. Louis Harbor in Missouri provided the following summary of probable and contributory causes:

> "The National Transportation Safety Board determines that the probable cause of the ramming of the Eads Bridge in St. Louis Harbor by barges in tow of the Anne Holly and the subsequent breakup of the tow was the poor decision-making of the captain of the Anne Holly in attempting to transit St. Louis Harbor with a large tow, in darkness, under high current and flood conditions, and the failure of the management of American Milling, L.P., to provide adequate policy and direction to ensure the safe operation of its towboats. The National Transportation Safety Board also determines that the probable cause of the near breakaway of the President Casino on the Admiral was the failure of the owner, the local and State authorities, and the U.S. Coast Guard to adequately protect the permanently moored vessel from waterborne and current-related risks" (US NTSB MAR-00/01)

Analyst C identified six probable causes; three regulatory failures, two organisational failures and one instance of human error. Analyst I identified two causes involving human error and management. Analyst M classified seven causes; one environmental problem; one organisational issue; three regulatory problems; one company issue and an instance of human error. For completeness neither analyst M or C identified any contributory factors. Analyst I identified three instances of managerial failure that contributed to this adverse event. Such findings illustrate considerable differences in interpretation and classification. Given the limited sample size and the small number of analysts it is difficult to draw firm conclusions about the analysis of particular incidents. However, the growing body of evidence from this and previous studies does illustrate that such incidents are the exception rather than the norm. This methodology can yield a surprising level of agreement in the identification of causal and contributory factors in official investigation reports.

Our analysis of these diagrams and of the earlier tables also undermines some of the previous accusations made by safety researchers. All analysts identified a large number of systemic causes and contributory factors throughout the sample of NTSB reports. Overall managerial or organisational failures accounted for approximately 55% of all probable causes and contributory factors. Individual forms of 'error' only represented 26% of this total. Equipment failures came to 17% and 4% fell into the 'other' classification. Even after the results from our previous aviation study, these findings came as a considerable surprise. In particular, we had anticipated a higher proportion of equipment related problems in the maritime industry. However, the NTSB reports seem to reveal the commitment that this agency has to look beyond immediate causes to look at the organisational and regulatory issues contributing to incidents and accidents.

Canadian TSB Results

We were anxious to determine whether the US NTSB were atypical in the prominence of regulatory and managerial factors in their causal analysis of major maritime and aviation accidents. The results of our previous study had already identified some differences in the aviation data between Canada and the USA. As mentioned, many of these differences stem from the traffic patterns in each country and also to some differences in reporting procedures (Johnson, 2003). We were, therefore, anxious to determine whether these patterns could also be seen in the maritime reporting system. Our work proceeded in a similar manner to that of the NTSB sample. The first stage was to make our initial selection of incidents from the many thousands of adverse events that are reported to the TSB each year. Again we focused our efforts on the higher profile occurrences that resulted in more sustained reports. These did, however, include near miss incidents as well as multiple fatalities. This yielded a far larger sample compared to either our aviation datasets or to the NTSB major maritime incident reports. In the previous studies, we had used a heuristic to cut down the TSB aviation corpus so that we only focussed on the most serious incidents and accidents. This left a total sample of 27 TSB aviation documents compared to 26 reports from the NTSB. In contrast, our more ambitious maritime study yielded 16 accident reports from the NTSB and 149 from the TSB. The problems of obtaining comparable samples might seem like a relatively trivial methodological issue for this research project. It is important, however, not to lose the wider perspective. These problems indicate some of the difficulties that can arise when attempting to exchange information about similar types of adverse events between different investigatory agencies.

The TSB documents included sections on "Findings As to Causes and Contributing Factors", "Findings as to Risk", and "Other Findings”. We focussed on the sections detailing causes and contributory factors. This task was complicated because some reports used a slightly different format with two sections entitled "Causes" and "Findings”. As might be expected, we focussed on the section describing the causes of the adverse event. As before, our work progressed by independently categorising the probable causes and contributory factors. There was no expectation that each analyst would use the same categories that had emerged from the analysis of the NTSB maritime reports. This posed several problems that had not arisen during the previous studies. In particular, many hours of analysis were required to work through all of the 149 reports. It was difficult for analysts to ensure that they applied the same classification criteria at the end of the period as they had used at the start of their analysis. As we shall see, the very diversity of the incidents included in this larger sample also forced the analysts to develop a far wider range of categories for the TSB sample.

