OPERATIONAL EVALUATION REPORT

ATR – GIE AVIONS DE TRANSPORT RÉGIONAL

ATR 42/72

GRUPO DE AVALIAÇÃO DE AERONAVES – GAA

BRAZILIAN AIRCRAFT EVALUATION GROUP

AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

BRAZIL

REVISION 5 – OCTOBER 27TH, 2020

Revision Control

REVISION	DATE	HIGHLIGHTS OF CHANGE
Original	June 12th, 2012	ATR 42/72-600 Original Report.
Revision 1	October, 2013	Editorial Changes; changes in the type rating list; inclusion of new differences training from the ATR-500 to the -600 based on different pre-requisites; review of differences level in Recurrent Training; review of the determination for currency; exclusion of Appendixes 3, 4 and 5 of revision O; included the requirement for ANAC qualification of the devices VHP and FFT.
Revision 2	March 6th, 2017	Editorial changes; review of FFS sessions flight time in the Initial Type Rating training (Appendix 1).
Revision 3	September 18th, 2018	Merge of the revision 2 of this report, IAC 121-1008 (ATR 42/72) and OSD report for ATR 42/72 from EASA.
Revision 4	August 14th, 2019	MDR typo correction
Revision 5	October 27th, 2020	Recurrent Training correction

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1 General

1.1 Evaluation Team

1.1.1. ATR 42/72-600

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1.2 Acronyms

- ADU – Advisory Display Unit
- AFCS – Automatic Flight Control System
- APM – Aircraft Performance Monitoring
- ATO – Approved Training Organization
- ATR – Avions de Transport Régional
- ATPCS – Automatic Take off Power Control System
- CBT – Computer Based Training
- CFIT – Controlled Flight Into Terrain
- CL – Condition Lever
- CRM – Crew Resource Management
- EASA – European Aviation Safety Agency
- ECL – Electronic Check List
- EFB – Electronic Flight Bag
- EGPWS – Enhanced Ground Proximity Warning System
- EWD – Engine & Warning Display
- FAA – Federal Aviation Administration
- FAR – Federal Aviation Regulation
- FFS – Full Flight Simulator
- FFT – Full Flight Trainer
- FGCP – Flight Guidance Control Panel
- FMA – Flight Mode Annunciator
- FNPT – Flight Navigation and Procedures Trainer
- FPTD – Flat Panel Training Device
- FSB – Flight Standardization Board (FAA)
- FSTD – Flight Simulator Training Device
- FTD – Flight Training Device
- GI – Ground Instructor
- ICP – Index Control Panel
- JAR – Joint Aviation Requirements
- LIFUS – Line Flying Under Supervision
- LOFT – Line Oriented Flying Training
- MCC – Multi Crew Coordination
- MCDU – Multi-Function Control and Display Unit
- MCP – Multi-Function Control Panel
- MDR – Master Difference Requirements
- MEL – Minimum Equipment List
- MFD – Multi-Function Display

- MMC – Multi Crew Coordination
- MMEL – Master Minimum Equipment List
- NAS – New Avionics Suite
- ODR – Operator Differences Requirements
- OSD – Operational Suitability Data
- PEC – Propeller Electronic Control
- PF – Pilot Flying
- PIC – Pilot in Command
- PL – Power Lever
- PM – Pilot Monitoring
- POI – Principal Operations Inspector
- RBAC – Regulamento Brasileiro de Aviação Civil
- RBHA – Regulamento Brasileiro de Homologação Aeronáutica
- SHP – Shaft Horse Power
- SIC – Pilot Second in Command
- TASE – Training Areas of Special Emphasis
- TCAS – Traffic Alert and Collision Avoidance System
- TCDS – Type Certificate Data Sheet
- TRTO – Type Rating Training Organizations
- VHP – Virtual Hardware Platform Trainer
- WBT – Web Based Training

2 Introduction

2.1 Background

The evaluation was conducted by documentation analysis using the information provided by three documents:

1) IAC 121-1008, Original Version, issued by ANAC on June 21st, 2005;

2) Operational Evaluation Report of ATR 42/72-600, Revision 2, issued by ANAC on March 6th, 2017; and

3) OSD Report (Flight Crew Data) of ATR 42 & ATR 72, Original Version, issued by the European Aviation Safety Agency (EASA) on December 11th, 2015.

In case more detailed information is required, refer to the OSD Report mentioned above.

2.2 Variant Definition

The ATR 42 and 72 series aircraft have undergone significant product improvements over the years introducing several models/versions. The table below summarizes the various type certified aircraft models according to their commercial designation and definition of variant for Flight Crew training according to the OSD Report.

Table 1 – Variant Definition

Commercial Designation	Definition of Variant	Type Certified Models / Versions (ref. TCDS ANAC EA-9312-13)
ATR 42-300	ATR 42 Non PEC	ATR 42-300 /-320
ATR 42-500	ATR 42 PEC	ATR 42-500
*ATR 42-600	*ATR 42 Glass Cockpit	*ATR 42-500 Version with NAS
ATR 72-200	ATR 72 Non PEC	ATR 72-101/ -102/ -201/ -202/ -212
ATR 72-500	ATR 72 PEC	ATR 72-212A
ATR 72-600	ATR 72 Glass Cockpit	ATR 72-212A Version with NAS

Note: * The ATR 42-600 (ATR 42-500 Version with NAS) is not certified by ANAC.

2.3 Objective

This report presents ANAC collection of results obtained from the operational evaluations of ATR aircraft models commercially knows as ATR 42-300/500/600 and ATR 72-200/500/600.

