U.S. Department of Transportation
Federal Aviation Administration
Washington, DC

Flight Standardization Board Report

Revision: 4
Date: XX/XX/XXXX

Manufacturer
Embraer S.A.

Type Certificate Data Sheet (TCDS)	TCDS Identifier	Marketing Name	Pilot Type Rating
TC00062IB	EMB-550	Legacy 500 and Praetor 600	EMB-550
TC00062IB	EMB-545	Legacy 450 and Praetor 500	EMB-550

Approved by the Aircraft Evaluation Division
Federal Aviation Administration
Air Carrier Branch
AFS-100
800 Independence Avenue, S.W.
Washington, DC 20591

AED Email: 9-AVS-AFS-100@faa.gov

TABLE OF CONTENTS

1. RECORD OF REVISIONS

Revision Number	Section(s)	Date
Original	All	01/12/2015
1	1, 2, 3, 4, 5, 7, 12, Appendices 1, 2, and 3	02/05/2016
2	Appendices 4 and 5	04/06/2017
3	All	06/21/2022
4	3, 4, 5, 9.9, 12, Appendix 7	XX/XX/XXXX

2. INTRODUCTION

Aircraft Evaluation Groups (AEG) are responsible for working with aircraft manufacturers and modifiers, during the development and Federal Aviation Administration (FAA) certification of new and modified aircraft to determine:

1) The pilot type rating,
2) Flightcrew member training, checking, and currency requirements, and
3) Operational suitability.

This report lists those determinations for use by:

1) FAA employees who approve training programs,
2) FAA employees and designees who certify airmen, and
3) Aircraft operators and training providers, to assist them in developing their flightcrew member training, checking, and currency.

3. HIGHLIGHTS OF CHANGE

The purpose of this revision is to incorporate Appendix 7. Required Navigation Performance; Authorization Required (RNP AR).

4. BACKGROUND

In 2014, the Kansas City AEG formed a Flight Standardization Board (FSB) that evaluated the Embraer EMB-550 aircraft as defined in FAA Type Certificate Data Sheet (TCDS) No. TC00062IB. The evaluation used methods described in FAA Advisory Circular (AC) 120-53, Guidance for Conducting and Use of Flight Standardization Board Evaluations.

In 2015, the Seattle AEG formed an FSB that evaluated the Embraer EMB-545 aircraft as defined in TCDS No. TC00062IB. The evaluation used the methods described in AC 120-53.

In December 2015, an FSB in conjunction with a Joint Operations Evaluation Board (JOEB) consisting of Agência Nacional de Aviação Civil (ANAC) and European Aviation Safety Agency (EASA) representatives, convened to determine operational suitability and to evaluate training, checking, and currency requirements for conducting steep approach landing operations in the EMB-545/550 aircraft (see Appendix 5, EMB-545/550 Steep Approach Landing Operations).

In 2016, the FSB evaluated the Rockwell Collins Head-Up Guidance System (HGS)-3500 (hereafter referred to as Head-Up Display (HUD)) and Rockwell Collins Enhanced Vision System (EVS)-3000 for both the EMB-550 and EMB-545. The evaluation applied operational credit per 14 CFR part 91, § 91.176 when operated by crewmembers trained and qualified according to the provision of Appendix 4, Rockwell Collins Head-Up Display (HUD); Enhanced Visual System (EVS); and Enhanced Flight Vision System (EFVS).

The Seattle AEG formed an FSB that evaluated the reactive wind shear, overwing emergency exit relocation, and Future Air Navigation System 1/A+ (FANS 1/A+) (compared with the base aircraft with Controller-Pilot Data Link Communications (CPDLC) installed); and found them to have Level A/A differences. See paragraph 9.9.

The Seattle AEG formed an FSB that evaluated the Pro Line Fusion® Avionics Load 4.1.1, compared to the base load 4.1 and found them to have Level A/A differences. See paragraph 9.9.

The Seattle AEG formed an FSB that evaluated the Pro Line Fusion® Avionics Load 6.3, compared to the base load 5.4 and found them to have Level A/A differences. See paragraph 9.9.

The Seattle AEG formed an FSB that evaluated the Embraer EMB-550 (Praetor 600) and EMB-545 (Praetor 500) aircraft as defined in TCDS No. TC00062IB and found them to have Level A/A differences (see Appendix 3, Differences Tables).

The Seattle AEG formed an FSB that evaluated the Automatic Dependent Surveillance-Broadcast (ADS-B) In and the weather radar (RTA-4218) and found them to have Level A/A differences. See paragraph 9.9.

In 2019, the Seattle AEG formed a JOEB with ANAC that evaluated the SVGS for both the EMB-550 and EMB-545. This evaluation applied operational credit per 14 CFR parts 91 and 135 when operated by crewmembers trained and qualified according to the provision of Appendix 6.

The EMB-550 FSB, in conjunction with the Flight Operations Group (AFS-410), conducted an evaluation of the certification results and equipment requirements stemming from the EFVS evaluation accomplished in September 2016. This evaluation determined that the aircraft modified in accordance with Service Bulletin (SB) 550-31-0004 or factory-incorporated equipment meets the requirements of § 91.176(b)(1)(ii).

In 2022, the Air Carrier Branch, Aircraft Evaluation Division (AED) formed a JOEB with ANAC & EASA that evaluated the RNP AR for both the EMB-550 and EMB-545.

5. ACRONYMS

- 14 CFR Title 14 of the Code of Federal Regulations
- AC Advisory Circular
- ACFT Aircraft
- ACS Airman Certification Standards
- ADS Automatic Dependent Surveillance
- ADS-B Automatic Dependent Surveillance-Broadcast
- AEG Aircraft Evaluation Group
- AFCS Automatic Flight Control System
- AFM Aircraft Flight Manual
- AGL Above Ground Level
- ALS Approach Lighting System
- ANAC Agência Nacional de Aviação Civil
- ANP Actual Navigation Performance
- AOM Airplane Operations Manual
- APP Approach
- ATP Airline Transport Pilot
- AV Audiovisual Presentation
- CAS Crew Alerting System
- CAT Category
- CAVOK Ceiling and Visibility OK
- CFIT Controlled Flight Into Terrain
- CG Center of Gravity
- CPDLC Controller-Pilot Data Link Communications
- CPT Cockpit Procedures Trainer
- DEP Departure
- DH Decision Height
- DU Display Unit
- EASA European Aviation Safety Agency
- ECL Electronic Checklist
- ECS Environmental Control System
- EFB Electronic Flight Bag
- EFVS Enhanced Flight Vision System
- EICAS Engine Indicating and Crew Alerting System
- EVS Enhanced Vision System
- FAA Federal Aviation Administration
- FAF Final Approach Fix
- FANS Future Air Navigation System
- FANS 1/A+ Future Air Navigation System 1/A+
- FD Flight Director
- FFS Full Flight Simulator
- FMS Flight Management System
- FPA Flight Path Angle

