

4-FLIGHT

The most innovative ATM
system in Europe

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INITIAL DEPLOYMENT

TOWARDS OPERATIONS

The program 4-FLIGHT goes into the home straight : first commissioning is scheduled in the two DSN A pilot-control centres, Marseille and Reims ACCs, during the winter 2021/2022 and in Paris ACC during the winter 2022/2023.

On the road to compliance with Pilot Common Project requirements and SES implementing rules.



THALES



Co-financed by the Connecting Europe
Facility of the European Union

In 2018, the French air navigation services handled 3.2 million flights, with one-day peak 11,105 flights, setting new records for air traffic in Europe.

The 4-FLIGHT system, defined by DSNA and developed by Thales, the world leader in air traffic management, is a response to the high increase in air traffic demand in France and Europe. It will equip all 5 French Area Control Centres (ACCs) operating in 1 million km² of airspace. This new generation, stripless control system integrates Coflight, the advanced flight data processing system, an interface (HMI) proposing innovative control tools, and the simulation environment for controller transitioning. One of the first expected benefits is an increase of around 20 per cent in overall capacity, enabling DSNA to offer higher quality and more competitive services to all aircraft operators. Notably, Free Route, and more widely the 'User Preferred Route', will be implemented in a complex, high density airspace.

Incremental deployment of 4-FLIGHT system versions allows the organization of several live trials with increased complexity levels until its first commissioning scheduled in the two pilot-control centres, Marseille and Reims ACCs, during the winter 2021/2022 and in Paris ACC during the winter 2022/2023.

4-FLIGHT AND THE MILITARY OPERATIONS

The main technical issues under consideration are:

- **Guaranteeing interoperability (IOP) between civil and military ATM systems** during the transition phase, until 4-FLIGHT implementation in the 5 ACCs. Military ATM systems must be adjusted to take into account 4-FLIGHT interfaces. First operational evaluations took place in 2018.

- **Matching 4-FLIGHT for specialized military air traffic control cells**, called CMCC, collocated in each ACC. Unlike the current ATM system, 4-FLIGHT will handle military flight plans. Moreover, military ATCOs will benefit from most of civil ATCOs tools. Military specifics will be totally integrated in the civil needs processing. These matchings will be tested in 2019.

4-FLIGHT AT PARIS ACC

Test and training platforms have been deployed, allowing the software setting and the preparation of ATCOs and ATSEPs training program. At the same time, technical activities consisting in facilities upgrading and reorganization of technical rooms for the installation of

4-FLIGHT equipment are taking place. The training room will allow the preparation of future training sessions and also the activities to get started with the system. The software setting and the working methods will thus be consolidated.



Thanks to Coflight, air traffic controllers are able to optimise flight trajectories, which results in flight time and fuel consumption savings. The performance delivered to airspace users is optimal!

- Flight plan data services for civil and military air traffic control
- An advanced 4D trajectory prediction
- Interfaces to feed all ATC tools (MTCD, AMAN/DMAN, Data Link...)
- ATFCM/ATC efficiency improved through advanced 'What-If' tool
- Interoperability based on Flight Object Sharing for seamless operations

4-FLIGHT AT MARSEILLE ACC, PILOT-CENTRE

The outcome of live trials conducted in 2018 are used for evaluation and testing of the system as well as for fine tuning and finalization of ATCOs and ATSEPs training



Operational trial involving ATSEPs and ATCOs controlling on 4-FLIGHT positions simultaneously on several sectors.

material. Parametrization work and testing of new releases of 4-FLIGHT software has continued.



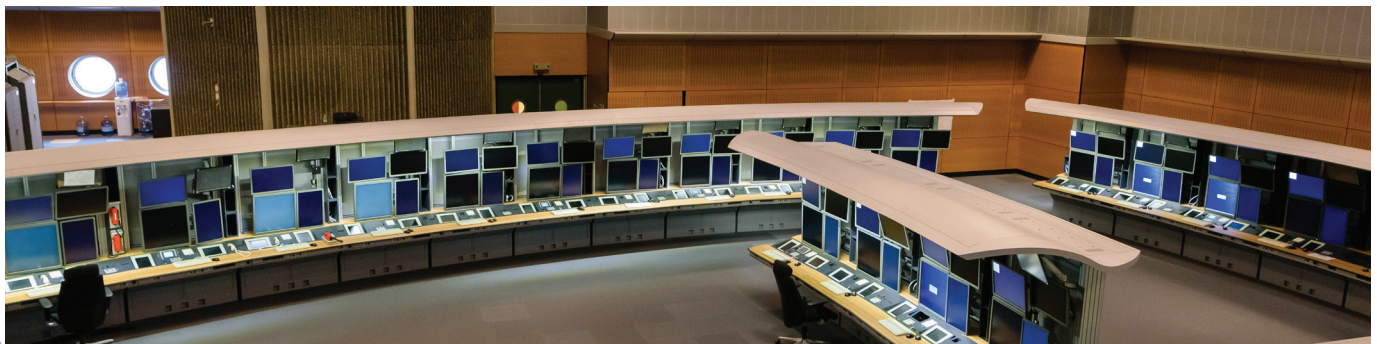
Controller in training on 4-FLIGHT.

