ESESA EGNOS Service Extension to South Africa

EGNOS IMPLEMENTATION: EUROCONTROL ACTIVITIES

ESESA Aviation Workshop 26th – 27th October 2010

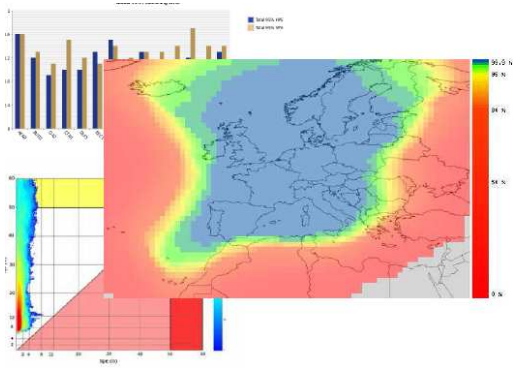
ESESA is a project co-funded by the EU 7th FP and South Africa

Overview

- Eurocontrol’s role in EGNOS development
- The ATM environment and Eurocontrol tasks
- Main EGNOS implementation activities
- Focus on safety assessments
- Focus on GNSS NOTAM system

Eurocontrol and EGNOS Development

- Part to the Tripartite Agreement on EGNOS programme with EC and ESA (1998)
- Eurocontrol provided expertise on civil aviation requirements and support to operational introduction
- Eurocontrol organised monitoring of the system performance to verify that the aviation requirements were met:
  - ✓ Development of the appropriate tools (PEGASUS)
  - ✓ Deployment with many ANSP's of the EGNOS Data Collection Network (21 EGNOS receivers across Europe)
  - ✓ Developments of methodologies for data collection, evaluation, performance assessment and results presentation
  - ✓ Harmonization of the performance assessments with Certification Team

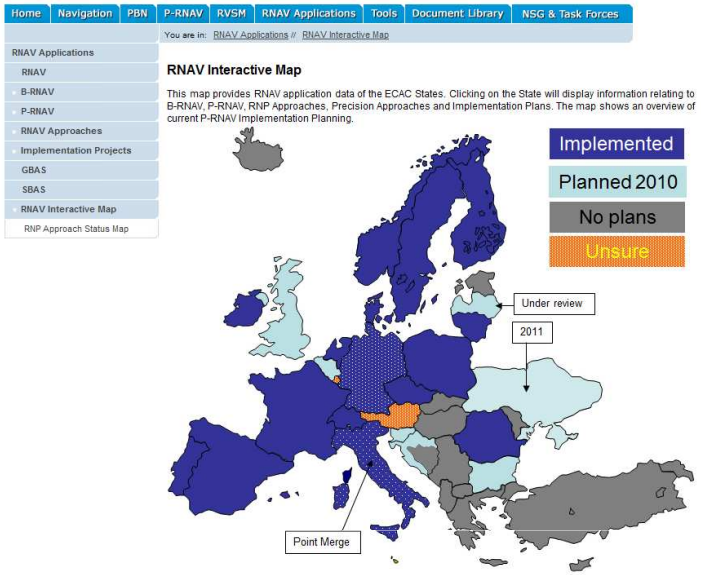


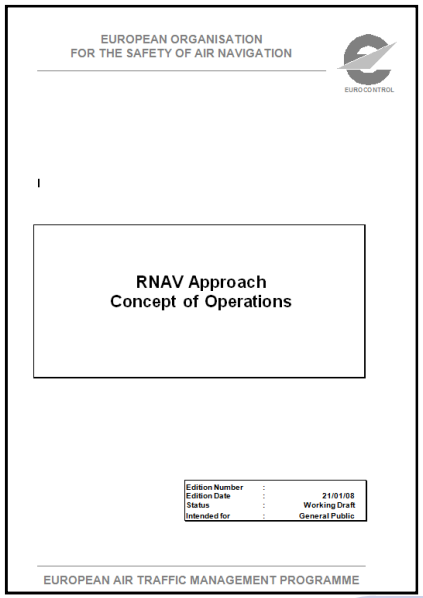
The ATM environment and Eurocontrol tasks

