PBN Implementation Status in Spain

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Aena

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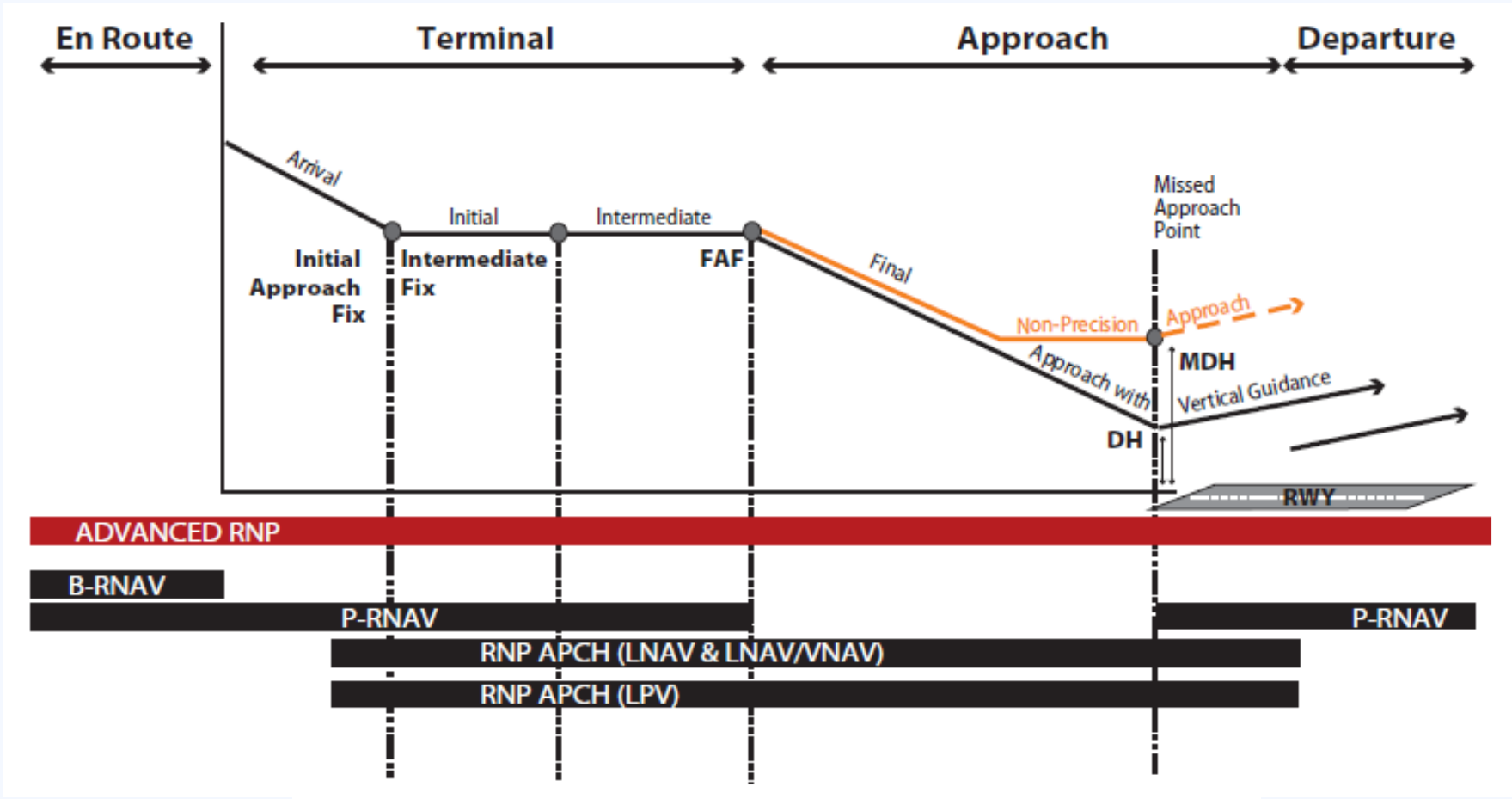
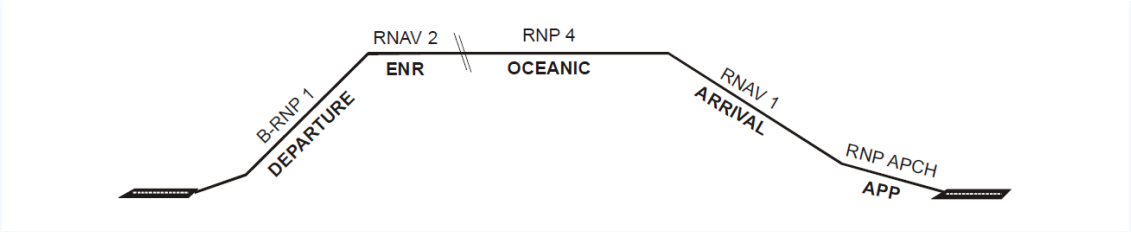
GNSS as a valid sensor





