



# **PBN IMPLEMENTATION STATUS IN NEPAL March 2012**

**Civil Aviation Authority of Nepal**

# INTRODUCTION

- Nepal PBN Implementation plan revised and submitted to ICAO, currently under revision by PBN Review group
- Commitment to adopt PBN implementation and intent to proceed to the extent possible as per the PBN plan
- More efficient use of airspace and more flexibility for procedure design
- Ultimate goals are the improved safety, capacity, predictability, operational efficiency, and reduced environmental impact



**PART 1**  
**RNP AR APCH IMPLEMENTATION AT**  
**Tribhuvan International Airport**

# RNP AR IMPLEMENTATION AT TIA

Project objectives, Fleet Assessment and Selection of Nav Spec

31 March -1 April 2011

- A PBN Implementation Workshop was conducted in Kathmandu with the facilitation of COSCAP and ICAO FPP in which QUOVADIS presented the viability of RNP AR Approach to improve TIA operations
- Airbus graciously agreed to support the project financially
- 65 representatives including almost all the 29 air operators flying to/from Kathmandu attended. A survey revealed that 15 operators have RNP AR APCH capability and 7 can be readily upgraded for it. About 68% aircraft fleet flying to Kathmandu were capable of flying RNP AR APCH

# RNP AR IMPLEMENTATION AT TIA

Data quality is essential : AIP data update required

- Jul 2011
  - QUOVADIS, together with FUGRO GEOID SAS, a French data survey company recognized by DGAC France, performed an obstacle data survey around Tribhuvan International Airport for the implementation of the RNP AR procedure
  - CAA Nepal approved Data Survey Report
- Feb 2012
  - AIP SUPP issues on updated THR coordinates, runway elevation and obstacles

# RNP AR IMPLEMENTATION AT TIA

## Publication of PBN regulation

- Aug 2011
  - AIC issued concerning the ATS Requirements for PBN operations
- Nov 2011
  - Approval of Nepal PBN Operational Handbook

# RNP AR IMPLEMENTATION AT TIA

Collaborative work: procedure designers, local ATC for efficient integration into the existing traffic, airlines for operational inputs

- 2-3 Aug 2011
  - Conceptual design review of the RNP- 1 STARs and RNP AR APCH to RWY 02 proposed by QUOVADIS, held in CAAN with all project stakeholders
  - Fruitful discussions and collaborative work to accommodate the requirements and constraints of all. All stakeholders agreed on the procedure final design to be produced by end 2011
- 5-6 Dec 2011
  - Detailed Design Review Meeting with CAAN, QUOVADIS and project airlines in Kathmandu
  - Detailed design of RNP-1 STARs from South, West and East, and RNP AR Approach from South approved by CAAN



# RNP AR IMPLEMENTATION AT TIA

## Procedure validation and approval process

- Oct-Nov 2011
  - QUOVADIS procedure verification and validation internal process : fully documented and submitted to CAAN
  - Procedure technical report and charting approved by the French Civil Aviation University (ENAC)
- Dec 2011
  - CAAN officials and Qatar Civil Aviation Authority performed a Full Flight Simulator Session on Qatar Airways' A320 Simulator in Doha to validate Kathmandu RNP procedures



# RNP AR IMPLEMENTATION AT TIA

## Procedure validation and approval process

- Dec 2011 (cont'd)
  - All procedures were flown in All Engines Operative and One Engine Inoperative conditions and found appropriate in all tested scenarios
  - The fly-ability was satisfactory
  - No significant deviation –vertical and lateral- was observed and no TAWS alert triggered

# RNP AR IMPLEMENTATION AT TIA

ATC Training is key to the success of the project

- 12-14 Dec 2011
  - QUOVADIS ATM Expert conducted three one-day PBN courses for ATCs focusing on RNP AR APCH procedure and ATC role
  - The training was interactive, informative and useful for ATCs
  - Separation between RNP AR approach aircraft and other traffic, phraseology and clearance to be used were reviewed