- FPV Flight Path Vector
- FSB Flight Standardization Board
- FSBR Flight Standardization Board Report
- FSTD Flight Simulation Training Device
- FTD Flight Training Device
- FWD Forward
- GAA Grupo de Avaliação de Aeronaves (Brazilian Aircraft Evaluation Group)
- GPWS Ground Proximity Warning System
- GS Glideslope
- HALTO High Altitude Landing and Takeoff Operation
- HAT Height Above Threshold
- HGS Head-Up Guidance System
- HO Handout
- HUD Head-Up Display
- HLS High-Level Sensor
- IAP Instrument Approach Procedure
- ICBI Interactive Computer-Based Instruction
- ILS Instrument Landing System
- IMC Instrument Meteorological Conditions
- IR Infrared
- JOEB Joint Operations Evaluation Board
- LOC Localizer
- LOC BC Localizer Back Course
- LSP Left Seat Pilot
- LVO Low-Visibility Operations
- MDR Master Differences Requirements
- MFF Mixed Fleet Flying
- MFW Multifunction Window
- NAS National Airspace System
- NAVAID Navigational Aid
- NDB Nondirectional Radio Beacon
- NM Nautical Mile
- NSP National Simulator Program
- ODR Operator Differences Requirements
- OEI One-Engine-Inoperative
- OEM Original Equipment Manufacturer
- OpSpecs Operations Specifications
- PAPI Precision Approach Path Indicator
- PF Pilot Flying
- PFD Primary Flight Display
- PIC Pilot In Command
- POI Principal Operations Inspector
- PTT Part Task Trainer
- QRH Quick Reference Handbook

- RNAV Area Navigation
- RNP Required Navigation Performance
- RNP AR Required Navigation Performance Authorization Required
- RVR Runway Visual Range
- RVSM Reduced Vertical Separation Minimum
- RWY Runway
- SAM Steep Approach Mode
- SB Service Bulletin
- SOPM Standard Operating Procedures Manual
- SU Stand-Up Instruction
- SVGS Synthetic Vision Guidance System
- SVS Synthetic Vision System
- TC Type Certificate
- TCAS Traffic Alert and Collision Avoidance System
- TCBI Tutorial Computer-Based Instruction
- TCDS Type Certificate Data Sheet
- TCPM Training Center Program Manager
- TDZE Touchdown Zone Elevation
- TOLD Takeoff and Landing
- V_1 Takeoff Decision Speed
- VASI Visual Approach Slope Indicator
- VMC Visual Meteorological Conditions
- VOR Very High Frequency Omni-Directional Range
- V_{REF} Reference Landing Speed
- VTRL Ventral
- W&B Weight and Balance
- WS Windshear

6. DEFINITIONS

These definitions are for the purpose of this report only.

6.1 Base Aircraft. An aircraft identified for use as a reference to compare differences with another aircraft.

6.2 Current. A crewmember meets all requirements to operate the aircraft under the applicable operating part.

6.3 Differences Tables. Describe the differences between a pair of related aircraft, and the minimum levels operators must use to conduct differences training and checking of flightcrew members. Differences levels range from A to E.

6.4 Master Differences Requirements (MDR). Specifies the minimum levels of training and checking required between a pair of related aircraft, derived from the highest level in the Differences Tables.

6.5 Mixed Fleet Flying (MFF). The operation of a base aircraft and one or more related aircraft for which credit may be taken for training, checking, and currency events.

6.6 Operational Evaluation. The AEG process to determine pilot type rating, minimum flightcrew member training, checking and currency requirements, and unique or special airman certification requirements (e.g., specific flight characteristics, no-flap landing).

6.7 Operational Suitability. The AEG determination that an aircraft or system may be used in the National Airspace System (NAS) and meets the applicable operational regulations (e.g., Title 14 of the Code of the Federal Regulations (14 CFR) parts 91, 121, 133, and 135).

6.8 Qualified. A flightcrew member holds the appropriate airman certificate and ratings as required by the applicable operating part.

6.9 Related Aircraft. Any two or more aircraft of the same make with either the same or different type certificates (TC) that have been demonstrated and determined by the Administrator to have commonality.

6.10 Seat-Dependent Tasks. Maneuvers or procedures using controls that are accessible or operable from only one flightcrew member seat.

6.11 Special Emphasis Area. A training requirement unique to the aircraft, based on a system, procedure, or maneuver, which requires additional highlighting during training. It may also require additional training time, specialized flight simulation training devices (FSTD), or training equipment.

6.12 Specific Flight Characteristic. A maneuver or procedure with unique handling or performance characteristics that the FSB has determined must be checked.

7. PILOT TYPE RATING

7.1 Type Rating. The EMB-550 and EMB-545 type rating designation is EMB-550.

7.2 Common Type Ratings. Not applicable.

7.3 Military Equivalent Designations. Military aircraft that qualify for the EMB-550 type rating can be found at www.faa.gov under “Licenses & Certificates,” “Airmen Certification,” “Online Services,” “Aircraft Type Rating Designators.” This webpage is kept up-to-date and can be found at https://www.faa.gov/licenses_certificates/airmen_certification/.

8. RELATED AIRCRAFT

8.1 Related Aircraft on Same TCDS. The EMB-550 aircraft is related to the EMB-545 aircraft.

8.2 Related Aircraft on Different TCDS. Not applicable.

9. PILOT TRAINING

9.1 Airman Experience. The provisions of this section apply to all EMB-545/550 training programs and assume the training will be given to airmen with previous experience. Previous experience may include experience in part 91, 121, or 135 air carrier operations, multiengine turbojet aircraft, new generation avionics, high altitude operations, military, and flight management system (FMS) experience. Pilots without this experience may require additional training.

9.2 Special Emphasis Areas.

9.2.1 Pilots must receive special emphasis on the following areas during initial, transition, and recurrent ground training:

a) Preflight software, Weight and Balance (W&B), and performance planning.
b) Electronic display system/display control panel/cursor control devices operation and interaction.
c) Flight control modes/control laws.
d) Emergency descent mode functionality.
e) Optional HUD/EFVS. See Appendix 4 for details.
f) Steep approaches. See Appendix 5 for details.

