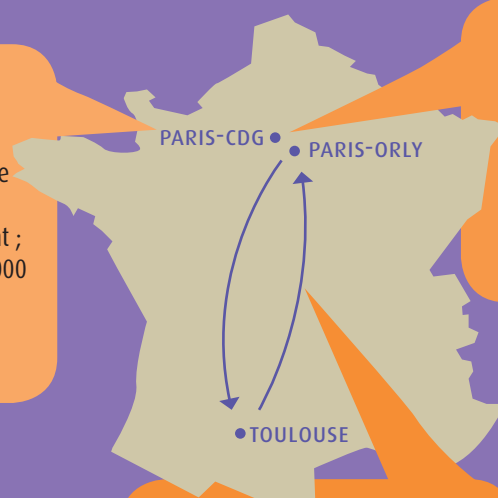


Initiative to Reduce Emissions of Greenhouse Gas in Aviation



Green Transatlantic flights
Number of flights : 50 ;
Total reducing of CO₂ : 2 to 5
metric tons per flight.

Greener airports operations under adverse conditions
Reducing time of average rolling :
up to 2 minutes per flight ;
total reducing of CO₂ : 6000
metric tons per year ;
Paris-CDG approved
"Airport-CDM".



Down wind optimisation
Number of flights : 218
Total reducing of CO₂ :
up to 1 metric ton per flight.

Making "La Navette" greener
Number of flights : 100
Total reducing of CO₂ : up to 1 ton
per flight.

Directeur de la publication Maurice Georges / Editions DSN A cabinet juin 2011 / co-édition DGAC / réalisation DGAC / crédits photos M. Bonini, V. Paul / Imprimerie DGAC, juin 2011

Reducing the environmental impact of air navigation is DSN A's second strategic priority

The Atlantic Interoperability Initiative to Reduce Emissions (AIRE) agreement between the European Commission and the FAA is a partnership program which aims at reducing CO₂ emissions by taking advantage of air traffic management (ATM) best practices capitalizing on present aircraft technologies. AIRE accelerates the development and implementation of environmentally friendly procedures for all phases of flight (gate-to-gate), through validation of continuous improvements with trials and demonstrations.

AIRE is an important part of the green component of the SESAR programme (Single European Sky ATM Research). The SESAR Joint Undertaking (SESAR JU) is responsible for its management from a European perspective. The initiative's main goal is to accelerate implementation of greener daily ATM operations reducing CO₂ emissions by up to 10% and noise around airports.

In May 2010, the SESAR JU selected and co-sponsored 4 DSN A led projects that make a proof of concept flight trials as described in the following sections. The DSN A with its projects partners has carried out several evaluations in 2010-2011 with significant results in terms of reduction of fuel consumption and gas emissions.



DSNA and its partnerships involved in AIRE flight trials in 2010-2011

Ressources, territoires, habitats et logement
Énergies et climat
Prévention des risques
Développement durable
Infrastructures, transports et mer

Présent pour l'avenir

AIRE : FLIGHT TRIALS IN 2010/2011 IN THE FRAMEWORK OF THE SESAR PROGRAMME

THE NEW SESAR "AIRPORT" CONCEPTS

This section describes flight trials of greener airports operations under adverse conditions in partnership with Aéroports de Paris and Air France. The DSNA has led studies in Paris-CDG airport, the first European airport in terms of aircraft movements.



(1)

Traffic on the ground was often congested on the major platforms and aircraft were waiting in single file on taxiways before take-off (1). Airport operations indeed were not sufficiently optimized due to lack of coordination of information-sharing between all stakeholders.



(2)

The project was based on the use of two new tools. Using Airport Operator, Air Traffic Control (ATC), Central Flow Management Unit (Eurocontrol) and airlines data and integrating all constraints, the pre-departure sequence system developed by Aéroports de Paris and DSNA (2) computes an optimized off-block departure time for each flight called TSAT (Target Start-Up Approval Time) and the corresponding TTOT (Target Take-Off Time).



(3)

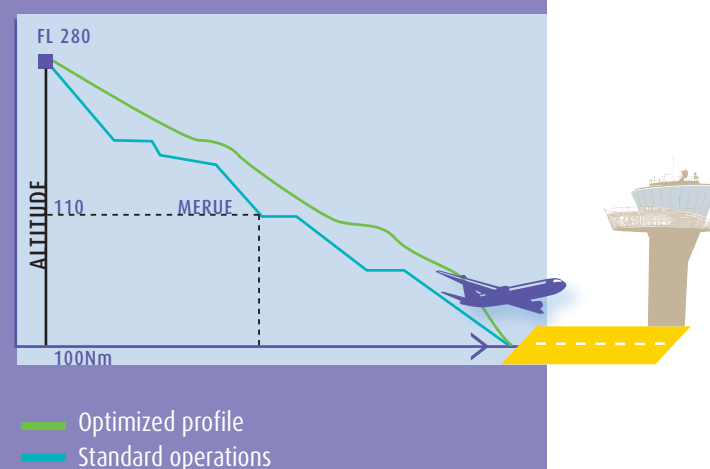
The controller delivers clearances taking into consideration the off-block sequence according to the optimized departure times thanks to a departure manager tool (DMAN) developed by DSNA and the company Egisavia. The operational domain concerns nominal situations but also adverse conditions such as runway closure, low visibility procedures, de-icing and possibly snowing operations (3).

