International Civil Aviation Organization

NINETEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION AND SURVEILLANCE SUB-GROUP (CNS SG/19) OF APANPIRG

Bangkok, Thailand, 20 – 24 July 2015

Agenda Item 3:   Aeronautical Fixed Service (AFS)

INFORMATION MANAGEMENT AT CARATS

(Presented by Japan)

SUMMARY

This paper presents the activity of CARATS Information Management Working group. In addition, it provides several methods for the awareness; what is a SWIM, and how we should collaborate with the relevant stakeholders for the consistent recognition from ICAO document.

## 1.   INTRODUCTION

1.1   Manual on System-Wide Information Management (SWIM) Concept was published while disclaiming, as ICAO Doc 10039. The SWIM is basically depend on the governance on all stakeholders. The collaborative activity with them is important to the SWIM implementation. Through the activity of CARATS Information Management working group, several methods are presented.

2.   DISCUSSION

2.1   For the establishment of the future Air Traffic Systems, JCAB is engaged in promoting the renovation while the organizing the contributing body as following;

   (1) 2009 ~ 2010   Development of long-term vision
      ·   Establishment of
          "Study group for Promoting Renovation of the Air Traffic System"

      ·   Development and promulgation of
          "Collaborative Actions for Renovation of Air Traffic Systems" (CARATS)

   (2) 2010 ~ 2011 Development of roadmap for each measures
      ·   Establishment of
          "Committee for Promoting Renovation of the Air Traffic System"

      ·   Consideration of concrete measures and development of roadmap

   (3) 2011 ~   Implementation of the measures

2.2   Especially, relevant matters for System-Wide Information Management (SWIM) is discussed at 'Information Management Working Group' in the framework of CARATS as below. As special mention, the constituent member of CARTAS are made up of many organization which are from Industry, Academia and Government.
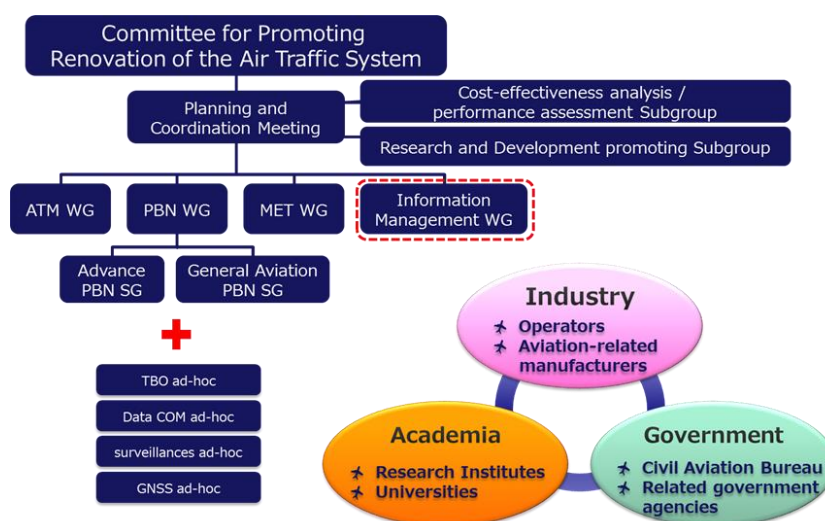
2.3   Current Issues

2.3.1   The ATC and the neighborhood are exchanging information which are such as Weather information, Aeronautical information and Flight information required for the aircraft operation, through the international aeronautical fixed communication station. In the case of Japan, we are exchanging information within the Fukuoka FIR that is our responsibility area.

2.3.2   Concerning to the circumstances surrounding us, with the introduction of development and computer processing for the communication technology, the communication speed is improved, and the amount of data handled is increasing. The mechanism of information exchange has not changed from the communication by Morse and teletype. (Use of abbreviations, such as character limit)

- Performs system processing by analyzing the received text
- For other States, distribute it as simplified text file
- On Flight of the same aircraft, lose the connectivity on the system processing

2.3.3   When each ANSP implementing with advanced systems attempts to cooperate, it become a major barrier. Each ANSP is in advanced systems processing only the information within the responsibility of the FIR. However, it is not possible to achieve seamless information sharing with other States. From take-off to landing of aircraft, it cannot be managed as a series of information in the Gate to Gate.

2.4   Origin of SWIM

2.4.1   The SWIM Concept initially appeared in the ICAO document which is described the concept of the future vision of ICAO, *"The Global Air Traffic Management Operational Concept (Doc 9854)"*. It is stated as follows.

