



Airworthiness Directive

AD No.: 2015-0237

Issued: 15 December 2015

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 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 AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:

ATR-GIE AVIONS DE TRANSPORT RÉGIONAL

Type/Model designation(s):

ATR 42 and 72 aeroplanes

Effective Date: 29 December 2015

TCDS Number(s): EASA.A.084

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2015-0230 dated 01 December 2015.

ATA 22 – Auto Flight – Auto Pilot and Yaw Damper – Operational Limitations Master Minimum Equipment List – Amendment

Manufacturer(s):

ATR-GIE Avions de Transport Régional (ATR), formerly Aerospatiale – Aeritalia, Aerospatiale – Alenia, Aerospatiale ATR – Alenia, EADS ATR – Alenia

Applicability:

ATR 42-500 and ATR 72-212A aeroplanes, all manufacturer serial numbers modified in production by incorporating ATR modification 5948 (New Avionics Suite installation), except aeroplanes modified in production in accordance with ATR modification 6977 (New Avionics Suite Standard 2) or modified in service by incorporation of ATR Service Bulletin (SB) ATR42-31-0091 (applicable to ATR 42-500 aeroplanes) or ATR SB ATR72-31-1092 (applicable to ATR 72-212A aeroplanes).

Reason:

During flight evaluations performed on Flight Synthetic Test Devices of ATR aeroplanes equipped with New Avionics Suite (also known as 'Glass Cockpit'), with one Air Data Computer (ADC) or one Attitude and Heading Reference System (AHRS) inoperative, it was found that, after engine failure during autopilot (AP) or Yaw Damper (YD) re-engagement, the YD unit commanded the rudder to return to neutral position leading to inadequate balancing of the asymmetric power.



Subsequent flight tests confirmed the YD unit behaviour observed during flight simulator evaluation and identified that a software issue is the root cause of this system reaction.

Additionally, it was identified that the failure of one of the Direct Current (DC) Generators with a concurrent shutdown of the opposite engine leads to loss of the AHRS#2 and ADC#2 and resulting in in YD command the rudder into neutral position.

This condition, if not corrected, could result in loss of control of the aeroplane.

To address this potential unsafe condition EASA issued AD 2015-0230 to introduce operational restrictions affecting in-flight use of AP and/or YD with an inoperative AHRS, or ADC and the relevant dispatch limitations.

Since that AD was issued, it was determined that aeroplanes modified in service by incorporating New Avionics Suite Standard 2 are not anymore affected and that the operation of an aeroplane with combination of inoperative ADC, AHRS and DC Generator items is allowed. Additional investigation identified that the use of AP or YD could lead to unsafe condition also in case of both engine operative, when an ADC or an AHRS becomes inoperative.

For the reasons described above, this AD retains the requirements of EASA AD 2015-0230, which is superseded, and introduces AP or YD operational restrictions applicable for dual engine operation.

This AD is considered an interim action and further AD action may follow.

Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously:

- (1) From the effective date of this AD, **do not use** AP nor YD during flight, when one of the following fault messages appears in Amber on the Engine & Warning Display:
 - (1.1) ADC, or
 - (1.2) AHRS.
- (2) Amending the Aircraft Flight Manual (AFM) of an aeroplane by inserting a copy of this AD into the applicable AFM of an aeroplane and, concurrently, informing all flight crews is acceptable to comply with the requirements of paragraph (1) of this AD for that aeroplane.
- (3) Not later than on 15 December 2015 [the effective date of EASA AD 2015-0230], amend the applicable ATR Master Minimum Equipment List (MEL), on the basis of which the operator's MEL is established, by incorporating the dispatch restrictions as listed in Appendix 1 of this AD, inform all flight crews and, thereafter, operate the aeroplane accordingly.

Note: For affected ATR operators registered in Europe, amending the operator's MEL after any applicable change to the MMEL is required by Commission Regulation (EU) 965/2012.



- (4) From the effective date of this AD, dispatch of an aeroplane with inoperative equipment, as identified in paragraph (4.1) or (4.2) or (4.3) of this AD is allowed, provided that the MEL of that aeroplane has been amended to be consistent with the Master MEL restrictions as specified in Appendix 1 of this AD.
- (4.1) One of 2 ADC's inoperative,
- (4.2) One of 2 AHRS's inoperative,
- (4.3) One of 2 DC Generator's inoperative.
- (5) Amending the ATR Master MEL of an aeroplane by inserting a copy of this AD or incorporating a later Master MEL revision which includes the same dispatch restrictions as detailed in Appendix 1 of this AD and concurrently informing all flight crews is acceptable to comply with the requirements of paragraph (3) of this AD for that aeroplane.
- (6) Modification of an aeroplane, after the effective date of this AD, in accordance with ATR SB ATR42-31-0091 or ATR SB ATR72-31-1092, as applicable to aeroplane model, is an acceptable method to comply with the requirements of this AD.

Ref. Publications:

ATR SB ATR42-31-0091, dated 17 December 2014.

ATR SB ATR72-31-1092, dated 07 October 2014.

The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. For any question 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-aircraft.com.



