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Critical incident reporting systems: A necessary multilevel understanding

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ABSTRACT

The nature of critical incident reporting systems and the reality of underreporting of critical incidents in complex socio-technical environments may have skewed our view of causality when it comes to safety management. This study explores the social construction of reporting through case based thematic analysis across three organizational levels and four stakeholder groups in an African Air Navigation Service Provider. The study shows that the reporting system and the act of reporting are not the only drivers. Reporting emerges as a mere actor, while new dimensions of safety drivers emerge from the study: safety also comes from a value contribution focus, a decentralized safety management approach, the centrality of reporting in a safety management system and the dependency on engaged relationships. The study concludes with an illustration of how these dimensions interact and inter-relate, and the necessity of such cognizance in system design and reviews.

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1. Introduction

1.1. A need for critical incident reporting

Professor Liam Donaldson from the World Health Organisation once said that "*to err is human, to cover up is unforgivable, and to fail to learn is inexcusable*" (Patient Safety Technical Briefing to World Health Assembly, n.d.). Moreover, Müller-Leonhardt et al., 2014 add that within hospitals and air traffic operations, which operate as complex systems, the occurrence of critical incidents are unavoidable. The latter authors go on to illustrate that even minor incidents are an opportunity to provide valuable feedback for reviewing and improving the safe operation of a complex safety management system (SMS).

Yet Di Gravio et al., 2015 stated that Air Navigation Service Providers (ANSPs) use basic metrics such as frequency of traffic counts and number of incidents to express their safety performance. These authors argue that these generic indicators fail to represent the overall safety performance of the system as well as the underlying safety perspective of the operational fraternity. In certain cases the significance of such a safety parameter bias creates a simplicity perspective that easily transforms into a systemic weakness (Patil et al., 2012). The bottom line is that critical incident reporting remains a critical component to any SMS.

We chose the definition of Staender (2011) as an appropriate definition of a critical incident. A critical incident in this study is considered any and every occurrence that departs from normal routine and that originates from the process at large, the technique applied by the operator or the environment. Most critical incidents though appear to originate from a combination of these domains.[1]

1.2. Aim of the study

Rochlin (1999) explains the importance of continued and expanding research and enquiry into the reporting and performance of safety beyond just its statistical and measurable properties. The author goes on to explain that safety should be explored from the perspective or experience of safety as a corporate myth and ritual as well as that of agency and structure. The non-academic view of safety is, however, usually limited to a way of expressing the avoidance of consequential accidents. In addition, the main-stream safety research and operational safety focus has been aimed at the reporting procedure and the operating system

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[1] Staender's (2011: 209) extended definition of a critical incident is: "*Every occurrence or non-routine situation can have its origin in the processes, the technique, the environment and the human/team or in any combination of all these factors. A critical incident can either return to normal operations (if primary defences, such as Standard Operating Procedures, are in place and function sufficiently) or develop into a critical one when these primary defences fail. If there are no recoveries available or it is not working for a specific critical incident, an accident will occur. Should a recovery be functioning, the situation will end in a near-miss*".

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rather than on the individual-level behavior and cognition that produces safety.

The aim of the study therefore, is to explore and understand the social construction of reporting. In other words, the act of reporting and the subsequent responses to reporting is embedded in organizational practices, conventions and conceptual schemes of groups and individuals. These phenomena are bounded by time, context and environment where meaning is constructed through various facets of culture and human decision-making (Mallon, 2007). We see this gap in the literature as a call for a multi-level view of critical incident reporting, from a social construction theory point of view. We expect that obtaining narratives from safety stakeholders that differ significantly in role and authority will broaden our understanding of reporting behavior and the fluidity it introduces to safety systems. This study is particularly concerned with individual behavioral differences across organizational levels that may influence organizational reporting and subsequently safety management practices such as investigations.

Therefore this paper sets out to test the following two questions worthy of investigation. Is there a social context within which reporting occurs and which is influenced by a collective, intersubjective and connectionist dimension of operation? The authors set out to understand what this social context looks like from the perspective of the multitude of factors that influence the decision making process of safety stakeholders when they digest a potential critical incident prior, during and after the act of reporting. The second research question has to do with the assessment of a reporting system by adding the dimensions of social context, safety system history and local information, which are constructed at varying organizational levels.

