



## OPERATIONAL EVALUATION REPORT

### EMBRAER

**EMB-500 PHENOM100**



**EMB-505 PHENOM300**



RIO DE JANEIRO, BRAZIL

REVISION 1 – FEBRUARY, 2014

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**EMB-500 Phenom100/ EMB-505 Phenom300 Common Type Rating**


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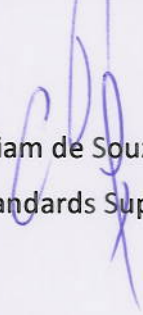
### EMBRAER

**EMB-500 (PHENOM 100)**

**EMB-505 (PHENOM 300)**



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### REVISION RECORD

Revision Nº.	Content	Date
Original	Collection of preliminary results for both models	22 NOV 2013
1	Changes on type rating endorsement and privileges concept	28 FEB 2014

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## 1. INTRODUCTION

### 1.1. Background

In April 2009 GAA Phenom100 conducted the EMB-500 operational evaluation of type rating training jointly with the European Aviation Safety Agency – EASA. At that time the flight segment was based on the aircraft only since no EMB-500 full flight simulator was available.

After that Embraer presented the syllabus revision containing the curricula for single pilot and dual pilot training, considering the full flight simulator as the primary flight training device. This operational evaluation was conducted in September 2009.

In November 2009 Embraer presented the EMB-505 differences training course from EMB-500. At that time the flight segment was based on the aircraft only since no EMB-505 full flight simulator was available.

In February 2010 Embraer requested and ANAC conducted an operational evaluation of Garmin G1000 Electronic Checklist – ECL, used on both airplane models.

In August 2010 ANAC conducted the EMB-505 full type rating training operational evaluation, considering the use of full flight simulator. Following the syllabus presented for the EMB-500 Embraer presented the EMB-505 syllabus containing the curricula for single pilot and dual pilot training.

In February 2013 ANAC conducted the Garmin G3000 operational evaluation. The G3000 is available in EMB-505 only and the pilot qualification is based in the differences training from Garmin G1000.

At that time ANAC GAA had a collection of operational evaluation results establishing different type ratings for models EMB-500 and EMB-505.

However, Embraer has applied for a common type rating assessment for models EMB-500 and EMB-505 and in August 2013 a joint ANAC, FAA and EASA operation evaluation was conducted to assess the aircrafts operation under a single license endorsement.

The result of the evaluation was positive and ANAC GAA has determined a common type rating for the models. However the reassessment has shown that what was previously established in terms of differences training between the models was not sufficient to support ANAC decision on establishing a single license endorsement. The reason is the credit towards the partial check, the yearly alternate proficiency check and the currency specifications given to a pilot in a mixed fleet operation.

Further details of the results described above will be shown on this report.

### 1.2. Objective

This report presents ANAC collection of results obtained from the operational evaluations of Embraer aircraft models **EMB-500** and **EMB-505** commercially known as **Phenom100** and **Phenom300**, respectively.

This report contains the results of the following operational evaluations:

- EMB-500 initial type rating training;
- Differences training from EMB-500 to EMB-505;
- Differences training from EMB-505 to EMB-500;

- EMB-505 initial type rating training;
- EMB-505 (Garmin G3000) differences training;
- EMB-500 and EMB-505 ECL (Electronic Checklist);
- EMB-500 TAWS-B to TAWS-A;
- EMB-500 and EMB-505 CPDLC (Controller–Pilot Data Link Communications); and
- EMB-500 and EMB-505 common type rating.

### **1.3. Purpose**

The purpose of this report is to:

- Define the Pilot Type Rating assigned for the EMB-500 and EMB-505;
- Define the requirements for training, checking and currency applicable to flight crew for the EMB-500 and EMB-505, and functionalities;
- Provide the Master Differences Requirements (MDR) for crews requiring differences qualification for mixed-fleet-flying;
- Provide an acceptable Operator Differences Requirements (ODR);
- Describe the required Flight Simulation Training Device (FSTD) for crew training and checking.

### **1.4. Applicability**

This report is applicable to:

- Brazilian operators of EMB-500 and EMB-505 under RBHA 91 and RBAC 135 rules;
- Approved Training Organizations certified under RBAC 142 (Training Centers);
- Civil Aviation Inspectors (INSPAC) related to safety oversight of EMB-500 and EMB-505;
- ANAC Principal Operations Inspectors (POIs) of EMB-500 and EMB-505 operators.

### **1.5. Cancellation**

This report revokes and replaces the following ANAC issued documents:

- Letter 059/2010/GAAS/GGTA/SSO-ANAC, dated 10 Feb. 2010;
- Letter 180/2010/GAAS/GGTA/SSO-ANAC, dated 23 Aug. 2010 and
- Letter 206/2011/GAAS/GGTA/SSO-ANAC, dated 04 Aug. 2011.

