OPERATIONAL EVALUATION REPORT

DASSAULT AVIATION

FALCON 7X

FALCON 8X

GRUPO DE AVALIAÇÃO DE AERONAVES – GAA

BRAZILIAN AIRCRAFT EVALUATION GROUP

SÃO JOSÉ DOS CAMPOS, BRAZIL

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GRUPO DE AVALIAÇÃO DE AERONAVES (GAA)

Aircraft Evaluation Group

Dassault Falcon 7X and Falcon 8X

ANAC

Marcelo Luiz de Oliveira Portela	- Original Report - Falcon 7X with EASy II and Falcon 8X Evaluation - Differences from F7X EASy I to EASy II, F7X EASy II to F8X and F8X to F7X EASy II - F8X Steep Approach, HUD without approach guidance cue, EFVS without operational credit, F8X NADP and F7X M1000 Windshear escape guidance
Cláudio Xavier da Silva	- EFVS and Steep Approach Evaluation

OPERATIONAL EVALUATION REPORT

DASSAULT AVIATION

FALCON 7X (EASY I AND II)

FALCON 8X (F7X WITH M1000 PACKAGE AND EASY III)

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REVISION RECORD

Revision Number	Content	Date
Original	Initial Falcon 7X Operational Evaluation	09 JAN 2012
Revision 1	Operational Evaluation of the EFVS and Steep Approach in the Falcon 7X	12 JAN 2012
Revision 2	Report translated into English Operational Evaluation of the Falcon 7X with EASy II and Falcon 8X (Falcon 7X with M1000 Package and Easy III) Differences from F7X EASy I to EASy II, F7X EASy II to F8X and F8X to F7X EASy II	25 NOV 2016
Revision 3	F8X Steep Approach Capability HUD without approach guidance cue EFVS without operational credit F8X NADP F7X M1000 Windshear escape guidance Other minor revisions as some LIFUS related texts and substituting the PM concept for PNF, for instance	26 MAY 2017

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ACRONYMS

AB	Airbrakes
AFM	Airplane Flight Manual
AGL	Above Ground Level
ALAR	Approach and Landing Accident Reduction
AP	Autopilot
ATC	Air Traffic Control
CAT	Commercial Air Transport operations
CBT	Computer Based Training
CFIT	Controlled Flight Into Terrain
CODDE	Crew Operational Documentation for Dassault EASy
CPT	Cockpit Procedure Trainer
CRM	Cockpit Resource Management
CVS	Combined Vision System
DA	Dassault-Aviation
DAC	*Departamento de Aviação Civil* – Civil Aviation Department (previous Brazilian civil aviation authority)
DME	Distance Measuring Equipment
DTK	Desired Track
EASA	European Aviation Safety Agency
EASy	Enhanced Avionics System
EFB	Electronic Flight Bag
ECL	Electronic Check List
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FFS	Full Flight Simulator
FMS	Flight Management System
FPV	Flight Path Vector
GA	Go-Around
HGS	Head-up Guidance System (Rockwell-Collins)
HUD	Head Up Display
IAC	Instrução de Aviação Civil - Civil Aviation Instruction
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IPFD	Integrated Primary Flight Display
IS	Instrução Suplementar – Suplementary Instruction
LIFUS	LIne Flying Under Supervision
LPV	Localizer Precision with Vertical guidance
MDR	Master Difference Requirements
MDU	Multifunction Display Unit
MMEL	Master Minimum Equipment List
NADP	Noise Abatement Departure Procedure
OEB	Operational Evaluation Board
OSD	Operational Suitability Data
PAPI	Precision Approach Path Indicator
PDU	Primary Display Unit
PF	Pilot Flying
PIC	Pilot In Command
PM	Pilot Monitoring

PNF	Pilot Not Flying
QRH	Quick Reference Handbook
RBAC	Regulamento Brasileiro de Aviação Civil – Brazilian Civil Aviation Regulation
RNP-AR	Required Navigation Performance - Authorization Required
SFD	Secondary Flight Display
SOP	Standard Operating Procedure
SPO	Flight Standards Department
SVS	Synthetic Vision System
SYST	System
TASE	Training Areas of Special Emphasis
TO	Take-Off
TOGA	Take-Off / Go-Around
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation

1. INTRODUCTION

1.1. Background

This report was made in two moments. The first one addressing only the Falcon 7X with Easy I and the second one including EASy II for Falcon 7X, the Falcon 8X and their differences and similarities. As the approach for these operational evaluations was very distinct, consequently, this report can be considered as composed by two parts:

The first part presents a summary of the evaluation conducted by the Dassault Falcon 7X Aircraft Evaluation Group (BAEG-FA7X) formed by DAC inspectors in order to evaluate the aircraft, its characteristics and operational aspects involved, owing to its operation in Brazilian territory. The analysis was based on several operational evaluation activities, including document analysis and operational evaluation flights. The result was a draft of a Supplementary Instruction, the IS-RBHA 135-1006. It was made based on this previous work and current standards and regulations. All the technical basis, conclusions and recommendations are those obtained by the original working group so that the current work is a mere compilation of data to adhere to current regulations and formal standards.

The second part, including EASy II, the 8X and all differences training among them, was made by the Aircraft Evaluation Group (GAA) by analyzing the Operational Suitability Manual - Flight Crew - Revision 1, from June 24, 2016 – DGT148654 of Dassault Aviation.

This report is a reference for the type rating definition. It recommends training for the Brazilian pilots and indicates the relevant documentation, among other operational issues.

1.2. Objective

The objective of this report is to present the ANAC results from the operational evaluation of the Dassault Falcon 7X with EASy I and II and Falcon 8X, as well as addressing the differences among them.

1.3. Applicability

This report is applicable to:

- Brazilian operators of Falcon 7X and 8X under RBHA 91 and RBAC 135 requirements;
- Approved Training Organizations certified under RBAC 142 (Training Centers);
- Inspectors from ANAC related to safety oversight of Falcon 7X or Falcon 8X aircraft;
- ANAC Principal Operations Inspectors (POIs) of Falcon 7X or Falcon 8X operators.

2. SUMMARY DESCRIPTION OF THE AIRCRAFT

2.1. General Information

The Falcon 7X and 8X have three Pratt & Whitney Canada PW307A engines of 6,402 lb thrust each.

While the Falcon 7X is equipped with Honeywell Primus EASy system (I or II), the Falcon 8X is equipped with EASy III.

Their cabin allows maximum of 19 passengers but with typical configuration for 12.

The following table summarizes the main features of the aircraft according to the manufacturer:

Falcon 7X/8X – Main Characteristics	
Certification Basis	RBAC 25
Minimum Crew	02 (two) pilots
Maximum Cruise Speed	488 kt
Operational Certified Ceiling	51,000 ft
Range (with 4 passengers)	5,850 NM
MTOW	70,000 lb

Table 1: Falcon 7X/8X main characteristics

2.2. External Dimensions

In addition to the previous section, Figure 1 shows the three views of the aircraft.

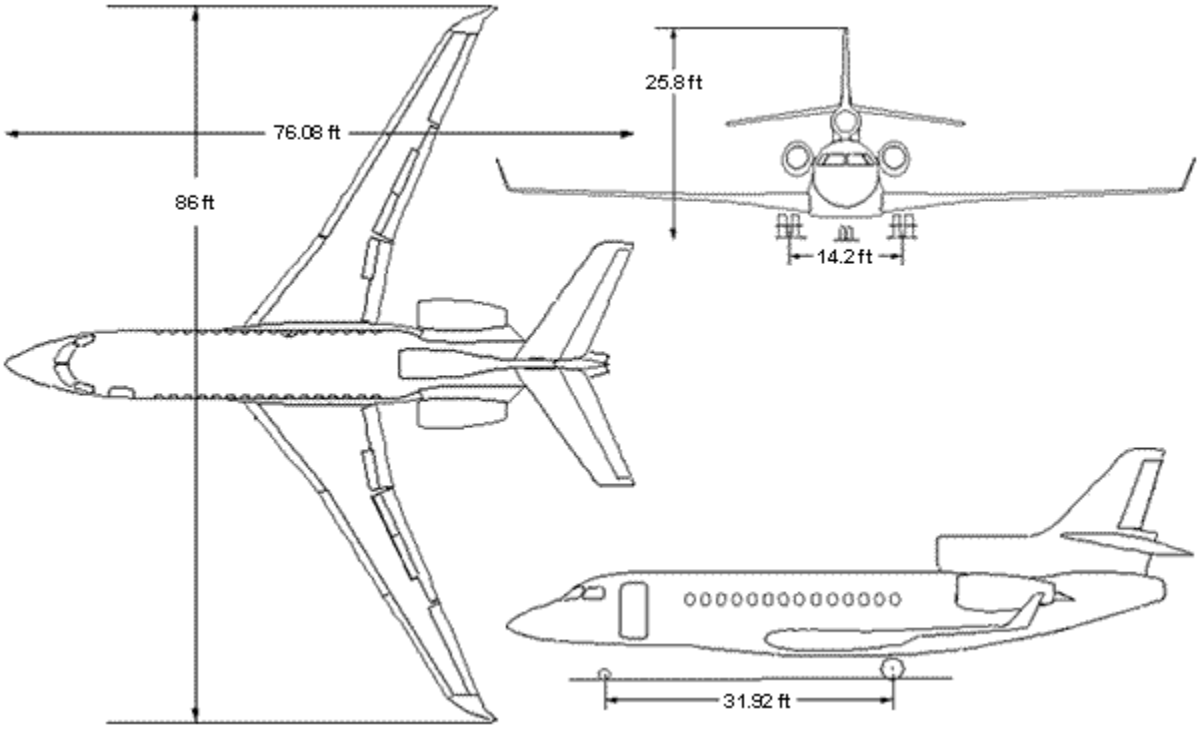

Figure 1: Dassault Falcon 7X/8X External Dimensions

3. TYPE RATING

The aircraft Dassault Falcon 7X and 8X were first operationally evaluated by the FAA and EASA and operates in many countries under the rules of those authorities.