2.4 Purpose

The purpose of this report is to:

a. Define the Pilot Type Rating assigned for the ATR 42 and ATR 72;

b. Define the requirements for training, checking and currency applicable to flight crew for the ATR 42 and ATR 72;

c. Provide the Master Differences Requirements (MDR) for crews requiring differences qualification for mixed-fleet-flying;

d. Describe the required Flight Simulation Training Device (FSTD) for crew training and checking.

2.5 Operator's Responsibility

It is the operator's responsibility to demonstrate the safety equivalence and applicability of any difference between the recommendations contained in this report and its proposed standards and procedures.

The recommendations contained in this informative document were made based on the aircraft in operation and on the existing requirements at the time of its elaboration. Changes in aircraft and requirements may require a review of this report.

2.6 Applicability

This report is applicable to:

a. Brazilian operators of ATR 42 and ATR 72 – identified as ATR-42-300, ATR-42-320, ATR-42-500, ATR-72-101 / 102, ATR 72-201 / 202, ATR-72-212 and ATR 72-212A in the ANAC Type Certificate Data Sheet (TCDS) EA-9312-13 – who operate under RBHA 91 and RBAC 121 rules;

b. Approved Training Organizations certified under RBAC 142 (Type Rating Training Organizations - TRTO);

c. Civil Aviation Inspectors related to safety oversight of ATR 42 and ATR 72 aircraft;

d. ANAC Principal Operations Inspectors (POIs) of ATR 42 and ATR 72 operators.

2.7 Cancelation

This report revokes and replaces the following ANAC issued documents:

a. IAC 121-1008, dated Jun. 21st, 2005; and

b. Operational Evaluation Report of ATR 42/72-600, Revision 3, dated Sep. 18th, 2018 and all older revisions.

3 Aircraft Design

The ATR family of aircraft are conventional high-wing monoplane passenger aeroplanes, powered by two Pratt & Whitney 120 series turbo-propeller engines. The 42 and 72 variants differ primarily in a fuselage stretch of 4.49 meters for the latter, although significant product improvements over the years mean that there are several variants within each model.

The flight controls are all mechanically actuated and are conventional in arrangement, comprising two elevators, one aileron on each wing and a single rudder; roll assistance is provided by one spoiler on each wing. Engine maximum power ratings vary from 2000 SHP for the ATR 42-300 to 2750 SHP for some ATR 72 models. The maximum operating altitude for all aircraft is 25,000 ft.

4 Pilot Type Rating

The ATR family (ATR 42 and ATR 72) type rating designation is "**AT47**".

Table 2 - Pilot Type Rating

Avião (*Airplane*)				
Fabricante *(Manufacturer)*	**Aeronave** *(Aircraft)*		**Observações** *(Remarks)*	**Designativo** *(Designative)*
	Modelo *(Model)*	**Nome** *(Name)*		
ATR - GIE AVION DE TRANSPORT RÉGIONAL	ATR 42-300/320 ATR 42-500 ATR 72-101/102/201/202/212 ATR 72-212 A	ATR 42-300 ATR 42-500 ATR 72-200 ATR 72-500/600	Relatório de Avaliação Operacional ATR 42/72 *ANAC Operational Evaluation Report ATR 42/72*	AT47

5 Master Difference Requirements (MDR)

The Master Difference Requirements matrix for ATR 42/72 is shown in Table 3. These provisions are applied when there are differences between models which affect crew knowledge, skills, or abilities related to flight safety (e.g., Level A or greater differences) for training, checking and currency, respectively, according to IS 00-007.

Table 3 - Master Difference Requirements

		From Airplane					
		ATR 42-300 (Not PEC Equipped)	ATR 72-200 (Not PEC Equipped)	ATR 42-500 (PEC Equipped)	ATR 72-500 (PEC Equipped)	ATR 42-600 (Glass Cockpit)	ATR 72-600 (Glass Cockpit)
To Airplane	ATR 42-300 (Not PEC Equipped)	-	C/B*/A	C/B*/A	C/B*/A	D/C*/C	D/C*/C
	ATR 72-200 (Not PEC Equipped)	C/B*/A	-	B/B*/A	B/B*/A	D/C*/C	D/C*/C
	ATR 42-500 (PEC Equipped)	C/B*/A	B/B*/A	-	A/A*/A	D/C*/C	D/C*/C
	ATR 72-500 (PEC Equipped)	C/B*/A	B/B*/A	A/A*/A	-	D/C*/C	D/C*/C
	ATR 42-600 (Glass Cockpit)	D/C*/C	D/C*/C	D/C*/C	D/C*/C	-	A/A*/A
	ATR 72-600 (Glass Cockpit)	D/C*/C	D/C*/C	D/C*/C	D/C*/C	A/A*/A	-

Note:

(1) The * denotes the need of operation experience with an instructor (RBAC 121.434)

6 Operator Difference Requirements (ODR)

Each operator of a mixed fleet of ATR 42 and ATR 72 shall produce its own ODR, as recommended by IS 00-007.

The ATR 42/72 ODR Tables developed by the OEM are available under request to ATR and may be used by operators as reference to assemble their own customized table.

These tables assume that pilots are current and qualified on the base aircraft.

7 Specifications for Training, Checking and Currency

Specifications for training, checking and currency are detailed on OSD Report mentioned in 2.2 Background.

Additional familiarization training for variants may be included in the theoretical knowledge training of the initial type rating course.

Flight training is conducted on a single ATR 42/72 variant.