Further problems stemmed from the way in which the TSB group together probable causes and contributory factors within their reports. For instance, the section of a report into the ‘Capsizing and Loss of Life on a Small Fishing Vessel *Cap Rouge II* off the Entrance to Fraser River, British Columbia’ contains the following list:

> **“3.1 Findings as to Causes and Contributing Factors**
>
> 1. Inherent transverse stability was progressively reduced by structural additions and the installation of more and heavier fishing gear, including the adoption of a "West Coast" seine net of 7.4 tonnes, all of which were located at or above the main deck level.
> 2. The installation of additional gear and its effects on stability were not monitored or assessed by a suitably qualified person, nor brought to the attention of Transport Canada (TC) inspectors, between or during routine quadrennial inspections.

3. The watertight integrity of the main deck was compromised by the ineffective gaskets of five flush-fitting manhole covers, which resulted in extensive downflooding, a marked increase in after trim, and reduced transverse stability.
4. Because of their limited knowledge of basic principles of trim and stability, the additional weight of the seine net, the inherent heel to starboard, the routine presence of water on deck, and the towing resistance of the seine skiff were not considered by those on board the *Cap Rouge II* to present any undue risk to vessel operation.
5. The vessel lost transverse stability due principally to the cumulative free surface effects of water shipped and retained on the main deck and other liquids in four partially full fish holds, four fuel tanks, a freshwater tank, and the lazarette.
6. The rapidity of the capsizing precluded orderly abandonment of the vessel".

(TSB report M02W0147)

As can be seen, the TSB provide no explicit indication between causes and contributory factors in this list. Each analyst, therefore, had to arrive at this classification independently. In consequence, analyst C identified two causal factors of design and regulation. Analyst M also identified two; design and equipment failure. Analyst I identified a single cause of design failure. Analyst C found four contributory factors. These included maintenance, human error, design and 'other'. Analyst M identified three. They were human error; environmental factors and regulatory issues. Analyst I identified four contributory factors including two management issues, a failure in maintenance and an instance of human error.

	Analyst C			**Analyst M**			**Analyst I**	
P – Probable, C - Contributory	**P**	**C**		**P**	**C**		**P**	**C**
Clothing	0	0		1	2		0	0
Company/Organisation	12	49		12	56		14	58
Design	31	46		22	41		5	40
Emergency responders	0	0		0	3		1	18
Environment/Weather	30	19		32	27		26	17
Equipment failure	31	12		30	8		20	8
Health	0	0		0	1		0	0
Human Error	101	140		114	138		60	118
Maintenance	15	21		10	17		7	12
Operations	31	20		8	8		24	37
Physics	0	0		14	10		3	1
Regulator	2	9		2	10		1	11
Unknown	3	2		2	2		6	0
Others	0	4		0	0		23	30
Total	256	322		247	323		190	350

Figure 4: Causal Information in the TSB Maritime Dataset

This reliance on individual judgement led to some disagreement over causes and contributory factors. The 149 reports incidents yielded a total of 256 probable causes for analyst C, 247 for analyst M and 190 for analyst I. Analyst C identified 322 contributory factors, analyst M identified 323 and analyst I identified 350. Figure 4 provides a more detailed distribution of these causes and contributory factors within the various categories that were induced during our analysis. The variance between the investigators could have been reduced if a more formal method for distinguishing causes from contributory factors had been used. For instance, the PRISMA analysis technique provides a flow chart that investigators can work through to identify the role that various factors can play in an incident or accident (Johnson, 2003). At the start of the study, we decided not to use this approach because the development of appropriate root cause analysis techniques remains an active area for research. We are currently exploring the impact that more formal techniques might have on the results of our analysis.

