Stargate
within EU Green Deal

Project Fact Sheet

Conituous Descent Operations

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01 BASIC PROJECT INFORMATION

Project name	**Continuous Descent Operations (CDO)**
Partners involved	**skeyes, Brussels Airport Company, DHL, TUI, Brussels Airlines, To70**
Implementing airport / site	**Brussels Airport**
Period tested	**2022-2024**
Project lead / contact	**skeyes**

02 OBJECTIVE

What are we trying to solve or tackle with this project?

The objective was to improve the environmental performance (reduced noise annoyance, reduced fuel burn and improved local air quality) of arrivals to Brussels by providing a more predictable arrival path. By improving predictability crews are given a chance to optimise the descent to the maximum extent. To do so instead of standard radar vectoring towards an ILS (Instrument Landing System), crews were encouraged to fly published RNP procedures (Required Navigation Performance). Trials facilitated the familiarization of the crews with the new approaches and highlighted areas for improvement and potential issues.

Success criteria

- Confirm that RNP approaches enhance predictability and flight efficiency
- Improve crew and ATC familiarization with fixed routings
- Assess whether predictable routes support better CDO
- Define changes needed for wider use

03 APPROACH (HOW WE TESTED)

Test set-up & method

Two trial phases were conducted between 2022 and 2024. During the trials, participating airlines were encouraged to fly RNP approaches whenever operationally feasible. Trials were conducted during night-time operations (23:00-05:59 local time) and subject to traffic and weather conditions.
The concept was evaluated under live traffic conditions against standard arrival methods (vectoring to ILS). Phase 1 focused on familiarizing the operational staff with RNP procedures and assessing the operational and environmental impact of increased RNP use. Phase 2 incorporated lessons learned previously, evaluation has been done and complemented with noise measurement assessment.

Data & measurement

The trials evaluation included the analysis of the operational flight data, fuel assessment, noise measurements as well as the feedback of pilots and air traffic controllers. Evaluation focused on the following areas:

- RNP eligibility and acceptance
- Horizontal and Vertical l flight efficiency
- Noise assessment (simulation and measurement)
- Fuel assessment (performed by participating airlines)
- ATC/Flight Crew feedback

Risks & mitigations

As RNP procedures were not routinely flown at Brussels Airport, operational safety and stakeholder awareness were key throughout the trials. Continuous monitoring was performed between skeyes, the airlines and the airport. Lessons learned during the first trial phase were incorporated into the second phase, to improve operational robustness and stakeholder understanding.

Limitations

The trials could only take place when operational conditions allowed, meaning that traffic demand, runway configuration and weather affected the number of eligible flights. More importantly, the expected benefits of RNP were constrained by the limited operational familiarity of pilots and ATC.

04 RESULTS & IMPACT

Key results

The trials demonstrated that RNP approaches improve route predictability without significantly increasing track distance, resulting in more consistent flight paths.

However, the expected environmental benefits were only partly realised. Fuel consumption and noise impacts remained broadly comparable to conventional operations, while RNP approaches initially resulted in longer low-altitude level-offs.

The second trial phase showed clear improvements following procedural refinements, highlighting that operational familiarity and experience are key to unlocking the full benefits of predictable, fixed-route arrival procedures.

Criterion	Advantage for RNP?	Key finding
Horizontal flight efficiency	Yes	No significant increase in track miles; routes were more predictable and less dispersed.
Vertical flight efficiency	Mixed	Similar performance at higher altitudes, but longer level-offs at low altitude than expected.
Fuel use	Mixed	No significant fuel benefit observed
Noise impact	Mixed	Overall comparable, with noise primarily driven by low-altitude
Operational feasibility	Mixed	Benefits from improved predictability were offset by limited
Procedure uptake	Yes	Airline acceptance was high for eligible flights

05 RATINGS (QUICK ASSESSMENT)

Deployment Approach

How standardised is the solution: can it be deployed off the shelf, or does it require extensive customization?

Off The Shelf — Custom-Built

Investment Magnitude

From low-cost deployment to major investment.

Low Investment (less than €10k) — High Investment (more than €15mio)

OPEX ■ □ CAPEX

Sector Readiness

From non-existing or emerging standards, regulations, and certification pathways to fully established industry practices.

Emerging Framework — Established Framework

Innovation Maturity

How does the solution score in terms of maturity, from low TRL experimental/pilot-stage to high TRL market-ready.

Experimental — Market-Ready

Operational Impact

Does the innovation deliver targeted improvements or rather drastically transform processes and/or operations.

Incremental Improvement — Transformational Change

06 NEXT STEPS / RECOMMENDATION

Recommendation

Continue operational improvement, but do not claim uniform RNP benefits; focus on predictability, traffic context and redesign of arrival procedures.

Next steps

- To be investigated if follow-up trials – promoting RNAV transitions to ILS – could be organized. This implies that the transition (initial segment) can be flown for any (final) approach type. RNAV to ILS would bring both the better predictability thanks to a fixed routing while ILS as a final approach has higher familiarity and would facilitate better.
- Awareness campaigns, refresher courses and/or briefings for operational staff should be set up.
- If transitions are to be flown systematically, a structural optimization and approach system redesign (e.g. PMS, trombone, etc) is needed. This is a development on long term, as it will require significant training, revision of working methods, etc. This work is currently on-going.