7.1 ATR 42/72 Initial Type Rating

The training footprint in Appendix 1 provides summary description of a training program for ATR 42/72 Glass-cockpit type rating course. This footprint can be equally applicable to all other ATR variants initial type training courses by adapting the contents (see note in the Appendix 1).

The base curriculum is comprised of the ground segment and the flight segment.

The ground segment uses a combination of the following resources: Web Based Training (WBT), Classroom instruction and a procedures trainer referred to as Virtual Hardware Platform (VHP).

The flight segment uses two Flight Simulation Training Devices (FSTD): the Full Flight Trainer (FFT) and the Full Flight Simulator (FFS). The FFT is used in the first 4 sessions of the flight segment and the FFS is used in the other 6 sessions and in the proficiency check session. Any of the FFT sessions may be replaced by FFS sessions.

More information on the FSTDs can be found in section 10 of this report.

7.1.1 Prerequisites for Initial Type Rating

7.1.1.1 Pilot in Command (PIC)

To enroll the training the pilot must as a minimum:

- hold a commercial pilot license;
- have at least 1500 hours in total as pilot of airplanes;
- hold an IFR rating;
- hold a Land Multiengine Class Rating (MLTE) or a type rating of a multiengine aircraft;
- have been approved in the theoretical exam of ANAC Airline Transport Pilot License (PLA).

7.1.1.2 Pilot Second in Command (SIC)

To enroll the training the pilot must as a minimum:

- hold a commercial pilot license;
- have at least 70 hours as pilot in command of airplanes;
- hold an IFR rating;
- hold a Land Multiengine Class Rating (MLTE) or a type rating of a multiengine aircraft;
- have been approved in the theoretical exam of ANAC Airline Transport Pilot License (PLA).

In addition to the requisites listed above, ATR recommends that pilots with less than 500 flight hours should enroll an Entry Level Training (ELT), prior to commencing the type rating course. The ELT is provided by ATR Training Center and uses a combination of ground instruction and flight instruction in a Flight Simulation Training Device.

A FFT can be used as part of the practical training. The FFT is an approved device in accordance with FTD Level 2 and FNPT Level II MCC. It may be substituted by a FFS Level C or D (no motion required).

7.1.2 Entry Level Training (ELT)

The objective of ELT is to provide training for pilots who do not meet the knowledge and skills for initial type rating, in order to achieve sufficient level before entering the initial type rating as determined by an ATO.

For those pilots who do not meet the ATR prerequisites (stated on the item before) but are considered to have sufficient experience and skills, an initial evaluation could be done in order to assess if the trainee has sufficient level for entering the initial type rating course.

The ELT uses Ground and SFI Instructors and Web Based Training and the training devices (FPTD, FFT, FFS), as needed. The footprint in Appendix 2 shows an example of ELT program.

7.2 ATR 42/72 Differences / Familiarization Training

7.2.1 ATR 42/72 Non-PEC to PEC (vice-versa)

The Differences / Familiarization Training Courses are designed to provide the ATR qualified pilot with the theoretical knowledge (Differences / Familiarization Training) and practical skills (Differences Training) necessary to safely and competently transition from any Non PEC to PEC aircraft (or vice-versa).

Differences training from the ATR 42 (Non PEC equipped) to the ATR 42 (PEC equipped) (or vice versa) or familiarization training from the ATR 72 (Non PEC equipped) to the ATR 72 (PEC equipped) (or vice versa) are considered minor and maximum level consists of Level C or Level B respectively as summarized in the MDR.

7.2.2 ATR 42/72 Glass Cockpit to ATR 42/72 Non PEC or PEC

The differences training from the ATR 42/72 Glass Cockpit to ATR 42/72 PEC or to Non PEC variants as summarized in the MDR is Level D and the training footprints in Appendix 8 and Appendix 9 provides summary description of a training program for the difference training. These footprints can be equally adapted for either ATR 42 or 72 versions.

7.2.3 ATR42/72 Non PEC or PEC to ATR 42/72 Glass Cockpit

7.2.3.1 Pre-Requisites

The ATR42/72 PEC or Non PEC to ATR 42/72 Glass Cockpit differences training footprint as shown in Appendix 3 or Appendix 6 respectively requires the trainee to be current and qualified on the ATR Non PEC or PEC and have a minimum experience of 500 hrs. total or 100 hrs. in the last twelve months on ATR aircraft.

Pilots not meeting the above pre-requisites of ATR Non PEC or PEC experience should follow the ATR PEC or Non PEC to ATR-Glass-Cockpit Differences Training footprint shown in Appendix 4 or Appendix 7 respectively.

7.2.3.2 Training Footprint

The level of differences between the ATR 42/72 Non PEC to ATR 42/72 Glass-Cockpit or ATR 42/72 PEC to ATR 42/72 Glass-Cockpit is Level D as shown in the MDR table.

ATR 42/72-PEC to ATR 42/72 Glass-Cockpit differences training has been assessed and found acceptable to meet the training requirements. The training is based upon clearly defined objectives and addresses all items as identified in the ODR tables and validated by the GAA. The footprint of the evaluated course, including the minimum course duration and training devices used is shown in Appendix 3 or 6 and 4 or 7, as applicable for pilots with and without the ATR 42/72 Non PEC or PEC experience requirements described above.

7.2.4 ATR 42 to ATR 72 (vice-versa)

The ATR 42 to ATR 72 Training (or vice versa) is designed to provide an ATR current and qualified pilot with the knowledge and skills necessary to

safely and competently transition between the ATR 42 and ATR 72 (or vice versa) or models.

