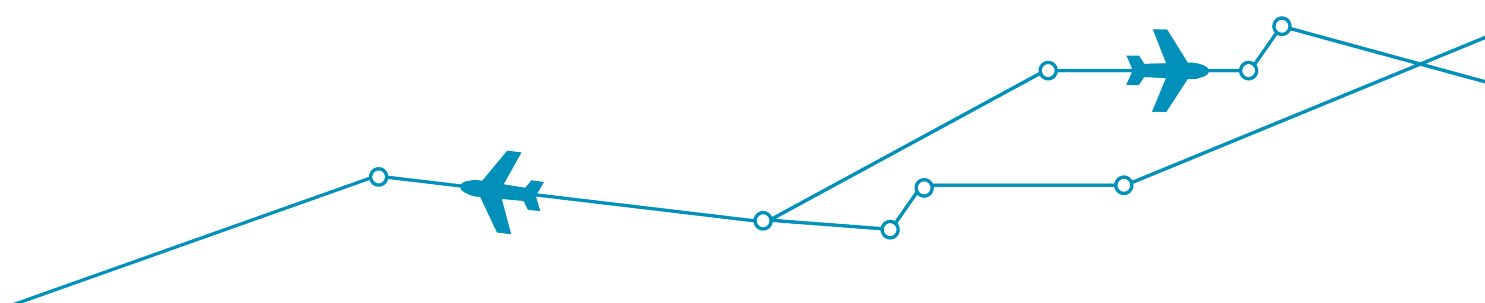




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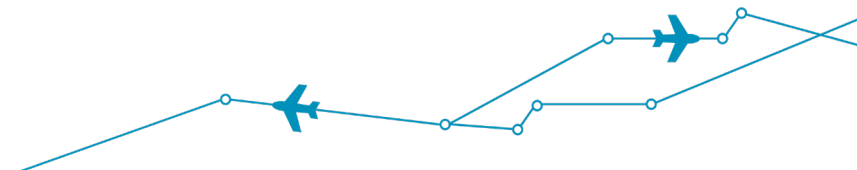
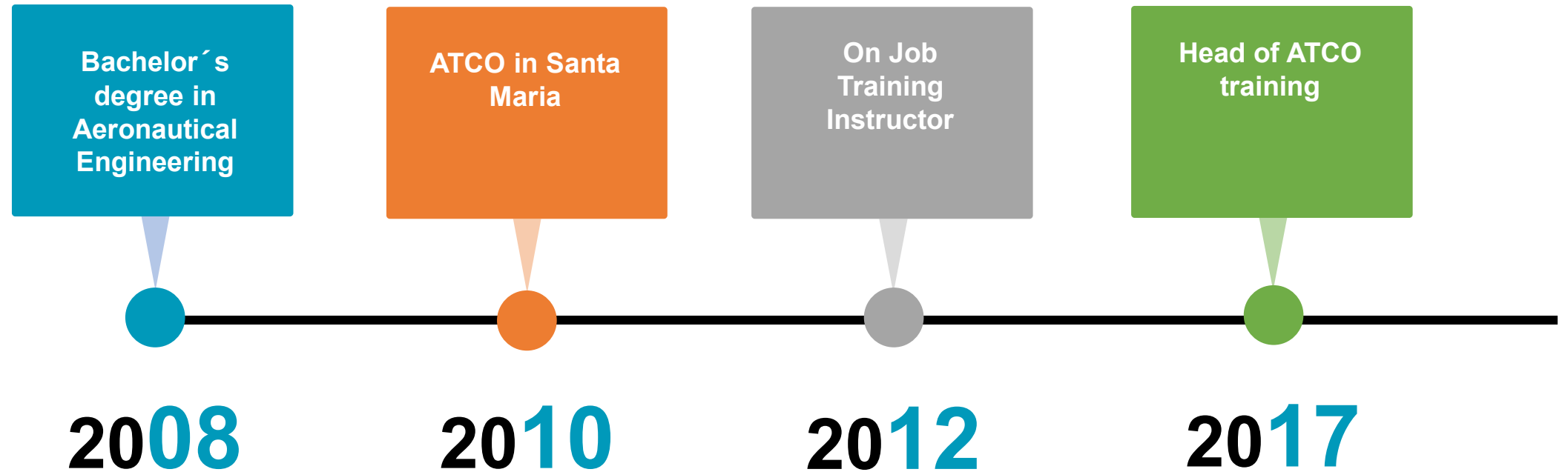
Santa Maria Oceanic FIR

September 20, 2021

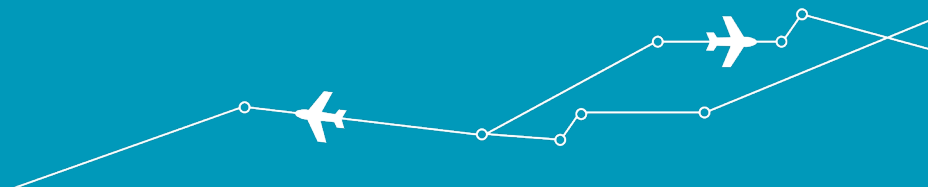


About me

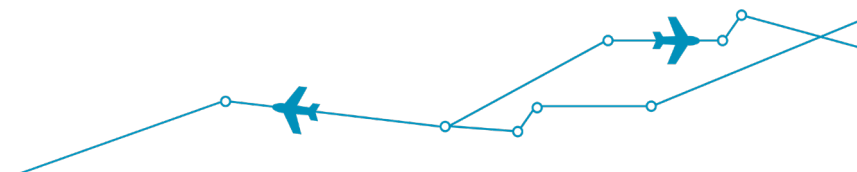
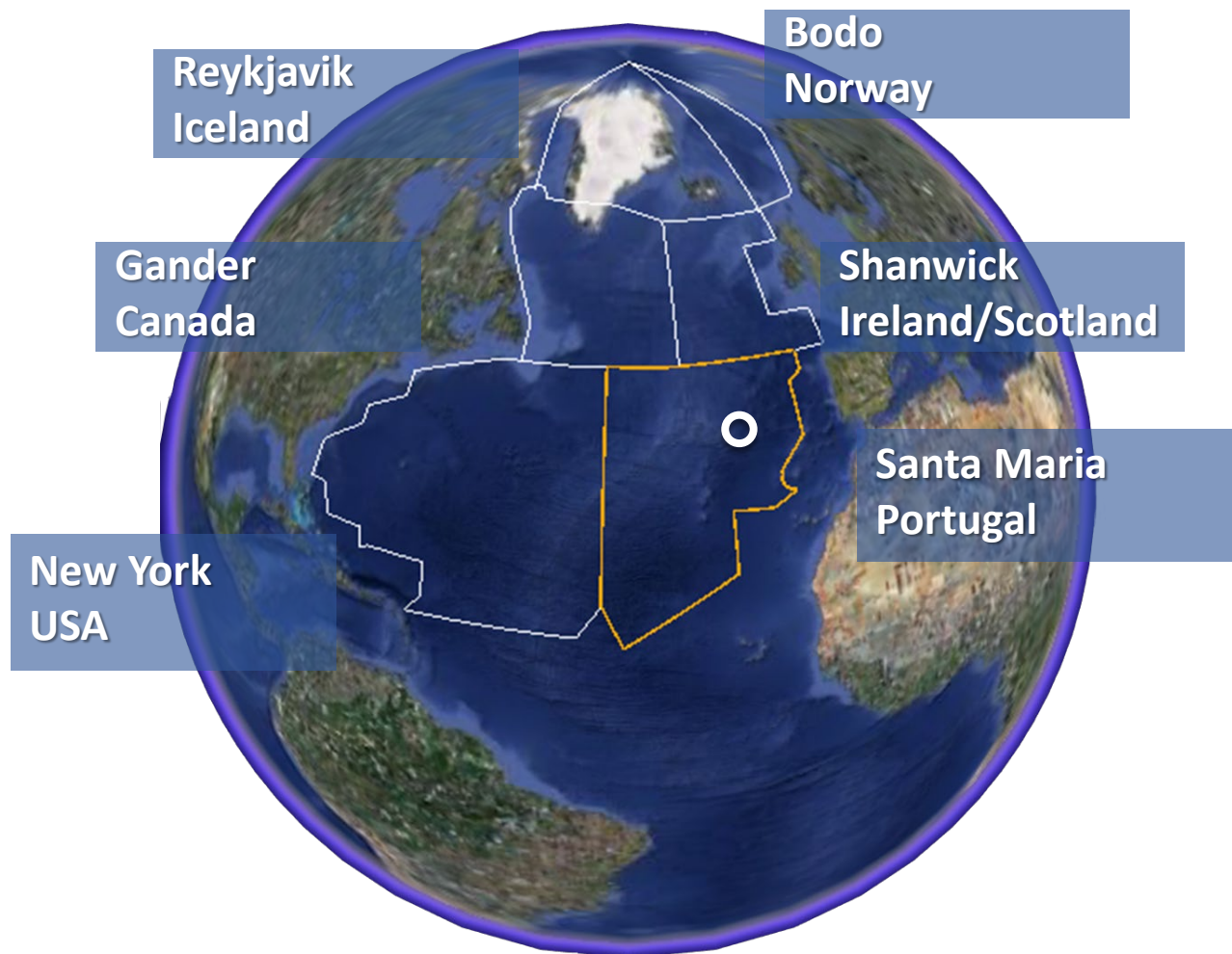
Tiago Lima Reis

