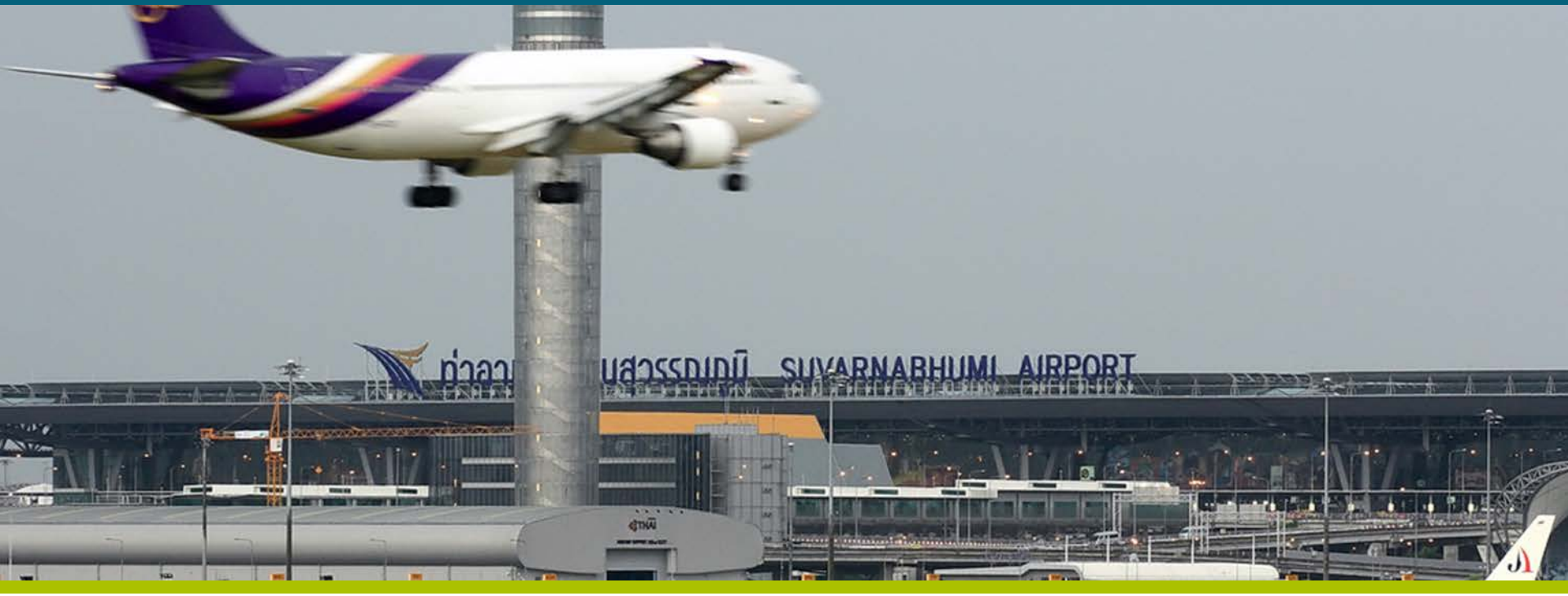
CREATIVE FOR THE LONG TERM



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From planning to implementation

Some examples of airspace reorganization projects

CONTENT

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2 AIRSPACE RE-ORGANISATION: PROJECT LIFECYCLE

3 EXAMPLE OF PROJECTS:

- 3.1 Morocco: airspace re-organisation
- 3.2 Jersey: TMA re-organisation
- 3.3 Philippines: safety studies
- 3.4 Europe: GARDEN project
- 3.5 West Africa: CCO/CDO