For Non PEC version the maximum level of differences between ATR 42 and ATR 72 (or vice versa), is Level C as shown in the MDR table, and this could be addressed adequately with a difference training typically one day.

For both PEC and Glass cockpit version the maximum level of differences between ATR 42 and ATR 72 (or vice versa), is Level A as shown in the MDR table.

A footprint of familiarization training for Glass cockpit (ATR 42 and ATR 72) is shown in Appendix 5 and typically lasts 4 hours.

7.3 Training Area of Special Emphasis (TASE)

7.3.1 Initial and differences training

The following items must receive special emphasis at the appropriate point during the ground and flight training (e.g. during CBT, FPTD, FFT and/or FFS training) during initial and differences training courses:

- Engine malfunctions during take-off
  - Knowledge and procedural handling skills of the consequences of Engine malfunctions during take-off including ATPCS malfunctions.
- Engine Controls
  - Knowledge of different positions and notches for (PL and CL) and procedural handling skills
- Propeller Brake
  - Knowledge of system and procedural handling skills
- Ice detection and management systems and displays
  - Knowledge of all ice detection including APM systems and management of ice protection and prevention, procedural skills managing the consequences of icing;
  - Ground icing and effect of improper de-icing on different structural components and flight controls (elevator)
- Use of avionics system

- Recognitions of caution and warning messages on the Engine & Warning Display (EWD or CAP),
- Normal and abnormal / emergency operations of the system
- Knowledge and procedural handling skills of FMA / ADU annunciations (call outs, cross-checks)

When transitioning to the glass-cockpit or Initial glass-cockpit training

- Use of Flight Management System (FMS);
  - Knowledge and skills related to MFD / MCDU use
  - Knowledge of the various associated modes of automation
  - The associated human factors issues and Crew Resource Management (CRM) skills to manage the new functionality
- Use of Electronic Checklist (ECL);
  - Knowledge of appropriate skills of use of ECL
  - Crew discipline and coordination of use of normal / abnormal / emergency checklists

7.3.1.1 Failure of Display Unit (DU) #3 event: certification requirement

In case of DU#3 failure, an automatic reversion displays the EWD format on DU#2 or DU#4, depending on the coupling side (Pilot Monitoring side). The DISP button allows to cycle between the three formats (PFD/MFD/EWD). However, it must be emphasized in the training that the flight crew must display the EWD format on DU#2 or DU#4 at any time during take off, approach and landing flight phases.

7.3.2 Familiarization Training

The following differences must be included in the ATR 42 to ATR 72 (and vice versa) training:

Knowledge of

- aircraft limitations and flight envelope;
- Go-around procedure
- Tail Prop Use (on ground operation)

Operators may add additional elements as required for their operation. Training organizations should review their training courses when applicable

aircraft modifications occur. Training organizations may add additional elements as required by the operator.

7.4 Special Events Training

Special events training to improve basic crew understanding and confidence regarding aircraft handling qualities, options and procedures as these relate to design characteristics and limitations may include the following:

- recovery from unusual attitudes;
- manual flight with minimum use of automation, including flight under degraded levels of automation;
- handling qualities and procedures during recovery from an upset condition (e.g., wake vortex encounter, loss of control incident);
- Controlled Flight Into Terrain (CFIT), TCAS, EGPWS (emphasis on avoidance and escape manoeuvres, altitude awareness, TCAS / EGPWS warnings, situational awareness and crew co-ordination, as appropriate).

Special events training is not considered as required additional training.

7.5 Recurrent Training

Recurrent training must be compliant with ANAC regulations, as applicable, and should include the Training Areas of Special Emphasis as identified in this report. These requirements should be considered as a minimum and expanded, as appropriate, for pilots who have had only limited exposure and/or who do no longer fulfil the currency requirements.

Operators should establish an approved recurrent training and checking programme which is relevant to the aircraft variant flown and its intended operation. The recurrent training programme may vary with several factors which have a significant influence. Some of these factors are: actual exposure of the flight crew member(s), specific routes and aerodromes used by the operator and new developments in technology. These factors and/or a combination thereof will determine the required recurrent training.

Recurrent training should incorporate special events training as described in this report on a rotational basis.

The recurrent training shall be developed by the Operator or a RBAC 142 Approved Training Organization in accordance with the requirements of RBAC

121.427 and 121.433, and submitted to ANAC for approval. In addition, when developing the recurrent training, the recommendations discussed in this section should also be respected.

7.6 Specifications for Checking

License skill tests and operator proficiency checks must be performed in accordance with applicable ANAC regulations for civil aviation aircrew and air operations.

ATOs and operators should ensure that the knowledge and skills received in differences training are validated appropriately.

7.6.1 Recurrent Training and Checking

When operating any two ATR 42/72 variants (PEC, Non PEC and / or Glass cockpit) the recurrent training and checking should be conducted on an alternating basis between the two applicable ATR 42/72 variants using FFS, or appropriate tools for training.

As shown in the MDR table the differences between ATR 42/72 Non PEC and ATR 42/72 PEC for recurrent training and checking is level B. Therefore, if recurrent training and checking is not alternated, differences between variants operated must be addressed separately in accordance with the difference levels for training and checking as identified in the MDR tables.

When operating more than two variants (e.g. ATR 42 Non PEC, PEC, and Glass cockpit) the recurrent training and checking should be conducted on an alternating basis between the ATR 42 NON PEC and Glass cockpit variants as this would allow to cover the maximum differences and the particularity of the PEC (such that PEC could be covered with the Glass cockpit while the Conventional instruments with Non PEC).

