



**3<sup>rd</sup> FABEC Vertical Flight Efficiency (VFE)  
Workshop Report**

**7 December 2022**

**Nice Airport**

## DOCUMENT SUMMARY

<b>Objective:</b> A third workshop with FABEC ANSPs and industry stakeholders (mainly aircraft operators) to discuss vertical flight efficiency, provide an update on VFE since the first workshop in 2020, exchange views and explore actions recently taken to improve VFE			
<b>Origin:</b>	FABEC SC ENV	<b>Audience:</b>	Members of the FABEC ANSP teams, and representatives from the NM, airlines and CFSPs
<b>Title:</b> 3 <sup>rd</sup> FABEC Vertical Flight Efficiency Workshop			
<b>Reference:</b> 3 <sup>rd</sup> FABEC VFE Workshop Report v1.0			
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## DOCUMENT CHANGE RECORD

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## APPROVALS

Approved version	Approved by	Approval date and reference	Approval outcome
1.0	FX.Prach	14.02.2023 V1.0	2022-12-07-FABEC_VFE Workshop Report v 1.0
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## 1 WELCOME

The meeting was opened at 10 am. All the participants were welcomed by Alain Bourgin (Head of Environment Department at DSNA) as local host in France, John Santurbano (FABEC Champion Environment and Director of MUAC) and Marylin Bastin (Head of Aviation Sustainability at EUROCONTROL HQ), moderator of the workshop

After two meetings which took place in a hybrid mode in 2020 and 2021, Alain Bourgin, on behalf of DSNA, was happy to welcome the participants at Nice Airport business centre in a face-to-face meeting.

It was noted that most of the workshop presentations had been prepared as a duo, which showed the willingness to enhance the existing cooperation between ANSPs, airlines and industry.

Note: All presentations will be available on the FABEC website at <https://www.fabec.eu>.

## 2 AGENDA

The following agenda was sent prior to the workshop.

9:30 Welcome Coffee			
Time	#	Item	Owner
10:00	1a	Welcome	Alain Bourgin (DSNA)
	1b	Opening the Workshop	John Santurbano (Chairman ASB)
	1c	Presentation of the agenda	Marylin Bastin (EUROCONTROL)
10:10	2	Setting the scene	Ilona Sitova (Chairwoman FABEC SC ENV)
10:25	3	Green operations	Adrien Emeraux (Air France) & Pierre Berolatti (DSNA-DO)
11:00	4	Military contribution to VFE improvement	Col Christophe Hindermann (DSAE)
Coffee break 11:20 – 11:35			
11:35	5	AI based analytics of Frankfurt TMA leading to an airspace geometry change	Joachim Scheiderer (Lufthansa) & Christian Ruppert (DFS)
12:15	6	Increased use of RNP approaches at EBBR	Simon De Backer (Brussels Airlines) & Andrej Mikula (skeyes)
Lunch break 13:00 – 14:00			
14:00	7	Optimum management of aircraft energy state during descent and approach Insights from the SESAR projects DYNCAT and ALBATROSS	Martin Gerber (Swiss)
14:30	8	PBN to final LFMN : Closed trajectories for VFE improvement	Adrien Emeraux (Air France) & Virginie Bonneval (DSNA)
15:00	9	Green Flag and Provert. for more often eco-friendly procedures	Farid Zizi (FRACS) & David Antonello (THALES)
15:30	10	Improving the situation	ALL
15:50	11	Wrap up & Follow up actions	Marylin Bastin, Moderator
End 16:00			

## 3 ATTENDEES

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## 4 SETTING THE SCENE

The presentation was made by Ilona Sitova, Chairwoman FABEC SC ENV and Environmental Expert (MUAC).

Ilona Sitova introduced the SC ENV and its activities. She presented all the work to which SC ENV is contributing to, in particular on the proposals for RP4 (and/or RP5) indicators to be developed in the framework of the Transparency WG led by Eurocontrol.

Her key messages were:

- The "one size fits all" approach cannot be applied for measuring environmental ANSP performance.
- It is time to move from measuring performance to improving performance.

## 5 GREEN OPERATIONS

The presentation was made by Pierre Berolatti (DSNA, Deputy COO) and Adrien Emeraux (Air France, First Officer B787-900).

