

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 2: Safety and security in air traffic management (ATM)

2.1 Safety management systems and programmes :

SAFETY CULTURE IN AIR TRAFFIC MANAGEMENT

(Presented by Sweden)

SUMMARY

This paper addresses the concept of safety culture and its effect on safety in air traffic management. It highlights the importance of establishing practical tools for continuous improvements concerning safety and safety culture. The harmonization with the development of a safety culture within airline and airport operations is also stressed.

Action by the conference is in paragraph 5.

1. INTRODUCTION

1.1 In the area of air traffic management (ATM), where many changes are currently taking place (e.g. new functional areas within national administrations, publicly and privately owned corporations and companies operating in an increasingly market-oriented setting), the focus must be set on preserving and continuously improving safety. A successful safety management depends on the existing safety culture in the organization.

1.2 The Swedish Civil Aviation Administration (SCAA) in cooperation with the University of Lund aim to develop a practical model for supporting continuous improvements and learning in the organization focussing on safety and safety culture. The overall objective of the model is to provide a toolbox for recurring investigations and feedback concerning aspects of safety and safety culture, to increase learning at all levels within the SCAA, and to be a part of the safety management system.

1.3 In order to have a successful global safety management in air transport, the development of a safety culture within ATM should be harmonized with the same development within airline and airport operations.

2. SAFETY CULTURE AT ALL LEVELS

2.1 The work should be based on a system perspective for controlling safety. In a system perspective one is aware that a socio-technical system is divided into levels (political, legislative, regulative, managing, safety offices, work planning and operating) and that these levels need to have well functioning coordination processes for safety. It describes the importance of strong connections between the levels in the form of goals with feedback, learning and action both within and across levels. Learning becomes a basic principle in the dynamic socio-technical system and in creating a proactive risk management direction for safety.

2.2 The learning must yield such results that the organization becomes better in making itself safer by: 1) influencing the individual to choose a safe instead of an unsafe behaviour by e.g. increasing the risk awareness, more training etc.; 2) improving the man-machine systems from a safety point of view; and 3) managing organizational conditions. Concerning the latter it is important that the learning process goes so deeply that existing latent conditions are eliminated or become more visible, and that different types of safety barriers can be identified to manage these conditions.

3. NECESSARY CONDITIONS FOR SAFETY

3.1 *Technology* — Safety should be built into the system. Unsafe acts do not only depend on what goes on in an operators head, but also depend largely on poor functionality and interface design of man-machine systems.

3.2 *Safety culture in all groups at all levels* — All individuals within an organization must feel motivated and be involved in the safety work, i.e. all are focused on safety and involved in continuous improvements of the safety. Groups of specialists within the organization (or consultants) are often needed, but are not always enough. The individuals performing the work are often those having the best opportunities to see where the risks are. They can often give unique suggestions for improvements based on their domain knowledge. The quality of the co-workers engagement is dependent on competence. To increase efficiency in safety management programmes the relevant competence needs to be developed.

3.3 *Knowledge* — The available knowledge in an organization should contain a process view and a comprehensive view. A process view involves, where possible, to look at an organization's activities as processes. With processes means the flow of activities and information within the organization. These processes are often divided into subparts run by different persons or groups. The work within the parts is optimized but inefficiencies may often evolve at the boundaries between the parts. Efficiencies could be gained by looking at the flow in the whole process.

3.3.1 In the border areas between people, groups and technology lie often many causes for accidents. In investigations of accidents and incidents, there are many examples where failures of communication between people are identified.

3.3.2 With a comprehensive view is meant that safety management should be integrated with the general management of the organization, but also as far as possible coordinated with the areas of health, environment and quality.

3.4 *Safety management system*— Within an organization there are rules, written and unwritten, for how the work should be performed in a safe way. Rules should be known by all and easy to understand and follow. Procedures must be such that they are not to be judged as unnecessary or detailed. Therefore, the writing of rules should be done in collaboration with the users in order to increase the efficiency of the rules, and to be combined with information that motivates their existence. The resultant practice is of course dependent of knowledge and rules; however, the knowledge is not always used and rules are not always followed.

