U.S. Department
of Transportation
**Federal Aviation
Administration**

SAFO

Safety Alert for Operators

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http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Importance of Standard Operating Procedures (SOP) as Evidenced by a Take-off Configuration Hazard in Boeing DC-9 series, MD-80 series, MD-90, and B-717 Airplanes.

Purpose: To emphasize the overall importance of SOP and specifically the need for SOP to ensure proper operation of the Take-off Warning System (TOWS) for DC-9 series, MD-80 series, MD-90 and B-717 airplanes.

Background: A recent loss of an MD-82 aircraft during takeoff and a subsequent Airworthiness Directive (AD) by the European Aviation Safety Agency (EASA) serve to underline the criticality of correct take-off configuration. The investigation of this accident is still ongoing and the probable causes have not yet been identified, however, preliminary information released by the investigating authority indicates the airplane's flaps and slats were not configured for take-off.

A review of accidents and incidents involving civil transport category aircraft shows that, worldwide, take-off configuration errors have figured in 49 accidents and incidents since 1968. These events have resulted in 392 fatalities. It should be noted that the FAA has already taken actions in response to these accidents and incidents such as revising airworthiness standards and issuing ADs. The hazard of mis-configuration of the flaps and slats at take-off can be mitigated in two distinct ways:

1) warning systems, and

2) standard operating procedures.

The recent MD-82 loss underlines the need for the industry to consider its SOP, as well as warning systems when mitigating take-off configuration hazards.

Discussion: DC-9 series, MD-80 series, MD-90 and B-717 airplanes are specifically equipped with a TOWS intended to prevent mis-configuration during take-off. Likewise Original Equipment Manufacturer (OEM) -recommended and air carrier-approved SOP have been designed to prevent a mis-configuration take-off. A warning system and SOP can only be effective mitigations if the system is properly maintained and the SOP is properly designed and followed.

The AD issued by EASA addresses SOP for DC-9 series, MD-80 series, MD-90 and B-717 airplanes. This AD revises Airplane Flight Manual SOP to require the crew to check the TOWS before engine start prior to every flight. This was previously recommended by McDonnell Douglas following a 1987 accident. In the AD, EASA states concern that "some operator's procedures no longer reflect the initial intent of the [McDonnell Douglas] recommendation…as the check is performed less frequently." Readers may review the entire AD at the following website: http://ad.easa.europa.eu/ad/2008-0197

SOP are universally recognized as basic to safe aviation operations, as evidenced by the MD-82 example. In 2003, the FAA issued an advisory circular (AC) on SOP, AC 120-71A, "Standard Operating Procedures for Flight Deck Crewmembers". In that AC, the FAA noted the following key features of SOP:

> **"KEY FEATURES OF EFFECTIVE SOP.**
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> **a.** Many experts agree that implementation of any procedure as an SOP is most effective if:
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> (1) The procedure is appropriate to the situation.
> (2) The procedure is practical to use.
> (3) Crewmembers understand the reasons for the procedure.
> (4) Pilot Flying (PF), Pilot Not Flying (PNF) / Pilot Monitoring (PM), and Flight Engineer duties are clearly delineated.
> (5) Effective training is conducted.
> (6) The attitudes shown by instructors, check airmen, and managers all reinforce the need for the procedure."

In order to be most effective, operators should review OEM recommended procedures, define SOP, explain the reason behind the SOP, and effectively train SOP. Each operator should avoid a "double standard" between SOP as trained and as operated in routine practice. To do otherwise is to eliminate one of the most simple and effective hazard mitigations in flight operations. Readers may review the entire AC at the following website: http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/b173ba8a295764f086256cde006a44ad/$FILE/AC120-71A.pdf

Recommended Action: Directors of Operations, Directors of Maintenance, Directors of Safety and Directors of Training should review their procedures to ensure that maintenance procedures and flight crew SOP are effective for ensuring proper operation of a TOWS. Operators of DC-9 series, MD-80 series, MD-90, and B-717 operators may refer to the OEM-recommended procedures for the TOWS. Operators of other airplanes should review their maintenance and flight crew SOP to determine if the procedures achieve a similar assurance of configuration warnings.

Directors of Operations, Directors of Maintenance, Directors of Safety and Directors of Training should ensure that their operations and maintenance personnel are effectively trained in and follow approved standard procedures for their aircraft.