

**OeKF Jour fixe**  
Capt. Michael KRIZ

# Performance Based Navigation

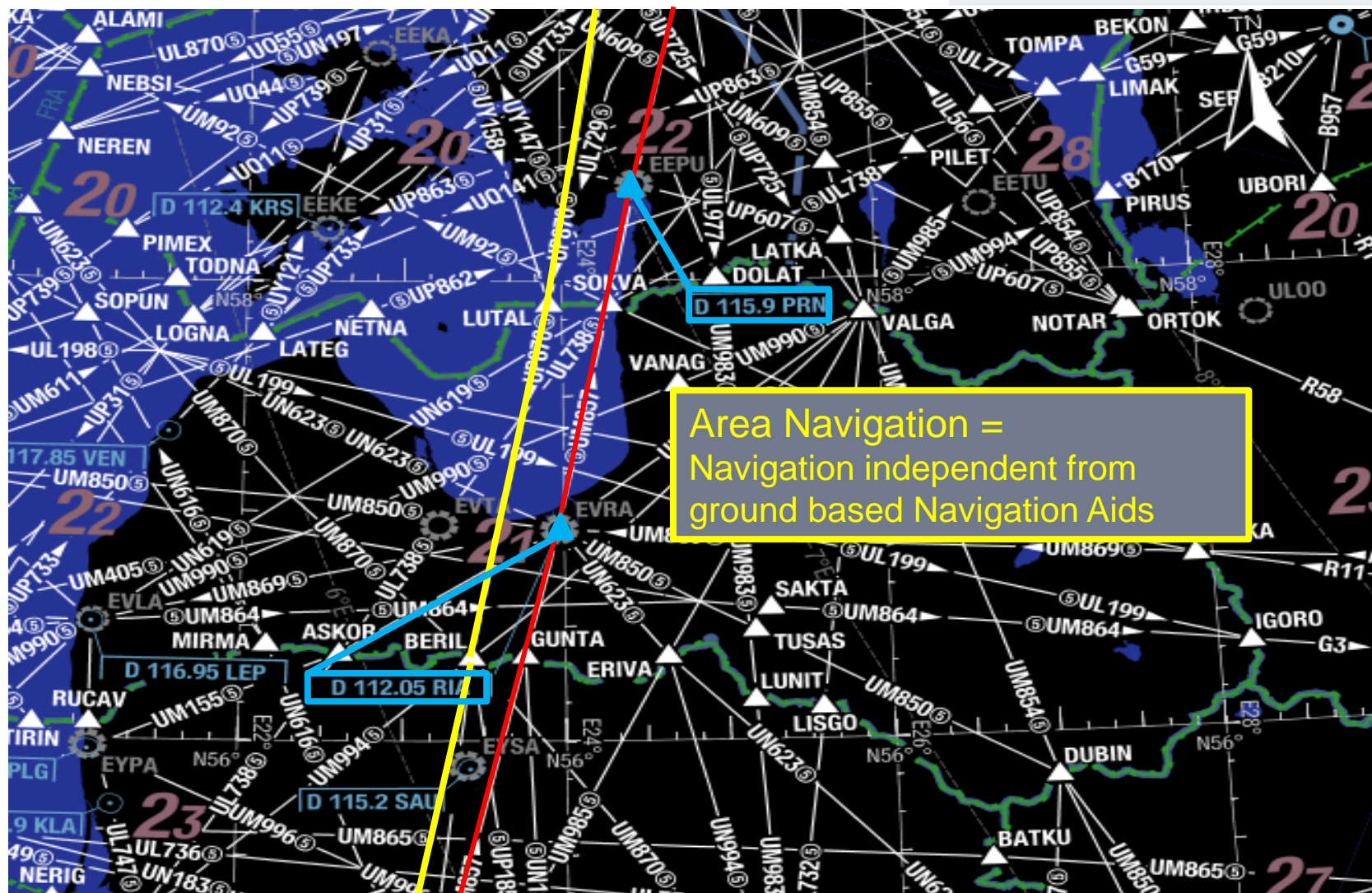
RNAV – GPS

# What is Performance Based Navigation?

- PBN specifies **SYSTEM PERFORMANCE REQUIREMENT** for aircraft operating on air traffic routes or instrument approach procedures, in a designated airspace.
- The performance requirements are defined in term of accuracy, integrity, continuity and availability
- and **ALSO** In term of **FUNCTIONALITIES**
  - Display
  - ARINC 424 leg...

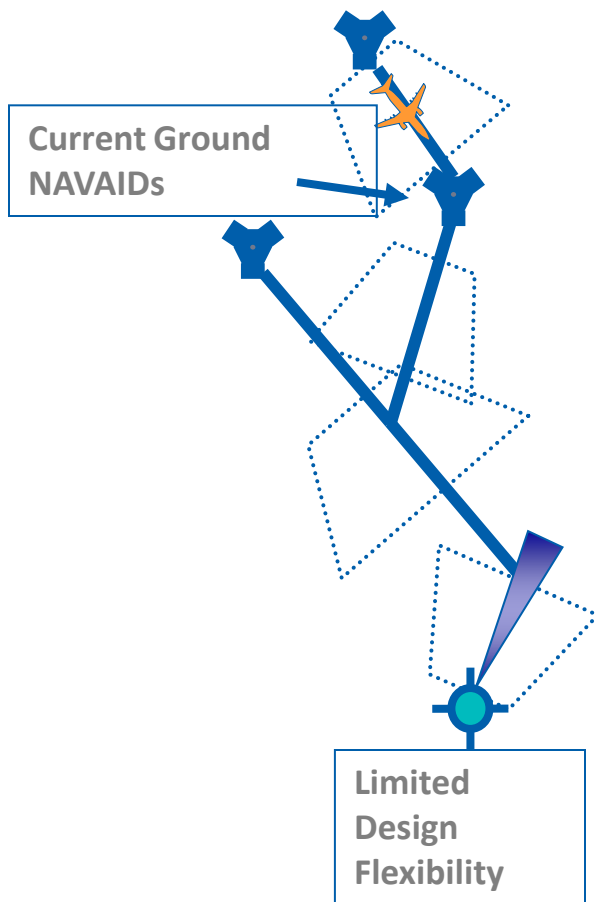
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# From Conventional Navigation to RNP - RNAV

