

Safety Risk Attitudes in Commercial Aviation

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ABSTRACT

The commercial aviation industry is a human-built and human-led system, and so hazards are identified, assessed and managed by people. Perceptual dissonance induces inherent subjectivity, and this has the potential to reduce the efficacy of safety risk management. Whilst perception is a key driver of risk attitudes, evidence to show the impact of their proactive management is limited. This case study aims to demonstrate the rationale for further research.

KEYWORDS

Risk Attitude, Perception, Safety Risk, Safety Management Systems, Aviation.

Introduction to the Problem

Although the aviation industry is one of the safest sociotechnical systems ever developed, “the entire risk management process is undertaken by people” (Hillson & Murray-Webster, 2007, p. 17). Unfortunately, variations in human perception may mean that the hazards identified by one individual could appear benign to others (Reason, 2008), and different attitudes to uncertainty have been shown to induce significant subjectivity in the management of safety risk (Slovic, 1987). Whilst the impact of this perceptual dissonance is well understood, “very little has been written about what this means in practice, or about how to manage proactively the influence of human behaviour on the risk process” (Hillson & Murray-Webster, 2007, p. 13).

Whilst the identification of hazards is a vital prerequisite for the management of safety risk (ICAO, 2009), the processes which underlie complex systems are intrinsically uncertain, and it is difficult to manage risk through statistical analysis alone (Slovic, 1987). For this reason, Dekker (2014) states that it is vital to understand the mechanisms through which hazards are perceived, and Weber, Blais, and Betz (2002, p. 263) argue that “there is a great need for a scale that assesses individual attitudes towards risk”.

Investigation & Analysis

Risk attitude may be defined as a chosen response to uncertainty which is driven by perception (Hillson & Murray-Webster, 2007). Whilst the organisational model of accident causation proposes that safety should be managed from a systemic perspective, high-level systemic conditions originate from risk management decisions which are first made at an individual level (ICAO, 2009). This means that systematic risk analysis and control strategies remain vulnerable to inappropriate perceptions and risk attitudes at both an individual and group level (Hillson & Murray-Webster, 2008). As a result, the proactive management of individual and group risk attitudes is capable of providing an organisation with a versatile and encompassing defence against both latent organisational conditions, and active failures at an individual level.

All hazard identification and risk management techniques are ultimately driven by perception and judgement, and research by Gowda (1999) has shown that risk decisions are not always based on the foundations of rational choice. The inaccurate assessment of safety risk is a symptom of inappropriate risk attitudes, and Slovic (1987) argues that their proactive management could reinforce the integrity of existing risk reduction and control strategies. As a result, this review aims to demonstrate the rationale for further research, and support the future development of models, tools and techniques to proactively manage perception and risk attitudes in the control and classification of safety risk.

Impact & Implications

Whilst Cohen (2015) argues that current risk management models are not dynamically consistent, the proactive management of risk attitudes could reduce uncertainty within the hazard identification process, and improve the efficacy of safety management systems (Goglia & Stolzer, 2016). This has the potential to reduce subjectivity within existing safety risk management methodologies, and reinforce the effectiveness of tools such as Bowties, Hazard Operability Studies, and Failure Modes & Effects Analysis (Maragakis et al., 2009).

Hillson and Murray-Webster (2007) support the proactive management of risk attitudes, however Reason (2008) argues that such strategies are rarely implemented. This is despite the potential for such resources to be used by regulatory bodies to reduce subjectivity in the management of safety (Molesworth & Chang, 2009). As a result, the authors' plan to review existing literature, and undertake further primary research to examine how the proactive management of risk attitudes could reinforce the management of safety risk across a broad spectrum of commercial aviation operations.

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