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Operational Suitability Data (OSD) Flight Crew

Gulfstream GVI (G650)

15 December 2014

Gulfstream GVI

Operational Suitability Data (OSD) – Flight Crew

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Revision Record

Rev. No.	Content	Date
OEB Report Original	GVI Initial Evaluation	06 Mar 2013
OSD FC Original	Replaces and incorporates the OEB report for the GVI. Addition of new Appendix 3 – PlaneView II Avionics Software Version “Block Point I” (ASC 901)	15 Dec 2014

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Acronyms

AC	Advisory Circular
AFM	Aircraft Flight Manual
AGL.....	Above Ground Level
AMC	Acceptable Means of Compliance
AP	Autopilot
AT	Autothrottle
CBT.....	Computer Based Training
CPD	Common Procedures Document for conducting Operational Evaluation Boards, dated 10 June 2004
CRM.....	Crew Resource Management
CS-FCD	Certification Specifications for Operational Suitability Data (OSD) Flight Crew Data CS-FCD, Initial issue, 31 January 2014
CS-FSTD(A)	Certification Specifications for Aeroplane Flight Simulation Training Devices of 4 July 2012
Difference Level	A designated level of difference as defined in CS-FCD
DU	Display Unit
EASA	European Aviation Safety Agency
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EGPWS.....	Enhanced Ground Proximity Warning System
EU-OPS	Commission Regulation (EC) No 859/2008 of 20 August 2008 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane.
EVS.....	Enhanced Vision System
FAA.....	Federal Aviation Administration
FADEC.....	Full Authority Digital Engine Control
FAR.....	Federal Aviation Regulation
FCS.....	Flight Control System
FFS	Full Flight Simulator (Level C/D)
FPA.....	Flight Path Angle
FPV	Flight Path Vector
FSB	Flight Standardization Board
FTD	Flight Training Device
GM	Guidance Material
HUD	Head-up Display
ISI	Independent Standby Instrument
LIFUS.....	Line Flying Under Supervision
LPC.....	Part-FCL Licence Proficiency Check
LOFT.....	Line Orientated Flying Training
LST	Licence Skill Test

MDR	Master Difference Requirements
MEL.....	Minimum Equipment List
MFD	Multi-Function Display
MMEL.....	Master Minimum Equipment List
MMO	Maximum Operating Mach Number
NAA.....	National Aviation Authority
ND	Navigation Display
OEB	Operational Evaluation Board
ODR	Operator Differences Requirements
OPC	Operator Proficiency Check
OSD	Operational Suitability Data
Part-FCL	Flight Crew Licensing: Annex I to Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (as amended)
Part-ORO	Organisation Requirements for Air Operations: Annex III to Commission Regulation (EU) No 965/2012 of 05 Oct 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (as amended)
Part-SPA	Specific Approvals: Annex V to Commission Regulation (EU) No 965/2012 of 05 Oct 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (as amended)
PF	Pilot Flying
PFD.....	Primary Flight Display
PIC	Pilot In Command
PM.....	Pilot Monitoring
QRH	Quick Reference Handbook
RAAS	Runway Awareness Advisory System
Route Sector	as defined in Part-FCL ["Route sector" means a flight comprising take-off, departure, cruise of not less than 15 minutes, arrival, approach and landing phases]
SIC	Second In Command
SFD	Standby Flight Display
SMC	Standby Multifunction Controller
TASE	Training Areas of Special Emphasis
TAWS.....	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
V2	Take-off Safety Speed
VNAV	Vertical Navigation

Preamble

1. Introduction

Where references are made to requirements and where extracts of reference texts are provided, these are at the amendment state at the date of evaluation or publication of this document. Users should take account of subsequent amendments to any references, in particular concerning requirement for civil aviation aircrew and air operations.

Determinations made in this document are based on the evaluations of specific configurations of aircraft models, equipped in a given configuration and in accordance with current regulations and guidance.

Modifications and upgrades to the aircraft evaluated require additional OSD assessment for type designation, training / checking / currency, operational credits, and other elements within the scope of the OSD evaluations.