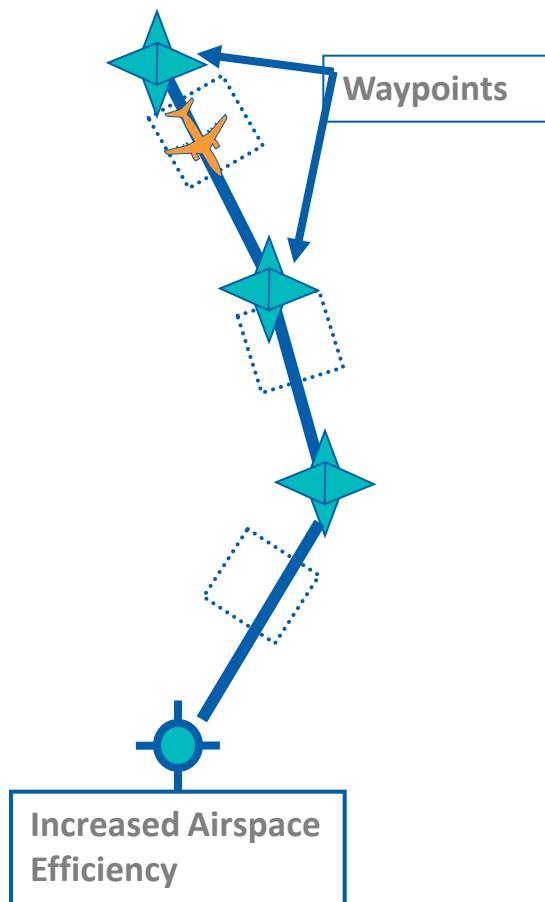


# RNAV, RNP - General Principles

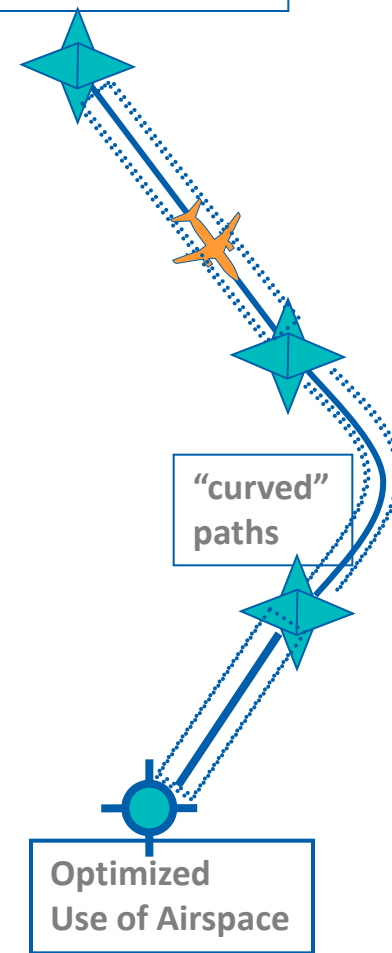
Conventional Routes



Basic RNAV

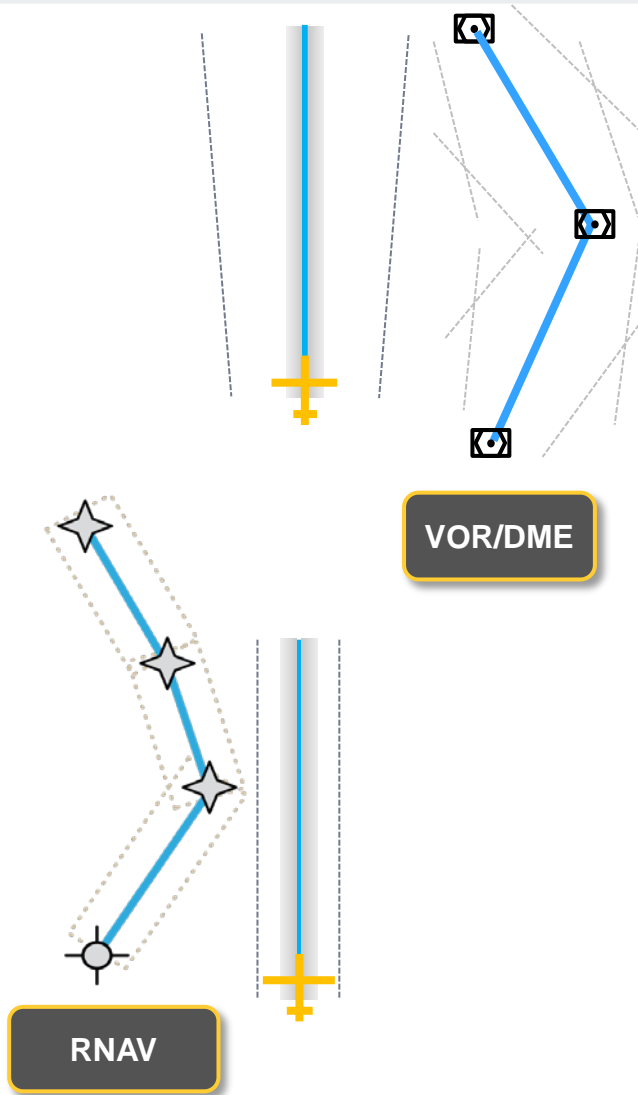


Low-RNP RNAV



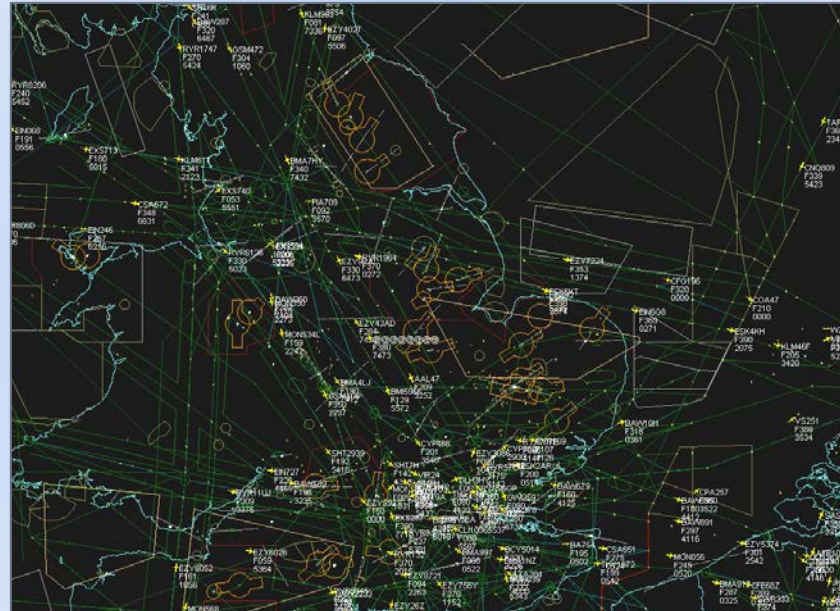
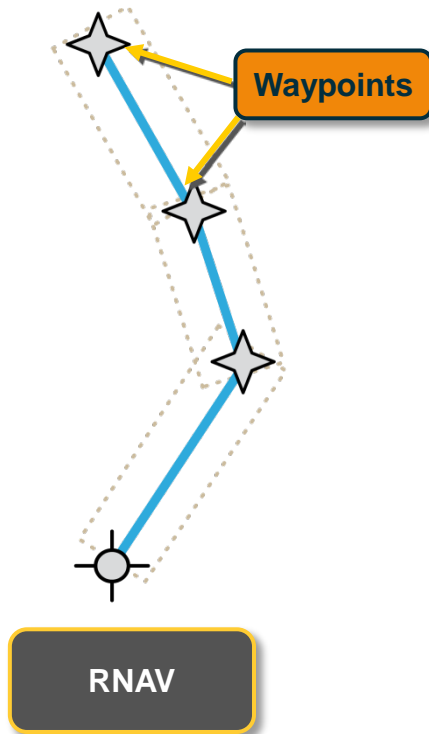
