

Monitoring takeoff Performance

EOFDM - WGB

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EOFDM WGB Document

→ Risk areas covered

- RE (34 precursors)
- LOC-I (32 precursors)
- CFIT (14 precursors)
- MAC (9 precursors)

→ Guidance on:

- Flight Data Parameters
- Measurements and Events
- Flight Data Monitoring Techniques

→ Last version available on [LINK](#)



Takeoff Performance Precursors

- One survey was conducted as part of the actions of SPT.112 from EPAS 2021-2025, in order to provide information to:
 - Improve the contents of **EOFDM WGB documentation**
 - Provide evidence for the revision of **SIB 2016-02** (<https://ad.easa.europa.eu/ad/2016-02R1>)
 - **BIS** “Erroneous takeoff parameters”

Takeoff Performance Precursors

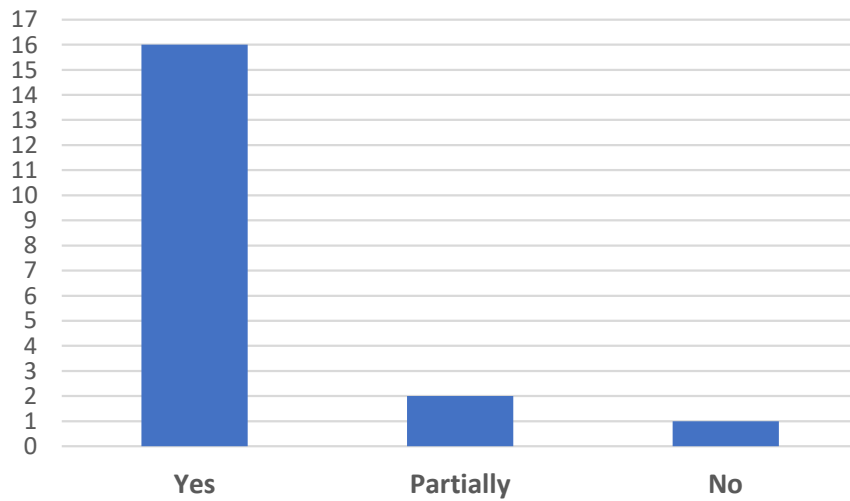
- Precursors identified to monitor **takeoff performance** - RE
 - RE01 — Incorrect Performance Calculation
 - RE03 — Monitoring the Centre-of-Gravity (CG) Position
 - RE04 — Reduced Elevator Authority
 - RE05 — Slow Acceleration
 - RE07 — Late Rotation
 - RE08 — Slow Rotation
 - RE15 — Runway Remaining at Lift-off
 - RE33 — Wrong runway or wrong runway entry point used

Takeoff Performance Precursors

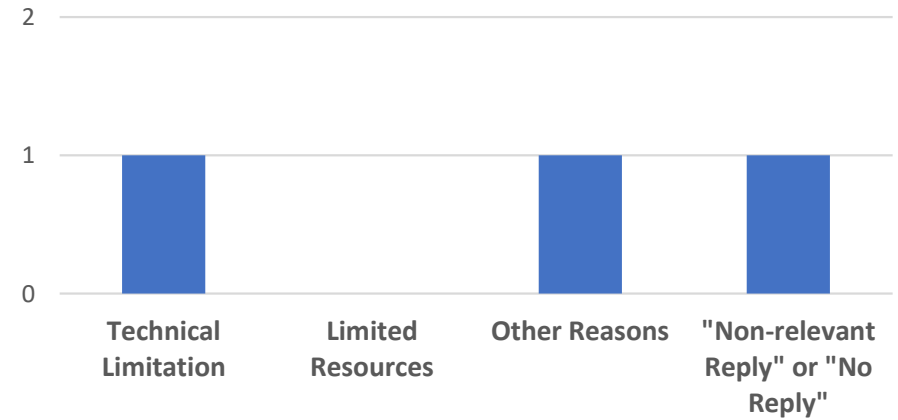
- Precursors identified to monitor **takeoff performance**, LOC-I
 - LOC08 — Centre of gravity (CG) out of limits
 - LOC10 — Incorrect Performance Calculation
 - LOC11 — Overweight Take-off

