Critical Incident Reporting Systems: Perceived Competing Social Consequences Considered by Reporters

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Abstract

The safe operation of complex socio-technical systems is dependent upon the reporting of safety critical incidents by operators within a system. Through the action of reporting, systems develop the capability as a learning organisation to improve human and organisational performance. The aim of the study is therefore to develop a richer understanding of reporter behaviour that is influenced by the safety management system and the social context within an Air Navigation Service Provider in Africa. A case study methodology was applied with complementing inductive coding and thematic content analysis to explore underlying explanations for underreporting behavior. The findings of the study illustrated the prominence of self-preservation beyond system demands as well as the premium that operators place on context when determining which incidents should be reported. An additional five competing consequences added to the complex dilemma of judging reportable incidents. The key implication of the study is that high risk organisations should acknowledge the existence of the social construction of reporting, while associated adjustments to the reporting system may have benefits to the safety performance of an organisation through increased reporting and greater insight into system deficiencies.

Keywords: Reporting, underreporting, air navigation service provider, social construction, safety management system.

1   Introduction

'To not be allowed to err is not to be allowed to learn' (Rochlin, 1999, p.1552).

The above statement may be true for all humans, though society expects people in certain industries to perform at an elevated standard that constitutes an error free environment (Bosk, 2000). These industries are typically aviation, petro-chemical, nuclear engineering and health care. The industries where critical incidents resulting from human error are avoided at all costs operate as complex socio-technical systems in high risk environments (or as so-called high reliability organisations) based on the realisation that a minor human error can have catastrophic consequences (Rochlin, 1999). This applies to the Air Navigation Service Provider (ANSP) that participated in this study. Staender (2011) refers to the learning from critical incidents as experience that leads to expertise and states that incident reporting offers this experience in the

form of a window to system weaknesses that become visible. Therefore the reporting of critical incidents is an essential part of this learning process and the underreporting of incidents is likely to have a negative effect on both the occurrence of incidents and learning.

Critical incidents are events or non-standard situations, with '...origin[s] in the processes, the technique, the environment and the human/team or in any combination of all these factors' (Staender, 2011, p. 209). Research indicates that the mitigation of risk inherent to complex systems in high risk industries remains dependent on the information flowing within such a system (Griffin, Young and Stanton, 2010) and this is dependent on the reporting of critical incidents. Unfortunately, literature also shows significant underreporting of critical incidents in several industries. In a study on the underreporting of maritime accidents, approximately 50% of accidents were underreported across Canada, Denmark, Norway, Sweden, The Netherlands, The United Kingdom and The United States (Hassel, Asbjornslett and Hole, 2011). In 1996 a study in the health care sector found that 39% of hospital service workers had not reported one or more occupational injuries. This high percentage of non-reporting occurred despite the fact that 64% of such unreported injuries required medical treatment and 44% resulted in lost work time (Weddle, 1996). A study by Zellman (1991) found that 40% of health care personnel in the USA admitted to underreporting perceived child abuse. Hauer and Hakkert (1988) found that up to 20% of severe injuries, 50% of minor injuries and 60% of no-injury vehicle crashes remained unreported in France.

1.1 Critical incident reporting

In the literature review on the reporting and underreporting of critical incidents, four main themes which influenced the likelihood of reporting were identified. These were the organisational systems and processes of reporting, barriers and enablers to reporting, ethics and organisational culture, and reporters' perceptions and experiences of reporting.

1.1.1 Organisational systems and processes of reporting

Benn, Koutantji, Wallace, Spurgeon, Rejman, Healey and Vincent (2009) reviewed 23 international healthcare reporting systems and highlighted criteria for effective reporting systems. These included:

- The inclusion of corrective actions to improve safety in corporate feedback from incident reporting;
- The dissemination and sharing of feedback across the organisation;
- The provision of different versions of feedback to various groups within an organisation or industry;
- Continuous dialogue between the risk management system and the staff where the incident has occurred;
- The safety-feedback loop should represent an ongoing and cyclical process of reporting, evaluation and corrective action.

There is a tendency for reported data to be over-simplified by reporting systems (Tourtier, Auroy, Grasser and Pats, 2010), and to include only individual perspectives

instead of incorporating wider social, managerial and organisational process perspectives. The process of reporting is also important, as professionals prefer to engage with their immediate multi-disciplinary peers when reporting and reviewing critical incidents (Gallizzi, Miesmaa, Punnett and Slatin, 2010; Neuspiel, Stubbs and Liggin, 2011).

