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ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 4: AIR NAVIGATION

**THE REPUBLIC OF KOREA'S EFFORTS TO IMPLEMENT
SWIM-BASED SURVEILLANCE INFORMATION-SHARING
SYSTEM**

(Presented by the Republic of Korea)

INFORMATION PAPER

SUMMARY

This Paper introduces the Republic of Korea's efforts to implement a SWIM-based domestic and international surveillance information-sharing system. This document introduces the cases of sharing and using surveillance information between stakeholders in the domestic SWIM trial operation and explains Korea's contributions to implementing a global surveillance information sharing system, such as participation in the ICAO APAC SWIM Implementation Trial Group (S3TIG).

THE REPUBLIC OF KOREA'S EFFORTS TO IMPLEMENT SWIM-BASED SURVEILLANCE INFORMATION-SHARING SYSTEM

1. INTRODUCTION

1.1 The Republic of Korea (ROK) has been interested in sharing surveillance information in the SWIM (System Wide Information Management) environment. This includes technical method and procedures to enable efficient surveillance information sharing between stakeholders.

1.2 The scope of surveillance information covered includes not only Automatic Dependent Surveillance-Broadcast (ADS-B) data but also other surveillance information from other sources, such as Air Route Surveillance Radar (ARSR), Airport Surface Detection Equipment (ASDE), Multilateration system (MLAT) and so on. And these facilities operated in ROK have not yet had the capability to provide their surveillance information to the SWIM environment.

1.3 ROK implemented a SWIM testbed and developed pipelines to collect, process, save, and provide surveillance information in the SWIM environment. With the SWIM testbed, a domestic SWIM trial operation with Air Traffic Management (ATM) stakeholders is being conducted, and ATM stakeholders are able to consume surveillance information through SWIM.

1.4 ROK also has actively tried to share research findings and lessons learned in the technical aspect to member states at the ICAO APAC SWIM TF, ICAO APAC SWIM Implementation Trial Group (S3TIG), ICAO APAC Surveillance Study Group (SUR SG) and ICAO APAC SWIM workshop.

1.5 This Paper introduces ROK's efforts in implementing surveillance information sharing in the SWIM environment. This Paper also introduces some use cases of surveillance information sharing and its utilization and ROK's contributions to global efforts to implement a surveillance-sharing environment, such as participation in the S3TIG.

2. DISCUSSION

Status of SWIM-based Surveillance Information Sharing of ROK

2.1 The SWIM testbed has a pipeline which collects, processes, saves, and provides surveillance information in the SWIM environment. Once surveillance information is received from legacy sources, the SWIM testbed processes it so that it can be provided through a web service or a messaging service.

2.2 The SWIM surveillance information services include not only basic surveillance information services such as real-time surveillance distribution service, but also derived surveillance information services such as track history. Stakeholders of the trial operation are able to consume surveillance information both in an all-Purpose Structured EUROCONTROL Surveillance Information Exchange (ASTERIX) format and a Javascript Object Notation (JSON) format.

2.3 The trial operation with SWIM stakeholders is in progress, and stakeholders who consume surveillance information through SWIM information service are as follows:

[Table 1. Stakeholders of ROK SWIM Trial Operation]

Stakeholder	Service	Format
DATM Center, National Information Resources Service	Messaging Service	ASTERIX
Korea Aerospace Research Institute	Messaging Service	ASTERIX, JSON
Air Traffic Center, Daegu	Web Service	JSON
Air Traffic Center Regional Office, Incheon	Web Service	JSON
NAVAIDS Business Center, Seoul Regional Aviation Administration	Web Service	JSON
Korea Airports Corporation - Operations Control Center (HQ) - Airside Control Tower, Gimpo Int'l Airport - Airport Operation Control Center, Gimpo Int'l Airport - Instrument Landing System (ILS) Department, , Gimpo Int'l Airport	Web Service	JSON