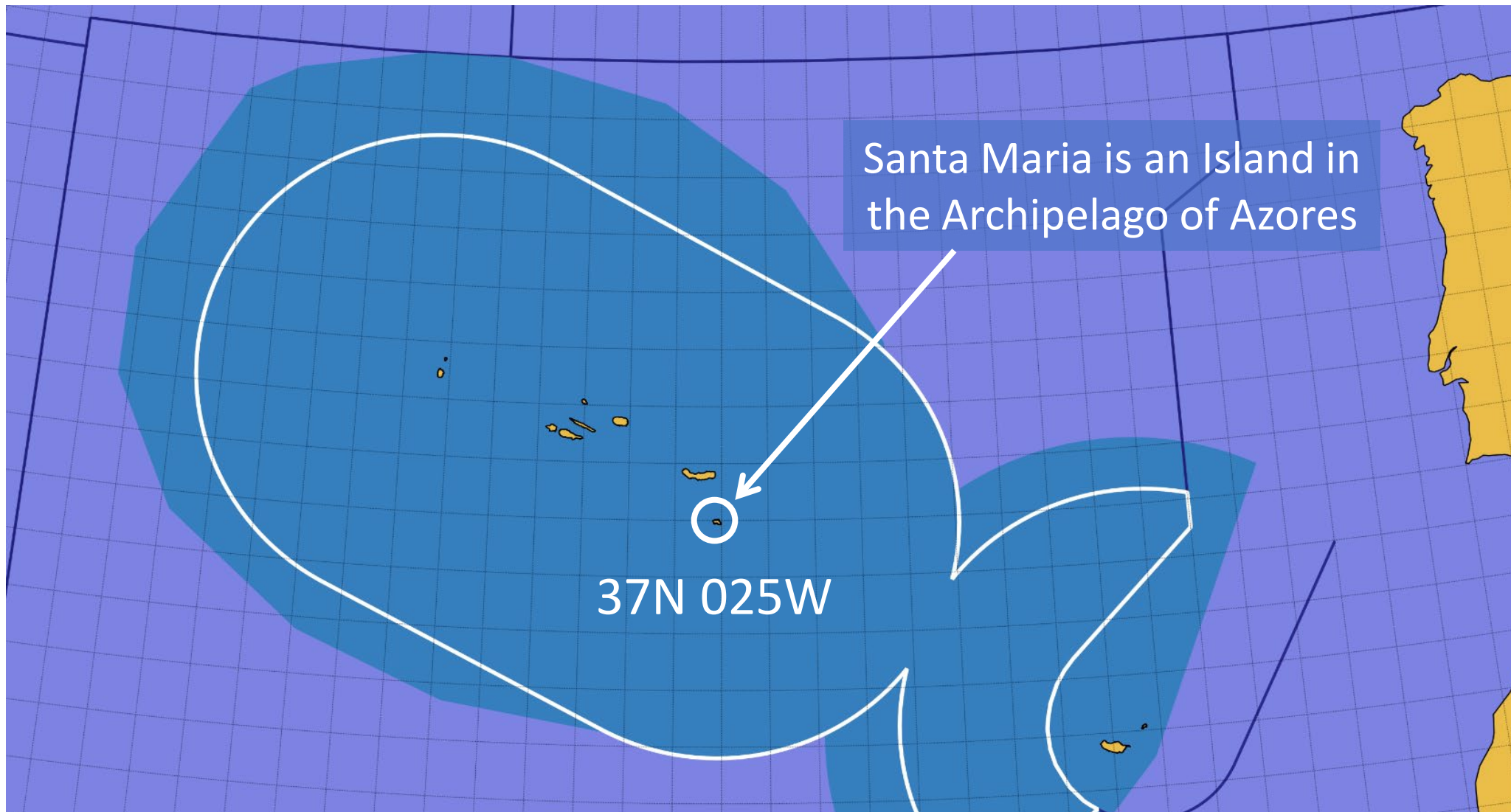


NAT Region

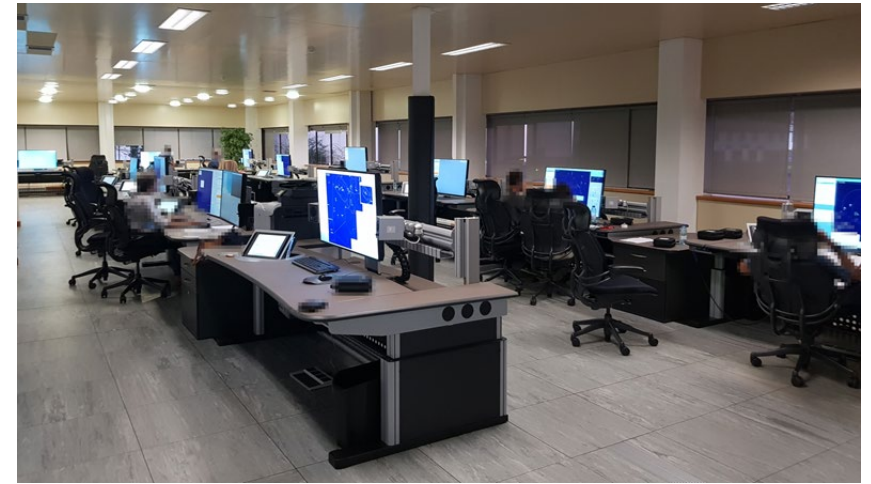


NAT Region

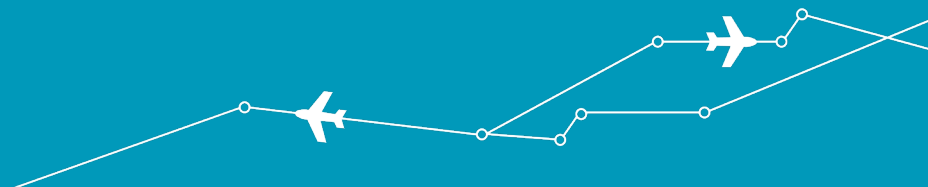




Aviation in Santa Maria



Working environment





NAT

Gander

Shanwick

Madrid

New York

**Santa
Maria FIR**

Lisboa

Canárias

Piarco

Sal

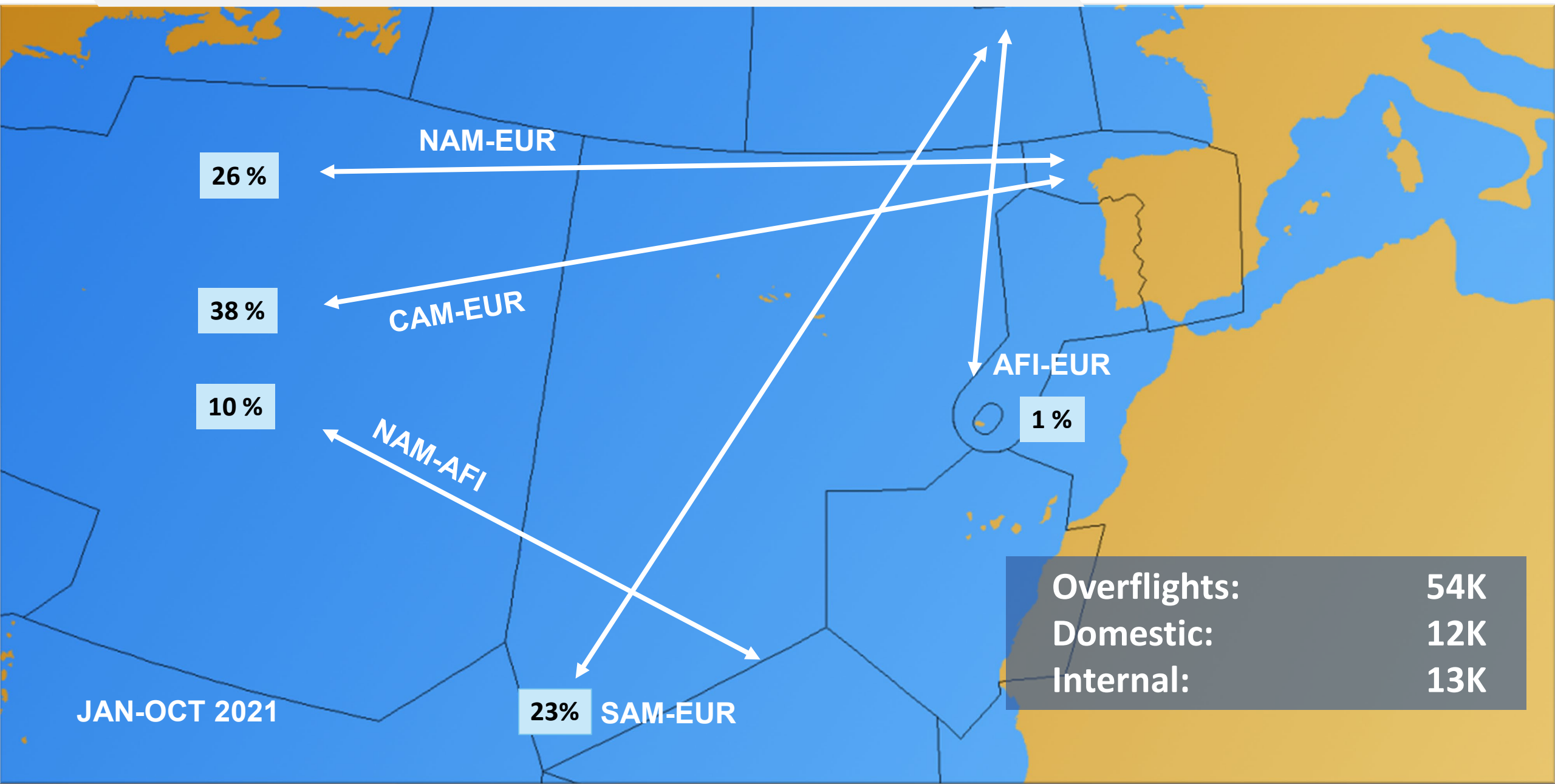
**Adjacent
centers**

CAR

Dakar

AFI

Traffic flows (% overflights)



