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SESAR Digital Academy Webinar:
Smarter, Safer and More Efficient Arrivals
Part 2
Moderated by Olivia Nunez
ATM expert, SESAR JU
Hosted by
SESAR

Today's speakers

Increased second glide scope and second runway aiming point

- Frédéric Rooseleer, Airport ATM Expert, EUROCONTROL

Smoother and safer approaches with geometric altimetry

- Pierre-Yves Dumas, Navigation Engineer, Thales

Integrating RPAS into the arrival stream

- Gunnar Schwoch, Research Associate, DLR

Question	Answer
It is correct that HALS was for closely spaced Runways. But DTOP was for one Runway (Dual Threshold Operations on RW25L).	Indeed. Thank you for the clarifications.
@pierre-yves : What about aircraft capability (readiness)to manage this transition from Baro to Geo ? or FMS readiness ? could you sum-up what is the main gain for operators ?	You need SBAS GPS and a FMS capable of managing the transition and decoding these future procedures. The main gain is safety and reduced track miles in approach when using these dedicated procedures. Indeed, thanks to the improved glide capture, we can intercept the final approach point closer to the threshold (as close as 3Nm as shown in our simulations) and optimize the lateral path accordingly.
How do you manage the noisiness and vertical error of GPS altitude?	It needs to be corrected GPS altitude, for example from SBAS or GBAS.
This presentation is said to contain theoretical approach but the objectives needs to be clearly stated, for the latter practical purposes. What could be real added value compared to the existing conditions?	ISA model is a theoretical one but the expected gains are real: safety and reduced track miles in approach when using these dedicated procedures.
Theoretically all these "yes", practically negligible.	True if you intercept the ILS from a level flight. With more and more optimized (or continuous descent) approaches the effect of non-compensated T° on altitude could become more visible at glide capture. 30° C above ISA translates into a 12% altitude error, which is equivalent to one dot above the ILS glide. That could prevent some autopilots from capturing it.
Real feasibility assessment of the concept (displaced threshold and different GS) is really needed. Who benefits from what?	It depends on the airport and operational needs. Either to reduce noise impact on final approach (for both ISGS and SRAP), or with SRAP for reducing flight time to the parking position when located close to the runway end, hence reducing emissions and optimising use of the runway
Did you make (or do you plan to make) any Lidar campaigns to measure the actual impact of flying an IGS as a leader / follower in terms of wake vortex?	For this we use data from previous LiDAR campaign which already supported RECAT & TBS and risk assessment methodology, for both the reasonable worst case altitude (typically 1 generator wingspan) or higher on the glide (Out of Ground effect). However we are looking to methodology refinement in order to limit the possible separation impact

Are there any proposals for the naming convention of the approaches in terms of ARINC 424 coding to make sure the correct procedure is loaded into the FMS and flown? (i.e. to the correct THR or using the correct GS)	Each procedure would be published using standard naming conventions. For example, a GLS Z RWY05 would be 3.0deg while GLS Y RWY05 would be with a steeper GPA. For the SRAP, there could be a runway number increment, e.g. RNP Z RWY 06, however we are still considering the us of same runway number but another letter convention, e.g. GLS D RWY 05 (D for Dual or Displaced). On the chart, the SRAP location and profile will be published like for a displaced threshold and a caution box
How do you consider the Runway Occupancy Time of an aircraft landing at the SRAP (in particular the time from first threshold to the SRAP threshold, i.e. 13-15s approximately)? Is this considered in the separation with following aircraft if the next aircraft is landing a the conventional threshold?	The separation will indeed depend on how the ROT is defined. Depending on the SRAP location, we can take advantage of the '2400m' rule already enabled by ICAO when the next traffic will be flying to the conventional threshold
Actually the principles are the same as HALS-DTOP. The question is the real purpose: when, where, under what conditions.	The principles are close, however HALS-DTOP was applied to Closely Spacing Parallel Runway (EDDF 25L and 25R, the latter since become 25C), and mostly about reducing wake separation between Heavy on one runway (25R) and medium aircraft on the adjacent (25L / 26L). For SRAP, there are several benefits which airport can get depending on their runway configuration (e.g. reducing runway occupancy, or time to reach parking position or exit when close to runway end.
A steeper approach will in many cases require more flaps, potentially with increased fuel consumption and engine noise. A steeper approach is also more challenging in the landing phase. Comments on this issue?	Indeed, there is an optimum to find. We are working with manufacturer on this, to determine the optimum slope & speed for an optimum between noise reduction but keep flying idle and manage the speed on final (cockpit assistance are being developed for energy management and flare management, aimed for larger medium aircraft models
Also two different glideslopes to the same threshold is in operations at Frankfurt airport for years now. What is new in the SESAR approach? Best Regards Manfred Maiss form DFS	The new element is to apply to single runway (while HALS-DTOP was with adjacent closely spaced parallel runways), and to support the Controllers for managing the complexity with use or separation delivery tool (like for TBS)
What is the min length of the runway to implement secondary threshold so that it will be enough for common aircraft landings?	It depends on the SRAP location and the targeted traffic (e.g. business jets or medium-haul), so if around 1050m for full runway marking design, we would target runway length of 3300m or more, in order to keep sufficient landing distance for aircraft like A320 or B737.
Hi Frederic, what you are showing had been in operations at Frankfurt Airports under the name HALS-DTOP, Fraport and DFS made the capacity gain analysis, the threshold realization, the procedures and I have done the safety assessment for that.	We are aware of HALS-DTOP, and have a copy of brochure and presentations. The principles are indeed close, however to my understanding HALS-DTOP was applied to Closely Spacing Parallel Runway (EDDF 25L and 25R, the latter since become 25C), and mostly about reducing wake separation between Heavy on one runway (25R) and medium aircraft on the adjacent (25L / 26L). Here we look at single runway case, and with support of ATC separation delivery tool to facilitate the ATC management.