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THE EGIS GROUP

OUR FIGURES

egis

GROUPE Caisse des Dépôts

1 Billion USD

100 Countries

12 000 Employees

More than 50 Years of Operations

WHAT WE DO


CONSULTANCY
ENGINEERING
OPERATION & SERVICES TO USERS
PROJECT STRUCTURING
TURNKEY SOLUTIONS

WORLDWIDE PRESENCE

AVIATION DOMAIN: FROM SOFREAVIA TO EGIS

- 1969: Sofréavia

- 2005-2006 → Sofréavia joined the Egis group and became Egis Avia

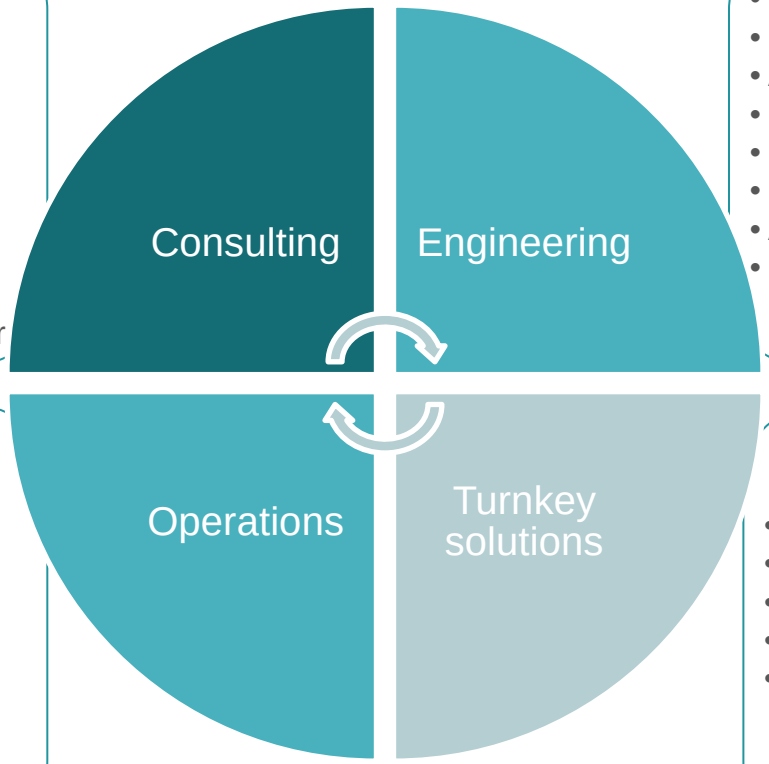
- 2012: Creation of Egis Airport Operation

- 2013 → Helios joined Egis

AVIATION: PORTFOLIO OF SERVICES

Our services cover the whole project lifecycle

- Strategy
- Feasibility studies
- Project management
- Financial advisory
- Regulation / certification
- Master planning
- Safety / security
- Performance / capacity
- Environmental impact
- Operational readiness and transfer



- Technical studies
- Infrastructure and building design
- Architectural engineering
- Equipment / systems engineering
- Human factors
- Works supervision
- Airport surface access
- Utility networks

Operation activities for a network of airport partners:

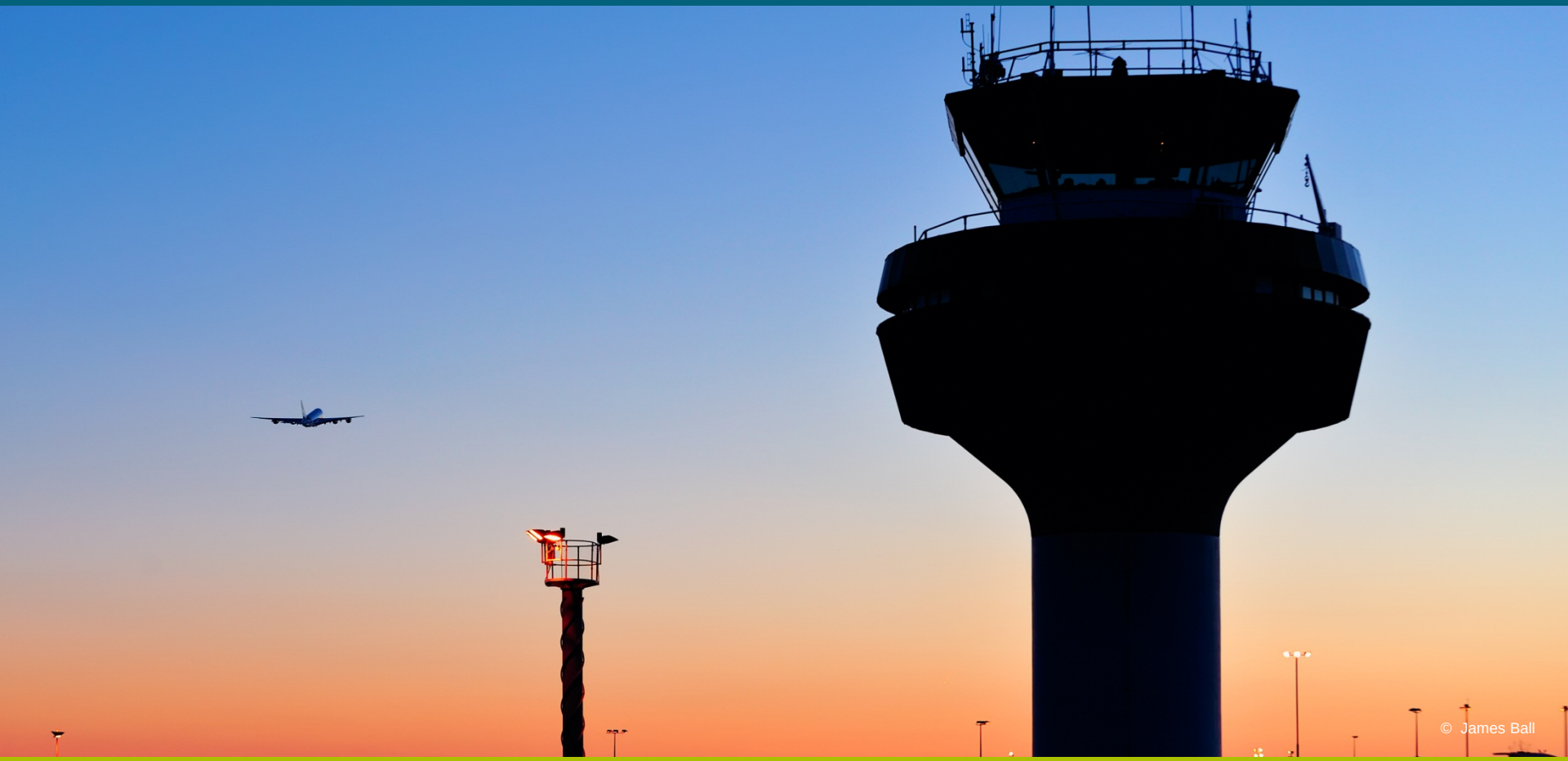
- Investment
- Operation & maintenance
- Business development

- Passenger terminal
- ATC tower / cabs
- Airside equipment
- Terminal equipment
- Airside / terminal / landside systems