The main documents to be analyzed in the case of evaluation of aircraft certified by foreign civil aviation authorities are issued by AEG (Aircraft Evaluation Group) and the OEB (Operational Evaluation Board) which are the Groups equivalent to the Brazilian GAA inside of the FAA and the EASA, respectively.

3.1. Pilots

The Falcon 8X is a modification of the Falcon 7X with a new commercial designation and it is not considered as a new model.

As they share the same Type Certificate, the GAA has established the Same Type Rating for the Falcon 7X and the Falcon 8X, requiring specific skills and training for their flight.

The GAA recommends to update the publication "Instrução Suplmentar - IS 61-004" (ANAC Type Rating List) with the following information:

Table X – Type Rating (Airplane) – Land – Multi Pilot Operation, Multi Engine (all engines)

MANUFACTURER (1)	AIRCRAFT (2)		RMK (3)	TYPE RATING (4)
	MODEL	NAME		ANAC
X – Type Rating (Airplane) – Multi Pilot Operation				
Dassault Aviation	Falcon 7X	Falcon 7X	AAD D	FA7X
		Falcon 8X		

*AAD stands for HPA in Portuguese

3.2. Data Related to the operation of more than one variant

3.2.1. F7X Variants

	F7X	F8X
EASy I *	X	*N/A*
EASy II	X	*N/A*
EASy III	*N/A*	X

* "EASy I" is equivalent to "EASy Load 10".

3.2.2. Differences Requirements (MDR)

		From airplane ↓		
		F7X EASy I	F7X EASy II	F8X EASy III
To airplane ←	F7X EASy I	*N/A*	Not evaluated	Not evaluated
	F7X EASy II	D / A / B #	*N/A*	B / A / B
	F8X EASy III	Not evaluated	B / A / B	*N/A*

The differences training course is valid from the F7X EASy I variant to the F7X EASy II variant for crewmembers previously qualified on the F7X EASy I variant.

Note: Dassault Aviation has not provided yet any OSD-FC Data for F7X EASy II variant to F7X EASy I variant.

3.2.3. General rules for currency on both F7X EASy I and F7X EASy II

To maintain currency when flying F7X EASy variants in both EASy I and EASy II, the following apply:

- Pilot current on the EASy I variant has to undergo the relevant "F7X - EASy I to EASy II" difference course in order to be proficient on both EASy I and EASy II.
- If a pilot has not flown one of EASy I or EASy II variant for more than 6 months, he should perform a self-review on that variant prior to flying on that variant.
- If a pilot has not flown one of EASy I or EASy II variant for more than one year, he should perform a minimum two hours Cockpit Procedure Training (CPT) session on that variant, covering the differences between EASy I and EASy II, especially take-off and go-around procedures.
- If a pilot has not flown within a period of 2 years the EASy II variant for which he has been qualified through the "F7X - EASy I to EASy II" difference course, further differences training or a proficiency check on that EASy II variant will be required.
- If a pilot has not flown within a period of 2 years the EASy variant for which he has been qualified through an initial course ("Initial F7X EASy I" or "Initial F7X EASy II"), the pilot should meet any refresher training requirements as determined by ANAC and complete a proficiency check in accordance with Air Crew regulations.

Note For the purpose of this paragraph, a Cockpit Procedure Trainer (CPT) is a training device which represents the cockpit environment including the cockpit controls, displays and computer programs necessary to represent the aircraft in ground and flight operations to the extent that the systems appear to function as in an airplane. The purpose of the CPT is to allow learning the functioning of the controls and displays as well as practicing CRM principles and application of procedures. A CPT is based on software issued from FFS simulation, with the exception of Avionics, which is re-hosted from the aircraft software; it is validated for its intended use.

3.2.4. General rules for currency on both F7X EASy II and F8X (EASy III)

To maintain currency when flying both F7X EASy II and F8X (EASy III) variants, the following apply:

- Pilot current on the F7X EASy II variant has to undergo the relevant "F7X EASy II to F8X" difference course in order to be proficient on both F7X EASy II and F8X (EASy III).
- If a pilot has not flown one of F7X EASy II or F8X (EASy III) variant for more than 6 months, he should perform a self-review on that variant prior to flying on that variant.
- If a pilot has not flown one of F7X EASy II or F8X (EASy III) variant for more than one year, he should perform a minimum two hours Cockpit Procedure Training (CPT) session on that variant, covering the differences between EASy II and EASy III.
- If a pilot has not flown within a period of 2 years the F8X (EASy III) variant for which he has been qualified through the "F7X EASy II to F8X" difference course, further differences training or a proficiency check on that F8X (EASy III) variant will be required.
- If a pilot has not flown within a period of 2 years the EASy variant for which he has been qualified through an initial course ("Initial F7X EASy II" or "Initial F8X"), the pilot should meet any refresher training requirements as determined by ANAC and complete a proficiency check in accordance with Air Crew regulations.

Note For the purpose of this paragraph, a Cockpit Procedure Trainer (CPT) is a training device which represents the cockpit environment including the cockpit controls, displays and computer programs necessary to represent the aircraft in ground and flight operations to the extent that the systems appear to function as in an airplane. The purpose of the CPT is to allow learning the functioning of the controls and displays as well as practicing CRM principles and application of procedures. A CPT is based on software issued from FFS simulation, with the exception of Avionics, which is re-hosted from the aircraft software; it is validated for its intended use.

4. CHARACTERISTICS AND PROCEDURES

4.1. AP Engagement Altitude

As in the approved flight manuals, the minimum altitude for autopilot engagement on takeoff is 400 ft AGL.

4.2. Minimum altitude for AP use in Non-Precision approach

The AP must be disengaged before descending below the MDA during non-precision approaches, or 200 ft, whichever is higher, unless the aircraft is in go-around mode.

4.3. Minimum altitude for AP use in Precision approach

The AP must be disengaged before descending below 80 ft when coupled to the ILS, unless the aircraft is in go-around mode.

4.4. Minimum for landing

To determine the minimum for landing, the Falcon 7X is considered as category C.

The minimum for circling approach must be approved in the operational specifications of each operator.

Operators under RBHA 91 must establish that the speed to be used for circling is approximately 130 KIAS to determine the minimum visibility, which should not be less than 1.5 km (approx. 1 mile).

4.5. Flap Setting for Landing

The normal flap setting for landing is “SF3”.

5. TRAINING SPECIFICATION

5.1. General – Training Program

5.1.1. Individual Programs

Depending on the experience of the operator, different configurations of training programs may be acceptable, so the approval should be made case by case for each operator. Each operator shall submit a training program for approval of ANAC forwarding it to the responsible inspector. The instructions in this operational evaluation report apply to programs for **pilots with experience in operating EFIS/FMS and operational experience in transport aircraft with multiple engines according to RBAC 121 and/or 135, i.e., pilots with ATP License**. For pilots who do not have this experience, additional requirements to increase their level of knowledge and aeronautical experience will be required. Other factors such as credit for experience in other Falcon aircraft, for instance, may be considered.

Requirements for an acceptable ground curriculum to the training program of the Falcon 7X and 8X are presented in this operational evaluation report. A less detailed program can be approved if the equivalence can easily be established or if other specific factor can be applied, for example, the efficacy improvement in the training processes or a better quality of training devices.

5.1.2. Training Program – General Objectives

To prepare their training programs, operators and training providers should consult Dassault Manual entitled "Falcon Training Policy Manual".