In accordance with Commission Regulation (EU) No 69/2014 of 27 Jan 2014, the Operational Suitability Data contained in this document are identified as follows:

[M].....mandatory Operational Suitability Data, bearing the status of rule (see GM No 3 to 21A.15(d))

[AMC]non-mandatory Operational Suitability Data, bearing the status of Acceptable Means of Compliance (see GM No 3 to 21A.15(d))

2. Initial Operational Evaluation GVI (G650)

An initial operational evaluation for the Gulfstream GVI (G650) aircraft was conducted by a joint EASA OEB and FAA FSB team in Savannah, GA between May and July 2012. The EASA Operational Evaluation was conducted in accordance with the EASA OEB Handbook, the CPD, and applicable Part-FCL and EU-OPS requirements.

The scope of the initial operational evaluation included:

- Aircraft type designation and pilot license endorsement;
- initial pilot type rating training;
- reduced pilot type rating training based on commonality between the following aircraft types:
 - GV-SP (G550 and G500) to the GVI (G650); and
 - GIV-X (G450 and G350) to the GVI (G650);
- Head-up Display (HUD) & Enhanced Vision System (EVS) training
- pilot training, checking, and currency / recent experience.

Operations or the use of special equipment or functions such as RNP AR approaches, Steep Approaches, ETOPS, wake vortex categorisation, etc. were not evaluated.

3. PlaneView II Block Point I (ASC 901) Operational Evaluation

In a further operational evaluation in July 2013, pilot qualification requirements for the PlaneView II Avionics Software version with 'Block Point I' upgrade (ASC 901) were evaluated.

4. Operational Evaluations – Group Composition

Name	Organization	Function
Helge Andreassen ¹⁾	EASA	EASA Team Member
Jonas Gavelin ¹⁾	EASA	EASA Team Member
Terry Neale ^{1) 2)}	EASA	EASA OEB Chairman
Jamie Shawyer ¹⁾	EASA	EASA Team Member
Herbert Meyer ^{1) 2)}	EASA	EASA Section Manager
Craig Edkins	FAA	FSB Team Member
Mark Humphreys	FAA	FSB Chairman
Don Kerr	FAA	FSB Team Member
Thomas Witts	FAA	FSB Team Member

¹⁾ initial evaluation, 2012

²⁾ PlaneView II Block Point I (ASC 901) evaluation, 2013

Operational Suitability Data (OSD) – Flight Crew**1. Aircraft Type Designation and Pilot License Endorsement [M]**

With reference to Part-FCL, FCL.010 ('type of aircraft') and GM1 FCL.700, the Gulfstream GVI (G650) series aircraft has been evaluated for aircraft categorisation and license endorsement.

The license endorsement is established as "GVI".

Manufacturer	Aircraft Model / Name	License Endorsement	Variants	Complex	SP / SP HPA / MP	OEB FC REPORT / OSD FC available	Remarks
Gulfstream Aerospace Corporation	Gulfstream GVI (G650)	GVI	X	X	MP	X	OSD FC, dated 15 Dec 2014
	Gulfstream GVI (G650) with PlaneView II Avionics Software Version "Block Point I" (ASC 901)						

2. Aircraft Specifics**2.1 Customization of Procedures and Checklists**

[AMC] 2.1.1 EASA evaluated standard Gulfstream procedures and checklists. Any customization should be evaluated by the Competent Authority.

[M] 2.1.2 The manufacturer has developed procedures to be followed in case of abnormal and emergency situations. It is the manufacturer's philosophy to not identify any steps in these procedures as so-called "Memory Items". Yet pilots are expected to perform some of those initial and critical steps without reference to any documentation. The manufacturer has advised that the following emergency procedures should be initially performed promptly without reference to a checklist:

Rejected Take-off, Engine Failure/Fire after V1, Emergency Descent, Rapid Decompression, AP or AT Uncommanded Disconnect, Engine Exceedance, Overspeed, Stall Protection / Stall Warning Activation, Flight Control Jams, Total Loss of Braking, EGPWS Alert, Windshear Alert, TCAS Alert. In addition, crews are expected to don oxygen masks promptly when appropriate – for example when smoke is detected.