PROJECT LIFECYCLE

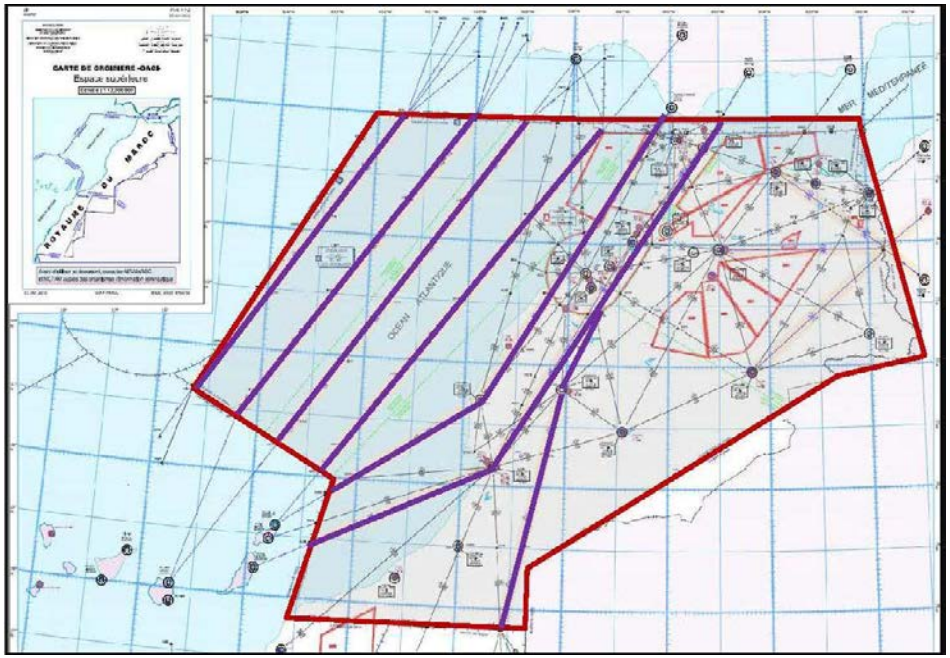
AIRSPACE DESIGN: PROJECT LIFECYCLE

EXAMPLES OF PROJECTS



MOROCCO: AIRSPACE REOGANISATION

PROJECT OUTLINE



- UIR/FIR Casablanca
- Few routes defined as RNAV 5 others are based on conventional VOR/DME
- No specific regulation for lateral separation – buffers applied
- Objective was to develop the operational model to face traffic for 2012-15 / 2018 and beyond 2025
  - Analysis of current situation
  - ConOps & scenarios definition
  - Development of simulations
  - Safety cases
  - Transition & Implementation plan
- Introduction of FUA & Free route
- Project developed in partnership with INECO & Isdefe (Spain)

MOROCCO: AIRSPACE REORGANISATION
MAJOR OUTCOMES

Scenario 2012-15:

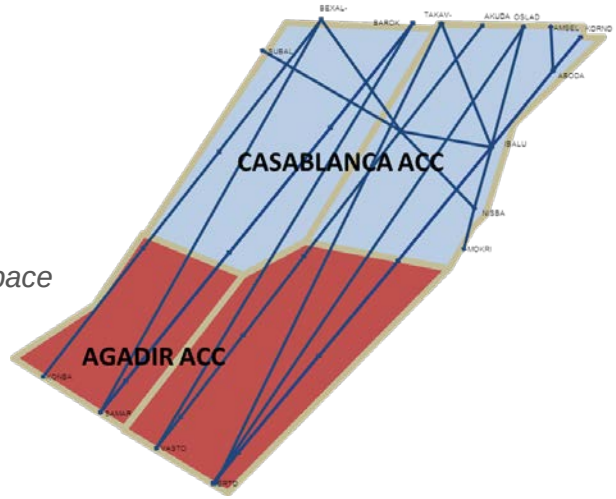
- *Change in the Air Space Classification,*
- *New routes created and RNAV 5 considered in the whole FIR/UIR*
- *Transition to RNAV 1 planned for big TMAs of Marrakech and Casablanca*
- *Introduction of FUA level 1*
- *New ACC expected to be put into operation in Agadir*

Scenario 2018:

- *Introduction of free route for Oceanic airspace + new routes for Continental airspace*
- *New ACC fully operational and integrated in the concept of free route*
- *FUA level 2*

Scenario 2025:

- *A-RNP navigation capabilities will be mandatory*
- *Free route concept implemented in 2 areas / 2 ACCs allowing “cross-boarder” DCT*
- *FUA level 3*



MOROCCO: AIRSPACE REORGANISATION
LESSONS LEARNT

Success

- *Collaborative approach*
  - Since the beginning, involvement of operational teams
  - Cooperation between Moroccan ACC, ANSP HQ and Military
- *Air traffic forecast*
- *Safety from airspace perspective*
- *Agadir ACC operational & integrated within the system*

Opportunities

- *Scenario 1 implemented today: ONDA to fully validate the long-term design after maturity assessment of the Concept*
- *Re-organisation of major TMAs of the country (Casablanca to start soon)*
- *Transfer of knowledge & capacity building*