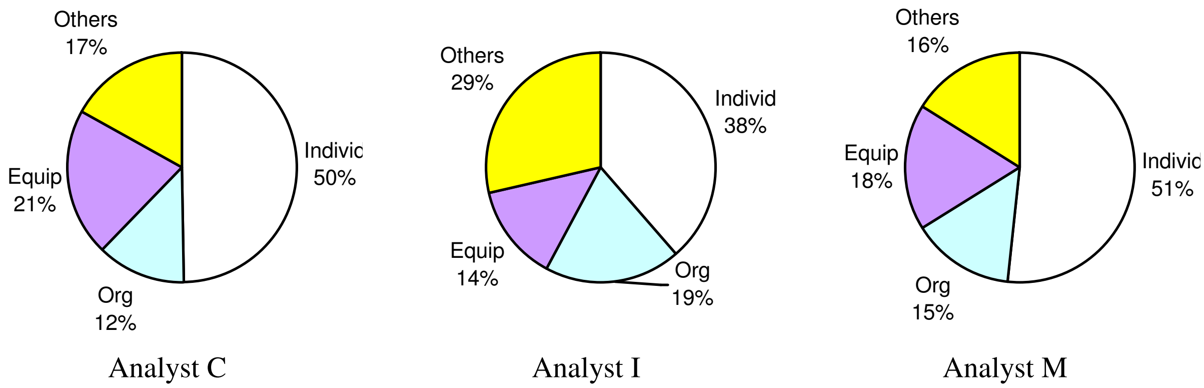

Figure 5: Categorisation of Causes and Contributory Factors in the TSB Maritime Dataset

Figure 5 presents an overview of the more detailed classification illustrated in Figure 4. By combining causes and contributory factors we can abstract away from some of the individual classification differences that were mentioned in the previous paragraphs. As can be seen, the TSB maritime reports show a pattern that is very similar to the results from our previous aviation study, illustrated in Figure 1. Our earlier work identified approximately 50% of all causes and contributory factors could be related to individual 'error' within our sample of aviation reports. 20% stemmed from equipment related issues, 22% to organisations and 8% to other factors. Here we can see a remarkably similar pattern in the maritime incidents, especially between analysts C and M. There are, however, some differences between analyst I's classifications and those from the previous TSB study. These can be explained in terms of individual differences in the analysis employed by each individual. Analysts C and M simply assigned each cause and contributory factor at face value. Analyst I's results show a tendency to perform an initial re-interpretation of the TSB findings. Hence, analyst C and M were more likely to identify an instance of human error while their colleague would look slightly deeper to find organisational causes or other factors, including team based interaction.

The initial analysis indicates that individual error plays a more prominent role in the TSB dataset than in the NSTB and that this pattern reflects the results from our previous aviation study. This can also be explained in similar terms. For example, the Canadian reports contain many incidents involving small charter vessels and owner-operators. In such cases, there is less opportunity for larger management structures and external organisations to create the preconditions for failure. Many of these incidents occur in remote locations well away from the more busy, regulated passages. Finally, it might also be argued that the prominence of individual error is an artefact of the different analytical techniques being employed by each agency (Johnson, 2003).

It is important, however, not to exaggerate the prominence of human error in our study. The 38-50% of causal and contributory factors identified for individual failure in Figure 5 is amongst the lowest estimates made in the wider human factors literature. It should also be remembered that this range is still significantly higher than our results for the NTSB dataset. Within the Canadian incidents, managerial and regulatory failures play a greater role in the contributory factors than they do in probable causes. Across all three analysts, organisational factors were identified in approximately 6% of all causes. In contrast, these factors were identified in 21% of all contributory factors in the TSB reports.

Conclusions

We have described the results of an independent analysis of the primary and contributory causes of maritime accidents in both the United States and Canada between 1996 and 2003. The purpose of the study was to assess the comparative frequency of a range of causal factors in the reporting of adverse events. Our results suggest that many of these high consequence accidents were attributed to human error. However, the overall proportion of causal and contributory factors were very much smaller than has been suggested elsewhere in the human factors literature. A large number of reports also mentioned wider systemic issues, including the managerial and regulatory context of maritime operations. These issues are more likely to appear as contributory rather than primary causes in reports issued by the Canadian TSB and the US NTSB. Based on these results we believe that is inaccurate to assert, as some have, that most investigations stop as soon as they find someone to blame, or that organizational causes are usually ignored.