Operators and training providers must ensure that pilots are trained in accordance with this or other acceptable defined procedures that satisfy these provisions for time-critical emergencies.

[AMC] 2.1.3 Standard Noise Abatement procedures should be included in SOPs, as these are common at many European airports.

2.2 Aircraft Approach Category [M]

With reference to Part-CAT, CAT.OP.MPA.320(b) the approach category for the GVI is as follows:

Aircraft	Category
GVI	C

The approach category can be higher dependent on the operation. The determination should be made by the operator based on approach speed calculations in accordance with applicable regulations.

2.3 Forward Observer Seat

The GVI forward observer seat is part of the type certificated design. The OEB evaluated it and found that it is operationally suitable.

[AMC] 2.4 Standby Flight Display (SFD)

The GVI contains a new concept Independent Standby Instrument (ISI), referred to as a Standby Flight Display (SFD), which is incorporated into a dual Standby Multifunction Controller (SMC).

Each SMC is located on the glare shield in front of each pilot. The SMC combines the ISI and a menu control system for other system displays. The crew may manually select the SFD for display on either SMC at any time when it is operationally desirable. In addition, the following conditions will result in the automatic display of the SFD, without additional crew action:

- Loss or Reversion of a PFD
- Electrical Break Power Transfer (in-flight only)
- PFD to MFD conversion after loss of two DU's
- Cross-side SMC failure
- Attitude Miscompare (PFD-to-PFD or PFD-to-SFD or SFD-to-SFD)
- Altitude Miscompare (PFD-to-PFD or PFD-to-SFD or SFD-to-SFD)
- Heading Miscompare (PFD-to-PFD or PFD-to-SFD)
- Airspeed Miscompare (PFD-to-PFD or PFD-to-SFD)
- Unusual Attitudes (greater than ± 30 degrees of pitch and/or greater than 65 degrees of roll)

Furthermore, the EASA AFM includes limitations and operational procedures for the flight crew to have one SFD displayed during the take-off and approach/landing phases of flight when the airplane is lower than 1500 ft AGL. Operators should consult these limitations and may wish to apply higher altitude limits when determining their own operational procedures.

2.5 Part-CAT, Subpart D – Instruments, Data, Equipment

EU operators must show compliance with applicable elements of Annex IV to EU Regulation 956/2012 (Part-CAT, Subpart D), prior to beginning commercial transport operations. EASA did not evaluate the GVI for compliance with the applicable elements of Part-CAT, Subpart D.

3. Operator Differences Requirements (ODR)

[M] GIV-X to GVI and GV-SP to GVI, as well as GVI to GIV-X and GVI to GV-SP, ODR tables have been evaluated and approved for reduced type rating training. These are retained by Gulfstream as part of the Operational Suitability Data.

Evaluated ODR tables are Gulfstream generic and therefore may not include items that are applicable to particular operators.

[AMC] Operators using more than one variant must have approved ODR tables pertinent to their fleet.

4. Master Differences Requirements (MDR) [M]

4.1 MDR Tables

MDR tables for the GVI show the various levels for Training / Checking / Currency related to the installation of the PlaneView II Avionics Software Version “Block Point I” (ASC 901).

Master Differences Requirements (MDR) Table			
	FROM AIRPLANE		
TO AIRPLANE		GVI	GVI with PlaneView II Avionics Software Version “Block Point I” (ASC 901)
	GVI	—	not evaluated
	GVI with PlaneView II Avionics Software Version “Block Point I” (ASC 901)	C ¹⁾ / A / A	—
¹⁾ Level C Differences Training refers to initial differences training (see Appendix 3 for further details).			

5. Specifications for Training

5.1 GVI Initial Type Rating Training (Transition)

5.1.1 Prerequisites

[AMC] Prior experience in multi-engine transport turbojet aircraft and prior knowledge on EFIS, FMS operation and integrated avionics is recommended for initial training on the GVI.