## 2. SUMMARY AIRCRAFT DESCRIPTION

### 2.1. EMB-500 Phenom100

The Embraer model EMB-500, commercially known as Phenom100, is a low wing, T-tail and pressurized airplane, powered by two high by-pass ratio rear mounted turbofan engines. The tricycle landing gear is fully retractable, designed to be operated on paved runways only. The panel has the glass cockpit concept with the Prodigy Avionics System. It was based on the Garmin G1000 avionics system, developed by Embraer and Garmin Corporation for use in the EMB-500. It consists of two primary flight displays (PFD) and one multifunction display (MFD). Each display unit receives information from its Garmin Integrated Avionics unit.

The minimum crew is one pilot on the left pilot seat plus additional equipment as specified in the Limitations Section of the ANAC approved AFM; or one pilot in command (PIC) and one second in command (SIC). The maximum occupants are eight (two pilots plus six passengers or one pilot plus seven passengers, considering one passenger on the right pilot seat).

The EMB-500 is certified for Day, Night, VFR and IFR flight conditions to a maximum operating altitude of 41.000 feet, and is approved for flight into reduced vertical separation minimum (RVSM) airspace if the aircraft meets the minimum equipment requirements contained in the Aircraft Flight Manual, Supplement 1. The EMB-500 is also approved for flight into known icing conditions.

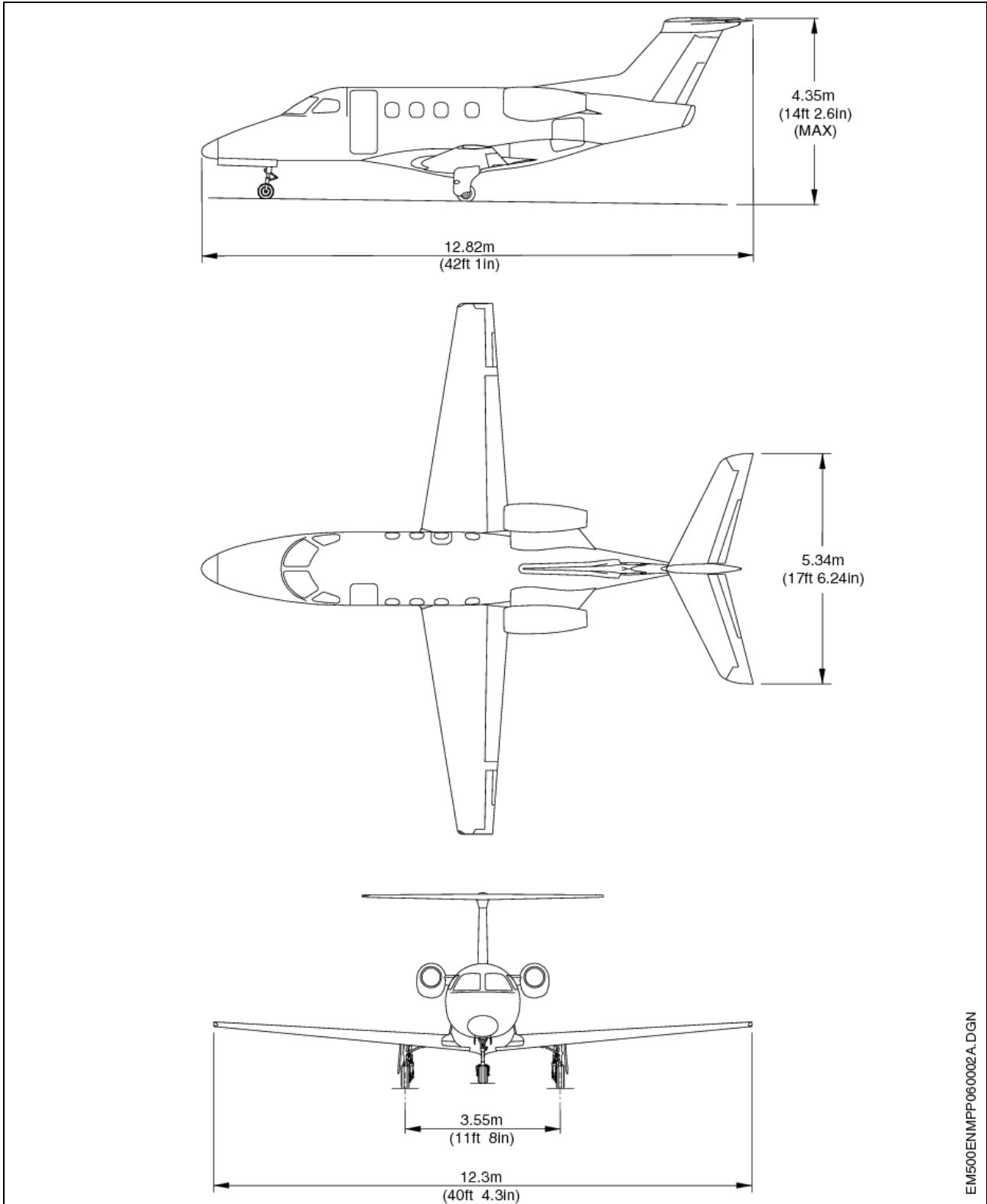
The EMB-500 is certified in accordance with RBAC 23. It is listed on ANAC Type Certificate Data Sheet (TCDS) Number EA-2008T09 as the model EMB-500. Embraer received their ANAC type certificate on 09 Dec. 2008.

