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TECHNICAL COMMISSION

Agenda Item 28: Aviation Safety – Standardization

SAFETY CULTURE AND THE FUTURE ENHANCEMENT OF ICAO PROVISIONS RELATED TO SMS IMPLEMENTATION

(Presented by CANSO)

EXECUTIVE SUMMARY

Tangible improvements in safety management and a successful implementation of the State safety program (SSP) will rely on the recognition that safety culture is critically important to aviation safety and its role well-understood. Major accident investigations have identified a poor safety culture as a causal factor that increases the probability and severity of occurrence of accidents. A proactive approach to integrate a safety culture at the organisational level is required in order to safeguard all safety-related functions against developing behaviours and practices that manifest themselves well before an accident occurs. The existence and understanding of a safety culture is a requirement for successful SMS implementation. It is for this reason that CANSO has done a considerable amount of work in assessing and understanding safety culture.

Since the new Annex 19 – *Safety Management* contains provisions related to the implementation of State safety programmes (SSP) and safety management systems (SMS), CANSO is of the view that future enhancements to ICAO provisions on safety management must include guidance on safety culture.

Action: The Assembly is invited to agree on the recommendation contained in paragraph 4.

1. INTRODUCTION

1.1 Safety culture represents and influences the way in which safety is managed and understood in the organisation, and reflects the attitudes, beliefs, perceptions and values that employees share in relation to Safety. It is the way in which safety personnel "breathe life" into their organisation's safety policies, processes and procedures documentation and how safety is prioritised in the organisation.

1.2 All organisations operating in safety-critical industries, including Air Navigation Service Providers (ANSPs), have a safety culture. Whether that safety culture is a good one or not will determine what impact there might be on those in the organisation's service delivery value chain. Many of the investigations into major accidents have shown that poor safety culture was a key element in creating the environment which made the accident more probable. Optimising safety culture is, therefore, one of the best ways for an organisation to protect itself from developing behaviours and practices which may

otherwise only manifest themselves for the first time in an accident investigation. It is for this reason that CANSO has done a considerable amount of work on assessing and understanding safety culture.

2. DISCUSSION

2.1 What is safety culture? The term 'safety culture' originated after the Chernobyl disaster, which drew attention to the importance and impact managerial and human factors can have on safety performance. Safety culture is the safety 'personality' of the whole organisation, i.e. "it's the way we do things around here". Safety culture refers to the underlying (safety) values, beliefs and practices that make a business what it is. The concept explains how the lack of adequate knowledge and understanding of as well as the priority placed on risk and safety among managers and employees can contribute to disasters.

2.2 Management psychologist E. H. Schein describes culture as "a pattern of shared basic assumptions that a group learns as it solves problems." safety culture manifests itself through behaviour, group norms, standards and values, and the thinking habits of the organisation.

2.3 The 'lay' definition in the Cullen Report into the UK's Ladbroke Grove rail crash suggests that safety culture is simply "the way we typically do things around here." This relates to the full range of safety behaviours, from the wearing of safety equipment to the rigor applied to carrying out safety and quality inspections to the seriousness with which safety is discussed at a the organisation's highest levels.

2.4 It is important to distinguish between safety culture and organisational culture. Organisational culture refers to the underlying culture found in any type of organisation, regardless of the industry or business realm within which it operates. Organisational culture is framed by such items as corporate mission, strategic direction, customer focus, core organisational values, etc. Thus, banks, schools, universities, charities, government agencies, IT, or telecommunications companies all have an organisational culture of some kind. Of course, ANSPs, airlines, aircraft and engine manufacturers, and airport operating authorities also have organisational cultures. However, one of the subsets of the organisational culture of entities operating in safety-critical industries is their safety culture.

2.5 Why is safety culture important? The investigations into many high profile accidents have shown that a poor safety culture was one of the key factors in creating the conditions without which the accident could not have happened. Thus, improving safety culture is among an organisation's best defences against serious incidents or accidents. However, in order for organisations to improve their safety culture, it is first necessary to assess and understand their current culture. As some organisations have found to their detriment, if you do not understand and manage safety culture, it will manage you.

2.6 The challenge for many organisations is how to change an existing culture; as culture is rooted deep in the subconscious, but presented in behaviour and practice. Since the 1980s there has been a large amount of research into safety culture which has identified the key elements of an organisation's safety culture:

a) **Just culture**: People are treated fairly if they make mistakes – even if those mistakes lead to negative outcomes. However, there is a clear distinction between which behaviours are acceptable and which ones are unacceptable;

b) **Reporting culture**: Organisations whose personnel believe that they will be treated fairly even if they make mistakes are much more likely to report the day-to-day errors

and/or problematic practices which have not yet led to a negative safety event. This means that the organisation has a truer picture of its latent risks and can mitigate these before the occurrence of an incident or accident; and

c) **Learning culture**: Where safety-related information is reported honestly, openly, and without fear of retribution, and proper feedback is given by the management, the organisation has an opportunity to treat these data as 'safety lessons'.

