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UPDATE ON TIME-BASED SEPARATION IMPLEMENTATION AT TORONTO/LESTER B. PEARSON INTERNATIONAL AIRPORT (CYYZ)

Time-Based Wake Turbulence Separation Standards

Time-Based Separation

In May 2022, Timed-Based Separation (TBS), was introduced to all runways at Toronto/Lester B. Pearson International Airport (CYYZ).

This AIC is published to provide an update to operators and as a reminder to highlight some operational aspects of TBS that are essential to safe and efficient operation at CYYZ.

Background

Prior to TBS, CYYZ experienced a decrease in the landing rate while using distance-based separation standards during medium to strong headwind conditions. When there is a strong headwind, an aircraft's movement relative to the ground is reduced, resulting in increased time separation for each arrival pair. This increased time separation between arrivals reduces the landing rate.

TBS dynamically adjusts separation distances using time, rather than distance, to keep landing rates consistent in strong headwinds. TBS minima for wake turbulence were developed to mitigate the loss of runway throughput in headwind conditions by delivering time intervals between arrivals that are consistent with distance-based separation in low wind conditions.

TBS at CYYZ on final approach is based on the ICAO Enhanced Wake Separation Groups (A-G) achieving improved management of wake risk over and above distance-based separations. Separation and spacing rules between arriving aircraft and departing aircraft remained unchanged.

Post-implementation feedback

Through collaboration and feedback received from operators at CYYZ and Air Traffic Control, the following operational items have been identified as opportunities to provide further context and operational expectations for TBS operations at CYYZ

Speed Compliance

Adherence to speeds assigned by ATC is mandatory and is key to achieving accurate separation and fully achieving TBS benefit. Thus, it is imperative that crews advise ATC if they are unable to comply with the speed and to state what speed can be used.

All speed restrictions are to be flown as accurately as possible. Aircraft unable to conform to assigned speeds should inform ATC and state what speed can be used.

Spacing on Final Approach

In a TBS operation, ATC separates aircraft on final approach by time, not distance. In practice, this means that aircraft may appear closer on Traffic Alert and Collision Avoidance Systems (TCAS) or visually during headwind conditions, although the actual separation will be constant in time.

Pilots should expect to be positioned closer behind preceding aircraft on final approach as headwinds increase. The tables below give some example separations in different wind conditions. TBS minima are based on a conversion of the current Enhanced Wake Turbulence separation minima in a light headwind condition (5-7 knots.).

Examples of TBS conversion from distanced-based minima						
Nautical Miles	3	4	5	6	7	8
TBS equivalent (seconds)	68	90	113	135	158	180

Examples of TBS distances (NM) in different winds		
Headwind	**Heavy – Heavy**	**Heavy – Lower Medium**
5 kts	4.0	5.0
25 kts	3.5	4.4
45 kts	3.0	3.8

Wake Encounter Reporting

There have been extensive safety studies with the change from distance-based separations to time-based separations, particularly around the subject of wake turbulence encounters. However, as with any change to an operational concept, safety monitoring of events is being performed since the implementation of TBS.

Pilots must report wake encounters during TBS operations.

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