


EASA	AIRWORTHINESS DIRECTIVE
	<p>AD No.: 2009-0170</p> <p>Date: 10 August 2009</p> <p>Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.</p>
<p>This AD is issued in accordance with EC 1702/2003, Part 21A.3B. In accordance with EC 2042/2003 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive unless otherwise specified by the Agency [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].</p>	
<p>Type Approval Holder's Name : ATR - GIE Avions de Transport Régional</p>	<p>Type/Model designation(s) : ATR 42 series and ATR 72 series aeroplanes</p>
TCDS Number :	EASA A.084
Foreign AD :	Not applicable
Supersedure :	None
ATA 31	Indicating / Recording Systems - Multi Purpose Computer (MPC) with Aircraft Performance Monitoring (APM) Function - Installation
Manufacturer(s):	ATR - GIE Avions de Transport Régional (formerly AEROSPATIALE – AERITALIA, AEROSPATIALE – ALENIA, AEROSPATIALE ATR–ALENIA, EADS ATR – ALENIA).
Applicability:	<p>Model ATR 42-200, 42-300, 42-320 aeroplanes that are not already equipped with Multi Purpose Computer / Aircraft performance Monitoring (MPC/APM) per ATR Mod. 08420 (SB ATR42-31-0071), and</p> <p>Model ATR42-400 and 42-500 aeroplanes that are not already equipped with MPC/APM per ATR Mod. 05567 or by retrofit through SB ATR42-31-0068, and</p> <p>Model ATR 72-101, 72-102, 72-201, 72-202, 72-211, 72-212 and 72-212A aeroplanes that are not already equipped with MPC/APM per ATR Mods 05567 or 08392 or 08442 or by retrofit through SB ATR72-31-1051 or SB ATR72-31-1050 or SB ATR31-1054 respectively.</p>
Reason:	<p>This Airworthiness Directive (AD) is intended to minimize hazards on ATR42/72s aeroplanes associated with the inadvertent encounter of severe icing conditions (which are beyond current certification envelope requisites for Part 25 aeroplanes) by providing the flight crew with measurable and objective evidence and timely alert when such severe ice conditions are encountered.</p>

The accumulated experience on the worldwide fleet of commuter aeroplanes, and recently reported ATR42/72 in-flight incidents, show that a long exposure to severe icing conditions, outside the certification envelope, can result in "unsafe conditions" leading to rapid performance degradation leading to sudden stall of the lifting/controlling aerodynamic surfaces and subsequent loss of control of the aeroplane.

Prolonged exposures to these severe icing conditions are due to the lack of crew awareness of these extreme environmental conditions leading to their late detection and/or untimely or incorrect application of the existing AFM procedures, which require the flight crew to actively monitor the encountered icing conditions and to leave them as soon as they are recognised as severe.

Current ATR42/72 AFM emergency procedures for the encounter of severe icing conditions - as mandated by AD F-1999-015-040 R2 - remain valid and must be applied by the flight crew. However, their application is based on the detection of such severe icing conditions by means of flight crew subjective interpretation of:

- an unexpected decrease of the aeroplane speed and/or rate of climb and/or;
- a set of very different visual cues like ice covering unheated portion of either forward side windows, possibly associated with water splashing and streaming on the windshield and/or;
- several secondary indications based on visual observation of ice accretion on different parts of the airframe.

All these together require the flight crew to perform a final qualitative judgement based upon its experience to fly icing conditions, and which could be different depending on the specific circumstances of each case where other concurrent environmental factors like poor light conditions, night operations, etc..., can impair the decision-making process.

In addition, even if the severe icing conditions are quickly identified by the crew and the escape manoeuvre promptly initiated, it may still take a few minutes for the aircraft to exit these conditions.

In order to improve flight crew situation awareness in icing conditions, ATR developed a new function called Aircraft Performance Monitoring (APM) that is available on ATR aeroplanes with Multi Purpose Computer (MPC) installed.

The APM processes a collection of different parameters (among them the aeroplane take-off weight as selected by the crew on a specific rotary selector), and in particular computes and compares the actual drag on the current flying path with the theoretical/expected value. From the comparison, a measurable and objective determination of the performance degradation possibly due to abnormal ice accretion can be calculated. When the performance degradation passes given thresholds, the APM annunciates warning signals by triggering up to two different levels of alerts while on climb/descent and three levels of alerts on cruise to the flight crew to make them aware of potential severe icing conditions degrading the aircraft performance.