4-FLIGHT AT REIMS ACC, PILOT-CENTRE

4-FLIGHT activities are focused on the preparation and the launch of conversion training for ATCOs and ATSEPs and the validation of the latest software versions including the simulator. In 2020 all 250 controllers will benefit from the initial training module. The full training program will last 13 days, covering theoretical and practical simulation training (about 50 exercises). Specific educational tools designed with ENAC, the French Civil Aviation Academy, will be used to complete the training sessions. The

ATSEP training will also be launched. The second phase of conversion training including training for adverse conditions, will be organized in 2021.

Until the deployment, new instructors will be trained and will perform new live trials with a much wider scope to evaluate in-depth system integration, including technical monitoring and civil-military coordinations. A second phase of conversion training involving adverse conditions will also be organized.



In 2019, new control working positions 4-FLIGHT will be set up in the operations room.

AN INNOVATIVE STRIPLESS ENVIRONMENT

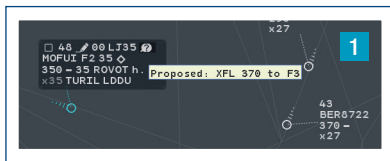
DESIGNED BY CONTROLLERS FOR CONTROLLERS

A new ATCO user experience thanks to TopSky – Controller HMI and Coflight

In addition to ergonomic studies and thanks to Java technologies, sophisticated and complex support tools are integrated and accessible in a simple and intuitive way on radar displays. This guarantees consistency and readability in the displayed information. The controllers can therefore focus on their main control tasks.

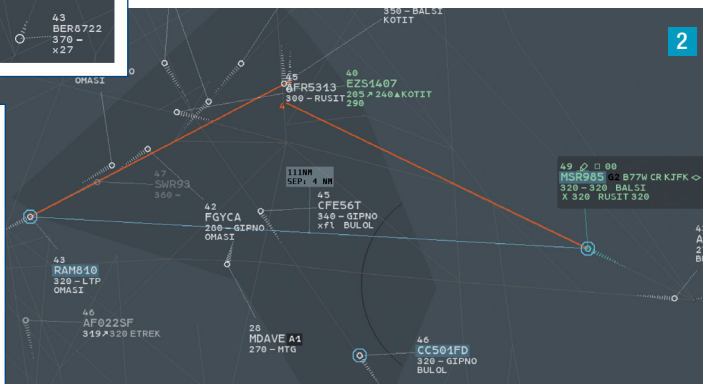
1 Electronic negotiation of coordination data (“What if”)

coordinates flight levels or direct routes with adjacent sectors, directly from track radar without phone calls. Easy to reach, it covers a large part of operational cases.



2 A full set of ATC tools to facilitate the analysis of a set of flights

- Minimum radar Separation Tool (**SEP**)
- Vector measurement (**QDM**)
- Minimum Flight Plan Separation (**CPA**)
- **Route** (flight leg) to display graphical flight plan trajectory
- **Extrapolation** to estimate the future position of a set of flights at any time along their flight leg
- **Contextual filters** to filter the in flight situation according to specific criteria such as levels (XFL, AFL...) or lflux.



3 Tactical Control Tool (TCT)

detects potential conflicts within a 5 minutes look-ahead time, complementing the STCA alert detection. It also checks the clearances given by the controller.

4 Cooperative tools providing shared situational awareness allow a gain in safety and efficiency by a better sharing of the workload between Executive and Planner Controllers.

- **Shared Highlight:** Marking specific data labels or conflicting flights
- **Datablock:** Identifying set of flights that require specific analysis
- **Agenda:** Displaying shared potential conflicts allowing rapid access to the flights involved.