

Weather impact prediction for ATFCM ('WIPA')

Executive summary

The impact of severe weather conditions such as heavy rainfall, strong winds, hail, lightning on air traffic management (ATM) is increasing over the years as they are becoming more intense and difficult to predict sufficiently in advance. According to EUROCONTROL, weather is responsible for 30% of all ATM delays in Europe and 25.5% of Air Traffic Flow and Capacity Management (ATFCM) delays, causing capacity reduction, increase of delays and disruptions to planned schedules. Given the increased workload for the air traffic controllers during the tactical phase, it is necessary to provide them with support decision tools for better weather ATFCM tactical regulations.

Given the rising significance of weather as a factor in reducing ATM capacity in Europe, new ways have to be found to maintain and measure ATM performance. Air traffic management organisations in Europe will have to develop new mitigation methods and build more capacity into their systems to cope with this developing challenge.

FRANCE AVIATION CIVILE SERVICES, or FRACS, and METSAFE addressed the “Thematic challenge 3: Efficient provision and use of meteorological information in ATM” with the design and validation of a Weather Impact Prediction tool for ATFCM (WIPA). The objective of the tool was to provide weather hazards impact information on air traffic control sectors in intervals of 1 hour over the ATFCM horizon (from D-day to D-day + 3 hours). For the impact analysis, WIPA considered the convection information as an input provided by the MET Enhanced ATFCM product (developed in the context of the first Catalyst call), additional MET information (as turbulences, icing and SIGMET), and ATM flows.

Two complementary domains of expertise were combined through this *Weather impact prediction for ATFCM* project. Reims and Marseille Upper Area Control Centres (UAC), along with FRACS, the coordinator, brought their experience on air traffic control operations and operational validation activities. As a MET expert, MetSafe mastered the tool design and technical validation activities.

The research plan was based on a pragmatic and agile approach:

- Step 1: Use cases definition
- Step 2: Delivery of WIPA tool
- Step 3: Technical and operational validation
- Transversal Step: Project Management and dissemination

Findings of this project will contribute to SESAR initiatives related to MET (meteorology), and other existing initiatives, such as the annual Weather Trials led by the European Network Manager which involves various Air Navigation Services Providers (ANSPs) and MET services providers.

Beyond the *Weather impact prediction for ATFCM* R&D project, there is an opportunity to evolve towards an operational product. The tool is now integrated into a global product, VIGIAERO, designed by METSAFE and dedicated to the provision of accurate MET information to air traffic control. Beyond the Engage framework, the WIPA service/VIGIAERO will be made available to Reims and Marseille UACs up to November 2021.



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