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A qualitative study on the exploration of challenges to the implementation of the Safety Management System in aircraft maintenance organizations in Turkey[☆]

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ABSTRACT

Safety management has recently started using a paradigm that 'sees the world as it is' rather than 'prescribing how it should be'. The Safety Management System (SMS), a product of this paradigm shift, has fairly new and different characteristics. These changes are expected to pose a number of challenges to the successful implementation of the SMS. This qualitative research study sets out to explore challenges to the implementation of the SMS in aircraft maintenance organizations in Turkey, with reference to the perceptions of Quality Management Systems (QMSs) and SMS experts working at these maintenance organizations.

Qualitative data was collected from thirty participants through an open-ended questionnaire. Both inductive and deductive methods were used for the data analysis. The results suggest that the SMS entails a cultural transformation and is likely to bring about certain challenges because of its new and different characteristics. It is concluded that significant challenges may derive from a poor positive safety culture. Top management support and the practices of the civil aviation authority also have the potential to pose challenges. Other challenges are expected to result from SMS training and the need for the integration of stakeholder SMSs.

The research results are expected to improve the success of the SMS and hence safety in aircraft maintenance. The results may also encourage the regulatory authorities to take measures to improve the success of the SMS in the launch of State Safety Programs (SSPs).

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1. Introduction

Safety Management Systems (SMSs) are expected to greatly improve aviation safety. In fact, the International Civil Aviation Organization (ICAO) requires countries to implement a State Safety Program (SSP) and airlines to implement an SMS (ICAO, 2013b). The fulfillment of these expectations is contingent upon the fact that the SMS does not remain an idea on paper. The implementation of the SMS is likely to entail a tough transformation process.

The traditional safety management paradigm prescribes 'how the world should be', provides a detailed description of the ideal world and argues that service providers should comply with the

prescribed world order. Safety is believed to improve when regulations that guarantee an ideal world order are implemented. Traditional safety management approaches ground their practices through audit in order to assure compliance, tend to punish non-compliance, fail to see the system as a whole, disregard sub-system interactions, and resort to reactive tools for analysis (ICAO, 2013a:2–32; ICAO, 2009:3–10, 3–11, 3–13).

On the other hand, the new safety management paradigm does not prescribe 'how the world should be', but considers 'how it really is'. The paradigm goes beyond compliance with regulations and adopts a 'performance-based' approach (ICAO, 2009:3–13; ICAO, 2013a:2–5, 2–32). What is essentially expected from business organizations is the continuous improvement of safety performance, in addition to compliance with regulations (ICAO, 2013a:2–5, 2–32). The changes are summarized in Fig. 1.

The managerial tool that underpins this approach is the Safety Management System. The ICAO defines the SMS as an organized approach to managing safety, including the necessary organizational

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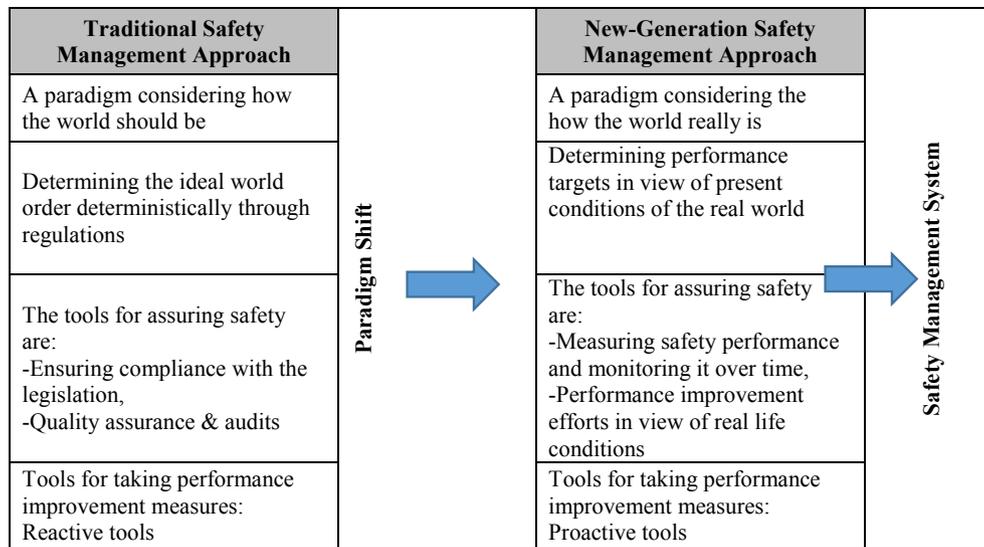