# From Conventional Navigation to RNP – Navigation accuracy

Modern aircraft multi-sensor systems  
always navigate with the same accuracy  
irrespective of the protection area:  
...within some tenths of a NM...





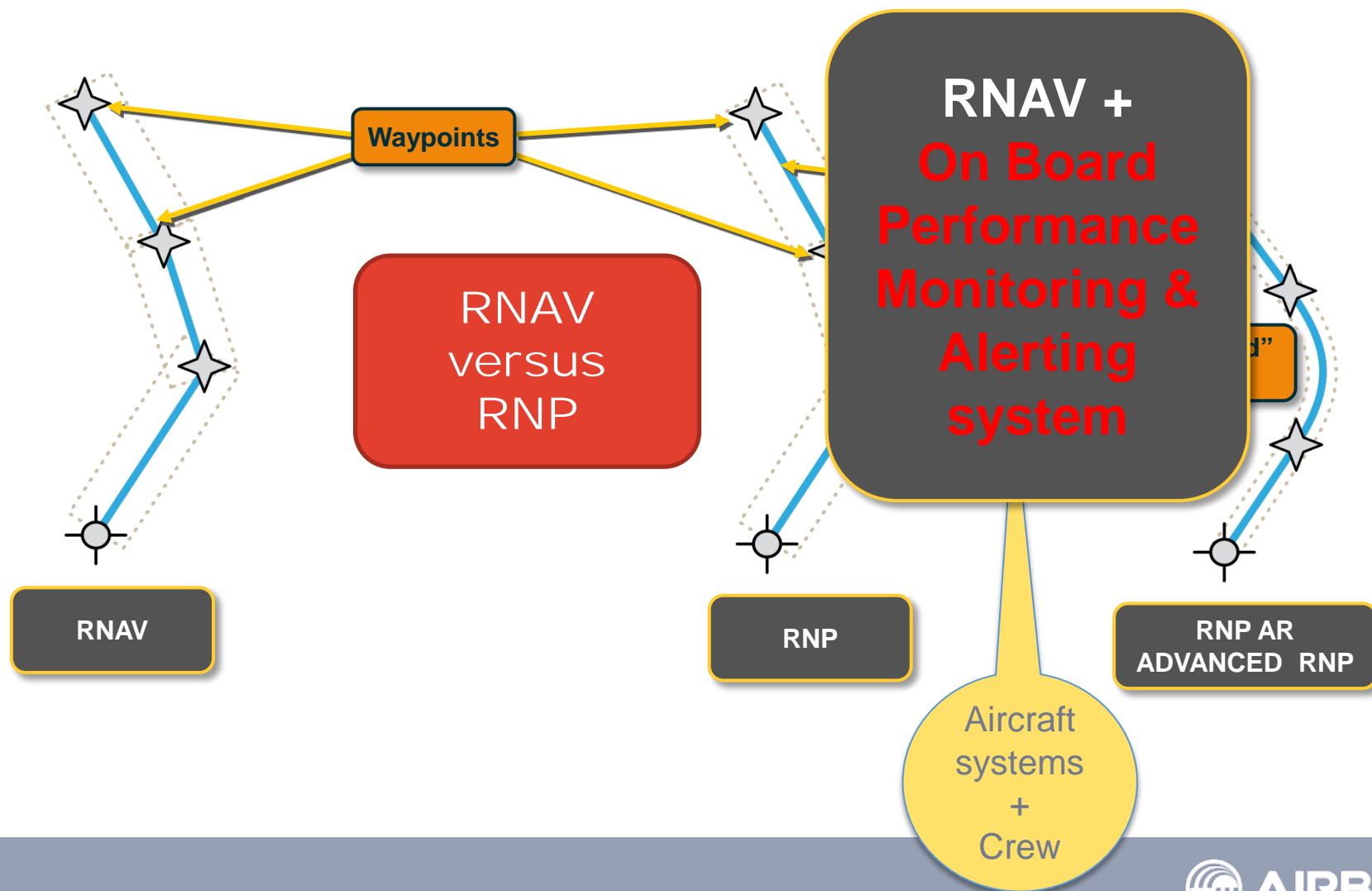
# From Conventional Navigation to RNP – Navigation surveillance