In addition to the relevant training objectives described in this manual, apply the following:

On completion of the type rating training program, a pilot should be able to:

- Clearly understand the global philosophy of Dassault regarding the design, documentation and operation methodology;
- Use the appropriate documentation from the manufacturer, including the operational documentation CODDE 1, CODDE 2, CODDE 3, QRHs and operator’s MEL;
- Demonstrate a good knowledge of the aircraft, its systems and limitations;
- Demonstrate a good knowledge of the philosophy used in the design and development of the cockpit "EASY";
- Safely perform all maneuvers with smoothness and accuracy;
- Demonstrate proficiency in flying the plane with and without automation, in a degraded flight envelope, without attitude protection, with and without HUD and EFVS when installed;
- Perform with proficiency all emergency operation techniques in a timely and coordinated manner;

- Strictly apply the normal, abnormal and emergency procedures, including the operating techniques, at appropriated time and in a coordinated manner. The recommended sequencing normal-actions in emergency, abnormal actions and normal actions should be assimilated;
- Maintain situational awareness at all times so there is no doubt regarding the success of procedures and maneuvers;
- Show relevant judgment in flight management ("airmanship");
- Understand and apply the CRM procedures;
- Communicate effectively and positively with the other crewmembers;
- Demonstrate adequate knowledge and proficiency in determining the performance of the aircraft using the available documentation

5.2. TRAINING AREAS OF SPECIAL EMPHASIS FOR PILOTS

5.2.1. Initial F7X EASy I and II and Falcon 8X

The following systems and procedures should get special attention in the pilot training program for Falcon 7X EASy I and II and Falcon 8X. These areas are common for all these variants.

Ground Training

- Physiology for operation in high altitude,
- Aerodynamics and mechanics of high altitude flight,
- Aerodynamics and flight mechanics in high subsonic speed,
- Fatigue, loss of sleep and disruption of daily cycle,
- Operational procedures for operations in RVSM airspace, MNPS, RNP-10 and RNAV-5,
- "Flight Management System" (FMS) in general,
- Characteristics of the fuel and the fuel temperature at high altitude operations and low temperatures,
- Contamination by ice or other contaminants in the leading edge of the wings and their effect on the stall speed in clean configuration and with extended flaps,
- Wind shear Escape,
- Characteristics of systems associated with the generation of thrust (engine and its components) and the procedures and techniques for selecting and adjusting the takeoff thrust,
- CRM - Crew Resource Management,
- Terrain Avoidance and Warning System - TAWS and (E)GPWS,
- Traffic Collision Avoidance System (TCAS),
- Description of the aircraft (interior and exterior),
- Review of Operations and Flight Manuals (AFM And CODDE) including normal, abnormal and emergency procedures and limitations,
- Lighting system,
- CAS - "Crew Alerting System",
- Power Plant,
- Fire protection system,
- Electrical system,
- Fuel system,
- Hydraulic system,
- Flight control system,
- Pneumatic system,
- Air-conditioning system,

- Rain and ice protection system,
- Oxygen System,
- Pressurization system,
- Preflight procedures,
- Avionics system, controls and "displays",
- Integration of systems,
- Dispatch procedures considering the MMEL / MEL,
- Introduction to jet aircraft performance,
- Procedures for determining the weight and CG of the aircraft,
- Procedures and aircraft performance limitations,
- Automatic flight control system,
- Flight Path Symbol (FPS)
- FMS / MKB / CCD,
- Limitations,
- Performance,
- Alarms and alerts,
- Normal / abnormal and emergency procedures,
- Electronic checklist, and
- "Head Up Display" - if installed.

Special emphasis should be observed on the explanation of the aircraft takeoff performance. The definitions and meanings: V1, Vr and V2 should be well detailed. The student must be proficient in determining the takeoff weight due to the available runway length, climb performance of the aircraft, clearance of obstacles and maximum energy brake. The student must be proficient in determining the approach speed and landing distance both factored and non-factored and the requirements for its use.

Flight Training in FTD or FFS

In-flight training should address the following events or maneuvers:

- Walk around;
- Cockpit familiarization;
- Tests and checks of systems;
- Multiple approaches requiring reprogramming of the FMS;
- Approaches to stall until recognizing the activation of protection provided by the flight control system. Repeat the alternate and direct mode (it is satisfactory to perform this maneuver only in FFS);
- Operating techniques – Reflex Actions;
- Use of Manual pressurization mode;
- No flap landing procedure;
- Normal procedures;
- Abnormal Procedures;
- Ground Steering;
- TCS (Touch Control Steering);
- Autothrottle;
- Taxi with steering system inoperative;
- Use of airbrakes with autopilot engaged;
- Use of the parking brake as an emergency brake;
- Use of checklist in paper and electronic;

- Use of Flight Path Symbol (FPS) and Acceleration Chevron (EC) and best practices to mitigate potential failures;
- Proper use and interpretation of the Low Speed Cues (LSC);
- Go-around with low speed and reduced thrust (idle);
- Go-around using TOGA pushbuttons on throttles;
- Emergency Descent from high altitudes;
- Emergency panel on the pedestal;
- PDU and/or MDU multiple failures;
- Use of SFD ILS raw deviations;
- Oxygen Use above FL250 and FL350;
- Controls and "displays";
- Use of the FMS / MKB / CCD;
- Check of protection and failures of the flight control system, including flight in alternate and direct mode;
- Maneuvering in Direct Law (light weight / rear CG)
- Sidesticks priorities;
- Integrated use of CAS messages, switch positions and synoptic pages to determine the condition of the aircraft systems;
- Use and interpretation of color codes of avionics system;
- Procedures thrust management;
- Engine operating characteristics at high altitude (delayed response);
- Manual Piloting above FL310;
- Use of manual trim with degraded control laws and use of pitch trim in backup mode;
- Operation and response to TCAS and EGPWS alarms;
- Procedure associated to CAS message FCS: THS DEGRAD;
- Use and understanding of overhead panel pushbuttons logics;
- Undamped Dutch Roll oscillations at high altitude/Mach
- Takeoff profile for noise abatement; and
- Special training program for HUD, if installed.

Takeoff safety - Particular emphasis on some topics related to takeoff safety is appropriate. For example:

- V_1 meaning and its appropriate use;
- The importance of prompt and correct execution of a RTO procedure;
- The need to minimize the exposure to risk in a RTO at high speed due to an occurrence of minor severity that does not impact takeoff safety;
- Appropriate technique to runway alignment and use of available runaway;
- Proper consideration of the conditions for the occurrence of reduced braking efficiency;
- Correct use of the FPS, the basic mode of DV is PATH and not pitch as in other planes;
- Engine Performance;
- Unsuitability of the use of FMS speeds since there will be conflict with CLB mode. Emphasize that only the speeds set manually are compatible with the obtainment of the desired takeoff performance;
- Discuss the takeoff characteristics with different CG positions;
- Full aft stick rotation technique;
- Discuss the aircraft rotation technique when there is engine failure at $V_{1;}$ and
- Discuss the takeoff characteristics and use of side-stick and rudder in crosswind condition.

Digital cockpit - The Falcon 7X incorporates an instrument of digital cockpit known as "EASY cockpit" that utilizes a graphical interface through a modular architecture in the avionics system, using a flight path symbol (FPS - "Flight Path Symbol") and uses a side-stick in place of a conventional center stick.

Therefore, the maintenance of the situational awareness as well as the awarenesses of the aircraft automation condition and the status of the aircraft systems will require an increase in workload and attention of a crew not familiar with digital instrumentation. Thus, the use of simulator in the training is required. If the airplane has to be used in training, it must be emphasized that the use of the aircraft on the ground with the connected systems or training in FTD should be maximized to avoid problems regarding loss of situational awareness in flight.

Electronic Checklist (ECL) - Falcon 7X incorporates an electronic checklist, so its use should be properly processed. The use of CLC and MKB with the ECL should be intensively practiced. Pilots should also be properly trained in the use of conventional checklist, since the MMEL allows dispatch of the aircraft with inoperative ECL and there is also the possibility of failure of the ECL in flight.

Long-range flight / "overwater" operation - Because of the criticality of monitoring fuel consumption in long-range flights, crewmembers must be proficient in all aspects of fuel management in both normal and abnormal conditions.

Stall Prevention - The protections provided by the flight control system prevent the aircraft stall if the system operates in "*normal law*". However, the training program should be adequate to ensure that the pilot is properly trained in a FFS in the recognition and recovery of the stall in "*direct law*". Training should ensure that the pilot will apply the appropriate technique for stall recovery if a stall alarm or any other natural stall indication occur and that the pilot will NOT apply a stall recovery procedure in the case of an "increase speed" alarm. This training should not be practiced if the flight control system deteriorates and comes out of "*normal law*".

Operation in hazardous weather conditions and/or in winter in places where winter is rigorous - Proper training should be propitiated addressing the operation in hazardous weather conditions and/or in cold winter conditions that may be specific to the 7X. For example, topics covering the use of the "anti-ice" system, braking characteristics with the "anti-skid" on slippery or wet runways, windshear escape training, RTO at high speed and wet runway and "de-ice" operation before takeoff ("hold over" tables) are appropriate. Besides these topics, the operator should select for training all events that outcomes from their safety management program.