# RNP AR IMPLEMENTATION AT TIA

Procedure publication for operational use planned early April

- 09 Feb 2012
  - Real Time Altimeter Setting approved for operational use
- 19 Mar 2012
  - Successful Demonstration Flight performed by Qatar Airways with QCAA and CAAN on board
- Today
  - Procedure documentation approval by CAAN in final stage
- 5 Apr 2012
  - Procedure will be published in AIP SUPP on AIRAC Date Cycle 5 April 2012

# RNP-1 STARs AT TIA

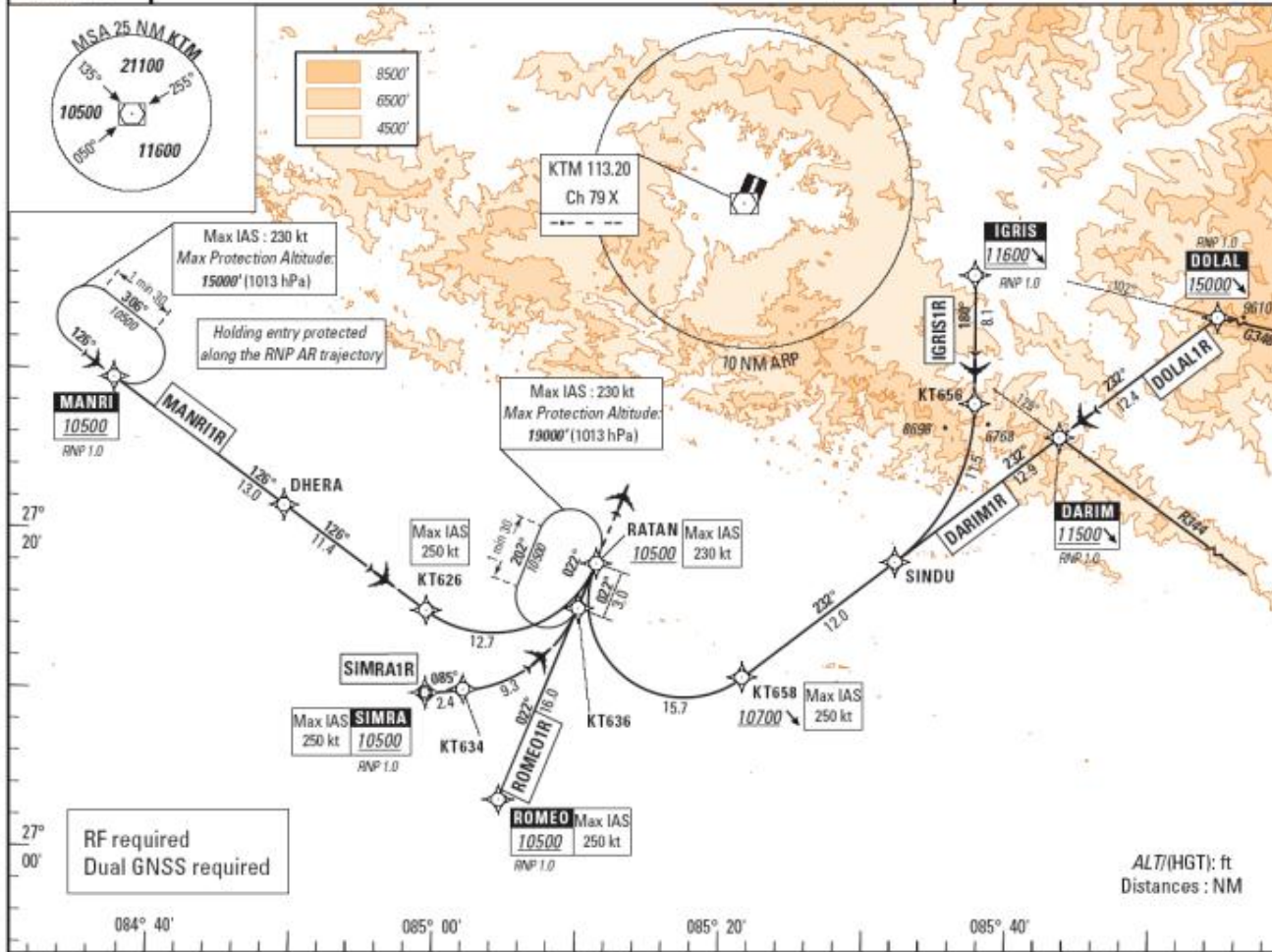
CAT.: A B C D

AD ELEV : 4395, THR ELEV : 4318 (148 hPa)