26 %

NAM-EUR

38 %

CAM-EUR

10 %

NAM-AFI

1 %

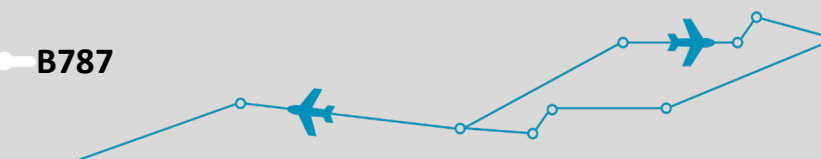
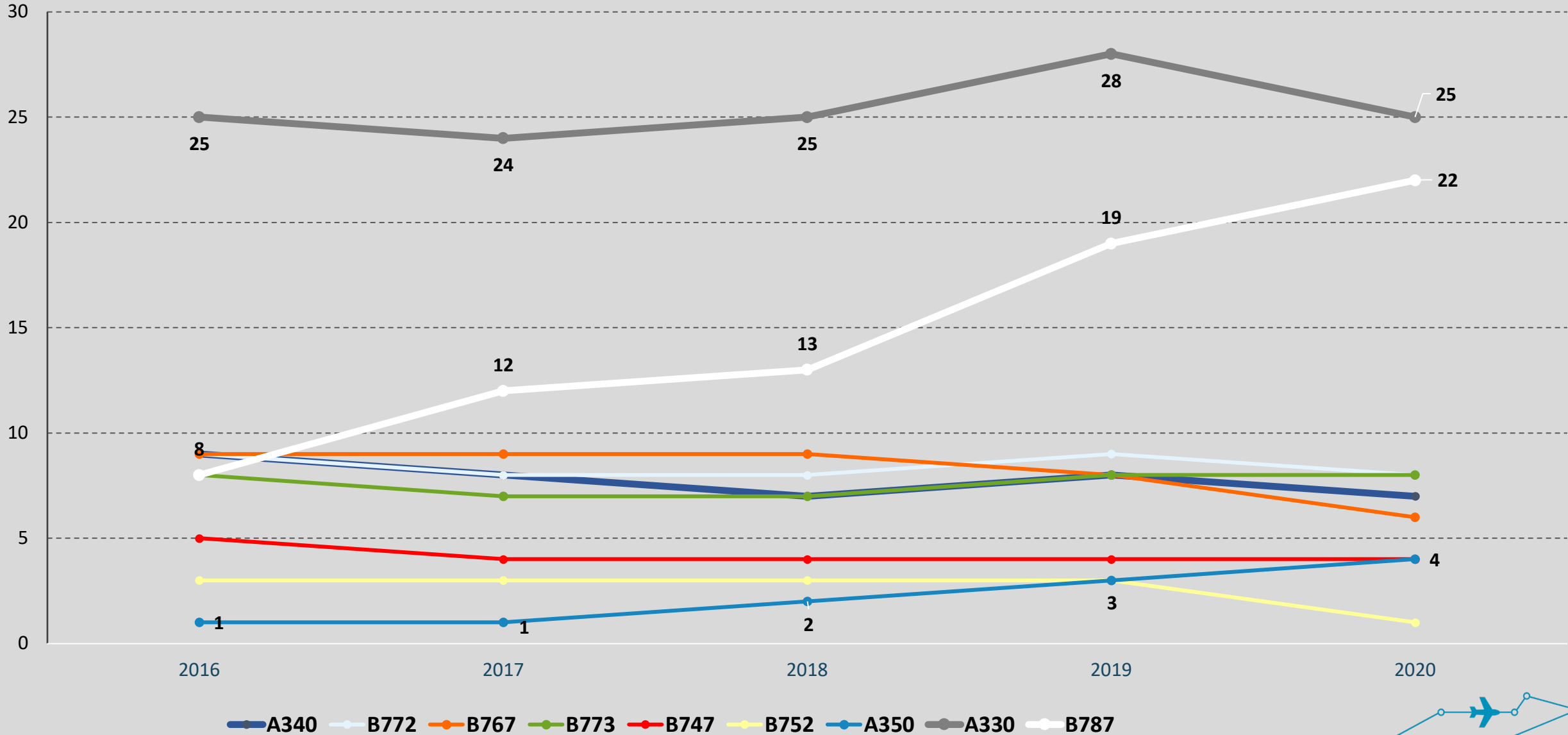
AFI-EUR

23 % SAM-EUR

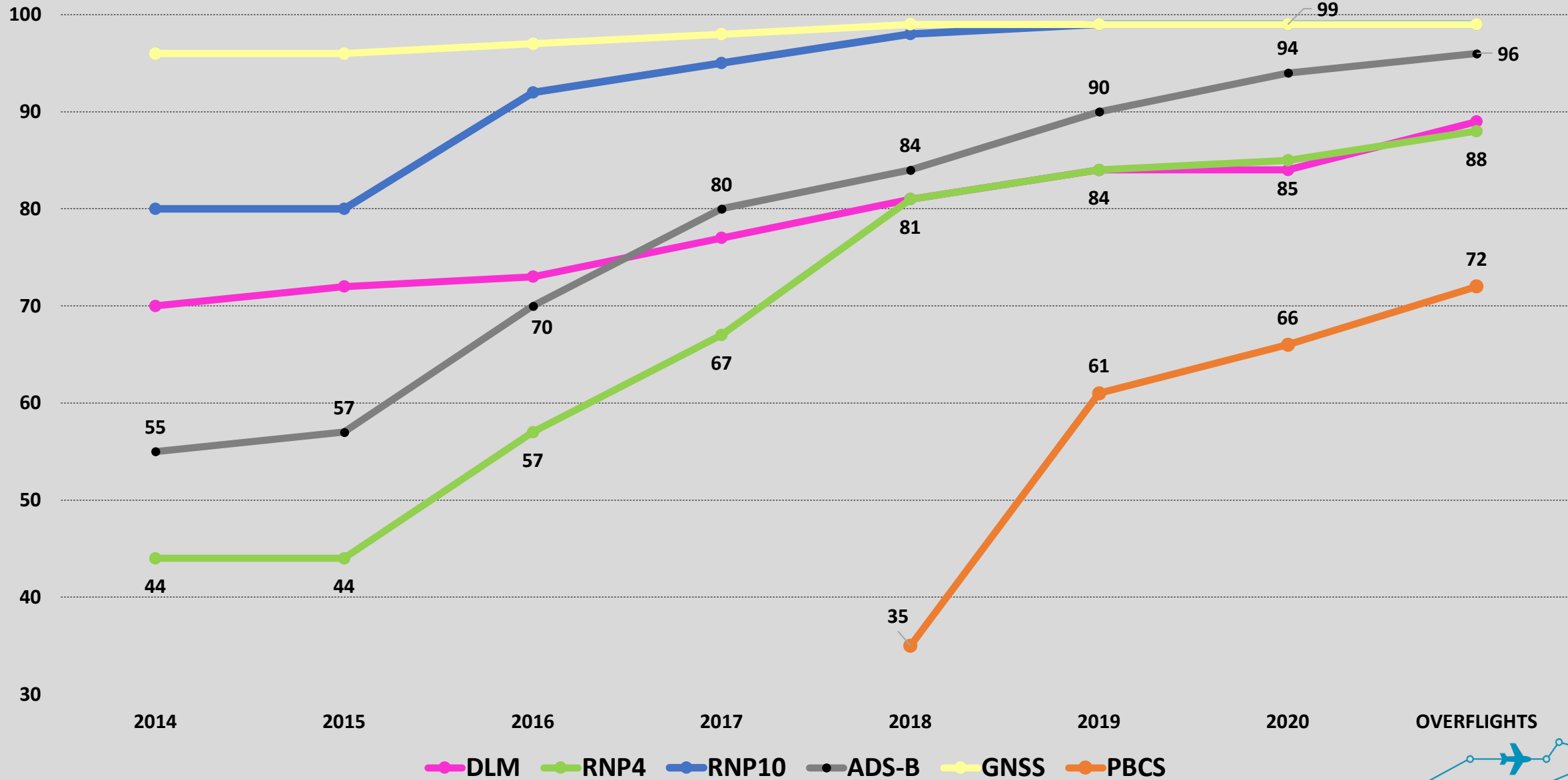
JAN-OCT 2021

Overflights:	54K
Domestic:	12K
Internal:	13K

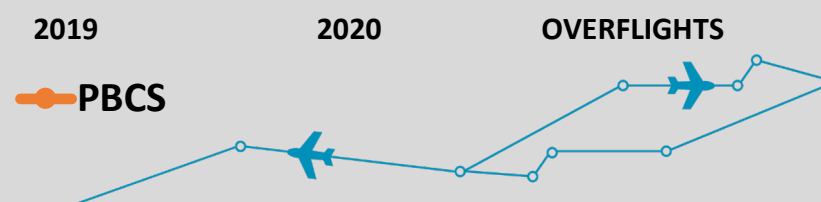
Aircraft types (% overflights)