5.1.2 GVI Transition Training

The Gulfstream GVI Standard Transition Course for initial pilot type rating training was evaluated and confirmed compliant with the applicable requirements.

[AMC] The Gulfstream GVI Standard Transition Course for initial pilot type rating training should be used as a baseline for the GVI type rating training.

[AMC] Appendix 1 shows the footprint of the evaluated training, including duration and training devices used.

5.2 Reduced Type Rating Training GIV-X (G450 and G350) to GVI and/or GV-SP (G550 and G500) to GVI

5.2.1 Prerequisites

[M] The provisions for reduced type rating training apply to pilots who are current and qualified on either the GV-SP or the GIV-X and have flown at least 150 hours in the respective GV-SP or GIV-X aircraft within the last 24 months.

5.2.2 Training

[M] Training for the areas of commonality as defined in the ODR tables, requires as a minimum, the use of an FTD Level 2 or an FFS Level A or B. Training for elements which are outside the area of commonality requires the use of an FFS Level C or D.

[AMC] The Gulfstream GVI Reduced Type Rating Training should be used as a baseline for the reduced type rating training from the GIV-X to the GVI or from the GV-SP to the GVI.

[AMC] Appendix 2 shows the footprint of the evaluated reduced type rating course, including duration and training devices used.

5.3 Seat-dependent tasks training

[M] The following training items have been identified for seat dependent tasks for the GVI training:

- Head-up Display (left seat)
- Enhanced Vision System (left seat)
- Passenger Oxygen System activation (right seat)

5.4 PBN Operations (Future Air Navigation Systems - FANS, RNP, ANP, CNS, CPDLC, ADS)

[AMC] Flight Crews operating aircraft equipped with FANS software should receive appropriate instruction in its general operational functions, appropriate uses for areas of operation, routes, or procedures to be flown. General training should address communications, navigation, and surveillance (CNS) functions covered by FANS, RNP, and ANP. In addition, sufficient training in use of data link communication and Automatic Dependent Surveillance (ADS) to ensure adequate knowledge, skill, and proficiency for flight crews to operate the above system(s) in typical daily operations (requiring their use) should be provided.

5.5 HEAD-UP DISPLAY (HUD)

5.5.1 HUD Training

The GVI is fitted with a HUD as standard equipment and the training in its use is integrated into the type rating course.

[M] Pilot training for HUD must be accomplished in an FFS Level C with a daylight visual display, or an FFS Level D. Each pilot in command must receive a minimum of 3 hours ground school instruction followed by a minimum of 4 hours of FFS training in the left-hand seat of a suitably qualified FFS. An aircraft may be used for in-flight training if an FFS is not available. In-flight training must consist of a minimum of 4 hours in the left-hand seat.

[M] 5.5.2 HUD Training Areas of Special Emphasis (TASE)

The following items must receive special emphasis as specified, during ground and flight training in all referenced training:

Ground training:

- Crew Co-ordination and CRM
- Crew briefings and callouts
- Duties of PF and PM

Flight Training:

- Use of the caged and un-caged mode, especially in crosswind conditions
- Use of the Pitch Limit Indicator (PLI) during windshear and TAWS escape manoeuvres
- Approaches using the Flight Path Vector (FPV)
- Misuse of the acceleration cue as a potential Flight Path Angle (FPA)
- Relationship of glide path angle to the airport symbology
- Use of the flare cue during approach and landings
- Recovery from unusual attitudes

- TCAS RA
- Take-off performance using the FPA as an aid in meeting the required climb gradient
- Steep turns
- Importance of the 'design eye position' indicators in acquiring the full HUD image
- HUD repeater imagery, use and CRM implications

5.5.3 Checking

[AMC] To ensure pilots do not become 'HUD dependent', training and checking should ensure proficiency is also maintained without the use of HUD

[AMC] Steep turns are a manoeuvre designed to exercise pilots' instrument scan and should be performed without the use of the HUD or FPV (on the PFD).

5.6 Enhanced Vision System (EVS)

5.6.1 EVS Prerequisites

[M] Pilots undergoing EVS training must be fully proficient in the use of the HUD.

