



ICAO

International Civil Aviation Organization

First Meeting of the APAC ANSP Committee (AAC/1)

Bangkok, Thailand, 17 – 18 April 2023

Agenda Item 3: Work Program

JCAB's International Cooperation Activities

(Presented by Japan)

SUMMARY

Inter-regional cooperation ('clustering') for the research, development and implementation is a key principle of the ATM Modernization, which is addressed under the "ASIA/PACIFIC SEAMLESS ANS PLAN". This paper introduces Japan Civil Aviation Bureau's recent international cooperation activities related to ANS domain.

1. INTRODUCTION

1.1 To date, Japan Civil Aviation Bureau (JCAB) has supported some forms of international cooperation activities in APAC region from the viewpoints of developing Air Navigation Services in line with Asia/Pacific Seamless ANS Plan. This paper presents representative examples among the international cooperation activities which are currently ongoing such as "demonstration trial project", "JICA (Japan International cooperation Agency) technical cooperation project and GNSS Implementation Plan Training in ASEAN.

2. DISCUSSION

2.1 Demonstration Trial Project

2.1.1 The Demonstration Trial Project is supported by Ministry of Internal Affairs and Communication (MIC) and Japan Civil Aviation Bureau (JCAB) from Japan through the industrial promoting program that supports Japanese industries' activities to solve the social problems/challenges in foreign countries by using Japan's cutting-edge wireless technologies with mutual cooperation. Currently, three Japanese manufactured ANS equipment, Ground-Based Augmentation System (GBAS), Multilateration (MLAT) and Foreign Object Debris Detection System (FODDS) were adopted for the project and demonstration trial has been conducted in Thailand, Viet Nam and Malaysia respectively. The expected outcome of this collaboration project would be beneficial for both sides as well as to facilitate other member states for the effective implementation of these systems in the Asia-Pacific region. JCAB is supporting these activities from this perspective.

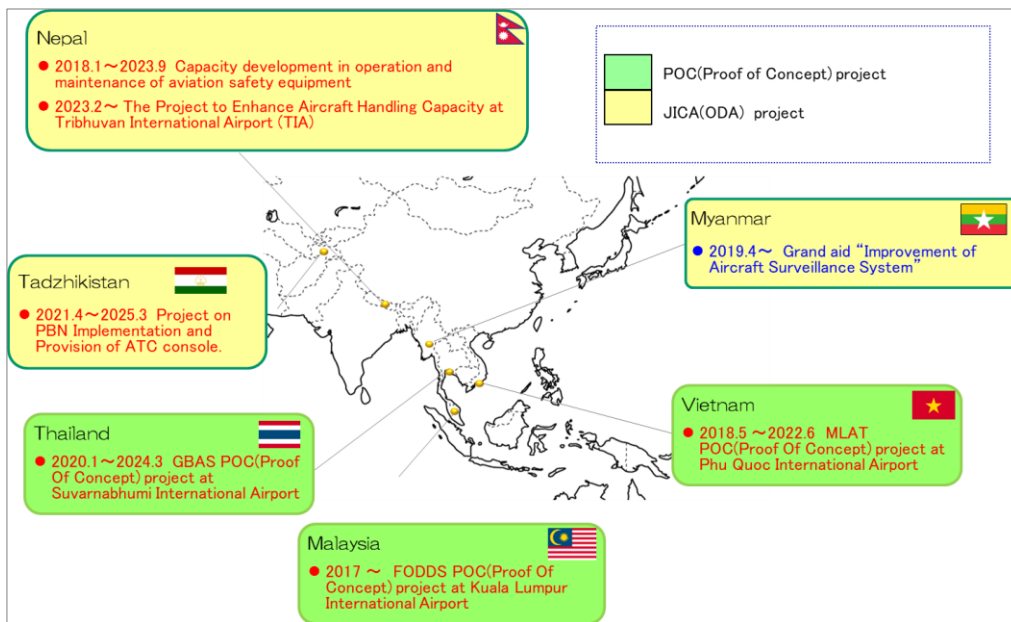


Figure 1. Current JCAB’s International Cooperation Activities

2.1.2 GBAS Demonstration Trial Project, as it’s also called “Proof-of-Concept (PoC) project at Suvarnabhumi International Airport started early 2020. The main objective of this collaboration project is to conduct an experiment for the deployment of GBAS equipment, manufactured by Japanese company at low geomagnetic latitude area, where the performance is affected by the ionospheric irregularities. The expected outcome of this collaboration project would be beneficial for both sides as well as to facilitate other member states for the effective implementation of GBAS in the Asia-Pacific region.