A key finding from our research is that investigatory organizations show a similar distribution of causes and contributory factors between individual, organizational and equipment failures across different modes of transportation. Hence, there are strong similarities between the prominence of organizational factors in the NTSB reports in aviation and the maritime industries. Similarly, close comparisons can be made between the classifications for the TSB aviation and maritime reports. There are, however, considerable differences between the NTSB and TSB distributions in both modes. We conclude that these results are due to differences in the operational profile in each country. For instance, the TSB reports document a larger number of incidents involving private pilots and owner-operator vessels in remote areas than their NTSB counterparts. These differences may also be due to different analytical techniques, such as the TSB ISIM approach (Johnson, 2003).

Human error is often identified as a leading cause of incidents and accidents in safety-critical systems. In consequence, several regulatory and investigatory agencies have argued for the introduction of automation as a means reducing the opportunity for operator intervention. By restricting the scope for human ‘error’, it should be possible to reduce the overall accident rate (Johnson, 2003). This paper has attempted to challenge these assertions about the claimed prominence of human error in incidents and accidents.

Acknowledgement

Michael Holloway’s participation was funded by a NASA Langley Research Center Floyd Thompson Fellowship. Ildeberto Muniz de Almeida’s research was supported by the Fundacao de Amparo a Pesquisa do Estado de Sao Paulo (FAPESP), Brazil, process number 0302475-4.

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Appendix: Data Sources Used in the Study

An important aim of our study was to enable others to replicate our work. The NTSB and TSB documents in our data set included all major maritime reports between 1996-2003.

For the NTSB they were: MAR-04/01, MAR-02/05, MAR-02/03, MAR-02/04, MAR-02/02, MAR-02/01, MAR-01/02, MAR-01/01, MAR-00/01, MAR-99/01, MAR-98/03, MAR-98/02, MAR-98/01, MAR-97/02, MAR-97/01, MAR-96/01.

The TSB reports in our data set were:

M96C0022, M96C0032, M96C0032, M96C0056, M96C0062, M96C008, M96C0090, M96C0093, M96F001, M96F0023, M96F0025, M96H0016, M96L0006, M96L0017, M96L0037, M96L0043, M96L0052, M96L0059, M96L0069, M96L0083, M96L0111, M96L0112, M96L0116, M96L0131, M96L0142, M96L0146, M96L0148, M96L0156, M96M0002, M96M0038, M96M0090, M96M0128, M96M0132, M96M0144, M96M0150, M96M0176, M96M0178, M96N0047, M96N0061, M96N0063, M96W0025, M96W0061, M96W0100, M96W0109, M96W0175, M96W0183, M96W0187, M96W0243, M96W0250, M97C0013, M97C0055, M97C0057, M97F0002, M97F0027, M97L0019, M97L0021, M97L0030, M97L0035, M97L0050, M97L0076, M97M0005, M97M003, M97M0094, M97M0141, M97N0067, M97N0071, M97N0073, M97N0099, M97N0129, M97W0022, M97W0044, M97W0048, M97W0152, M97W0194, M97W0197, M97W0236, M98C0004, M98C0015, M98C0026, M98C0040, M98C0046, M98C0066, M98F0009, M98F0023, M98F0039, M98L0097, M98L0120, M98L0139, M98L0149, M98L0165, M98M0003, M98M0061, M98M0078, M98N0001, M98N0064, M98W0019, M98W0045, M98W0245, M99C0003, M99C0005, M99C0008, M99C0016, M99C0019, M99C0027, M99C0048, M99F0023, M99F0038, M99F0042, M99L0011, M99L0098, M99L0099, M99L0126, M99M0062, M99M0142, M99M0161, M99W0033, M99W0058, M99W0078, M99W0087, M99W0095, M99W0116, M99W0133, M99W0137, M99W0145, M00C0026, M00C0033, M00C0053, M00C0069, M00H0008, M00L0034, M00L0114, M00N0098, M00W0005, M00W0044, M00W0059, M00W0230, M00W0265, M00W0303, M01C0033, M01C0054, M01L0080, M01L0112, M01M0100, M01N0020, M01W0006, M02C0030, M02W0147.