

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

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

2.3 Safety regulation :

ATC GROUND SYSTEM COMMISSIONING AND THE APPLICATION OF THE MINIMUM EQUIPMENT LIST (MEL) CONCEPT

(Presented by the International Federation of Air Line Pilots' Associations —
IFALPA)

SUMMARY

The minimum equipment list (MEL) concept is applied in the determination of the airworthiness of aircraft to manage aircraft operation under technical outages and system degradation. This concept should be considered to provide equal guidance to ATC systems.

Action by the conference is in paragraph 5.

1. INTRODUCTION

1.1 In response to the mid-air collision that had occurred over Southern Germany in 2002, the need was recognised to, inter alia, “investigate whether accelerated action is required in respect of ground-based safety nets [and] to consider whether guidance is required for the management of technical outages and system degradation.”

1.2 The minimum equipment list (MEL) concept — as applied in the determination of the airworthiness of aircraft — may constitute a specific example on how “technical outages and system degradation” can be managed and, hence, would be a candidate for ground use also.

1.3 Furthermore, the certification and operational oversight processes used for aircraft and airborne equipment should also be considered as example processes for the safe commissioning of ground-based air traffic management (ATM) systems.

2. HISTORICAL BACKGROUND

2.1 While civil aviation airborne equipment is subject to a detailed and controlled certification process in the hands of independent (regulatory) authorities, implementation and operation of ground-based elements of the ATM system are subject to a different process.

2.2 In many cases the “commissioning” of such systems is effected without outside oversight.

2.3 In recent years, ICAO provisions have been developed to require safety assessments and safety monitoring of ground systems.

3. GROUND SYSTEM COMMISSIONING CONSIDERATIONS

3.1 Current, and in particular, future ATM systems rely — more than the historic communications, navigation, and surveillance (CNS) systems — on interoperability and even cooperation between airborne and ground system elements.

3.2 There is a need to establish processes that assess the operational characteristics of these systems regarding safety, integrity, continuity of service not on an isolated but on a “total system” basis. In effect, the functioning of the ground environment must be part of the certification process: “end-to-end certification”.

3.3 It should be considered that this certification process must be undertaken by an authority which is independent from the ground air navigation services (ANS) provider.

3.4 Equally, continued operation of the established ground ATC systems should be subject to oversight by an independent authority.

3.5 These requirements should be seen as a supplement to the internal safety management processes of ANS providers as required by recently implemented ICAO provisions.

4. THE MEL CONCEPT

4.1 It is understood that no technical system is capable of operating for 100 per cent of the time without any technical outages or system degradation. The occurrence of partial operation is covered — for airborne equipment — by the establishment of “minimum equipment” regulations.

4.2 It should be considered to adopt this concept for application with ground systems as well.

- 4.3 Specific aspects of the concept include, for example:
- a) determination of vital system elements that may not be unserviceable;
 - b) determination of acceptable and unacceptable failure combinations;
 - c) development of technical procedures/measures to ascertain that sub-system failures do not affect other system parts; and
 - d) development of operational procedures to enable/support operation of degraded system elements.

5. **ACTION BY THE CONFERENCE**

- 5.1 The conference is invited to:
- a) note the information provided in this paper; and
 - b) consider the adoption of the MEL concept for ATC systems.

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