2.1.3 JCAB provided technical transferring to Thailand on Flight Inspection and Flight Procedure Design on GBAS. Main components of this project, Flight demonstration was already finished in November, December 2022 and January 2023 successfully project is expected to complete in 2024.

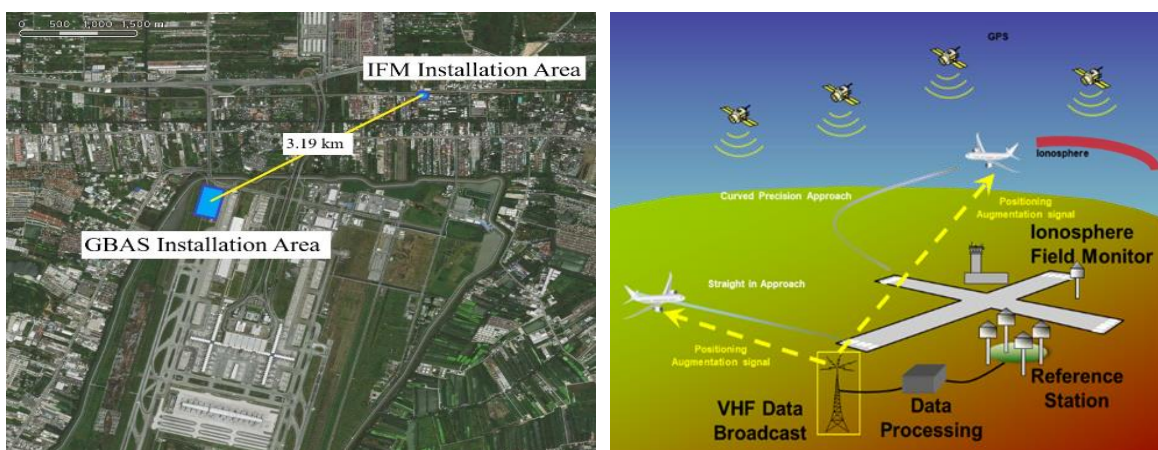


Figure2. GBAS PoC system installation location (left) and GBAS Overview (right)

2.1.4 Multilateration (MLAT) is a surveillance system of taxiing aircraft for runway, taxiway and apron through the accurate and precise monitor of the aircraft and vehicles moving location at

airport surface. MLAT calculates aircraft positions using TDOA (Time Difference of Arrival) of received signals from SSR mode S, A, C, Transponder equipped on aircraft.

2.1.5 In the Demonstration trial, which started from 2018, Advanced MLAT was evaluated at Phu Quoc International Airport in Viet Nam. Advanced MLAT has its distinctive features such as

- a) Minimize the number of Rx station due to less affected by multi-path
- b) Advanced operation for monitoring not only the airport surface but also the aircraft flying in the vicinity, up to 20NM~30NM of the airport
- c) Free from lightning surge due to Optical power feeding instead of a commercial power supply
- d) Reduce costs for initial construction, operation and maintenance (free)...etc....

2.1.6 JCAB supported this trial project by providing several times technical seminar to Viet Nam. The project already finished and actual MLAT operation started at Phu Quoc International Airport since last July.