In an RNAV environment, radar surveillance grants navigation accuracy

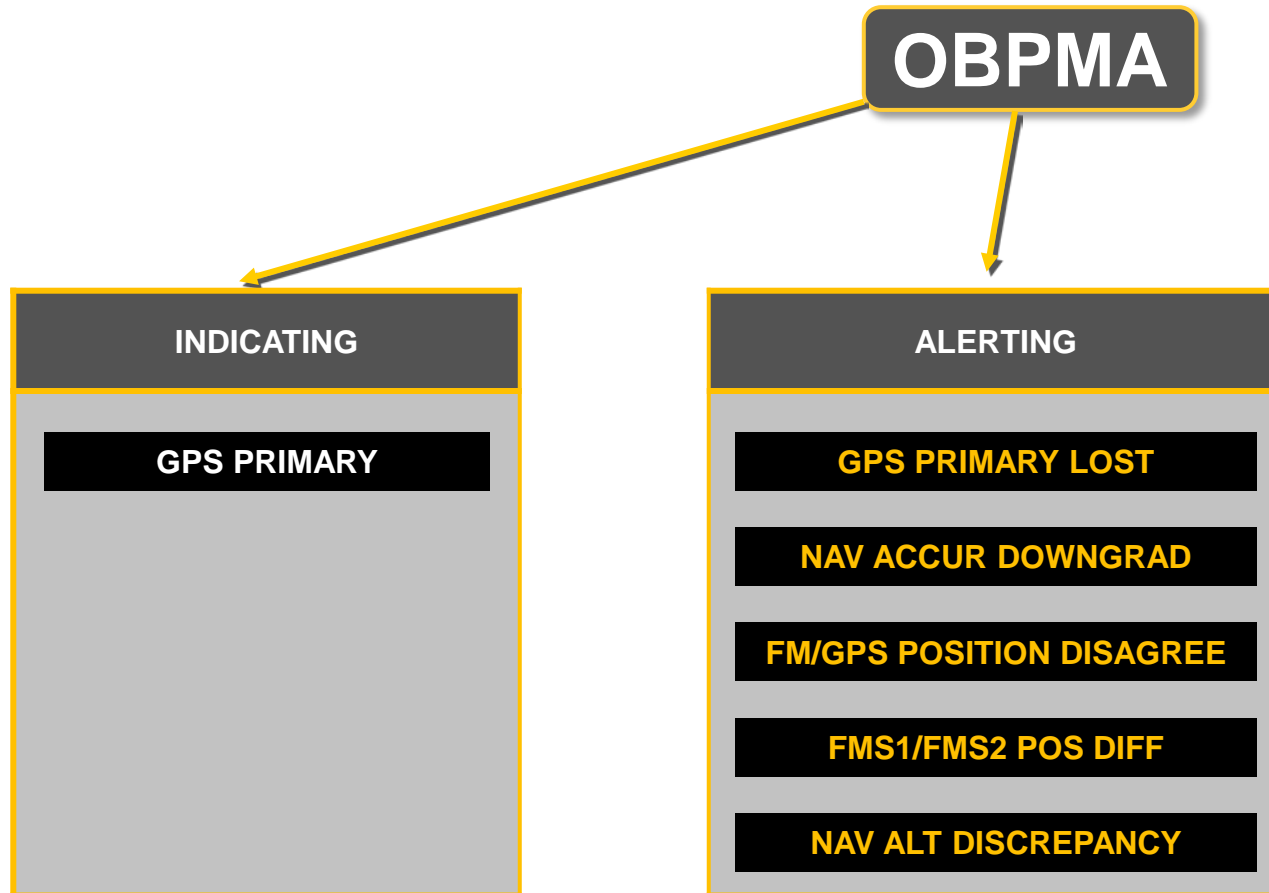
# From Conventional Navigation to RNP - OBPMA

Required Navigation Performance – who is monitoring the Navigation Performance?