1.1.2   Enablers and barriers to reporting

The way in which reporting systems are positioned in terms of their purpose can act as an enabler or barrier to reporting. Reporting systems may serve two conflicting functions: holding providers accountable for performance; or providing information that leads to improved safety (Institute of Medicine, 1999). In addition, researchers have identified other factors that influence the likelihood of reporting safety incidents in health care (Cullen, Sweitzer and Bates, 1997; Evans, Berry, Smith, Esterman, Selim, O'Shaughnessy and De Wit, 2006). These were:

- Risk of liability;
- The burden of reporting;
- Clarity regarding what is considered reportable;
- Incidents that gradually developed over time;
- Incidents that were considered to be known complications of hospitalisation;
- Incidents that cannot be assigned to a single causal factor.

Professional cultures play a significant role in the likelihood of reporting safety incidents, for example Staender (2011) found that doctors with highly unrealistic attitudes about their own vulnerability to error results in a barrier to reporting. Furthermore, a study on situational factors affecting reporting found that the severity of an incident, the emotional closeness of the operator to the witness, the presence or absence of other witnesses and cost-benefit calculations all affect the reporting of incidents where colleagues were involved, better known as peer reporting (Curphy and Gibson, 1998). Peer reporting and the cost-benefit analysis are also informed by ethics, morals and culture.

1.1.3   Ethics, morals and culture

Relatively few studies on reporting were found that focused on the ethics and morals of reporting, in safety related industries. However, some studies have found that self-interest influences a person's ethical beliefs about reporting (Babcock, Loewenstein, Issacharoff, and Camerer, 1995; Blanthorne and Kaplan, 2008). On the other hand, a small power distance is invaluable for creating actual reporting behaviours in Japanese hospitals (Itoh, Abe and Anderson, 2002). However, Olson (2000) cautioned against powerful professional cultures that overrode national or local cultures of reporting. In the same light, an operational 'can do' culture impaired the reporting of incidents (Nicholson and Tait, 2002).

1.1.4   Reporter perceptions and experiences of reporting

The decision whether to report a safety incident is related to perceptions of the consequences of reporting the event. Wagner, Harkness and Gallagher (2012) highlighted how staff perceptions in Canadian nursing homes influenced reporting behaviour:

- Feedback mechanisms were deemed inadequate by 49% of staff;
- Personal confidence in competence was damaged by disclosing errors to residents/families;
- Only 38% of respondents believed that nursing homes adequately supported nurses in coping with the stress associated with nursing errors.

Vincent, Stanhope and Crowley-Murphy (1999) and Firth-Cozens, Redfern and Moss (2004) found that the top perceptions and experiences for underreporting were (this excludes factors already noted from other research mentioned in this article):

- The perceived safe outcome made it unnecessary to report
- The blaming of junior staff
- Risk of the media reporting on the incident
- Fear of being perceived as incompetent
- Perceived negative consequences for future employment opportunities or career progression

In the aviation industry, one of the reasons for underreporting was that operators did not consciously detect report worthy errors (Sarter and Alexander, 2000). Given the numerous perceptions that influence the likelihood of reporting incidents, it is important to understand how operators perceive reporting, how reporting is socially constructed by them, and how this inhibits or enhances the reporting of critical incidents.

Gergen (2009, p. 2) describes social constructionism as a complex reality: '... what we take to be the world importantly depends on how we approach it, and how we approach it depends on the social relationships of which we are part.' This emphasises the links between social relationships, perceptions and reporting behaviour. This study attempts to understand the reporting of critical incidents from the perspective of multiple socially constructed realities. The social realities of reporting are viewed as existing in an interdependent fashion that can only be understood in relation to other aspects of reporting (Hosking and Bouwen, 2000; Karatas-Ozkan and Murphy, 2010).

The aim of the study was to identify and understand reporter perceptions of the influences of a critical incident reporting system on reporting behaviour by analysing the role that organisational behaviour plays in the reporting of critical incidents in an Air Navigation Service Provider. To this end, a richer understanding of the social construction of reporting explains and facilitates an understanding of the interconnection between the social construct of reporting and the reporting system design together with the organisational complexities as multi-directional influencers.

Furthermore, although the vast majority of reporting research is found in the medical domain, the medical research literature continuously refers to the exemplary operational practices of the aviation industry in critical incident reporting, although very little evidence of such empirical research is available (Nicholson and Tait, 2002; Wu, Pronovost and Morlock, 2002).

2   Method

As the research seeks to explain the working of the social phenomenon of reporting in detail an interpretive case study methodology was considered most appropriate (Perry, Riege and Brown 1999; Yin, 2008).