Appendix 1 – MMEL amendment

(1) DC Generator loss

(1.1) Dispatch conditions

ATA 24 – ELECTRICAL POWER (Continued)				
ATA CHAPTER	1	2 - REPAIR INTERVAL CATEGORY		
		3 - NUMBER INSTALLED		
		4 - NUMBER REQUIRED FOR DISPATCH		
		5 - REMARKS OR CONDITIONS		
ITEM				
DC				
30-1 DC generator channel (generator + related GCU)	A	2	1	* (o) (m) May be inoperative except for ETOPS, provided: (a) The Autopilot and Yaw Damper are deactivated, and (b) TRU is checked operative prior to each departure, and (c) Aircraft does not fly extended overwater routes, and (d) Two engines taxi is performed, and (e) Aircraft does not line up until 6 minutes elapsed after operative generator comes on line, and (f) Operations are limited to two flights

Note: This new dispatch condition only supersedes the related current approved MMEL items applicable to ATR 42-500 and ATR 72-212A fitted with ATR Modification 5948, except aeroplanes modified in accordance with ATR modification 6977, the others dispatch conditions remain valid.



Appendix 1 – MMEL amendment (continued)

(1.2) Associated procedures

Dispatch Deviation Guide
ATA 24 – ELECTRICAL POWER
30-1 DC generator channel (generator + related GCU)
OPERATIONAL PROCEDURES :
➤ Check of remaining generator feeder integrity: 6 minutes are necessary to establish the temperature difference between the feeders if one line is broken. So aircraft should not line up until 6 minutes elapsed after operative generator comes on line. ➤ Operational test of TRU (if installed): <u>Note:</u> During the test, the ACW electrical network must be available (The AC GPU connected or ACW generators running). Checking are performed only on Main Electrical Panel (left hand panel): - Switch OFF the pushbutton DC EXTERNAL POWER (if selected ON) - Switch OFF the pushbuttons DC GEN 1 & 2 (if selected ON)
On Main Electrical Panel; check that the following caution lights are switched ON: - BATTERY ARROWS - Both BUS OFF - INVERTER 2 FAULT - Both DC BUS OFF - SHED LEGEND OF DC SVCE/UTLY BUS
Check that the following systems are supplied: - VHF 1 - FUEL QTY INDICATOR - FLAPS POSITION INDICATOR
On Main Electrical Panel; press the TRU push-button; then check that: - The TRU push-button is switched ON - The TRU ARROW caution light is switched ON - The BATTERIES ARROWS caution lights are not illuminated - The UNDRV legend of OVRD/UNDRV push-button is not illuminated
On Main Electrical Panel, check that the BATTERY AMMETER shows zero load either if BAT selector switch is placed in EMER or MAIN position.
Check that the following systems are still supplied: - VHF 1 - FUEL QTY INDICATOR - FLAPS POSITION INDICATOR
On Main Electrical Panel, switch off the TRU push-button; then check that: - The TRU push-button is not illuminated - The TRU ARROW caution light is not illuminated - The BATTERY ARROWS caution lights are switched ON
MAINTENANCE PROCEDURES :
- Pull C/B AFCS/YAW SERVO, secure and tag



Appendix 1 – MMEL amendment (continued)

(2) **ADC or AHRS fault**

(2.1) Dispatch conditions

ATA 34 – NAVIGATION				
ATA CHAPTER ITEM	1	2 - REPAIR INTERVAL CATEGORY		
		3 - NUMBER INSTALLED		
		4 - NUMBER REQUIRED FOR DISPATCH		
		5 - REMARKS OR CONDITIONS		
- Air Data System				
11-1 Air Data Computer (ADC)	A	2	1	* (o) (m) One ADC may be inoperative provided: (a) The Autopilot and Yaw Damper are deactivated, and (b) The TLU manual mode is operative (c) The IESI is operative, and (d) All the IOM DC are operative, and (e) The operations are limited to two flights, and (f) For day VMC flight only, and (g) For ETOPS, the ADC#1 must be operative <u>Note :</u> When TLU automatic mode is inoperative Refer to MMEL 27 item 23-2
- Attitude – Heading				
20-1 AHRS	A	2	1	* (m) One may be inoperative, provided: (a) The Autopilot and Yaw Damper are deactivated, and (b) The IESI is operative, and (c) For day VMC flight only, and (d) Operations are limited to two flights, and (e) For ETOPS, AHRS#1 must be operative

This new dispatch condition **only** supersedes the related current approved MMEL items applicable to ATR 42-500 and ATR 72-212A fitted with ATR Modification 5948, except aeroplanes modified in accordance with ATR modification 6977, the others dispatch conditions remain valid.



Appendix 1 – MMEL amendment (end)

(2.2) Associated procedures

Dispatch Deviation Guide
ATA 34 – NAVIGATION
11-1 ADC OPERATIONAL PROCEDURES : ADC switching must be set to valid ADC TLU manual mode check: ➤ Select HI SPD and check alert is generated after 25 seconds: MC, SC, FLT CTL TLU on FWS and TLU FAULT light ➤ Check rudder travel is limited ➤ Select AUTO and check alert stops after 15 seconds ➤ Check rudder travel is not limited MAINTENANCE PROCEDURES : - Pull C/B AFCS/YAW SERVO, secure and tag 20-1 AHRS OPERATIONAL PROCEDURES : None for this chapter MAINTENANCE PROCEDURES : - Pull C/B AFCS/YAW SERVO, secure and tag.