# From Conventional Navigation to RNP - OBPMA

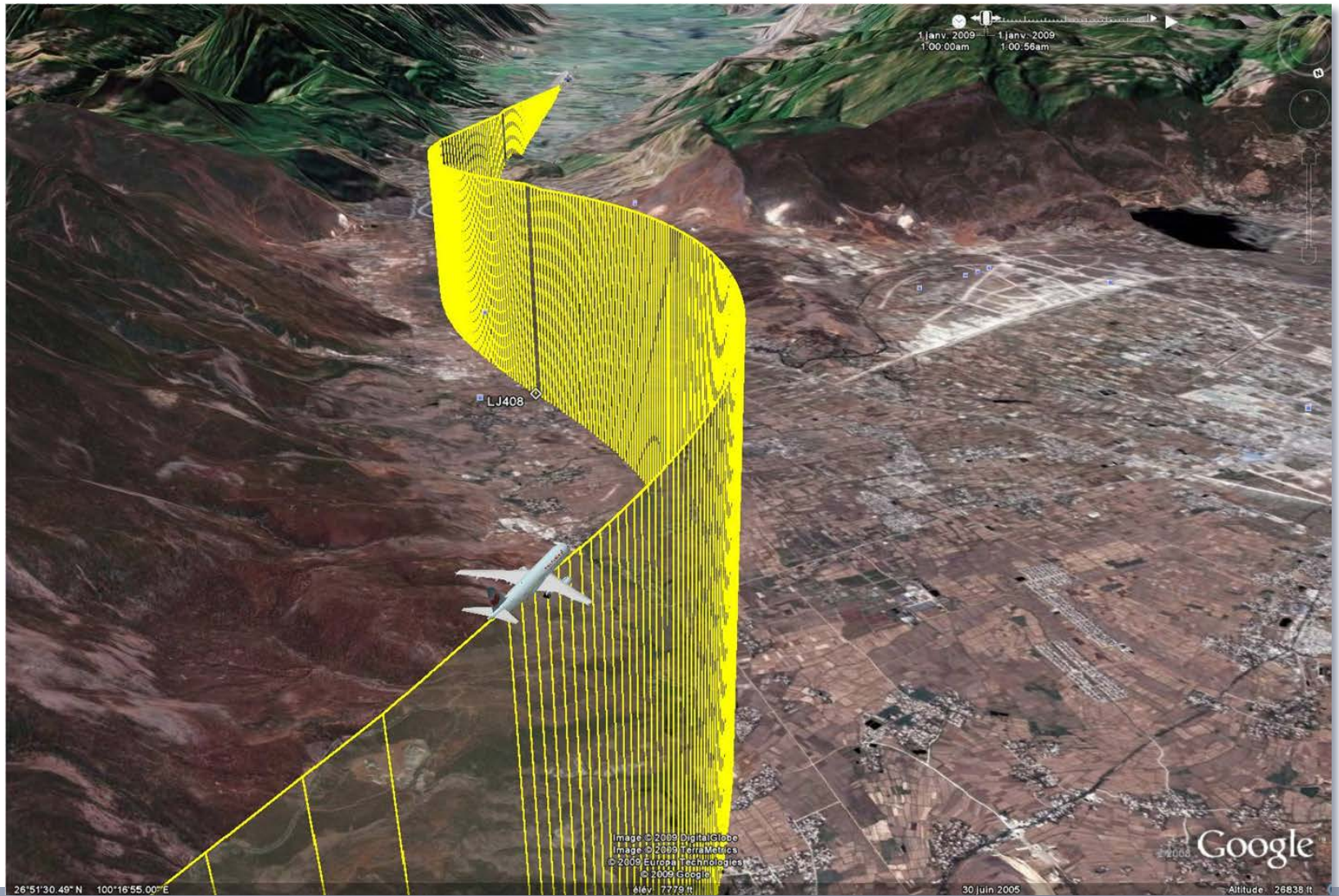
*OBPMA provides ALERTS when the navigation SYSTEM misbehaves*



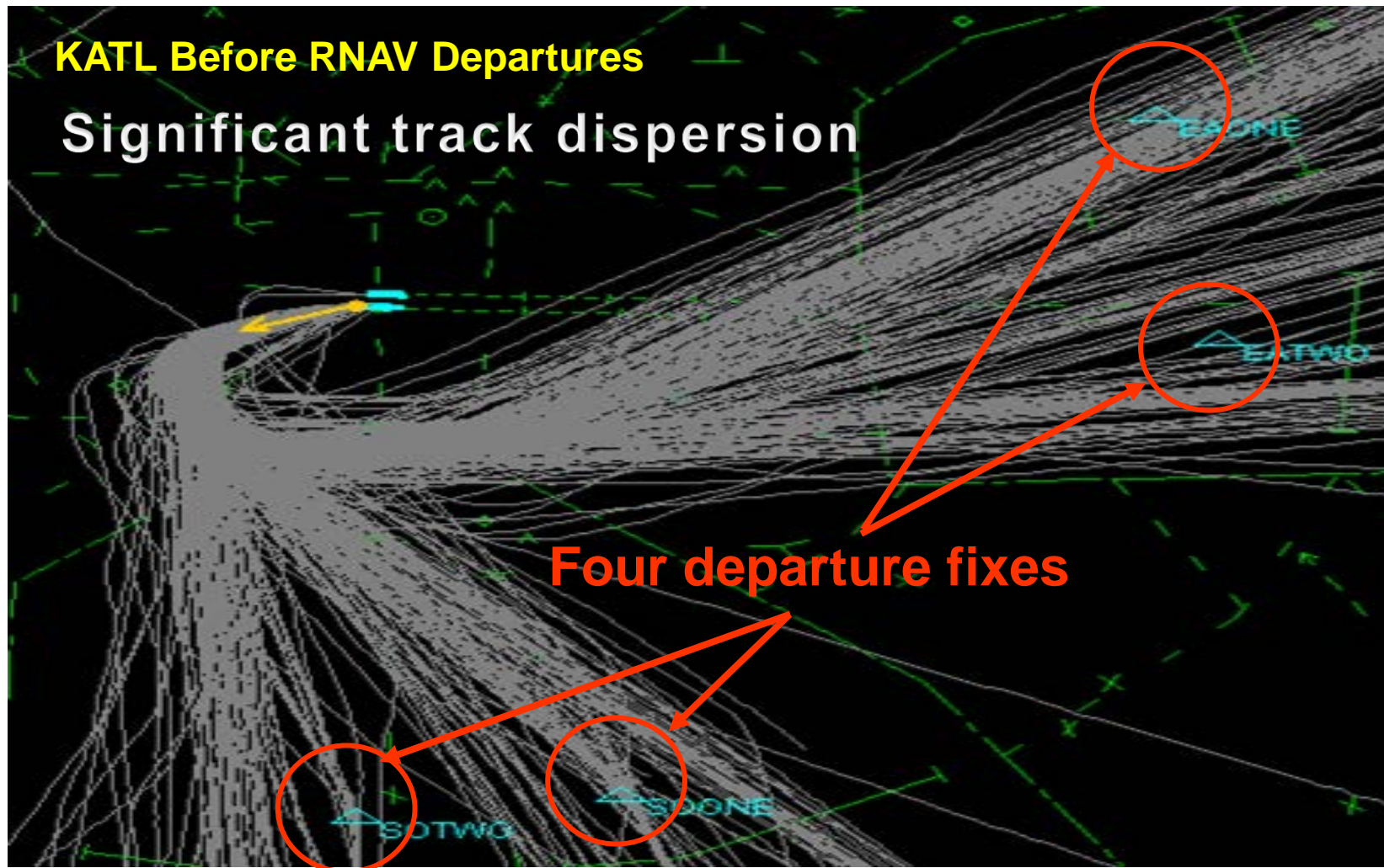
*Note: LDEV or XTK are monitored by the crew (it is an FTE...)*



