EUROPEAN AVIATION SAFETY AGENCY





Bombardier Learjet 60
Bombardier Learjet 60XR

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2. REVISION RECORD

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JAA Operations Evaluation Board (JOEB)

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4. GLOSSARY

AC	Advisory Circular
ADF	Automatic Direction Finder
ADG	Air Driven Generator
ADS	Air Data System
AEG	Aircraft Evaluation Group
AFCS	Automatic Flight Control System
AFM	Aircraft Flight Manual
AGL	Above Ground Level
AMC	Acceptable Means of Compliance
AOC	Air Operator Certificate
AOM	Aircraft Operations Manual
APU	Auxiliary Power Unit
APR	Automatic Performance Reserve
ATC	Air Traffic Control
ATPL	Airline Transport Pilot License
AWO	All Weather Operations
CCP	Cursor Control Panel
CDU	Control Display Unit
CPD	Common Procedures Document
CPL	Commercial Pilot License
CPT	Cockpit Procedure Trainer
CVR	Cockpit Voice Recorder
DA	Decision Altitude
DCP	Display Control Panel
DH	Decision Height
DRP	Display Reversionary Panel
EASA	European Aviation Safety Agency
ECS	Environmental Control System
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
FAA	Federal Aviation Administration
FCL	Flight Crew Licensing
FCOM	Flight Crew Operating Manual
FCP	Flight Control Panel
FDR	Flight Data Recorder
FGS	Flight Guidance System
FMA	Flight Mode Annunciator
FMS	Flight Management System
FSB	Flight Standardization Board
FTD	Flight Training Device
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
HAA	Height Above Aerodrome
IEM	Interpretative and Explanatory Material
IFR	Instrument Flight Rules
ILS	Instrument Landing System
ISA	International Standard Atmosphere
JAA	Joint Aviation Authorities
JOEB	Joint Operational Evaluation Board
JSET	Joint Simulator Evaluation Team
LIFUS	Line Flying Under Supervision
LOFT	Line Oriented Flight Training
MCR	Master Common Requirements
MCDU	Multifunction Control Display Unit

MDA	Minimum Descent Altitude
MDR	Master Difference requirements
MFD	Multi-Function Display
MMEL	Master Minimum Equipment List
MSL	Mean Sea Level
MTOW	Maximum Take-Off Weight
MLAW	Maximum Landing Weight
MZFW	Maximum Zero Fuel Weight
NAA	National Aviation Authority
ODR	Operator Difference Requirements
PFD	Primary Flight Display
PIC	Pilot In Command
QRH	Quick Reference Handbook
RTU	Radio Tuning Unit
RVSM	Reduced Vertical Separation Minima
SOP	Standard Operating Procedure
STD	Synthetic Training Device
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TCCA	Transport Canada Civil Aviation
TRTO	Type Rating Training Organization
V_A	Design maneuvering speed
V_{FE}	Maximum flaps extended speed
VFR	Visual Flight Rules
V_{LE}	Maximum landing gear extended speed
V_{LO}	Maximum landing gear operating speed
V_{MO}	Maximum operating speed
V_{MCA}	Minimum control speed air
V_{MCG}	Minimum control speed ground
TSO	Technical Standard Order
VNAV	Vertical Navigation
V_S	Stall speed
WOW	Weight on Wheels

5. EXECUTIVE SUMMARY

In July 2007, a Bombardier Learjet 60XR Joint Operational Evaluation (JOEB) was conducted. The JOEB Chairman, nominated by the European Aviation Safety Agency (EASA), is a qualified and current Learjet 60 Captain who completed initial type rating training at the Bombardier training center in Dallas Texas, USA in 2006.

The findings for the two phase operational evaluation are identified in this report. As no previous evaluation of the Learjet 60 was performed and the Learjet 60XR is simply an upgraded version of the Learjet 60, this report addresses both variants. Provisions of this report are effective until amended, superseded or withdrawn by subsequent operational evaluation determination.

The operational evaluation was conducted in accordance with the: JAA Terms of References for JOEBs; JOEB Handbook; and the document "Common Procedures for Conducting Operational Evaluations" (CPD). During the evaluation it was determined that Bombardier's proposal to award Learjet 60 and Learjet 60XR same pilot type rating/single license endorsement was valid.