2.4 Use cases of surveillance information provided through SWIM are as follows:

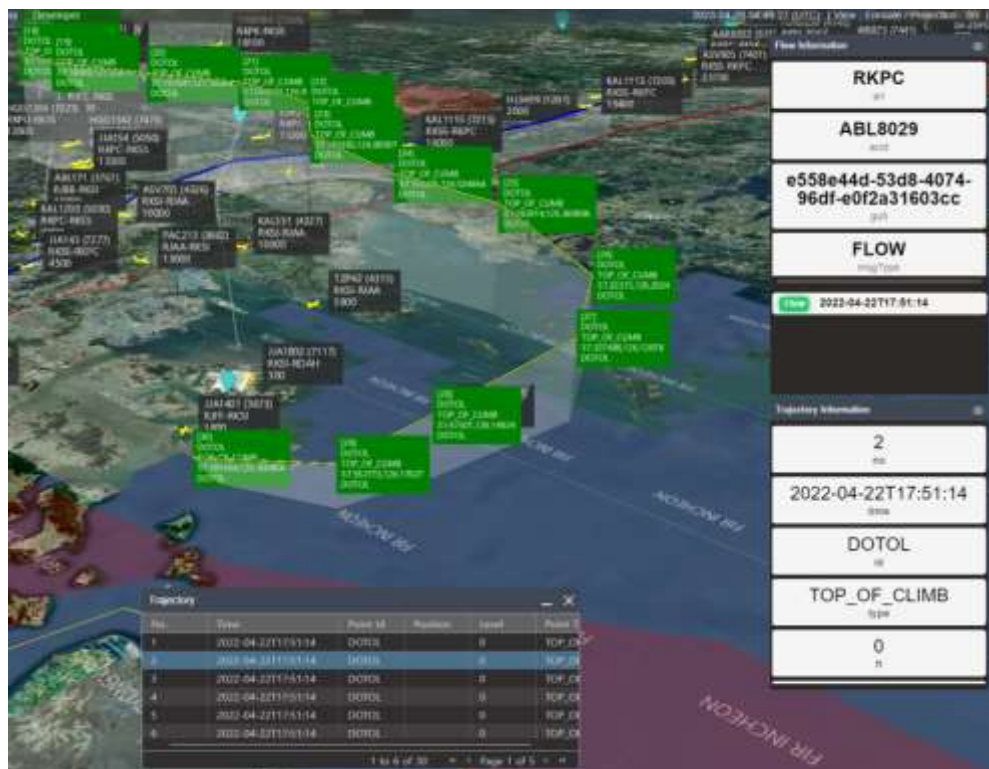
- a) **Aircraft Arrival Monitoring Application.** The application receives surveillance information and monitors the movement of abnormal aircraft in the approach control area.



- b) **SWIM Dashboard Application.** The application which receives aeronautical information (e.g., Notice to Airman (NOTAM)), flight information (e.g., FPL), surveillance information (e.g., en-route, surface movement), meteorological information (e.g., Meteorological Terminal Aviation Routine Weather Report (METAR)), Significant Meteorological Information (SIGMET), Airmen's Meteorological Information (AIRMET), Terminal Area Forecast (TAF), and automated Meteorological Observation System (AMOS), and displays information on the 3D Map.



- c) **Collaborative Tactical Flow Management System (in development).** The system which receives flight information (e.g., FPL), surveillance information (e.g., en-route, surface movement), meteorological information (e.g., Meteorological Terminal Aviation Routine Weather Report (METAR)), Significant Meteorological Information (SIGMET), Airmen's Meteorological Information (AIRMET), Terminal Area Forecast (TAF), Automated Meteorological Observation System (AMOS), and provides calculated trajectory and flow using the SWIM information service.



ROK's Global Efforts on Surveillance Information Sharing

2.5 ROK also tries to contribute to the implementation of the global surveillance information-sharing environment. This includes not only sharing research findings and lessons learned in the technical aspect but also governance and standardization efforts and participation in global demonstrations or trials.

2.6 ROK's efforts to share research findings and lessons learned in the technical aspect are

as follows:

- a) (1st ICAO APAC SWIM Workshop, 2021) “ROK’s SWIM Journey : SWIM Service Implementation for Flight/Surveillance Information”
- b) (ICAO APAC SWIM TF and ICAO APAC Surveillance Study Group, 2022) “Implementation of FFICE Interoperability using GUFi in SWIM”
- c) (ICAO APAC SWIM TF and ICAO APAC Surveillance Study Group, 2023) “Lessons Learned in Sharing Surveillance Data using SWIM Information Service”
- d) (2nd ICAO APAC SWIM Workshop, 2023) “ROK’s SWIM Journey Lifecycle of information from Provider to Consumer in ROK’s SWM Trial Operation”

2.7 ROK is participating in the S3TIG using the ROK SWIM testbed, and ROK is going to provide surveillance information in real-time during the demonstration.

2.8 Surveillance information to be provided during the demonstration will be limited to ADS-B data (Cat. 21) within 20NM of JEJU International Airport. And, ROK is collaborating with Singapore, Thailand and Hong Kong China, to support a demonstration scenario which shares surveillance information in a JSON format.

2.9 Network connection using Pseudo CRV (Common Aeronautical VPN(Virtual private network)) will be started in the 3rd quarter of 2023, software development and connection tests for demonstration will be conducted in the 4th quarter of 2023, and the demonstration event will be held in the 1st quarter, 2024.

2.10 ROK will actively support this demonstration event and participate in global collaboration to implement the surveillance information-sharing environment in the APAC region.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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