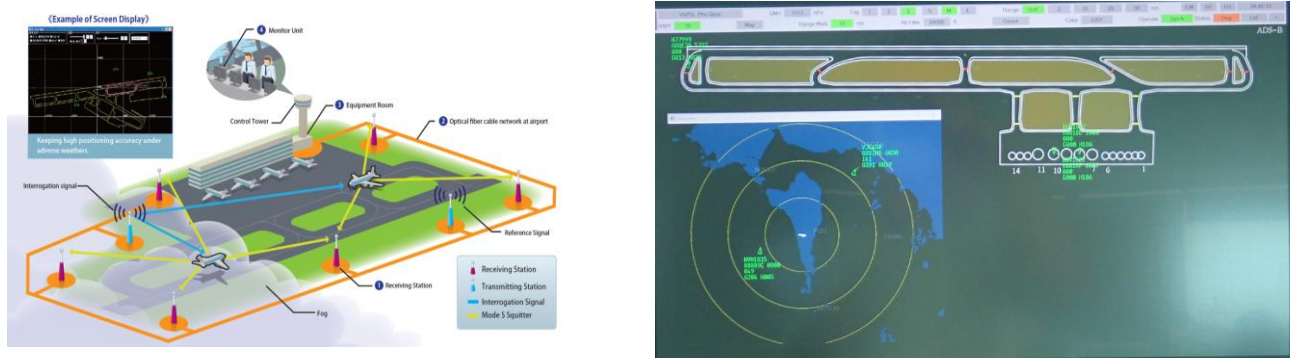
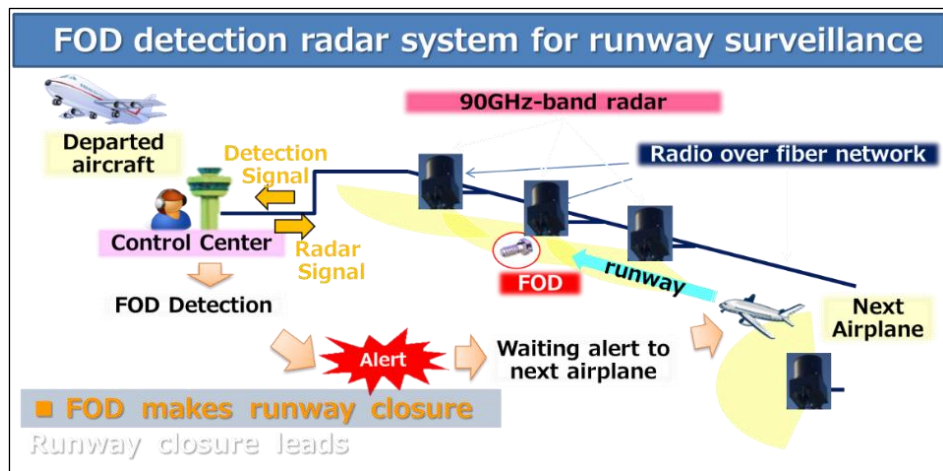


Figure 2. MLAT overview (left) and Display of Advanced MLAT (right) at Phu Quoc International Airport

2.1.7 The Foreign Object Debris Detection System (FODDS), which is based on ultra-wideband millimeter-wave radar systems and various sensors, is a surveillance system to support airport operations. It detects foreign object debris (FOD) on runways automatically and informs airport operators. As well as preventing accidents, FODDS can also shorten the runway closure periods for safety inspection. We expect CO2 emission reductions by preventing stagnation of aircraft due to runway closures and to be able to maximize the usage rate of airport runways.

2.1.8 The FODDS demonstration at Kuala Lumpur International Airport (KLIA) is to evaluate capability on detecting and capturing runway condition such as crack, dent and water ponding. Evaluation parameters are Detection of FOD at night time/bad weather, Detection of FOD minimum size, capability of detecting multiple FOD and so on. All stakeholders concerned with FODDS trial project had workshop at KLIA to consider development of FODDS standard documentation for ICAO APAC and enhance collaboration toward the FODDS operation. The demonstration trial has still been continuing for system performance study.

Figure 3.
FODDS Overview



2.2 JICA related activities

2.2.1 JCAB has carried out international cooperation activities on ANS field for more than 30 years in collaboration with Japan International Cooperation Agency (JICA), especially using JICA Technical Cooperation scheme.

2.2.2 Technical Cooperation is one of JICA's major area of development assistance, which conducts cooperation to foreign countries through dispatch of experts, the training of local officials for “capacity development”, and the supply of equipment and so on. JCAB has dispatched more than 200 officials to around 20 countries as long-term or short-term expert for JICA Technical Cooperation Project to develop human resources during the past 30 years.

