**ARINC 424 NDB**

**Draft 2 of Supplement 24**

**Discussion/Proposal**

**Location Neu-Isenburg, Germany**

**June 13-15, 2023**

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ADD ADDITIONAL RULES FOR WHEN TURN DIRECTIONS SHOULD NOT BE CODED

**V1.0**

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| **SUMMARY** |
| Several aircraft have experienced a 360 loop when a turn direction was erroneously coded on a turn less than 90 degrees. |

# INTRODUCTION/ BACKGROUND

In ARINC 424-21, the turn direction requirement in Attachment 5, 2.6 was changed from 90 degrees to 135 degrees. Specifically:

ARINC 424-20

**2.6** The Turn Direction/Turn Direction Valid combination is used to indicate that turn in the specified direction must be executed prior to intercepting the path defined in the record. Turn Direction must always be indicated whenever the turn is 90 degrees or more.

ARINC 424-21

**2.6** The Turn Direction/Turn Direction Valid combination is used to indicate that turn in the specified direction must be executed prior to intercepting the path defined in the record. Turn Direction must always be indicated whenever the turn is **135** degrees or more.

However, we have never had any rules around when a turn direction cannot be provided. Extraneous turn directions can cause issues for some Flight Management Systems.

# DISCUSSION and or ACTION

In January of 2022, a pilot departing Las Vegas (KLAS) RW06 using the RATPK2 SID experienced the FMS begin a 360° turn to waypoint LEELN between 800 and 1000 feet AGL. LEELN is on the runway’s 259° bearing and therefore this should be a straight flight path. As this 360° loop was displayed in the pre-flight review, the pilot wasn’t completely surprised by this and thus disengaged the autopilot and flew direct to LEELN.

Upon review, it was determined that an erroneous right-hand turn was coded on the leg to LEELN. This was subsequently removed and no issues have been reported since.

Honeywell is therefore proposing the following changes be made to ARINC 424.

# Changes as depicted (Track Changes is Helpful)

Attachment 5

**2.6** The Turn Direction and Turn Direction Valid leg data fields are used in combination to force a particular turn direction whenever the track/heading change exceeds 135 degrees. If the turn direction is indicated with the L or R, and the turn exceeds 135 degrees, then the turn direction valid character must be set to Y. If the turn direction is indicated with E, then the turn direction valid field must always be blank. For legs that are turning legs such as the AF or RF legs, the Turn Direction is always required.

The Turn Direction/Turn Direction Valid combination is used to indicate that turn in the specified direction must be executed prior to intercepting the path defined in the record. Turn Direction must always be indicated whenever the turn is 135 degrees or more.

Turn Direction and Turn Direction Valid are not coded on TF/TF leg combinations in any procedure coding, unless turn direction is specified by source.

**Aside from AF and RF legs where the Turn Direction is always required, the Turn Direction should not be coded if the course change is less than 90 degrees.**