5.6.2 EVS Training

The GVI is fitted with EVS as standard equipment.

[M] Pilot training for EVS must be accomplished in an FFS Level C with a daylight visual display, or an FFS Level D. Each pilot in command must receive a minimum of 4 hours ground school instruction followed by a minimum of 4 hours of FFS training in the left-hand seat of a suitably qualified FFS. An aircraft may be used for in-flight training if an FFS is not available. In-flight training must consist of a minimum of 2 hours in the left-hand seat.

[AMC] EVS approaches may be conducted as part of LIFUS. Pilots occupying the right-hand seat should undergo the same theory instruction and a minimum of one departure and two approaches, including one go-around from minima in the FFS or aircraft.

[M] 5.6.3 EVS Training Areas of Special Emphasis (TASE)

The following items must receive special emphasis as specified, during ground and flight training in all referenced training courses:

Ground training:

- Crew Co-ordination and CRM
- Crew briefings and callouts including annunciation of published minima and EVS minima
- Transition from EVS imagery to non-EVS imagery, visual conditions
- Use of videos of actual EVS approaches

- Visual anomalies (e.g., “blooming” and “noise”)
- Importance of cross-checking HUD presentations against EVS visual scene presentation to enable pilots to recognise malfunctions of the ground-based navigation equipment and improper presentation of elements in the visual scene during an approach
- Use of barometric altitude and/or radio altitude at low heights, including temperature correction if applicable
- Possible lack of obstacle clearance following go-around below normal published minima
- Importance of calibration checks
- Limitations and failure modes
- Duties of PF and PM
- Weather limitations
- Eye level to camera level
- Taxi speed awareness especially in low visibility

Flight Training:

- Crew Co-ordination and CRM
- Crew briefings and callouts including annunciation of published minima and EVS minima
- Transition from EVS imagery to non-EVS imagery, visual conditions. Maximum use should be made of videos of actual EVS approaches as seen through the combiner
- Importance of “design eye position” in acquiring the correct EVS image
- Use of the yoke mounted ‘ON/OFF’ switch “clear” mode
- Precision and non-precision approaches in both day and night conditions
- Weather limitations
- Possible obscuration of symbology when EVS image is incorrectly set too bright
- Use of the caged and un-caged modes in crosswind conditions
- Runway lights
- EVS repeater imagery, use and CRM implications
- Limitations and failure modes

5.7 Training Areas of Special Emphasis (TASE)

[M] 5.7.1 Ground and Flight Training (all type rating courses)

The following items must receive special emphasis as specified, during ground and flight training in all referenced training courses:

- **Flight Control Modes:**

This aircraft utilizes fly-by-wire flight controls. It is important to thoroughly understand the operation of the aircraft in each of the flight control modes.

This item must be included in initial and recurrent ground and in initial and recurrent flight training.

- **Fan blade out:**

The vibrations caused by the loss of an N1 fan blade are the most severe when the airplane is in the approximate mid-range of the airspeed operating envelope. At normal cruise speeds and altitudes, it is not intuitive to speed up to M_{MO} / V_{MO} when the aircraft is vibrating severely.

This item must be included in initial and recurrent ground and in initial and recurrent flight training.

- **No-flap landing including the effects of wing anti-ice and de-rotation:**

When the anti-ice switches are selected ON, the angle-of-attack protection function schedule changes (due to assumptions in the flight control laws about ice formation on the wings when flaps are less than 10 degrees) and a lower approach speed is achievable. The airplane will have a higher pitch attitude on landing and the nose wheel must be positively lowered to the runway to avoid excessive landing distance. Selection of reverse thrust before nose wheel touchdown may cause a pitch-up and require more nose-down pilot input.

This item must be included in initial ground training and in initial and recurrent flight training.

- **Emergency descent procedure:**

The autopilot may disconnect due to angle-of-attack protection activation if the speed brake is rapidly deployed.

This item must be included in initial ground training and in initial flight training.