Windshear prevention and recovery - The training centers and companies should ensure that every crewmember is familiar with AC 00-54A Pilot Windshear Guide.

5.2.2. Additional TASE for Falcon 7X with EASy II

In addition to the areas of special emphasis common to all Falcon 7X variants pointed before, the following TASE are also considered necessaries for the Falcon 7X equipped with EASy II.

- Proficiency in using Flight Path Vector vertical and lateral displacement (un-caged FPV) in new IPFD design.
- Proficiency in performing ILS/LPV approaches in raw data.
- Proficiency in using FPV in connection with synthetic vision (terrain, virtual runway).
- Proficiency in using all Flight Management System Windows.
- Proficiency in using TO and GA modes of EASy II.

VNAV mode.

5.2.3. Additional TASE for Falcon 8X

In addition to the areas of special emphasis common to all Falcon 7X variants pointed before, the following TASE are also considered necessary for the Falcon 8X.

- Proficiency in using Flight Path Vector vertical and lateral displacement (un-caged FPV) in new IPFD design.
- Proficiency in performing ILS/LPV approaches in raw data.
- Proficiency in using FPV in connection with synthetic vision (terrain, virtual runway).
- Proficiency in using TO and GA modes of EASy II.
- Proficiency in operating EASy III FMS.
- Proficiency in operating RDR-4000.
- Location of the TCS pushbutton on the F8X sidesticks.
- Landing technique in CLEAN configuration.
- Engine thrust setting during take-off in crosswind condition.
- Possible late and/or slow rotation at take-off.
- Windshear maneuver (only for A/C without Windshear Escape Guidance)
- Easy III: Heading legs and Floating DTK legs.

Training Footprint – Initial F7X EASy I

Ground Training schedule

Day 1 (7.0 Hrs)	Day 2 (7.0 Hrs)	Day 3 (7.0 Hrs)	Day 4 (7.0 Hrs)	Day 5 (7.0 Hrs)
OEM Publications	Review Exercises	Review Exercises	Review Exercises	Review Exercises
F7X overview	Navigation	Hydraulics	Flight Controls	Landing Gears - Brakes
Flight Deck Philosophy	Communications	Electrical	AFCS	Pneumatics
Operational Method				Air Cond. - Pressurization
Instruments				Anti-ice
				Lighting
				Emergency equipment
		Briefing	Briefing	Briefing
		Lab 1	Lab 2 NAV / FMS	Lab 3 Preflight
		Avionics overview	System pages	To engine start

Day 6 (6.75 Hrs)	Day 7 (0 Hrs)	Day 8 (6.5 Hrs)	Day 9 (6.5 Hrs)	Day 10 (7.0 Hrs)
Review Exercises	Scheduled Day Off	Written test #1	Test Review	Operational Method
APU		Weight & Balance	Performance	MMEL
Fuel		Trip Plan		Instruments
Engine - Thrust reverser		Performance		Navigation
Fire Protection				Communication
Oxygen				Hydraulics
Water & Waste				
Preflight				
Briefing				
Lab 4 Preflight				
APU / Engine start				

Day 11 (7.0 Hrs)	Day 12 (6.75 Hrs)	Day 13 (6.5 Hrs)	Day 14 (0 Hrs)	Day 15 (6.5 Hrs)
Review Exercises	Landing Gears	Fuel	Scheduled Day Off	Low Visibility (JAA)
Electrical	Brakes	Engine - Thrust reverser		HUD (optional)
Flight Controls	Pneumatics	Fire Protection		FBS
AFCS	Air Cond - Pressurization	Flight Profiles		
	Oxygen	LAHSO (FAA)		
	Anti-ice			
	APU			
Briefing	Briefing	Briefing		
Lab 5	Lab 6	Lab 7		
Reversion Modes	Preflight to TOC	Descent to Landing		

Flight Training schedule

Day 16 (6.0 Hrs)	Day 17 (6.0 Hrs)	Day 18 (8.0 Hrs)	Day 19 (7.0 Hrs)	Day 20 (6.0 Hrs)
		Written test	Test review	
Briefing	Briefing	Briefing	Briefing	Briefing
FFS 1	FFS 2	FFS3	FFS 4	FFS 5
Normal procedures	Normal procedures	Normal procedures	Engine Out - Fire	Cold / Loft - Anti-ice
Maneuvers	Precision Approach	Maneuvers	Avionics	Flight Controls
Debriefing	Debriefing	Debriefing	Debriefing	Debriefing

Day 21 (0 Hrs)	Day 22 (6.0 Hrs)	Day 23 (6.0 Hrs)	Day 24 (6.0 Hrs)	Day 25 (7.0 Hrs)
Scheduled Day Off	Briefing	Briefing	Briefing	Briefing
	FFS 6	FFS 7	FFS 8	FFS 9
	Hi D. A / Loft - Environmental	Review - Added malfunctions	Recommendation	Evaluation
	Debriefing	Debriefing	Debriefing	Debriefing

Classroom time
CPT time
FFS time

Training Footprint – Initial F7X EASy II

Ground Training schedule				
Day 1 (7.5 Hrs)	**Day 2 (7.5 Hrs)**	**Day 3 (7.5 Hrs)**	**Day 4 (7.5 Hrs)**	**Day 5 (7.5 Hrs)**
• 7X / EASy introduction • OEM Publications • Aircraft General • Avionics	• Operational Methodology (Normal) • Avionics / Navigation • Phase of Flight Training	• Electrical • Autoflight • Avionics / Navigation • Phase of Flight Training • Lighting	• Avionics / Navigation • Phase of Flight Training • Indicating & Recording • Operational Methodology	• Avionics / Navigation • Performance • Parking & Securing • Communications • Flight Deck Mgmt #4 • Flight Deck Mgmt #5
Day 6 (7.5 Hrs)	**Day 7 (0 Hrs)**	**Day 8 (7.5 Hrs)**	**Day 9 (7.5 Hrs)**	**Day 10 (7.5 Hrs)**
• Performance • Operational Methodology (Abnormal) • Master Warning System • Phase of Flight Training • Avionics / Navigation • Autoflight	• Scheduled Day Off	• Fuel • APU • Powerplant • Performance • Avionics / Navigation • Flight Deck Mgmt #6	• Hydraulics • Landing gear - Brakes - Nose wheel steering • Fire protection • Communications • Flight Deck Mgmt #7 • Flight Deck Mgmt #8	• Performance • Flight Controls • Operations - Crosswind take-off • CRM
Day 11 (7.5 Hrs)	**Day 12 (7.5 Hrs)**	**Day 13 (7.5 Hrs)**	**Day 14 (0 Hrs)**	**Day 15 (7.5 Hrs)**
• Performance • Avionics / Navigation • Pneumatics • Air Conditioning • Pressurization	• Ice & Rain Protection • Cold weather operations • QFE operations • Oxygen • Waste & Water • Avionics / Navigation	• Performance • High Altitude operations • Avionics / Navigation • Flight Deck Mgmt #9	• Scheduled Day Off	• High Altitude operations • Avionics / Navigation • ADMS - MMEL • Flight Deck Mgmt #10
Day 16 (7.5 Hrs)	**Day 17 (4.5 Hrs)**			
• Review • EASA Written Exam Part 1 (Sect. 1, 2, 3, 4, 5 and 6) • EASA Written Exam Part 2 (Sect. 7 and 8) • Flight Deck Mgmt #11	• Briefing • Cockpit Procedure Trainer • Debriefing			

Flight Training schedule				
Day 18 (5.5 Hrs)	**Day 19 (5.5 Hrs)**	**Day 20 (5.5 Hrs)**	**Day 21 (0 Hrs)**	**Day 22 (5.5 Hrs)**
• Briefing • Flight Simulator #1 • Debriefing	• Briefing • Flight Simulator #2 • Debriefing	• Briefing • Flight Simulator #3 • Debriefing	• Scheduled Day Off	• Briefing • Flight Simulator #4 • Debriefing
Day 23 (5.5 Hrs)	**Day 24 (5.5 Hrs)**	**Day 25 (5.5 Hrs)**	**Day 26 (5.5 Hrs)**	**Day 27 (6.5 Hrs)**
• Briefing • Flight Simulator #5 • Debriefing	• Briefing • Flight Simulator #6 • Debriefing	• Briefing • Flight Simulator #7 • Debriefing	• Briefing • Flight Simulator #8 • Debriefing	• Oral Exam (if required) • Flight Simulator - FAA or JAA • Check ride • Debriefing

Note: The first simulator session with motion must be done in normal FCS configuration, to be familiarized with EASy II and FBW within their normal operating envelopes, prior to introducing FBW degraded laws exercises in further FFS sessions.