A summary of the airplane specification is presented in the table below. For more information, the TCDS issued by ANAC Product Certification Management (Gerência Geral de Certificação de Produto Aeronáutico – GGCP/SAR) may be consulted. In case of information disagreement between the table below and the TCDS, this last source shall prevail.

**Table 1 – EMB-500 information**

<b>Embraer EMB-500</b>	
Certification Basis	RBAC 23
Engine	Two Pratt & Whitney Canada PW617F-E
Minimum Crew	One pilot on the left seat plus additional equipment (see AFM, Limitations); or one pilot in command (PIC) and one second in command (SIC)
Maximum Passengers	Up to 7, depending on the configuration (see AFM Section 2 – Limitations)
Maximum Weights	Maximum Ramp Weight (MRW): 4.770 Kg
	Maximum Takeoff Weight (MTOW): 4.750 Kg
	Maximum Landing Weight (MLW): 4.430 Kg
Speeds	Maximum operating mach (MMO): 0.70 Landing Gear Operation (VLO): 180 kias Landing Gear Extended (VLE) 275 kias.

Figure 1 – EMB-500 three views





## 2.2. EMB-505 Phenom300

The Embraer model EMB-505, commercially known as Phenom300, is a low wing, T-tail and pressurized airplane, powered by two high by-pass ratio rear mounted turbofan engines. The fuselage cross section is the same as the EMB-500 but is 9 feet 3 inches longer. It also has swept wing with winglets. The EMB-505 utilizes a moveable stabilizer. The tricycle landing gear is fully retractable, designed to be operated on paved runways only.

The panel has the glass cockpit concept with the Prodigy Avionics System. Initially it was based on the Garmin G1000 avionics system only, developed initially by Embraer and Garmin Corporation for use in the EMB-500. It consists of two primary flight displays (PFD) and one multifunction display (MFD). Each display unit receives information from its Garmin Integrated Avionics unit. It has also the option of the Garmin G3000 avionics system, consisting of two primary flight displays (PFD) and one multifunction display (MFD) and the main pilot interface with the system is through the GTCs (Garmin Touchscreen Controllers).

The minimum crew is one pilot on the left pilot seat plus additional equipment as specified in the Limitations Section of the ANAC approved AFM; or one pilot in command (PIC) and one second in command (SIC). The maximum occupants are eleven (two pilots plus nine passengers or one pilot plus ten passengers, considering one passenger on the right pilot seat).

The EMB-505 is certified for Day, Night, VFR and IFR flight conditions to a maximum operating altitude of 45.000 feet, and is approved for flight into reduced vertical separation minimum (RVSM) airspace if the aircraft meets the minimum equipment requirements contained in the Aircraft Flight Manual, Supplement 1. The EMB-505 is also approved for flight into known icing conditions.