Fig. 1. Traditional and new-generation safety management approach.

structures, accountability, policies and procedures (ICAO, 2013a:vii). The service provider improves safety during service delivery mainly through the two 'operational components' of the SMS; safety risk management and safety assurance, with safety policy and objectives and safety promotion playing a supporting, yet important, role (ICAO, 2009:6–15).

The traditional paradigm dominant from the first years of engine-driven flight to the early twenty first century has now been complemented by a new paradigm that requires significant transformation. The SMS will need a timely, accurate and rich set of data for proactivity, performance measurement and future prediction. An exploration of the challenges to a rapid and successful implementation of the SMS is an important research area for civil aviation regulatory authorities and service providers. The exploration of challenges is expected to facilitate the finding of effective solutions that will enhance the success of the SMS and thus improve aviation safety. The improvement of aviation safety will increase expected benefits of air transport and thereby provide social, economic and cultural benefits to humanity (O'Connor, 1995:14; Oum and Yu, 1998:1; Button and Taylor, 2000:209; Wells, 1999:25–29). This study will reveal what the paradigm shift in safety management requires and contribute to the literature with regard to safety management philosophy.

In other industries, there has been research on management systems similar to the SMS. The purpose of these studies is to identify the critical components of the SMS, to improve its performance, and to specify the critical success factors of the SMS as well as barriers to the implementation of the SMS (Ismail et al., 2012; Aksorn and Hadikusumo, 2008; Bhattacharya and Tang, 2013; Fernandez-Muniz et al., 2007). However, in the aviation industry, there have been few studies related to the SMS.

Current studies related to the SMS in the aviation industry generally aim at identifying the components of the SMS and the relationship between these and the culture of safety (McDonald et al., 2000; Gill and Shergill, 2004; Remawi et al., 2011; Liou et al., 2008; Hsu et al., 2010; Chen and Chen, 2011, 2012). On the other hand, the ICAO has already clearly defined the components and elements of an SMS to be implemented in the aviation industry in 2009 (ICAO, 2009). Therefore, it will be more useful for researchers, policy makers and managers to specify challenges regarding the components required by the ICAO to put them into practice, rather than carry out research on which components

aviation companies should have. No current study discusses the challenges related to putting the SMS into practice. However, researching a similar research question, with a different data collection and data analysis method, Gerede (2015) found that the most significant challenge to the SMS is the problem regarding a 'just culture'. In this study, he defined the problems that create a poor 'just culture' and the consequences that are likely to follow if these problems are not solved.

The purpose of this qualitative research study is to explore the challenges to the implementation of the SMS in aircraft maintenance organizations in Turkey, with reference to the opinions of experts gathered by an open-ended questionnaire. Its aim is that appropriate solutions should be developed before it is too late, in order to promote the success of the SMS by identifying challenges in the process of transition to the SMS. In this context, the research questions of this study are defined as follows:

- According to experts who will set up and implement the SMS, what are the challenges that are likely to occur in the process of implementing it in aircraft maintenance organizations throughout Turkey?
- Which of these challenges are likely to cause more problems compared to others in the process of transition to the SMS?

2. Method

2.1. Research model

The present study is qualitative research, where the aim is to investigate the challenges to the implementation of the SMS; a new-generation safety management tool. For Dey (1993), qualitative research is an attempt to discover the meaning that people attribute to events using their subjective perspective. Creswell (2013) stated that qualitative research is used to explore a problem or a subject. What necessitates this exploration is the need to define variables that cannot be measured easily, or to hear silenced voices. Qualitative research is preferred here since the study attempts to profoundly explore the meanings that experts and mid-level managers, responsible for the launch and implementation of the SMS, attribute to possible challenges in the transition process from their subjective perspective.

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