# PBN – flexibility in design

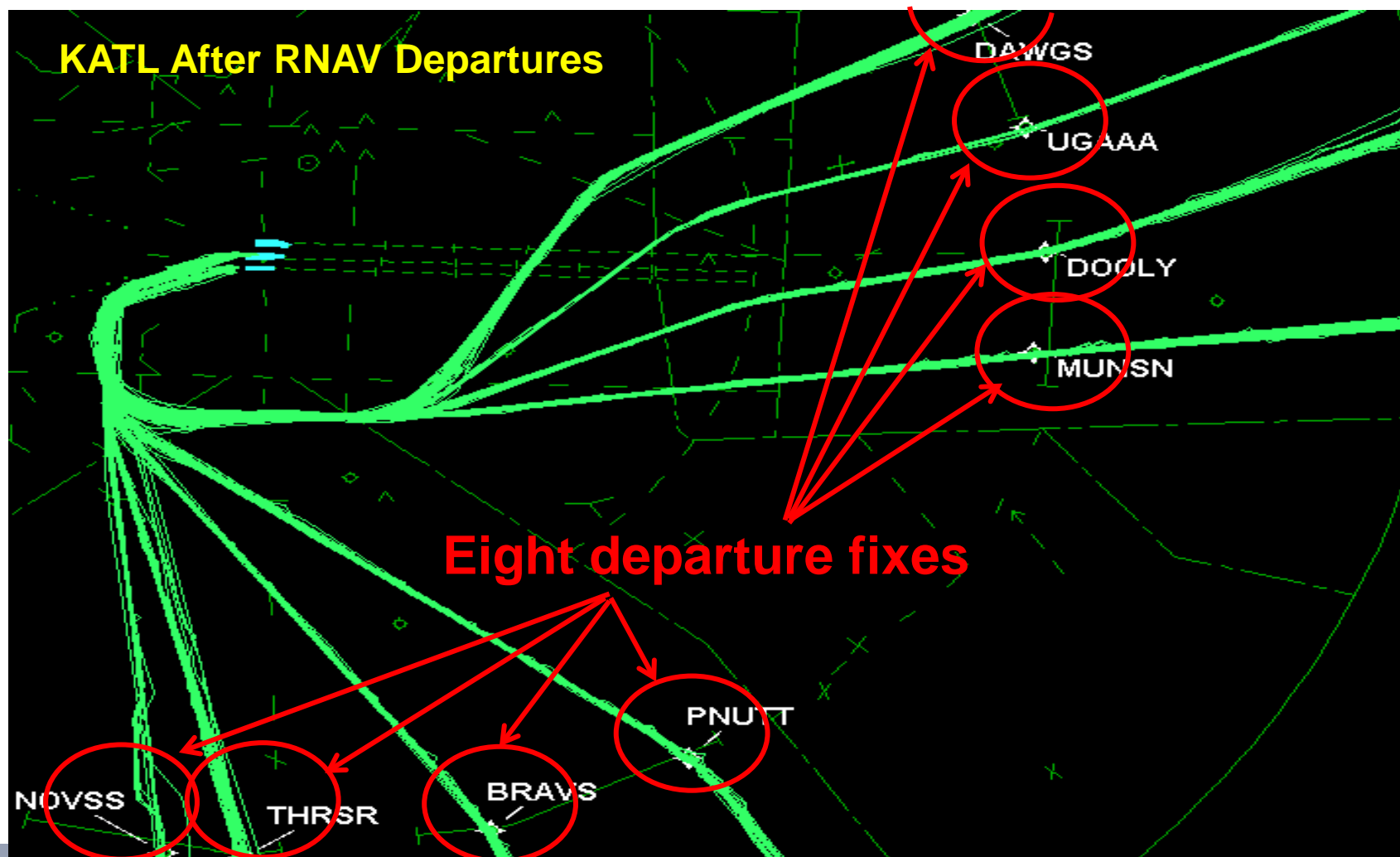


# PBN - Higher accuracy and repeatability





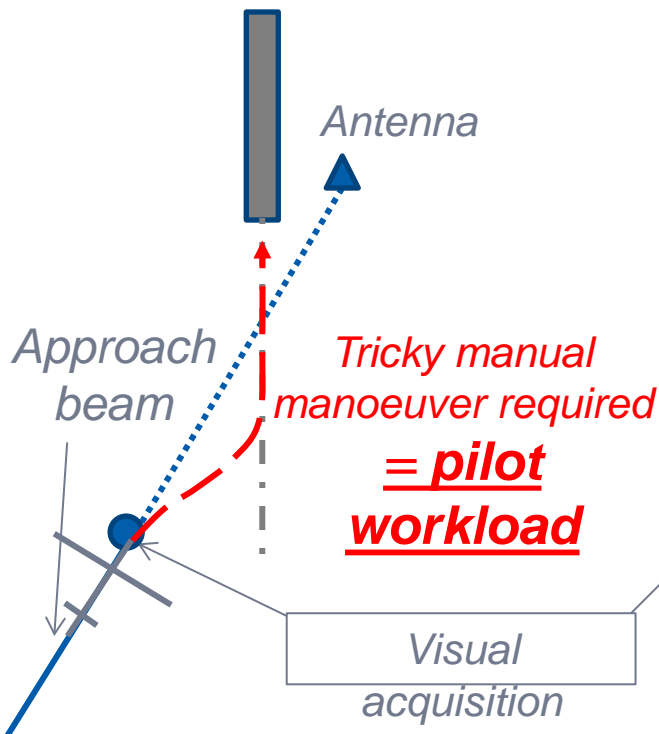
# PBN - Higher accuracy and repeatability