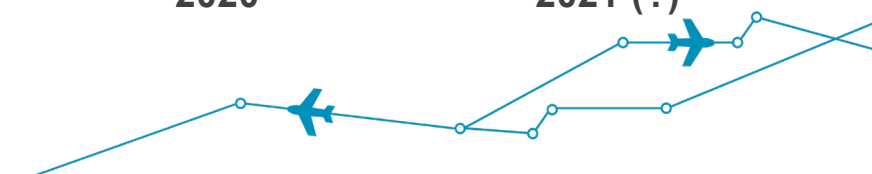
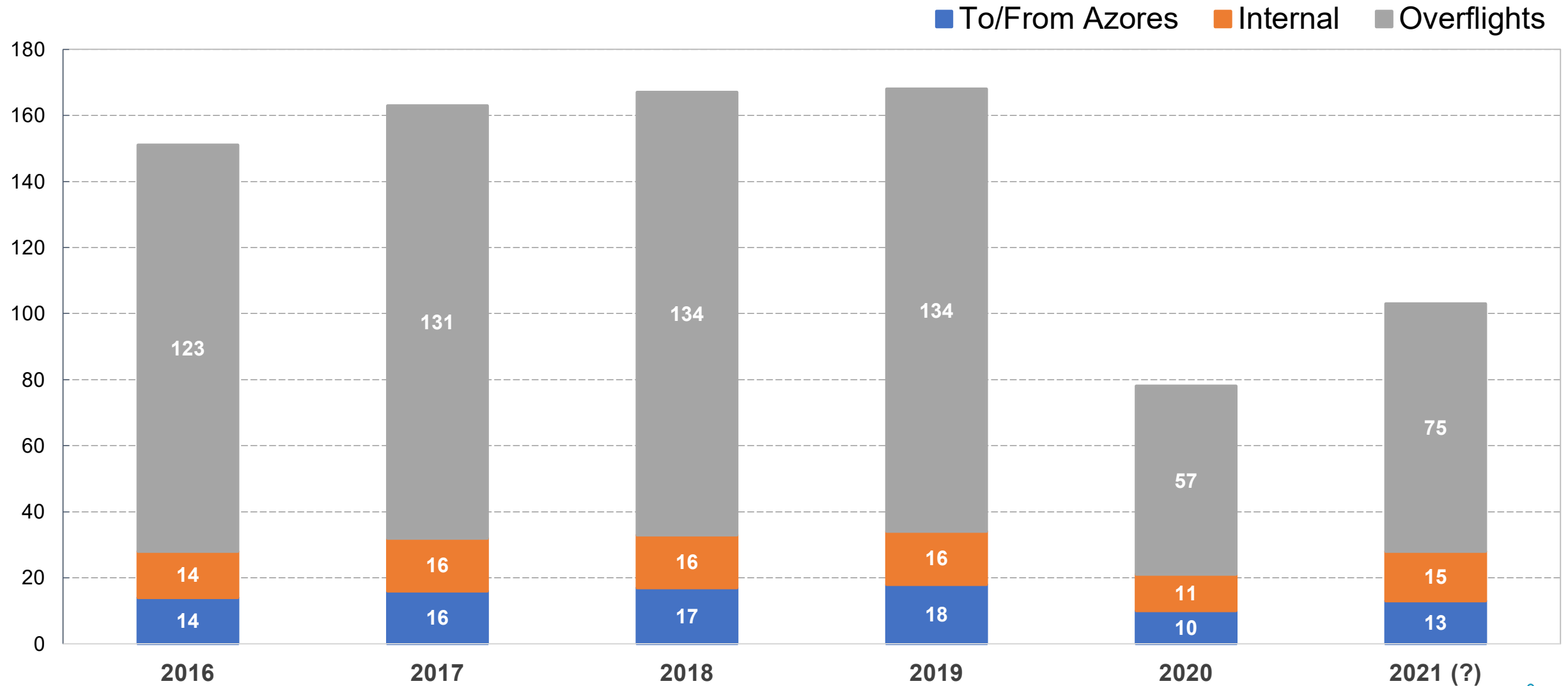
Equipment (% total flights)



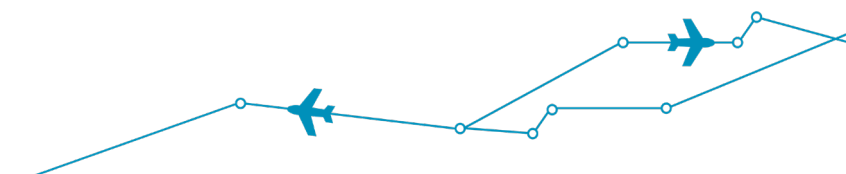
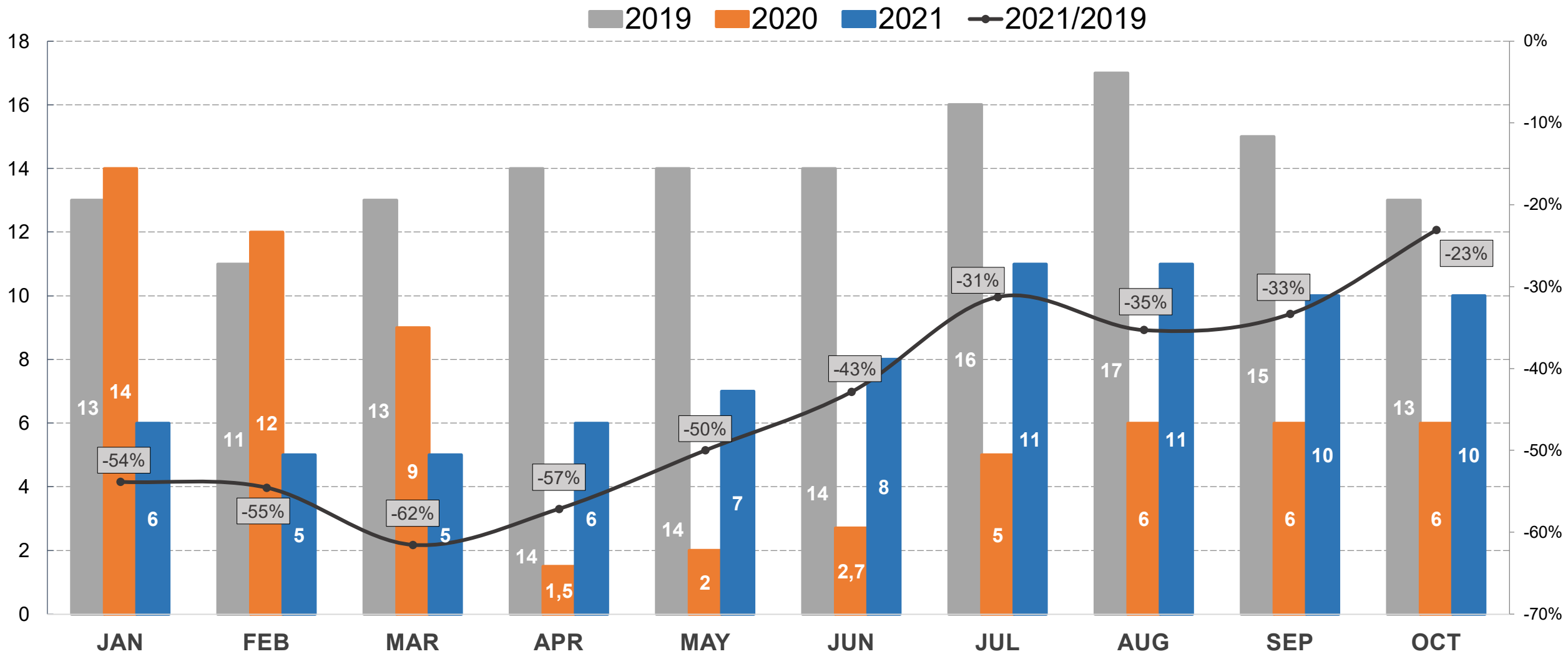
DLM RNP4 RNP10 ADS-B GNSS PBCS



Traffic demand (yearly)



Traffic demand (monthly)



Communications (A/G)

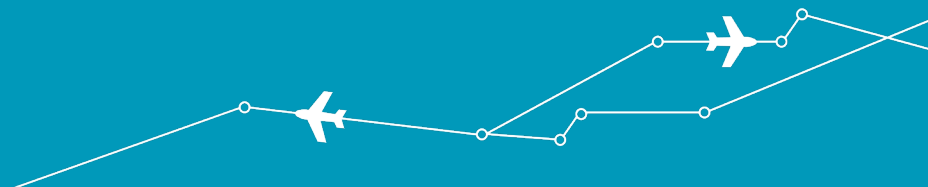
HF Radio Station (NAT A / E)

VHF (129.4 / 132.15 / 132.075)