9.2.2 Pilots must receive special emphasis on and perform in the following areas during initial, transition, and recurrent flight training:

a) Flight control system. Direct Mode should be demonstrated only in the full flight simulator (FFS) and should never be utilized in the aircraft unless a checklist requires it. The following events should be accomplished in Direct Mode: stall prevention, recovery from unusual attitudes, and a minimum of two instrument approaches demonstrated with satisfactory outcomes. Demonstration of Direct Mode is not required for the practical test.
b) Emergency descent mode demonstration (not required for recurrent training).
c) Autothrottle system. To include single-engine operation.
d) Flight instruments, engine indicating and crew alerting system (EICAS), and display units (DU) with multifunction windows (MFW).
e) Automatic flight control system (AFCS).
f) Control panels.
g) Wing and horizontal stabilizer ice protection system.
h) Pro Line Fusion® Avionics System. The operational use of and functionality concerning controllers, synoptic pages, display soft keys, FMS functions, database currency requirements, synthetic vision, annunciations, flight planning, hazard avoidance systems, system failure modes, and backup controllers.
i) Optional HUD/EFVS. See Appendix 4 for details.
j) Steep approaches. See Appendix 5 for details.

9.3 Specific Flight Characteristics. Maneuvers or procedures required to be checked as referenced in the Airline Transport Pilot (ATP) and Type Rating for Airplane Airman Certification Standards (ACS). There are no specific flight characteristics.

9.4 Seat-Dependent Tasks. Pilots must receive training in these seat-dependent tasks during initial, transition and recurrent curriculum:

a) Landing gear free fall lever/emergency extension (right seat).
b) Manual ram air turbine deployment (right seat).
c) Optional HUD (left seat). See Appendix 4 for details.
d) EFVS. See Appendix 4 for details.

9.5 Regulatory Training Requirements Which Are Not Applicable to the EMB-545/550.

9.5.1 Aircraft Used in Part 135 Operations (FAA-S-ACS-11).

a) Ground Training: Title 14 CFR part 135, § 135.345(b)(3) – Propellers.
b) Flight Training:
   1) AA.I.A.K3 – Propellers.
   2) IV.C. – Specific Flight Characteristics.

9.5.2 Aircraft Used in Part 91 Subpart K (part 91K) operations.

a) AA.I.A.K3 – Propellers.
b) IV.C. – Specific Flight Characteristics.

9.6 Flight Simulation Training Devices (FSTD). There are no specific systems, procedures, or maneuvers that are unique to the EMB-545/550 that require a specific FSTD for training.

9.7 Training Equipment. There are no specific systems or procedures that are unique to the EMB-545/550 that require specific training equipment.

9.8 Differences Training Between Related Aircraft. See Appendix 2, Master Differences Requirements (MDR) Table, and Appendix 3.

9.9 Other Training.

9.9.1 Future Air Navigation Systems (FANS). The Air Carrier Branch formed an FSB that evaluated the FANS 1/A+ (compared with the base aircraft with CPDLC installed) and found them to have Level A/A differences. Refer to AC 90-117, Data Link Communications, for ground and flight training recommendations. There are no aircraft specific requirements.

9.9.2 Instrument Approaches. Category (CAT) I/II approaches are permitted by certification. Operators should ensure that flightcrews are familiar with the appropriate use of the Autoflight Control System control panel, AFCS,

Standby Flight Instrument System, and FMS/Pro Line Fusion®, including modes to be used for the types of instrument approaches to be flown and methods in lieu of or in conjunction with Nondirectional Radio Beacon (NDB), very high frequency omni-directional range (VOR) radio beacon, Localizer (LOC), or Localizer Back Course (LOC BC) procedures. The following EMB-550 CAT II system characteristics should be addressed in training:

a) The minimum equipment required for CAT II operation.
b) Autopilot Flight Director (FD) Guidance System Single Lane (APPR 1) and Dual Lane (APPR 2) configurations.
c) Autopilot disconnect options, especially in case of Autopilot Quick Disconnect Button failure.
d) APPR 2 capability requirements.
e) APPR 2 operation, including failure recognition, handling, and its consequences.
f) Engine failure and one-engine-inoperative (OEI) APPR 2 operations.

NOTE: The means of compliance for approval of Low-Visibility Operations (LVO), training, and crew qualification programs (CAT I and II) are specified by AC 120-118, Criteria for Approval/Authorization of All Weather Operations (AWO) for Takeoff, Landing, and Rollout.

9.9.3 Hazardous Weather and Winter Operations. Cover wing/tail deice, autobrake and antiskid braking characteristics of the EMB-550.

9.9.4 Autobrake. Flightcrews operating aircraft equipped with Autobrake should receive appropriate instruction with emphasis on the performance associated to the different Autobrake settings versus manual braking utilization.

9.9.5 High Altitude Landing and Takeoff Operations (HALTO). Operators should ensure that flightcrews are familiar with appropriate use of the cockpit oxygen masks as part of the normal procedures during HALTO, as well as the minimum oxygen quantity required on board prior to each flight.

9.9.6 Pro Line Fusion® Avionics Load 4.1.1. The Air Carrier Branch formed an FSB that evaluated the Pro Line Fusion® Avionics Load 4.1.1, compared to base load 4.1, and found them to have Level A/A differences.

9.9.7 Pro Line Fusion® Avionics Load 6.3. The Air Carrier Branch formed an FSB that evaluated the Pro Line Fusion® Avionics Load 6.3, compared to the base load 5.4, and found them to have Level A/A differences.

9.9.8 ADS-B In and RTA-4218: The Air Carrier Branch formed an FSB that evaluated the ADS-B In and the weather radar (RTA-4218), and found them to have Level A/A differences.

9.9.9 Reactive Wind Shear and Overwing Emergency Exit Relocation. The Air Carrier Branch formed an FSB that evaluated the reactive wind shear and overwing emergency exit relocation, and found them to have Level A/A differences.

10. PILOT CHECKING

10.1 Landing From a No-Flap or Nonstandard Flap Approach. The probability of flap extension failure on the EMB-545/550 is not extremely remote due to system design. Therefore, demonstration of a no-flap approach and landing during pilot certification is required. During a §§ 61.58 proficiency check, 91.1065 competency check, or 135.293 competency check, this task may be required. Refer to FAA Order 8900.1, Volume 5, Airman Certification, when the test or check is conducted in an aircraft versus an FFS.

10.2 Specific Flight Characteristics. Maneuvers or procedures required to be checked as referenced in the ATP and Type Rating for Airplane ACS. There are no specific flight characteristics.

10.3 Seat-Dependent Tasks. There are no seat-dependent tasks.

10.4 Other Checking Items. Not applicable.

10.5 Flight Simulation Training Devices (FSTD). There are no specific systems, procedures, or maneuvers that are unique to the EMB-545/550 that require a specific FSTD for checking.

10.6 Equipment. There are no specific systems or procedures that are unique to the EMB-545/550 aircraft that require specific equipment.

