International Civil Aviation Organization

Third Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group (APSAPG/3)

Chennai, India, 21-25 January 2013

Agenda Item 4: Asia/Pacific Seamless ATM Status and Strategies

HUMAN PERFORMANCE

(Presented by IFATCA)

SUMMARY

This paper presents the need for human performance to be considered at all stages and at all levels of development of any ATM plan.

This paper relates to –

Strategic Objectives:
  A: **Safety** – *Enhance global civil aviation safety*
  C: ***Environmental Protection and Sustainable Development of Air Transport*** – *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:
GPI-5   RNAV and RNP (Performance-based navigation)
GPI-6   Air traffic flow management
GPI-7   Dynamic and flexible ATS route management
GPI-8   Collaborative airspace design and management
GPI-9   Situational awareness
GPI-10 Terminal area design and management
GPI-11 RNP and RNAV SIDs and STARs
GPI-16 Decision support systems and alerting systems

1.   **INTRODUCTION**

1.1   At the 12th Air Navigation Conference that was recently held at ICAO Headquarters in Montreal, four Working Papers were presented on the automation of ATM systems and four Working Papers were submitted on human performance in modern ATM systems.

1.2   In the deliberations of the Asia Pacific Seamless ATM Planning Group there has been much discussion on the automation and modernisation of ATM systems, but there has been very little reference to human factors and human performance, even though the two items are closely linked and frequently inter-dependent and it is one of the Recommendations in the Draft Plan.

1.3   Just as this Seamless ATM Plan may be the only opportunity this region will have to fully coordinate a new era of air traffic management, this may be the single opportunity for each ANSP to reconsider the needs of their single greatest asset, their staff, and ensure that human performance is given due consideration in the overall plan.

2.   DISCUSSION

2.1   Human performance in the context of new automated ATM systems includes such diverse elements as, equipment design, training, acceptance of change, workload, 'just culture' reporting and staffing. In accordance with ICAO, an ANSP is required to have an established Safety Management System - therefore human performance matters should already be addressed. However, it is all too common for an ANSP to have the correct documentation in place and to talk of safety culture at meetings and conferences, but regrettably there is hardly any real implementation – the documents remain on the shelf and there is no action to back up the talk.

2.2   Controllers by nature are sceptical individuals – they need to see the new equipment working and the benefits it brings, and they need to see the new procedures in place and the improvements they give. Equally they need to see an active safety culture 'from the top down' with a proper safety reporting system that controllers can trust. An essential part of this must be safety teams that include operational staff amongst the members, to ensure adequate contingency plans and back-up facilities are in place and comprehensive training is provided to create an effective safety net for controllers to efficiently handle increasing traffic with revised separation standards.

2.3   A few ANSPs can rightly say that they do have a fully automated ATM system with advanced tools, but all too often the adjacent units do not have such systems. Meaning that at the FIR boundary 'traditional' control procedures have to be implemented and the efficiency of the modern equipment and new procedures is negated at the transfer point. However there are some locations where improved procedures could be implemented right now, but the opportunity to provide a more efficient and effective service is not taken up. This could be for a number of reasons, including staffing, equipment reliability and long-standing procedures that have not been updated.

2.4   Workload and confidence in operational tools is constantly in the mind of every controller, but given correctly organised airspace, good equipment and proper training in traffic management, the old procedures that are no longer efficient should be reviewed and, subject to a safety analysis and thorough controller training, the appropriate surveillance or PBN separation standards should be implemented at the earliest opportunity.

2.5   In the past when new ATC equipment has been installed or new ATC procedures introduced, the ANSP has provided controllers with some basic training on equipment operating practices. Now when new automated ATM systems are installed or new PBN procedures are implemented, the ANSP must provide thorough and comprehensive training on all aspects of the changes and the consequent revisions to the basic control philosophy and handling of traffic.

2.6   Automated ATM systems undoubtedly reduce controller workload, thereby enabling greater traffic volume to be handled safely and more efficiently. However, the incremental reliance on automation to complete many current tasks and functions of the controller requires a fundamental change in the actions, responsibilities and skills of the controller. Therefore a comprehensive training programme covering new control techniques and modern aircraft capabilities must be provided. This should include detailed analysis on operating the new equipment, the fundamental change to the concept of traffic management, the necessity of maintaining situation awareness and a thorough knowledge of the contingency measures, as well as changes in aircraft operating techniques.

2.7   There are some ANSPs who do not have their own training facilities with ATC simulators, therefore they are limited in the training they can provide to their staff, but the resources are available to enable many ANSPs to provide comprehensive and effective training to their controllers, so that they can learn and familiarise themselves with the new skills.

2.8   There is an unfortunate precedent if a comparison is made with pilots. They experienced a similar paradigm change with the introduction of the glass cockpit and fully automated flight management systems more than 20 years ago. There were some accidents and incidents in the first few years of the learning curve due to misinterpretation of data or the incorrect management of systems – the primary cause of many of these mishaps was often poor or ineffective training. However in recent years there have been two significant accidents which highlighted deficiencies in pilot training programmes in managing automated systems and a lack of maintaining situation awareness. As a result ICAO is reviewing the pilot training requirements to ensure that basic pilot skills are maintained whilst accepting that correctly managed automation is normally the safest mode of aircraft operation.

2.9   We must ensure that not only is the training of controllers in the classroom and in the simulator comprehensive, but that they understand and implement the new skills in the workplace. There may be some who consider that the introduction of automated systems reduces the amount of training that is required. In fact the opposite is true, as training must cover the automated system and include the traditional control procedures as part of the contingency and fall-back plan. We must learn from the experiences of others.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

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