Differences between the ATR 42/72 series aircraft are identified in ODR tables. The ATR 42/72 Glass Cockpit differences to other ATR 42/72 PEC/NON PEC variants have been assessed at Level C for recurrent training and checking, i.e. these differences should be addressed in a FPTD (or higher device).

Example of alternating recurrent checking and training between ATR42/72 Non-PEC/PEC and ATR42/72 Glass Cockpit variants when operated in commercial air transport operations.

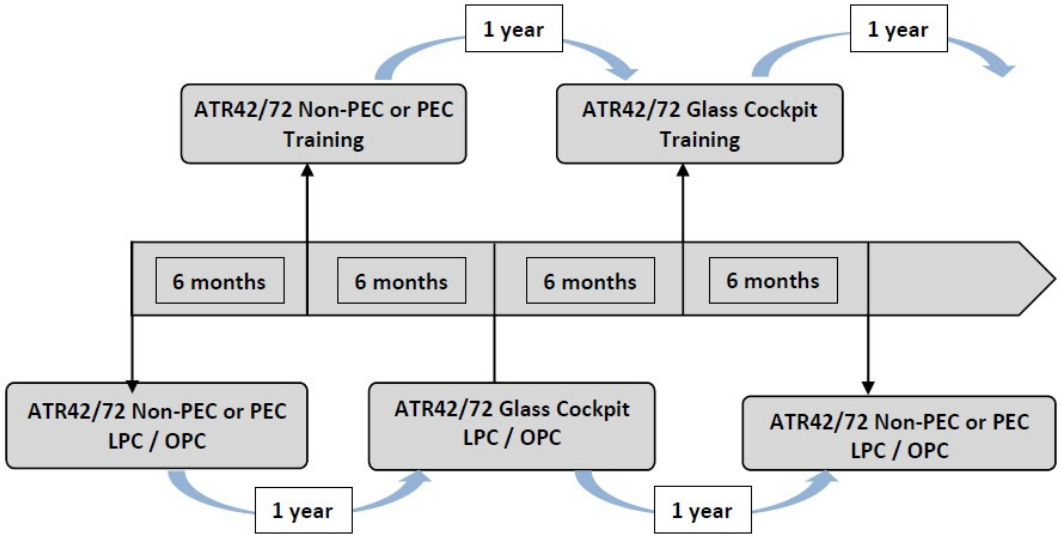

Figure 4 – Example of Alternating recurrent checking and training between ATR 42/72 Non PEC/PEC and ATR 42/72 Glass Cockpit variants

7.6.2 Line Check

A line check performed on either ATR 42/72 variant is valid for all variants.

Pilot in command (PIC) of ATR 42/72 must perform line checks in accordance with RBAC 121.440.

This does not relieve operators from line check requirements specific to route and airport qualifications.

7.7 Specifications for Recent Experience and Currency

Pilots operating the ATR-600 and other ATR 42/72 family models in mixed fleet flying must complete at least **three** sectors in both variants, acting as Pilot Flying (PF) or Pilot Monitoring (PM), in the preceding 90 days.

Currency level is set at level C, because some maneuvers and procedures will have to be executed by the pilot when reestablishing currency.

7.7.1 Reestablishing Currency

After 90 days without the operation of a variant, 5 consecutive sectors on this variant must be accomplished with an instructor before resuming mixed fleet flying.

After 180 days without operation of one variant, 10 consecutive sectors on this variant must be accomplished with an instructor before resuming mixed fleet flying.

A session on a FFS or FFT of the variant in which currency was lost is also acceptable for reestablishing currency.

7.7.2 Recent Experience

Full credit should be granted for recent experience requirements when operating any ATR 42/72 variant.

7.7.3 ATR Glass Cockpit Currency

Flight crews operating an ATR Glass-cockpit together with any other variant should perform at least one route sector (as PF or PM) in an ATR glass-cockpit and one route sector in any other variant(s), within the previous 90 days. Re-establishing of currency can be done in FFT or equivalent tool with the appropriate configuration.

7.8 Line Flying Under Supervision (LIFUS) / Familiarization Flights

There is a variety of reasons why the GAA may recommend LIFUS / Familiarization Flights. One or more of the reasons described below may apply:

a. Introduction of new aircraft types or variants;

b. Introduction of new systems (e.g., FMS, ECL, TCAS, HUD);

c. Introduction of new operation (e.g. oceanic, polar or ETOPS operations);

d. Experience for a particular crew position (e.g. PIC, SIC);

e. Post qualification skill refinement (e.g. refining alternate or multiple ways to use particular equipment to increase operating efficiency, operating flexibility, or convenience); or

f. Special characteristics (e.g. mountainous areas, unusual or adverse weather, special air traffic control procedures, non-standard runway surfaces and dimensions, etc.).

NOTE: Although similar to the item 121.434 from RBAC 121, nowadays LIFUS is not foreseen in Brazilian regulations. However, the GAA found technically relevant that these items should be accomplished by the pilot after the regular training, as defined by EASA.

Moreover, the IS 00-007 foresees the Supervised Line Flying (SLF), a supervised experience associated with the introduction of equipment or procedures requiring post qualification skill enhancement during which a pilot

occupies a specific pilot position and performs particular assigned duties for that pilot position under the supervision of a qualified company flight instructor.

The operation experience and operation cycles must be completed in accordance with RBAC 121.434.

7.8.1 LIFUS

Where there is a change of operating conditions or route structure this should also be considered and may need the addition of sectors to cover these elements.

