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The Eighth Meeting of the APANPIRG ATM Sub-Group

Video Teleconference, 23 – 27 November 2020

Agenda Item 5: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

FUTURE AIR TRAFFIC SYSTEMS OF JAPAN (CARATS) VISION

(Presented by Japan))

SUMMARY

This paper presents the information about status update of the long-term vision for the future air traffic systems of Japan, namely “CARATS: Collaborative Actions for Renovation of Air Traffic Systems”.

1. INTRODUCTION

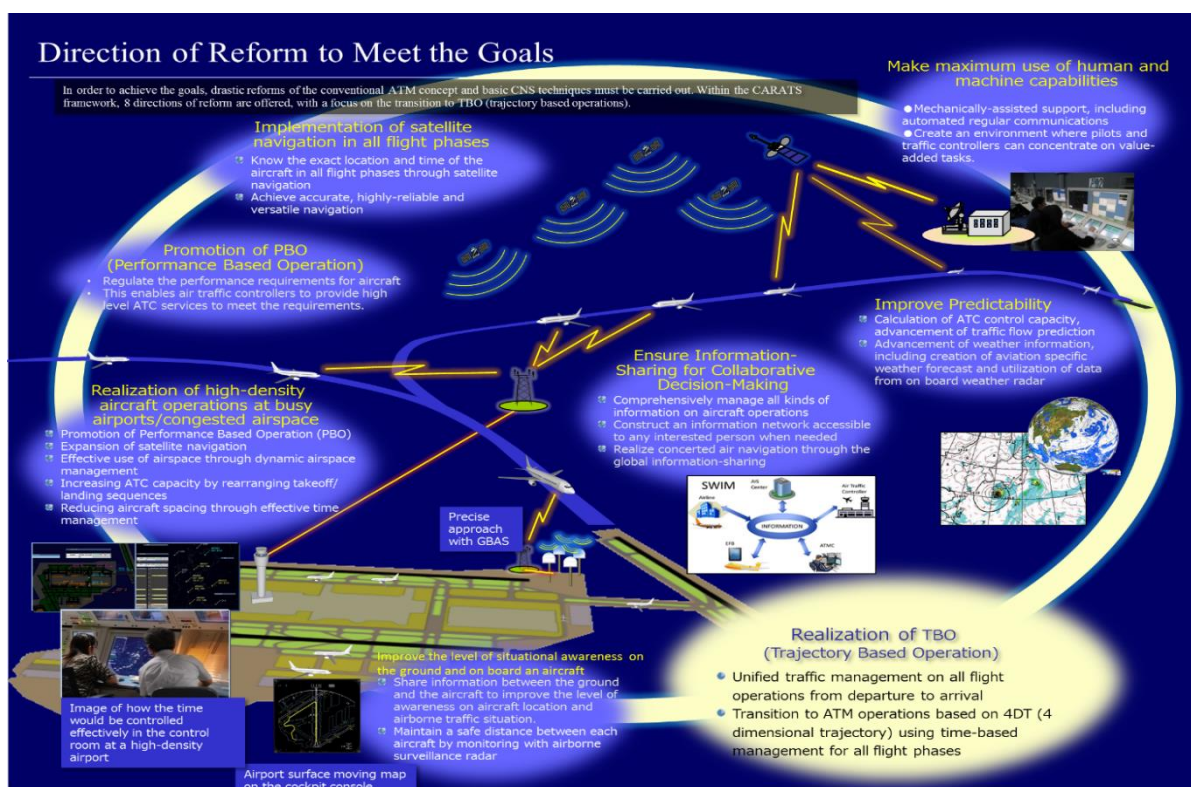
1.1 The Global Air Navigation Plan (GANP) indicates comprehensive direction for the globally harmonized air navigation systems with safe, effective and efficient air traffic. GANP also provides the various measures and technology development, in form of time series block, as Aviation System Block Upgrades (ASBUs) and Technology Roadmaps. This will allow States and stakeholders to realize the safe, sustained growth, increased efficiency and responsible environmental stewardship that societies and economies globally now require.

2. DISCUSSION

Long-Term Vision for the Future Air Traffic Systems in Japan

2.1 In Japan, in order to correspond appropriately to the growth in air traffic demand as well as the diversified needs of users, through the collaboration of industry, academia and government, the future of the air navigation services have been examined from various angles and also based on global trends. In 2010, JAPAN established "The long-term vision for the future air traffic systems (CARATS: Collaborative Actions for Renovation of Air Traffic Systems)" which describes goals aimed at for 2025, directions of renovation, etc. CARATS set goals like improvement of safety, correspondence to the growth in global air traffic demand, improvement of user-friendliness, improvement of operational efficiency, etc. CARATS also identify the following eight directions of renovation to achieve the goals, with a core of the "Trajectory Based Operations (TBO)".