It is recognised that, although the ice protection system of the aeroplane is compliant with the current certification envelope for flight into known-icing-conditions, the possible unsafe condition originating from a prolonged exposure to severe icing environment will be annunciated by the alert(s) provided by the APM, which has proved to be reliable during its in-service

	<p>experience.</p> <p>Because the APM warning will only indicate the significant aerodynamic penalties, the current AFM Emergency Procedures for severe icing remain totally valid and applicable. No relief to the pilot procedures concerning the current visual cues to detect severe icing conditions can result from this AD because APM function provides flight crews with objective indications which complement and enhance the situation awareness.</p> <p>EASA has therefore decided to make mandatory the APM system for ATR 42 and 72 series aeroplanes.</p>
Effective Date:	24 August 2009
Required action(s) and Compliance Time(s):	<p>Required as indicated, unless accomplished previously:</p> <p>Not later than the second "C" check or within 72 months, whichever occurs first after the effective date of this AD, install a Multi Purpose Computer (MPC) with Aircraft Performance Monitoring (APM) in accordance with the accomplishment instructions of:</p> <ul style="list-style-type: none"> • Service Bulletin (SB) ATR42-31-0071 revision 07 (Mod 008420) for ATR42-200/300/320 aeroplanes. • SB ATR42-31-0068 revision 07 (Mod. 05567) ATR42-400/500 aeroplanes. • SB ATR72-31-1051 revision 09 (Mod 05567) for ATR72-101/102/201/202/211/212/212A aeroplanes. <p>Installation of a MPC/APM done before the effective date of this AD in accordance with earlier revisions of the aforementioned SBs, satisfy the requirements of this AD.</p> <p>NOTE 1: Mod.05567 was factory-incorporated onto ATR 42-500 aeroplanes from Manufacturer Serial Number (MSN) 641 onwards and on ATR 72-212A aeroplanes on MSN 699, 722 and 724, and from MSN 726 onwards.</p> <p>NOTE 2: At the effective date of this AD, an appendix 15 describing the specific aeroplane procedures associated to the APM is included in the following Normal Revisions of the AFM:</p> <ul style="list-style-type: none"> - AFM 42-200/300/320 Normal Revision 27 dated April 2008. - AFM 42-400/500 Normal Revision 13 dated October 2008. - AFM 72-101/102/201/202/211/212 Normal Revision 22 dated July 2008. - AFM 72-212A Normal Revision 11 dated July 2008.
Ref. Publications:	<p>ATR Service Bulletins:</p> <p>ATR42-31-0068 original issue up to revision 07; ATR42-31-0071 original issue up to revision 07; ATR72-31-1051 original issue up to revision 09; ATR72-31-1054 original issue up to revision 04; ATR72-31-1050 original issue up to revision 01;</p> <p>Aeroplane Flight Manuals:</p> <p>AFM 42-200/300/320 Normal Revision 27 dated April 2008; AFM 42-400/500 Normal Revision 13 dated October 2008; AFM 72-101/102/201/202/211/212 Normal Revision 22 dated July 2008;</p>

	<p>AFM 72-212A Normal Revision 11 dated July 2008.</p> <p>The use of later approved revisions of these documents is acceptable for compliance with requirements of this AD.</p>
Remarks :	<ol style="list-style-type: none">1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.2. This AD was posted on 24 April 2009 as PAD 09-059 for consultation initially until 29 May 2009 and later extended to 30 June 2009. The Comment Response Document can be found at http://ad.easa.europa.eu.3. Enquiries regarding this AD should be referred to the Airworthiness Directives, Safety Management & Research Section, Certification Directorate, EASA. E-mail ADs@easa.europa.eu.4. For any questions concerning the technical content of the requirements in this AD, please contact: ATR - GIE Avions de Transport Régional Continued Airworthiness Service Tel.: +33 (0)5 62 21 62 21 - Fax: +33 (0) 5 62 21 67 18 E-mail: continued.airworthiness@atr.fr