7.8.2 LIFUS following ATR Initial Type Rating Training

A supervised exterior inspection on the aircraft should be part of the training course or LIFUS following the ATR 42/72 full type rating course. An unsupervised exterior inspection should not be permitted until this requirement has been fulfilled.

In the case of an initial type rating onto the ATR 42/72, a minimum of 10 route sectors including a line check should be required (i.e. 8 route sectors plus 2 route sectors line check).

7.8.3 Familiarization Flights following Differences Training

The following number of route sectors should be required following differences / familiarization training:

Number of Route sectors for familiarization flights (including line check)						
FROM / **TO**	**ATR 42 (Non PEC equipped)**	**ATR 72 (Non PEC equipped**	**ATR 42 (PEC equipped)**	**ATR 72 (PEC equipped)**	**ATR 42 (Glass Cockpit)**	**ATR 72 (Glass Cockpit)**
ATR 42 (Non PEC equipped)	--	0	2	2	10*	10*
ATR 72 (Non PEC equipped	2	--	2	2	10*	10*
ATR 42 (PEC equipped)	2	2	--	0	10*	10*
ATR 72 (PEC equipped	2	2	2	--	10*	10*

ATR 42 (Glass Cockpit)	10*	10*	10*	10*	--	
ATR 72 (Glass Cockpit)	10*	10*	10*	10*	2	--

* Pilots with less than 500 hrs. on ATR aircraft or less than 100 hrs. on ATR aircraft in the last 12 months should perform 30 route sectors.

7.9 Recommendations for Mixed Fleet Oprations

7.9.1 Crewing of inexperienced flight crew members

Following completion of ATR PEC or non PEC to ATR Glass-cockpit (or vice versa) differences training, a flight crew member is considered inexperienced, until he/she has achieved on the new variant, 30 route sectors and a minimum of 30 flight hours, as PF or PM (including any Familiarization Flights).

An inexperienced flight crew member should not operate the ATR Glass-cockpit together with any other ATR 42/72 variant.

8 Compliance to RBHA 91 and RBAC 121

Compliance checklists are provided as an aid to ANAC operations certification divisions and were not demonstrated to the ANAC Aircraft Evaluation Group – GAA/GCOI/SPO.

9 Technical Publications

9.1 Master Minimum Equipment List - MMEL

ATR 42/72 MMEL approved by the primary certification authority shall be used by Brazilian operators as a basis for developing their Operator Minimum Equipment List (MEL).

9.2 Airplane Flight Manual – AFM

Brazilian AFM of ATR 42/72, approved by GGCP shall be used by Brazilian operators as a basis for developing their Operator Airplane Operation Manual (AOM).

10 Flight Simulation Training Devices (FSTD)

Full Flight Simulators used as described in section 7 and to be used in accordance with RBAC 121.409 must be qualified by ANAC as level C or D, under JAR-FSTD A or FAA FAR Part 60.

The Full Flight Trainer used as described in section 7 and to be used in accordance with RBAC 121.407 must be qualified by ANAC as JAR-FSTD A FTD/FNPT Level 2 or FTD level 6 by FAA FAR Part 60.

The VHP used as described in section 7 and to be used in accordance with RBAC 121.407 must be qualified by ANAC as FTD Level 4 per FAA FAR Part 60, or other equivalent level.

10.1 Description of the FPTD device used in the ATR Pilot Training Courses

The three-dimensional type specific device consisted of graphically simulated, interactive touch panels, instruments, switches and controls in a spatially correct position.

Instruments and panels were computer generated, interactive touch activated graphics displayed on multiple screens, however aircraft panels requiring intensive manipulation such as Flight Guidance Control Panel (FGCP), Index Control Panel (ICP), MCDU, MCP and Electronic Flight Bag (EFB), if installed; consisted of replicated aircraft panels with physical controls, knobs and switches. The throttle box was displayed on a computer generated graphics display.

Airplane systems were operative for flight and ground conditions. Simulated aircraft systems were fully integrated to ensure correct interaction, especially between the FMS, ECL, flight instrument displays and EFB, if installed. The device was able to simulate the different approach modes. Warning and caution sounds were simulated.

Computer generated schematics to visualize aircraft system operation were provided.

The device incorporated the necessary malfunctions to accomplish the training of Normal, Supplementary Normal and Non-Normal operating procedures.

The device incorporated the necessary navigational databases to complete the defined training scenarios.

An instructor facility was available to allow the modification of flight and environmental conditions (wind, temperature, pressure, etc.). It permitted repositions (flight and ground), freezes, system resets, airport selection, aircraft services (doors, ground power, virtual circuit breaker, etc.). Lesson plan tools were provided.

The computer(s) had sufficient capacity and capability to ensure an accurate and reliable operation, with realistic responsiveness and aliasing free graphics.

The device was in a suitable quiet room, free of training distractions, with adequate temperature and lighting conditions.

10.2 FPTD Devices Recommendations

The device should allow airline specific options.

- The competent Authority approving the Training Organization should review the device for suitability to complete the customer specific training programme.
- The training organization operating the device should have a Compliance Monitoring System in place to cover, at least, the following training device aspects:
    - Recording, monitoring and rectification of failures and discrepancies;
    - Failure analysis and reliability figures;
    - Link with the aircraft manufacturer to ensure the device continues to reflect the real aircraft;
    - Link with the training device manufacturer for the incorporation of updates and modifications;
    - Configuration control processes to ensure adequate tracking and recording of software and hardware modifications; and
    - Resources and personnel training to support its operation.

