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WORKING PAPER

ASSEMBLY — 38TH SESSION

TECHNICAL COMMISSION

Agenda Item 36: Air Navigation — Emerging Issues

NEED FOR SARPS ON TYPE APPROVAL OF ATS EQUIPMENT FOR ENSURING COMPLIANCE WITH HUMAN FACTORS PRINCIPLES

(Presented by Nepal)

EXECUTIVE SUMMARY	
This paper outlines the challenges faced by Nepal in implementing the ICAO requirements in PANS-ATM (Doc 4444) that seek compliance with human factors principles during the introduction of new ATS equipment. **Action:** The Assembly is invited to: a) note the challenges being faced by Nepal; b) support in addressing the deficiencies in an effective manner; and c) request ICAO to introduce SARPs for type approval or design certification of ATS equipment including that of the ATC consoles.	
Strategic Objectives:	This working paper relates to the Safety and the Environmental Protection and Sustainable Development of Air Transport Strategic Objectives.
Financial implications:	Not applicable.
References:	*Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444)

1. INTRODUCTION

1.1 In 2006, ICAO published the 2nd Edition of the *Safety Oversight Manual* (Doc 9734) that outlined the duties and responsibilities of ICAO Contracting States with respect to aviation safety oversight and provided guidance on achieving the obligations as signatories to the Chicago Convention.

1.2 As awareness in Nepal grew on the obligations on regulatory aspects of air navigation services (ANS), challenges appeared on the horizon for ensuring implementation of ICAO SARPs as well as the contents of the PANS-ATM, especially those relating to the introduction of new ATS equipment that required conducting safety assessment studies apart from ensuring compliance with human factors principles.

1.3 The SARPs for SSP and SMS have existed for quite some time now, and simultaneously the Safety Management Manual (Doc 9859) has gradually evolved over the three editions and provides a workable basis for conducting safety assessment studies in various areas of civil aviation. But not much is available for ensuring compliance with the much stated applications of human factors principles.

2. DISCUSSION

2.1 The Civil Aviation Authority of Nepal is presently involved in replacing and upgrading ATS equipment and facilities, many of which have reached the end of their economic design life and or support from the manufacturer is lacking due to obsolescence. Introduction of such facilities have brought forth challenges for ensuring compliance with the ICAO guidelines mentioned in Section 1.3 above.

2.2 The realm of human factors encompasses a wide range of topics including biomechanics, ergonomics, anthropometry etc. The PANS-ATM provides for a definition of Human Factors Principles and refers to select ICAO documents on Human factors for references: the *Human Factors Training Manual* (Doc 9683), Circular 241-AN/145 and Circular 249-AN/149. These documents, however, do not provide the detailed human factors code or standards against which certification or validation of certification of ATS equipment and facilities may be carried out for ensuring compliance with the intent of the PANS-ATM regarding application of human factors principles before the equipment can be commissioned into regular service.

2.3 Nepal does not possess the necessary expertise in design, manufacturing and certification of ATS equipment and facilities including the Communication Navigation Surveillance components. Even the ATC console, which appears deceptively trivial in terms of significance, comprises the Controller's workplace and incorporates many human-machine interface features and thereby deserves certification as per established human factors principles that the PANS-ATM refers to.

2.4 Nepal imports all of the ATS equipment that are used for providing the air traffic services and unfortunately similarities are seldom found in consoles that have been installed at different ATC positions, as they were sourced from different manufacturers. Owing to this, a controller, who is often assigned to different ATS units within the same shift, therefore is susceptible to making any type of human factors related error.

2.5 Even the States from which such equipment and facilities are procured by Nepal do not often provide detailed human factors codes or standards that have been used for design and certification of such equipment and facilities. In Nepal's experience, often, no certification documentation is available from the respective aviation regulatory authorities of State-of-equipment-manufacture, which logically should have been involved in the approval of design and possible certification of such equipment for aviation use.

2.6 Therefore, in the above context, presently for Nepal, ensuring compliance with the intent of PANS-ATM on human factors issues does not appear feasible.

2.7 This deficiency in standardization of ATS equipment as per human factors principles, especially those equipment that provide for human-machine interfaces for sensitive air traffic control functions, has a potential for creating unanticipated deleterious effects that detract from the CAAN's objective of providing safe, efficient and reliable ATS services.

3. CONCLUSION

3.1 Issuance of adequate SARPs by ICAO on requirements for ATS equipment design conformance with established human factors principles by way of either type approval or by design certification by the respective state aviation authorities will help Nepal and probably other States that import such equipment and facilities in achieving the intent of the PANS and thereby comply better with their obligations to the Chicago Convention.

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