10.7 Differences Checking Between Related Aircraft. Not applicable.

11. PILOT CURRENCY

There are no additional currency requirements for the EMB-545/550 other than those already specified in 14 CFR parts 61 and 135.

12. OPERATIONAL SUITABILITY

The EMB-545/550 aircraft is operationally suitable for operations under 14 CFR parts 91 and 135. The list of operating rules evaluated is on file at the Air Carrier Branch.

13. MISCELLANEOUS

13.1 Forward Observer Seat. The EMB-545/550 forward observer seat optionally installed by TCDS No. TC00062IB has been evaluated and determined to meet requirements of §§ 135.75(b), 135.76(b) and Advisory Circular (AC) 120-83.

13.2 Landing Minima Categories. The EMB-545/550 (Legacy 450, Legacy 500, and Praetor 500) aircraft are considered Category B aircraft and the Praetor 600 is considered a Category C aircraft for the purposes of determining the appropriate instrument approach procedure (IAP) category in accordance with § 97.3.

13.3 Emergency Evacuation. An emergency evacuation has not been evaluated for the EMB-545/550 aircraft.

13.4 Ditching Demonstration. A ditching demonstration has not been evaluated for the EMB-545/550 aircraft.

13.5 Electronic Checklist (ECL). The ECL was evaluated and determined to be operationally suitable.

13.6 Normal Landing Flaps. The EMB-545/550 normal "final flap setting" per § 91.126(c) is Flaps FULL setting.

13.7 Paperless Operation. The Pro Line Fusion® system has capabilities of being utilized as an Electronic Flight Bag (EFB) that must be approved by the responsible Flight Standards office.

APPENDIX 1. DIFFERENCES LEGEND

Training Differences Legend

Differences Level	Type	Training Method Examples	Conditions
A	Self-Instruction	• Operating manual revision (handout (HO)) • Flightcrew operating bulletin (HO)	• Crew has already demonstrated understanding on base aircraft (e.g., updated version of engine). • Minor or no procedural changes required. • No safety impact if information is not reviewed or is forgotten (e.g., different engine vibration damping mount). • Once called to attention of crew, the difference is self-evident.
B	Aided Instruction	• Audiovisual presentation (AV) • Tutorial computer-based instruction (TCBI) • Stand-up instruction (SU)	• Systems are functionally similar. • Crew understanding required. • Issues need emphasis. • Standard methods of presentation required.
C	Systems Devices	• Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4-5)	• Training can only be accomplished through systems training devices. • Training objectives focus on mastering individual systems, procedures, or tasks versus highly integrated flight operations or “real-time” operations. • Training devices are required to assure attainment or retention of crew skills to accomplish more complex tasks usually related to aircraft systems.
D	Maneuvers Devices	• Level 6 or 7 flight training device (FTD 6-7) • Level A or B full flight simulator (FFS A-B)	• Training can only be accomplished in flight maneuver devices in a real-time environment. • Training requires mastery of interrelated skills versus individual skills. • Motion, visual, control-loading, and specific environmental conditions may be required.
E	Level C/D FFS or Aircraft	• Level C or D full flight simulator (FFS C-D) • Aircraft (ACFT)	• Motion, visual, control-loading, audio, and specific environmental conditions are required. • Significant full-task differences that require a high fidelity environment. • Usually correlates with significant differences in handling qualities.

Checking Differences Legend

Differences Level	Checking Method Examples	Conditions
A	None	None
B	• Oral or written exam • Tutorial computer-based instruction (TCBI) self-test	Individual systems or related groups of systems.
C	• Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4-5)	• Checking can only be accomplished using systems devices. • Checking objectives focus on mastering individual systems, procedures, or tasks.
D	• Level 6 or 7 flight training device (FTD 6-7) • Level A or B full flight simulator (FFS A-B)	• Checking can only be accomplished in flight maneuver devices in a real-time environment. • Checking requires mastery of interrelated skills versus individual skills. • Motion, visual, control-loading, and specific environmental conditions may be required.
E	• Level C or D full flight simulator (FFS C-D) • Aircraft (ACFT)	Significant full-task differences that require a high fidelity environment.

APPENDIX 2. MASTER DIFFERENCES REQUIREMENTS (MDR) TABLE

These are the minimum levels of training and checking required, derived from the highest level in the Differences Tables in Appendix 3. Differences levels are arranged as training/checking.

To Related Aircraft ↓	From Base Aircraft →	EMB-550 (Legacy 500)	EMB-550 (Praetor 600)	EMB-545 (Legacy 450)	EMB-545 (Praetor 500)
EMB-550 (Legacy 500)		Not Applicable	A/A	A/A	A/A
EMB-550 (Praetor 600)		A/A	Not Applicable	A/A	A/A
EMB-545 (Legacy 450)		A/A	A/A	Not Applicable	A/A
EMB-545 (Praetor 500)		A/A	A/A	A/A	Not Applicable

APPENDIX 3. DIFFERENCES TABLES

This Design Differences Table, from the EMB-550 (Legacy 500)) to the EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600), was proposed by Embraer and validated by the FSB on August 3, 2021. It lists the minimum differences levels operators must use to conduct differences training and checking of flightcrew members.

