N°4 – JULY 21, 2016

Restructuring Sudan Airspace Fast-Time Simulations completed

Both scenarios proposed by the French Team and accepted by SCAA were tested in June with fast-time simulations on OPAS platform. The results are very encouraging. Time has come now to engage the real-time simulations. They will take place on Eurocat-X simulator in Khartoum the first two weeks of September.

Restructuring process Quick reminder

Hereafter are quickly recalled the different steps of the Sudanese airspace restructuring process:

- February 2016: Kick-off meeting and data collection.
- March 2016: Inception report.
- April and May 2016: Development, drafting, introduction and modification of the two scenarios. Validation by SCAA.
- June 2016: Fast-Time Simulations in France on OPAS platform.
- July 2016: Safety assessment and preparation of the Real-Time Simulations.

To come…

- August 2016: Discussions and negotiations with neighbouring countries for the implementation of cross-border RNAV routes and rewriting letters of agreement.

- September 2016: Real-Time Simulations in Khartoum (Eurocat-X simulator).
- October/November 2016: Sudanese ATCOs training and Implementation Plan.

Brief content of scenarios

The deliverable "Scenarios Draft" validated by SCAA includes 96 pages that are difficult to summarize in a few lines. However let's see the main points and major changes. Most of them are the result of requests from controllers and/or airlines.

- Strengthening the "lower network" by creating new conventional and RNAV routes to open up Nyala, Ed Damazin and Kadugli airports.
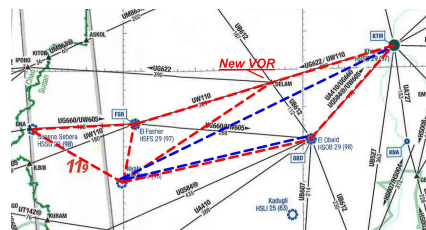
- Junctions between Khartoum new GNSS procedures and lower network (e.g. KUVTI-NUBAR or KUVTI-MRW).
- Limit between lower and upper airspace moved to FL 285.
- Resizing and moving the P10B area, so as to create several desired RNAV routes. Discussions are underway with military authorities to implement "Flexible Use of Airspace" and to improve the status of P10B (Temporary Segregated Area instead Prohibited Area).
- Creation of a corridor to join P10A and P10B (tentatively named P10C).
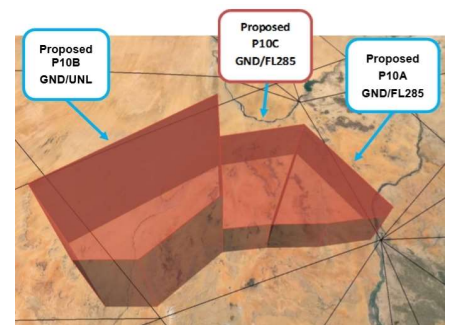
- A solid and efficient RNAV network above FL 285 by the creation of 40 new RNAV routes. Some of them are strictly included in the Sudanese airspace (this is what we call the Scenario 1).
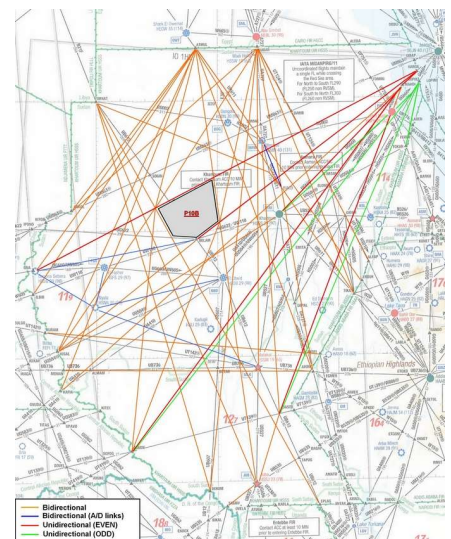
Scenario 1 chart

