

**55th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGION**

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AGENDA ITEM 4: AIR NAVIGATION

**AIR NAVIGATION SERVICES ENHANCEMENT INITIATIVES
OF NEPAL**

Presented by Nepal

INFORMATION PAPER

SUMMARY

For enhancing the aviation safety, efficiency, capacity and to cope with the increasing air traffic growth, improvements are considered essential in Air Navigation systems and services. On this ground, this paper presents the updated information on the improvement of Air navigation system and services in Nepal. The paper also explains about recent initiatives undertaken by CAAN and progress in the field of ATM, CNS, AIM, SAR and MET.

AIR NAVIGATION SERVICES ENHANCEMENT INITIATIVES OF NEPAL

1. INTRODUCTION

1.1 The formal beginning of aviation in Nepal started in 1949. Presently Nepal has 48 domestic airports and one international airport. Thirty-two international and twenty domestic airlines are operating in Nepal. Nepal has signed ASA with 38 countries.

1.2 Air traffic is continuing to rise in the Asia Pacific Region and around the world. Since many years except slight decline in 2015 due to earthquake, Nepal has realized continuous growth of international flight and passenger movements. In the year 2017, it has recorded 10.7% growth in international passenger and 23% growth in international aircraft movement as compared to the previous year. To cope with the international and domestic traffic growth, in addition to few domestic airports, Nepal is constructing three international airports among them one is going to complete in 2019 and next in 2021.

1.3 Nepal being a country of complex topography, it is challenging to ensure the uninterrupted CNS/ATM services at each location and airspace merely based on terrestrial CNS aids. CAAN has taken various initiatives to equip the airports with necessary communication, navigation and surveillance facilities together with the development of aerodrome and airfield infrastructure.

1.4 CAAN being also an ANS provider, it has been taking several initiatives for the operation, management and supervision of CNS and ATM system in accordance to ICAO SARPs for safe, smooth and reliable aviation activities. As a member of ICAO, COSCAP-SA and CANSO, it has followed the guidelines and procedures as per the resolutions made in different conventions and conferences.

2. DISCUSSION

2.1 Enhancement initiatives in the field of ATM:

Major CAAN initiatives in the key areas of ATS and AOM under ATM are as follows:

2.1.1 Air Traffic Services (ATS)

- Initiatives have been taken to enhance Air Traffic Services by reorganization and management of existing airspace structure and introduction of PBN concept into ATC operations. Initiatives have also been taken to introduce ATFM concept into ATC operations.
- Radar vectoring services has now been expanded from terminal airspace to enroute airspace of the country as well.

2.1.2 Airspace Organization and Management (AOM)

- Recognizing the significance of airspace design to enhance safety, capacity, efficiency, sustainability and accessibility of airspace and aviation operations, CAAN has taken initiatives to develop new routes and terminal procedures and revise existing domestic routes based on PBN principle as per the Nepal PBN Implementation Plan.
- RNP AR APCH procedure at Tribhuvan International Airport (TIA) has been implemented since June 2012. Eleven international operators are employing this procedure for landing at TIA. RNP AR SIDs and additional approaches at TIA is planned to be implemented by 2019.

- CAAN has implemented RNP1 SIDs, STARs and RNP APCH procedures at some major domestic airports Biratnagar, Dhangadhi and Chandragadhi. Some more domestic airports Janakpur, Nepalgunj and Bhairahawa are in the pipeline.
- Recently, flight procedure design automation software has been introduced to enhance the in-house capability to design instrument flight procedures- both terminal and en-route.

2.2 **Enhancement initiatives in the field of CNS**

2.2.1 Plan and manage Com. and Nav. Aid., Radar/RDPS, running the aviation services and facilities as per the international standards and introduce new technologies as per replacement plan. Installation of new equipment like RCAGs, MSSR, AMHS, VCCS, E-strips System and its Training have been conducted.

- **Communication**

VHF communication coverage has been significantly improved specially in the remote mountainous areas and to cover whole Nepalese FIR by the introduction of RCAG-west and RCAG-east stations.

CAAN has planned to strengthen domestic internal ATS Voice/Data Network and upgrade AMHS nodes by 2019.

- **Navigation**

PBN has become a major navigation enabler of airspace concept where the foremost NAVAID infrastructure is Global Navigation Satellite System (GNSS). So, to ensure the availability and reliability of GNSS signal, CAAN has planned to acquire GNSS Signal monitoring system in near future.

To enhance the airport accessibility and safety, it is planned to install DVOR/DME at two domestic airports Dhangadhi and Chandragadhi by 2019 and Localizer/T-DME at TIA by 2020.

- **Surveillance**

To ensure safer and more efficient aircraft operations in Nepalese airspace by enhancing the surveillance coverage in Nepalese FIR, modern air traffic control systems and services have been introduced utilizing the Enroute Mono-pulse Mode-S Surveillance Radar (E-MSSR), and new Terminal Mono-pulse Mode-S Surveillance Radar (T-MSSR), and Multi Surveillance Data Processing System (MSDPS). ADS-B is planned to be introduced to provide surveillance service in the western part of the country as well as a backup to existing MSSR system by 2019.

- **Automation**

E-Strips, AMHS and MSDPS have been effectively implemented at TIA as part of ATC Automation. Further, CAAN has allocated programmed budget for the study and implementation of AIDC for the upgradation of present ATM system.

Initiation has been taken to establish bi-lateral technical interoperability relations with KUNMING FIR/ATMB China.

2.3 Enhancement initiatives in the field of AIS:

2.3.1 CAAN is in the initial process of phase-wise implementation of AIS to AIM transition.

2.3.2 The preparation of design and specification for AIS automation project is in progress.

2.3.3 The project is supported with necessary budget and resources necessary for strengthening AIS capability and transition to AIM.

2.4 Enhancement initiatives in the field of SAR:

2.4.1 New SAR regulation has been formulated.

2.4.2 Revision of existing SAR manual is in progress to make it more compliant to ICAO SARPs.

2.4.3 Due care has been given on equipment, trainings and infrastructure development to improve RCC functions

2.5 Enhancement initiatives in the field of Aviation MET:

2.5.1 CAAN and Department of Hydrology and Meteorology (DHM) signed an agreement to ensure the smooth provision of meteorological services in Nepal as required by ICAO Annex 3.

2.5.2 DHM is recently planning to:

- install RVR for RWY 20 and AWOS at TIA,
- introduce Aviation Weather Radar System for the observation and analysis of weather phenomena of western part of the country and
- expand the scope of Aviation MET services to 20 more additional domestic airports with modern meteorological equipment.

2.5.3 Despite routine Aviation MET Services, SIGMET service has also been regularly provided to facilitate airline pilots and all airspace users.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper regarding Nepal's initiatives for the improvement of Air Navigation System and Services.