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) **TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)**	**DESIGN**	**REMARKS**	**FLT CHAR**	**PROC CHNG**	**TRAINING**	**CHECKING**
	Dimensions	Different Dimensions.	No	No	A	A
	Cabin	EMB-550 has different occupant capacity compared to EMB-545.	No	No	A	A
	Equipment/Furnishings	EMB-545 has the following optional furnishings: • Refreshment center; • Two-place divan; • Galley; and • Right-hand side wardrobe. EMB-550 has the following optional furnishings: • Side-facing seat; • Left-hand side forward cabinet; and • Three-place divan. EMB-545 has less emergency equipment than EMB-550.	No	No	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	Turning Radius	Different Turning Radius.	No	No	A	A
	Limitations Weight	Different Weights.	No	No	A	A
	Limitations Center of Gravity (CG)	Different CG Envelopes.	No	No	A	A
	Limitations Maneuvering Speed	EMB-550 (Praetor 600) has different Maneuvering Speed Envelope.	No	No	A	A
	Limitations Fuel	Different Fuel Quantities.	No	No	A	A
	Performance	Overall performance is different, including different range/endurance capability, noise levels, and takeoff/landing field length requirements.	No	No	A	A
	ATA 27 Flight Controls	EMB-550 (Praetor 600) has the following flight control law functions available in Normal Mode: • Pitch Trim Command on Ground and • Maneuver Load Alleviation.	No	No	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	ATA 28 Fuel	EMB-550 (Praetor 600) has the following modifications in the fuel system: • Two additional fuselage auxiliary fuel tanks: forward (FWD) and ventral (VTRL); • An auxiliary fuel system to transfer the fuel from the auxiliary fuel tanks to the wing tanks; • Air from Environmental Control System (ECS) is used to pressurize both auxiliary fuel tanks; and • The Fuel Control Panel has additionally a Fuel Transfer Knob. EMB-545 (Praetor 500) has the following modifications in the fuel system compared to EMB-545 (Legacy 450): Relocation of gravity port and High-Level Sensor (HLS).	No	No	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	ATA 31 Instruments	EMB-550 (Praetor 600) has the following modifications: • FMS W&B page has a different CG envelope and additional FWD, VTRL, and TOTAL fuel quantity fields; • The Fuel Synoptic page additionally provides visual representation of the auxiliary fuel transfer system operation and fuel quantity indication; and • EICAS fuel quantity indication portion additionally displays the auxiliary (FWD and VTRL) fuel tanks quantity indication. EMB-550 (Praetor 600) has the following additional Crew Alerting System (CAS) messages: (Continued Next Page)	No	No	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	ATA 31 Instruments (Cont'd)	CAUTION CAS Messages: • FUEL AUX TK NEG PRESS; • FUEL AUX TK OVERPRESS; • FUEL TK VENT FAIL; • FUEL WING OVERFLOW; • FUEL XFR AUTO FAIL; • FUEL XFR FWD FAIL; • FUEL XFR REVERSE FLOW; and • FUEL XFR VTRL FAIL. ADVISORY CAS Messages: • FUEL AUXTK PRESS FAIL; • FUEL XFR AUTO FAULT; and • FUEL XFR NOT AUTO.	No	No	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-545 (Legacy 450, Praetor 500) and EMB-550 (Praetor 600)	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	ATA 31 Lights	EMB-545 has less of the following emergency lights than EMB-550: • Floor proximity; • Reading lights; and • Exit signs.	No	No	A	A
	ATA 34 Navigation	Different databases for the Takeoff and Landing (TOLD) Function, W&B, and Performance.	No	No	A	A
	ATA 35 Oxygen	Different cabin oxygen masks quantity.	No	No	A	A
	ATA 53 Fuselage	EMB-550 (Praetor 600) has modified wing-to-fuselage fairing.	No	No	A	A
	ATA 57 Wing	EMB-545/550 (Praetor 600/Praetor 500) have modified winglet compared to EMB-545/550 (Legacy 500/Legacy 450).	No	No	A	A

This Maneuver Differences Table, from the EMB-550 (Legacy 500) to the EMB-550 (Praetor 600), was proposed by Embraer and validated by the FSB on August 3, 2021. It lists the minimum differences levels operators must use to conduct differences training and checking of flightcrew members.

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) **TO RELATED AIRCRAFT: EMB-550 (Praetor 600)**	**MANEUVER**	**REMARKS**	**FLT CHAR**	**PROC CHNG**	**TRAINING**	**CHECKING**
	Internal Safety Inspection	EMB-550 (Praetor 600) has a step to set the Fuel Transfer Knob in AUTO position.	No	Yes	A	A
	External Inspection	EMB-550 (Praetor 600) has auxiliary fuel tanks water draining.	No	Yes	A	A
	Before Start	EMB-550 (Praetor 600) has auxiliary tanks fuel quantity check and different Pitch Trim Setting table.	No	Yes	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-550 (Praetor 600)	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	Emergency, Abnormal Procedures	EMB-550 (Praetor 600) has the following modifications: **PERFORMANCE:** Different performance data for landing in abnormal configuration. **DITCHING:** Step to turn OFF the Fuel Transfer Knob. **FORCED LANDING:** Step to turn OFF the Fuel Transfer Knob. **PARTIAL OR GEAR UP LANDING:** Step to turn OFF the Fuel Transfer Knob. **ENG 1(2) FUEL LO PRESS:** Step to cover auxiliary fuel tanks. **FUEL XFEED MISCMD:** Remainder to cover auxiliary fuel tanks. (Continued Next Page)	No	Yes	A	A

FROM BASE AIRCRAFT: EMB-550 (Legacy 500) TO RELATED AIRCRAFT: EMB-550 (Praetor 600)	MANEUVER	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING
	Emergency, Abnormal Procedures (Cont'd)	Added abnormal procedure for the following CAS messages. • FUEL AUX TK NEG PRESS; • FUEL AUX TK OVERPRESS; • FUEL TK VENT FAIL; • FUEL WING OVERFLOW; • FUEL XFR AUTO FAIL; • FUEL XFR FWD FAIL; • FUEL XFR REVERSE FLOW; • FUEL XFR VTRL FAIL; • FUEL AUXTK PRESS FAIL; • FUEL XFR AUTO FAULT; and • FUEL XFR NOT AUTO.	No	Yes	A	A

APPENDIX 4. ROCKWELL COLLINS HEAD-UP DISPLAY (HUD); ENHANCED VISUAL SYSTEM (EVS); AND ENHANCED FLIGHT VISION SYSTEM (EFVS)

1. BACKGROUND

This appendix to the FSBR addresses the Rockwell Collins Head-Up Guidance System (HGS)-3500 (hereafter referred to as HUD) and Rockwell Collins Enhanced Vision System (EVS)-3000 for both the EMB-550 and EMB-545. It also addresses the combined operation of both systems, hereafter treated as EFVS, so that low visibility operational credits during approaches may be attainable provided that all the applicable training and operational requirements are met.

In September 2016, an FSB in conjunction with ANAC and EASA convened a JOEB at FAA-approved training facilities located at the FlightSafety International St. Louis Learning Center in St. Louis, Missouri.

The operational goal of EFVS is to maintain the safety of operations at night and in low visibility conditions due to weather or other environmental factors, especially during approaches where the final descent below the published minimums up to 100 ft above touchdown zone elevation (TDZE) is intended. Pilots using EVS should be careful not to conclude that the flightpath is free of hazards merely because none are visible in the EVS image either in the HUD (EFVS configuration) or in the EVS Multifunction Window (MFW). In some situations, imaging sensor performance can be variable and unpredictable.

During the evaluation, which included a determination of the system's operational suitability, the FSB found the HUD and the EVS operationally suitable for providing situational awareness for the crew. Moreover, the EFVS has been found suitable for applying operational credit per 14 CFR part 91, § 91.176(b) when operated by crewmembers trained and qualified according to the provision of this appendix.

The FSB used the Original Equipment Manufacturer (OEM) manuals (AFM, AOM, Standard Operating Procedures Manual (SOPM)) during the EFVS operational evaluation and found the procedures suitable. Approving authorities should ensure the operator's procedures meet the OEM intent.

It is recommended that operators and training providers review the current edition of AC 90-106, Enhanced Flight Vision Systems, prior to EFVS use and training.