SATCOM

CPDLC

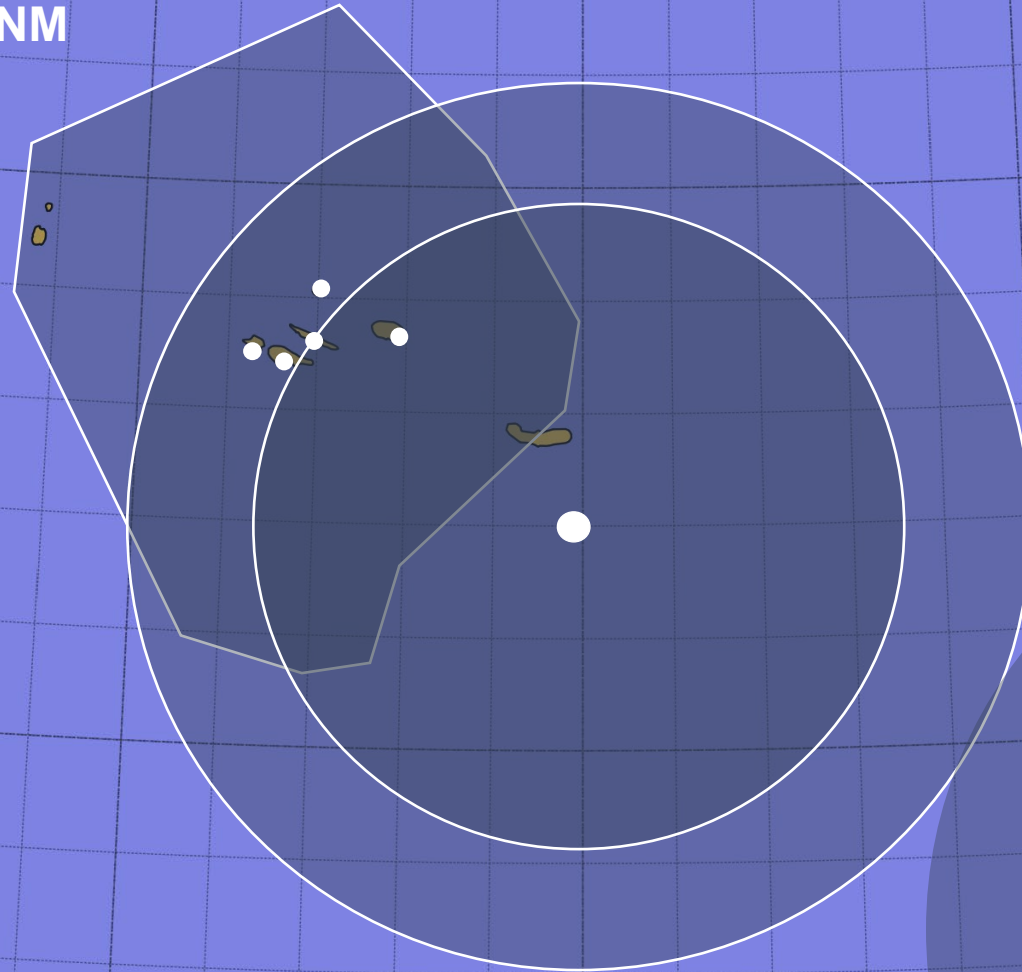
Transition from procedural to surveillance



Transition from procedural to surveillance

2006

SSR antenna in Santa Maria
Sector with radius of 170 NM
2 separate ATM systems
(Oceanic / Surveillance)