APPENDIX 1: Footprint: ATR Glass Cockpit Initial Type Rating Training

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction (3:00) **WBT** (4:00) **VHP A** (1:00)	**GI** (1:00) **WBT** (4:00) **VHP B** (1:00)	**GI** (1:00) **WBT** (4:00) **VHP C** (1:00)	**GI** (4:00) **GI - Icing** (1:30) **GI - Safety (1:00)**	**FFT 0** (2:00) **FMS 1/2 - VHP** (4:00)
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
GI - CRM (7:00)	**VHP 1** (3:00) **WBT** (2:00)	**VHP 2** (3:00) **WBT** (2:00)	**VHP 3** (3:00) **WBT** (2:00)	**VHP 4** (3:00)
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
VHP 5 (3:00)	**VHP 6** (3:00)	**FFT 1** (3:00)	**FFT 2** (3:00)	**FFT 3** (3:00)
Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
Theoretical Knowledge Test (3:30) **GI – Emergency Procedures Briefing** (2:00)	**FFT 4** (3:00)	**FFS 1** (3:00)	**FFS 2** (3:00)	**FFS 3** (3:00)
Day 21	**Day 22**	**Day 23**	**Day 24**	
FFS 4 (3:00)	**FFS 5** (3:00)	**FFS 6** (3:00)	**Skill Test - FFS** (4:00)	

Notes:

*** For Non PEC or PEC content can be adapted e.g. GNSS/HT 1000**
FFS - Full Flight Simulator (ATR-600 FFS Level C or D)
FFT - Full Flight Trainer (FTD A Level 2 and FNPT Level II MCC)
GI - Ground Instructor
VHP - Virtual Hardware Platform Trainer = FPTD - Flat Panel Training Device
WBT - Web Based Training

FFS, FFT and VHP sessions DO NOT INCLUDE time for briefing and de-briefing.

The training outlined above reflects the training evaluated by ANAC and considered acceptable for the ATR 72-600 type rating training of Brazilian pilots. An operator or a training center may develop a variation of this training, provided it is proven that it maintains an equivalent level of safety. Depending on the level of the modification, ANAC may judge necessary an operational evaluation of the proposed training.

APPENDIX 2: Sample Footprint of Entry Level Training (ELT)

Day 1	Day 2	Day 3	Day 4	Day 5
FFT 1 (4:00)	**FFT 2** (4:00)	**FFT 3** (4:00)	**FFT 4** (4:00)	**FFT 5** (4:00)

Entry Level Training is for initial ATR Type Rating of pilots who do not meet the prerequisites stated in 7.1.1

APPENDIX 3: Footprint: PEC equipped to Glass cockpit (1)

Differences training for pilots meeting the previous experience requirements described in paragraph 7.2.3.1

ATR 42 (PEC equipped) to ATR 42 (Glass cockpit) or,
ATR 72 (PEC equipped) to ATR 72 (Glass cockpit)

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction, Description of the Colour Code (0:30) **CRM Module** (3:00) **FPTD Introduction** (0:30) **WBT** (3:00)	**Review** (0:30) **WBT** (2:00) **ATR PEC/Glass-cockpit Systems** (2:30, with GI) **Training Devices (DU, IESI, VCP)** (1:00, with GI) **FPTD 1** (1:30)	**Briefing** (0:30) **WBT** (2:00) **FFT or FSS 1** (1:30) **FMS Ground Course** (1:30, with GI) **FPTD 2 FMS** (1:30)	**Briefing** (0:30) **Abnormal-/Emergency Briefing** (1:30) **WBT** (1:30) **FPTD 3** (1:30) **FPTD 4** (1:30)	**FFT or FSS 2** (4:00 per crew)
GI = Ground Instructor **FPTD = Flat Panel Training Device** **WBT = Web Based Training** **FPTD sessions DO NOT INCLUDE time for briefing and de-briefing**				

APPENDIX 4: Footprint: PEC equipped to Glass cockpit (2)

Differences training for pilots NOT meeting the previous experience requirements described in paragraph 7.2.3.1

ATR 42 (PEC equipped) to ATR 42 (Glass cockpit) or,
ATR 72 (PEC equipped) to ATR 72 (Glass cockpit)

Day 1	Day 2	Day 3	Day 4	Day 5
Welcome **Daily Briefing** **Systems Differences** **CBT 1** Glass Cockpit Familiarization **FPTD 1** (3:00) Flight Instruments / AFCS / VCP	**Daily Briefing** **FMS Course** **CBT 2** VCP / Flight Instruments **FPTD 2** (3:00) SD ENG / CABIN / ELEC / HYDRAULIC / EWD	**Daily Briefing** **CBT 3** IMA / FWS Abnormal / Emergency Procedures Briefing **FPTD 3** (3:00) FMS / INIT / NAV / PERF / COM / Failure Management	**Daily Briefing** **CBT 4** AFCS / Navigation / Communication **FPTD 4** (3:00) Use of all means for normal flight planning	**Daily Briefing Review** **FPTD 5** (3:00) LOFT
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
FFT 1 or FFS 1 (3:00) Normal Procedures	**FFT 2 or FFS 2** (3:00) Emergency Procedures	**FFT 3 or FFS 3** (3:00) Emergency Procedures and severe icing conditions	**FFT 4 or FFS 4** (3:00) LOFT	**FFT 5 or FFS 5** (3:00) LOFT
GI = Ground Instructor **FPTD = Virtual Hardware Platform Trainer** **FPTD sessions DO NOT INCLUDE time for briefing and de-briefing**				