- a) Realization of TBO
- b) Improvement of predictability
- c) Ensuring information sharing for collaborative decision-making
- d) Promotion of Performance Based Operation
- e) Implementation of satellite navigation in all flight phases
- f) Improvement of situational awareness on the ground and on board an aircraft
- g) Maximum utilization of human and machine capability
- h) Realization of high-density aircraft operations at busy airports and congested airspace



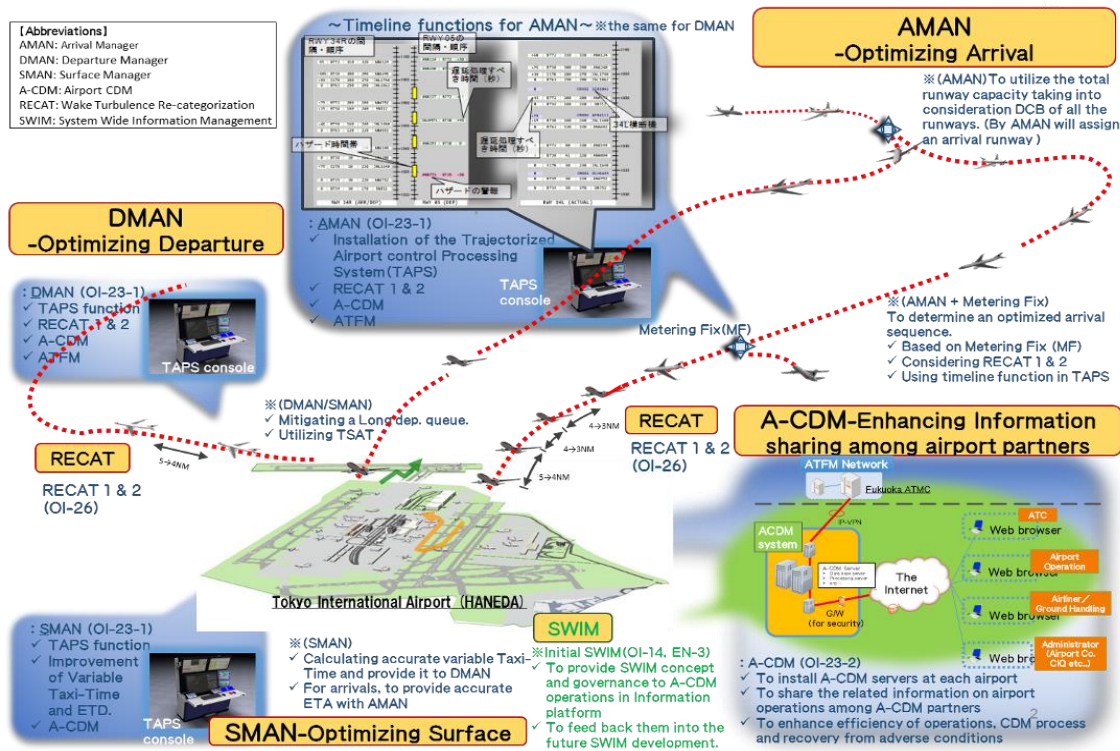
2.2 CARATS is also consistent with the ASBU Methodology. Japan has been mapped its planning to respective Block Upgrade Modules in order to ensure the near- and longer-term global interoperability of their Air Navigation solutions.

The Main Measures in CARATS

Improved efficiency in ATC operations of take-offs, Landings and surface.

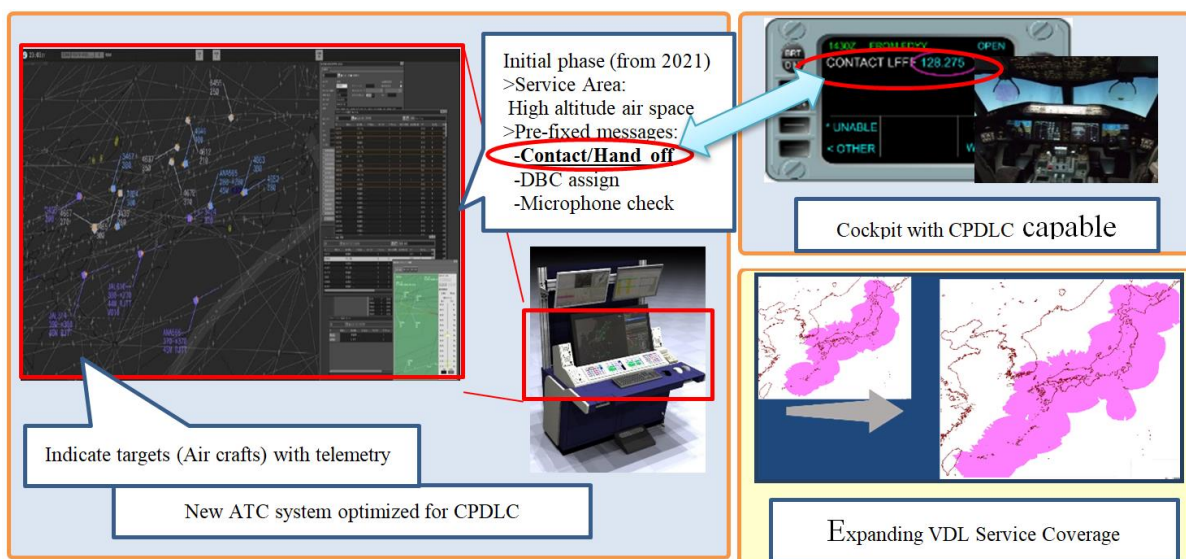
2.3 With Arrival Management (AMAN), Departure Management (DMAN) and SMAN Surface Management (SMAN) coordination, Japan Civil Aviation Bureau (JCAB) controls traffic flows effectively at airports including the Tokyo Haneda and the Tokyo Narita airports where airport surface operations are difficult and complicated. This enables the airports to maximize the use of its available resources including runways, and thus increases airport capacity to meet the ever-growing demand in air traffic in the Tokyo metropolitan area.