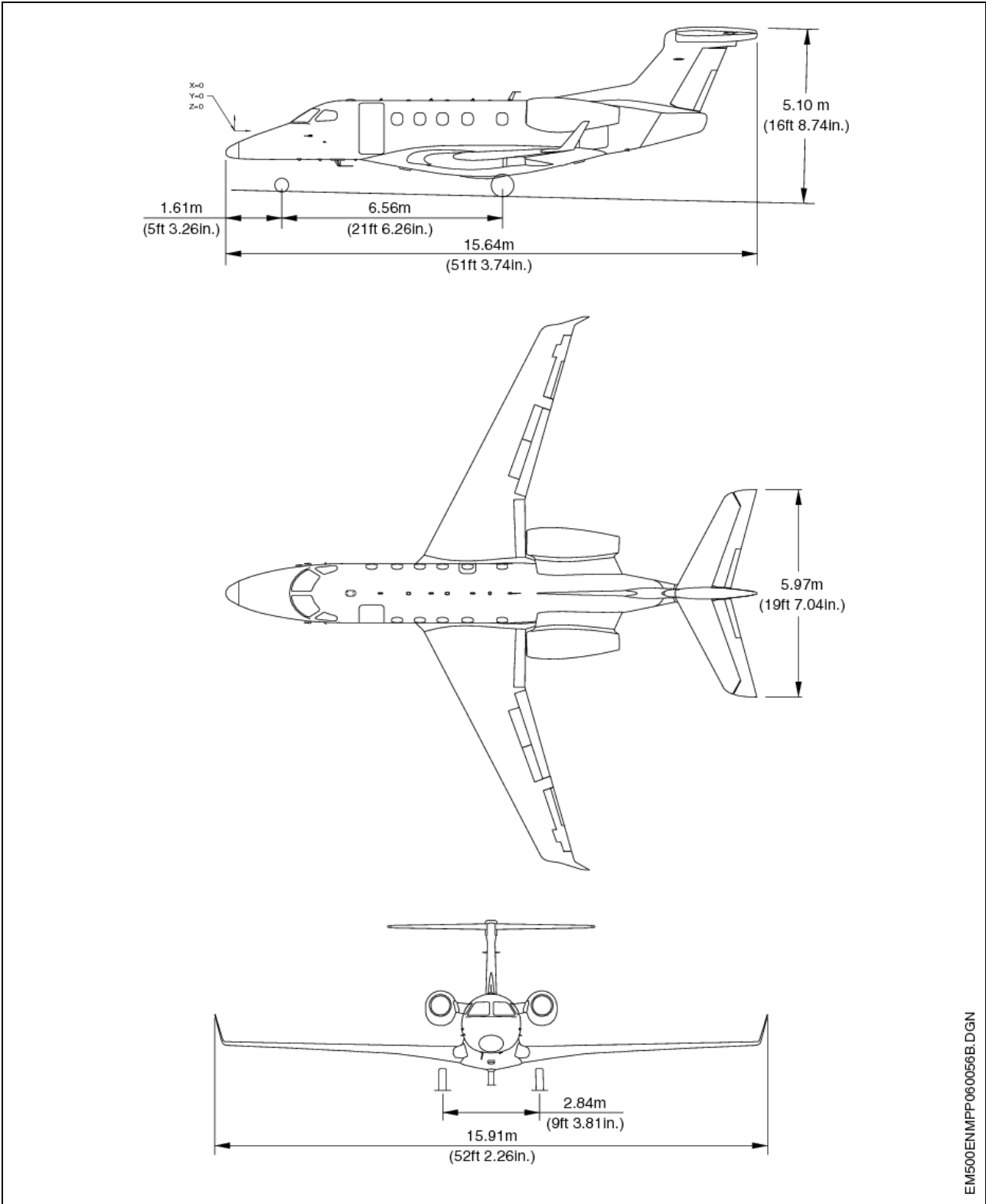
The aircraft is certified in accordance with RBAC 23. It is listed on ANAC Type Certificate Data Sheet (TCDS) Number EA-2009T12 as the model EMB-505. Embraer received their ANAC type certificate on 03 Dec. 2009.

A summary of the airplane specification is presented in the table below. For more information, the TCDS issued by ANAC Product Certification Management (Gerência Geral de Certificação de Produto Aeronáutico – GGCP/SAR) may be consulted. In case of information disagreement between the table below and the TCDS, this last source shall prevail:

**Table 2 – EMB-505 information**

<b>Embraer EMB-505</b>	
Certification Basis	RBAC 23
Engine	Two Pratt & Whitney Canada PW535E
Minimum Crew	One pilot on the left seat plus additional equipment (see AFM, Limitations); or one pilot in command (PIC) and one second in command (SIC)
Maximum Passengers	Up to 10, depending on the configuration (see AFM Section 2 – Limitations)
Maximum Weights	Maximum Ramp Weight (MRW): 8.200 Kg
	Maximum Takeoff Weight (MTOW): 8.150 Kg
	Maximum Landing Weight (MLW): 7.650 Kg
Speeds	Maximum operating mach (MMO): 0.78
	Landing Gear Operation (VLO): 250 kias
	Landing Gear Extended (VLE) 250 kias.

Figure 2 – EMB-505 three views



### 3. PILOT TYPE RATING

Initially the EMB-500 and the EMB-505 were approved for operation with different type ratings which were the “E50P” and the “E55P”, respectively. Both type ratings were endorsed following the kind of operation approved (“/S” for single pilot operations and “/D” for dual pilot operation).

However in August 2013 a joint ANAC, FAA and EASA operation evaluation was conducted to assess the EMB-500 and EMB-505 operation under a single license endorsement (common type rating). ANAC document IAC 121-1009 was used as reference for the activity, which was developed following the guidance for the “T2 test”. The results confirmed Embraer proposal that both models are sufficiently alike in handling qualities and operational characteristics.

After the T2 evaluation the GAA had a meeting with ANAC personnel licensing (PEL) and Part 135 certification offices representatives and the conclusion was that the single pilot endorsement (“/S”) was **not** necessary under the PEL process perspective since models EMB-500 and EMB-505 Type Certificates Data Sheets – TCDS define one pilot as the minimum crew.

Thus the GAA has established the common type rating “EPHN” for operation of both the EMB-500 and the EMB-505, as follows:

- **EPHN**, which is issued to a pilot who received training and demonstrated proficiency in the single pilot operation. This pilot will be able to act as the pilot in command (PIC) in both single and dual pilot operations, as described in this report; and
- **EPHN/D**, which is issued to a pilot who received training and demonstrated proficiency in the dual pilot operation. This type rating is issued either with pilot in command (PIC) or second in command (SIC) privileges depending on how the pilot was trained and evaluated.