APPENDIX 5: Footprint: Familiarization Training

ATR 42 Glass-cockpit to ATR 72 Glass-cockpit or Vice-versa Familiarization Training

Day 1
Differences Familiarization Self-Study / Ground Instructor (4:00)

APPENDIX 6: Footprint: Non PEC equipped to Glass cockpit (1)

Differences Training for pilots meeting the previous experience requirements described in paragraph 7.2.3.1

ATR 42 (Non-PEC equipped) to ATR 72 (glass cockpit)

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Introduction, to Glass Cockpit (2:00 with GI) **CRM module** (2:00) **WBT 1** (2:00)	**ATR Non PEC to GC systems** (2:30 with GI) **FPTD 1 (FMS, NAS)** (3:00)	**WBT 2** (2:00) **FPTD 2 (Normal Proc., FMS)** (3:00) **WBT 3** (2:00)	**FPTD 3 Normal/Abnormal procedures** (3:00) **FFT or FFS 1 Normal/abnormal procedures** (1:00)	**WBT 4** (2:00) **FFT or FFS 2** (4:00) LOFT, FMS, Abnormal/Emergency	**Review** (1:00 with GI) **FFT or FFS 3** (3:00) Abnormal/Emergency (Single Engine, PEC fault on short final, EEC Fault, Engine Flame Out at TO
GI = Ground Instructor **FPTD = Flat Panel Training Device** **WBT = Web Based Training** **FPTD sessions DO NOT INCLUDE time for briefing and de-briefing**					

APPENDIX 7: Footprint: Non PEC equipped to Glass cockpit (2)

Differences Training for pilots NOT meeting the previous experience requirements described in paragraph 7.2.3.1

ATR 42 (Non-PEC equipped) to ATR 72 (glass cockpit)

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Introduction, to Glass Cockpit (2:00 with GI) **CRM module** (2:00) **WBT 1** (2:00)	**ATR Non PEC to GC systems** (2:00 with GI) **FPTD 1** (FMS, NAS) (3:00)	**WBT 2** (2:00) **FPTD 2** (Normal Proc., FMS) (3:00)	**FPTD 3** Normal/Abnormal procedures (3:00) **WBT 3** (2:00)	**FPTD 4 Normal procedures and FMS practice** (3:00) **WBT 4** (2:00)	**FFT or FFS 1** (4:00) Normal Procedures (Non PEC to GC systems) work on FMS
Day 7	**Day 8**	**Day 9**	**Day 10**	**Day 11**	
FFT or FFS 2 (3:00) Review Normal Procedures, LOFT with work on FMS & Abnormal procedure	**FFT or FFS 3** (4:00) Emergency/ Abnormal (Severe Icing,…) Procedures	**FFT or FFS 4** (3:00) Practice Emergency Procedures (Single Engine, PEC fault on short final, EEC Fault, Engine Flame Out at TO)	**FFT or FFS 5** (3:00) Specific Emergency/ Abnormal failure revision **Review** (1:00 with GI)	**FFT or FFS 6** (3:00) (LOFT)	
GI = Ground Instructor **FPTD = Flat Panel Training Device** **WBT = Web Based Training** **FPTD sessions DO NOT INCLUDE time for briefing and de-briefing**					

APPENDIX 8: Footprint: Glass cockpit to PEC equipped

ATR 72 (glass cockpit) to ATR 72 (PEC equipped) or,

ATR 42 (glass cockpit) to ATR 42 (PEC equipped)

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction of the main Systems differences (conventional aircraft instruments) (2:00 with GI) **WBT 1** ATR GC to ATR PEC systems (2:00) **FPTD 1** (3:00)	**GNSS system** (2:30 with GI) **WBT 2** ATR GC to ATR PEC systems (2:00) **FPTD 2** (3:00)	**WBT3** ATR GC to ATR PEC systems (2:00) **FFT or FFS 1** (Normal Procedures) (4:00) **GNSS Self-study** (1:00)	**Review** (1:00 with GI) **FFT or FFS 2** (Abnormal/ Emergency Procedures) (4:00)	**FFS 3** LOFT, GNSS, Abnormal/ Emergency (4:00)

GI = Ground Instructor
FPTD = Flat Panel Training Device
WBT = Web Based Training
FPTD, FFT and FFS sessions DO NOT INCLUDE time for briefing and de-briefing

APPENDIX 9: Footprint: Glass cockpit to NON PEC equipped

ATR 72 (glass cockpit) to ATR 42 (Non-PEC equipped) or,

ATR 42 (glass cockpit) to ATR 42 (Non-PEC equipped)

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction of the main Systems differences (conventional aircraft instruments) (2:00 with GI) **WBT 1** ATR GC to ATR Non PEC systems (2:00) **FPTD 1** (3:00)	**GNSS system** (2:30 with GI) **WBT 2** ATR GC to ATR Non PEC systems (2:00) **FFT or FFS 1** (Normal Procedures) (3:00)	**WBT 3** ATR GC to ATR Non PEC systems (2:00) **FFT or FFS 2** (Normal and abnormal Procedures) (3:00) **GNSS Self-study** (1:00)	**Review** (1:00 with GI) **FFT or FFS 3** (Abnormal/ Emergency Procedures) (4:00)	**FFS 4** LOFT, GNSS, Abnormal/ Emergency (4:00)

GI = Ground Instructor
FPTD = Flat Panel Training Device
WBT = Web Based Training
FPTD, FFT and FFS sessions DO NOT INCLUDE time for briefing and de-briefing