2.7 The above are the key factors to a healthy safety culture and are critical in influencing many aspects of human performance and organisational safety. They generate personal commitment, accountability, communication, and learning, and challenge the manner in which things are done including the behaviours of everyone in the organisation, which includes the senior management – "A safety culture is a culture that allows the boss to hear bad news" (NL, Dekker, 2006).

2.8 Several major accident reports have identified safety culture as a factor that decisively affected the outcome. These include the Piper Alpha oil-platform explosion (UK, Cullen, 1990), the 1987 Kings Cross underground station fire (UK, Fennel, 1988), the sinking of the MS Herald of Free Enterprise passenger ferry (Belgium & UK, Sheen, 1987), and the NASA space shuttle accidents, Challenger (USA, Presidential Commissioner's Report, 1986) and Columbia (USA, CAIB/NASA, 2003).

2.9 The report into the space shuttle Challenger disaster identified numerous "flawed" decisions by NASA and Morton-Thiokol management. These decisions, which were symptomatic of a poor safety culture, were regarded by the investigation as contributing factors to the disaster. The accident was one which is typical of those that occur in poor safety cultures: the accidents are not a result of 'operator error', or chance environmental or technical failures alone. Rather, they happen because of a breakdown in safety culture, which leads the organisation's safety policies and procedures to become significantly less effective.

2.10 It is often argued that if hardware is manufactured and tested in line with technical requirements, the safety culture of the organisation is irrelevant. In the case of the Challenger accident, Morton-Thiokol's O-rings operated within design specification. However, the decision to launch was made based upon a 'known unknown' scenario regarding O-ring performance. Thus, it can be seen how – in the absence of conclusive technical data, or where decisions must be made based on expert interpretation of performance at the 'edge of the design envelope' – safety culture is a key influencing factor. In an era where completely new materials and technologies are becoming more prevalent, such judgments are likely to become more commonplace. Therefore, even those organisations which rely significantly less on human judgment than on engineered performance and quality processes must be cognizant of the role that safety culture will play in assuring successful safety outcomes.

2.11 Why worry about safety culture if you already have an SMS? An organisation's safety culture is ultimately reflected in the way in which safety is managed in the workplace. Therefore, an organisation's SMS cannot consist solely of a set of policies and procedures which sit on a bookshelf. Nor can it hope to be effective if everyone in the organisation is fully conversant with its contents, but does not act upon it appropriately. The SMS describes what needs to happen for safety to be handled in the workplace. How – and how successfully – those policies and procedures are implemented will be heavily influenced by the safety culture of the organisation. Therefore, the better an organisation's safety culture, the more robust will be its SMS.

2.12 In other words, in order to improve the robustness of their SMS, organizations need to improve their safety culture. This can only be done by first assessing and understanding the organisation's

safety culture using one of the many tools that are available for this purpose, e.g. those adopted by CANSO and EUROCONTROL. These can then be used to target continuous improvements relative to the organisation's baseline. However, regardless of the methodology used, the cycle of assessing, understanding, and continuously improving safety culture is key to improving the robustness of an organisation's SMS.

2.13 In support of this goal, CANSO has undertaken significant efforts to recognize and support the importance of safety culture within an ANSP and to the success of its SMS. The first step was the inclusion of safety culture as a key enabler to SMS as presented in the CANSO Standard of Excellence in safety management systems. As such a measure of an ANSP's SMS maturity is based, in part, on: having a positive and pro-active just, flexible, and informed safety culture that supports reporting and learning that is management led; regularly measuring their safety culture and implementing an improvement programme; and maintaining an "open climate" for the reporting and investigation of occurrences.

2.14 In order to assist ANSPs with their safety culture improvement efforts, CANSO also developed a wide range of guidance material. Key outputs include: a Safety Culture Definition and Enhancement Model; a Safety Climate Survey and Database; a Safety Culture Implementation Guide; and a summary of industry safety practices for advancing safety culture. Presentations were developed and provided at regional CANSO events to further the understanding and knowledge of safety culture. Regional safety culture champions were identified and are available to answer questions on safety culture and the related CANSO work.

2.15 Finally, CANSO is currently establishing a set of key leading safety performance indicators. An area identified for which leading indicators are to be developed is safety culture measurement and improvement.

3. CONCLUSION

3.1 In summary, safety culture is a crucial enabling component in delivering a robust and effective SMS. Organisations that have a clear understanding of their safety culture are more likely to be able to fully realise the requirements of their SMS. For this reason it is important that organisations seek to continuously improve their safety culture through a cycle of assessment, understanding, and improvement, and that appropriate guidance in this regard is reflected in ICAO provisions.

4. RECOMMENDATION

4.1 The Assembly is invited to task ICAO with initiating a review of the principles of safety culture and integrating these principles in successive stages of SARP development and implementation of SMS. The Assembly is invited to agree on the following recommendations:

Recommendation 31/x – Improving safety culture to enhance effectiveness of SMS implementation

That the Assembly:

a) consider that safety culture improvement should be a required element in the wider delivery of SMS;

b) agree that in order to improve safety culture, organisations must first assess and understand their current safety culture, and note the work CANSO is doing in this regard; and

c) agree that the necessary provisions to include safety culture in SMS be introduced into subsequent amendments to Annex 19 – *Safety Management* and other appropriate guidance material.

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