

Instrument Landing System (ILS) Autopilot Coupled Approaches – Not Authorized/Not Authorized Below Altitude

INFO ONLY – ANALYSIS ONGOING

Key Findings

Pilots are encouraged to review chart notes and company policy regarding autopilot (AP) coupled restrictions. Over 100 ILS approach procedures contain notes that restrict autopilot coupled approaches below a given altitude, or indicate AP coupled approaches are not authorized at all. An AP coupled approach may not be authorized because of an excessive rate of change or reversals in the slope of the glidepath observed during flight inspection.¹ These restrictions ensure the approach's safety and accuracy, as erroneous signals from the ILS may cause AP to make sudden pitch changes.

For ILS approaches containing AP coupled restrictions, it has been observed that some flights keep the autopilot system engaged below the authorized altitude or engaged during a large portion of the final approach where AP is not authorized.

NOTE: This analysis is ongoing, and the numbers below are subject to change; see disclaimers on page 2.

Risk Areas:[†]

Navigation Errors (NAV), Abnormal Runway Contact (ARC), Undershoot/Overshoot (USOS), Runway Excursion (RE)

Phases of Flight: Approach, Go Around

Likelihood:[‡] Frequent

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For more information, please contact asias@mitre.org.

Observations

Autopilot Coupled NA Below Altitude

Example chart note:

Autopilot coupled approach NA below 1307 MSL. Inop table does not apply to S-ILS 8. Simultaneous approach authorized. For inop ALS increase S-LOC 8 Cat C/D visibility to 2 SM.

- ~11 percent of flights disengage AP by 400 ft. below authorized altitude.
- ~3 percent of flights disengage AP more than 400 ft. below authorized altitude.
- Top 5 ILS instrument approach procedures where AP was coupled below allowable altitude (by operation count).

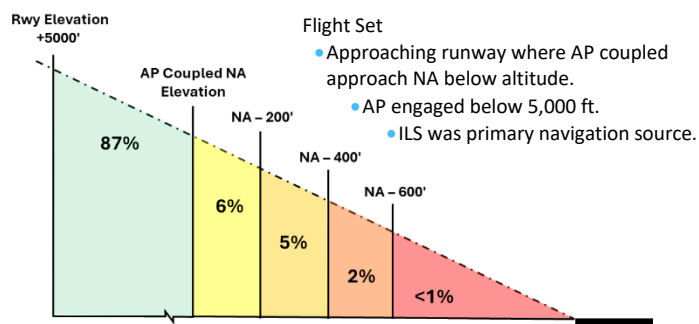


Figure 1. Percentage of flights that had AP engaged at the height above or below the altitude at which AP Coupled Approach is NA.

Autopilot Coupled Approach Not Authorized

Example chart note:

Autopilot coupled approach NA. Simultaneous approach authorized. For inop ALS, increase S-ILS 9 Cat E visibility to RVR 4000 and S-LOC 9 Cat C/D visibility to 1 1/2 SM. *RVR 1800 authorized with use of FD or HUD to DA.

The following results are runways where AP coupled approaches are not allowable at all.

- ~24 percent flights disengage AP between 1000 ft. and 600 ft.
- ~17 percent of flights disengage AP below 600 ft.

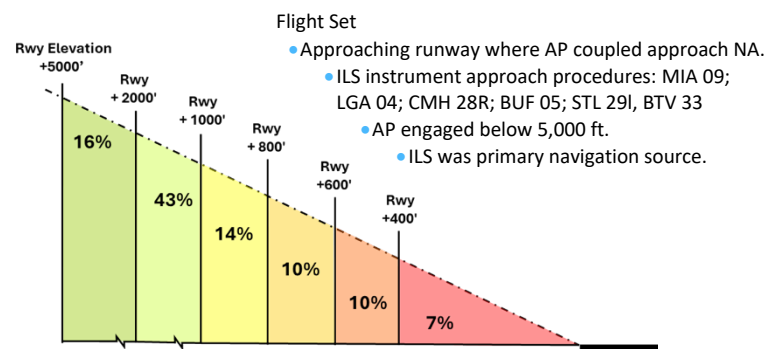


Figure 2. Percentage of flights that had AP engaged at the indicated height above the runway for which AP Coupled Approach is NA.

[†]See Commercial Aviation Safety Team (CAST) /International Civil Aviation Organization (ICAO) Common Taxonomy Team (CICCTT) Aviation Occurrence Categories, May 2021 (4.8).

[‡]See FAA Order 8040.4C, September 2023.

¹See FAA Order 8260.19J, Section 8–6–12, O: Landing Minimums (7), ILS/GLS restrictions.

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Disclaimers & Methodology

Study of this safety issue is ongoing, and analysis methodology and reported statistics are subject to change. For up-to-date information or questions, please visit the Aviation Safety Information Analysis and Sharing (ASIAS) Portal² or reach out to asias@mitre.org.

- For the AP Coupled Approaches-NA Below Altitude, the results compare when AP was disengaged to the runway-specific NA altitude.
- Some flights in the flight sets may have been flying a visual approach backed up by ILS; however, coupling the approach is still not authorized.
- The flight sets may include flights where air traffic control (ATC) instructed pilots to use the ILS; future analysis will use pilot-ATC voice data to verify whether the flightcrew was on the ILS approach.
- The flight sets were calculated using ASIAS Flight Operations Quality Assurance (FOQA) data provided by ASIAS stakeholders, which does not cover all National Airspace System (NAS) flight operations.

²<https://portal.asias.aero/>