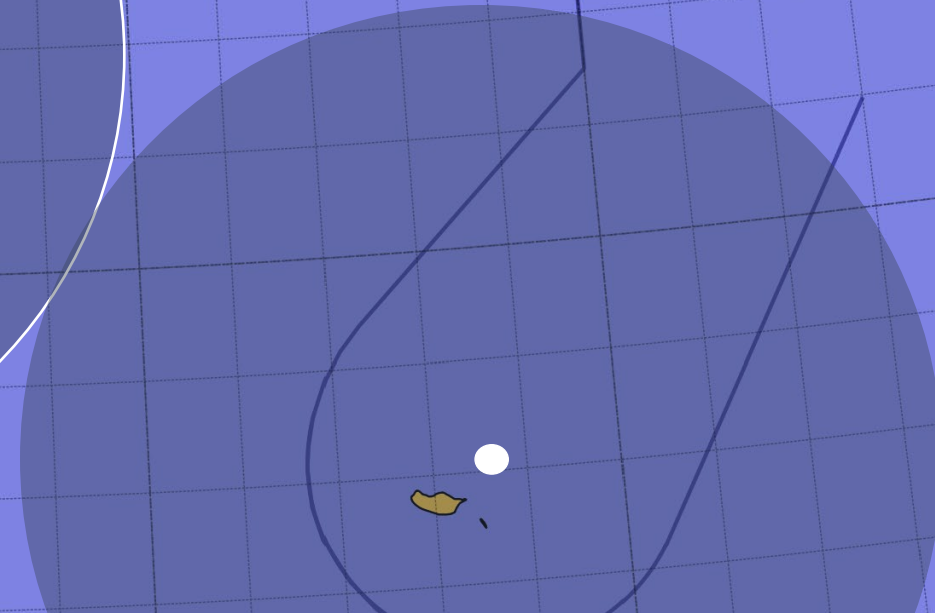


2012

Radius of 240 NM
Single ATM system

Surveillance data from
PST SSR antenna

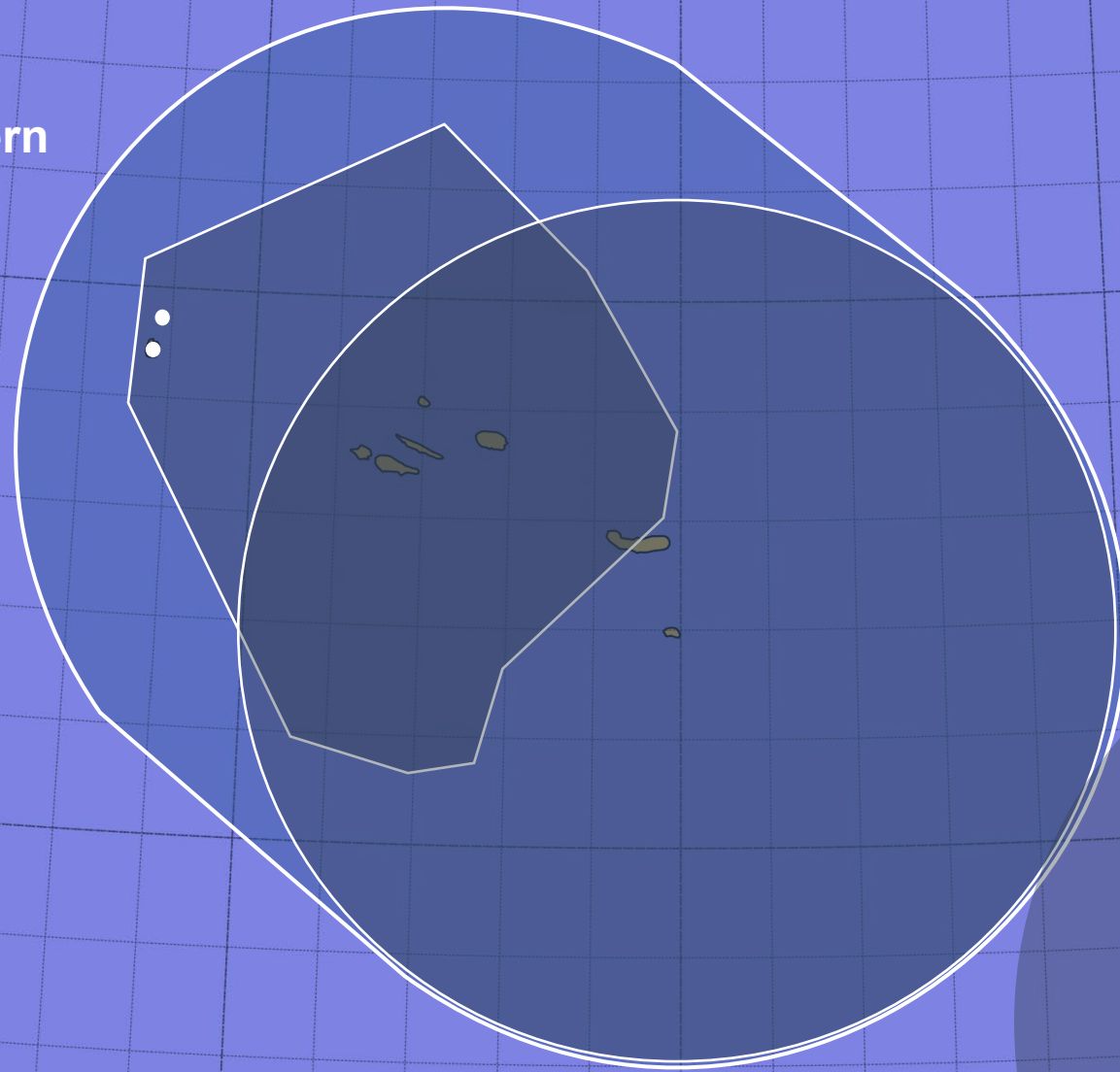
11 ground based
antennas in 5 islands



Transition from procedural to surveillance

Early 2015

6 antennas in Western
Islands



Current Surveillance Airspace

Mixed environment
SSR SMA + PST
WAM + ADS-B (ground based)
Partial VHF coverage

Surveillance sector, VHF coverage

- 101K hours
- 111K flights

55 min/flight

- ▲ ADS-B / MLAT
- SSR Antena
- VHF Antena

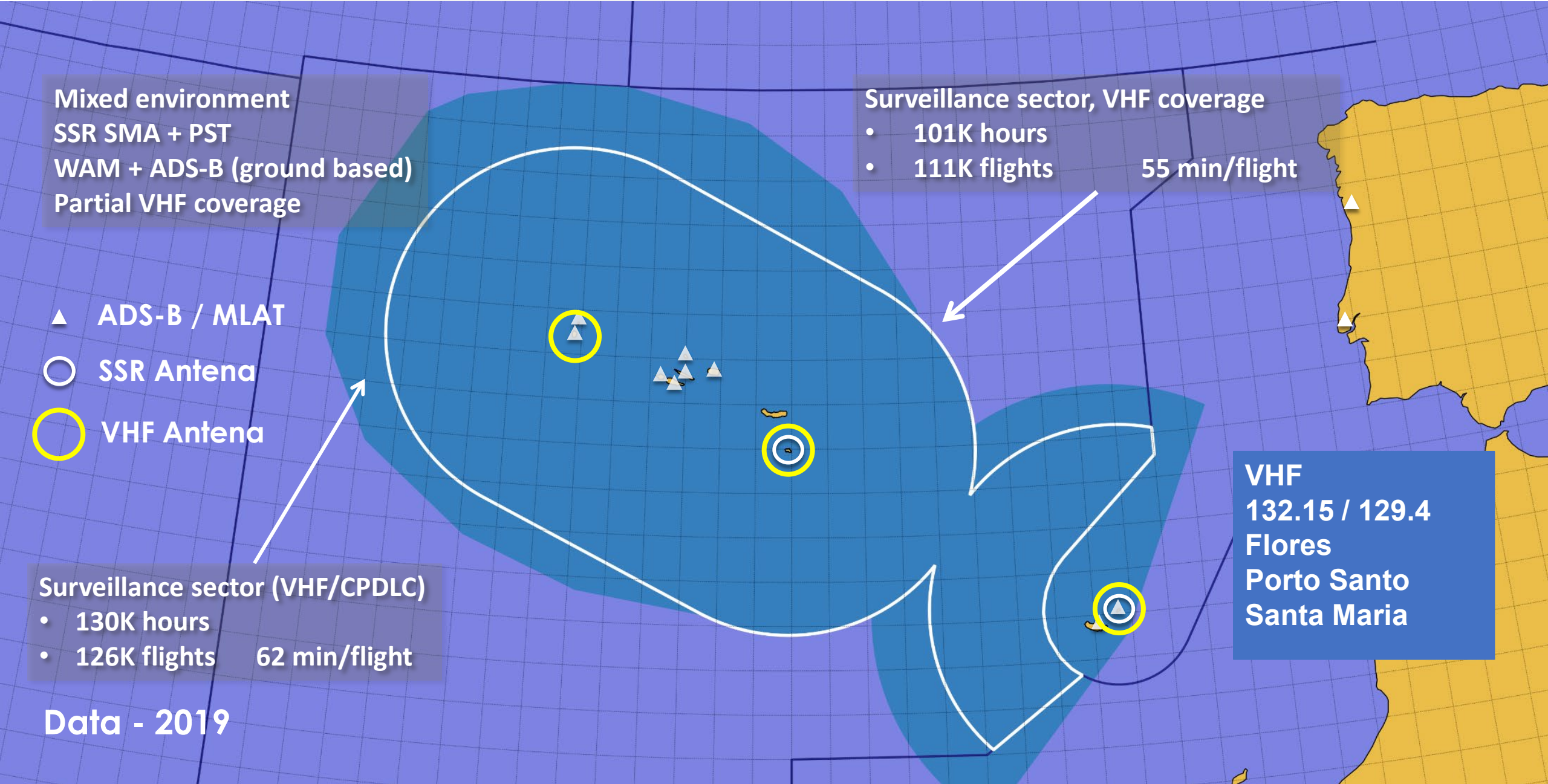
Surveillance sector (VHF/CPDLC)

- 130K hours
- 126K flights

62 min/flight

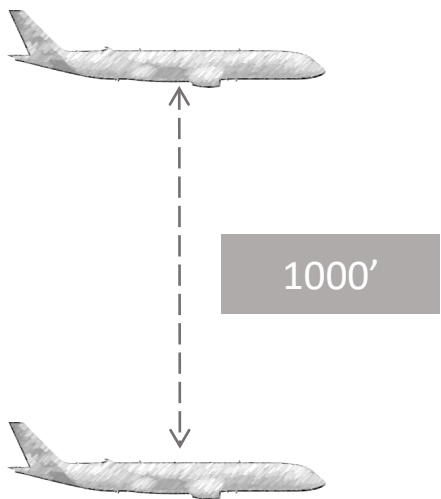
VHF
132.15 / 129.4
Flores
Porto Santo
Santa Maria

Data - 2019

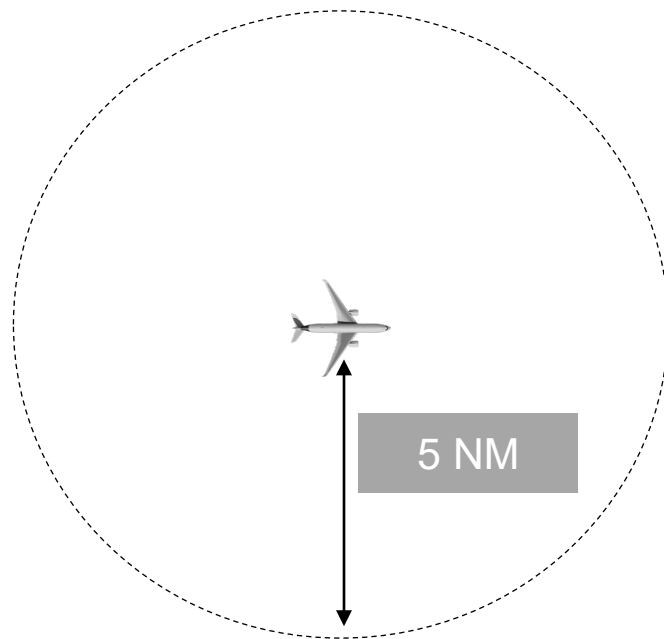


Frequently used separation minima

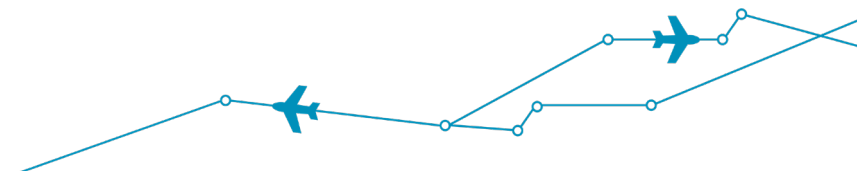
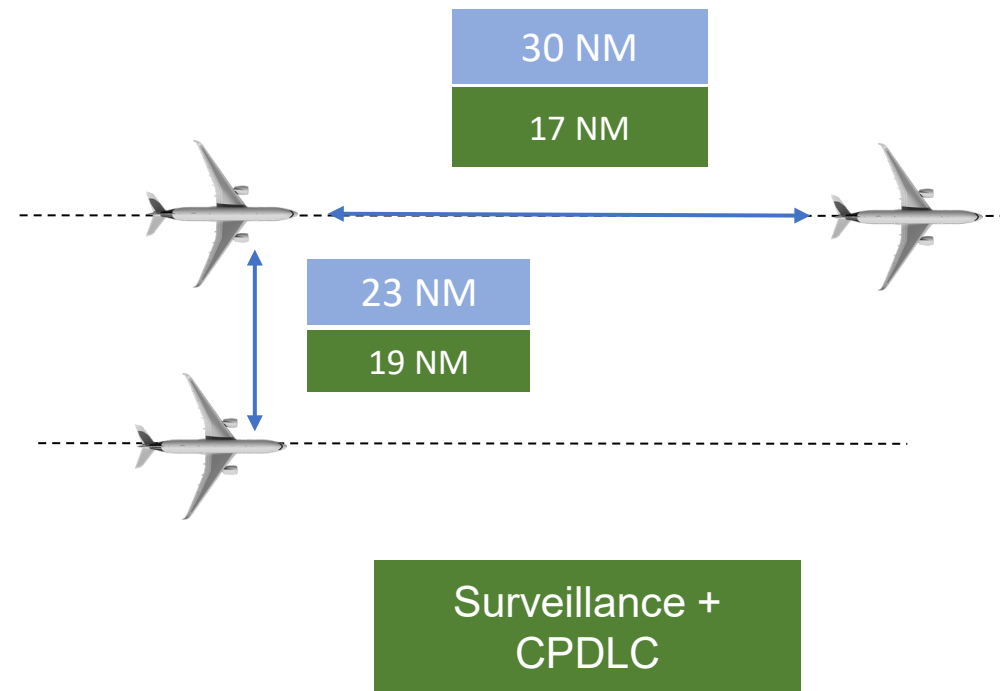
Vertical