2.4 Besides, a couple of Air Traffic Management (ATM) CARATS measures are implemented to improve operations for the Metropolitan airports, which are time-based metering at merging points, improved efficiency of aerodrome operations (AMAN/DMAN/SMAN), Airport Collaborative Decision Making (A-CDM), reduced wake turbulence separation minima (RECAT: Recategorization) etc. Each measure will also start the operation from around 2019 before when the Olympic and Paralympic games held in Tokyo in 2020, in a phased manner where necessary.



CARATS challenge for 2020 in Metropolitan Airports (For the Tokyo Haneda Airport).

2.5 Enhancement of ATC capacity by Continental Controller Pilot Data Link Communication (Continental CPDLC). In order to improve ATC capacity and safety, Continental Controller Pilot Data Link Communication (Continental CPDLC) by FANS with VDL is also going to introduce from 2021. The introduction will be made in phased manner. In initial phase, by transmitting non-time-critical ATC instruction (transfer of communication, Microphone check, DBC assignment) as pre-fixed format through the data link in the domestic en-route airspace, we expect that ATC capacity will be increased and human error risk will be reduced.



Continental Controller Pilot Data Link Communication (Continental CPDLC).

2.6 Realization of TBO utilized FF-ICE/SWIM (System Wide Information Management). In order to acquire common understanding of operational concept and benefit of TBO, JCAB joined Multi-Regional TBO Demonstration which was led by FAA from July 2020. As a technical supporter of JCAB, Electronic Navigation Research Institute (ENRI) developed a test system for validation and provide experience and well knowledge.

Decision-making and arrangement in the last fiscal year

2.7 In consideration of the various social situation and recent ICAO activities, last fiscal year, JCAB made decisions to implement following measures under the collaborative framework with industry, academia and government.

OIs: Operational Improvements

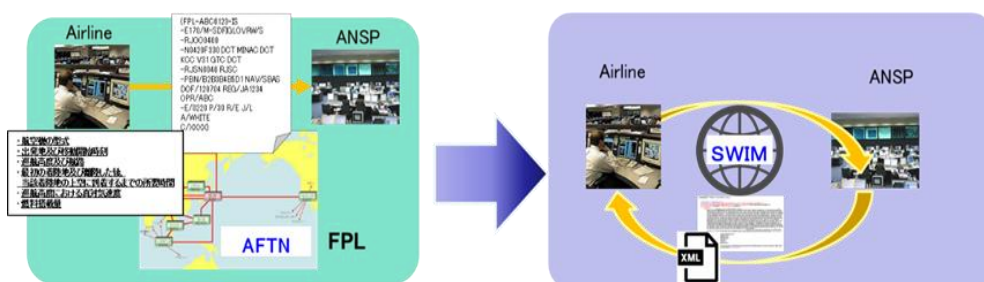
- ATS operation by utilizing aircraft derived data / CAP and utilization of wind information for ATS (CAP: Controller Access Parameter)

ENs: Enablers

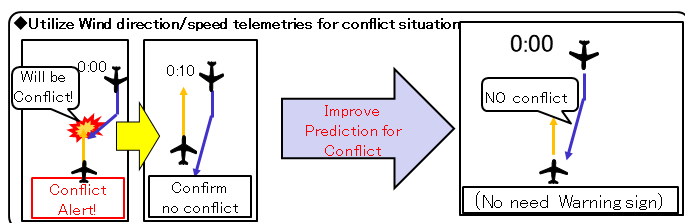
- Information management infrastructure / FF-ICE filing service
- Utilization of aircraft derived data / Enhanced DAPs data element (DAPS: Downlink Aircraft Parameters)

2.8 Regarding of FF-ICE (Flight & Flow Information for a Collaborative Environment), it is the key of ATC digitalization. However, such game change has huge impact for relevant stakeholders.

2.9 In the respective manner of such situation, JCAB has decided to introduce FF-ICE by step. As initial service, FF-ICE filing service are going to start from 2024 in accordance with opening JCAB SWIM service.



2.10 While ATS operation by utilizing aircraft derived data, it is utilized DAPS for improving situational awareness for ATC. DAPS is accommodated telemetries of Wind speed/direction by Aircrafts, to utilize such situational data, ATC system will be improved prediction of aircrafts conflicts.



3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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