52ND CONFERENCE OF
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ASIA AND PACIFIC REGIONS

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AGENDA ITEM 3.6: TECHICAL AND REGIONAL
COOPERATION

COOPERATION TO IMPLEMENT PBN FLIGHT PROCEDURES

(Presented by Japan)

INFORMATION PAPER

SUMMARY

As performance based navigation is one of Asia/Pacific seamless ATM priority, Japan as Official Development Assistance has contributed to implement Air Traffic Services route and PBN procedure design in Asia/Pacific countries.

This paper describes the activities of Japan to support PBN implementation for Asia/Pacific Region.

COOPERATION TO IMPLEMENT PBN FLIGHT PROCEDURES

1. INTRODUCTION

1.1   Performance Based Navigation (PBN) is one of priority elements in Asia/Pacific seamless ATM plan and enables to set flexible air route in using the aircraft equipped with GPS and Flight Management Computer System (FMS). It is indispensable for increasing air traffic with safety ensuring.

2. ACTIVITIES

2.1   Japan has provided the ATS route and PBN procedure design course as Official Development Assistance (ODA) since 2011 for 6 years. This course has been established to aim to enhance the capacity for flight procedure design including PBN procedures through understanding the related technical standards and techniques. Until this year, Japan has invited about 10 personnel every year who are engaged flight procedure design from totally 7 countries. This course mainly consists of following contents;

- Lecture
    - Overview of flight procedure design
    - Overview of PBN
    - Quality assurance for flight procedure design
    - Geographic data and obstacle data
- Exercise
    - Manual procedure design based on PANS-OPS
    - Survey exercise
    - Procedure design by using automated design tool
- Site visit
    - Flight Procedure Office in ATM center in Japan

2.2   Under the scheme of ODA, Japan has provided technical assistance to introduce PBN to some States with the flight procedure design tool. As for technical assistance, PBN experts were dispatched and supported for following activities;

- To check availability of WGS84 survey data and conduct additional surveys
- To publish coordinates of runway ends, radio navigational aids, obstacles, etc. with WGS84
- To conduct basic training for flight procedure designers
- To produce standards and manual for flight procedure designs
- To conduct flight procedure designs
- To conduct ground/flight validation of designed flight procedures
- To conduct training for air traffic controllers at airports where PBN is to be introduced
- To develop standards for operational approval of air operators
- To implement operational approval of air operators
- To conduct safety assessment for PBN flight procedures
- To provide RAIM information to air operators
- To publish and start operation with PBN flight procedures

2.3   As the conventional procedure may be available by manual designing, it possibly includes errors with time-consuming tasks, and it is difficult to design PBN procedure because it needs complicated calculation and data management. ICAO Doc9906 - Quality Assurance Manual for Flight Procedure Design - says that *use and validation of procedure design software tools facilitate the design work through a certain level of automation in calculation and procedure layout generation*, and *consequently the use of procedure design tools is encouraged in the framework of the quality process of Instrument Flight Procedure design*. Therefore, Japan also provided the training by using automated procedure design tool. Followings are the features of the provided tools;

- ◆ Although the design tool aims to automate the design process it also provides a variety of tools for manual drawing and area assessment. Users can:

  - ✓ Draw lines, shapes, area geometries, wind spirals and primary/secondary segments.
  - ✓ Perform a user-specified area assessment for the areas created by the user.

- ◆ Automation provided by the tool makes use of advanced algorithms to perform complex calculations for RNAV and conventional procedure designs. These algorithms also allow users to design protection areas and obstacle assessments with minimal inputs.

- ◆ Whole procedure from the initial approach segment through to a missed approach segment, is shown in a "single window". This is further enhanced by providing "what-if" scenario capabilities for procedure design. The ease of use also extends to the re-drawing of protected areas which can be achieved by means of a simple mouse operation.

- ◆ The procedure design tool provides a high degree of usability with a user-friendly interface which is aimed at increasing productivity.
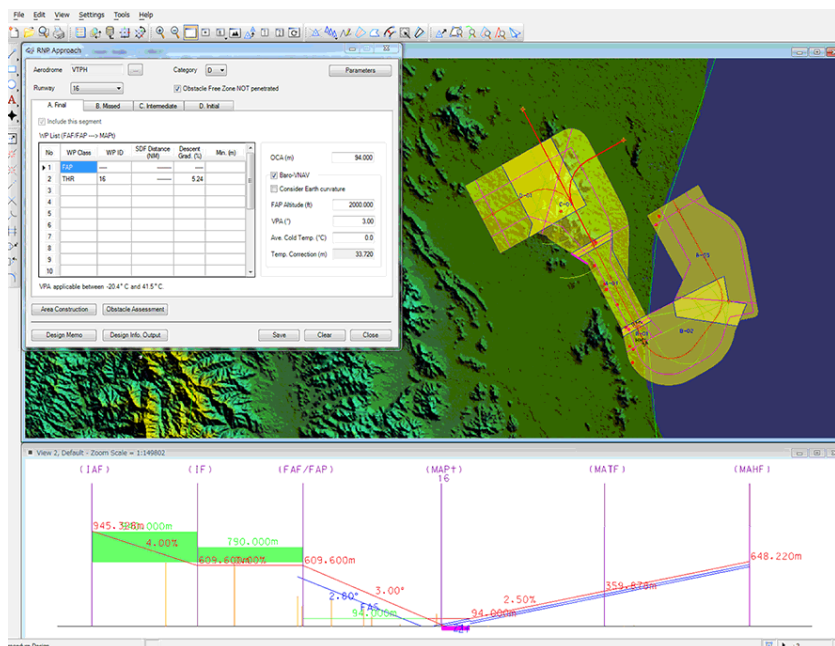
3.   ACTION BY THE CONFERENCE

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

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