The explorative study focussed on an ANSP in Africa where the target population consisted of operational Air Traffic Controllers (ATCs). Firstly, a random sample of four Air Traffic Service Units (ATSUs) was approached for four to seven volunteers to participate in focus groups. Secondly, the same set of questions developed for the focus groups were then applied on four interviews on Air Traffic Controllers from another two ATSUs that did not participate in the focus groups. These interviewees were purposively sampled based upon their experience of a critical incident report that was subjected to a full investigation. Questions elicited observations complemented by storytelling and actual examples of experiences on the actions and inactions of managers, peers and the organisation that influence reporting decision-making (Marshall, 1996; Patton, 2002). Data was analysed separately with specific attention afforded to differences in the social construction of reporting that may arise from reporters that have been exposed to investigations versus those in focus groups merely reporting and not followed by a subsequent investigation.

Inductive thematic analysis was performed according to Hycner's (1985) thirteen step approach to gain an overall understanding of the organisation's approach to the reporting of critical incidents, its effects within the organisation, and its perceived degree of success against the backdrop of social structures, positions and roles, social interactions and reproduced social structure (Perry, 2001; Edvardson, Tronvoll, and Gruber, 2011). This was achieved through an ongoing classification process of coding and thematic identification and analysis from commencement of the data collection phase up until the data analysis phase. This enabled the reduction of phenomena into defined themes that in turn informed further analysis and interpretation (Harwood and Garry, 2003; Hsieh and Shannon, 2005).

3   Results

The thematic content analysis showed no major differences in the responses from frontline operator focus groups versus the interviews with operators who had been involved in reports that were subjected to complete safety investigations. Therefore data from the two sources was combined and analysed as a single sample.

Five themes emerged from the data and these indicated that participants experienced competing social demands that they are required to juggle within the safety management system (figure 1). They encapsulate the types of factors that operators consider when deciding whether to report a critical incident or not. The decision to report a critical incident requires judgment on the part of the operator and usually involves specific situations that are not covered by established rules, requiring the operator to interpret data and make a decision. One respondent described this process as follows: 'It's a procedural reduction but I mean it's not like … a safety event [critical incident], it's not, it doesn't really affect safety.' Another respondent explained judgment to be dependent on the set of rules being applied: 'What I mean is, the reason why I didn't report it, was

because for me, in my instance I didn't think it was an incident because I had both aircraft in sight.' In other instances it appeared that similar incidents had different outcomes, as one respondent said, 'Some of these incidents you look and you think, man this guy was unlucky.

Furthermore, respondents showed signs of despair through the shrugging of shoulders, frowns or a deep sigh, resulting from the competing demands that are perceived as forcing an operator not just to judge the context but also to evaluate the potential consequences of reporting the critical event (figure 1).
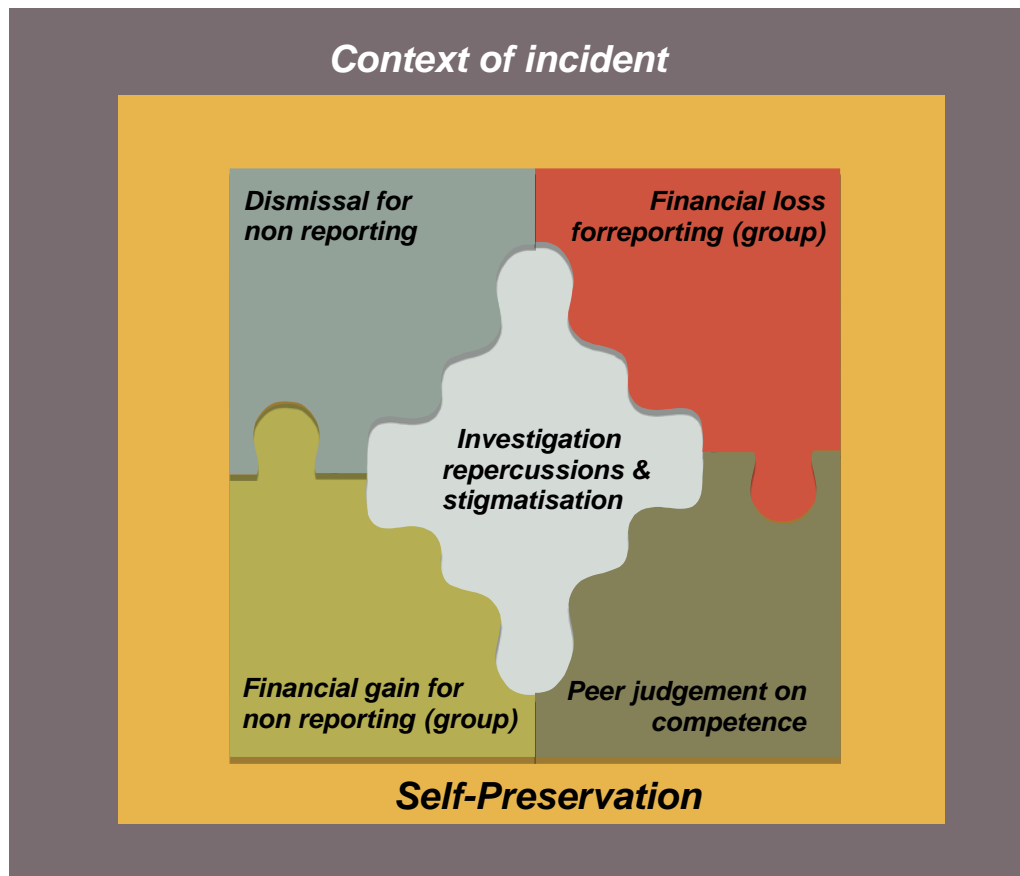
Figure 1. Perceived competing social consequences of reporting critical incidents.