4. IMPORTANT TASKS IN DEVELOPING A SAFETY CULTURE

4.1 The work of developing a safety culture within ATM and to find the relationship with safety management involves many challenges such as the development of a practical model for supporting continuous improvements and learning in ATM with focus on safety and a safety culture (see Figure 1).

4.1.1 Important questions needs to be answered:

- C what constitutes a safety culture within the ATM context?
- C what organizational aspects influence the safety culture?
- C how is the safety culture manifested in actions and behaviour?
- C how is the safety culture manifested in increased safety?

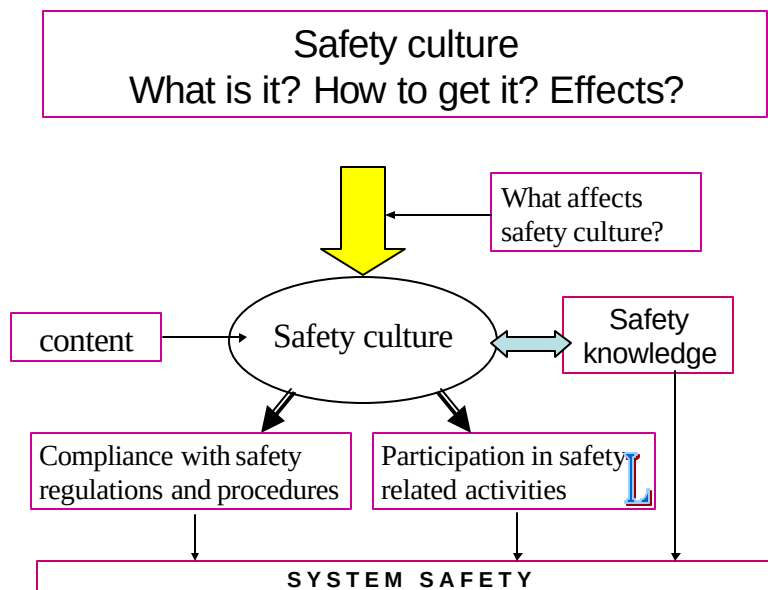


Figure 1. Many important issues need to be address in order to find the relationships between safety culture and successful safety management. L = learning

4.2 *Contents of a safety culture* — In the work of finding the relevant content of a safety culture the following nine areas are proposed for further development: *Learning*: the willingness to learn and to introduce changes. *Reporting*: the willingness to report incidents and anomalies. *Justness*: just judgments of human errors. *Flexibility*: the ability to transform the organization of the work to changing demands. *Communication*: good communication within and between work levels. *Safety-related behaviours*: comprise e.g. discussions about and encouragement of increased safety. *Attitudes towards safety*: commitment to safety from both management and staff. *Working situation*: concerns cooperation, support and appreciation. *Risk perception*: perceived risk of harming others and one's own influence on safety in work.

4.3 *Influences on a safety culture* — The safety culture does not exist as an isolated fraction within a living organization. Instead, it is present within different parts of the organization, with no boundaries between levels and organizational areas. The safety culture is therefore likely to be affected by different organizational aspects that exist as a part of the organization. In order to develop a practical model for improvements and learning with focus on safety, it is essential to form an improved understanding of these concepts and their relations to the safety culture. To provide such knowledge, the safety culture should be studied together with other organizational aspects such as organizational climate, team climate, situational leadership and psycho social working environment.

5. **ACTION BY THE CONFERENCE**

5.1 The conference is invited to:

- a) note the information provided in this paper;
- b) recommend that ICAO address safety culture as an important issue in ATM and also in the harmonisation of ATM – airline and airport operations; and
- c) recommend that ICAO incorporates issues like safety culture and related areas in the Technical Work Programme (TWP) in the field of Air Navigation and allocates resources to initiate and follow-up the implementation of this work.

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