

Flap Misconfiguration on Takeoff

As modern aircraft have become more sophisticated in recent years, the tasks flightcrews must perform to manage flight automation have grown increasingly more complex. These advances in technology, along with an increasingly busy airport environment, have led to a rise in distractions in the cockpit.



In October 2013, the Aviation Safety Information Analysis and Sharing (ASIAS) Executive Board (AEB) conducted a study on flap misconfiguration events during the takeoff phase of flight for a select group of aircraft fleets. This study included the following flap misconfiguration events:

- Commencing the takeoff roll with the flaps in the retracted (cruise) position,
- Changing the flap setting during takeoff roll, and
- Mistakenly retracting the flaps instead of the landing gear immediately after liftoff.

The AEB provided its analysis to the Commercial Aviation Safety Team (CAST) for the development of mitigation strategies. The AEB accepted the study results in November 2014, and the FAA issued a Safety Alert for Operators (SAFO) to communicate safety awareness of the events identified in the study and some of the causal factors.

CAST chartered the Takeoff Misconfiguration Joint Safety Analysis and Implementation Team (TOMC JSAIT) in August 2015.

The TOMC JSAIT's work led CAST to adopt three voluntary safety enhancements (SE), with two specific to air carriers:

- SE 227: Air Carrier Procedures for Takeoff Configuration
- SE 229: Takeoff Configuration Warning System Maintenance and Operational Assurance

The study identified that air carriers with policies to set flaps at the gate had a lower rate of flaps-zero takeoff attempts than air carriers with policies to set flaps during taxi. CAST recommends air carriers consider adopting policies to set takeoff flaps before commencing taxi whenever practical

In addition, the study found a correlation between off-nominal situations (such as deicing operations or runway changes) and increased risk of attempted takeoffs with flaps set incorrectly. CAST recommends air carriers have checklists specific to off-nominal situations to ensure the flightcrews properly configure or reconfigure the airplane for takeoff.

The takeoff configuration warning system (TCWS) is an effective final barrier to mitigate the risk of a misconfigured takeoff. CAST recommends air carriers review minimum equipment list (MEL) procedures to ensure the TCWS is not inadvertently deactivated.