9 April 2003

# ANSP COMMON METHODOLOGY FOR P-RNAV IMPLEMENTATION IN ECAC TERMINAL AIRSPACE

**1**

Collaborative decision by Users & ANSP to identify need for P-RNAV implementation.
Consider -
- ✦ Benefits of Terminal Airspace optimisation using P-RNAV e.g. ATC Workload reduction, fuel reduction, ACFT equipage cost (Cost benefit analysis)
- ✦ Viability of phased implementation to ease transition from operational perspective
- ✦ Associated ATC Procedures required to reap benefits.
- ✦ Impact of P-RNAV / Conventional Nav. Mix on ATC and Operators (e.g. Effects on operators not P-RNAV approved)
- ✦ Nav infrastructure requirements & associated RNAV flight checking
- ✦ PANS-OPS Procedure design: limitations & opportunities (e.g. Training of designers)

***Decision & Action -***
- ✦ Time scales for all actions associated with P-RNAV implementation#
- ✦ Notification of intent by operators to implement P-RNAV#

*( # These items may only be of relevance to States regularizing their RNAV applications by implementing P-RNAV)*

*GUIDELINES & REFERENCE MATERIAL FOR P-RNAV IMPLEMENTATION*

A. ECIP NAV.03

B. EUROCONTROL: REVISED SPECIMEN AIC : OPERATION OF PRECISION RNAV (P-RNAV) AIRBORNE EQUIPMENT IN ECAC TERMINAL AIRSPACE [Pending]

C. STANDARDISED SPECIMEN AIP TEXT (TO BE PREPARED BY EUROCONTROL)

- ✦ **Evaluation Phase (Qualitative Analysis)**
- ⇨ Proposed P-RNAV route placement [subject to NAV infrastructure availability & coverage]
- ⇨ Consider P-RNAV procedure design (PANS-OPS)
- ⇨ Re-design of Terminal Airspace volume, if required
- ⇨ Re-design of ATC sectorisation, if required
- ✦ **Quantitative Analysis**
- ⇨ ATM safety case to assess acceptability of proposed routeing and airspace changes; incl FTS/RTS as required.
- ⇨ If acceptable, continue with PANS-OPS procedure design for P-RNAV certified aircraft

**2**
**TERMINAL AIRSPACE MODIFICATIONS**

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D. EUROCONTROL: TERMINAL AIRSPACE DESIGN - GUIDELINES FOR AN OPERATIONAL METHODOLOGY[Edition 1, 1998) *Note: 2nd Edition Under Development, contact TATF*
E. ICAO: ATS PLANNING MANUAL - Doc. 9426 ()
F. ICAO: MANUAL ON AIRSPACE PLANNING METHODOLOGY FOR THE DETERMINATION OF SEPARATION MINIMA - Doc. 9689 ()

- ✦ **APPLICATION OF AVAILABLE STANDARDS AND GUIDANCE ON-**
  - ⬩ Minimum complexity
  - ⬩ Way-point naming
  - ⬩ Validation of procedures (e.g. flight checking & flyability for all ACFT. types)

**3.a ENSURE AVAILABILITY OF REQUIRED NAVAIDS**
- ⬩ Determine current P-RNAV coverage
- ⬩ Establish means of flight checking

**3.b ENSURE ACCURACY AND INTEGRITY OF ASSOCIATED CO-O0RDINATE DATA**
- ⬩ Verify WGS/84 compliance and associated AIS processes

**3.c P-RNAV PROCEDURE PUBLICATION**
- ⬩ AIP description incl. coding advice, charting, advice on when to engage RNAV/FMS (e.g. LNAV); non P-RNAV procedures
- ⬩ Application of available standards and guidance

**3**
**RNAV PANS-OPS PROCEDURES DESIGN**

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G. ICAO: AIRCRAFT OPERATIONS - Doc. 8168 ()
H. EUROCONTROL: GUIDANCE MATERIAL FOR DESIGN OF TERMINAL PROCEDURES (DME/DME, BARO-VNAV & RNP- RNAV) [Edition 3, JANUARY 2003] **
I. ICAO: AERONAUTICAL INFORMATION SERVICE, ANNEX 15 ()
J. EUROCONTROL: DATA ORIGINATION STANDARD [1st Edition, Pending ]
K. EUROCAE: STANDARDS FOR PROCESSING AERONAUTICAL DATA, ED-76A
L. EUROCAE: STANDARDS FOR AERONAUTICAL INFORMATION, ED-77A
M. JAA: TEMPORARY GUIDANCE LEAFLET Number 10: AIRWORTHINESS AND OPERATIONAL APPROVAL FOR PRECISION RNAV OPERATIONS IN DESIGNATED EUROPEAN AIRSPACE [November 2000]; *See specifically Section 4, ANSP assumptions*.
N. WGS SURVEYING, EUR DOC 007 (to be superceded by Ref. J) (see also http://www.wgs84.com/wgs84/downloads.html)

- ✦ IntroduceP-RNAV ATC procedures as per ICAO (e.g. use of waypoints for tactical routeings, aircraft RNAV contingencies) supplemented by -
  - ⬩ Local procedures, as required
  - ⬩ Local procedures for handling non-approved aircraft
  - ⬩ Publication of ATC procedures in local operations manuals and related documents.

**4**
**ATC PROCEDURES**

O. ICAO: AIR TRAFFIC MANAGEMENT, Doc. 4444 ATM/501 ()
P. ICAO: REGIONAL SUPPLEMENTARY PROCEDURES, Doc. 7030 ()

- ✦ Adapt local FDPS for processing of aircraft P-RNAV equipment info;
- ✦ Implement capability for automatic and systematic display of individual aircraft RNAV equipment information to ATC; (Radar or Flight Strip)

**5**
**ATC SYSTEM MODIFICATIONS**

Q. Ref. A

- ✦ Schedule and perform
  - ⬩ Local ATC training, taking into account
  - ⬩ Local real-time simulations

**6**
**ATC TRAINING**

R . EUROCONTROL TRAINING SUPPORT MATERIAL (Pending)

As required by National Authority -
- ✦ Documentation of processes and applied standards
- ✦ Address local peculiarities & local risk mitigation where required
- ✦ Detailed requirements dependent on requirements set by state authority taking into account material agreed through EUROCONTROL safety regulation material

**7**
**LOCAL P- RNAV SAFETY CASE**

S. EUROCONTROL: P-RNAV R. SAFETY ARGUMENT (May be used as basis for local P-RNAV Safety Case)
T. EUROCONTROL- SAFETY REGULATION COMMISSION: ESARR http://www.eurocontrol.be/src/index.html
T.1 http://www.eurocontrol.int/safety/GuidanceMaterials_SafetyPolicy.htm
T.2 http://www.eurocontrol.int/safety/GuidanceMaterials_SafetyAssessmentMethodology.htm

**IMPLEMENTATION**

*(Re **H**: This document incorporates two EUROCONTROL documents viz.*
- *EUROCONTROL: GUIDANCE MATERIAL FOR DESIGN OF TERMINAL PROCEDURES FOR DME/GME & GNSS AREA NAVIGATION. [Edition 2.2, September 2001]*
- *EUROCONTROL: CHARTING GUIDELINES FOR RNAV PROCEDURES. [Edition 1_1, May 2002])*

**SYSTEM MONITORING & INCIDENT REPORTING**

*APPROVED BY ANT/30*
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