Adrien started the presentation by showing that inefficiencies of some descent profiles can be very costly in terms of fuel, but also in terms of route extension, leading to extra flight time.

In addition, Pierre explained that these inefficiencies were reduced within the framework of the Green TF, which is a cooperation task force between Air France and DSNA.

Their key messages were:

- A good mindset on the ATC side is a key element in understanding the impact of inefficiencies in the descent phase.
- Dynamicity of constraints is a key factor in reducing inefficiencies, whether in higher levels (ACC), in intermediate levels (APP) or in the very low layers (TWR).

## 6 MILITARY CONTRIBUTION TO VFE IMPROVEMENT

The presentation was made by Colonel Christophe Hindermann, Head of the Airspace Division (DSAE / French Military ATM Directorate).

Christophe recalled that for more than 20 years, French Defence has been committed to adapt its military zones, both horizontally and vertically, to guarantee the proper conduct of military exercises while minimising the impact on civilian traffic.

His key messages were:

- The recent new need for large areas, required for new weapons, is a key element for Air Forces, especially during these periods of high international tension.
- French Air Defence remains sensitive to civilian environmental needs. Therefore CBA1 (area at the France-Belgium-UK interface) has been reshaped to facilitate the transit of flights coming from the United Kingdom via shorter routes.

## 7 AI BASED ANALYTICS OF FRANKFURT TMA LEADING TO AN AIRSPACE GEOMETRY CHANGE

The presentation was made by Christian Ruppert (DFS) and Joachim Scheiderer (Cpt Lufthansa).

Part of Albatross, this project studied multilateral correlations of trajectory efficiency in Frankfurt TMA. Joachim and Christian showed that thanks to artificial intelligence (AI) and machine learning algorithms, Lufthansa and DFS could collaborate in a project which led to a relevant reshaping of Frankfurt TMA depending on RWY in use.

Their key messages were:

- AI is a quite useful tool to highlight inefficiencies and reveal correlations that are not necessarily obvious at first glance. Hence causalities can be better evaluated.
- Airspace geometry is not untouchable. Depending on the RWY in use, airspace can be adapted to circumstances and can be enlarged temporarily or permanently to make vertical sequencing more efficient and safer in a TMA.

## 8 INCREASED USE OF RNP APPROACHES AT EBBR

The presentation was made by Andrej Mikula (skeyes) and Simon De Backer (Brussels Airlines).

They gave an overview on the assessment period of 'The Increased Use of RNP Procedures at Brussels Airport (EBBR)'. This assessment was only taking place during nighttime (low traffic) and over good meteorological conditions. When applied, these procedures had a relatively high acceptance by flight crews, resulting in better predictability, despite on average longer level-off time, compared to non-RNP procedures.

The airlines' feedback has been quite positive. Airlines stated that the level-off segment is not necessarily fuel inefficient, as it is often used for aircraft deceleration (flying on the idle thrust). Nevertheless, both ATC and airlines agreed on implementing speed constraints to harmonize the traffic flow and to mitigate especially long level-offs at low altitudes (e.g. 2000 ft) to avoid noise pollution. A new assessment period is planned for next year, also addressing noise issues.

Their key messages were:

- Using RNP procedures require a good situation awareness and more training to enhance the efficiency from both ATC and airlines' perspective.
- VFE is differently impacted by flying behaviour depending on operators using RNP procedures. Addition of speed constraints would help to harmonize the flying behaviour and also mitigate long level-offs at low altitude.

## 9 OPTIMUM MANAGEMENT OF AIRCRAFT ENERGY STATE DURING DESCENT AND APPROACH / INSIGHTS FROM THE SESAR PROJECTS DYNCAT AND ALBATROSS

The presentation was made by Martin Gerber (Technical Pilot Airbus A320, Swiss Airlines)

Martin showed that the performance of the VFE on approach was directly related to the length of the trajectory during descent. It is indeed essential for the pilot to know the distance to go (DGT) to execute a full approach at idle thrust thanks to an optimal management of the aircraft energy.