THE NEW SESAR "TERMINAL AREA" CONCEPTS

This section describes flight trials of the down wind optimization at Paris-CDG airport in partnership with Air France.

Flight trials have been performed to develop a concept of Green arrival procedures based on improvements of vertical profiles, particularly :

- Smooth descents from high altitudes (FL280 - FL110) to Initial Approach Fixes (IAF) "MERUE" and "LORTA",
- Publication into Aeronautical Information Publication (AIP) of green standard arrival and initial approach procedures so that they are integrated in aircraft FMS,
- Continuous descent operations with closed loop procedures.



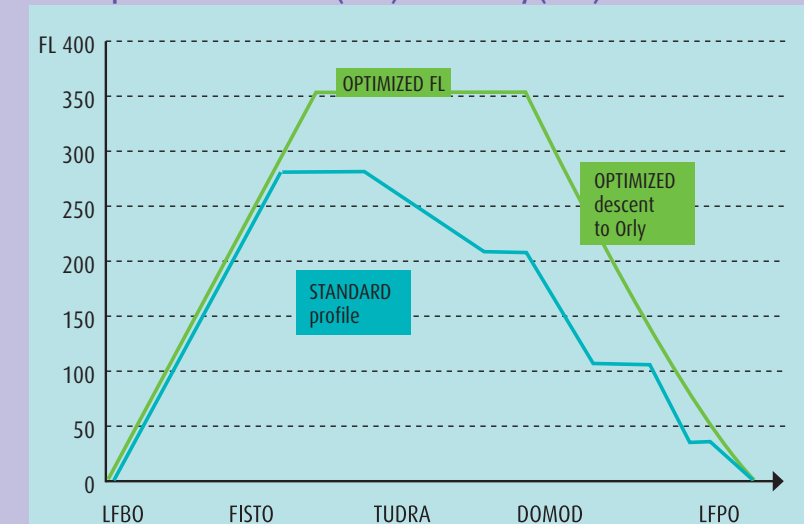
THE NEW SESAR "GATE-TO-GATE" CONCEPTS

Green shuttle : "making La Navette greener"

This section describes flight trials to make shuttle flights greener in partnership with Airbus and Air France. The national air carrier operates domestic daily shuttle flights named "La Navette" between Paris-Orly and Toulouse in complex airspace with military activities. This is one of the busiest European city pairs.

Flight trials have been carried out to develop Approach and En-route procedures evaluating full optimized profiles (in vertical domain and lateral domain) in both ways with shortened routing and a better use of airspace. For that, new rules have been set up in the Routes Availability Document (RAD) used by pilots, Air Traffic Controllers and Central Flow Management Unit (Eurocontrol). For DSNA, several Area Control Centres (ACC) have been involved : Paris ACC, Brest ACC, Bordeaux ACC, Orly and Toulouse.

Vertical profile from Toulouse (LFBO) to Paris-Orly (LFPO)

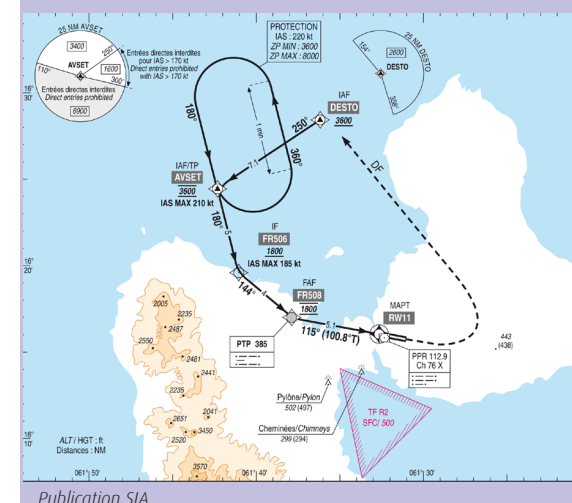


Green transatlantic flight to GNSS approach

This section describes flight trials of green transatlantic gate-to-gate flights in partnership with Air France, Nav Portugal, NATS, FAA and the ATM systems company Adacel. Westbound flight trials have been performed between Orly and the French West Indies (Pointe-à-Pitre).

The flights were optimized as follows :

- Vertical domain of the oceanic cruise was based on the use of the FMS calculation system and coordination with ATC to accommodate the optimized flight levels (FL) in flight, taking into account the actual aircraft weight and actual/forecast winds and temperatures,
- Lateral domain of the oceanic cruise has assessed the possibility to find an optimized route once airborne, based on the actual aircraft data using Air France flight planning system and coordination with ATC,
- Approach sequence has benefited from the performance of the new RNAV GNSS approach at Pointe-à-Pitre airport (1) based on satellite navigation.



(1)