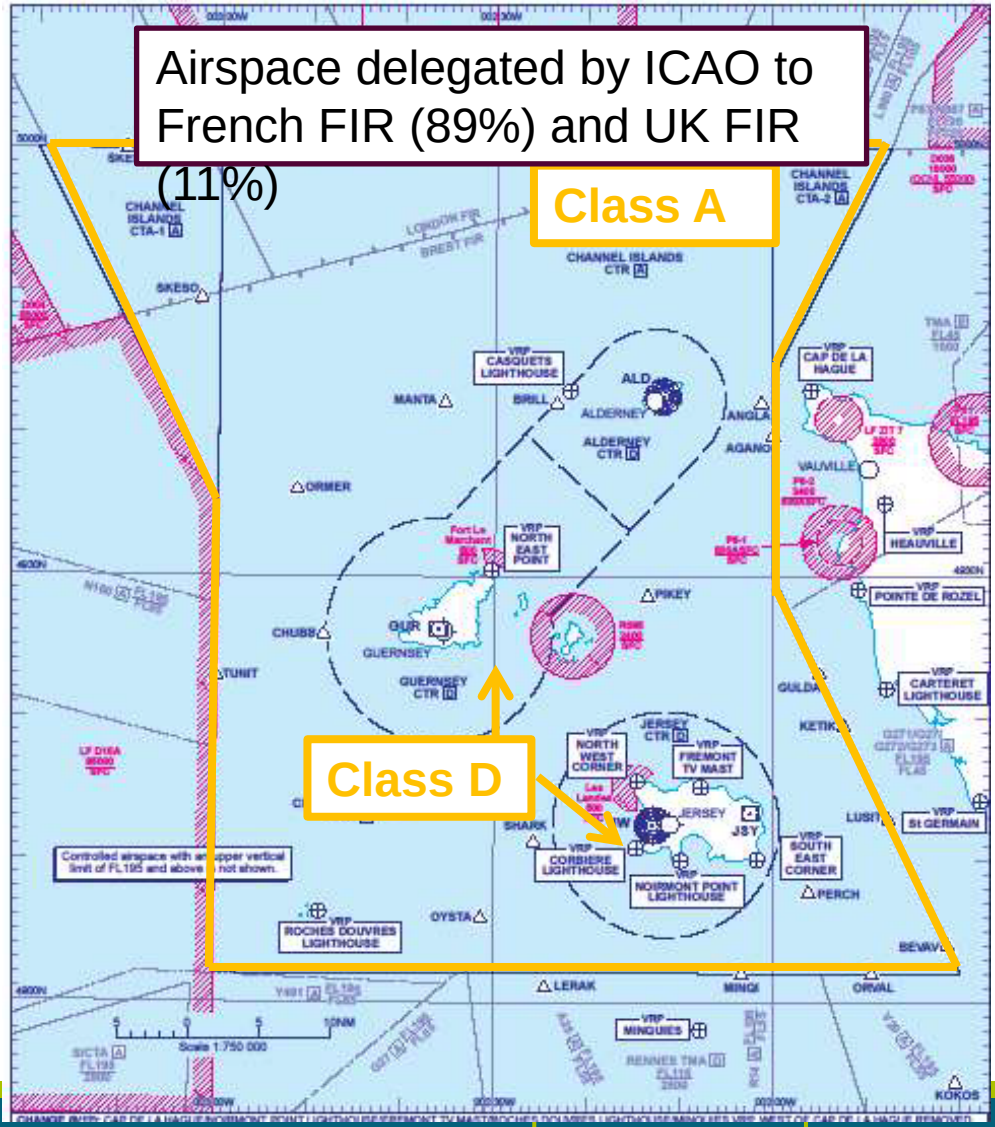
JERSEY TMA AIRSPACE RESTRUCTURATION: PRESENTATION

Led by Cyrrus in partnership with Egis

Main objectives:

- Introduction of PBN operations (SIDs/STARs/Approaches)
- Transition Altitude change
- Review airspace classification

