



# Advisory Circular

**Subject: Approach and Landing During Convective Weather Conditions**

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## 1.0 INTRODUCTION

This Advisory Circular (AC) is provided for information and guidance purposes. It may describe an example of an acceptable means, but not the only means, of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend or permit deviations from regulatory requirements, nor does it establish minimum standards.

### 1.1 Purpose

The purpose of this document is to identify to Canadian air operators hazards associated with flight operations in the vicinity of convective weather activity (thunderstorms), specifically during the approach and landing phases of flight. Also, it is to encourage operators to provide pilot decision making guidance and training to flight crew members regarding flight through, or landing in such weather conditions.

### 1.2 Applicability

This document is applicable to all Transport Canada Civil Aviation (TCCA) employees, to individuals and organizations when they are exercising privileges granted to them under an External Ministerial Delegation of Authority. This information is also available to the aviation industry for information purposes.

### 1.3 Description of Changes

Not applicable.

## 2.0 REFERENCES AND REQUIREMENTS

### 2.1 Reference Documents

It is intended that the following reference materials be used in conjunction with this document:

- (a) Part VII, Subpart 05 of the *Canadian Aviation Regulations (CARs)—Airline Operations*;
- (b) Transport Canada Publications, TP 9352, Edition 02, 2004-12-17—*Air Command Weather Manual*;
- (c) TP 14371, 2008-10-01— *Transport Canada Aeronautical Information Manual (TC-AIM)*;
- (d) TP 13897, Edition 01, 2002-02-01— *Pilot Decision Making*;
- (e) Federal Aviation Administration (FAA)— *Aeronautical Information Manual*;
- (f) FAA Advisory Circular (AC) 91-79, 2007-06-11—*Runway Overrun Prevention*;
- (g) FAA AC 00-54, 1988-11-25—*Pilot Windshear Guide*;
- (h) FAA Safety Alert For Operators (SAFO) 08003, 2008-01-17—*Guidance Material for Contaminated Runway Landing Operations*;
- (i) FAA SAFO 06012, 2006-08-31—*Landing Performance Assessments at Time of Arrival*;
- (j) Nav Canada—*Local Area Weather Manual*;
- (k) Dr. Wiggins, Mark, MARCS Auditory Laboratories, University of Western Sydney, *The Interpretation and Use of Weather Radar Displays in Aviation – Final Report*, April 2005;
- (l) Transportation Safety Board of Canada; Aviation Investigation Report, Runway Overrun and Fire, Air France, Airbus A340-313 F-GLZQ, Toronto/Lester B. Pearson International, Airport, Ontario, 2005-08-02.

## 2.2 Cancelled Documents

Not applicable.

## 2.3 Definitions and Abbreviations

The following definitions and abbreviations are used in this document:

- (a) **Wind Shear:** when produced by thunderstorms these small-scale intense down drafts will, upon on reaching the surface, spread outward from the downflow centre. This causes rapid vertical and horizontal changes in wind direction and speed that can be extremely hazardous to all types and categories of aircraft.
- (b) **Contaminated Runway:** this AC is relevant to runways that are contaminated by water, which means that there is 3mm or more of standing water on the runway.

## 3.0 BACKGROUND

There have been numerous documented aircraft accidents and incidents attributable to flight operations, specifically during the approach and landing phase, in the vicinity of convective weather activity. These accidents have ranged from runway overruns to aircraft crashing short of the runway due to windshear. It is common practice to give thunderstorms a wide berth during the cruise portion of the flight. However, when these conditions are encountered during the approach and landing phase of a flight, flight crew members are operating in constrained terminal airspace making avoidance more difficult. Thunderstorm activity in terminal areas pose many risks which pilots must manage, such as increased workloads due to deviations or last minute runway changes, windshear, rapid reductions in visibility and runways becoming contaminated by heavy rain. It is inevitable that flight operations will be conducted in the vicinity of convective weather activity and therefore it is important that air operators provide dispatchers and flight crew members with training and information to enhance decision-making during such weather events in line operations.

## 4.0 ACTION

Air operators should ensure that information is available to flight crew members and dispatchers regarding the hazards of flight operations in the vicinity of convective weather activity, as well as review this information during initial and recurrent training. This may include information such as, but not limited to:

- (a) windshear avoidance, recognition, and proper recovery techniques;
- (b) proper use of the weather radar installed, including limitations of the radar and guidance on how to interpret airborne weather radar images;
- (c) awareness of possible rapid changes in runway conditions due to heavy rain (wet runway vs. contaminated runway), the effects of that change on landing performance, and proper landing techniques on wet or contaminated runways;
- (d) the use of performance manuals and Electronic Flight Bags (EFBs) (if equipped) to calculate landing distances required for wet or contaminated runways and specific information about the stopping performance capability of the aircraft;
- (e) the use of dispatch resources at times other than the preflight briefing to obtain enroute weather briefings and/or aircraft landing performance consultations using the most current time of arrival weather information;
- (f) hydroplaning, and crosswind limitations on wet, slippery and contaminated runways and their relationship to the loss of directional control during landing rollout;

- (g) the effects of deviations in glide angle, threshold crossing height and touchdown point on the required stopping distance; and
- (h) training in human factors and decision making during challenging weather conditions, specifically during the approach and landing phases of flight.

## 5.0 SUMMARY

Air operators have a responsibility to provide adequate information and instructions in the Company Operations Manual (COM) so that flight crew members and dispatchers can perform their duties to the highest level of safety possible, as required by subsection 705.135(1) of the *Canadian Aviation Regulations* (CARs). This should include information and guidance with regards to the hazards of flight operations in the vicinity of convective weather activity. The onus is then on the flight crewmembers to make sound decisions when faced with landing in convective weather activity using the information provided to them.

## 6.0 CONTACT OFFICE

For more information, please contact the:

Standards Coordinator (AART)

Phone: 613-990-8234  
Fax: 613-996-9178  
E-mail: [CAIRS\\_NCR@tc.gc.ca](mailto:CAIRS_NCR@tc.gc.ca)

Suggestions for amendment to this document are invited, and should be submitted via the Transport Canada Civil Aviation Issues Reporting System (CAIRS) at the following Internet address:

<http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>

or by e-mail at: [CAIRS\\_NCR@tc.gc.ca](mailto:CAIRS_NCR@tc.gc.ca)

***Original signed by Susan Greene (for)***

D.B. Sherritt  
Director, Standards, Civil Aviation

***Dated March 5, 2009***