The GAA recommends the update of ANAC type rating list with the following information:

**Table 3 – ANAC Type Rating List revision**

IX – Type Rating (Airplane) – Land – Single Pilot Operation, Multi Engine (Turbojet Engine)				
MANUFACTURER (1)	AIRCRAFT (2)		RMK (3)	TYPE RATING (4)
	MODEL	NAME		ANAC
Embraer	EMB-500	Phenom100	HPA	EPHN, EPHN/D
	EMB-505 <sup>(*)</sup>	Phenom300	D	
	(*) Model EMB-505 is certified with both Garmin G1000 and G3000 avionics suite. A differences training is required for migration from G1000 to G3000 and vice versa.			

HPA – High Performance Aircraft

D – Differences training

#### 4. MASTER DIFFERENCE REQUIREMENT (MDR)

The Master Difference Requirements matrix for EMB-500 and EMB-505 is shown in table 4. 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 IAC 121-1009.

Table 4 – EMB-500/ EMB-505 MDR matrix

		FROM AIRPLANE		
		EMB-500	EMB-505	EMB-505 (G3000)
TO AIRPLANE	EMB-500	- - -	D/C/D	C/C/C <sup>(2)</sup> + D/C/D
	EMB-505	(1)	- - -	C/C/C
	EMB-505 (G3000)	(1)	C/C/C	- - -

Notes:

- (1) The EMB-500 to EMB-505 differences training has not been concluded.
- (2) Until a further evaluation is performed, pilots seeking transition from the EMB-505 (G3000) to the EMB-500 will have to perform the differences training from the EMB-505 (G3000) to EMB-505 (G1000) plus the transition from the EMB-505 to the EMB-500.

#### 5. OPERATOR DIFFERENCES REQUIREMENT (ODR)

Each operator of a mixed fleet of EMB-500 and EMB-505 shall produce its own ODR, as required by IAC 121-1009.

Embraer provided a sample of ODR table, which was considered acceptable by ANAC. This sample ODR may be made available on request and may serve as a basis for the operator to develop its own ODR tables to address the differences indicated in the MDR.

The ODR table related to the transition from the G3000 to the G1000 model was evaluated by analysis only. ANAC GAA recommends the same parameters listed in G1000 to G3000 ODR table in the event of development and analysis of a differences training from EMB-505 G3000 to G1000.

## 6. SPECIFICATIONS FOR PILOT TRAINING

### 6.1. EMB-500 or EMB-505 Initial Type Rating Course

The initial pilot type rating course described in this section was evaluated by ANAC and considered to be compliant with the requirements of RBAC 61. This course is recommended to be used as a baseline for EMB-500 or EMB-505 type rating training.

#### 6.1.1. Prerequisites

The candidate pilot must, at least:

- hold a private pilot license - airplane;
- hold a Land Multiengine Class Rating (MLTE) or a type rating of a multiengine aircraft;
- hold an IFR rating;
- Had been approved in the theoretical exam of ANAC Airline Transport Pilot License (PLA), or had accumulated flight experience in high altitudes airplanes, or in jet planes; or hold a certificate of an ANAC approved high altitude course; and
- Have a flight experience of at least 200 hours in airplane, of which at least 70 hours as Pilot in Command (PIC).

#### 6.1.2. Type Rating Base Curriculum

The initial type rating base curriculum is outlined in Appendix 1. The course is comprised of the ground segment and the flight segment.

The ground segment uses a combination of the following resources:

- Web-Based Training (WBT) – 16 hours;
- Classroom (instructor-led) instruction – 33 hours; and
- Integrated Procedures Training (IPT) – 14 hours.

The flight segment is based on the Full Flight Simulator (FFS). The following applies for single pilot (SP) and dual pilot (DP) training:

- SP – 20 hours, of which 14 hours the pilot will act as pilot flying and the other 6 hours as an observer.
- DP – 28 hours divided in seven full flight simulator sessions (with a 4 hour time each), 2 hours acting as pilot flying and 2 hours acting as pilot monitoring.

More information on the FSTD can be found in section 9 of this report.

Note: In the absence of a Full Flight Simulator the flight training portion may be conducted in the aircraft upon ANAC approval. Complementary training in a FSTD should be provided to include any abnormal/ emergency procedure which could not be trained on the airplane for safety reasons.

## **6.2. EMB-500 or EMB-505 Single Pilot (SP) Operation to Dual Pilot (DP) Operation Transition Training (and vice versa)**

Although it was not required by ANAC, Embraer did present transition training for evaluation destined for pilots previously qualified in one kind of operation to be qualified in the other kind of operation. After the evaluation ANAC concluded that this training can be used as a base line for commercial air transport (RBAC 135) operators training program development, required by RBAC 135.244. In parallel ANAC recommends this training to be used by general aviation (RBAC 91) operators with minimum crew of two pilots.