Kathmandu - VNKT

RNAV (RNP) - STAR - RWY02

APP : 120.6	<b>AUTHORIZATION REQUIRED</b>	VAR : 0°W (10)	STAR 1
TWR : 118.1		ARP : 27°41'49"N 085°21'28"E	
GND : 121.9		Minimum Temperature: -10°C	
Trans Alt : 13500'			



# RNP AR APCH RWY02

- Improved safety
- Smooth descent and easier energy management
- Fully managed approach and missed approach
- Missed approach segregated thus improved capacity

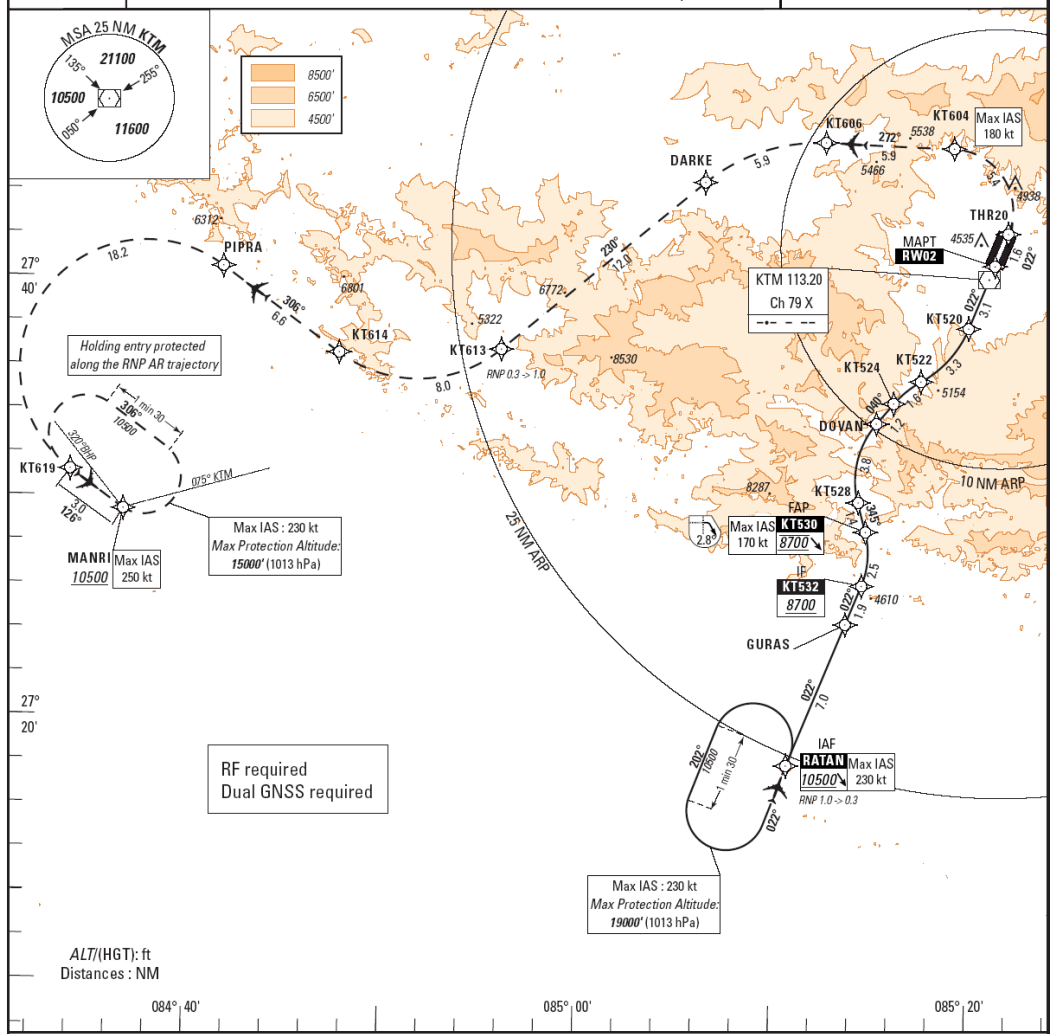
CAT. : A B C D

AD ELEV : 4395, THR ELEV : 4318 (148 hPa)