2.2.3 JICA Knowledge Co-Creation Program is another scheme of the technical cooperation that JICA carries out training in Japan. This program has received many participants across the world so far and provided ANS-related program as well such as “PBN Instrument Flight Procedure Design” to acquire enough knowledge and expertise to design air traffic services route and PBN procedure, which was conducted once a year from 2013 to 2019 with the support of JCAB. Also, new program titled “Introduction and management of Air Navigation Services (ANS) technology” will be started this year.

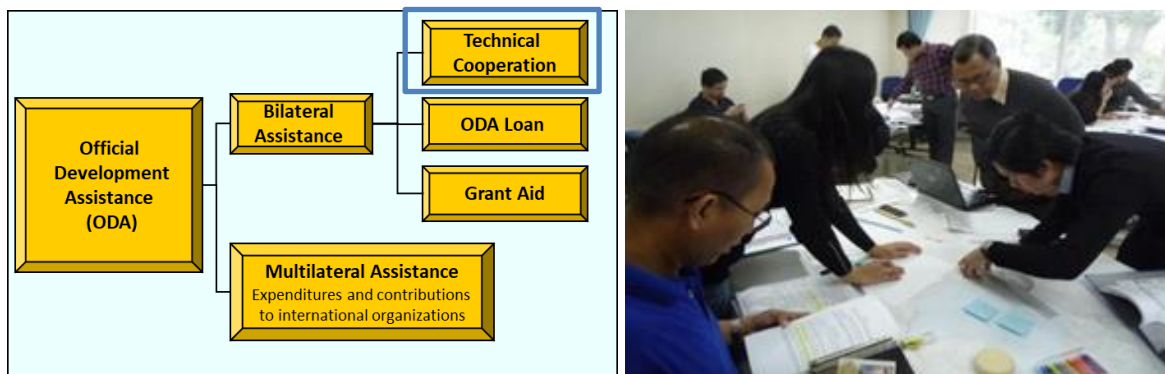


Figure 4. JICA Cooperation scheme structure (left) and Co-Creation Program for PBN Instrument Flight Procedure Design in Japan (right)

2.3 GNSS Implementation Plan Training in ASEAN(GIPTA)

2.3.1 The Global Air Navigation Plan recognizes GNSS as a key element of the air navigation system that will deliver improved services and meet environmental, efficiency and safety objectives. With the support of JCAB, This project was proposed by Japanese consulting firm and adopted under ASEAN-Japan Transport Partnership (AJTP) in 2019, which is designed to develop human resources to make a plan to implement GNSS. GIPTA consists of symposium for ATM personnel in charge of GNSS and training for technical officials of ATM personnel in ASEAN Member States.

2.3.2 Although work programs of symposiums and training on GNSS were temporarily suspended due to the COVID-19 pandemic for about 2 years, a symposium and training was finally held in September and November 2022 both in the Philippines. JCAB supported these program by dispatching trainers to both event and the project completed successfully. Next GNSS training project for ASEAN Member states toward 2024 is under consideration.

2.4 Japan Air Navigation Service’s Future Activities

2.4.1 According to Japan’s long-term vision for the future air traffic system, namely “Collaborative Actions for Renovation of Air Traffic Systems” (CARATS), which is in alignment with the Global Air Navigation Plan (GANP), JCAB has been working for the improvement of air navigation services in line with ”CARATS” to resolve many technical challenges such as “Decarbonization” for a globally harmonized air navigation system with safe, effective and efficient air traffic.

2.4.2 JCAB will further continue to work on international activities through mutual understanding and cooperation following the Asia/Pacific Seamless ANS Plan with aiming the “ No Country Left Behind (NCLB) ” initiative that ICAO highlights its efforts to assist States in implementing Standards and Recommended Practices (SARPs).



Figure 5. SBAS Overview and group photo of GIPTA symposium

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the importance of inter- regional cooperation in APAC region, which is the basic principle of Seamless ANS Plan
- b) note the information contained in this paper; and
- c) discuss any relevant matters as appropriate.

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