This report identifies the EASA/JAA minimum training, checking and currency requirements for the Learjet 60 and Learjet 60XR differences training programs and makes recommendations with regards to the initial type rating and differences training programs. The recommendations for the Training Courses were based upon direct participation, observation or analysis by the Chairman. The courses satisfy the requirements of JAR-FCL 1.

The Learjet 60 and 60XR are aircraft with a complexity and capabilities which can be compared to larger transport aircrafts and they are operated in the same environment. It is therefore recommended, that non-AOC holders follow the requirements and recommendations in this report.

The scope of the evaluation was limited to Category I operations. If approval for operations below Cat I minima is sought in the future, further JOEB involvement will be necessary.



Evan Nielsen
(EASA Certification, Head of Flight Standards)

Date: 25 September 2007

6. OPERATIONAL EVALUATION

6.1 History

Bombardier Learjet has introduced a modified configuration of the Learjet Model 60 as the new production aircraft. Beginning with aircraft serial number 319, the older Learjet 60 configuration will be discontinued and the new configuration marketed as the Learjet 60XR. The Learjet 60XR is not a new aircraft but an upgrade of a certified aircraft that has been in service for fourteen (14) years. Both aircraft are listed on EASA's Type Certificate Data Sheet (TCDS) # EASA.IM.A.21.2 and share the same model number.

Bombardier requested that the operational evaluation define the minimum training, checking and currency requirements for the differences training programs and the benefits associated with single license endorsement be granted. No JOEB report existed for the Learjet 60 therefore a catch-up exercise was necessary to create a Learjet 60 JOEB report; the base aircraft in this comparison is the Learjet 60.

For pilot training purposes, neither the Learjet 60 nor the 60XR are considered to be variants of earlier Learjet aircraft. During this exercise, no Learjet 60/60XR comparison was conducted with other types or variants and accordingly no credit may be given for training, checking and currency.

The FAA has completed their operational evaluation of the Learjet 60XR and on June 4, 2007 published their FSB report.

6.2 Overview

The Learjet 60 and 60XR are all metal, pressurized, low-wing, turbofan-powered aircraft.
Thrust is provided by two pod-mounted PW305A turbofan engines manufactured by Pratt and Whitney Canada, Inc. Each engine delivers 4600 lb of thrust at sea level.
Engine-driven hydraulic pumps supply hydraulic power for braking, extending and retracting the landing gear, wing flaps, and spoilers.

The flight controls are manually controlled through cables, bell cranks, pulleys, and push-pull tubes. Lateral and directional trim is accomplished by electrically-actuated trim tabs installed on the left aileron and the rudder. Longitudinal trim is accomplished by changing the angle of incidence of the horizontal stabilizer with an electrically operated linear actuator.

Aircraft environmental systems provide heating, cooling, and pressurization for the crew, passenger, and cabin baggage compartments.

The new Learjet-60XR variant introduces new passenger cabin configurations, increased legroom, light emitting diode (LED) lighting and a new audio-visual system. The most significant Learjet 60XR upgrade is to the cockpit. The Learjet 60XR aircraft is equipped with a Rockwell Collins Pro Line 21 avionics suite; the out of production Learjet 60 has the older Rockwell Collins Pro Line 4 avionics.

The Learjet 60XR aircraft is capable of maintaining a cruise speed of up to 0.81 Mach. The aircraft maximum operating altitude is 51,000 ft. The maximum operating range is 2499 nm (4.625 km) with four passengers, ISA, and IFR reserves.

The Learjet-60 and Learjet-60XR share identical handling characteristics and in-flight operational procedures therefore transitioning from the Pro Line 4 equipped Learjet 60 to the Pro Line 21 equipped Learjet 60XR can be addressed through differences training.

6.3 Process

A meeting was held 21 June 2007at EASA headquarters in Cologne at which Bombardier informed EASA of the immediate sale of a number of aircraft to European customers. EASA identified the need to conduct a Learjet 60XR JOEB.

The first phase of the operational evaluation was conducted at the Bombardier DFW training center in Texas. During the period July 14 – 21 the JOEB Chairman completed:

- Recurrency training in the Learjet 60 full flight simulator (FFS)
- Three days of instructor-led Learjet 60XR ground school training
- T3 test in Learjet 60XR FFS
- LOF training in the Learjet 60XR FFS

The second phase consisted of an administrative catch-up process that created a JOEB report that addressed both the Learjet 60 and 60XR. The JOEB findings presented in this report are based upon the JOEB Chairman's initial and differences training and his Learjet 60 operational experience. Existing FAA Learjet 60 and 60XR FSB reports were also referenced.