2. OPERATIONAL SUITABILITY ASSESSMENT

The EMB-545/550 HUD, EVS MFW, and EFVS are operationally suitable for operations under 14 CFR parts 91 and 135. The JOEB determined operational compliance by conducting an evaluation of the EVS MFW through documental analysis, and HUD and EFVS as installed on EMB-545/550 FFS (FAA ID No. 8646) in September 2016.

3. DIFFERENCES LEVELS DETERMINATION

3.1 EVS MFW. A document analysis conducted used AC 120-53B guidance. The JOEB sets the EMB-545/550 EVS MFW training flightcrew requirements as Level A.

3.2 HUD. A T3 test conducted used AC 120-53B guidance. The JOEB sets the EMB-545/550 HUD training flightcrew requirements as Level D.

3.3 EFVS. A T3 test conducted used AC 120-53B guidance. The JOEB sets the EMB-545/550 EFVS training flightcrew requirements as Level D.

4. PILOT TRAINING REQUIREMENTS

4.1 EVS MFW. The operational manuals (Aircraft Flight Manual (AFM), Airplane Operations Manual (AOM), Quick Reference Handbook (QRH), and SOPM) have been found suited to qualify flightcrews by means of self-study.

4.2 HUD. The Left Seat Pilot (LSP)/pilot flying (PF) must complete ground and flight training for HUD. HUD training can be integrated into the EMB-545/550 ground and flight training or can be a standalone training course. Standalone training requires the crewmember be qualified and current on the EMB-545/550.

4.2.1 Ground Training. Pilots must receive instruction on the following areas during HUD ground training:

- Operational Concepts;
- Benefits of HUD;
- Limitations;
- Normal and Abnormal Procedures;
- System Components and Controls;
- Symbology and Indication; and
- HUD Operations.

4.2.2 Flight Training. For all operators, the recommended HUD flight training program should include the following elements:

- Normal Takeoff;
- Airwork;
- Instrument landing system (ILS) Ceiling and Visibility OK (CAVOK) (practice deviation of glideslope (GS));
- Takeoff with V_1 cut;
- ILS OEI/Go-Around;
- Area Navigation (RNAV) OEI/LAND;
- Normal takeoff with reduced visibility;
- LOC/Circle/LAND;
- Takeoff with windshear (WS);

- RNAV WS/Go-Around; and
- Visual approach and landing.

NOTE: For FFS training, all required approaches should be flown from no closer than the final approach fix (FAF) for instrument approaches and from no closer than approximately 1,000 ft above ground level (AGL) and 3–4 nautical miles (NM) to the runway (RWY) threshold for visual approaches.

4.3 EFVS. The LSP PF must complete ground and flight training for HUD prior to training in EFVS. HUD training can be integrated into any EMB-545/550 training curriculum, to include concurrent training in EFVS. Standalone EFVS training requires the crewmember be HUD trained in accordance with this FSBR and qualified and current on the EMB-545/550.

NOTE 1: Accomplishing required EFVS training in the EMB-545/550 in accordance with this appendix meets the familiarity requirements of § 91.176(b)(2)(ii) for the EMB-545/550 aircraft.

NOTE 2: Review AC 90-106, Enhanced Flight Vision Systems, for training subjects and events.

4.3.1 Ground Training. Pilots must receive instruction on the following areas during EFVS ground training:
- Unless previously accomplished, subjects required by 14 CFR part 61, § 61.66(a).
- Design eye position.

4.3.2 Flight Training. Pilots must receive instruction on the following areas during EFVS flight training:

a) Unless previously accomplished, subjects and events required by § 61.66(b).

b) Prebriefing Events:
1) Some visual effects cannot be replicated in the FFS.
2) HUD/EFVS display brightness may be different than that in the aircraft.

c) Instrument Procedures.

NOTE: Different approach lighting configurations; use/non-use of aircraft landing and taxi lights in-flight and on ground; use of Flight Path Vector (FPV) and Flight Path Angle (FPA) reference cues; determination of enhanced flight visibility; transition from EFVS-required visual references to natural visual references; use of EVS Button and the use of cage and uncaged modes should be exercised.

1) An instrument approach into a mountainous airport (approach type is at instructor's discretion) is to be completed in night time/VMC conditions.
2) A minimum of five instrument approaches are to demonstrate EFVS operational credit utilizing all the following environmental/operational factors:
   (A) Departure (DEP)/Approach (APP)/Controlled Flight Into Terrain (CFIT) night instrument meteorological conditions (IMC) in mountainous terrain such as Innsbruck, Austria or Jackson Hole, Wyoming are examples.
   (B) DEP/APP with 25-kt crosswind with Flaps 3 for landing.

5. SPECIAL EMPHASIS AREA

The FSB recommends special emphasis in the following areas:

5.1 EVS MFW.

a) PF does not display EVS on primary flight display (PFD) as this might be confusing or distracting.

b) EVS "visual" of any Approach Lighting System (ALS), RWY environment, etc. Does NOT constitute "RWY in sight" criteria.

5.2 HUD.

5.2.1 Ground Training:

a) HUD operational concepts, crew duties and responsibilities, and operational procedures (preflight, normal, and non-normal pilot activities).

b) HUD modes of operation, controls, symbology, limit conditions, failures, crew procedures delineating PF duties and responsibilities during all phases of flight during which HUD operations are anticipated. Emphasis on the availability and limitations of visual cues encountered on approach both before and after decision height (DH).

5.2.2 Flight Training:

a) HUD symbology (differences in terms of symbology between the PFDs and the HUD).

b) Over-reliance on the HUD during circling approach. The need to stay "outside" the aircraft with the RWY/airport environment visual as much as possible until established on inbound turn to final is important.

c) Declutter mode transition at 1500 ft.

d) HUD stowage prior to entry/egress of left pilot seat.

5.3 EFVS.

5.3.1 Ground Training: None.

5.3.2 Flight Training:

- IR theory and associated limitations. The pilots should be made aware of the general infrared theory and the characteristics of the EFVS image, including the dependency of the image on the weather conditions or any meteorological phenomena that may potentially degrade the EFVS image and may require it to be removed.
- Flaps 3 landing EFVS visual cues not in same place as flaps full.
- Visual Approach Slope Indicator (VASI)/precision approach path indicator (PAPI) coloration under EFVS is monochrome and must not be used.

6. CHECKING REQUIREMENTS

6.1 EVS MFW. Not applicable.

6.2 HUD. Not applicable.

6.3 EFVS. Not applicable.

NOTE: Sections 61.66(a) and (b) requires that a logbook or training record endorsement certifying the person is proficient in the use of EFVS prior to operation under §§ 91.176(a) or (b).