- **Overspeed protection:**

Overspeed protection provided by the FCS is designed to prevent the aircraft from exceeding V_{MO} , but not M_{MO} when operating at higher altitudes. This is particularly relevant during an Emergency Descent when the autopilot is not engaged.

This item must be included in initial and recurrent ground and in initial and recurrent flight training.

- **Delayed engine response to full power applications at various altitudes:**

In particular, high altitude stalls and any manoeuvres with flaps less than 22 degrees.

This item must be included in initial ground training and in initial flight training.

- **Aerodynamics:**

This aircraft has some flight characteristics that are not present in other Gulfstream models:

- Take-off characteristics – the importance of not exceeding the commanded pitch

attitude during rotation, especially when single-engine, and the importance of appropriate rudder input, particularly after an engine-failure, to avoid pronounced yaw-induced roll.

- High induced drag below approximately 0.83M – the risk of getting slow and the associated difficulty in recovering with the thrust available at or near maximum cruise altitude in level flight.

This item must be included in initial ground training and in initial flight training.

- **Standby Flight Display (SFD):**

The SFD pop-up should be trained during normal and non-normal operations, both in manual selection and automatic display, including in startle scenarios and various phases of flight

This item must be included in initial and recurrent ground and in initial and recurrent flight training.

- **Flight Management System (FMS):**

Triple FMS failure is a possibility and was observed during the OEB evaluation. Pilots should be trained to handle such events in various phases of flight.

This item must be included in initial and recurrent ground and in initial and recurrent flight training.

- **Nose Wheel Steering (NWS) failure on landing**

NWS may fail upon touchdown as indicated by the amber “Steer by Wire Fail” CAS message. The accompanying aural indication will be inhibited, so the failure may not be readily detected. Tiller steering and rudder pedal controlled NWS will be inoperative. This will require the use of rudder and differential braking to maintain directional control on the runway.

Flight training in a simulator should include

- prior completion of the Airplane Flight Manual (AFM) Before Landing checklist to inhibit the associated aural warning; and
- the fault being upon nose wheel touchdown with a 28 knot crosswind. NWS should be restored by following the AFM procedure with the aircraft straight ahead on the runway because improper use of differential braking to turn, whilst taxiing with a free-castering nose wheel could cause damage to the nose wheel if it travels beyond its limits. The simulator should be capable of triggering the malfunction automatically upon nose wheel touchdown and allow crews to clear the fault by following the AFM procedure.

This item must be included in initial and recurrent ground training and initial and recurrent flight training.

5.7.2 Specific Flight Characteristics for training

- All items listed as TASE for flight training
- The first indication of the approach to a stalling angle-of-attack is normally the activation of the stick shaker, but under some circumstances the blue “FCC AOA Limiting” CAS message may appear first.

[AMC] 5.7.3 Operator specific elements

Operators may add additional elements as required by their operation, and these will vary. Training organisations should review their training courses when applicable aircraft modifications occur. Training organisations may add additional elements as required by the operator.

5.8 Differences Training, Checking and Currency requirements for pilots transitioning from the basic PlaneView II Avionics Software version to the ‘Block Point I’ upgrade installed with ASC 901 in the Gulfstream GVI (G650)

5.8.1 Prerequisites

[M] Pilots transitioning from the GVI to the GVI PlaneView II Block Point I Avionics Software must be current and qualified on the GVI base aircraft.

5.8.2 Differences Training

[M] Initial transition training requires level C differences training, recurrent training requires that differences are addressed at Level B.

[AMC] Initial differences training should be performed using any of the following training media: slide / tape presentations, computer-based tutorial instruction, stand-up lectures or video tapes.

5.8.3 Checking, Recent Experience/Currency

[M] There are no specific requirements for checking, recent experience/currency when transitioning to the PlaneView II Block Point I Avionics Software version.

5.9 Special Events Training

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

- recovery from unusual attitudes, including handling qualities and procedures during recovery from an upset condition (e.g., following a wake vortex encounter or loss of control incident);

- manual flight with minimum use of automation, including flight under degraded levels of automation;
- high altitude, high and low speed buffet margins and flight characteristics;
- Controlled Flight Into Terrain (CFIT), TCAS, EGPWS (emphasis on avoidance and escape manoeuvres, altitude awareness, TCAS / EGPWS warnings, situational awareness and crew co-ordination, as appropriate).