The JOEB is responsible for conducting future evaluations of the Learjet 60 and 60XR aircraft. Re-evaluation may be required if a new derivative is produced or significant hardware or software modifications are made to existing production 60XR aircraft. JOEB activity may also be required when new systems such as HUD, EVS or SVS are introduced. The Board will then determine the associated impact on training, checking and currency and will amend this report accordingly.
The Jeppesen map and its presentation has not been part of this evaluation. Before such equipment should be used by European operators, a proper EFB evaluation should be performed by the EASA Certification team and the JOEB team.
From the information we have on this optional equipment, it appears to be a class 3 EFB with type 3 software.

6.4 Results

1. In accordance with the provisions in JAR-FCL a Single License Endorsement or same pilot type rating was assigned to Learjet 60 and Learjet 60XR. The license Endorsement is

Learjet60.

2. The basic Type Rating or initial training course(s) as described in paragraph 10 of this report are recommended for approval.

3. The Differences Training course(s) as described in paragraph 11 of this report are recommended for approval.

4. A compliance check against JAR-OPS subpart K and L was not performed because a suitably configured aircraft was not available.

7. MASTER COMMON REQUIREMENTS (MCR)

The Master Common Requirements specify those items of crew qualification that apply to both variants. Master Common Requirements for all Learjet 60 and Learjet 60XR aircrafts are presented in Appendix 1.

8. MASTER DIFFERENCE REQUIREMENTS (MDR)

MDR provisions apply when differences exist between variants which affect crew knowledge, skills or abilities related to flight safety (e.g. Level A or greater differences). Master Difference Requirements for the Learjet 60 and Learjet 60XR are presented in Appendix 2.

9 OPERATOR DIFFERENCE REQUIREMENTS (ODR)

ODR tables are used to show an operator's compliance method for training, checking and currency requirements in mixed fleet operations. ODR tables for operators conducting mixed fleet operations, using Learjet 60 and Learjet 60XR aircraft are shown in Appendix 3. The tables represent an acceptable means to comply with MDR provisions but do not necessarily represent the only acceptable means of compliance.

Any operator seeking different means of compliance must request and obtain approval from their Authority.

10. INITIAL TYPE RATING TRAINING COURSE on Learjet-60:

Bombardier is an approved Type Rating Training Organization under JAR-FCL. Courses are conducted under the direction of the Head of Training.
The Bombardier Learjet 60 Type Rating training course consists of the following elements:

- Ground school: 6 days of 6 hours each. Additionally, each day includes a 2 hour FTD session each day to become familiar with the checklist and procedures and prepare for the simulator sessions.
- A written ground school exam (124 questions, multiple choice), covering the aircraft's systems, including performance and weight and balance.
- Flight simulator training, 6 sessions.
- Flight simulator Licence Skill Test.

The JOEB recommends that the course elements and number of hours above be regarded as the minimum training required.

This Training Course is recommended for Approval by the EASA/JAA to the National Aviation Authorities with the following conditions:

Pre-entry requirements:
Course pre-requisites shall be as determined by the Training Organisations and their Authorities.

11. DIFFERENCES TRAINING COURSE

Three days of differences training is required when transitioning between the two aircraft. Both courses share the same training footprint. The Bombardier Learjet 60 and 60XR Type Rating training courses consists of the following elements:

- Ground school: 3 days
- Level C Training: 2 days of 12 hours total. This will familiarize the student with the FMS and Proline 21 system. These FTD sessions are conducted as instructor-led training and supported by desk top interactive computer based training devices (level C). The last 4 hours of this training may be omitted if the student passes a 20 question written test consolidating knowledge and skills.

12. CABIN CREW REQUIREMENTS

There is no requirement for a cabin crew member on this aircraft. The aircraft has a Type I Main Door.

13. MISCELLANEOUS

13.1 All Weather Operations

Take-off capability at the lowest JAA minima (JAR-OPS, subpart E) was previously evaluated and was found to be acceptable. Approach capabilities other than Cat. I ILS, non-precision (including constant angle approach) were not evaluated.

For approval of approach limitations below Cat I, a specific evaluation of the aircraft's capabilities will need to be performed.