Training Footprint – Initial F8X

The first simulator session with motion must be done in normal FCS configuration, to be familiarized with EASy III and FBW within their normal operating envelopes, prior to introducing FBW degraded laws exercises in further FFS sessions.

5.3. Initial Training, Transition Training and Upgrade (to captain) Training

5.3.1. Pilots: RBAC 135.341, 135.343 e 135.345 – Initial, Transition and Upgrade Ground Training

Initial, transition and upgrade ground training for the Falcon 7X and 8X should be performed under the provisions of RBAC 135. In addition to the recommendations of paragraph 135.345, the Training Areas of Special Emphasis, should be included in the ground curriculum.

5.3.2. Pilots: RBAC 135.347 – Initial, Transition and Upgrade Flight Training

Initial, transition and upgrade flight training for the Falcon 7X and 8X should be performed according to RBAC 135.347 and to the Training Areas of Special Emphasis.

5.3.3. Crewmember: RBAC 135.331 – Crewmember Emergency Training

Training of appropriate emergency situations should be provided for each crew member as in RBAC 135.331. The purpose of the emergency training is to provide every crew member, the necessary knowledge about the location, function and operation of emergency equipment and procedures in order to assure the performance of right actions in the event of an emergency.

The emergency training consists of instruction on the location, function and emergency equipment operation that are different in each variant of the Falcon 7X and other aircraft in the operator's fleet. When the interior configuration elements are the same, training can be credited simultaneously for each variant. On the other hand, if there are differences within the same aircraft model, differences training should be executed. Suitable training record should be maintained to demonstrate that the crew meet the requirements of RBAC 135.331.

Emergency training consists of instructions on the procedures assigned to each member of the crew, including coordination between the crew and communication suitable for the control of an emergency situation and other abnormal conditions and other specific procedures for each variant or model.

The requirements for emergency training refer to the two types of training: general and specific training for the type of aircraft. General training refers to instruction in equipment that are commonly used in all aircraft operator's fleet, for instance, fire extinguisher. Specific training for the type of aircraft are instructions on specific items to Falcon 7X or 8X, for example, location of equipment on board.

5.3.4. TAWS/(E)GPWS, Windshear Guidance and TCAS

Crew operating aircraft with any of these systems should receive appropriate training to ensure knowledge, skills and proficiency in the routine operation of each of these systems. Special attention should be given to training "windshear" according to AC 00-54A - Pilot Wind Shear Guide and be familiar with the AC 120-55C regarding TCAS.

5.3.5. Seat Dependent Tasks

The execution of some tasks, procedures and maneuvers can be dependent on the crewmember position. The program should properly address this need. Events that may result in tasks, procedures and dependent seat controls are: rejected take-off, emergency descent and manual operation of the landing gear.

5.3.6. Special Events Training

Training for some special events is recommended. Such training should be conducted to increase the ability of the crew to deal with rare events eg. unusual attitudes recovery simulation and disturbances in the flight path due to wing tip vortices. Training should be conducted to improve the basic knowledge of the crew and their confidence with respect to the Falcon 7X and 8X handling characteristics as well as its limitations.

5.3.7. Controlled Flight Into Terrain (CFIT) and Runway Incursion Prevention, Approach and Landing Accident Reduction (ALAR)

To meet the ANAC and industry effort to reduce CFIT, ALA and Runway Incursion accidents, special emphasis is appropriate on these topics. The emphasis should be on situational awareness, crew coordination and mode selection of automated systems for guidance and flight control, use of TAWS or (E)GPWS, charts consultation, taxi procedures and familiarization with airports.

5.3.8. CNS/ATM

Crews operating in areas where CNS/ATM operations are implemented should receive instructions for proper use of systems related to operations in these areas, on the routes and procedures to be followed (eg. RNAV, RNP, ANP, RVSM, etc.). Training should address the communication, navigation, surveillance and "data link" functions to ensure proficiency and skill of the crew for routine operation of the systems.

Pilots should be able to understand the implications of VHF use with minimum spacing of 8.33 kHz in areas where the minimum spacing is 25 kHz and vice versa.

5.3.9. CRM - LOFT

The CRM - LOFT operators programs must be developed according to IAC 135-1002 and approved by ANAC / SPO to ensure its effectiveness.

5.4. Differences Training

5.4.1. F7X EASy I to EASy II

Prerequisites

- Type Rating on F7X EASy I, or
- Type Rating training on F7X EASy I up to but excluding the check ride.

Training Areas of Special Emphasis

- Proficiency in using Flight Path Vector vertical and lateral displacement (un-caged FPV) in new IPFD design.
- Proficiency in performing ILS/LPV approaches in raw data.
- Proficiency in using FPV in connection with synthetic vision (terrain, virtual runway).
- Proficiency in using all Flight Management System Windows.
- Proficiency in using TO and GA modes of EASy II.
- VNAV mode.

Checking

No Checking is required further to the EASy I to EASy II difference training course.

EASy II training credits (except ATC Data Link)

Considering the similarities in EASy II definitions among F2000EX EASy variants, F900EX EASy variants and F7X, the following training credits apply - refer to Dassault Aviation document ref. DGAC13DSOF025:

	Crew qualified and current on		
	F2000EX EASy / DX / LX /LXS / S EASy II (M3254)	F900EX EASy / DX / LX EASy II 1st Cert (M5340)	F900EX EASy / DX / LX EASy II 2nd Cert (M5595)
F7X EASy II (M1122)	D	B	B

- Note that neither checking nor currency credit have been determined yet.
- Existing Pilot Type Rating designations remain applicable.

5.4.2. F7X EASy II to F8X

Prerequisites

- Type Rating on F7X with training on EASy II, or
- Type Rating training on F7X with training on EASy II up to but excluding the check ride.

Training Areas of Special Emphasis

- Proficiency in operating EASy III FMS.
- Proficiency in operating RDR-4000.
- Windshear maneuver (only for A/C without Windshear Escape Guidance).
- Location of the TCS pushbutton on the F8X sidesticks.
- Landing technique in CLEAN configuration.
- Engine thrust setting during take-off in crosswind condition.
- Possible late and/or slow rotation at take-off.
- Easy III: Heading legs and Floating DTK legs.

Checking

No checking is required further to F7X EASy II to F8X difference training course for pilots fully type-rated on F7X with training on EASy II (i.e. with a successful check ride on F7X EASy II).

5.4.3. F8X to F7X EASy II

Prerequisites

- Type Rating on F7X covering the F8X variant, or

- Type Rating training on F7X covering F8X variant up to but excluding the check ride.

Training Areas of Special Emphasis

- Proficiency in operating Weather Radar P880.
- Location of the TCS pushbutton on the F7X sidesticks.

Checking

No checking is required further to F8X to F7X EASy II difference training course for pilots fully type-rated on F7X with training on F8X (i.e. with a successful check ride).

5.5. LINE FLYING UNDER SUPERVISION (LIFUS)

There is a variety of reasons why the GAA may recommend LIFUS. 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 addressed 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.

5.5.1. LIFUS - Falcon 7X with EASy I

For an initial Pilot Type Rating on F7X EASy I, the LIFUS comprises at least 10 route sectors plus a line check.

For pilots already qualified and current on F900EX EASy variants and / or on F2000EX EASy variants, due to similar EASy I avionics suites on F7X variants, the LIFUS on F7X variants could be reduced to 5 route sectors plus a line check.

5.5.2. LIFUS - Falcon 7X with EASy II

For an initial Pilot Type Rating on F7X EASy II, the LIFUS comprises at least 10 route sectors plus a line check.

For pilots already qualified and current on F900EX EASy variants and / or on F2000EX EASy variants, due to similar EASy avionics suites on F7X variants, the LIFUS on F7X variants could be reduced to 5 route sectors plus a line check.

5.5.3. LIFUS - Falcon 8X

For an initial Pilot Type Rating on F8X, the LIFUS comprises at least 10 route sectors plus a line check.

The required route sectors for LIFUS can be equally performed on F7X and/or F8X.

For pilots already qualified and current on F900EX EASy variants and/or on F2000EX EASy variants, and due to similarities with EASy III avionics, the LIFUS on F8X could be reduced to 5 route sectors plus a line check.

5.5.4. LIFUS - Falcon 7X EASy I to EASy II

For pilots already qualified and current on F900EX EASy variants and/or on F2000EX EASy variants, due to similar EASy avionics suites on F7X variants, the LIFUS on F7X variants could be reduced to 5 route sectors plus a line check.

5.5.5. LIFUS – Falcon EASy II to Falcon 8X

LIFUS performed on F7X is valid on F8X.

The required route sectors for LIFUS can be equally performed on F7X and/or on F8X.

