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SAFETY BULLETIN www.airservicesaustralia.com

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ILS Multipath Protection Issues

Recent pilot reports of ILS localiser or glide path instability indicate that there is a lack of awareness about both when these signals are protected by ATC, and pilot responsibilities to notify ATC when conducting coupled, autoland or similar approaches.

Multipath Effects and ILS Signal Protection

ILS multipath effects may be caused by an aircraft passing in front of the glide path antenna or operating in close proximity to the localiser antenna. These effects consist of signal fluctuations of the glide path or localiser.

There seems to be a widespread expectation that ILS signals are protected by ATC whenever an aircraft is flying an ILS approach in IMC. **This is not the case**. ILS signals are only protected in certain conditions.

To avoid multipath effects, ATC places restrictions on airport movements when:

- an aircraft flying an ILS is between the Outer Marker and the landing threshold or, if the Outer Marker is not available, between 4 NM final and the landing threshold; **and**
- the runway is not in sight; **and**
- in the following meteorological conditions:
    - broken or overcast cloud at or below 600ft, and/or
    - visibility at or below 2,000m.

Furthermore, localiser interference restrictions are not applied when a preceding aircraft will pass over or through the protected area while taking off, landing, or making a missed approach on the same or another runway.

In situations where protection of the ILS signals is not required and crews wish to conduct ‘coupled’, ‘autoland’ or similar approaches, early advice to ATC will ensure that ATC is able to advise of possible multipath effects using the phrase “*ILS CRITICAL AREA NOT PROTECTED”.*

It then becomes a crew responsibility to continue or discontinue in the particular approach mode.

Further Information

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Appendix 1 to Safety Bulletin *ILS Multipath Protection Issues*

The following occurrence reports describe the possible effects of conducting coupled ILS approaches when the glide path or localiser signals are not protected:

- *A Boeing 767 on an ILS approach at approximately 1800ft in IMC was notified by the Tower of possible localiser interference due to a heavy aircraft being towed across the upwind threshold of the runway. The cloud base was around 1000ft and visibility reported as 7000m in passing showers. As the aircraft passed 1600ft the localiser started full scale deflections to both left and right which lasted long enough for the autoflight system to try to follow the deviations. The autoflight system was disconnected and manual flight continued but the localiser was full-scale out of limits until 1000ft in IMC.*

- *A Boeing 737 on approach was cleared for the ILS. At approximately 2000 ft the crew heard the Tower clear another aircraft to line up. Shortly thereafter, the Boeing 737 pitched up approximately 3 degrees, followed by a pitch down of approximately 4 degrees, followed by the autopilot disconnecting. The crew stabilised the aircraft on the glideslope and informed the Tower that they had just had a glideslope fluctuation. The Tower replied that they had just lined up a 'heavy' on the runway, and that the aircraft lining up had probably caused the fluctuation. The Boeing 737 crew reported that at no point were they warned by ATC that there was the possibility of interference due to the aircraft lining up, even though they had been cleared for an ILS approach.*