# PBN - Improved fly-ability

## *Curved Paths : runway alignment in final*

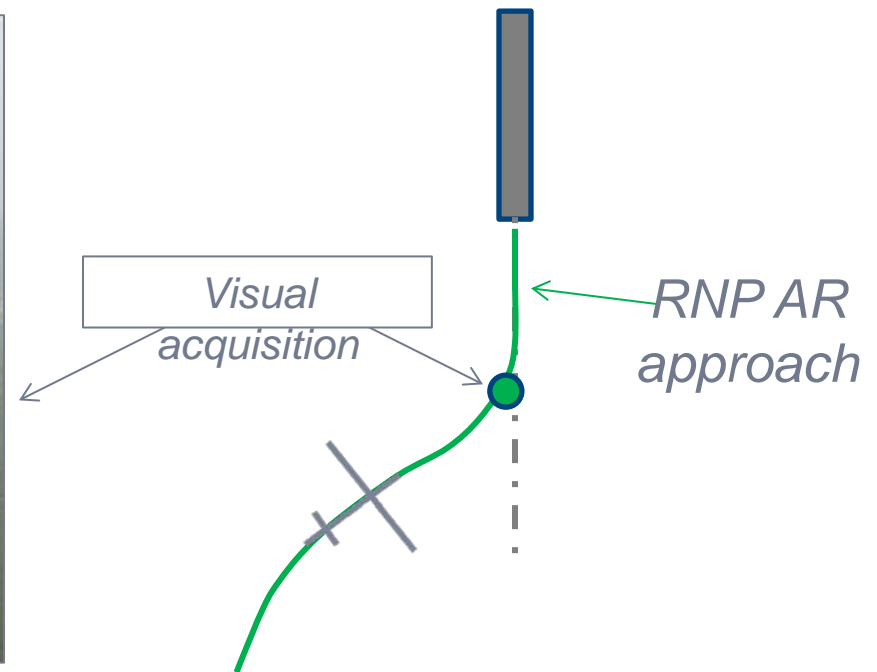
- Conventional approaches in Vagar : **not aligned with runway axis**
- In poor weather conditions, difficult for pilots



# PBN - Improved fly-ability

## *Curved Paths : runway alignment in final*

- Conventional approaches in Vagar : not aligned with runway axis.
- In poor weather conditions, difficult for pilots



# Better access to terrain critical airports





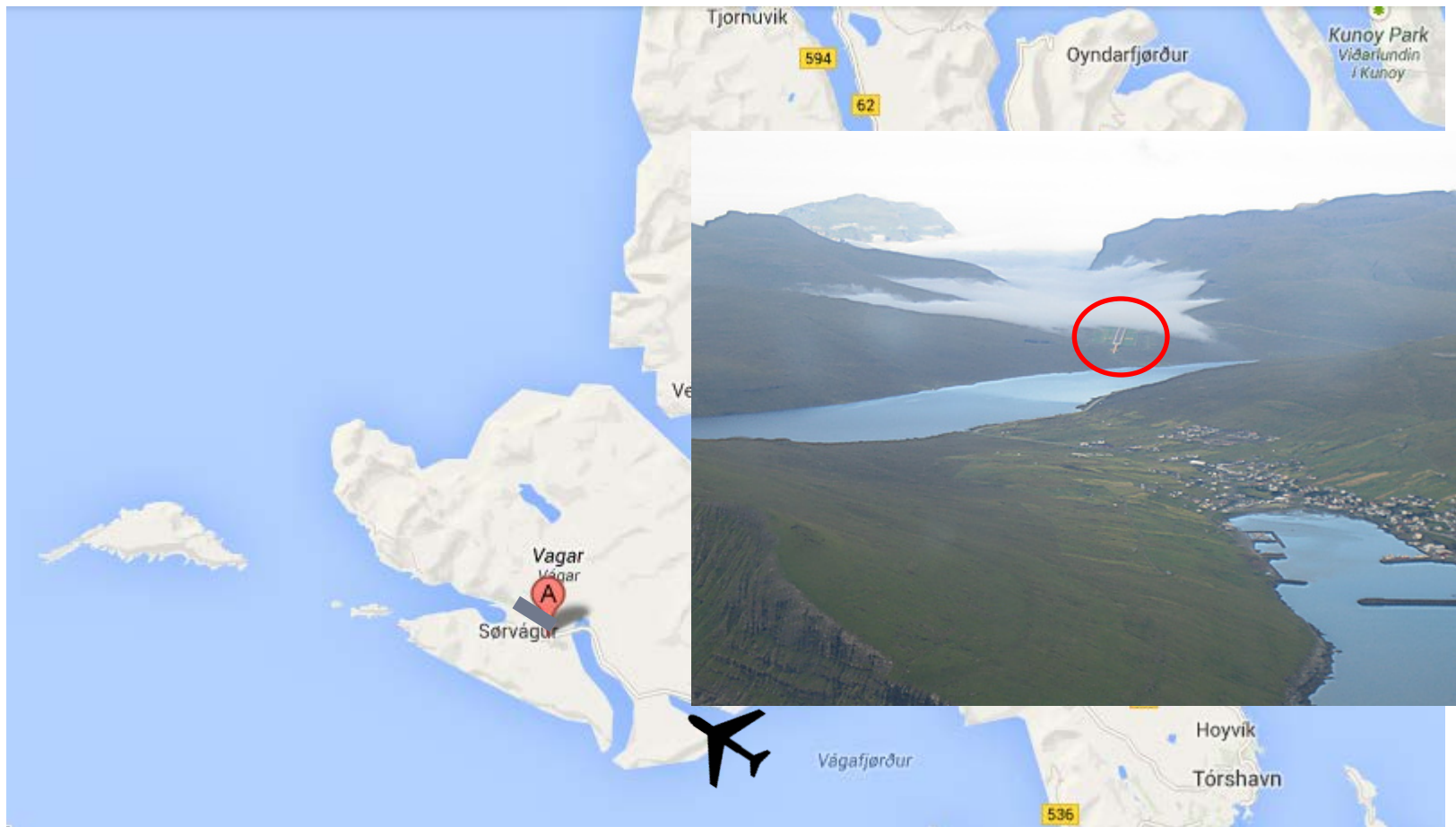
## First successful implementation of an RNP- AR 0,1 approach procedure in Europe