SRAP indeed looks very similar to the HALS/DTOP operations in Frankfurt 15 years ago. What are the differences between SRAP und DTOP?	Please see answers to other similar questions
This is still the concept requiring certification of aircraft but I recommend the academic papers and consultancy studies on the topic including the book "Greening Airports" to see what potential gains could be.	Thank you for the recommendations. Also the results (documentation datapack) from the SESAR 2020 wave 1 PJ02-02 on the Enhanced Approach Procedures solution are available on the Cordis European Commission website: https://cordis.europa.eu/project/id/731781/results
The problem is not to assess possible gains in the runway capacity but the real conditions/barriers for implementation - which aircraft and airports to be the candidates.	We are seeing interests from some airports / ANSPs in Europe, looking to solutions to address in the near to medium term the noise footprint and capacity challenges needs. Initial live trials are underway, and can be the basis for larger demonstrations (part of the topic of the ongoing SESAR Demonstrators CEF call)
In 1998 I worked on displaced threshold. I can remember that there was a reduced separation between half of the flights, but also an increased separation for the other half of the flights. The resulting throughput increase was almost zero. Is this still an issue with the concept?	Yes, there are separation reduction or increase, but it depends on the way the traffic is assigned. We must avoid mixing aircraft on each glide, and maximise the use of the SRAP for smaller aircraft in order to achieve the throughput benefits
This has been studied already ten years ago embracing both the same GS with displaced threshold and steeper GS. At London City airport GS i 5 degrees.	For ISGS we limit the profile to max 4.49deg so as to avoid specific certification, like needed for some aircraft type flying to LCY, such as A318
Where can i get your presentation or documents about it?	You can find the PJ02-02 datapack on https://cordis.europa.eu/project/id/731781/results with the results of the SESAR Wave 1 activities (which concluded in 2020). The ongoing research and demonstration reports will be published when concluded (2023) in respectively https://cordis.europa.eu/project/id/874477/results and https://cordis.europa.eu/project/id/874469/results
RECAT has been studied with traffic all on the same slope, I understand. How could you extrapolate that for different slopes?	We use the same methodology based on reasonable worst case conditions however by analysing specifically in addition the risk of the wake to persist at a higher area above the standard slope angle
Are the GNSS approaches for the steeper angle down to LNAV only minima or also LPV, LNAV/VNAV?	Yes, the RNP GNSS approaches with the steeper angle are aimed down to LNAV/VNAV and LPV minima
Are these the evolutions of the activities done in Frankfurt HALS/DTOP?	Somehow yes. The SRAP solution corresponds to the DTOP part on single runway, and embarking the benefits of wake separation optimisation of the HALS part. In addition, we now take further advantage of the use of an ATC separation delivery tool (like use for time-based separation - TBS and Optimised Runway Delivery ORD solution), developed since, to facilitate the ATC management.

Why is there [in the RPAS integration] a difference in the latency between the voice communication and the control?	One major difference is that voice communication is assumed to be one-way (voice from pilot's mouth to the ATCO's ear), and control commands are assumed to be two-way (sending of command + acknowledgement message, for example). If there are hops between systems, the values add up, e.g. for processing. The values presented are result of an extensive literature research, using publications, project results and own calculations, presented in INVIRCAT deliverable D2.3. INVIRCAT's public deliverables, including D2.3, are available at https://www.invircat.eu/deliverables and also at https://cordis.europa.eu/project/id/893375/results