If a pilot rated with the “EPHN/D” intends to be rated with the “EPHN” for single pilot operations then a new proficiency check ride must be conducted. The opposite case is not applicable, considering the “EPHN” privileges.

### **6.2.1. Prerequisites**

The candidate pilot must, at least:

- hold a valid “EPHN” type rating; and
- be qualified and current on the reference aircraft operation.

### **6.2.2. Transition Training Base Curriculum**

The base curriculum is outlined in Appendix 2.

## **6.3. EMB-505 to EMB-500 Differences Training**

The differences training from EMB-505 to EMB-500 is required for a pilot previously qualified for the EMB-505 operation who intends to be qualified in the EMB-500. Differences levels for training, checking and currency are described in the “Table 4 – EMB-500/ EMB-505 MDR matrix” of this report.

### **6.3.1. Prerequisites**

The candidate pilot must, at least:

- hold a valid “EPHN” type rating; and
- be qualified and current on the EMB-505 operation.

### **6.3.2. Transition Training Base Curriculum**

The base curriculum is outlined in Appendix 3.

## **6.4. EMB-500 to EMB-505 Differences Training**

The evaluation of differences training from EMB-500 to EMB-505 has not been concluded.

## 6.5. EMB-505 Garmin G1000 to G3000 Differences Training

The G1000 to G3000 differences training is required for an EMB-505 who intends to be qualified in the new avionics suite.

No EMB-505 with G3000 initial type rating training was evaluated at this moment. However ANAC has also evaluated a G3000 to G1000 differences training based on documental analysis and on the G1000 to G3000 evaluation. Differences levels for training, checking and currency based on EMB-505 with G1000 are described in the “Table 4 – EMB-500/ EMB-505 MDR matrix” of this report.

### 6.5.1. Prerequisites

The candidate pilot must, at least:

- hold a valid “EPHN” type rating; and
- be qualified and current on the EMB-505 operation.

### 6.5.2. Type Rating Base Curriculum

The base curriculum is outlined in Appendix 4. The course is comprised of the theoretical and practical ground segments, as follows:

- Classroom (instructor-led) instruction – 3 hours; and
- Practical (FTD/ Aircraft) instruction – 2 hours.

Although no EMB-505 with G3000 initial type rating training was evaluated at this moment the base curriculum outlined in Appendix 4 of this report can be used as a reference for future G3000 to G1000 differences training.

More information on the FSTDs can be found in section 9 of this report.

## 6.6. Controller–Pilot Data Link Communications (CPDLC)

A CPDLC training module for pilots qualified and current on EMB-500 or EMB-505 was evaluated in August 2013 during the common type rating joint evaluation by ANAC, FAA and EASA. This training consists in an instructor-led theoretical training.

Differences levels for training, checking and currency were established as B/B/A, respectively. ANAC GAA recommends that CPDLC training should be integrated to the initial or differences type rating training whenever it is possible.

## 6.7. EMB-500 TAWS-B to TAWS-A Training

A TAWS-B to TAWS-A training module for EMB-500 was evaluated in February 2013 during the EMB-505 Garmin G1000 to G3000 joint evaluation by ANAC and FAA. This training consists in an instructor-led theoretical training.

Differences levels for training, checking and currency were established as B/B/A, respectively. ANAC GAA recommends that EMB-500 TAWS-B to TAWS-A training should be integrated to the initial or differences type rating training whenever it is possible.

## 6.8. Electronic Checklist (ECL)

The Garmin Prodigy G1000 ECL evaluation was based on AC 120-64 (FAA) requirements and consisted in a demonstration of the system functionality and one flight.

It was found a very simple system without link with other systems of the aircraft. It is provided on EMB-505 Type Certification. For EMB-500 Embraer applied for a DCA (Design Change Application). For both models the ECL is optional.

Embraer proposal was the ECL training to be addressed in pilot training during the WBT and ground school, besides the use of an ECL free play. ANAC GAA recommends that ECL training should be integrated to the initial or differences type rating training whenever it is possible.

## 6.9. Training Areas of Special Emphasis (TASE)

Special emphasis training includes systems or procedures training elements that are unique to the aircraft and should be given a higher degree of emphasis than regular training. ANAC GAA has identified the following training items that are either unique to the EMB-500 or EMB-505, based on installed systems and equipment, or are important because of operational aspects associated with a single pilot crew, or flight crews with a low level of prior operating experience.