For pilots already qualified and current on F900EX EASy variants and/or on F2000EX EASy variants, and due to similarities with EASy III avionics, the LIFUS on F8X could be reduced to 5 route sectors plus a line check.

5.5.6. LIFUS – Falcon 8X to Falcon 7X EASy II

LIFUS performed on F8X is valid on F7X.

The required route sectors for LIFUS can be equally performed on F7X and/or F8X.

For pilots already qualified and current on F900EX EASy variants and/or on F2000EX EASy variants, and due to similarities with EASy III avionics, the LIFUS on F8X could be reduced to 5 route sectors plus a line check.

5.6. Recurrent Training

The recurrent training must be developed according to RBAC 135.351.

5.6.1. Recurrent Flight Training

The recurrent flight training requires that the appropriate maneuvers according to RBAC 135 are executed. Emphasis should be placed on systems and procedures that may not have been and/or will not be used operationally until the next training.

5.7. Other Trainings

5.7.1. Flight Attendant: RBAC 135.349 and 135.351 – Initial, Transisiton and Recurrent Training

Cabin crew are not required for operation of the Falcon 7X or 8X. However, if an operator wishes, cabin crew may be employed and, in this case, should be properly trained. Anyone who is hired to do any service in the cabin should be considered as cabin crew.

The purpose of the ground training is to provide cabin crew an understanding of Falcon 7X / 8X aircraft. This knowledge is necessary for the crew to perform their tasks and procedures required in normal, abnormal and emergency situations.

The training should include instruction on the ground in two distinct areas: general subjects and specific emergencies subjects of each aircraft. Specific emergencies subjects training are included in paragraph 5.3.3.

The general subjects training includes instruction on the general description of the aircraft, its equipment, systems and interior furnishings; routine reporting procedures and coordination procedures; tasks assigned to each crew member in routine operations, abnormal and emergency

procedures in each flight phase for each variant. If there are differences in the cabin setting the cabin crew members should be trained separately on each type of aircraft. Such qualification can be completed simultaneously. Credit is allowed for common items.

As part of an approved training program, an operator can use many methods to conduct ground training, including instruction in the classroom, photos, video, training devices, CBT and the aircraft itself.

Initial and transition training should include an examination to determine the competence of the crew to perform their tasks. The examination shall cover each equipment and emergency procedure that is unique to each variant.

Recurrent training for cabin crew should include reviews and tests to determine the level of their knowledge about their procedures and tasks to be performed in normal, abnormal and emergency procedures for each variant of the Falcon 7X aircraft in the fleet. In addition, recurrent training of cabin crew members should include a check of their competence to perform their tasks in abnormal and emergency situations in each variant of the Falcon 7X fleet, whether specific or general tasks. The proficiency check shall cover each device and procedure that is unique to each variant.

6. Exam Specifications

6.1. Exam Items

The knowledge, procedures and maneuvers in the RBAC 61 and RBAC 135 related to the multiengine jet aircraft apply to the Falcon 7X and 8X.

6.2. Areas of Emphasis

The following areas should be addressed during the exams as necessary:

a) Proficiency in manual and automatic flight (including FMS) in normal, abnormal and emergency conditions should be demonstrated by the crew. Emphasis should be applied in the selection and use of the appropriate mode, crew coordination to implement changes in the mode and the data and interpretation of the information;
b) It should be demonstrated proficiency in the operation of systems such as electrical, hydraulic, pressurization and air conditioning, etc;
c) Proper visual scan without prolonged fixation on FMS should be demonstrated by examining pilot. Failures of FMS components should be addressed;
d) Appropriate selection of maps "displays", raw data and flight director should be demonstrated by the examined pilot, particularly in instrument approaches;
e) GPS/FMS navigation, if approved for the operator;
f) Demonstration of proficiency shall be performed in RNP, RVSM or other equipment or specialized operations where appropriate;
g) Landing and braking procedures and techniques;
h) No flaps approach and landing should be addressed during the training and verified during the examination; and
i) Proficiency in speed control in various phases of flight should be demonstrated.

6.3. No Flaps Landing

Proficiency in approach and abnormal landing with no flaps should be demonstrated. However, a touchdown is not required, just an approximation to a point from which, in the opinion of the examiner, a landing would be safely performed.

6.4. Use of MEL

The use of MEL should receive an appropriate emphasis as part of the check process to address the problems related to workload and safety. For proper use of the MEL, should be confirmed that the training, qualifications and experience of the crew are adequate.

6.5. Proficiency Checks

Proficiency checks should be administered as designated in RBAC 61 and RBAC 135 for the Falcon 7X and 8X.

6.6. Oral Examination

An oral examination for the Falcon 7X and 8X should be run between the ground training and the training in flight simulator.

7. FLIGHT TRAINING DEVICES SPECIFICATIONS

7.1. Approval of Aircraft Simulators and Other Training Devices - RBAC 135.335.

The use of flight simulators and training devices approved for the training program or pilot training should only be approved after the issuance of the qualification by ANAC.

Training and periodic checks can be performed both in the Falcon 7X/8X simulators or combination of simulators, flight training devices and aircraft, as appropriate for each operator.

8. GENERAL

8.1. Aircraft proving and validation tests (Operational Evaluation Flights - RBAC 135.145)

Each operator must perform the operational evaluation flights according to the RBAC 135.145 and as approved by ANAC case by case.

9. SPECIAL TRAININGS

Special training is the training that should be prepared by an operator to qualify its crew to conduct certain operations. Special training is typically used for operations that require specific authorization; for example. Cat III, ETOPS, alternative CG, use of HUD, EFVS, etc.

Special training programs should be submitted for approval case by case.

10. SPECIFIC OPERATIONS

Data contained in this section are only applicable if the end-user intends to operate the specific operations outlined in this paragraph.

These data are equally applicable to F7X equipped with EASy I or EASy II avionics, or to F8X, unless otherwise specified.

None of these Specific Operations affects the Pilot Type Rating / Pilot License Endorsement, which remain unchanged.

10.1. Customization of Normal Checklists

Operators can customize the Normal Checklists of the ECL, provided they comply with the guidance provided by Dassault "General Rules - Guidance for Customizing Normal Procedures" document reference DGAC-07-DOT-097.

10.2. Rockwell-Collins HGS 5860 Head-Up Display (HUD) only - *Not applicable to F8X*

10.2.1. Prerequisites

The minimum prerequisite for entering the Rockwell-Collins HGS 5860 HUD training course is:

- A current Type Rating on F7X,
- Or a Type Rating training on F7X, up to but excluding the check ride.

10.2.2. Training Area of Special Emphasis

The TASE for the Rockwell-Collins HGS 5860 HUD is the following:

- DME distance in Rockwell-Collins HUD during LPV approach.

10.2.3. Currency

No specific currency requirement has been identified to operate Rockwell-Collins HUD.

10.2.4. Credits

No specific credit has been identified.

10.3. Rockwell-Collins HGS 5860 HUD with Enhanced Vision System (EVS) for situational awareness - *Not applicable to F8X*

10.3.1. Prerequisites

The minimum prerequisites for entering the Rockwell-Collins HGS 5860 HUD with EVS course are:

- A current Type Rating on F7X,
- Or a Type Rating training on F7X, up to but excluding the check ride,
- A training course for the Rockwell-Collins HGS 5860 HUD,
- The ability to use the Rockwell-Collins HGS 5860 HUD safely as a primary flight display in every EVS approved phases of flight.

10.3.2. Training Area of Special Emphasis

The TASE for the Rockwell-Collins HGS 5860 HUD with EVS for situational awareness is the following:

- Enhanced Vision System for situational awareness.

10.3.3. Currency

In addition to Air Crew and Air Operations regulations, the recurrent training (ground course) should include the EVS TASE listed above.

Recency is maintained by the recurrent training and checking as prescribed by the Air Crew and Air Operations regulations.

10.3.4. Credits

No specific credit has been identified.

10.3.5. Other Recommendations

PM EVS familiarization flown in the left seat is recommended.

Operator's Operations Manual for EVS should include the following items:

- Procedures for call-outs during approach based on the EFVS image available for both pilots.
- Procedures for calibration of the EFVS.
- Procedure for the use of the kill/dim switch, especially when "frozen" images are displayed.
- Detailed procedures for both precision and non-precision EFVS approaches including crew coordination and call out items.
- Procedures to ensure, that the EFVS image is removed whenever it is degraded by weather conditions (e.g. rain, ice, mist...).
- Procedures to be followed whenever the EFVS image has been removed during an approach.

10.4. Rockwell-Collins HGS 5860 HUD with Enhanced Vision System (EVS) with operational credits (IS 91-003) - *Not applicable to F8X*

10.4.1. Prerequisites

The minimum prerequisites for entering the Rockwell-Collins HGS 5860 HUD with EVS with operational credits training course are:

- A current Type Rating on F7X,
- Or a Type Rating training on F7X, up to but excluding the check ride,
- A training course for the Rockwell-Collins HGS 5860 HUD, and
- The ability to use the Rockwell-Collins HGS 5860 HUD safely as a primary flight display in every EVS approved phases of flight.