All restructuration process activities conducted



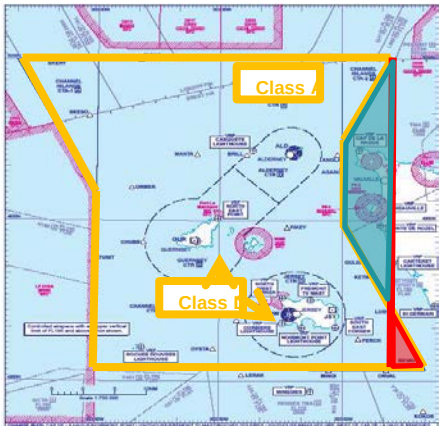
JERSEY TMA AIRSPACE RESTRUCTURATION:
LESSONS LEARNT

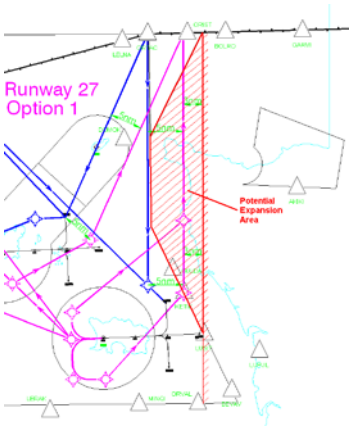
Success

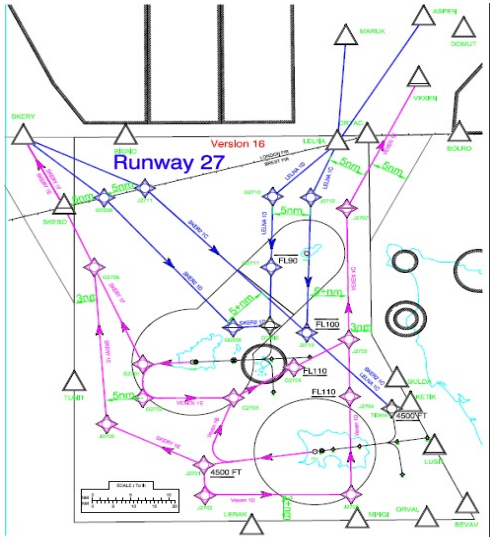
- *Collaboration with Stakeholders: validation of the reference scenario, consultations, safety workshops*

Challenges

- *Change of scope = lack of time and budget*







- *Importance of the assumptions/constraints/enablers*

SAFETY FOR PBN IMPLEMENTATION IN THE PHILIPPINES: PRESENTATION

- Airbus Prosky in charge of the development of air navigation procedures (PBN procedures) for the Civil Aviation Authority of Philippines (CAAP)
- Egis Avia sub-contracted activity: safety studies for PBN SIDs&STARs (RNP1) and approaches (RNP APCH)
- Safety study supported by workshops with key Stakeholders and transfer of knowledge towards CAAP

SAFETY FOR PBN IMPLEMENTATION IN THE PHILIPPINES : LESSONS LEARNT

Success

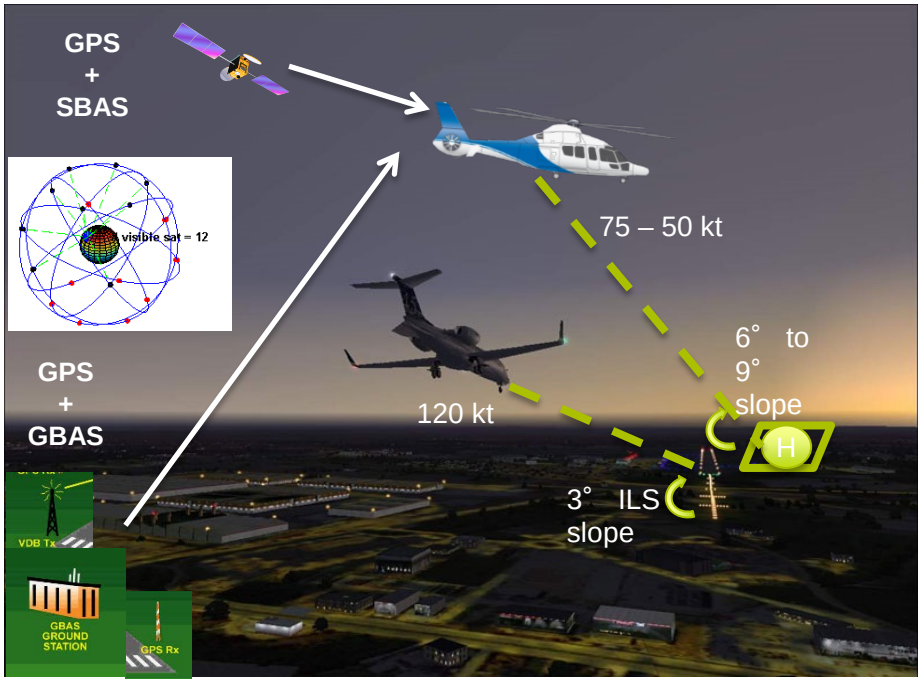
- *High involvement of all the Stakeholders during the Safety Workshops (controllers, pilots, procedure designers, authorities)*
- *Iterative and coordinated process between procedure design & safety*
- *Enhancement of CAAP existing safety methodology*
- *Definition of a process, ready for implementation, related to safety studies with a clear identification of roles & responsibilities*