- A permanent evolutionary environment
  - ✓ New concepts permanently evolving (B-RNAV, RVSM, P-RNAV, PBN, FAB etc.)
  - ✓ Increasing pressure of Member States and airlines to face airspace congestion
  - ✓ EU basic regulatory framework re-designed in depth (SES package I and II, EASA)
  - ✓ Definition phase and launch of the SESAR programme with the EC
  - ✓ Commissioning into service EGNOS for aviation use (SoL)
- ANSPs urgent needs for APV implementation
  - ✓ Cost benefit assessment
  - ✓ Safety assessment
  - ✓ Procedure design and validation
  - ✓ Fleet upgrade and airworthiness/ops approval
  - ✓ Demonstrations in the field
  - ✓ Supporting tools (Recording, Notam etc.)
  - ✓ Compliance to SES regulations

Main EGNOS implementation activities (1)

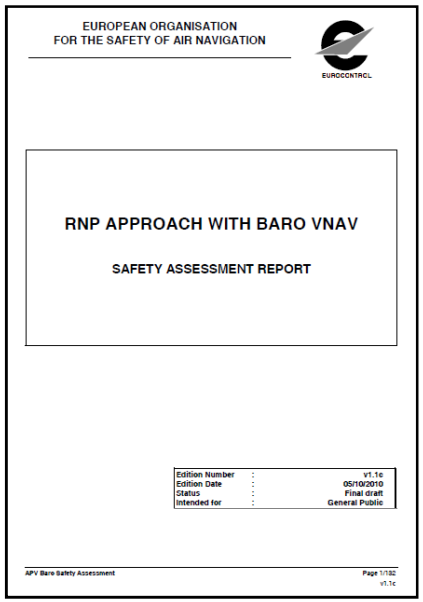
- Coordination and information dissemination
  - ✓ Synthesis of ECAC MS plans for PBN and RNAV GNSS Approach implementation
  - ✓ Coordination with ICAO, EC/ESA EGNOS programme and SESAR JU, FAA
- Operational field
  - ✓ Elaboration of CONOPS for different types of APV (Baro-VNAV and LPV)
  - ✓ Implementation of APV procedures:
    - Development of guidelines for RNP APCH implementation
    - ATC procedures – Runway infrastructure requirements
    - Development of a GNSS NOTAM system and update of the AUGUR web tool





Main EGNOS implementation activities (2)

- Safety – Airworthiness and regulatory fields
  - ✓ Development of 2 generic safety assessments (APV Baro-VNAV and APV SBAS)
  - ✓ Follow up of EASA AMCs drafting
  - ✓ Participation to EGNOS and ESSP certification processes
  - ✓ Investigations and development of Implementing Rules (IR in the SES framework)


EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL

RNP APPROACH WITH BARO VNAV

SAFETY ASSESSMENT REPORT

Edition Number	:	v1.1c
Edition Date	:	05/10/2010
Status	:	Final draft
Intended for	:	General Public

APV Baro Safety Assessment Page 1/182 v1.1c

- EU funded projects on APV testing & implementation
  - ✓ Procedure design and aircraft equipage/certification
  - ✓ Customized Cost Benefit Analysis
  - ✓ Flight demonstrations

HEDGE

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ACCEPTA

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Airbus ATI Project

Focus on Safety Assessments (1)

- Two independent but consistent (assumptions) safety assessments
  - ✓ APV Baro-VNAV : comparative assessment with GPS NPA (LNAV); work achieved.
  - ✓ APV SBAS: comparative assessment with ILS; final report scheduled end 2010

- APV Baro VNAV safety assessment
  - ✓ Report reviewed by the Eurocontrol Safety Regulatory Unit (SRU)
  - ✓ Publicly published on Sept 2010

This report addresses a Specimen application of APV Baro. As such, it is left to individual Stakeholders to adapt the APV Baro design and the results herein to their own specific operational environment and local conditions. It is expected that local safety cases will make use of this document and expand it to address the local design and conditions and to further cover the implementation, transition into service and operational lifecycle phases

The safety assessment provides evidence supporting the claim that the APV Baro system has been specified and designed to be acceptably safe. It addresses the differences between the Specimen Baseline operations considered (GPS NPA) and APV Baro operations and identifies Service Safety Requirements and Safety Objectives that need to be fulfilled in order to satisfy the Safety Targets.