10.4.2. Training Area of Special Emphasis

The TASE for the Rockwell-Collins HGS 5860 HUD with EVS with operational credit is the following:

- Rockwell-Collins HUD with Enhanced Vision System for operational credits

10.4.3. Currency

In addition to Air Crew and Air Operations regulations, the recurrent training (ground course) should include the EVS TASE listed above.

EVS training in the duties of the PM in the right seat is required.

Recency is maintained by the recurrent training and checking as prescribed by the Air Crew and Air Operations regulations.

10.4.4. Credits

No specific credit has been identified.

10.5. FalconEye Head Up Display (HUD) only - *applicable to F8X only*

10.5.1. Prerequisites

The minimum prerequisite for entering the FalconEye HUD training course is:

- A current Type Rating on F7X with training on F8X,
- Or a Type Rating training on F7X with training on F8X, up to but excluding the check ride.

10.5.2. Training Area of Special Emphasis

The TASE for the FalconEye HUD is the following:

- FalconEye HUD: ILS deviations instead of expected LPV deviations
- FalconEye HUD: DME distance during LPV approaches
- FalconEye HUD only: no deviation from standard escape procedures
- FalconEye HUD: lateral deviation scale
- FalconEye HUD: LH pilot perception of weather conditions
- FalconEye HUD must only be used in the standard IRS configuration
- FalconEye HUD: SVS Runway Clear Zone activation
- FalconEye HUD: possible misalignment cases
- FalconEye HUD: controls localization and accessibility
- FalconEye HUD: Thrust Director dynamic
- FalconEye HUD: possible FPV saturation
- FalconEye HUD: video quality

10.5.3. Currency

No specific currency requirement has been identified to operate FalconEye HUD.

10.5.4. Credits

Credits for training between F2000LXS/S or F900LX, and F8X, all fitted with FalconEye HUD

Due to similar installation/functions and use of the FalconEye HUD between F2000LXS/S, F900LX and F8X, a pilot type-rated on both F2000LXS/S and F8X or on both F900LX and F8X who has attended respectively the F2000LXS/S or F900LX FalconEye HUD training course is de-facto considered trained on F8X fitted with FalconEye HUD (and vice-versa) if a self-instruction (Level A) is performed to highlight the differences between F2000LXS/S FalconEye and F8X FalconEye or between F900LX FalconEye and F8X FalconEye (and vice-versa).

The **Maximum difference levels** from airplane F8X to F8X fitted with FalconEye CVS is **D/B/B** for training checking and currency, respectively.

10.5.5. Other Recommendations

Training Footprint

The following minimum Dassault Aviation footprint is applicable to Pilot Flying (PF) a F8X fitted with FalconEye HUD:

- 4 hours of ground school instruction, and

- 2 hours of simulator training.

For more details regarding the training specification, refer to Dassault Aviation document reference DGAC15DSOF202 (FalconEye Head-Up Display and Enhanced Vision System Pilot Training Programs).

Note 1: This F8X FalconEye training footprint covers both HUD and EVS.

Note 2: When the F8X FalconEye training is performed during a F8X initial training course, the F8X FalconEye training can be included into the current F8X Type Rating training footprint.

10.6. FalconEye HUD with Enhanced Vision System (EVS) for situational awareness - *Only applicable to F8X*

10.6.1. Prerequisites

The minimum prerequisite for entering the FalconEye HUD training course with EVS for situational awareness are:

- A current Type Rating on F7X covering the F8X variant,
- Or a Type Rating training on F7X covering the F8X variant, up to but excluding the check ride,
- And the ability to use the FalconEye HUD safely as a primary flight display in every EVS approved phases of flight.

10.6.2. Training Area of Special Emphasis

The TASE for the FalconEye HUD with EVS for situational awareness is the following:

- FalconEye HUD with EVS: call-outs in EVS/CVS final approach phase
- FalconEye EVS: EVS contrast setting
- Enhanced Vision System for situational awareness

10.6.3. Currency

No specific currency requirement has been identified to operate FalconEye HUD with EVS for situational awareness.

10.6.4. Credits

<u>Credits for training between F2000LXS/S or F900LX, and F8X fitted with FalconEye EVS for situational awareness</u>

Due to similar installation/functions and use of the FalconEye HUD with EVS between F2000LXS/S, F900LX and F8X, a pilot type-rated on both F2000LXS/S and F8X or on both F900LX and F8X who has attended respectively the F2000LXS/S or F900LX FalconEye EVS training course is de-facto considered trained on F8X fitted with FalconEye EVS (and vice-versa) if a self-instruction (Level A) is performed to highlight the differences between F2000LXS/S FalconEye and F8X FalconEye or between F900LX FalconEye and F8X FalconEye (and vice-versa).

The **Maximum difference levels** from airplane F8X to F8X fitted with FalconEye is **D/B/B** for training checking and currency, respectively.

10.6.5. Other Recommendations

Training Footprint

The following minimum Dassault Aviation footprint is applicable to Pilot Flying (PF) a F8X fitted with FalconEye HUD and Enhanced Vision System (EVS) for situational awareness:

- 4 hours of ground school instruction, and
- 2 hours of simulator training.

For more details regarding the training specification, refer to Dassault Aviation document reference DGAC15DSOF202 (FalconEye Head-Up Display and Enhanced Vision System Pilot Training Programs).

Note 1: This F8X FalconEye training footprint covers both HUD and EVS.

Note 2: When the F8X FalconEye training is performed during a F8X initial training course, the F8X FalconEye training can be included into the current F8X Type Rating training footprint.

10.7. Close-in Noise Abatement Departure Procedure (NADP)

The following elements of special emphasis apply for the London City Close-In NADP procedure developed by Dassault Aviation. They are applicable to London City airport, and can be validated for other airports, provided:

- The new NADP procedure is accepted by ANAC,
- All obstacle clearance requirements are fulfilled,
- The initial NADP training should comprise, as a minimum, three normal take-offs, and two abnormal take-offs (e.g. engine failure / medium windshear at thrust reduction),
- The recurrent NADP training should be annually, and should include, as a minimum, one normal take-off and one abnormal take-off,
- If both pilots are intended to act as PF, all take-offs should be conducted with PF position in right seat, then PF position in left seat.

10.7.1. Training Areas of Special Emphasis

The NADP TASE are the following:

- NADP - Use of close in NADP Limitations, Operating Procedures and Performance.
- NADP - Special operation procedures / Task sharing.
- NADP - Key parameters.

10.7.2. Other Recommendations

Training footprint

- The initial NADP training should comprise, as a minimum, three normal take-off, and two abnormal take-off (e.g. engine failure / medium windshear at thrust reduction),
- The recurrent NADP training should be annually, and should include, as a minimum, one normal take-off and one abnormal take-off.

10.8. Steep Approach Landing

10.8.1. Prerequisites

There is no prerequisite for entering the Steep Approach training, except a current type rating on the airplane, or a full type rating training up to, but excluding, the check ride.

10.8.2. Training Area of Special Emphasis

Flight training (as PF or PM) may be conducted in a Level C or D Full Flight Simulator or in the aircraft, with a Type Rating Instructor (TRI) and must address the following Steep Approach Landing TASE:

- Steep Approach Landing (F900EX EASy / F7X variants).

10.8.3. Checking

There is no requirement for knowledge checking or flight proficiency testing for F7X variants steep approach qualification.

10.8.4. Currency

There is no specific recent experience or currency requirement for Steep Approach Landing.

10.8.5. Credits

Full credit is granted for training requirements when operating Steep Approach in either F7X or F8X.

Steep Approach training may be performed either on a F7X or a F8X Full Flight Simulator.

10.8.6. Other Recommendations

Training for Steep Approach Landing consists in flight training, including briefing (no formal academic training, i.e. no classroom training), for competency in conducting Steep Approach Landing operations.

The Steep Approach Landing pilot training course can be an integral part of the airplane type rating training course.

The **Maximum difference levels** from airplane F7X with Steep Approach Landing to F8X with Steep Approach Landing is **A/A/A** for training checking and currency, respectively.

The **Maximum difference levels** from airplane F8X with Steep Approach Landing to F7X with Steep Approach Landing is **A/A/A** for training checking and currency, respectively.

The **Maximum difference levels** from airplane F8X to F8X with Steep Approach Landing is **D/A/B** for training checking and currency, respectively.

Initial training

The initial training should comprise, as a minimum, three Steep Approaches:

- One 5.5° path angle approach with full stop landing to comply with normal procedures, and
- One 6° path angle approach with a $\pm$ 5 kt speed abuse managed by crew, followed by a go-around event if the speed is stabilized, and
- One 5.5° or 6° path angle approach with an engine failure below 400 ft, followed by a full stop landing or a go-around at pilot's discretion.