7. RECURRENT REQUIREMENTS

7.1 EVS MFW. Not applicable.

7.2 HUD. The FSB recommends a review of all HUD academic and flight training items be accomplished annually. Once the HUD is introduced, subsequent training and checking sessions should be accomplished utilizing the HUD.

8. OPERATIONAL APPROVAL

This FSBR does not constitute operational approval for EFVS approaches in the EMB-545/550.

APPENDIX 5. EMB-545/550 STEEP APPROACH LANDING OPERATIONS

1. BACKGROUND

An FSB in conjunction with a JOEB consisting of ANAC and EASA representatives was convened in December 2015 to determine operational suitability and to evaluate training and checking requirements for conducting steep approach landing operations in the Embraer 545/550 aircraft.

JOEB members completed academic and flight training at the test facility in Gavião Peixoto, Brazil.

Certification activities were conducted prior to the FSB evaluation.

Steep approach landing operations in the EMB-545/550 are defined as those glidepaths greater than 4.5° and less than or equal to 5.5°.

2. OPERATIONAL SUITABILITY ASSESSMENT

The FSB has determined that the conduct of steep approach landing operations, once trained, does not require greater than average piloting skill levels. Since steep approach landing operations are often tailored to demanding airports, the FSB requires academic and flight training for competency in conducting steep approach landing operations.

3. DIFFERENCES LEVELS DETERMINATION

The FSB determined that the differences levels for this operation are D/A.

4. STEEP APPROACH PILOT TRAINING REQUIREMENTS

Both required flightcrew members must complete ground and flight training for steep approach operations. Steep approach training can be integrated into the EMB-545/550 ground and flight training or can be a standalone training course. Standalone training requires the flightcrew qualified and current on the EMB-545/550.

4.1 Ground Training. Ground training must consist of training in the following areas and is appropriate to any aircrew position:

- Operational Concepts.
- Embraer Manuals.
- System Changes and Functions.
- Steep Approach Limitations.
- Normal Procedures.
- Abnormal Procedures.
- Performance.

- Stages of the Steep Approach to include stabilized approach concept, appropriate flaps configuration, and approach speed.
- Comparison of the Steep Approach sight picture to that of 3.0° (normal) approach.
- Pilot Techniques to include avoidance of abrupt control inputs and ground rush illusion.
- Identification of airports with steep approaches and their specificity (e.g., the landing distance safety factor for London City Airport).

4.2 Flight Training. For all operators, the recommended initial flight training program should include the following elements:

- One Approach following a 5.5° Approach Path Angle with Full Stop Landing.
- One Approach following a 5.5° Approach Path Angle with Engine Anti-Ice introducing variations in speed and 1,000 ft stabilization criteria, managed by the crew resulting in an unstabilized approach near minima followed by a Go-Around.
- One Approach following a 5.5° Approach Path Angle with an Engine Failure below 400 ft AGL followed by a Full-Stop Landing or a Go-Around at pilot discretion.

During the performance of these approaches the instructor optionally may, at a safe altitude and as conditions permit, demonstrate:

- Reference landing speed (V_{REF}) Steep Approach Mode (SAM) Flying Qualities Along the GS.
- Engagement/Disengagement Logics.
- Stabilized Approach Concept.
- Recognition of SAM Failure.

4.3 Integrated Steep Approach Training. The steep approach should be included in ground training. Steep approach flight training must be conducted in a simulator (Level C or D) or aircraft.

4.4 Standalone Steep Approach Training. As a prerequisite, flightcrew members must be qualified and current on the EMB-545/550 before completing standalone steep approach course. The steep approach should be included in ground training. Steep approach flight training must be conducted in a simulator (Level C or D) or aircraft.

5. SPECIAL EMPHASIS AREA

Calculation of landing distances for glidepaths from 4.5 to 5.5°.

6. STEEP APPROACH CHECKING REQUIREMENTS

There is no checking requirement for EMB-545/550 steep approach qualification. Proof of completion of EMB-545/550 steep approach training is sufficient for showing qualification.

7. STEEP APPROACH RECURRENT REQUIREMENTS

The FSB recommends, regardless of the number of steep approaches completed, a review of all academic and flight training items be accomplished annually and documented in a manner acceptable to the administrator. SAM recurrent training should be performed every 12 calendar-months and must comprise of the three aforementioned approaches described under “Maneuvers” in the “Flight Training” segment of this appendix. The academic segment may be abbreviated as deemed adequate by the instructor.

8. OPERATIONAL APPROVAL

This FSBR does not constitute operational approval for the execution of steep approaches in the EMB-545/550. Additionally, be advised, it is common that individual airport authorities have training and documentation requirements specific to their airfields with regard to steep approaches.

APPENDIX 6. EMB-545/550 SYNTHETIC VISION GUIDANCE SYSTEM (SVGS)

1. BACKGROUND

In December 2019, an FSB and ANAC Aircraft Evaluation Group, Grupo de Avaliação de Aeronaves (GAA), convened a JOEB at FAA-approved training facilities located at FlightSafety International St. Louis Learning Center in St. Louis, Missouri.

This JOEB determined operational suitability and evaluated training and checking requirements for EMB-545/550 SVGS to conduct Special Authorization (SA) CAT I ILS operations.

The SVGS is a combination of Synthetic Vision System (SVS) RWY image depiction and APPR 2 flight guidance through the FD and FPV that provide additional integrity monitoring and reduces flight technical error. In addition to typical GS and LOC presentations, the SVGS provides the flightcrew with a continuous indication of desired trajectory to the RWY touchdown zone, especially in high crosswind scenarios. Thus, flightcrew situation awareness is enhanced with SVGS, specifically with the transition at DH to the visual segment of the approach.

The standard navigation guidance is CAT I ILS (GS/LOC). SVGS in the EMB-545/550 is certified in accordance with AC 20-185 and operational credit is granted through the process defined in AC 120-118. The EMB-545/550 aircraft is capable of performing SA CAT I ILS approaches with a DH of 150 ft Height Above Threshold (HAT) and 1,400 ft Runway Visual Range (RVR).

2. OPERATIONAL SUITABILITY ASSESSMENT

The EMB-545/550 SVGS is operationally suitable for operations under parts 91, 91K, and 135. The JOEB determined operational compliance by conducting an evaluation of the SVGS as installed on EMB-545/550 FFS (FAA ID No. 8646) in December 2019.

3. DIFFERENCES LEVELS DETERMINATION

A T3 test conducted used AC 120-53B guidance. The JOEB sets the EMB-545/550 SVGS training flightcrew requirements as Level D.

4. SVGS PILOT TRAINING REQUIREMENTS

Both required flightcrew members must complete ground and flight training for SVGS. SVGS training can be integrated into the EMB-545/550 ground and flight training or can be a standalone training course. Standalone training requires the flightcrew to be qualified and current on the EMB-545/550.