### 6.9.1. TASE for EMB-500 and for EMB-505 Initial Type Rating Training and EMB-505 to EMB-500 Differences Training.

The following aircraft systems or procedures have been identified as training areas of special emphasis for EMB-500 and for EMB-505 initial type rating training and for the EMB-505 to EMB-500 differences training:

#### 6.9.1.1. Ground training:

- High Altitude Physiology
- Single/ Dual Pilot Resource Management (as applicable)
- Stick Pusher System
- Emergency Gear System
- Performance calculations, including wet/contaminated runways – OPERA
- Weight & Balance calculations, including use of Balance sheet, based on Index
- CAS Logic and Abnormal Procedures Training

#### 6.9.1.2. Flight Training:

- High Altitude Single Pilot Operations (as applicable)
- Loss of cabin pressure control and Emergency Descent procedures
- Use of Emergency Gear System
- Stick Pusher System
- Use of Alternate Trim
- Operations in Icing Conditions including Handling Qualities
- High Speed Approaches at high density operation airports
- Instrument flying on standby instruments
- Fuel X feed, including X feed failure
- Smoke procedures, including smoke removal



### **6.9.2.TASE for EMB-500 or EMB-505 Single Pilot (SP) Operation to Dual Pilot (DP) Operation Transition Training (and vice versa).**

The following aircraft systems or procedures have been identified as training areas of special emphasis for EMB-500 and for EMB-505 initial type rating training and for the EMB-505 to EMB-500 differences training:

#### **6.9.2.1. Flight Training:**

- Loss of cabin pressure control and Emergency Descent procedures
- High density airports operation
- Smoke procedures, including smoke removal
- Dual pilot resource management/ multi crew coordination
- Use of Flight Director and Autopilot, monitoring modes

### **6.9.3.TASE for EMB-505 Garmin G1000 to G3000 Differences Training.**

The following aircraft systems or procedures have been identified as training areas of special emphasis for EMB-505 Garmin G1000 to G3000 differences training:

#### **6.9.3.1. Ground training:**

- G3000 operations concept

#### **6.9.3.2. Flight Training:**

- Use and setup of Garmin Prodigy G1000 or G3000 integrated avionics (as applicable), including selection of display (System Synoptic, Map, Weather Radar and Electronic Check List)
- G3000 different location of panels and knobs, including Engine/Fire Control, Trim, Air conditioner and Lights
- Loss of Garmin Touchscreen Controller (GTC)
- Alternate gear extension

## **6.10. Recurrent Training**

No recurrent training was evaluated by GAA. The recurrent training must be developed by the operator or RBAC 142 Training Organization in accordance to the requirements of RBAC 61 and RBAC 135, including the training areas of special emphasis described in this report.

When operating in a mixed fleet it is recommended that the recurrent training is performed alternating yearly the EMB-500 and the EMB-505.

## **7. SPECIFICATIONS FOR CHECKING**

### **7.1. Proficiency Check**

The initial proficiency check shall be performed in accordance with RBAC 61. In addition ANAC GAA strongly recommends the use of ANAC High Performance Airplane Checkride Profile in the conduct of the proficiency check flight. This reference document is available at ANAC website, through the link [http://www2.anac.gov.br/aeronaves/arquivos/pdf/ANACProfile\\_Revisao5.pdf](http://www2.anac.gov.br/aeronaves/arquivos/pdf/ANACProfile_Revisao5.pdf).

A partial check should be performed after accomplishment of EMB-505 to EMB-500 differences training.

When operating in a mixed fleet it is recommended that the recurrent check is performed alternating yearly the EMB-500 and the EMB-505. It should be guaranteed that at least one recurrent check in both models EMB-500 and EMB-505 is performed within the period of 13 months.

### **7.2. Consolidation Flight**

A consolidation flight, conducted by an ANAC Operations Inspector or an EMB-500/505 Examiner, shall be executed after the satisfactorily completion of the proficiency check, in the following cases:

- Pilots who have never acted as PIC in jet planes; and
- Pilots who have accomplished the training and the proficiency check in a FFS level C, and do not meet the experience required to perform the check in this device, as defined in RBAC 121 – Appendix H.

## **8. SPECIFICATIONS FOR CURRENCY**

Currency will be maintained or reestablished in accordance with the requirements of RBAC 61.

Pilots operating both the EMB-500 and the EMB-505 aircrafts in a mixed fleet must complete two sectors on each variant within the previous 90 days.

A sector as defined in this report shall be accomplished between two different airports and shall include all phases of flight: Take off, climb, cruise, descent, approach and landing.

## **9. FLIGHT SIMULATION TRAINING DEVICES (FSTD)**

Full Flight Simulator – FFS described in this report must be qualified by ANAC as level C or D according to JAR FSTD-A or FAA Part 60 technical requirements.

Flight Training Device – FTD described in this report must be qualified by ANAC according to FAA Part 60 technical requirements.

The Integrated Procedures Training (IPT) used in ground segment as described in section 7 does not need to be qualified by ANAC.

## **10. COMPLIANCE TO RBHA 91 AND RBAC 135**

Embraer has submitted both EMB-500 and EMB-505 operational requirements (RBHA 91 and RBAC 135) compliance checklists. Both documents were considered satisfactory.

