

Name of the exercise: EXE07.01-01 'Airspace Users' Trajectory definition processes including FOC agreement on SBT/RBT'.

Date: Two iterations in December 2017 and April 2018.

Location: CRIDA/ENAIRe Premises – Madrid.

Points of Contact: Amalia García (amgalonso@e-crida.enaire.es), Dominik Janisch (djanisch@e-crida.enaire.es), Eva Puntero (epuntero@e-crida.enaire.es).



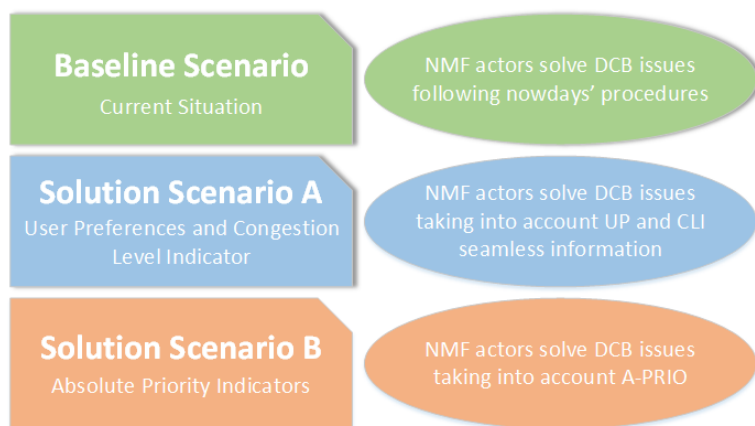
The Validation Technique

EXE07.01-01 is part of PJ07 Project – Optimised Airspace Users Operations –funded by SESAR programme and led by Eurocontrol. It consisted of a series of *human in the loop exercises*, exploring the use of *User Preferences*, *Congestion Level Indicator* and *Absolute Priority* in Demand and Capacity Balancing (DCB) process. These concepts are– according to E-OCVM- at V0 or V1 maturity phase. To such immature concept, *Expert Judgement* (brainstorming - first iteration) and a *Role Gaming* session (second iteration) were the techniques selected.

The Operational Concept

Airspace Users (AUs) Trajectory Definition processes -including Flight Operations Centre (FOC) agreement on Shared/Reference Business Trajectory (SBT/RBT)- aim at *integrating the AUs in the DCB process* through decision-making mechanisms with an acceptable impact over the different Air Traffic Management (ATM) stakeholders. The coordination shall take place before Estimated Off-Blok Time, and allows the AUs to express their preferences in case their initial flight plan could not be respected.

Three scenarios were used to validate the AUs integration in the DCB process:



Being these three the main concepts assembling such integration:

- *Advanced Congestion level indicator* (A-CLI) –provision to the AUs of a measurement of the airspace saturation along the planned trajectory.
- *AU preferences* (UP): data associated to a flight to help the NMF to take the less impacting decision to solve an imbalance situation and/or hotspot.
- *Absolute Priority* (A-PRIO) –indicators based on the information provided by all the AUs to support NMF in the selection of the set of flights for which potential DCB measures will minimise impacts.

Significance & Relevance

The use of Expert Judgment and Role Gaming Sessions is indicated to *define operational concepts*, as well as their *expected benefits*. *R&D needs* were also identified.

Three operational use cases covered:

- User Preferences
- Advanced Congestion Level Indicator
- Absolute Priority

Operational Involvement

Different R&D initiatives and projects were put in place to involve the AUs in DCB with limited success. PJ07 offers the possibility to consider the *AUs as a key stakeholder* of the process as subcontractors of Eurocontrol. It develops requirements and validate FOC procedures and workflows, enabling them to better interact with other ATM stakeholders, and especially with the Network Manager and the ANSPs, regarding trajectory definition.

Two operational improvements, part of the ATM Master Plan were addressed:

- Inclusion of preferences in SBT for DCB processes.
- Use of enriched DCB information to improve AU flight planning.

Operational Actors

Network Manager Function (NMF) actors and AUs:

- *FMPs* for the ACCs of study (two ANSPs),
- NM and,
- *Flight Dispatcher* (four AUs).

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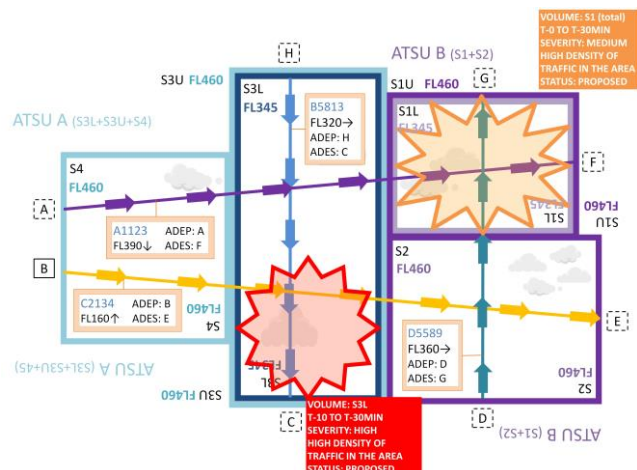
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Validation Scope (Use Case/Scenario example)



Scenarios layout modelled the management of several DCB issues along two ATSU



The role of each actor was defined.



Services, functions, roles and timeframe related aspects to be maintained, eliminated, achieved or avoided were identified.

OVERVIEW											
SECTOR S3L											
Timeframe	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	OUT
	8:00	8:30	8:30	8:30	8:30	8:30	8:30	8:30	8:30	8:30	8:40
CL1	85%	CL1	85%	CL1	85%	CL1	85%	CL1	85%	CL1	85%
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CL100	85%	CL100	85%	CL100	85%	CL100	85%	CL100	85%	CL100	85%

NM and AU visualisation of the A-CLI and UP were developed and analysed.

Validation Objectives /Results

Main validation objectives were:

1. Identify **actors' interactions**, timing and workload, as well as the most relevant **information** for every role.
2. Assess **feasibility** of User Preferences integration in the DCB process.
3. Validate the CLI information **usability**.
4. Develop the **operational use** of A-PRIO Indicators information.

Most important results are summarized below:

- a) **User Preferences** are useful in the short-term planning phase. AU's tactical coordination could decrease while increasing for NMF actors. Predictability could improve if the concept is integrated in a machine-learning environment. Closer cooperation between actors and a reduction of workload should be addressed through automation.
- b) **A-CLI** was well received by the different actors as it shows additional information to the decision-making process. It is enough to evaluate the sector stability from NMF viewpoint.
- c) **A-PRIO** indicators could facilitate the DCB process by selecting candidates to apply cherry-picking measures. Different indicators are needed, being the most important the Network Impact Assessment and the Impact on Reactionary Delays.