GNSS usable for air navigation

- **Air Navigation in Spain**
  - DGAC (Direccion General de Aviación Civil) → Spanish CAA
  - AESA (Agencia Española de Seguridad Aerea) → NSA (NationalSupervisory Authority)
  - Aena (Aeropuertos Españoles y Navegación Aerea) → ANSP (Air Navigation Service Provider)
- **Several letters and documentation exchanged recently between the three partners in order to establish the guidelines and strategy for the use of GNSS as a valid sensor for Air Navigation within the TMA**

GNSS usable for air navigation

- **DGAC has approved the use of GNSS as a valid sensor for P-RNAV and RNP APCH in the Spanish Air Navigation following**
  - **Requirements and conditions that AESA imposes**
  - **Based on the strategy proposed by Aena, that is in line with ICAO**
  - **Establish the framework for the use of GNSS systems for navigation applications in Spain**

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2. RNAV-5 (B-RNAV) status

- **FL150 or above**
  - **for ATS routes**
  - **for those in Lower Airspace classified as RNAV (AIP GEN 1.5-1).**
- **In the short-term, B-RNAV will be extended down to FL95**
  - **It still has to be approved by the Spanish Regulator (DGAC).**
- **TMAs**
  - **Barcelona and Canarias: B-RNAV (SIDs and STARs) to be terminated in the short-term as a result of the implementation of the new TMAs.**

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3. RNAV-1 (P-RNAV) status

- **P-RNAV currently based only on DME/DME**
- **Current P-RNAV SIDs and STARs published in AIP, together with conventional procedures:**
  - **Barcelona , Madrid, Canarias, Sevilla, Valencia, Palma, Pamplona and Jerez airports.**
- **P-RNAV is intended to be implemented in high-traffic density TMAs as a main navigation solution.**
  - **Minimum of conventional SIDs and STARs retained to provide service to exempted aircraft.**

3. RNAV-1 (P-RNAV) status

- **P-RNAV & GNSS**
  - **Plan to remove the restriction for P-RNAV procedures based only on DME/DME,**
    - **accepting GNSS as a valid sensor to fly those P-RNAV SIDs and STARs**
  - **Short Term (1 year timeframe)**
    - **Perform all common activities needed to be able to extend an existing P-RNAV by using GNSS as a sensor.**
    - **First P-RNAVs Selected:**
      - **P-RNAV Jerez**
      - **P-RNAV Sevilla**
  - **Mid Term**
    - **GNSS as an enabler in the design of new TMAs.**
    - **New designed TMAs and modifications of existing TMAs will include P-RNAV with GNSS as valid sensor**