When a HUD is installed, the first approach should be flown using the HUD (final phase is VMC), and in accordance with the Dassault Aviation Limitations, Operating Procedures, and Performance section applicable for steep approaches. In flight, the HUD should be used during the VMC phase.

Recurrent training

The recurrent steep approach training should be taken every 6 months, and should include, as a minimum, one steep approach and a second steep approach where non-normal situations are introduced during the approach.

Lugano airport - Dassault Aviation letter of non-objection

Dassault Aviation letter reference DGT592425 provides a non-objection for steep approach landing on Lugano airport runway 01 (LSZA).

10.9. ATC Data Link with EASy II avionics - *Not applicable to F8X*

10.9.1. Prerequisites

Prerequisite for ATC Data Link training is a type rating training on any EASy Aircraft (F7X variants, F900EX EASy variants or F2000EX EASy variants).

10.9.2. Training Area of Special Emphasis

The ATC Data Link TASE is the following:

- ATC Data Link.

10.9.3. Credits

Considering the similarities in ATC Data Link definitions among F2000EX EASy variants, F900EX EASy variants and F7X variants, ATC Data Link training is valid for all Falcon aircraft equipped with EASy II.

10.10. ATC Data Link with EASy III avionics - *Not applicable to F7X*

10.10.1. Prerequisites

Prerequisite for ATC Data Link training is a Type Rating training on F7X covering the F8X variant up to but excluding the check ride.

10.10.2. Other Recommendations – ATC DATA Link (with EASy II or EASy III Avionics)

Initial Training

The initial course should cover the ICAO Global Operational Data Link Document (GOLD) and should include CBT or equivalent for the pilot to become familiar with the operational use.

The first ATC Data Link flight should be conducted under supervision.

Currency

It is recommended to use ATC Data Link at least once every 6 months.

Checking and currency credit are not applicable.

10.11. iPad Electronic Flight Bag (EFB) - *Not applicable to F8X*

This EFB solution consists in two iPad 2 (models A1395 and A1396, iOS versions 5.x) to be operated as backup in the EASy cockpit with the purpose to display:

- Jeppesen Mobile TC iOS application (version 1.2), as a backup of the EASy Jeppesen terminal charts (in replacement of the current paper backup).
- Jeppesen Mobile FD iOS application (version 1.0), with terminal charts as a backup of the EASy Jeppesen terminal charts, and with en-route charts and airway manuals used as primary means with FMS as a backup.

The following items should be complied with:

- The EFB administrator should lock down the location services (own ship position) of the devices using a password protection. Activating the own ship position option may qualify the applications as type C.
- The EFB administrator ensures that non-EFB software applications do not adversely impact the operation of the EFB.
- A kneeboard that follows Dassault recommendations (form factor) is used. In that case only the approval may be granted for use during all phases of flight.
- The training proposed by Jeppesen for Mobile FD iOS en-route charts proposes a tutorial as a basic means to allow optimizing the use of the en-route charts, however operators must adapt it to their procedures.

The above does not substitute to, or prevail over any of the terms of the Jeppesen applications End User License Agreements (EULA) and of the Apple hardware and software Product Agreements. The users must read the EULA and have the responsibility to accept the different agreements prior to using the applications.

10.12. CMC Electronic Flight Bag (EFB) - *Not applicable to F8X*

This EFB solution consists in two CMA-1100TM EFB devices manufactured by CMC Electronics. The primary use of the EFB system is backing up the EASy charting system that is integral part of the EASy cockpit concept, but the system may be used as a standalone system in the absence of the EASy charting system.

Each EFB device hosts software applications for the operational use of the pilot. These software applications are limited to EFB Type A and Type B software.

The evaluated type B software are:

- Jeppesen JeppView software application at version 3.5.1.0, and
- Jeppesen FliteDeck software application at version 3.7.1.0.

10.12.1. Training

Initial training

Initial Ground Training should be at Level B. Level B training can be adequately addressed through aided instruction such as slide / tape presentation, computer based instruction which may be interactive, video or classroom instruction.

Initial Flight Training should be at Level C. Level C training should be accomplished by use of “hands on” training in an EASA qualified FSTD level C/CG or higher, or on an airplane equipped

with the Dassault Class 2 EFB. The training should address skills and abilities as well as knowledge and include both normal and non-normal procedures.

Initial checking

At the end of the ground training, the check can be either a questionnaire (oral or written) or an automated component of EFB computer-based training depending on the nature of the training conducted.

Where the operator is the TRTO and the Skill Test is being conducted following training that is integrated with the operator's conversion course, or where the Proficiency Check is being conducted concurrently with the Operator's Proficiency Check, and where the operator's SOPs are dependent on the use of the EFB on the particular type or variant, proficiency in the use of the EFB should be assessed in the appropriate areas.

During the Operator Proficiency Check and the Line Check, when an operator's SOPs are dependent on the use of an EFB, proficiency in its use should be assessed.

10.12.2. Currency

Recurrent training

Recurrent training for the use of an EFB is not normally required, provided the functions of the EFB system are used regularly in line operations.

Normal EFB operations should be included as a component of the annual ground and recurrent training, including, in particular, the alternative procedures to be used for dispatch with an EFB inoperative or not available.

11. OPERATIONAL DOCUMENTATION

- Operators are strongly recommended to use CODDE 1 (Airplane Description), CODDE 2 and CODDE 3 (Operations Manual) provided by Dassault Aviation.

- The Electronic Check-List (ECL) provided by Dassault Aviation is considered as a primary mean for the execution of abnormal and emergency procedures and normal check-lists. The AFM, QRH 2 and ECL should be updated simultaneously (to the extent practicable), to ensure that there are no discrepancies between them. However, any discrepancy that may exist due to the nature of the paper versus electronic should be brought to the knowledge of the operator.

11.1. MMEL/MEL

The dispatch as established in the MEL should be analyzed and will eventually result in specific training requirement. The Operator should specify the procedures and crew training.

11.2. Aircraft Operating Manual

The use of POM as a base for operating in Brazil can be benefic, but should be examined in detail by the sector in charge of the approval before the first flight.

12. CONCLUSION

12.1. Operations in Brazil

The results in this report are based on data obtained from previous reports, on materials produced and sent by the manufacturer of the aircraft, operators and documents of other civil aviation authorities, on the meeting held with the manufacturer and on the familiarization flight conducted by BAEG- FA7X.

In this way, any documents, information or actions taken and which do not have registration as integral parts of the process conducted by BAEG-FA7X were not considered in the preparation of this report. The documentation used by the ANAC inspectors during analysis, in printed or digital versions, is held by the Agency, and should be considered in future evaluations of the aircraft Falcon 7X and 8X operation by Brazilian operators.

This reference document is available at ANAC website, through the link: http://www.anac.gov.br/assuntos/setor-regulado/profissionais-da-aviacao-civil/avaliacao-operacional

ANNEX 1: EFVS AND STEEP APPROACH - FALCON 7X

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2. REFERENCE DOCUMENTS
• OEB Report - EASA
• FSB Report - FAA

3. RESULTS

3.1 Type Rating Definition
There is already a Type Rating for Falcon 7X in ANAC: FA7X.

There is no specific Type Rating required for EFVS operation, nor for Steep Approach, although specific training is required for EFVS operation.

3.2 Special Operations
The manufacturer has developed a recommended minimum training program for EFVS operation as well as for Steep Approach.

Based on the analysis of both programs and evaluating the relevance of the proposed content, as well as the theoretical and practical workload, the GAA recommends, in consonance with the manufacturer, that both pilots should undergo the initial specific training in flight simulator for EFVS operations and Steep Approach.

The GAA, also in line with the manufacturer, recommends specific recurrent training in flight simulator annually for EFVS operation.

3.3 MMEL
The EVFS components (FLIR and HUD) are already included in the MMEL.

3.4 Aircraft Operating Manual
The manufacturer provides both Airplane Flight Manual (AFM) and QRH (Quick Reference Handbook) as well as the "CODDE" operating manual. These manuals already incorporate the EFVS (with and without operational credit for 100 ft of DH (Decision Height)) and the Steep approach.

3.5 Compliance with applicable RBHA and RBAC
The new systems comply with the applicable RBHA and RBAC. However, there is no provision in the Brazilian regulations so far for the granting of operational credit for aircraft operating EFVS to follow up to a DH of 100 ft.

Thus, until a Brazilian regulation covering this possibility, the operation will be restricted to the minimums currently in use. Once such a regulation is created in Brazil, no further action would be required to allow the aforementioned operating credit, since the flight manuals and the simulator training (both initial and recurrent) already cover this scenario.

3.6 Flight Simulator

In order to be used in an EVFS training program for Falcon 7X, the flight simulator must be qualified by ANAC.