The first perceived consequence was the fear of being dismissed from the organisation or other sanctions, particularly if the incident was not reported. This stemmed from an industry regulation that makes incident reporting compulsory and that was incorporated into the organisation's policies. The organisational focus on reporting was described as 'We know that if you do not submit um, um, an incident report, you can get fired for that as well. So, so that is the only kind of motivation that the organisation instills in us.'

The second perceived consequence was a financial loss suffered as a result of reporting an incident. This reality was often described as a limitation to the reporting system in the following ways:

- 'I think the biggest, biggest mistake [ANSP] did was [that] on one hand we said we have a confidential reporting system and we're encouraging reporting, on other hand said the safety ratio is linked to your bonuses.'
- 'What I'm frightened [of], my biggest concern with people having incidents yes is that if we have incidents, it will impact the bonuses, definitely yes.'
- 'Experiencing that as very, very um, what's the word um, unfair in, in the sense that if your pool didn't make the safety ratio or the whole company didn't make the safety ratio then immediately we're going to punish you on a financial you know level.'

Unlike the perceived consequence of financial loss for reporting an incident, there was also a perceived gain to underreporting that operators considered. This perceived consequence influenced reporting behaviour as 'Some people actually, you know, have an incident without anyone noticing and they wouldn't report it because now it would sort of increase the safety ratio.' These judgments were influenced by financial implications, for example: 'But I'm not going to say anything, I need that bonus, I've already spent that bonus. That's a reality.'

The fourth perceived consequence was that respondents would be judged as being incompetent. Such considerations were described as 'Some people will look at you, you know as not [such a] good controller because they've got their own, different, different views.' This fear extends beyond the reporting of the incident, as described by a participant who was exposed to an investigation into a critical incident that s/he had reported: 'You are just thinking what are your colleagues thinking about you, are you still competent, you start second guessing yourself, it's, it's the treatment afterwards that's the problem.' People who were involved in incidents were frequently referred to as 'culprit,' 'afraid' and 'punishment.'

The perceived reality of the repercussions of reporting a critical incident and subsequent stigmatisation were similar for operators who had not been exposed to an investigation following a critical incident and for participants who had incidents that were subsequently investigated. The following are examples of responses that indicate a preference for avoiding investigations through underreporting:

- 'Some people are afraid of, you know, going the whole investigation process, you know, and the repercussions of the investigation.'
- '… because now you feel like your boss is already standing against you and they haven't even started the investigation yet.'
- '… it looks like they're out to get you, you know.'
- '… but you must be narrowed down to be a culprit.'

The need for self-preservation emerged as the underlying theme of the competing consequences. When operators realised that an incident had occurred, their first thought was likely to be about self-preservation, as described by a participant: 'The first thing I think about is 'How is it going to affect me?'' In addition, critical incidents had a strong emotional impact on operators: 'A very stressful time, very stressful, it takes a toll on literally everything, family, personal. Emotionally you're up and down the place, it's ridiculous I mean.' Similarly, a focus group respondent described his/her reality as

'very, very few people are strong enough to report if they know they are going to be penalised, if they know they are going to get away with it.