- Location
- Procedure design challenge
- Video of the final approach

# EKVG – Vagar, Faroe Islands

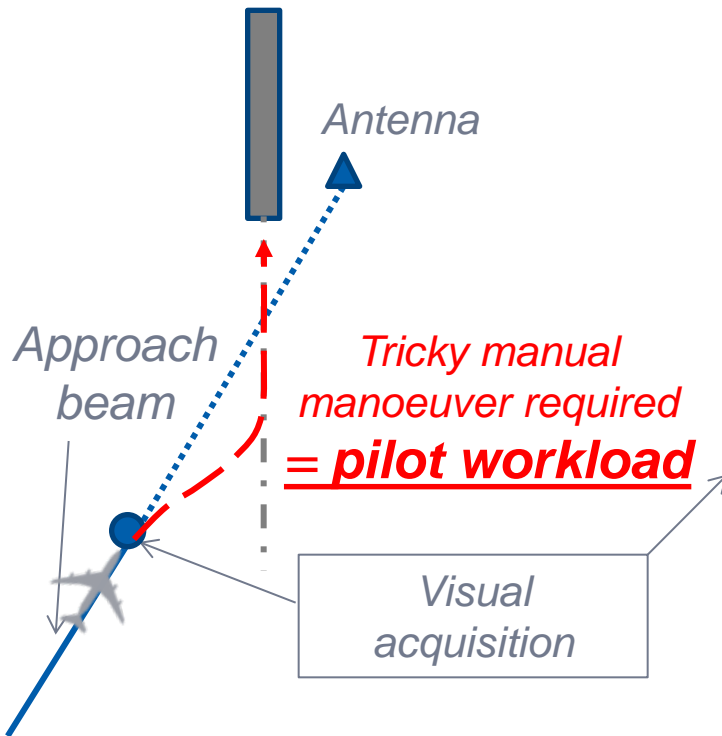


# EKVG – Vagar, Faroe Islands





# Benefits of the RNP AR procedure



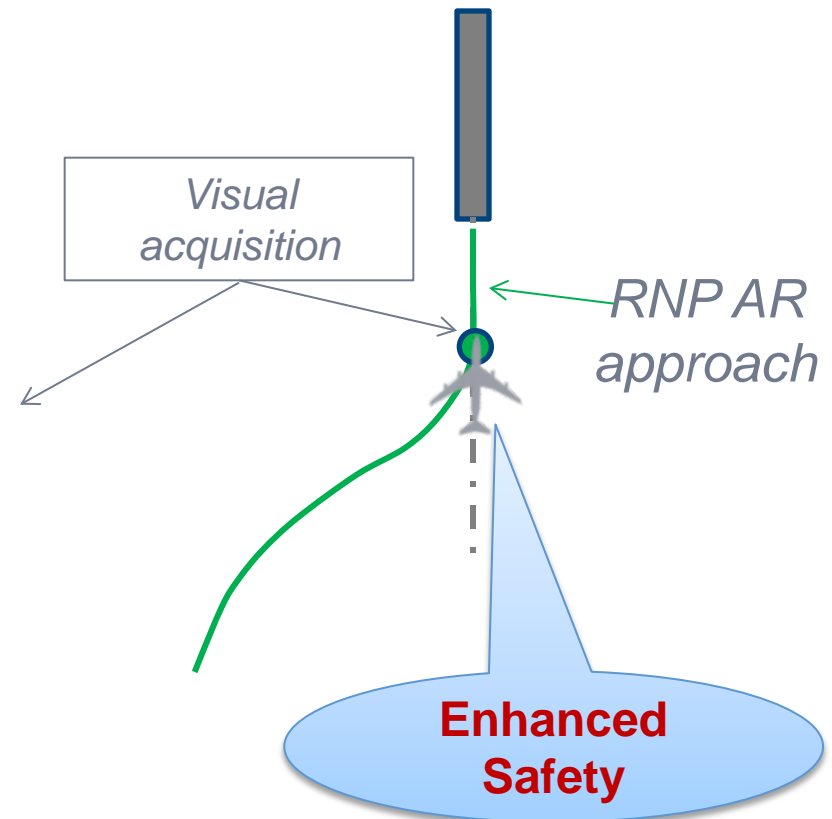
## Offset Path - runway alignment in final

- ✓ Conventional LLZ approach in Vagar:  
**Not aligned with runway axis**
- ✓ In poor weather conditions: difficult visual maneuver for pilots

# Benefits of the RNP AR procedure

## Curved Paths - runway alignment in final

- ✓ RNP AR approach final is aligned with runway axis.
- ✓ In poor weather conditions better position for visual final.





# EKVG – Vagar, Faroe Islands



This  is where the video starts...