The Automatic Direction Finder – ADF is offered as optional equipment for both models. For Brazilian operators, an ADF is required to be used as the primary reference for NDB-based approaches and other NDB related procedures, even if the procedures are executed with the use of GNSS.

## **11. TECHNICAL PUBLICATIONS**

### **11.1. Master Minimum Equipment List - MMEL**

Both EMB-500 and EMB-505 MMEL approved by GGCP/SAR shall be used by Brazilian operators as a basis for developing their MEL. These documents are available at ANAC website, through the link <http://www2.anac.gov.br/certificacao/MMEL/MMEL.asp>.

### **11.2. Airplane Flight Manual - AFM**

Both EMB-500 and EMB-505 AFM approved by GGCP/SAR shall be used by Brazilian operators as a basis for developing their Operator Airplane Operation Manual (AOM).

## APPENDIX 1

### EMB-500 OR EMB-505 TYPE RATING TRAINING FOOTPRINT

Day 1	Day 2	Day 3	Day 4	Day 5
<b>Introduction</b> (00:30) <b>Pre Entry Test</b> (00:50) <b>Paperwork review</b> (00:30) <b>GS</b> (05:10) <b>IPT Session 1</b> (1:00)	<b>GS</b> (7:00) <b>IPT Session 2</b> (1:00)	<b>GS</b> (5:00) <b>IPT Session 3</b> (3:00)	<b>GS</b> (5:00) <b>IPT Session 4</b> (3:00)	<b>GS</b> (5:00) <b>IPT Session 5</b> (3:00)
Day 6	Day 7	Day 8	Day 9	Day 10
<b>GS</b> (5:30) <b>IPT Session 6</b> (3:00)	<b>FFS session 1*</b> (4:00)	<b>FFS session 2*</b> (4:00)	<b>FFS session 3*</b> (4:00)	<b>FFS session 4</b> (single pilot 2:00) (dual pilot 4:00)
Day 11	Day 12	Day 13	Day 14	
<b>FFS session 5</b> (single pilot 2:00) (dual pilot 4:00)	<b>FFS session 6</b> (single pilot 2:00) (dual pilot 4:00)	<b>FFS session 7</b> (single pilot 2:00) (dual pilot 4:00)	<b>Proficiency check</b> (single pilot 2:00) (dual pilot 4:00)	
<b>Legend:</b> <b>FFS</b> = Full Flight Simulator <b>GS</b> = Ground School <b>IPT</b> = Integrated Procedures Training				
<b>Notes:</b> 1. (*) The pilot acts 2:00 as an observer during FFS sessions 1, 2 and 3 in single pilot training. 2. FFS and IPT sessions DO NOT INCLUDE time for briefing and debriefing.				

The training outlined above reflects the training evaluated by ANAC and considered acceptable for EMB-500 and EMB-505 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

### EMB-500 OR EMB-505 TRANSITION TRAINING FOOTPRINT

EMB-500 or EMB-505 Single Pilot (SP) Operation to Dual Pilot (DP) Operation Transition Training  
 EMB-500 or EMB-505 Dual Pilot (DP) Operation to Single Pilot (SP) Operation Transition Training

Day 1	Day 2
FFS session 1 (2:00)	Proficiency check (2:00)
<b>Legend:</b> <b>FFS</b> = Full Flight Simulator <b>GS</b> = Ground School	
<b>Note:</b> FFS session DOES NOT INCLUDE time for briefing and debriefing.	

The transition training outlined above reflects the training evaluated by ANAC and considered acceptable for the transitions between models EMB-500 and EMB-505. 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.

This training can be used as a base line for commercial air transport (RBAC 135) operators training program development, required by RBAC 135.244.

### APPENDIX 3

#### EMB-505 TO EMB-500 DIFFERENCES TRAINING FOOTPRINT

Day 1	Day 2	Day 3
GS (8:00)	<b>FFS session 1</b> (single pilot 2:00) (dual pilot 4:00)	<b>Partial check</b> (single pilot 2:00) (dual pilot 4:00)
<b>Legend:</b> FFS = Full Flight Simulator GS = Ground School		
<b>Note:</b> FFS session DOES NOT INCLUDE time for briefing and debriefing.		

The differences training outlined above reflects the training evaluated by ANAC and considered acceptable for a pilot previously qualified on EMB-505 to be qualified on model EMB-500. 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 4

### EMB-505 GARMIN G1000 TO G3000 DIFFERENCES TRAINING FOOTPRINT

Day 1
<p><b>GS</b> (3:00)  <b>FTD</b> (2:00)  <b>Partial Check</b> (1:00)</p>
<p><b>Legend:</b>  <b>FTD</b> = Flight Training Device  <b>GS</b> = Ground School</p>
<p><b>Note:</b>  FFS session DOES NOT INCLUDE time for briefing and debriefing.</p>

The differences training outlined above reflect the trainings evaluated by ANAC and considered acceptable for the differences from G1000 to G3000 and vice versa. 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.