His key messages were:

- Without accurate information on DGT a descent cannot be made at idle speed.
- Wherever feasible, flexibility in ATC assignments for speed and altitude would help to facilitate an idle approach.

## 10 PBN TO FINAL LFMN: CLOSED TRAJECTORIES FOR VFE IMPROVEMENT

The presentation was made by Adrien Emeraux (First Officer B787-900, Air France) and Virginie Bonneval (ATCO at Nice APP, DSNA).

They explained that the former CDO procedure was not used in a proper manner and was therefore potentially unsafe. A good collaboration started with Air France in the framework of the Green TF and led to the project "PBN to final LFMN".

Designed for low periods of traffic, a trial will start in March 2023 and the concept is based on closing some trajectories and providing DCT on specified RNP procedures delivering DTG (Distance To Go) in order to optimise VFE.

Their key messages were:

- Predictability is key and can be improved through good cooperation between pilots and ATCOs.
- Vectoring after IAF offers transition possible at all times, in low or heavy traffic periods.

## 11 GREEN FLAG AND PROVERT, FOR MORE ECO-FRIENDLY PROCEDURES

The presentation was made by Farid Zizi (FRACS) and on behalf of David Antonello (THALES)

He presented the “Provert” simulation which took place in October 2022 on potential vertical improvements that have been identified in Marseilles’ airspace in terms of descent profile or cruising levels. He explained that on the analysed flows around 4% of emissions could be saved thanks to a good pre-tactical preparation between stakeholders.

He also presented a collaborative platform, called “DIADEME” which can integrate different traffic data and existing environmental analysers, and which can be used by any ANSP in the world.

His main key messages were as follows:

- VFE can be significantly improved through pre-tactical work preparation.
- FRACS developed a tool which can be used by ANSPs across the world, allowing them to improve their vertical or horizontal performances.

## 12 IMPROVING THE SITUATION

Marylin Bastin invited the participants to discuss how we could all improve the situation together and asked for their feedback on the workshop. In addition to the key messages expressed by the presenters, the following messages were noted:

- Improving vertical flight efficiency can often only be done under certain circumstances. Hence, optimisations require a dynamic application of procedures so that benefits can be obtained when it is possible to do so.
- The language used is essential to understand each other, and a standard phraseology for CDO procedures would help to improve flight profiles, especially in the French phraseology.
- Some AOs are confronted with VFE issues in a FRA environment, in particular for TOD, which is difficult to identify due to lack of WPTs.
- From Ryanair’s perspective, familiarisation flights would be more than welcome to share information between crews and ATC about respective constraints from each side.
- Sharing best practices (e.g. at FABEC level) helps in identifying opportunities for improving flight efficiency. Exchanging ideas, but also outcomes, helps in shortening the journey towards improved flight efficiency and reduced carbon footprints.
- Collaboration works: several examples of fruitful mutual efforts between ANSPs and airlines, breaking the old narrative that these actors cannot work together.
- Improving (vertical) flight efficiency is and remains a priority for all partners involved (ANSPs, airlines, CFSPs and – indirectly – also airports). Especially with higher fuel prices.
- The projects presented were very impressive but mostly local or regional solutions. Not one size fits all. The following questions still need to be discussed:
  - Can these solutions be transferred to other locations (airports; arrival systems)?
  - Are these specific projects valuable for others?
- The projects presented contained mostly TMA related solutions, but no en-route concepts for optimized TODs. No cross-border activity/collaboration with other ANSPs has been conducted yet.
- Overall the organizers of the workshop were pleased to see so many joint propositions. Awareness on both sides is still a prerequisite. Training is also an important enabler. Little things done can result in huge benefits. Exchange of data is also necessary and openness too.



### **13 WRAP-UP AND FOLLOW-UP ACTIONS**

Marylin Bastin concluded the workshop by expressing her satisfaction about the good discussions we had in this workshop at expert level. She said that working together was a good way to find innovative solutions.

Ilona Sitova, Chairwoman of the FABEC Standing Committee Environment, also thanked the participants for their very valuable contribution to the workshop and announced that the next VFE WS will focus on en-route efficiency.

Marylin Bastin thanked all the presenters and participants for their active participation in the workshop.

**THE MEETING ENDED AT 4 pm**