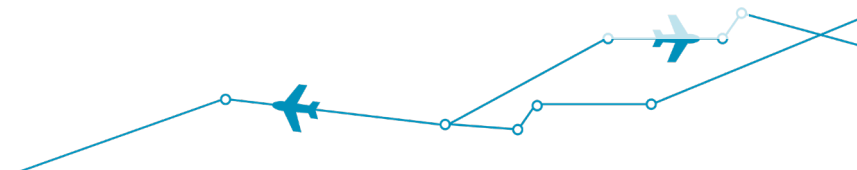
Surveillance + VHF



CPDLC + ADS-C

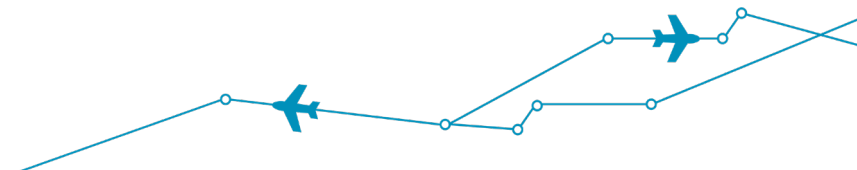


- **ATM System developments**
 - Add surveillance data processing capabilities to the FDP.
 - Add direct feeds and tracker feed (ARTAS, EUROCONTROL ASTERIX format).
 - Develop an HMI for the air traffic controllers.
 - Update the conflict prediction interface.
- **Documentation**
 - Operations manual (new operational procedures had to be developed).
 - ATM System manual.
 - Letters Of Agreement with adjacent centers.
 - AIP
 - UCS (???)
 - Unit Training Plans.
- **Training and licensing.**
 - Basic training.
 - Conversion training, for existing controllers.
 - “On the job” training for all controllers.
 - ACS/OCN/TCL (?)
- **Safety assessments.**
- **Regulator approval (in Portugal, ANAC).**

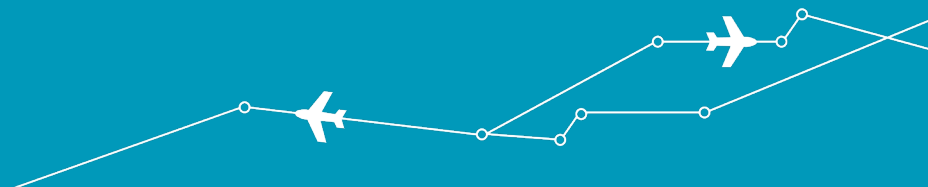


Transition from procedural to surveillance

- Initially there were only two procedural ratings
- Some Santa Maria controllers took the basic surveillance training.
- ATC surveillance instructors from several mainland facilities got a rating in Santa Maria Terminal Area.
- Conversion training for Santa Maria controllers was done.
- The service was started, using an independent system for the surveillance sector.
- Santa Maria controllers had their OJT and got their ratings.
- When enough local controllers had the surveillance rating, the “temporary” instructors returned to their original facilities.
- In time, the process was repeated, but with instructors selected from the local controllers.
- The main ATM system was upgraded to encompass both services. The “surveillance only” system was decommissioned.
- Currently all controllers are rated in Oceanic and Surveillance control.



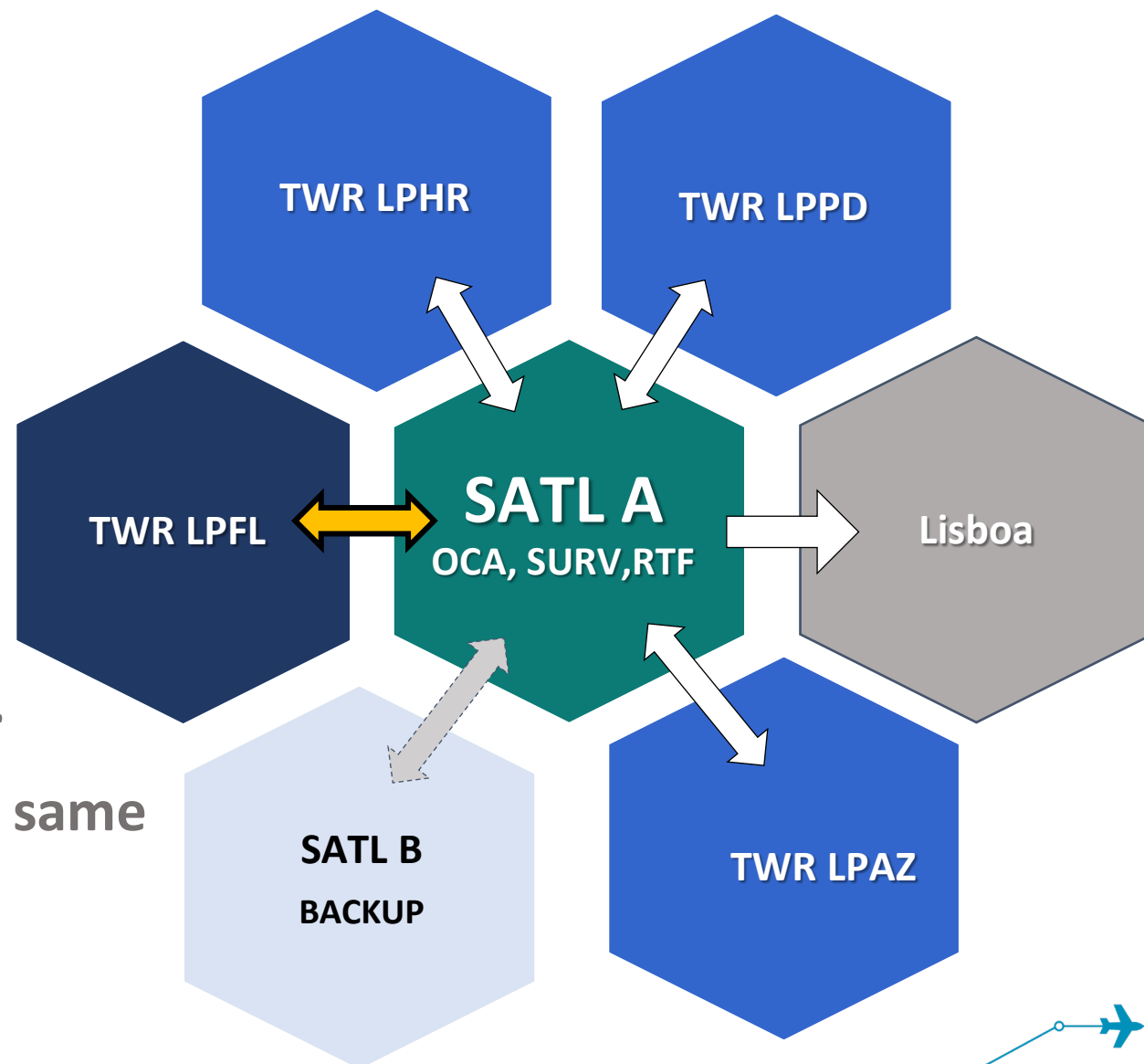
ATM system overview



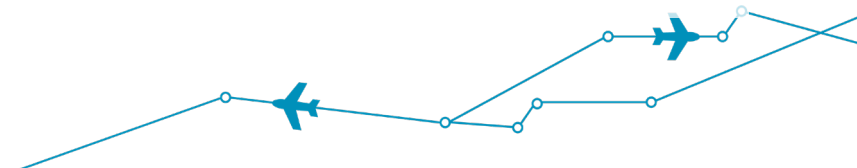
Single system

- Oceanic sectors
- Surveillance sectors
- Radio station
- Airports in 3 islands:
Santa Maria, São Miguel e Faial;
Soon, Flores;
- Passive visualization in Lisboa ACC.

2 independent chains (A e B), with the same functionalities.



- Surveillance (SSR, MLAT and ADS-B) data processing.
- Flight position extrapolation if lost/no surveillance data.
- Flight equipment monitoring.
- Select flight level conformance monitoring (ADS-B)
- Data Link capabilities (ADS-C, CPDLC and OCD via ACARS), PBN / PBCS compliant.
- Conformance Monitoring.
- Dynamic conflict prediction based on
 - Flight equipment
 - Flight location
- Long term (CPAR), medium term (MTCD) and short term (STCA) conflict alerts.



Advantages

Same system for OCS and RDS, with integrated dynamic conflict prediction.

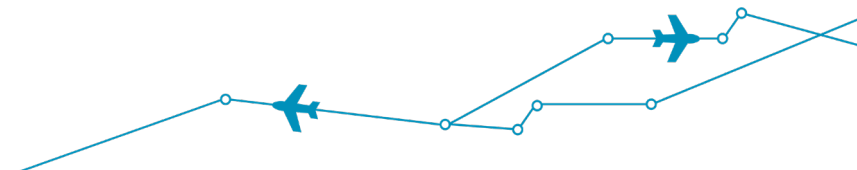
- If a flight's surveillance track is lost, procedural separation minima will be used for that single flight.
- If the surveillance system is down, procedural separation minima will be used for all flights.

Single rating, Surveillance / Oceanic.