The authors believe that the nature of the research questions lends itself to an interpretive case-based methodology with an associated thematic analysis to delve into the depths of the social construction of reporting and underreporting. As meaning is created in different spheres within an organization through the social construction of reporting related behavior (Gergen, 2009), the application of a case study approach with a thematic analysis enables a deep dive into the detail under the surface that informs the social construction of reporting.

1.3. Potential contributions of the study

The study contributes to system safety on a practical and theoretical level. The first contribution being by a depiction of how social behavior influences and is influenced by a safety system and other organizational and industry activities. In other words, having a good safety philosophy and reporting procedure is not enough in a complex safety critical industry. Therefore, improving safety requires ANSPs to also understand how these policies and procedures impact operator and line manager behavior versus how senior management behavior influence the application of procedures.

On a theoretical level the study show cases the interesting multi-dimensional reality to system safety that emanates from the social context across organizational levels. These contexts illustrate a broader spectrum of safety behavior that would otherwise be restricted to the study of the physical system, the report and the act of reporting. The literature illustrating these realities and the aforementioned organizational and social gaps are discussed next.

1.4. A literature review of the antecedents to critical incident reporting

We begin by providing a reflection on the focus areas of research specifically pertaining to a broad spectrum of critical incident reporting related literature that was completed between 1990 and 2016.

Five categories of research focus is found within the literature. These are: (i) a systems approach to reporting; (ii) statistical underreporting models; (iii) enablers of and barriers to reporting; (iv) the influence of ethics, morals and culture on reporting; and finally, (v) a focus on reporter perceptions and experiences. We found that research to date on the reporting of critical incidents has mainly been found to originate from the medical domain, with some focus on shipping, road accident and aviation reporting systems.

On the first category of a system approach to reporting, Benn et al. (2009) discovered that learning did not automatically occur as a result of the safety or error reports that are submitted to reporting systems, disseminated and distributed again. In the UK health services, this lack of learning was attributed to the absence of a clear procedure for monitoring the lessons that are learned or acted on at local levels. Furthermore, the realization of participation bias was evident in a Scottish intensive-care unit study where 90% of all reports were submitted by nurses and then the analysis was simplified to an assumption that senior staff were reluctant to participate in reporting schemes (Johnson, 2003). In the same light, Tourtier et al. (2012) argue that many studies drew conclusions that were too simplistic. For example, from 398 adverse drug events at nine medical and surgical units over an eight-month period, only 23 were voluntarily reported. The simple conclusion was that the disparity stemmed from a reluctance to make voluntary reports because the social context within which these reports were withheld was not understood.

Secondly, the category of models and predictability in the literature is mainly dictated by studies focussing on underreporting and more so the ability of systems and organizations to predict future incidents from a financial budgeting point of view. Yamamoto et al., 2008 are critical about the application of models to determine accident causation and injury severity when such models are not capable of adjusting for underreporting. They found that underreporting is especially prominent for lower injury severities and, as a result, road traffic-accident data can be regarded as outcome-based samples that are over-represented in higher-severity accidents that render the system or industry wide view skewed or biased. This is of course a point in case for the need to understand the social context within which reporting exists.

The third category of enablers and barriers to reporting contain elements of social construction in the findings. For example, Wu et al., 2002 had focus-group participants raising the following contributory factors to underreporting as: (i) risk of liability, (ii) lack of feedback and (iii) the burden of reporting. Furthermore, according to these authors, data from critical incident reporting appears to underestimate the realistic level of operator errors because of: (i) fears from reporters of unintended consequences; (ii) competing safety versus efficiency demands; and (iii) the belief and/or judgement that a particular case does not qualify as a reportable incident. In short, contextual factors have a prominent role to play in reporting behavior as well as the absence of reporting. Context plays a notable role in the social construction of reporting and therefore in decision-making around reporting behavior.

Fourth, no understanding of reporting is complete without the inclusion of the elements of culture and ethics in understanding behavior. According to Olson (2000), professional ethics play a vital role in promoting reporting behavior as it forms the basis from which reporting and underreporting practices evolve. Unfortunately, the opposite is also relevant; research has demonstrated that personal gain and seniority changes views of ethical considerations (Blanthorne and Kaplan, 2008). It will be noteworthy to know how seniority and personal gain influences such considerations from a social construction point of view.

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