"the migration from the one-to-one message exchange concept of the past to the many-to-many information distribution model of the future, that is, many geographically dispersed sources collaboratively updating the same piece of information, with many geographically dispersed destinations needing to maintain situational awareness with regard to changes in that piece of information"

2.4.2   In addition, we can find the phrase of SWIM in the *"Manual on Flight and Flow Information for a Collaborative Environment (FF-ICE) (Doc 9965)"* for the first time, and it is stated as follows.

"SWIM - integrating all relevant ATM data - FF-ICE relies on a supporting SWIM environment. SWIM - integrating all relevant ATM data – will form the technical basis for information management of the entire ATM system and be essential for its efficient operation. The corresponding information management solution will be defined at the overall system level rather than individually at each major subsystem and interface level. SWIM aims at integrating the ATM network in the information sense, not just in the system sense."
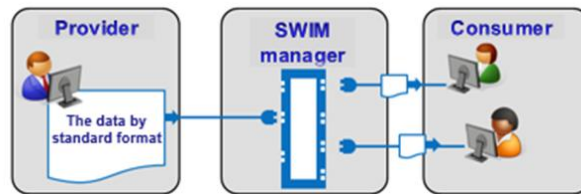
2.5   The fruits of Mini-Global Demonstration
2.5.1   The introduction by these ICAO documents was difficult to understand by all member of CARATS. However, Mini-Global Demonstration which was established by the constructing technology for SWIM was demonstrated the effectiveness that the essential information for the aircraft operation was standardized to XML/GML data format. (Flight information, Aeronautical information, Weather information, etc.)

2.5.2   For information on aircraft international flight, it was clarified that the stakeholders could monitor seamlessly from the departure point to the destination point.

2.6   The approach in CARATS – "The need for re-confirmation of SWIM"
2.6.1   ANSPs are providing a high quality service by using the advanced systems which processes the collecting information in domestically. Also ANSPs are already constructing the enrich circumstance which is utilized information analyzing and processing by the systems. In the view point of domestic, it is difficult to feel the effectiveness of the improvement by implement SWIM. As the result, it severe on maintaining a motivation for discussion.

2.6.2   In technical aspects, the CARATS information management WG does not perform the system developments in directly. The academia perform it, under collaboration. (supported by Research institutes and Universities)

2.6.3   However, the important point in order to understand the ICAO concept is the increasing awareness of members through active discussion of participants.

2.6.4   Thus, discussion is necessary for synchronize the level of consciousness of all members, because consider that it is not possible to make mature the awareness of loosing the owning data, by swallow the concept.

2.6.5   The provisions of how to proceed SWIM implementation
The CARATS Information management WG developed *"Provision how to proceed SWIM implementation"* in 2013. In the course to consider the provision, it was possible to synchronize the awareness of all members.

The contents of the provision are as followings;
- Principle toward implementation

- Definition of Stakeholders

- Provision of constructing the communication infrastructure

- The necessity of Governance

- Evolution of operation caused by Governance

- Recognition of the necessity to coexisting with current operation

- Relation on ICAO ASBU, and so on

While it is the concept which does not describe detailed provisions, after the creation of this document, forward-looking initiatives and awareness of the parties has increased.

2.6.6   Work for the realization from concept
Important thing it cannot be seen always. In order to steadily realize the concept, it is necessary to understand the influence on the current operation. It is not that the most important thing is clearly shown the concept. From the viewpoint of the responsibility for safety, a method of resolving this issue has to be supplemented as part of the new service. At this point, by addressing the demonstration, it is possible to see through complex environments. The opportunity is precious.

2.6.7   Benefits of visualization by international demonstration
The international demonstration is able to;
- Confirm the benefits that cannot be adequately represented in the domestic demonstration.

- Verify the optimal technology that can withstand the operation of a global scale.

- Prompt the introduction judgment by find the possibility of SWIM

2.7   Future Subject

2.7.1   The environment will widely use COTS. So far, each State provides the services by own developed system. While ensuring comprehensive service, it is necessary to evaluate to determine its propriety. In the case of install new services, it is required to define the procedure to configure collaboratively with the generic function.

2.7.2   Each State is ensuring the safety by performing the responsibility district which is defined clarify. This mechanism does not match the structure to ensure safety in the future concept. In the mixed phase and the accomplishment phase, it is necessary to formulate a plan how to hold the responsibility for safety by any way, while always thinking.

2.7.3   Then, this innovation without changing the explosively will be assumed that it will spread to change the operation over time.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a)   note the information contained in this paper;

b)   share the experience of increasing the awareness for the SWIM implementation through the international demonstration;

c)   refer to ICAO documents listed regarding SWIM/IM, which are useful to further consideration, from ICAO IMP website as following; and

·   http://www.icao.int/airnavigation/IMP/Pages/default.aspx

d)   discuss any relevant matters as appropriate.

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