



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 1: Strategic issues that address the challenge of integration, interoperability and harmonization of systems in support of the concept of “One Sky” for international civil aviation

1.1: Global Air Navigation Plan (GANP) – framework for global planning

ICAO’S CONTRIBUTION TO THE RESOLUTION OF THE ISSUES EACH STATE FACES

(Presented by Japan)

SUMMARY

Japan is now implementing measures in order to realize the long-term vision CARATS and facing various issues. Some of the issues are considered globally common. Those concerned should share the issues each state/region face and resolve them cooperatively toward the realization of global harmonization, operational interoperability, and seamless ATM advocated in the APAC region.

In the process of ICAO’s requesting each state/region the progress report through ANRF, ICAO should collect also the issues that each state/region are facing so that the studies on the progress world wide are successfully continued.

Action: The Conference is invited to recommend to ICAO that, when ICAO requests each State/region to submit a progress report on relevant ATM implementation, ICAO should also collect and analyze the issues they face in conducting decision-making pertaining to the introduction of their ATM improvements measures, so that ICAO will be able to continue to study for the solutions.

1. INTRODUCTION

1.1 Japan is now facing the harsh realities of population decrease, declining birthrate and aging population, as well as economic growth of neighboring Asian states and measures to counter global warming. Under the circumstances, Japan needs to draw up and carry out a growth strategy in order to enhance its economic growth. Aviation service is a fundamental economic and social infrastructure that supports Japan’s economic growth. Since there are various problems with the current air traffic systems such as the concentration of traffic flows in certain airspace and routes, it is necessary to renovate Japan’s air traffic systems decisively and strategically for the future.

1.2 Based on awareness of the issues, in cooperation with parties concerned, we organized the long-term vision collaborative actions for renovation of air traffic systems (CARATS) in 2010. In the long-term vision, we set specific numerical targets such as improving safety, expansion of processing capacity control, improving service levels and operational efficiency. The plan also calls for cooperation with those concerned by showing the direction for eight renovations toward achieving goals such as the trajectory-based operation (TBO).

1.3 In cooperation with parties concerned, we are working towards the realization of this long-term vision but various issues have emerged at the same time.

2. DISCUSSION

2.1 In order to build the future air traffic systems based on the CARATS long-term vision, we need to implement short-term measures and promote research and development in a planned manner with regard to the long-term measures. We made roadmaps on which we described 55 specific measures. Roadmaps have 39 operational improvements (OIs) and 16 enablers (ENs). Each measure has the duration of preliminary activities such as research and development, the year of decision-making of the introduction and the preparation period for the implementation. We have defined that the implementation phase of CARATS starts in 2011, and are promoting the study and implementation of the measures that are described on the roadmap. However, we have been facing various implementation issues.

2.2 One of the issues which we have been facing in implementing TBO and CDO is the aircraft equipage of ground-to-air data communication systems. Some states have imposed mandatory equipage on aircraft operators in order to introduce ground-to-air data communication systems. However, it is not easy for each state to impose mandatory equipage because of the high cost which aircraft operators have to pay to retrofit the fleet. We assume it takes quite a while to improve the equipage by showing operational benefit as the incentive for installation of this equipment because the benefit of equipage is little at the early stage.

2.3 One of the issues is to estimate each amount of communication volume required because there are multiple operational improvements when using ground-to-air data communication systems. In the case of using ground-to-air data communication systems in order to improve some operational improvements, such as frequency change and exchange of trajectory data, system requirements should be decided according to the estimate volume of communication required for each application. It also requires sufficient study including the prediction of the equipment installation ratio. In addition, the estimate of the effect of the introduction of ground-to-air data communication systems should also be studied extensively. Key performance area may differ depending on each application and expected benefit may depend on the equipage ratio.

2.4 Implementation of performance-based navigation (PBN) will be a crucial element in order to expand the airspace capacity, but in fact aircrafts which cannot satisfy PBN (especially RNP) requirements will continue to exist. To develop required navigation performance (RNP) approach procedures and departure/arrival procedures to congested airports will be key to expand air traffic capacity at these airports, but airspace capacity may be constrained when non-RNP aircraft exists and different ATC procedure must be applied between RNP aircraft and non-RNP aircraft within the same space. The procedures in the mixed environments should be reviewed.

2.5 Another issue is to quantify the cost performance regarding the effect of weather-related measures. The improvement of meteorological observation and forecast expect us to introduce the effect in various flight phases. Improvement of meteorological observation system can strengthen the weather-monitoring capability at airports or in the airspace. For example, to avoid cumulonimbus enables aircraft to reduce various risks of lightning strikes on aircraft etc. Enhancement of meteorological forecast system enables us to model and coordinate the flight trajectory at an early stage before flight. It also enables us to modify the flight trajectory real time in flight by predicting the weather change precisely. It is assumed that benefits will include generation of appropriate flight plan, realization of safe operation, suitable decision-making regarding runway change and choice of approach type, as well as restraining effect of reduced airspace capacity under bad weather conditions. However, it is not easy to quantify cost performance of these measures.

2.6 As mentioned above, we should quantify cost and benefit as well as develop an appropriate implementation plan in order to implement measures. However, there are several issues we are facing. To prepare for “standards, avionics, ground system and procedures” is not enough to solve these issues.

2.7 It is considered to be necessary that each state/region must solve the issues the state/region faces in order to ensure global harmonization and interoperability as well as to realize seamless ATM which is advocated in the APAC Region. It is required to report the progress of each state/region when making an annual report of ICAO Global Air Navigation Plan. In addition, ICAO should collect information on the issues each state/region are facing so that the future improvement measures will be reviewed on the global basis.

3. **CONCLUSION**

3.1 Note the information contained in this paper.

3.2 The Conference is invited to recommend to ICAO that, in case of requesting each state/region to report its progress situation, it should collect the issues they are facing when making the decision regarding the implementing the measures.

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