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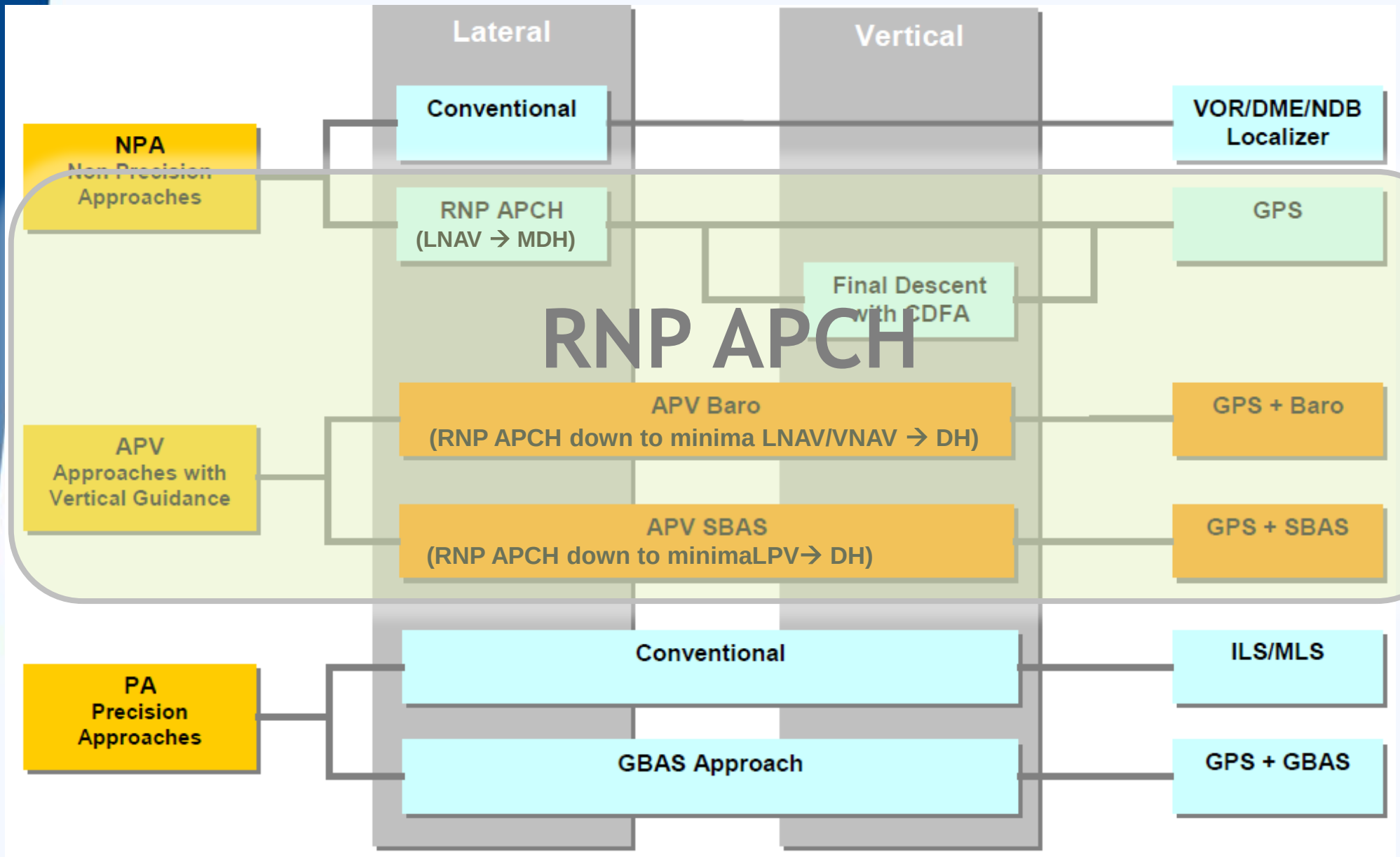
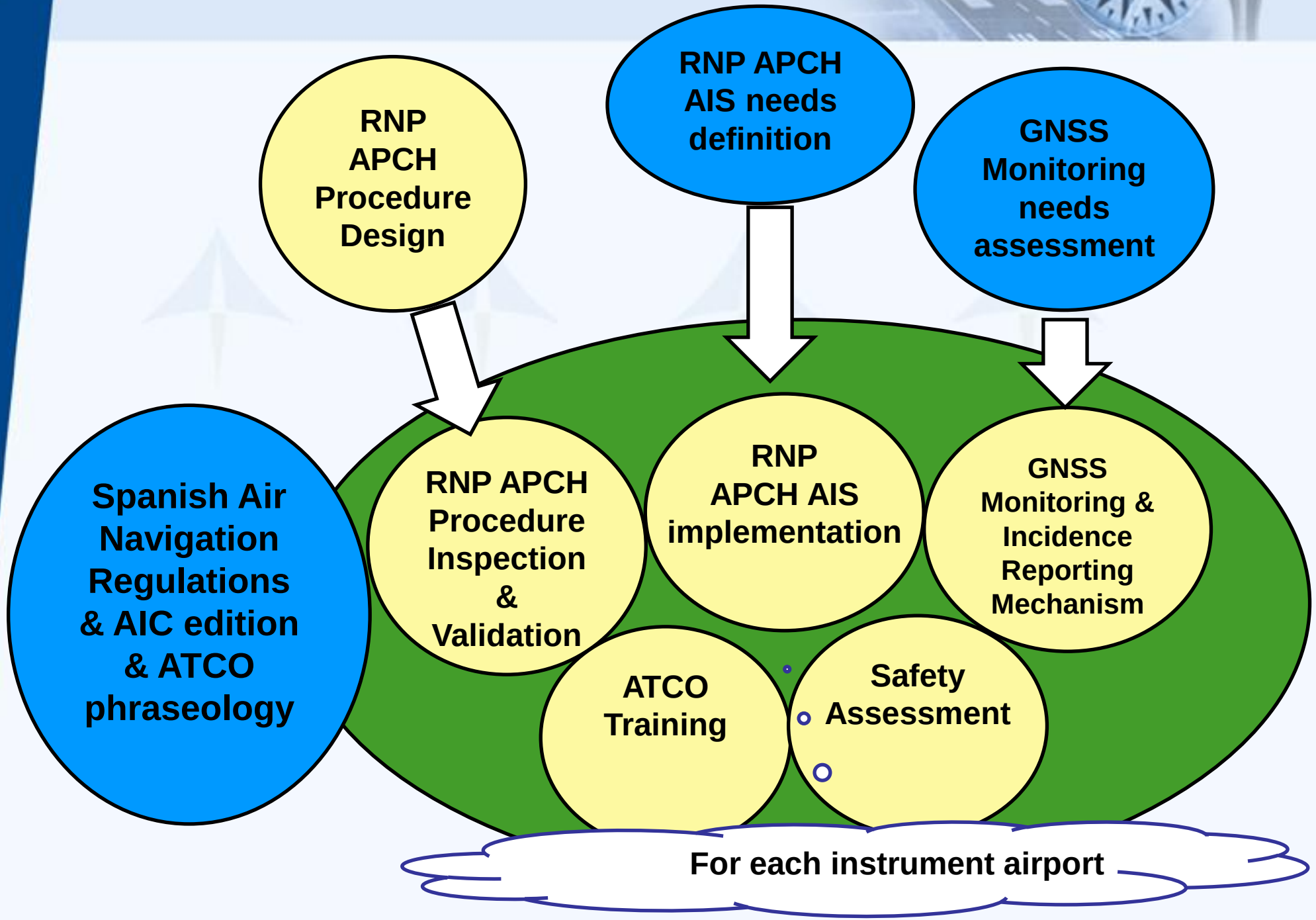


