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ASSEMBLY — 37TH SESSION

TECHNICAL COMMISSION

Agenda Item 35: The global air traffic management (ATM) system

THE LONG-TERM VISION FOR THE FUTURE AIR TRAFFIC SYSTEM IN JAPAN (CARATS)

(Presented by Japan)

EXECUTIVE SUMMARY

This paper provides the information about the long-term vision for the future air traffic system in Japan, namely "CARATS: Collaborative Actions for Renovation of Air Traffic Systems." CARATS can be downloaded from the following website: http://www.mlit.go.jp/koku/koku_CARATS.html.

This information paper provides the information about the outline of CARATS.

1. INTRODUCTION

1.1 Global ATM Operational Concept, the fundamental direction of globally harmonized air traffic management (ATM) targeting 2025 and beyond, has been developed by ICAO in order to improve safe and efficient operation of aircraft in the future. In the U.S. and Europe, NextGen and SESAR have been developed based on that concept.

1.2 In Japan, in order to accommodate the increase of air traffic demand in the future as well as to respond to the diversified needs of operators and the global environmental issue, various problems inherent with the current air traffic systems such as the concentration of traffic flows in certain airspace and route arising from partially restricted use of airspace and routes need to be overcome/solved. It is, therefore, necessary to renovate Japan's air traffic system for the future.

1.3 In light of the global, regional, and domestic situation, a study group consisting of representatives from industry, academia and government, including academic experts, operators, research institutes and the JCAB, was set up. This study group has carried out necessary studies from various aspects and developed "Long-term Vision for the Future Air Traffic System in Japan," which is called "CARATS: Collaborative Actions for Renovation of Air Traffic Systems" since it requires the following collaborative works with various aviation stakeholders:

a) collaboration among industry, academia and government;

b) collaboration between operators and air navigation service providers (ANSPs);

c) international collaboration to realize seamless air traffic;

d) collaboration among airspace users (civil and military); and

e) collaboration with local communities.

2. OBJECTIVES OF THE FUTURE AIR TRAFFIC SYSTEMS IN JAPAN

2.1 In establishing the future air traffic systems, it is necessary to clarify the objectives, considering the needs of operators and aviation users, social and economic trends, etc. 2025 is the target year of this vision. In CARATS, the following specific numerical targets are defined, taking into account the characteristics of air traffic and social situation in Japan.

Item	Numerical target
Enhancing safety	Increase safety level by 5 times
Responding to the increase in air traffic volume	Double the air traffic control capacity in congested airspace
Improving user convenience	Improve service level (punctuality and rapidness) by 10%
Increasing operational efficiency	Reduce fuel consumption per flight by 10%
Improving productivity of air traffic services	Improve productivity of air traffic services by 50% or more
Responding to environmental issues	Reduce CO2 emissions per flight by 10%
Enhancing the international presence of Japan in the aviation field	Qualitative target. The number of international conferences in Japan, the number of international cooperation projects, etc may be the indicators.

3. DIRECTIONS OF RENOVATION OF THE FUTURE AIR TRAFFIC SYSTEMS IN JAPAN

3.1 In the current air traffic systems, there are various problems and limitations including “airspace-based ATM operation” with chronic delays caused by the concentration of traffic flow in specific airspaces and routes, and the inability to fully optimize entire flight routes from departure to arrival. It is difficult to solve such problems based on traditional solutions and approaches. Rather, it is necessary to dramatically change the traditional ATM operational concept and CNS technology in order to achieve the above numerical targets of the future air traffic systems.

3.2 In renovating the ATM operational concept and CNS technology, Japan will focus on a shift to a trajectory-based ATM operation from the traditional airspace-based ATM operation, minimizing operational restrictions and optimizing the performance of air traffic as a whole, while also realizing flexible and efficient flights. In CARATS, the following eight key directions of renovation are indicated:

a) realizing trajectory-based operation (TBO);

b) improving predictability in ATM operation;

c) promoting performance-based operation (PBO);

d) realizing satellite-based navigation for all flight phases;

e) enhancing situational awareness on the ground and in the air

f) making maximum use of the capability of humans and machines;

g) adequate information-sharing and collaborative decision making; and

h) realizing high-density operation in congested airports and airspaces.

4. REALIZING CARATS

4.1 In order to systematically establish the future air traffic system in accordance with the long-term vision of CARATS, Japan is planning to draw up a detailed road map with the cooperation of the parties concerned. Implementation should be initiated step by step for the short-term measures, and research and development should systematically be carried out for the long-term measures. The road map will be revised as necessary to flexibly cope with changes in the situation.

5. CONCLUSION

5.1 The meeting is invited to note the information about the CARATS.

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