5.10 Recurrent Training

Recurrent training must be compliant with EU regulations for civil aviation aircrew and air operations, as applicable, and include the identified Training Areas of Special Emphasis.

[AMC] Recurrent training should incorporate special events training as described in this document on a rotational basis.

6. Line Flying Under Supervision (LIFUS) / Supervised Operating Experience (SOE)

LIFUS should be performed in accordance with ORO.FC.220 and AMC1 ORO.FC.220(e). Furthermore, GM1 ORO.FC.220(d) provides guidelines for operators to use when establishing their individual requirements. Supervised Operating Experience (SOE) may be established in accordance with Part-FCL, FCL.720.A (g) through the operational suitability evaluation.

6.1 LIFUS following GVI Initial Type Rating Training

[AMC] In the case of pilots completing the initial type rating for the GVI, a minimum of 8 route sectors LIFUS should be performed, followed by a 2 route sector line check. Operation with and without the use of HUD / EVS in different phases of flight should be addressed.

6.2 LIFUS following GVI Reduced Type Rating Training

[AMC] In the case of pilots completing the Reduced Type Rating Training GIV-X (G450 and G350) to GVI and/or GV-SP (G550 and G500) to GVI, a minimum of 4 route sectors LIFUS should be performed, followed by a 2 route sector line check. Operation with and without the use of HUD / EVS in different phases of flight should be addressed.

[AMC] Where there is a change of operating conditions or route structure, this should be taken into account and may need additional route sectors to cover these elements.

7. Specifications for Checking – LPC/OPC

7.1 Recurrent Checking – LPC/OPC

Recurrent checking is addressed in Part-FCL and Part-ORO, specifically in ORO.FC.130, ORO.FC.220, ORO.FC.230, AMC1 ORO.FC.230, GM1 ORO.FC.230, ORO.FC.240, and AMC1 ORO.FC.240

[M] The following items must be included in the LST and LPC/OPC:

- Precision approach using HUD and EVS;

Note: *See also paragraph 5.5 – HUD*

- LPV approach; and
- Landing from a No-Flap or Non-Standard Flap Approach

Note: *The probability of flap extension failure on the GVI is not extremely remote due to system design. Therefore, demonstration of a no-flap / non-standard flap approach and landing during the LPC/OPC is required.*

7.2 Line checks

[M] A line check performed on either GVI variant of PlaneView II Avionics Software is valid for both.

8. Specifications for Recent Experience and Currency

8.1 Recent Experience

Recent experience requirements are contained in Part-FCL, FCL.060.

8.2 Currency

[AMC] Operators should consider establishing currency requirements when operating GVI variants with different PlaneView avionics upgrades.

9. Specification for Operations of More Than One Type – MFF (Mixed Fleet Flying)

Operation on more than one type or variant is addressed in Part-ORO, ORO.FC.140, ORO.FC.240 and associated AMCs.

Credits for the operation of the GVI together with other type of aircraft have not been evaluated.

Appendix 1**[AMC] GVI Initial Type Rating Training**

Day 1	Day 2	Day 3	Day 4	Day 5
Manuals CRM Systems (7:00)	Flight Planning Systems (7:00)	Systems (7:00)	Systems (7:00)	Pre-Flight Systems (7:00)
Day 6	Day 7	Day 8	Day 9	Day 10
Systems (7:00)	Systems (7:00)	Systems (7:00)	Systems (7:00)	Mass & Balance Performance Systems (7:00)
Day 11	Day 12	Day 13	Day 14	Day 15
Systems (7:00)	Systems (7:00)	Review TKE (7:00)	FFS 1 (7:00)	FFS 2 (7:00)
Day 16	Day 17	Day 18	Day 19	Day 20
FFS 3 (7:00)	FFS 4 (7:00)	FFS 5 (7:00)	FFS 6 (7:00)	FFS 7 (7:00)
Day 21				
LST – FFS (5:50)				

Notes:

FFS: Full Flight Simulator (FFS Level C or D); FFS times INCLUDE time for briefing and de-briefing; FFS Training and the LST are performed in a multi-pilot environment

TKE: Technical Knowledge Examination

LST: Licence Skill Test

Daily training time is dependent upon the progress, and the needs, of the student and may exceed 8 hours.