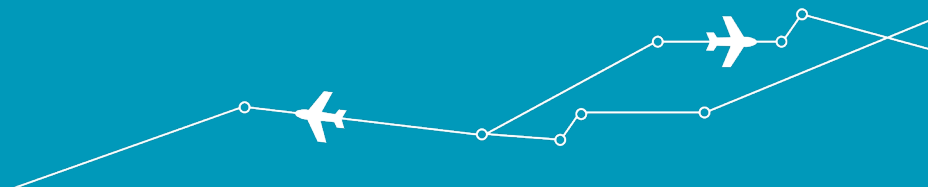
All workstations can be used for any function

- Surveillance
- Oceanic
- Mixed operations (Surveillance + Oceanic)
- Radio station

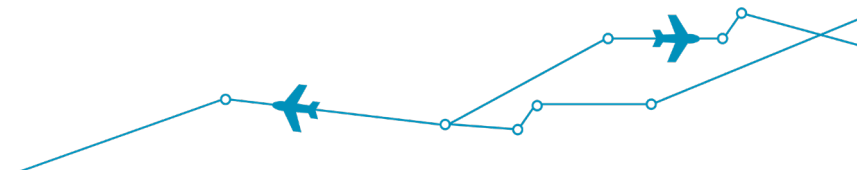
Efficiency, effectiveness and flexibility.



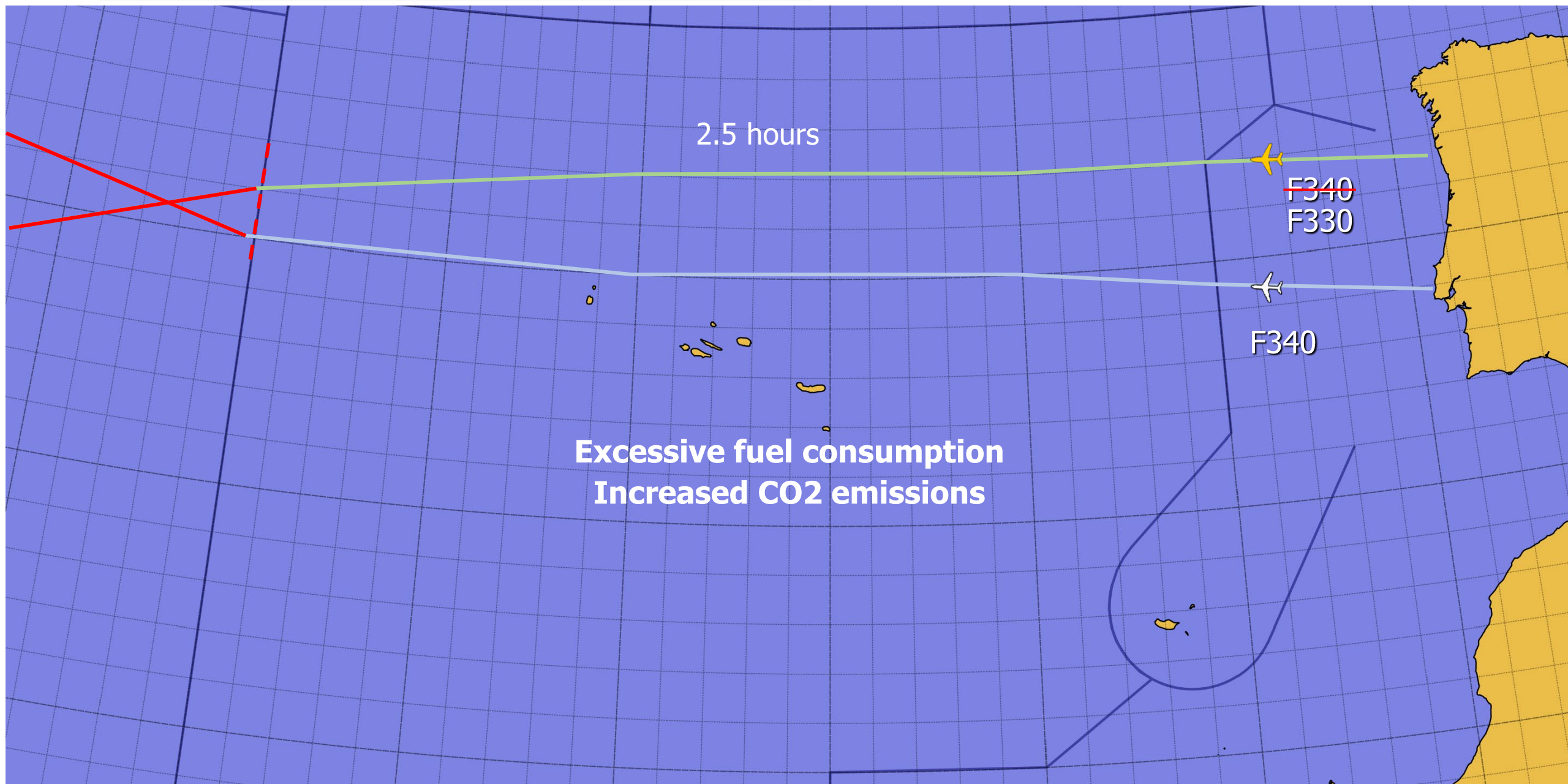
Services provided

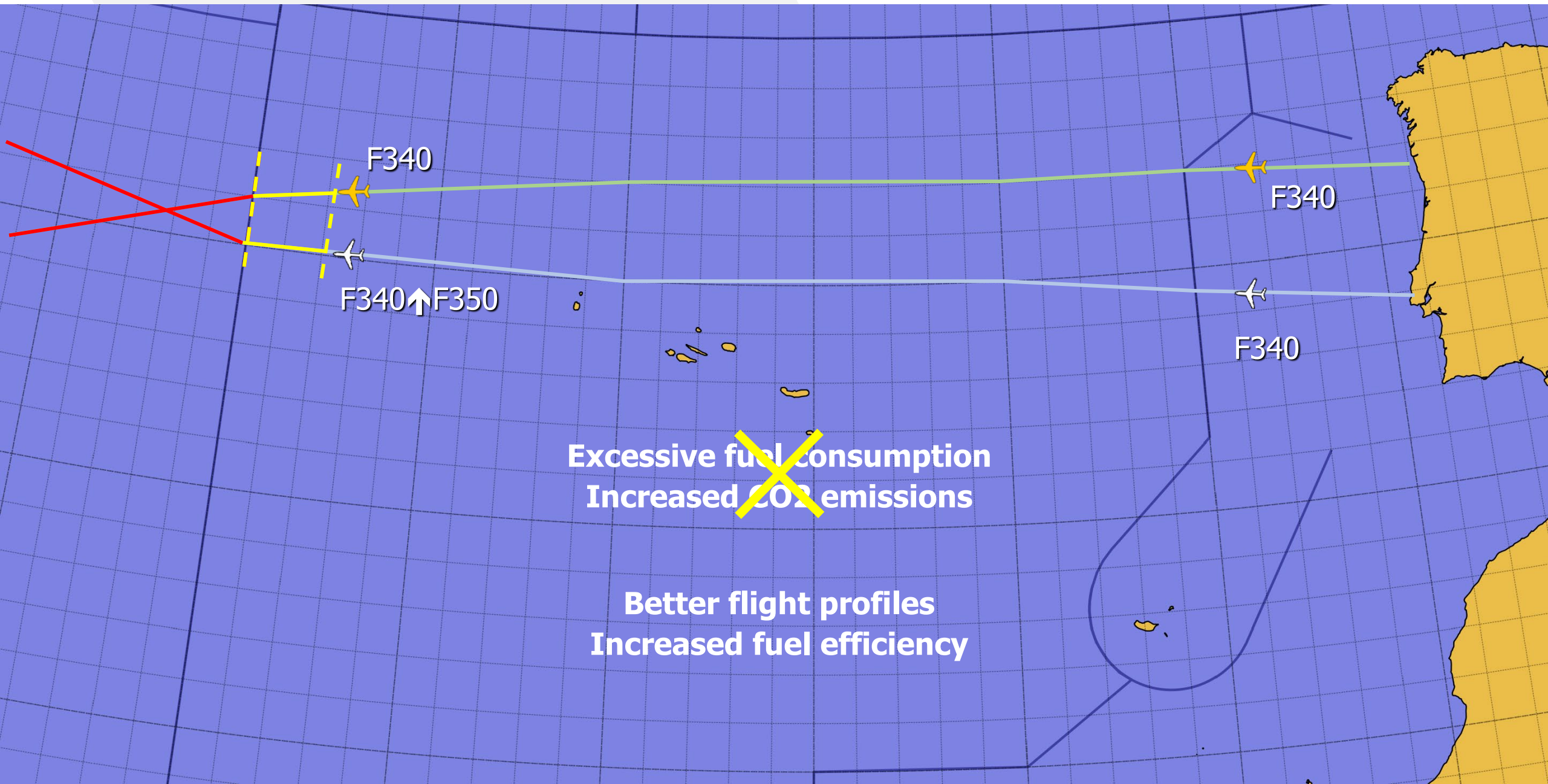


- **FREEROUTE (User preferred routes)**
- **ECON (No speed restrictions)**
- **Cruise climbs / blocks of altitude**
- **Tactical environment, better flight profiles**



Strategic environment





F340

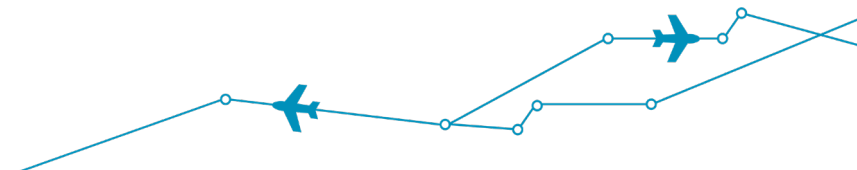
F340↑F350

F340

F340

~~Excessive fuel consumption
Increased CO2 emissions~~

Better flight profiles
Increased fuel efficiency



Thank you !





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