Focus on Safety Assessments (2)

- APV SBAS safety assessment
  - ✓ Work on going, final report expected end 2010
  - ✓ Identical methodology to the one applied for APV Baro VNAV
  - ✓ Formal acceptance of the methodology explains the delays between both assessments

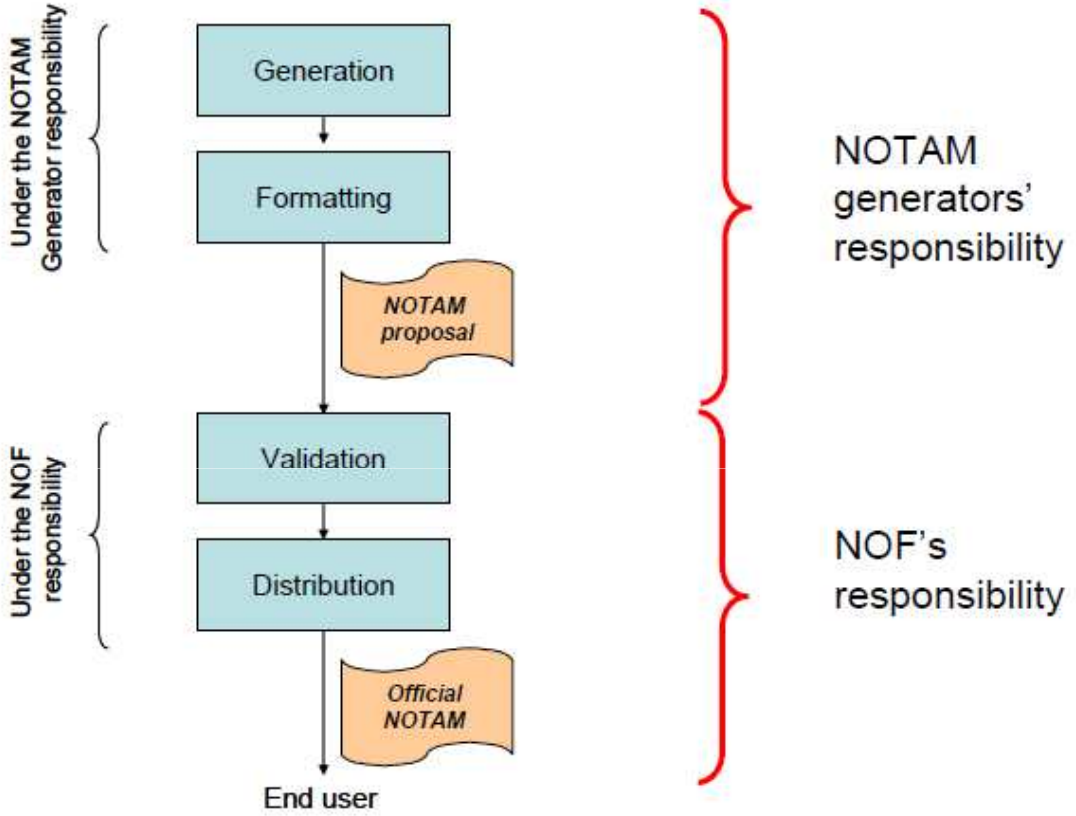
- Other safety assessments development
  - ✓ APV SBAS safety assessment developed by DSNA (French ANSP)
    - Generic safety assessment
    - Tailored to 11 airports
    - APV SBAS procedures to be published once EGNOS SoL operational
  - ✓ APV SBAS safety case developed by “pilot” projects:
    - Customized to the airports at stake in the projects
    - Build upon available generic safety assessment material
    - Helicopters operations considered in some projects (ambulance in Switzerland and North Sea oil platforms air services)

Focus on GNSS NOTAM System (1)

- Background: Eurocontrol GNSS tools
  - ✓ Development of GNSS data collection and analysis: PEGASUS (SBAS – GBAS)
  - ✓ Development of GNSS ops tools: RAIM prediction tool (AUGUR) – Web based
- New needs arising around the SBAS service provision
  - ✓ Identified in the APV safety assessments
    - GNSS NOTAM service including EGNOS service
    - RAIM prediction able to support SBAS capable aircraft
  - ✓ Consolidated with Transport Canada and FAA (WAAS)
  - ✓ Questions from ECAC ANSPs about GNSS monitoring and alerting service
- Eurocontrol action
  - ✓ To develop and set up a GNSS Information System for Europe (GISE)
  - ✓ By upgrading European NOTAM system to account for the implementation of GNSS based RNAV approaches
  - ✓ Objective: GNSS NOTAM to predict and inform about foreseen unavailability of system/function required for RNAV GNSS approach procedures

Focus on GNSS NOTAM System (2)

- Principle and responsibilities



- Issues
  - ✓ EGNOS and RAIM NOTAMS
  - ✓ Information distribution channels
    - AFTN
    - EAD (ESIT and ESI interfaces)
    - Web (AUGUR tool)

Focus on GNSS NOTAM System (3)

- Roles and architecture for RAIM and EGNOS pre-flight information service