Supplemental Training Modules (if required) must be completed prior to attending this course.

Appendix 2

[AMC] GVI Reduced Type Rating Training

Day 1	Day 2	Day 3	Day 4	Day 5
Manuals CRM Systems (8:00)	Systems (8:00)	Pre-Flight Windshear Systems (8:00)	Systems (7:00)	Systems (6:00)
Day 6	Day 7	Day 8	Day 9	Day 10
Systems (8:00)	Mass & Balance Performance Flight Planning Systems TKE (8:00)	FFS 1 (5:50)	FFS 2 (5:50)	FFS 3 (5:50)
Day 11	Day 12	Day 13		
FFS 4 (5:50)	FFS 5 (5:50)	LST – FFS (6:50)		

Notes:

FFS: Full Flight Simulator (FFS Level C or D); FFS times INCLUDE time for briefing and de-briefing; FFS Training and the LST are performed in a multi-pilot environment

TKE: Technical Knowledge Examination

LST: Licence Skill Test

Daily training time is dependent upon the progress, and the needs, of the student and may exceed 8 hours. Supplemental Training Modules (if required) must be completed prior to attending this course.

Appendix 3

PlaneView II Avionics Software version with 'Block Point I' upgrade installed with ASC 901

The PlaneView II Avionics Software version 'Block Point I' upgrade will be installed in all Gulfstream GVI (G650) airplanes from S/N 6001 to S/N 6093 via Aircraft Service Change (ASC) 901 and as standard equipment in S/N 6094 and subsequent. It includes the following functions (in alphabetical order):

- Alternate Flight Plan Performance Predictions
- Automatic Dependent Surveillance – Broadcast, transmit only (ADS-B Out) ¹
- Automatic Navigation Preview of ILS Approaches
- Circling Approaches in Navigation Approach Database
- Control of Waypoint Crossing Time during Cruise Phase of Flight
- Delete the Flight Plan FROM Waypoint
- EGPWS Mode 5 ("Glideslope") Alerting for LPV Approaches
- Engine-out Drift Down Distance and Altitude Depiction
- Flight Plan Route Depiction on Vertical Situation Display (including terrain and vertical weather radar depiction with respect to the flight plan route)
- FMS Automated Speeds for All Flight Phases and Airplane Configurations
- FMS Crossing Points: Equal Time Point (ETP), Point of No Return (PNR)
- FMS Redundancy Management Modification
- Increased Flight Plan Waypoint Capacity: 200 Waypoints
- Main Entry Door Emergency Switch Access Door on DOORS Synoptic
- Navigational RNP for each Leg Segment of Instrument Approach Retrieved from Navigation Database
- Planned and Optimal Step Climbs
- Polar Operations (above 89° latitude)
- Range and Time to Reserve Fuel Quantity Remaining
- RNAV RNP 0.1 Navigation Capability ²
- Secondary Flight Plan
- Subsequent Flight Plan Leg Course Depiction on HSI during Waypoint Transition ('Ghost Pointer')

- Temperature Compensation for FMS Flight Plan Altitudes
- Undo Direct-To Flight Plan Waypoint
- ‘Vectors to Final’ Approach Course Intercept
- Vertical Direct-To Waypoint Altitude

Notes:

- ¹ Installation is in accordance with the criteria for ADS-B Out operations outside of US designated airspace (e.g., EASA Approved Means of Compliance (AMC) 20-24, FAA OPSPEC / MSPEC / LOA A353 and Australian Advisory Circular (AC) 21-45) and is not sufficient for compliance with 14 CFR 91.225 and 91.227.
- ² RNAV RNP AR approach capability authorisation will be acquired separately.