If the SVGS is intended to be used together with the HUD, the LSP PF must be qualified and current on the HUD.

NOTE: Additional training may be required for operators to receive credit for LVOs.

4.1 Ground Training. For all operators, the recommended initial ground training program should include the following elements:

- Operational Concepts;
- Embraer Manuals;
- SVGS Changes and Functions;
- SVGS Limitations;
- Normal Operation and Procedures; and
- Abnormal Procedures.

4.2 Flight Training. For all operators, the recommended initial flight training program should include the following elements:

- SA ILS CAT I with Missed Approach at Minimums;
- SA ILS CAT I with Balked Landing;
- SA ILS CAT I with Missed Approach due to Loss of Approach Capability;
- SA ILS CAT I to Landing with 15-kt Crosswind; and
- OEI SA ILS CAT I to Landing.

4.3 Integrated SVGS Training. The SVGS should be included in ground training. SVGS flight training must be conducted in a Level C or D FFS.

4.4 Standalone SVGS Training. As a prerequisite, flightcrew members must be qualified and current on the EMB-545/550 before completing standalone SVGS course. The SVGS should be included in ground training. SVGS flight training must be conducted in a Level C or D FFS.

5. SPECIAL EMPHASIS AREA

SVGS approach with 25-kt crosswind to demonstrate PFD tapes reduction.

6. SVGS CHECKING REQUIREMENTS

There is no checking requirement for EMB-545/550 SVGS qualification. Successful completion of EMB-545/550 SVGS training is sufficient for qualification.

7. SVGS RECURRENT REQUIREMENTS

The FSB recommends a review of all SVGS academic and flight training items be accomplished annually. Once the SVGS is introduced, subsequent training and checking sessions should be accomplished utilizing the SVGS.

8. OPERATIONAL APPROVAL

This FSBR does not constitute operational approval for SVGS approaches in the EMB-545/550.

APPENDIX 7. REQUIRED NAVIGATION PERFORMANCE AUTHORIZATION REQUIRED (RNP AR)

1. BACKGROUND

This appendix to the FSBR addresses RNP AR approach capability (limited to RNP 0.3 for approach and RNP 1.0 for missed approach) for both the EMB-545 and EMB-550.

In September 2022, an FSB in conjunction with ANAC and EASA convened a JOEB at an FAA-approved training facility at the Flight Safety International DFW Learning Center located near the DFW airport, in Dallas, TX. The OEM proposed RNP AR training was evaluated by a T3 test in accordance with FAA Advisory Circular (AC) 120-53B, in a Level D, Full Flight Simulator (FFS).

The FSB used the Original Equipment Manufacturer (OEM) manuals (AFM, AOM, and Standard Operating Procedures Manual (SOPM)) during the RNP AR evaluation and found the procedures suitable. Approving authorities should ensure the operator's procedures meet the OEM intent, and that student demographics are considered when reviewing proposed footprints accounting for overall experience as well as previous RNP AR experience/exposure.

2. OPERATIONAL SUITABILITY ASSESSMENT

During the evaluation, which included a determination of the system's operational suitability, the FSB found the RNP AR approach functionality (limited to RNP 0.3 for approach and RNP 1.0 for missed approach), for both the EMB-545 and EMB-550 operationally suitable for operations under 14 CFR parts 91 and 135.

The EMB-550 pilot type rating for Embraer 545/550 aircraft modified with RNP AR approach capability remains unchanged.

3. DIFFERENCES LEVELS DETERMINATION

The FSB has determined that the minimum differences training level from "EMB-545/550, certified without RNP AR APCH" to "EMB-545/550 with RNP AR APCH" to be "D" level training, as defined in Appendix 1 of this report, except that the training must be accomplished in a Level D FFS. Training to proficiency is required.

The FSB has determined that the minimum differences level for checking is Level A (no checking required), as defined in Appendix 1 of this report.

4. RNP AR APPROACH PILOT TRAINING REQUIREMENTS

This Flight Standards Board Report (FSBR) does not address all training requirements for RNP AR. See the current version of AC 90-101, Approval Guidance for RNP Procedures with AR, for additional information regarding RNP AR training.

In conducting RNP AR approaches, specified duties and procedures are assigned to both the PF and PM. Therefore, the requirement for initial and recurrent training as defined below are applicable to both a PIC and SIC.

4.1 Minimum Prerequisites.

- A current PIC type rating on the EMB-550, or current participation in PIC type rating training on the EMB-550 prior the certification test.

4.2 RNP AR Initial Training.

4.2.1 Initial ground training is required in the areas outlined in the current version of AC 90-101.

4.2.2 Initial flight training is required in the areas outlined in the current version of AC 90-101.

4.3 RNP AR capability installed on EMB-545 and EMB-550 airplanes has been found to be functionally equivalent. If training, checking, and currency requirements are accomplished in one aircraft, RNP AR training, checking, and currency need not be repeated in the other.

4.4 Integrated RNP AR Training. The RNP AR should be included in ground training. RNP AR flight training must be conducted in a Level D simulator.

4.5 Standalone RNP AR Training. As a prerequisite, flightcrew members must be qualified and current on the EMB-545/550 before completing a standalone RNP AR course. The RNP AR should be included in ground training. RNP AR flight training must be conducted in a Level D simulator.

5. SPECIAL EMPHASIS AREA

NOTE: In addition to the training requirements set forth in AC 90-101, as amended, the following items must be emphasized within an operator's RNP AR training syllabus. Additionally, operators not utilizing a Flight Dispatch Department need to incorporate the Flight Dispatcher Training elements, as outlined within AC 90-101, as amended, within the ground training modules administered to their pilots.

5.1 Ground Training. Review the AFM Supplement Required equipment for RNP AR approaches.

5.2 Flight Training.

- Use of LNAV, VNAV and APP pushbuttons;
- Use of altitude selector to ensure proper engagement of PATH and GP modes;
- Management of GA versus "discontinued approach" or "contingency procedures"; and
- Awareness of the flight deck effects of changing the AP source during the approach.

6. RNP AR APPROACH CHECKING REQUIREMENTS

The FSB evaluation determined Level A checking, as defined in Appendix 1 of this report, is appropriate for RNP AR initial training.

NOTE: Operational rules for parts 91K and 135 operators may require specific checking requirements for RNP AR operations.

7. RNP AR APPROACH RECURRENT REQUIREMENTS

See current version of AC 90-101 for RNP AR approach recurrent and currency requirements.

8. OPERATIONAL APPROVAL

This FSBR does not constitute operational approval for RNP AR approaches in the EMB-545/550. See current version of AC 90-101 for requirements to obtain operational approval for RNP AR operations.