4   Discussion

The aim of the study was to understand perceptions regarding the social and organisational influences on the decisions to report critical incidents in an African ANSP. This is important because negative perceptions of the potential consequences of reporting incidents could result in underreporting which in turn could deprive individuals and organisations of opportunities to learn from critical incidents (Griffin, Young and Stanton, 2010). The themes that emerged from the results related to perceptions of the potential consequences of reporting or not reporting critical incidents. The themes were the fear of financial or job loss due to not reporting, the possibility of financial gain by not reporting the incident, concerns regarding an investigation and its repercussions, and fear of judgment from peers.

The need for self-preservation seems to underlie the themes identified in this research. This is consistent with other studies that identified the risk of liability, the burden of reporting (Cullen *et al.*, 1997; Evans *et al.*, 2006), and self-interest (Babcock *et al.*, 1995; Blanthorne and Kaplan, 2008) as reasons for underreporting. The word choice of respondents, such as 'culprit,' 'afraid' and 'punishment' was consistent with Mahajan's (2010) findings that reports were inhibited by investigation experiences that only 'bad' professionals make mistakes. Moreover, this strengthens the notion of self-preservation from Babcock *et al.* (1995) because reporters consider not only the value and purpose of a report, but also weigh up the financial and experiential consequences in deciding to report.

The primary themes indicate negative perceptions of the consequences of reporting incidents. However, positive perceptions were identified as being localised to ATSUs where the line manager was promoting learning as a main theme to reporting. On a corporate level, the ease of submitting reports electronically were noted a great enhancer of reporting. This suggests that self-preservation might be the top priority of operators when an incident has occurred and that this is seen as being more important than opportunities for learning. In these situations, underreporting is likely to occur although underreporting was not directly evaluated in this study.

There is tension between the negative perceptions of reporting and the requirement in the ANSP that operators report incidents. One way in which this tension appears to be resolved is through deciding whether the nature of the incident is such that it should be reported. Clarity regarding what is considered to be reportable has been identified as a factor that is related to reporting (Cullen *et al.*, 1997; Evans *et al.*, 2006). This was also identified in the current study, where the decision to report a critical incident required judgment on the part of the operator and usually involved specific situations that were not covered by established rules, requiring the operator to interpret data and make a decision. In addition, operators tended to do a risk-benefit analysis for incidents which were not clearly reportable, and this is consistent with findings in other industries (e.g., Curphy and Gibson, 1998).

The professionals who participated in the research considered the context of an incident to play a significant role in judging whether an incidents was reportable. This is supported by Wagner *et al.* (2012). Tourtier *et al.* (2010) note that organisations should be cautious about oversimplifying reported incidents this can result in overlooking the context of incidents. Detailed reporting can play a significant role in identifying hidden risks and embedding associated learning. In this study, operators clearly battled with the conflicting functions of the reporting system. This was similar to the findings of the Institute of Medicine's 1999 report in that the ANSP's performance accountability (through its safety ratio) was suppressing the collection of information (reporting).

The tension between the requirement that incidents be reported and the need to increase reporting on the one hand, and the perceived negative consequences and the need for self-preservation on the other hand, represent a contradiction in the current reporting system. Although accountability is needed when incidents occur, there may be a need to change the organisational practices, some possibilities being to unlink financial gains/losses from incidents and re-introducing learning from reporting as a central theme where the focus is directed away from the individual and more towards system improvements (Dekker, 2007).

High risk organisations can enhance their safety system by means of adjustments to their incident reporting system through an exploration of the social construction of internal reporting practices. Typically, the identification of experiences of blaming and reprimand, as prevalent in the medical industries noted by Vincent *et al.* (1999) and Firth-Cozens *et al*. (2004) could inform adjustments aimed at improving the quality of reports and the subsequent evolution of the safety management system as more system deficiencies come to light.

The limitations of the study include the small sample size as well as the fact that the sample was restrained to a single organisation within the African aviation industry. Furthermore, the study was performed by an ex-air traffic controller and this introduces a particular frame of reference.

Further research is proposed in other parts of the aviation industry to identify alternative or additional factors that inform the social construction of reporting. In addition, it may be valuable to explore how cultural differences influence the social construction of reporting across different demographic groups in developed and developing countries.

5   Conclusion

In conclusion, the literature shows that underreporting exists in complex socio-technical industries and although an efficient reporting system is required to facilitate the collection of safety information, the automatic reporting of critical incidents cannot be expected from operators. The results highlight the importance of the need for self-preservation when an incident occurs and that this need is likely to take precedence over other safety system requirements, regardless of how important these requirements may be. Therefore high risk industries or so-called high reliability organisations need to develop an understanding of the social construction of reporting as an integral part of the design of the reporting system. This could assist with the aim of learning from critical incidents and improving the performance of systems that revolve around safety.

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