4. RNP APCH implementation plan



4. RNP APCH implementation plan

- **Short Term (1 year timeframe)**
  - **Perform all common activities needed to be able to publish the first RNP APCH procedure.**
  - **First procedure selected:**
    - **RNP APCH with 3 minima (LNAV, LNAV-VNAV, LPV) at Santander airport**

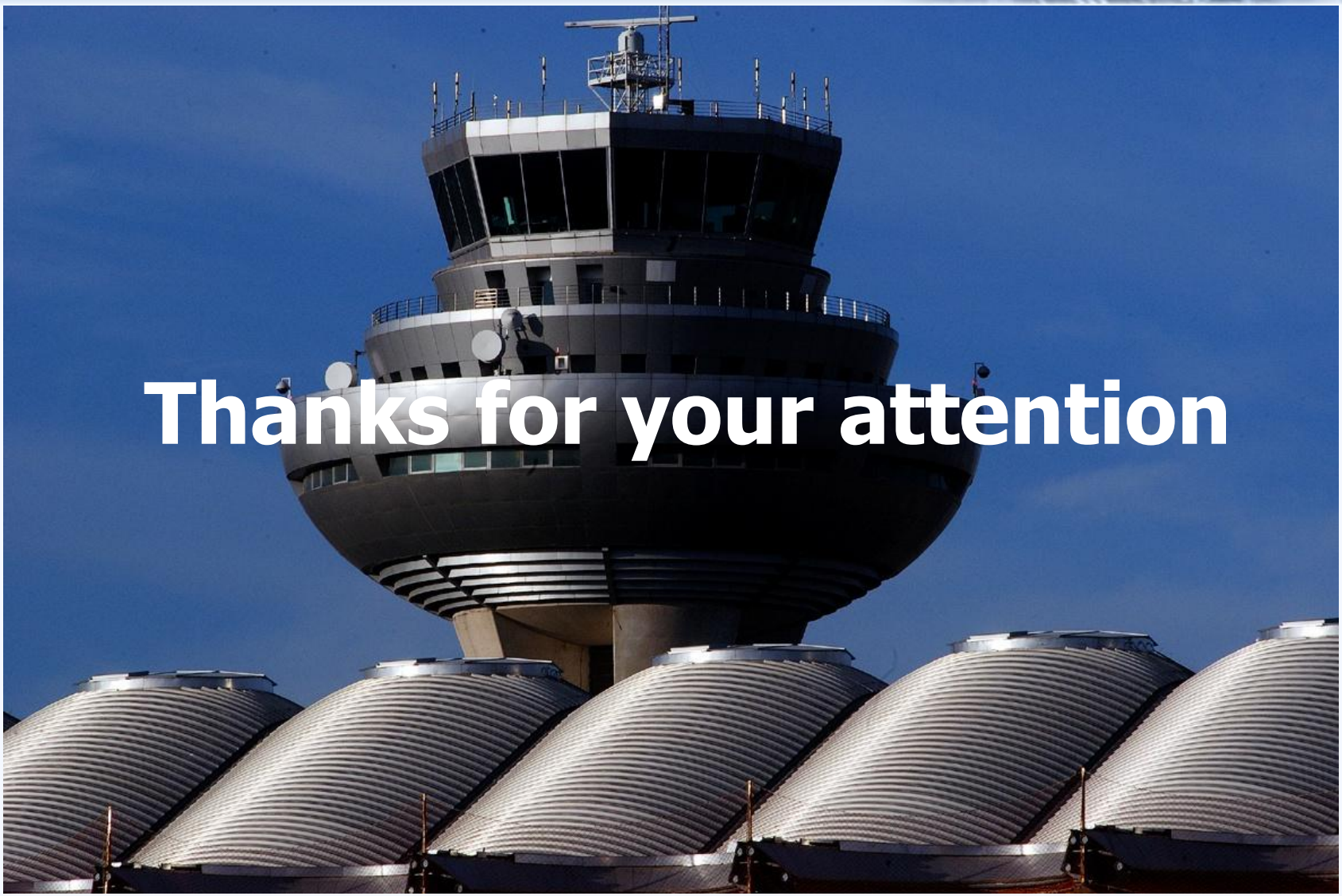
To achieve confidence on GNSS Operations

4. RNP APCH implementation plan

- **Mid Term**
  - **RNP APCH design at all instrument runway-ends.**
    - **As far as possible, design of the RNP APCH will consider 3 minima lines.**
    - **Next airports selected:**
      - **San Sebastian**
      - **Girona**

4. RNP APCH implementation plan

- **Main hurdles:**
  - Update of National Regulations
  - Workload for Safety Assessment (PSSA, FHA, SSA) for each RNP APCH procedure
  - Possible need to develop a GNSS performance simulation tool
  - CAA/NSA requirements on RNP APCH implementation
    - Limitation on the use of GNSS (requirements for conventional back-up, etc)
    - NOTAM implementation and usage by Pilots /ATCO
    - Flight Validation requirements
    - Requirements for GNSS Performance monitoring & reporting


Thanks for your attention