Opportunities

- *Improvement of CAAP processes through systematic safety studies*
- *Need to ensure that the generic safety studies are instantiated in each specific environment*

GARDEN: PRESENTATION

GNSS-based ATM for Rotorcraft to DEcrease Noise

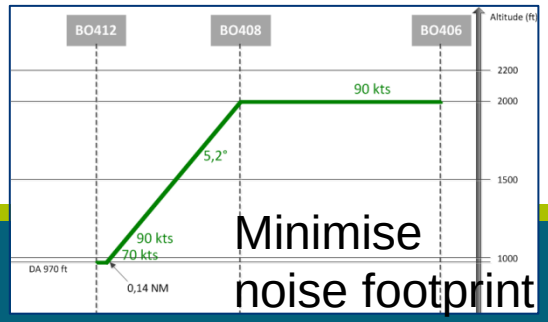


- Definition of innovative Rotorcraft-specific IFR procedures based on the flexibility of the PBN concept
  - "Point-in-Space" type (VFR FATO)
  - Steep final segment

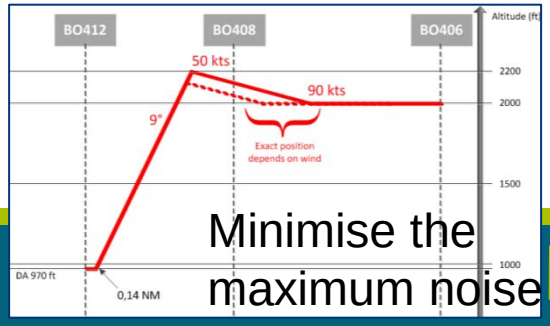
⇨ Noise abatement
⇨ Vertical separation

- Simultaneous Non Interfering aircraft-rotorcraft operations

- Regulatory study, concept of operations, procedure design, safety, in-flight demonstrations



Minimise noise footprint



Minimise the maximum noise

GARDEN: LESSONS LEARNT

Success

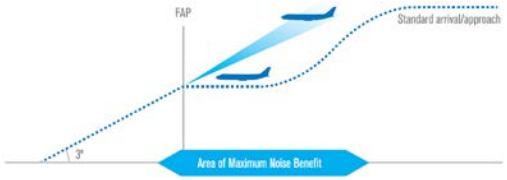
- *First time SNI concept of operations is defined*
- *Approved generic safety studies (PinS LPV and SNI)*
- *SNI concept feasibility demonstrated thanks to flights with a H175 from Airbus Helicopters on 5-6 May 2015 (H175 A quiet approach)*
- *In-flight demonstrations successful thanks to the high coordination with relevant authorities (ANSP & regulator)*
- *Contribution to the validation of the Concept of Operation developed by SESAR for improving airports capacity and in which SNI aircraft and rotorcraft operations are considered*

Challenges

- *Implementation of SNI operations required first the full definition of the SNI concept*
- *Local safety study needed for the demonstrations*
- *Demonstrations paved the way for operational implementation, but still a lot to do*

ASECNA –CCO/CDO DEVELOPMENTS
THE PROJECT

- Development of new procedures for two airports
- We provide, together with CGX Aero, support & training for the development of procedures and associated safety cases
- 4-month project involving a large team of specialists from various sites at ASECNA
- An interesting approach for capacity building:
  - *Dakar: developed by our specialists - as a training*
  - *Abidjan: performed by ASECNA staff for consolidation under the supervision of our teams*
- Objective of ASECNA: study the benefits before making decision to develop at more airports



ASECNA –CCO/CDO DEVELOPMENTS
LESSON LEARNT

Success

- *High involvement of all the Stakeholders during the Safety Workshops (controllers, pilots, procedure designers, authorities)*
- *Iterative and coordinated process between procedure design & safety*
- *Enhancement of ASECNA existing safety methodology*

Opportunities

- *ASECNA to flight-validate the procedures before publication*
- *ASECNA to study in detail the benefits brought (noise, fuel burn, integration within Air Navigation system*
- *Develop implementation at other sites in line with ASBU 0*

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