Kathmandu - VNKT

RNAV (RNP) - APPROACH - RWY02

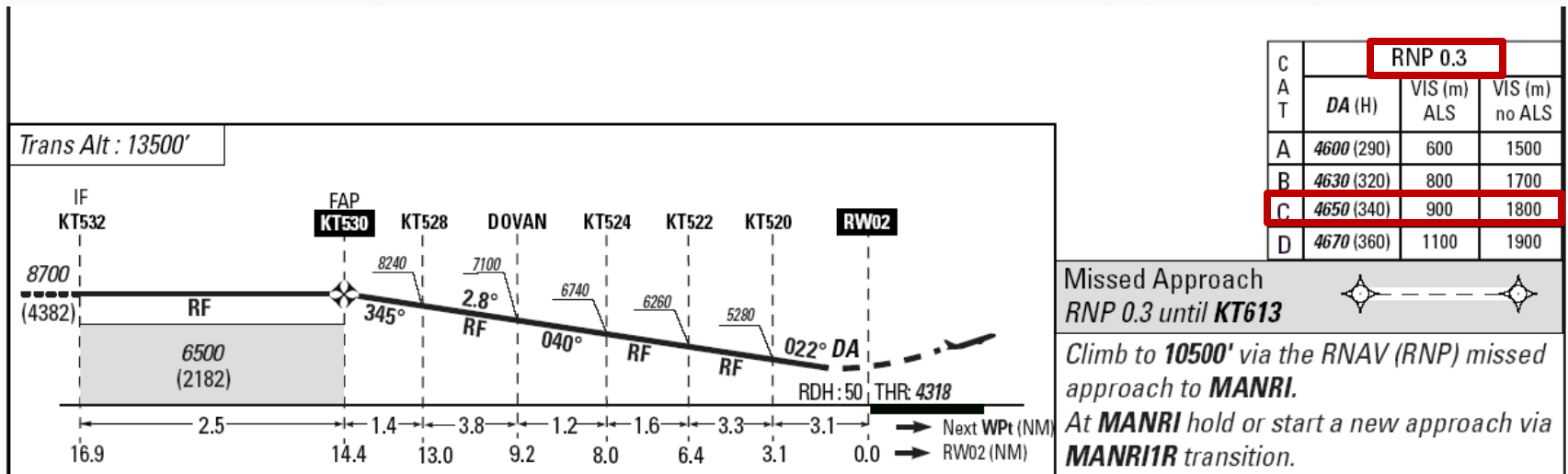
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GND : 121.9			





# RNP AR APCH RWY02

- DH instead of MDH
- Reduced minima and visibility criteria
  - CAT C : DH 340ft (VOR MDH 635ft)



C A T	RNP 0.3		
	DA (H)	VIS (m) ALS	VIS (m) no ALS
A	4600 (290)	600	1500
B	4630 (320)	800	1700
<b>C</b>	<b>4650 (340)</b>	<b>900</b>	<b>1800</b>
D	4670 (360)	1100	1900

For Demonstration Flight purpose only

V1.6 15 MAR 2012 CHG : AD Elev

QUOVADIS® GéoTITAN® & AIP-GIS Charting®



**PART 2**  
**PBN IMPLEMENTATION STATUS OF OTHER  
NAVSPECS**



# BIRATNAGAR RNP APCH

- December 2011
  - RNP APCH has been designed and flight validated by Aerothai.
- 30 April 2012
  - The procedure will be published in AIP SUPP on AIRAC Date Cycle and will come into commercial use subsequently.

# RNP APCH NEXT STEPS

- 2012
  - CAAN intends to introduce RNP APCH at Chandragadhi Airport
- 2013
  - CAAN intends to introduce RNP APCH at Gautam Buddha Airport



THANK YOU