- Twelve new RNAV routes will be unidirectional, which is a guarantee of safety and efficiency. Major changes occur on one hand between Ethiopia and Egypt and also between Chad and Saudi
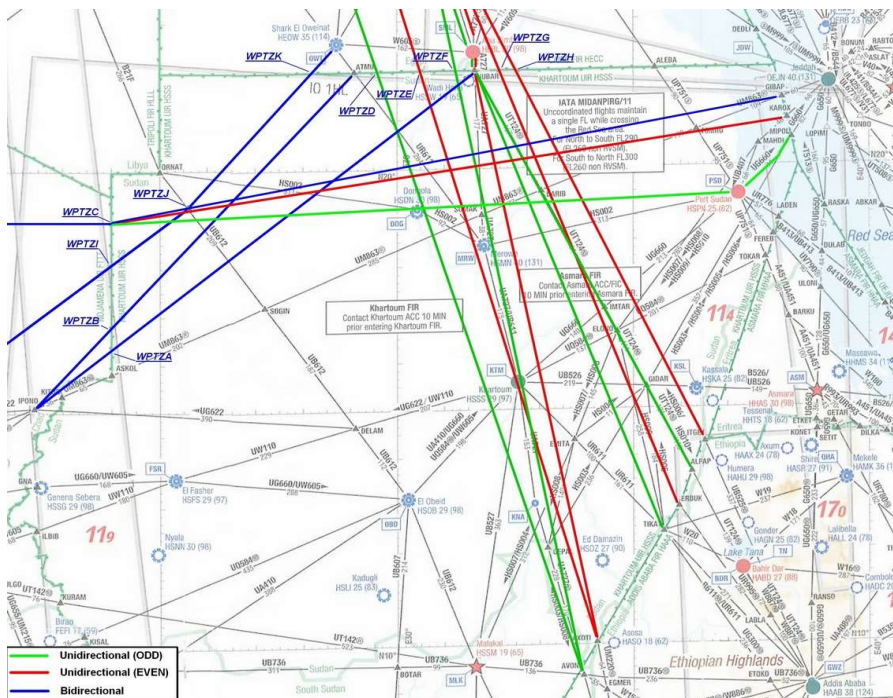
Scenario 2 chart

Arabia, with implantation of new cross-border unidirectional RNAV routes. Some of them still need the acceptance of neighbours (ongoing discussions, as explained above). This is what we call scenario 2.

• A Free Route Airspace above FL 385, during night time.

FTS – Fast Time Simulations

Simulators are valuable tools in many airspace design projects to test current ATM systems and assess the level of safety, capacity, feasibility and operational benefits of future ATM systems before their implementation in real operations.

In the frame of Airspace design projects, DSNA Services relies on OPAS, a suite of Fast-Time simulation tools. OPAS tool is used since 2005 by French Civil Aviation for national and international purposes to assess at an early stage the relevance of improvement measures.

Two new scenarios have been studied and compared with the current situation.

• **Workload:** FTS demonstrates that the number of conflicts de-creases significantly, thanks mainly to the new unidirectional RNAV routes (number of conflicts decreases of 42% in scenario 1 and 55% in scenario 2).

• **Efficiency:** Shorter flight planned routes will allow in both Scenarios a yearly fuel gain between 4.000.000 and 8.600.000 USD in 2016 (depending on the fuel cost). The yearly saving reaches between 11.900.000 and 25.500.000 USD in 2026.

These encouraging results have to be confirmed in the future Real Time Simulations in Khartoum. Restructuring of the Sudan Airspace could then become a win-win challenge for ATCOs and airlines.
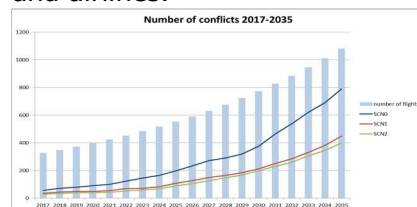
Safety Study
~ Training and documents ~

Since February 2016 and the official launch of the project, things have been moving faster and faster. Change is now in the air and a lot of work has been already implemented. Two ambi-tious scenarios have been proposed and SCAA is about to make the final decision on what will be the future of Sudanese airspace. Fast-time simulations were recently completed and the next major step will be the achievement of the real-time simulation. Considering the huge depth of changes in all ATM domains, a safety study is conducted to help SCAA succeed in implementing the future airspace architecture. Lots of risks and hazards have been listed and remedial actions as well. Amongst these actions, two main directions must be considered and strongly highlighted:

• **Exhaustive internal information** and **staff training.**

• Precise **aeronautical publications**.

A long list of additional protections has been proposed in the safety assessment but let's focus on these two main points. They will have to be emphasized to give air traffic controllers an excellent knowledge of their new environment and to give airlines all mandatory updated documents.

Under this conditions, the change provided will be acceptable and smoothly implemented.

Upcoming events

➢ **August/September**: Discussions with bordering countries to implement new cross-border RNAV routes and to update corresponding Letters of Agreement.

➢ **September 4 to 15**: Real Time Simulations in Khartoum ACC on Eurocat-X simulator.