Survey's data processing

RE08 — Slow Rotation

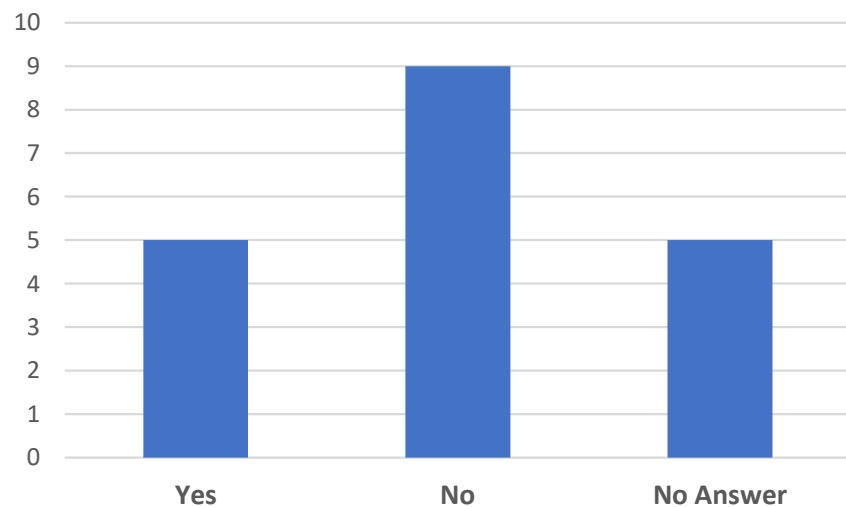


RE08 — Reasons for "No" and "Partially"

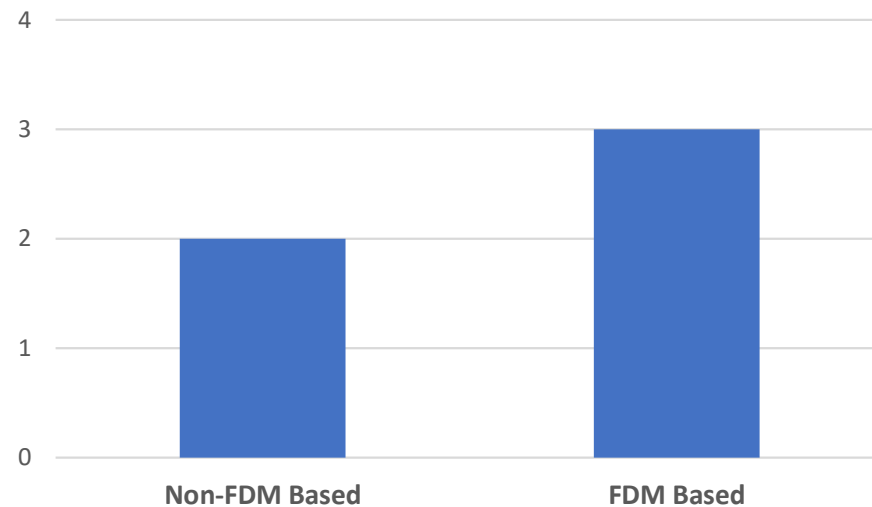


Survey's data processing

RE08 — Alternative ways to monitor



RE08 — Alternative methods



Survey's delivery

Take-off Performance Precursors Survey

Take-off Performance FDM Precursors Survey

Assessment of the status of the implementation of the take-off performance related precursors as defined by EOFDM guidance documentation

March 2022

Assessment of the status of the implementation of the take-off performance related precursors as defined by EOFDM guidance documentation

March 2022

Improvements to WGB document

→ RE07 - Late rotation

- Vr may not be available as a recorded parameter. To overcome this, a measurement is proposed to determine the time comprising the elapsed time since the NLG is in the AIR until the MLG is in the AIR (Lift-off).

→ RE15 - RWY remaining at Lift-Off

- Include the measurement “take-off run distance” using the Ground Speed Integration instead of LAT/LONG.

Improvements to WGB document

→ RE08 – Slow rotation

- Rotation is defined as starting at the application of the first input that causes pitch-up command and finishing at lift-off



Improvements to WGB document

→ RE05 – Slow acceleration

→ Linear regression model that predicts the longitudinal acceleration during take-off roll when GS = 80 Kts. Proposed to provide a more detailed information about the implementation of this precursor.

$$LONG80 = c1 * GW80 + c2 * EPR80 + c3 * ALTSTD80 + c4 * SAT80 + c5 * FLAPPOS80)$$

Thank you for your attention

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